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Handbook to Strategy 1 Fungal Species in the Northwest Forest Plan

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Cover

The mushroom genus *Phaeocollybia* is represented by 25 species in the Pacific Northwest. *Phaeocollybia* is placed in the family Cortinariaceae and is typified by ornamented, brown basidiospores, presence of a distinct pseudorhiza, a cartilaginous stem cortex, and a glabrous, viscid, umbonate cap. *Phaeocollybia sipei* A.H. Smith a strategy 1 fungus species from table C-3 in the record of decision is presented on the cover. *Phaeocollybia sipei*, although locally abundant at times, is rarely encountered and is known from only seven locations, all within Oregon. Photo courtesy of L. Norvell.

Handbook to Strategy 1 Fungal Taxa from the Northwest Forest Plan

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Abstract

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There are 234 fungal species listed in the record of decision (ROD) for amendments to Forest Service and Bureau of Land Management planning documents within the range of the northern spotted owl. There are four strategies to established guidelines for the survey and management of various organisms, including amphibians, mammals, bryophytes, mollusks, vascular plants, lichens, arthropods, and fungi. Strategy 1 (S1) entailed compiling all known distribution and ecological information on 147 fungus species. Other strategies convey protection or encourage the collecting of additional geographic and habitat information.

Upon further taxonomic examination of the S1 fungal species, it was determined that only 135 separate species existed, with the others reduced to synomomy. Most of these S1 fungal species are poorly known and uncommon to rare. A few S1 fungal species were revealed to be much more common than previously thought. This handbook was designed to facilitate understanding of the life history of all S1 and protection buffer species and to aid in their discovery and identification. Each species is represented by a condensed description, a set of distinguishing features, and information on substrate, habitat, and seasonality. We also present a list of known sites within the range of the northern spotted owl, a distribution map and additional references to introduce the available literature on a particular species. A set of artificial taxonomic keys is presented to aid the worker in identification. A partially illustrated glossary helps introduce the novice to mycological terms.

Keywords: Mycology, mushrooms, sequestrate fungi, truffles, biodiversity, monitoring, rare fungi, forest ecology.

Contents

INTRODUCTION

The social and political setting leading to the development of this handbook

Recent interest in conserving biological diversity has led to a Federal mandate to inventory forest organisms, previously ignored, occurring within the range of the northern spotted owl (*Strix occidentalis caurina*). For the first time, fungi, nonvascular plants, and invertebrates are part of forest management issues in the Pacific Northwest. The Pacific Northwest, a geographical region encompassing southeast Alaska, British Columbia, Washington, Oregon, Idaho, western Montana, and northern California, contains ancient (old-growth) forests that have experienced little or no human disturbance for centuries, resulting in a late-successional or climax stage in forest development (Norse 1990). Much controversy has surrounded the management and harvest of these late-successional forests during the last decade, polarizing environmental and timber harvesting groups. Legal challenges surrounding the protection of the northern spotted owl, declared "threatened" by the U.S. Fish and Wildlife Service in 1990, essentially brought timber sales on Federal land in the region to a halt by 1993 (Thomas 1997). Political and legal debates over forest management plans clarified that the issue was not one of saving or maintaining viable populations of an individual species, but was centered on public and scientific concerns with the maintenance of ecosystem functions (Thomas 1997). The increased awareness that many species, in addition to the northern spotted owl, depend on this diminishing habitat helped bring about a more holistic approach to forest management. This new approach, ecosystem management, is defined by Thomas (1997) as "a concept for dealing with larger spatial scales, longer time frames, and many more variables (ecological, economic, and social) than have commonly been considered in past management approaches."

Conservation of forest fungi and the Northwest Forest Plan

President Clinton took steps to end the court-ordered injunction on logging by convening a forest conference in Portland, Oregon, on April 2, 1993. Following the conference, the Forest Ecosystem Management Assessment Team (FEMAT) was formed to develop management alternatives (within the context of environmental laws) to balance forest conservation with the economic and social needs of people in the Pacific Northwest (FEMAT 1993). The team focused on the maintenance and restoration of biological diversity, particularly in late-successional and old-growth forests within the geographic range of the northern spotted owl. FEMAT evaluated the likelihood of maintaining sufficient well-distributed habitat on Forest Service and Bureau of Land Management lands to provide for continued viability of 1,119 species within eight groups of organisms (fungi, lichens, bryophytes, amphibians, mammals, mollusks, vascular plants, and arthropods) associated with late-successional forests.

The panel of mycological experts identified 527 fungal species (nearly half of all species listed) as strongly associated with old-growth forests or their legacy (for example, coarse woody debris). The final supplemental environmental impact statement (FSEIS; USDA and USDI 1994a) includes additional analysis on late-successional- and old-growth-related species. It focuses on public comments to the preferred alternative (alternative 9) and addresses the following objectives: (1) identify species needing additional consideration and analysis, (2) gather pertinent information on potential impacts of forest management on these species, and (3) discuss specific mitigation measures, including their benefits and costs of implementation.

Of the 1,119 species initially considered, 715 had adequate habitat protection or were not expected to be adversely affected by the cumulative effects of anticipated land management activities, so they were dropped from further consideration. The FSEIS specifies site management for specific localities from which the original specimens of a species were collected, providing the site is within boundaries of the assessment area.

The final record of decision (ROD; USDA and USDI 1994b), the document that specifies how the FSEIS will be implemented, lists 234 fungal species in table C-3 that require some level of attention under the four survey-and-manage strategies of the plan. Survey strategy 1 requires management of known sites for all species shown in table C-3. Of the 234 species, 129 are known from only one or a few sites; 80 are endemic to the Pacific Northwest, others appear more common. Sites with rare and endemic fungus species will have 64.8 hectares (160 acres) temporarily withdrawn from management activities until those sites can be thoroughly surveyed and site-specific management measures prescribed. One particular fungus, the "noble polypore" (*Bridgeoporus nobilissimus*), will have 240 hectares (600 acres) of habitat protected from disturbance at each known site. Survey strategy 2 requires surveys before the occurrence of any ground-disturbing activities. Two fungus species require this protective strategy: *Bridgeoporus nobilissimus* and *Bondarzewia mesenterica* (Schaeff.) Kreisel, (=*B. montana* (Quel.) Sing.). *Bondarzewia mesenterica* was inadvertently placed in strategy 2 because it was at first thought to form perennial sporocarps, it does not. The annually variable, ephemeral nature of its sporocarps limits our ability to discover it during surveys for a major portion of the year or in any one year. Survey strategy 3 requires conducting extensive surveys to find additional high-priority sites for species management. All 234 fungal species are included in survey strategy 3, and protocols are currently under development. The general regional surveys of survey strategy 4 are designed to provide further information about little known species not yet designated as rare and endemic. These regional surveys began in 1996 and are expected to take 10 years to complete.

Purpose and scope of this guidebook

The FEMAT guidelines mandate unprecedented study of fungi in forests occurring within the range of the northern spotted owl. The purpose of this handbook is to acquaint Forest Service and Bureau of Land Management personnel and others with the species of fungi in table C-3 occurring from the Pacific coast to the east slope of the Cascade Range and from northwestern California to the Canadian border. Although FEMAT guidelines specifically address Federal forests within the range of the northern spotted owl in the Western United States, the surveys it mandates have increased awareness concerning the ecological importance of forest fungi and the need to ensure protection for these species (see Molina et al.1993, Pilz and Molina 1996).

To date no photographic book of the region's rare fungi has been published. This handbook will facilitate identification of survey strategy 1 fungi listed in table C-3 of the final Record of Decision (USDA and USDI 1994b). Maps of known locations, detailed descriptions, and references for further information are provided. A simple key for distinguishing among the survey strategy 1 fungal species is included, as well as guidelines for collecting voucher specimens and recording information. Additionally, this handbook introduces the reader to the role of fungi in forest ecosystems and their unique features that distinguish them from other organisms.

Over the past two years the authors have sought photographs of the 234 fungi listed in table C-3 of the ROD (USDA and USDI 1994b). Many are included in this handbook and all photographs used

are with permission of the photographer. We appreciate all the mycologists who contributed photographs, as these photographs and the accurate identification of the specimens reflect lifetimes of dedication to the field of mycology. Photographers' names are displayed next to the photos and listed in the acknowledgments. Many more photographs and fleeting photo opportunities remain to be found and incorporated into subsequent editions. If you have photographs or slides that you would consider contributing, please contact the Regional Mycologist, USDA Forest Service, Pacific Northwest Research Station, 3200 S.W. Jefferson Way, Forestry Sciences Laboratory, Corvallis, OR 97331.

Names and classification of fungi

As with all organisms, scientific nomenclature for fungi follows Carl Linnaeus' binomial system in which each species name consists of two parts: the generic component and a species component. A genus is a collection of species with similar traits. Although a genus name may be written alone to refer to a group of species, a species name written alone could describe many different species in different genera. By itself, a species name does not identify any organism. However, a genus with its species name describes a unique species; for example, *Agaricus brunnescens*, the button mushroom found in grocery stores, and *Agaricus campestris*, the meadow mushroom, are different species belonging to the same genus. Unlike plant species and the examples of *Agaricus* species, most fungi do not have well-recognized common names. The next taxonomic level above genus is that of family; families are then grouped in orders, classes, and phylums within a kingdom. Family names always end in "-aceae" and are groupings of genera that have some specific characters in common. Order names always end in "-ales." In the Agaricales, the taxonomic order for mushrooms possessing gills, family characters may include spore color, gill attachment to the stalk, presence or absence of a veil, etc. Below is an example comparing the classification of four well-known edible fungi (table 1).

Table 1 – Taxonomic comparison of four edible fungi species.

Category	Button	Shaggy mane	Chanterelle	Morel
Kingdom	Fungi	Fungi	Fungi	Fungi
Phylum	Basidiomycota	Basidiomycota	Basidiomycota	Ascomycota
Class	Basidiomycetes	Basidiomycetes	Basidiomycetes	Ascomycetes
Order	Agaricales	Agaricales	Aphyllophorales	Pezizales
Family	Agaricaceae	Coprinaceae	Cantharellaceae	Morchellaceae
Genus	*Agaricus*	*Coprinus*	*Cantharellus*	*Morchella*
Species	*brunnescens*	*comatus*	*cibarius*	*esculenta*

What distinguishes fungi from other organisms?

Fungi are an incredibly diverse group of nonphotosynthetic organisms that absorb their food, characteristically form branching threadlike cells called hyphae (yeasts are exceptions). Many species are capable of astonishingly rapid growth. They inhabit every possible environment. Although fungi have been traditionally grouped with plants, they have no direct evolutionary connection. More than 35 years ago, fungi were deemed distinct from plants and placed in their own kingdom (Whittaker 1959). The Kingdom Fungi is second only to insects in numbers of species. Over 200,000 fungal species have been described, but estimates of total fungi in the world range from 1 to 1.5 million (Hawksworth 1991). The vast majority of described fungal species are

microfungi (such as molds, mildews, and yeast) that produce reproductive structures not visible to the unaided eye. Although these are difficult to see, their presence does not go unnoticed in our everyday lives. They are active as yeast in bread, fermentors in wine, and sources of antibiotics. They cause athlete's foot, rot in houses and fence posts, and damage to crops. In contrast, less than 1 percent of the described species are macrofungi that produce relatively, large, showy reproductive structures (mushrooms, truffles, puffballs, shelf, and cup fungi).

Fungi are as distinct from plants as they are from animals or insects, although they share similarities with each. Unlike plants, fungi lack chlorophyll and therefore are unable to manufacture their own food from sunlight. Like animals and insects, they must feed themselves by absorbing carbon compounds from the immediate environment. Fungi have evolved enzymes for digesting recalcitrant substrates such as chitin (insect exoskeletons), keratin (hair, skin, horn, feathers), cellulose (most plant material), and even lignin (wood) (Kendrick 1992).

Like plants, most fungi are nonmotile although some possess motile spores. Fungi reproduce by spores which are simpler in structure than seeds or eggs.

How else are fungi like insects and plants? The walls of hyphae that extend through the soil or aggregate to form a mushroom or other type of sporocarp (fruiting bodies that produce spores) are mainly composed of the polysaccharides, chitin, and cellulose. Chitin is part of the exoskeletons of insects but is found nowhere in the plant kingdom. Cellulose occurs in wood and most plant material.

Comparing a fungus to a tree requires "seeing" beyond the fruiting body, such as a mushroom. The main body (thallus) of a fungus typically consists of an aggregation of filaments (hyphae, collectively called mycelium) that usually grows immersed in its substrate (wood, host tissue, or soil) and thus is concealed from casual observation (some may grow on the substrate surface; e.g., bread molds). This mycelium is analogous to a tree's trunk, branches, and roots. The familiar mushroom is simply the reproductive structure or fruit produced by that hidden network. As such, the mushroom is analogous to the fruit of a tree, such as an apple, and the spores are analogous to the seeds. Picking a mushroom is analogous to picking an apple from a tree and as such, usually should not harm the fungus so long as care is taken minimize disturbance. Some macrofungi form perennial sporocarps that cannot be collected without impacting the fungus; e.g., *Bridgeoporus nobilissimus*.

Detecting the presence of fungi

An individual fungal thallus may live for many years in one spot yet produce sporocarps briefly or infrequently. This cryptic nature and production of ephemeral reproductive structures poses problems in locating specimens. We currently depend on the occurrence of these sporocarps to detect the presence of a species. Only a relatively few species have perennial sporocarps. Therefore, a site must be repeatedly surveyed to detect or monitor fungal species of interest. Failure of a species to fruit for several years evokes uncertainty about whether the fungal colony has died, lies dormant, or is merely not fruiting (O'Dell et al. 1996).

Biology, ecology, and function of forest fungi

Macrofungi and microfungi alike contribute to the function of healthy forest ecosystems by forming

mutualistic, symbiotic associations with plants, decomposing organic matter, contributing to nutrient cycling, providing food for animals, and creating habitat diversity for many forest organisms. Microfungi include the molds, yeast, lichen symbionts, endophytes, endomycorrhizae, and plant pathogens. Microfungi are found throughout the forest, both high in the canopy as well as throughout the soil. They are more difficult to study than macrofungi, and their sheer numbers can overwhelm scientists and managers alike. Because they were not included in the ROD, microfungi will not be further discussed here.

Macrofungi come in a dazzling array of colors and forms and interact with a multitude of forest organisms. Table C-3 of the ROD includes mushroom, sequestrate, shelf, coral, teeth, club, and cup fungi forms. These forms largely make up a group commonly termed "fleshy fungi" although shelflike species can be hard and woody. The fleshy fungi are comprised of the two most highly evolved taxonomic classes in the fungus kingdom, the Basidiomycetes and Ascomycetes, which are distinguished by microscopic differences in how the spores are formed. Basidiomycetes produce spores on the outside of club-shaped cells called basidia, and Ascomycetes produce spores inside round to cylindrical saclike cells called asci. Basidiomycetes include mushrooms, puffballs, coral, teeth, and shelf fungi, and Ascomycetes include cup fungi and morels. Sequestrate (truffle and trufflelike) fungi can be either Basidiomycetes or Ascomycetes, although a distinction is sometimes drawn between true truffles (Ascomycetes) and trufflelike or false truffles (Basidiomycetes). The broad definition of truffle is typically applied in North America to refer to all fungi that have evolved a belowground fruiting habit, although the term "sequestrate" may more accurately define this group (Kendrick 1992, Smith 1995).

"Sequestrate" has been adopted by many mycologists to describe aboveground or belowground fungal sporocarps that have evolved an enclosed fruiting habit in which the spores are retained in the sporocarp until it decays or is eaten by an animal (Kendrick 1992). Evolution of sequestrate fungi from their aboveground relatives (mushrooms or cup fungi) resulted in the stalk being greatly reduced or lost and the cap or cup forming enfolded or potatolike sporocarps. Intermediate forms between aboveground mushrooms with forcible spore discharge and belowground sequestrate species can be found. The genus, *Thaxterogaster*, for example, has aboveground stalked members with enclosed caps.

Sequestrate fungi depend on mycophagous (fungus-eating) animals for spore dispersal. As sequestrate fungi mature, they produce odors that attract forest mammals, especially small mammals like squirrels, chipmunks, voles, and mice. These mammals excavate and consume sporocarps; spores pass through the digestive tract unharmed and are excreted in the animals feces (Maser et al. 1978, Maser and Maser 1988). Spores from the fecal pellets are washed into the soil where they contact roots of mycorrhizal hosts.

A large proportion of the mushrooms and sequestrate fungi in table C-3 of the ROD are mycorrhizal. Mycorrhiza, which literally translates as "fungus-root," refers to a common and mutually beneficial association between plants and specific fungi (Smith and Read 1997). Indeed, nearly all terrestrial woody plants depend on mycorrhizal fungi for their survival and growth. Mycorrhizal hyphae greatly extend the nutrient-absorbing surface area of the roots and are more effective in nutrient and water absorption than roots themselves. Soil nutrients essential to plant growth, such as phosphorus and nitrogen, are absorbed by the mycorrhizal fungus and transported to the root for use by the plant. In return, the plant provides sugars produced in photosynthesis to fuel activities of the mycorrhizal fungus. Plants generally associate with numerous species of

mycorrhizal fungi; Douglas-fir (*Pseudotsuga menziesii*) may associate with as many as 2000 species (Trappe 1977). The ability of plants to form mycorrhizae with numerous fungus species benefits the host by increasing access to nutrients and water and by protecting against fine-root pathogens.

Mushrooms and sequestrate fungi are important wildlife food and are consumed by numerous forest animals including deer, elk, bear, small mammals, slugs, insects and birds (Carey 1991; Fogel and Trappe 1978; Maser et al. 1978). The sporocarps provide animals with minerals, amino acids, proteins, carbohydrates, and vitamins. Some rodents, such as the California red-backed vole (*Clethrionomys californicus*) and northern flying squirrel (*Glaucomys sabrinus*), rely on mushrooms and sequestrate fungi for over 90 percent of their food supply (Hayes et al. 1986; Maser et al. 1978, 1985). In turn, these small mammals are primary food for predators such as the northern spotted owl.

In addition to mycorrhizal fungi, fungi can be divided into two other categories based on their relation to their environment. Pathogenic fungi inhabit the living tissue of plants, animals and even other fungi, typically causing damage and disease. They contribute to habitat diversity in forests by killing trees that later become snags and logs inhabited by wildlife and a variety of other organisms. Openings develop in the canopy when diseased trees die and fall, allowing shade-intolerant plants to flourish in the increased light (Holah et al. 1993). Some pathogenic fungi, such as *Cordyceps* species, parasitize insects, spiders and certain truffles. Pathogenic fungi include microfungi and shelf and mushroom forms.

Saprobic fungi perform essential ecosystem functions by decomposing dead organic matter (wood, humus, plant material, dung, bones, insects, etc.) and cycling nutrients. Wood-decay fungi soften the interiors of snags and logs, allowing birds, reptiles, amphibians, insects, small and even some large mammals to burrow into them and create homes (Harmon et al. 1986; Maser et al. 1978, 1988; Perry 1994; Thomas et al. 1979). Many wood-decay fungi are associated with late-successional forests and are included in table C-3 of the ROD, including *Bondarzewia mesenterica* and *Bridgeoporus nobilissimus*. Saprobic fungi include cup, shelf, earth tongue, mushroom, and toothed forms.

Cultural attitudes concerning fungal diversity

Fear, mystery, repulsion, reverence, indifference or delight reflect culturally- influenced attitudes people have toward fungi. Fungiphobia (the fear of fungi), a term coined by British mycologist W.D. Hay (1887), concisely depicts the viewpoint towards mushrooms of most British and their colony descendants. The antithesis of this view is held by a majority of other cultures throughout the world. In Slavic cultures of eastern Europe and Russia, only rarely does a family not gather wild, edible mushrooms. The Italians and French are also avid mushroom and truffle hunters. People in most African countries place a great importance on gathering mushrooms for culinary and medicinal uses (Benjamin 1995). Although mushrooms are eaten in India and are most popular in the northern mountainous area near the Himalayas, they are not as prized there as in the rest of the Southeast Asian continent. Some mushrooms and puffballs were used by native North Americans for medicine, spiritual, and ceremonial purposes.

The Asian cultures of China and Japan are strongly mycophilic (lovers of fungi). Fungi have been revered by the Chinese for over 3,000 years, not only as esculents but for maintaining health and

promoting longevity (Hobbs 1995, Stamets 1993). Several species of fungi listed in table C-3 of the ROD, including *Cantharellus formosus* and *Cordyceps ophioglossoides*, historically have been used medicinally (Hobbs 1995). In China, fungi with medicinal properties are mostly sought by people in remote and sparsely populated areas, although some varieties are cultivated. Most of the culinary mushrooms in China are varieties easily cultivated, because access to natural habitats is limited for the average Chinese citizen.

Dense populations in Japan also have encouraged the cultivation of many popular edibles. Most attempts to cultivate mycorrhizal species, such as the prized matsutake (*Tricholoma matsutake*), however, have not proven successful. As a result, the Japanese have developed an enthusiasm for the hunt itself that mirrors the fervor displayed by the Russians towards mushroom gathering. Literally thousands of Japanese take to the forests each fall in search of matsutake. Declining forest health, however, has greatly reduced and threatens matsutake production in Japan (Hosford et al. 1997).

In the Pacific Northwest, habitat alteration, principally due to logging and urbanization, and the potential impacts from commercial harvest of mushrooms are the primary concerns surrounding loss of fungal diversity. European studies provide salient documentation for this concern; decreased or discontinued sporocarp production has been noted among many species of macrofungi, coincident with widespread forest decline (Gulden et al. 1992) and loss of forest habitat. In several long-term studies, diversity of ectomycorrhizal species has diminished by half since the 1950s (Arnolds 1991). Fungus species associated with late-successional forests show the greatest decline. We have much to learn from forestry practices and fungal surveys conducted in other countries of the world.

The many reasons for maintaining diversity of forest fungi include (1) unknown potential for producing medicines to combat bacterial and viral diseases, (2) significant commercial value, (3) intrinsic value, and (4) sustaining ecosystem productivity and a healthy environment. People are an integral part of ecosystems and their successful management. We cannot discount the importance of poorly understood organisms to ecosystem function. The importance of the diverse fungal community of Pacific Northwest forests to tree growth and interactions with forest organisms, and to people for medicines and esculents, is still being discovered.

Methodology

Voucher specimens

Collection of voucher specimens of mushrooms, cups, corals, and sequestrate fungi is requisite to document species occurrence. In general, specimens should be annotated with appropriate information on species identity, location, date, habitat, and collector, and then sent to a recognized herbarium for long-term storage (see appendix H2 for forms). All collections of suspected or confirmed ROD-listed fungal species should be sent for verification to the Regional Mycologist (3200 S.W. Jefferson Way, Corvallis, OR 97331). Except in the case of multiple collections of extremely common species from the same locality in a narrow timeframe, all collections should have a voucher. Large collections of common species do not provide additional useful information, particularly for a location where collection has occurred previously. One to five representative specimens (depending on size) of each of the common species per collecting period is adequate to document presence over time. Most if not all specimens of rare or uncommon species should be carefully harvested, dried, and sent to a herbarium, as these may yield additional morphological information or represent incompletely known taxa. Remember, sporocarps are like apples from a tree, if you are careful not to disturb the substrate then minimal damage will be done to the actual organism itself.

Some fungi can be reliably identified with few or no notes, others require at least some notes for identification to species. *For the novice collector and identifier, notes are critical*. Some of the important characters to record include the surface texture, fresh colors and odors, subsequent color after exposure and handling (after 10-20 minutes and again after 2-3 hours or the next day after storage in a refrigerator), color after drying, and whether the specimens exude a latex from a cut surface or the cut surface of a specimen changes color. Use the appropriate field form (see appendix H2) to record fresh characters. The date, specific location, and notes on the plant community, particularly the large woody plants, are important in reporting on the ecology of these fungi. Note whether the specimens were found on the soil surface (epigeous), were emergent, or were completely below the surface of the ground (hypogeous). Note whether they were found solitary, in groups of two or more, or in clusters. See the field forms (appendix H2) for location and ecological data that should be recorded. Until processed, fungal specimens are best kept in cool conditions in waxed-paper sandwich bags, loosely rolled up in wax paper, or loosely rolled up in aluminum foil. Never use plastic wrap or closed “air-tight” containers because they lead to anaerobic conditions that stimulate resident bacteria and other microorganisms that can quickly degrade the condition of the sporocarp(s).

Specimens should be described and then dried as soon as possible, preferably within 1 day from collection. If specimens of some species are in prime condition when collected, and they are handled properly, and stored correctly, they can be kept for several days before drying. Once begun, deterioration proceeds rapidly and then much of a specimen’s value for later study is lost.
Rapid drying using moving air at relatively low temperatures has proved the most successful in preserving most fungi. A food dryer set at ≈30-40 ˚C works well. Good air circulation is critical to rapidly dry specimens. Specimens can deteriorate quickly when heat alone is used. When electricity is not available, there are alternative methods to dry specimens. If specimens are not large (<2 cm wide) they should be thinly sliced, ±2 mm in thickness, and placed in a sealed, air-tight container with predried silica gel (4-5 times gel to specimens in volume). Care should be taken to pack the specimens closely in the silica gel. Specimens should not touch each other within the container.

Air space within the container should be kept to a minimum to ensure the effectiveness of this method. No more than one collection should be put in a container because, when dried, species often can be difficult to separate by macroscopic characters. One to two days will dry specimens sufficiently if the volume of silica gel is adequate for the quantity of specimens. Use the indicator crystals to tell when the gel is wet. Specimens dried by silica gel should be transferred to a more conventional dryer at the first opportunity to ensure that they dry completely. You can redry the silica gel in the field in a frying pan over a low fire. Keep well-dried specimens in sealable plastic bags to prevent rehydrating until you get them to the herbarium.

In circumstances where silica gel is unavailable or impractical because of size or number of specimens, specimens can be strung together with waxed dental floss and a large needle and suspended over a campfire. Care is needed to space the thin slices to allow air movement between them and adjustment to the right height above the heat is needed to prevent cooking while encouraging drying. Alternatively, lightweight frames covered with a fine aluminum mesh screen can be used. The screens can be suspended over the campfire or a fueled camp stove (set low) or exposed to a steady but not forceful breeze. Again, care is needed when using heat to prevent cooking while encouraging drying.

Special considerations –

Mushrooms – Notes on fresh characters, particularly colors, are critical to aid identification. A spore print from mushrooms is also important to aid identification. Cut off the stem of a fresh specimen and place the cap with the gills or pores facing down on a piece of black and white striped paper (see appendix H2) for 8-12 hours to capture a spore print on both dark and light surfaces. Wrap in aluminum foil or place in a container to prevent drying. Do not place specimens in the refrigerator or expose them to heat before setting up a portion of the collection to capture a spore print. For purposes other than obtaining a spore print, well-dried specimens are much easier to work with later than those preserved in liquid.

Sequestrate specimens – Information on colors is useful but usually not necessary for all species. When in doubt, take some notes on fresh characters. Each sporocarp should be cut at least in half to hasten drying; large specimens (those over 2-3 cm in diameter) should be cut in several vertical slabs of ±5 mm thickness. Many sequestrate species have leathery, somewhat impermeable peridia (outer skins) that slow drying. Other sequestrate species dry to the hardness of bone and any attempt to break open the sporocarp to access spores results in disintegration of the sporocarp. A cut cross section can readily be rehydrated with water or KOH and sectioned with a razor blade. Many sequestrate species resemble one another on the surface but differ strikingly in the interior. Examining the interior reduces the chance of including more than one species in a single collection.

Collecting protocols

It is difficult to impossible to recommend a specific protocol to collect fungi. Each protocol has strengths and weaknesses and the appropriateness of any one protocol is determined by the constraints of the project.

Most forests contain diverse microhabitats. Even in “uniform” plantations, the microtopography varies with localized wet and dry soil conditions. Distribution of woody debris is also variable, and the debris can be patchy, buried, or exposed. Some fungi are associated with or found in rotten

wood; i.e., some *Ramaria* spp., *Gymnopilus punctifolius*, *Radiigera* spp., and *Hydnotrya variiformis*. The patchiness of ground cover and shrub and herb layers also can dramatically affect the microclimate in restricted areas. Sites with heavy ground cover will be more difficult to search for specimens because of obstruction of view and difficulty in laying out plots. Slope and aspect will have an important effect on water relations and temperature. In the Pacific Northwest, south-facing steep slopes tend to be the driest and north facing gentle slopes the wettest. All these variables must be accounted for when designing sampling procedures for each sampling objective.

Fungal sporocarp production is relatively clustered (Fogel 1981; States and Gaud 1997). Also fungi differ in their sporocarp abundance and size. A major difficulty with using sporocarps to determine presence is the lack of data on the correlation between the presence of the thallus and sporocarp production. Some species produce sporocarps irregularly or infrequently.

Use of a relatively small number (with respect to the selected stand area) of random quadrants may not effectively sample the selected area. A large number of randomly distributed plots is necessary but impractical to achieve a well-dispersed sample pattern. Alternatively, systematic placement of fewer plots will achieve the best coverage for unit area sampled.

Sampling protocols

Methodology used in vegetation surveys is not completely adequate for use in fungal surveys owing to the need for repeated sampling of often cryptic populations.

Protocol implementation should be supervised by personnel trained in their use and in fungal identification. Before sampling, personnel should familiarize themselves with the general biology, ecology, habitat associations, and specific morphological features of target species. This will aid identification in the field and use field search time most efficiently.

Fungi can fruit any time of the year depending on weather and substrate. Some species fruit in the middle of the drought season in or on buried rotten wood or near streams or standing water. For the most part, fungi should be sampled in the warm, rainy season; e.g., in lowland areas, mid-October through December and April through June. Some fungi are restricted in sporocarp formation to a particular season (see seasonality data for target species). Freezing weather truncates or delays the maturation of sporocarps and high temperatures may accelerate drying of substrate and specimen, thus curtailing fruiting. When sampling across an elevational gradient, one should visit low elevation, south-facing slopes first in the spring but last in the autumn and high-elevation, north-facing slopes last in the spring and first in the autumn (Luoma 1988).

Periodicity

Each area surveyed should be visited every 2-3 weeks during the fruiting season(s). Surveys should be conducted for a minimum of 3 and preferably 5 years to increase the liklihood of detection (Arnolds 1981; Fogel 1981; Lange 1978; Luoma 1991; Luoma et al. 1991; O'Dell et al. 1992; Richardson 1970). Three to four days of lab work should be anticipated for each day of field work.

In general, fungi form sporocarps during a restricted portion of the year; some only in the spring, some in winter, still others in the autumn. The cryptic nature of sequestrate fungus sporocarps make them more difficult to detect than epigeous sporocarps. Nearly all sequestrate fungi fruit below the litter and some fruit well within the mineral soil layer.

Survey methods

The three survey methods of choice are plotless transects, line transects, or randomized plots. All can be implemented as permanent or temporary (moving) plots. Once a clear objective is identified and a full understanding of the resources available for sampling assessed, the best method can be selected to meet objectives with the available resources.

Line transects – This method has plots located along a line, which may or may not be straight. These plots should be widely dispersed in a stand and intercept a wider variety of microsites than a single circular plot of the same area (Luoma et al. 1996; Mehus 1986; Ohenoja and Metsänheimo 1987; Ruhling et al. 1984). This methodology is particularly useful when the exact habitat requirements of the target species is unknown. One method uses twenty-five 4-m^2 plots that comprise the sample. On slopes the upper, mid, and lower slope strata contain transects of 8, 9, and 8 plots, respectively. Plots may be placed every 6 m along 50 m (Luoma 1996b). A "collection" is defined as those sporocarps of the same species from a particular 4-m^2 plot. A total area of 100 m^2 per 5- to 15 hectare stand in twenty-five 4-m^2 circular plots gives a reasonable sample for a particularly small stand. Plots are marked with a flag or stake to avoid resampling the same area in a future sampling period. Another approach is to space plots 25 m apart on transects in the horizontal direction (along contour) and space transects 75-150 m apart in the vertical direction (across contour). A statistician should be consulted before sampling. Of course, any time the target species is encountered outside the plots, it should be collected and recorded.

Randomized plots – Though statistically sound, this method is logistically difficult to implement owing to the inordinate amount of resources needed.

Plotless transects (time-constrained search) – Before conducting the search, plan the search route to give an extensive reconnaissance-level approach to the entire area of interest. The most likely habitats should be identified and located on the landscape. Likely habitat should be intensively searched but other less likely habitat should not be ignored. Use moving rules to designate how much time will be spent in each designated area within the overall interest area.

Time of search applies only to time spent actively searching for sporocarps. When moving to a new site or collecting specimens that were found, the collector stops the timer. The time needed is unknown for any particular stand and will depend on size of the stand, accessibility, objectives, and available resources. Because of the uncertainty of fruiting, the site must be repeatedly sampled in any one year and over 3 to 5 years to be considered adequately assessed.

Special considerations for sequestrate species

In season, a good indicator of sequestrate fungus fruiting is the presence of fresh, small animal digs, 5-8 centimeters in diameter. Small animals, such as squirrels, mice, and voles, commonly unearth sequestrate fungi one at a time as they mature, leaving a small pit 2-8 centimeters deep. These small animal digs can sometimes be hard to distinguish from other types of digging; i.e., for seeds or insects, or from hoof prints. Sometimes only a portion of the specimen has been eaten and a portion remains at the bottom of the small pit. Many sequestrate fungi fruit in clusters so further exploration within a radius of 30-60 centimeters around a suspected fruiting spot often reveals additional specimens. It is best to rake into the soil to the depth of the nearby small animal dig. Needles, leaf fragments, and other debris or spider webs in a small animal dig indicate that it is not

fresh. Further exploration may yet reveal specimens, however, particularly if there are fresh digs scattered about in the habitat.

Plotless transects also can be useful in habitat with compacted soil or where the humus layer is thin. Under such circumstances, even small specimens form small humps at the soil surface that look detectable to the trained observer. Larger specimens often times are emergent from these small humps. Campgrounds, abandoned roads, road banks, and used or abandoned walking trails are sometimes productive.

Some caution is needed in repeated sampling for sequestrate fungal species. The nature of the sampling procedure for sequestrate fungi is disruptive. The disturbance of the microhabitat may adversely impact the microhabitat and render it uninhabitable by the rare fungus that once was resident. This is particularly evident in habitat such as coarse woody debris that is dismantled in sampling. Woody debris thus sampled does not rapidly, if ever, return to its former structure. It is our experience in low-elevation forests in western Oregon that soil substrate and concomitant herbs and forbs return to predisturbance levels 1 to 2 years after sampling.

Remarks concerning using the keys

The keys that follow, for the most part, contain only fungus species listed in the ROD as strategy 1 in table C-3 or as protection buffer. The number following a species name refers to the page number where that species description is found within the handbook. There are a few species of *Ramaria* keyed that are not included in the handbook. These are for the most part varieties of similar species, and it was thought that including them would help discriminate among varieites.

Arriving at a species determination should serve only to direct the reader to the species description within the handbook. In particular, the reader's attention should then be directed to the distinguishing features section for that species. If the characters of the specimen fit exactly the characters listed in the description, the specimen has a high likelihood of being that species. For the most part, verification of specimens should be done by an accomplished mycologist, as often there are non-ROD-listed species that are quite similar and difficult to distinguish.

Additional pictures of the species contained in this handbook can be found on the world-wide web at: **http://mgd.nacse.org/fsl/survey/**

Keys to taxa

(see Glossary for terms)

A. Sporocarp with a cap and (usually) a stem, the underside of the cap with radially arranged bladelike gills ..... **Gilled mushrooms**

B. Sporocarp soft to fleshy, with a cap and stem, the underside of the cap with a layer of tubes often easily separated from cap, tube layer over 0.5 cm thick at maturity ..... **Boletes**

C. Sporocarp sheetlike or cushionlike, smooth or lacking a cap and stem smooth or poroid ..... **Resupinate polypores**

D. Sporocarp with cap and stem, underside of cap with repeatedly forking, blunt ridges ..... **Chanterelles**

E. Sporocarp erect, unbranched (clubs) or branched corallike from a common base, cap lacking ..... **Corals**

F. Sporocarp minute, erect, unbranched, yellow with a differentiated flattened rounded cap ..... **Earth tongues**

G. Sporocarp cup, disc, or bowl shaped, stem present or absent ..... **Cups and allies**

H. Sporocarp with cap and stem, the cap saddle shaped or irregularly lobed (brainlike) ..... **Elfin saddles**

I. Sporocarp with the appearance of a distorted agaric or bolete or resembling a potato, interior solid, with gills, or irregular chambers, if gills present they are covered by a persistent veil ..... **Sequestrate fungi**

J. Sporocarp tough or leathery, with a cap and stem, the underside of the cap with a layer of tubes, tube layer less than 0.5 cm thick at maturity ..... **Stalked polypores**

A. Key to gilled mushrooms

1. Gills contorted and fused ..... **see sequestrate fungi**

1. Gills more or less radial and bladelike **2**

2. Spores deposit white, yellow or pink **3**

2. Spores deposit red-brown, brown or black **17**

3. Gills decurrent, thick, waxy, basidia 5 times as long as broad, fruiting in spring or near melting snow **4**

3. Gill not waxy, (but may be decurrent), basidia not 5 times as long as broad; may fruit in spring or near melting snow **5**

4. Cap blue to cream colored, often with basal rhizomorphs ..... see ***Hygrophorus caeruleus*** (60)

4. Cap yellow-brown when young, becoming tinged with bright pale vinaceous colors in age, viscid, less than 5 cm broad ..... see ***Hygrophorus vernalis*** (61)

5. Gills serrate, spores inamyloid, entire mushroom with red-brown resinous coating ..... see ***Neolentinus adhaerens*** (75)

5. Gills serrate, spores inamyloid, on *Picea* logs ..... see ***Neolentinus kaufmanii*** (76)

5. Not on *Picea* logs and gills not serrate, or if gills serrate then spores amyloid **6**

6. Stem slender, fragile; cap conic to campanulate, margin striate **7**

6. Stem not slender, or if slender then more tough and wiry; margin not striate **11**

7. Cap blue to dark blue-black ..... see ***Rhodocybe nitida*** (130)

7. Cap not blue **8**

8. Cap pink to red, gill edges and faces white; cheilocystidia with long projections (over 3 μm) that occasionally

branch ..... see ***Mycena monticola*** (72)

8. Cap some other color **9**

9. Cap gray, fruiting in spring, usually near melting snow ..... see ***Mycena overholtsii*** (73)

9. Cap not gray, or if gray fruiting in fall **10**

10. Cap gray to black, margin pale grey to white, fruiting in fall, cheilocystidia and pluerocystidia clavate with short spines; spores 8-10 µm long ..... see ***Mycena hudsoniana*** (71)

10. Cap brown-black, cap and stem viscid, cheilocystidia and pleurocystidia long pedicellate without spines .... see ***Mycena quinaultensis*** (74)

11. Cap white, often with pink tints, on conifer logs, cheilocystidia of two types: broadly clavate and obtuse and irregularly cylindric and the other nodulose to lobed ..... see ***Collybia bakerensis*** (22)

11. Cap not white with pink, or cheilocystidia otherwise **12**

12. Cap brown to dark red-brown, odor of garlic ..... see ***Marasmius applanatipes*** (67)

12. No garlic odor **13**

13. Cap tan to honey-brown, stem pale yellow to yellow-orange, fibrillose streaked, spores pink to pink-brown in deposit, angular, spores subglobose to obovoid, slightly angular ..... see ***Rhodocybe speciosa*** (131)

13. Cap not tan and scaly or spores not pink in deposit and not angular **14**

14. Cap white with gray to tan scales, stem silky fibrillose, white spore print, spores ellipsoid .... see ***Tricholoma venenatum*** (137)

14. Cap some other color, gill attachment otherwise or spore print not white **15**

15. Cap orange-yellow to yellow-tan, with tawny fibrils near margin, gills adnate, white spore print, spores broadly ellipsoid ..... see ***Tricholomopsis fulvescens*** (138)

15. Cap some other color or gill attachment otherwise or spore print not white **16**

16. If spores white, then gills decurrent **17**

16. Spores not white, gills not decurrent **18**

17. Cap, stem and gills gray, cap fibrillose matted, stem with white basal rhizomorphs ..... see ***Clitocybe senilis*** (20)

17. Cap, stem and gills gray-brown to gray-buff, cap glabrous, rhizomorphs lacking .. see ***Clitocybe subditipoda*** (21)

18. Spores black, up to 30 µm long, gill often contorted and fused, cap orange and fibrillose, partial veil present .... see ***Chroogomphus loculatus*** (19)

18. Spores brown to rusty brown **19**

19. Stem not deeply rooting **20**

19. Stem deeply rooting **28**

20. Cap viscid, violet to pale lilac, becoming white with a yellow disc, stem with marginate base, KOH on cap turns pink to red immediately ..... see ***Cortinarius olympianus*** (25)

20. Cap or gills colors different, cap not reacting to KOH **21**

21. Veil red ..... see ***Cortinarius boulderensis*** (23)

21. Veil not red **22**

22. Cap a variable blend of green, blue and yellow, lavender basal mycelium, on well-rotted wood .....

..... see ***Gymnopilus punctifolius*** (52)

22. Lavender basal mycelium lacking **23**

23. Cap dull cinnamon, viscid, veil faintly fibrillose ..... see ***Hebeloma olympianum*** (53)

23. Cap not dull cinnamon, or dry or lacking persistent veil **24**

24. Cap orange, with yellow veil remnants on stem and dark scales on cap ..... see ***Cortinarius rainierensis*** (26)

24. Without orange cap and yellow veil **25**

25. Cap brown, with enrolled margin and gray gills ..... see ***Cortinarius variipes*** (28)

25. Margin not enrolled or gills not gray **26**

26. Young gills olive-yellow, cap surface and flesh olive-yellow to dingy brown, cap surface turning purple-brown with application of KOH ..... see ***Dermocybe humboldtensis*** (31)

26. Young gills or cap some other color **27**

27. Cap gray-brown, with tan to gray-brown universal veil ..... see ***Cortinarius umidicola*** (27)

27. Cap vinaceous brown, viscid, stem with membranous annulus, on litter ..... see ***Pholiota albivelata*** (93)

28. Spores less than 8 µm long **29**

28. Spores greater than 8 µm long **31**

29. Clamp connections present ..... see ***Phaeocollybia dissiliens*** (86)

29. Clamp connections absent (or very infrequent) **30**

30. Stem stuffed, cheilocystidia cylindric ..... see ***Phaeocollybia oregonensis*** (89)

30. Stem hollow, cheilocystidia clavate ..... see ***Phaeocollybia sipei*** (92)

31. Cap typically greater than 8 cm broad ..... see ***Phaeocollybia kauffmanii*** (88)

31. Cap not more than 7 cm broad **25**

32. Cap small (less than 5 cm broad), taste bitter ..... see ***Phaeocollybia piceae*** (90)

32. Taste not bitter, cap usually broader **33**

33. Cap gray-brown, cheilocystidia cylindrical to clavate ..... see ***Phaeocollybia gregaria*** (87)

33. Cap orange to yellow-brown, cheilocystidia with a thin neck and capitate **34**

34. Cap orange-brown to brown, cap surface viscid not glutinous, sporocarps not fasciculate ..... see ***Phaeocollybia californica*** (85)

34. Cap yellow-brown to black-brown, cap surface highly glutinous, sporocarps fascicualte ..... see ***Phaeocollybia scatesii*** **(**91**)**

B. Key to boletes

1. Tubes yellow in youth, becoming green-yellow to olive ..... see ***Boletus haematinus*** (10)

1. Tubes red to dark brown to black **2**

2. Tubes dark brown to black, tubes bruising blue ..... see ***Tylopilus porphyrosporus*** (140)

2. Tubes dark red to red-brown ..... see ***Boletus pulcherrimus*** (11)

C. Key to resupinate polypores

1. Sporocarps small (<5 mm) cushion to disc shaped, pale yellow-brown hymenial surface on twigs, spores smooth ..... see ***Acanthophysium farlowii*** (1)
1. Sporocarps resupinate with irregularly warty hymenial surface, ochraceous-buff hymenial surface, spores ornamented, on dead conifer wood ..... see ***Dichostereum boreale*** (34)

D. Key to chanterelles

1. Cap yellow to yellow-brown to orange, hymenium sometimes with pink tones, odor often sweet .... see ***Cantharellus formosus*** (15)
1. Cap dark blue to black, hymenium concolorous, odor mildly pungent ..... see ***Polyozellus multiplex*** (96)

E. Key to corals

Due to the difficulty in working with *Ramaria* species we present both a traditional dichotomous key and a synoptic key. We suggest that the novice try both to build their skills in working with this troublesome genus. These keys contain all the *Ramaria* species from the ROD including the strategy 3 species. We hope this helps in identifying the closely related species that are slightly more common than the strategy 1 species.

Key to Subgenera of *Ramaria*

(after Marr and Stuntz 1973)

1. Spores striate ornamented, flesh usually amyloid ..... **Subgenus *Ramaria***
1. Spores smooth, warted or spiny, not striate, flesh in the majority of species inamyloid (except species of the *R. subbotrytis* complex) **2**
2. Sporocarps terricolous, spores smooth or warted, flesh and rhizomorphs monomitic ..... **Subgenus *Laeticolora***
2. Sporocarps with one or more of the following characters: (1) lignicolous or duff habit, (2) spiny spores, (3) skeletal hyphae **3**
3. Spores echinulate or echinulate-verrucose, with duff habit; rhizomorphs extensively developed, monomitic .... **Subgenus *Echinoramaria***
3. Spores smooth or warted, not spiny, lignicolous or duff habit, rhizomorphs extensively developed, dimitic in most species (except *R. apiculata*) ..... **Subgenus *Lentoramaria***

General descriptions of the subgenera in *Ramaria*

Subgenus *Ramaria*

Sporocarps generally large, profusely branched, entirely white, pale yellow, alutaceus, or upper branches orange, red to violet; spores ornamented with cyanophilic striae sometimes subreticulate or subverruculose, flesh usually amyloid.

Subgenus *Laeticolora*

Sporocarps generally large, profusely branched, terrestrial, often brightly colored in yellow, orange and red shades, a

few species cream, violaceous, or brown; spores of most species warted, ornamentation consisting of fine to coarse, irregularly shaped, cyanophilic raised areas, in a few spores smooth, flesh and rhizomorphs monomitic, hyphae with or without clamp connections.

Subgenus *Echinoramaria*

Sporocarps generally small, in a few species of medium to large size, growing on twig litter, cones, needle duff or leaf mold, rhizomorphic strands commonly conspicuous, and a well-developed felty basal tomentum or mycelial mat usually present; sporocarps cream, yellow, olive, green, or with brown shades, sometimes changing color where bruised; hyphae thin walled, monomitic, clamp connections frequently of the loop type or clamp cell vesiculate; spores echinulate or subechinulate, spines 0.2-3 µm tall.

Subgenus *Lentoramaria*

Sporocarps generally small to medium sized, habitat lignicolous or sublignicolous (growing from twig and leaf litter), rhizomorphic strands commonly conspicuous, and a well-developed felty basal tomentum or mycelial mat sometimes present; sporocarps cream, yellow, green, or with brown shades, sometimes quickly changing color where bruised; hyphae thin or thick walled, monomitic or dimitic, clamp connections present; spores smooth or finely warted.

Key to species of the subgenus *Ramaria*

1. Upper branches pale orange to brown, stem opaque white, bruising pale yellow to gray-orange, spores 12-16 x 4-6 µm ..... see ***R. botrytis* var. *aurantiiramosa*** (101)

1. Upper branches with red tones **2**

2. Red color of terminal branches evanesce at maturity, upper branches axils U-shaped, somewhat divergent, forked to multiforked near apices, stem milk-white discoloring yellow, bruising brown-violet, spores 10.5-14 x 4.5-5 µm, striae closely spaced ..... see ***R. rubrievanescens*** (116)

2. Red color of terminal branches persists at maturity, upper branches with axils mostly acute to subacute, forked to multiforked near apices, stem milk-white to yellow-white and do not bruise red to violet brown, spores 8-13 x 3.5-4.5 µm, striae oblique to longitudinal ..... see ***R. rubripermanens*** (117)

Key to species of the subgenus *Laeticolora*

1. Sporocarps with terminal branches distinctively enlarged, resembling irregular clubs, spores 9-10.5 x 4–5 µm .... see ***R. claviramulata*** (103)

1. Sporocarps with terminal branches not resembling a club **2**

2. Basidia with clamp connections at base, clamp connections frequent in the subhymenium and flesh of the branches **3**

2. Basidia without clamp connections at base, true clamp connections rare in the subhymenium and flesh of the branches **6**

3. Stem amyloid when fresh **4**

3. Stem inamyloid when fresh **5**

4. Lower branches distinctively staining red, flesh does not react with 10 percent $Fe_2(SO_4)_3$, spores 9-11 x 4-5 µm

with fine warts in subspirals ..... see ***R. maculatipes*** (112)

4. Lower branches occasionally bruised violet-gray, flesh react instantly blue-green with 10 percent $Fe_2(SO_4)_3$, spores 7-10 x 3-4 µm with fine warts in lines ..... see ***R. amyloidea*** (98)

5. Stem white bruising strongly red brown, branches white to pale yellow with pale green-yellow apices, spores 11.6-15.8 x 4-5 µm with discrete low warts ..... see ***R. thiersii*** (120)

5. Stem white to pale yellow not bruising red-brown, branches pale orange with intense orange apices, spores 11-15 x 3.5-5 µm with distinctive, irregularly shaped warts in subspirals ..... see ***R. largentii*** (110)

6. Spores finely warted or smooth **7**

6. Spores distinctively warted **8**

7. Stem medium sized, single and slender, white to orange-white, stem and lower branches staining dark red, flesh fleshy-fibrous without a brown fan-shaped area when cut longitudinally, fall fruiting, spores 10-14 x 3.5-5 µm, smooth to finely ornamented ..... see ***R. rubribrunnescens*** (115)

7. Stem large to massive, single white to off-white, slowly stains pale purple-gray where handled, flesh watery off-white, usually with brown band, spring fruiting, spores 8-13 x 3-4 µm, smooth to a few ill-defined, small, low warts ..... ***R. coulterae*** (not in handbook)

8. Flesh amyloid **9**

8. Flesh inamyloid **10**

9. Branches scarlet in youth, fading to pale orange-red when mature and with apices intensely colored, stem white to pale orange, flesh without a brown band and no reaction with 10 percent $Fe_2(SO_4)_3$, spores 7-10 x 3-5 µm with small warts ..... see ***R. stuntzii*** (119)

9. Branches pale to pale orange with sunflower yellow apices, stem yellow-white covered with subareolate patches of brown to red-brown superficial hyphae, flesh with a brown band and reacts blue-green with 10 percent $Fe_2(SO_4)_3$, spores 8-11 x 4-6 µm ..... see ***R. celerivirescens*** (102)

10. Sporocarps typically fasciculate or caespitose **11**

10. Sporocarps not fasciculate or caespitose **14**

11. Flesh gelatinous when fresh. **12**

11. Flesh fleshy, rubbery, fibrous or cartilaginous **13**

12. Apices deep orange and not bruising dull violet, gleoplerous hyphae absent, spores 8-11 x 3.5-5 µm .... see ***R. gelatinoaurantia* var. *gelatinoaurantia*** (107)

12. Apices apricot-yellow, bruising dull violet, gleoplerous hyphae distinctive in stem, spores 8-11 x 3.5-5 µm .... ***R. gelatinoaurantia* var. *violetingens*** (not in handbook)

13. Sporocarps white, branches salmon to peach with pale to maize yellow branch tips, sometimes bruising pale violet in some areas, spores 6-10 x 4-6.5 µm ..... see ***R. fasiculata* var. *sparsiramosa*** (106)

13. Sporocarps white with small surface spots of red present, branches pale yellow to yellow, not bruising violet, spores 7.9-9.4 x 4.7-5.8 µm ..... see ***R. lorithamnus*** (111)

14. Flesh gelatinous when fresh. **15**

14. Flesh fleshy or fibrous **16**

15. Sporocarps stout, cauliflowerlike, broadly obovate to broadly pyriform in outline with abortive branchlets, branches pale yellow to pale orange, spores 9-11.2 x 4.5-6 µm ..... see ***R. verlotensis*** (121)

15. Sporocarps broadly fusiform to broadly obconic in outline without abortive branchlets, branches bright yellow to pallid salmon, spores 9.4-11.2 x 4-5 µm ..... see ***R. hilaris* var. *olympiana*** (109)

16. Sporocarps dark orange brown to brown overall, branches brown to violaceous brown, apices violaceous brown when young, concolorus with branches at maturity, spores 7.2-10.1 x 4.7-6.1 µm .... see ***R. spinulosa var. diminutiva*** (118)

16. Sporocarps yellowish, brown-white, red to salmon, branches not showing violaceous tints **17**

17. Basidia with masses of cyanophilic granules **18**

17. Basidia without masses of cyanophilic granules **20**

18. Apices pale yellow to yellow **19**

18. Apices pale red, never yellow, spores 8-10 x 4-5µm ..... ***R. cyaneigranosa var. elongata*** (not in handbook)

19. Branches intensely red; yellow apices, spores 8-15 x 4-6 µm ..... see ***R. cyaneigranosa var. cyaneigranosa*** (105)

19. Branches peach or salmon with minutely yellow apices, spores 7-11 x 3.5-6 µm .... ***R. cyaneigranosa var. persicina*** (not in handbook)

20. Branches and apices intensely yellow orange. spores 8.5-14 x 3-5 µm ..... see ***R. aurantiisiccescens*** (100)

20. Branches magenta, red, yellow-orange, brown-salmon **21**

21. Branches red in youth fading to pale red at maturity, apices maize-yellow or pale to deep orange when mature, spores 8-13 x 3-4.5 µm ..... see ***R. araiospora var. araiospora*** (99)

21. Branches intensely magenta red with blue tones, fading to pale red, apices magenta in mature specimens, spores 8-14 x 3-5 µm ..... ***R. araiospora var. rubella*** (not in handbook)

Key to species of the subgenus ***Lentoramaria***

1. Spores small, 5-6.5 x 3.5-4 µm, skeletal hyphae strongly cyanophilic, resembles *Ramariposis kunzei* .... see ***R. gracilis*** (108)

1. Spores large, 6.5-11 x 3.5-6 µm, skeletal not cyanophilic, does not resemble *Ramariposis kunzei* **2**

2. Generative hyphae with inflated clamp connections, up to 13 µm broad, coarsely ornamented, spores 7-11 x 4.4-6 µm, cyanophilic warts in subspirals ..... see ***R. rainierensis*** (113)

2. Generative hyphae without ornamentation **3**

3. Sporocarps with pink-cinnamon coloration **4**

3. Sporocarps with brown coloration **5**

4. Rhizomorphs white, changing to bright pink in 10 percent KOH ..... ***R. rubella* f. *rubella*** (not in handbook)

4. Rhizomorphs white unchanging in 10 percent KOH ..... see ***R. rubella* f. *blanda*** (114)

5. Sporocarps up to 7 cm tall, stem indistinct to short often branched at the base, branches few and erect, pallid ochre to pink-brown, axils concolorous without green coloration ..... ***R. suecica*** (not in handbook)

5. Sporocarps up to 14 cm tall, stem distinct, branches dull brown to orange-brown, axils concolorus or green **6**

6. Branches open and lax, curved ascending, axils without green coloration ..... see ***R. concolor* f**. ***marrii*** (104)

6. Branches crowded and erect, axils with green coloration ..... ***R. concolor* f. *tsugina*** (not in handbook)

Synoptic key to *Ramaria* species contained in the ROD

1. *R. amyloidea*
2. *R. araiospora var. araiospora*
3. *R. aurantiisiccescens*
4. *R. botrytis var. aurantiiramosa*
5. *R. celerivirescens*
6. *R. claviramulata*
7. *R. concolor f. marri*
8. *R. concolor f. tsugina*
9. *R. conjunctipes var. sparsiramosa*
10. *R. coulterae*
11. *R. cyaneigranosa var. cyaneigranosa*
12. *R. cyaneigranosa var. elongata*
13. *R. cyaneigranosa var. persicina*
14. *R. gelatiniaurantia var. gelatiniaurantia*
15. *R. gelatiniaurantia var. violeitingens*
16. *R. gracilis*
17. *R. hilaris var. olympiana*
18. *R. largentii*
19. *R. lorithamnus*
20. *R. maculatipes*
21. *R. ochraceovirens*
22. *R. rainierensis*
23. *R. rubella f. blanda*
24. *R. rubribrunnescens*
25. *R. rubrievanescens*
26. *R. rubripermanens*
27. *R. stuntzii*
28. *R. suecica*
29. *R. synaptopoda*
30. *R. thiersii*
31. *R. verlotensis*

Macroscopic characteristics

(underlined numbers reflect that particular number occurs within more than one character)

Stem yellow: 2, 3, 5, 14, 15, 17, 18, 22, 23, 25, 26, 31

Stem orange: 1, 16, 17, 20, 22, 23, 24, 27, 31

Stem with pink tones: 23

Stem red to magenta: 31

Stem white to cream: 1, 2, 3, 4, 5, 6, 9, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 22, 23, 24, 25, 26, 27, 29, 30, 31

Stem brown: 1, 2, 5, 6, 7, 23

Stem tan to gray-orange (this could be just tan): 7, 16, 22

Branches green: 19

Branches yellow: 3, 6, 9, 13, 15, 16, 17, 19, 22, 23, 25, 29, 30, 31

Branches orange: 1, 3, 5, 6, 9, 12, 13, 14, 15, 16, 17, 18, 20, 22, 23, 24, 25, 26, 27, 30, 31

Branches with pink tones: 1, 2, 6, 9, 11, 12, 16, 19, 20, 23, 24, 25, 26, 31

Branches red to magenta: 2, 27

Branches white to cream: 4, 16, 22, 25, 29, 30

Branches gray to violet: 1

Branches brown: 7, 12, 23, 24

Branches tan-gray: 6, 7, 16, 22, 31

Branch tips green: 30

Branch tips yellow: 1, 2, 3, 5, 6, 7, 9, 11, 13, 15, 16, 17, 19, 20, 22, 24, 29, 30, 31

Branch tips orange: 1, 2, 3, 4, 6, 12, 13, 14, 17, 18, 22, 24, 27, 31

Branch tips with pink tones: 1, 2, 6, 11, 12, 25, 26, 31

Branch tips red to magenta: 2, 25, 26, 27

Branch tips white to cream: 7, 16, 22, 23, 25, 26

Branch tips violet to gray: 1

Branch tips brown: 1

Branch tips tan to gray-orange: 6, 7, 16, 22

Stem flesh white to cream: 1, 2, 4, 5, 6, 9, 11, 12, 13, 14, 15, 16, 18, 20, 22, 23, 24, 25, 26, 27, 29, 30, 31

Stem flesh yellow: 2, 3, 23

Stem flesh orange: 20, 22, 23, 24, 27

Stem flesh with pink tones: none

Stem flesh red to magenta: none

Stem flesh with brown: 1, 2, 5, 6

Stem flesh tan to gray-orange: 6

Branch flesh yellow: 1, 2, 3, 5, 9, 11, 13, 14, 15, 20, 24, 30, 31

Branch flesh orange: 1, 2, 3, 5, 9, 12, 13, 18, 20, 22, 24, 25, 27, 30, 31

Branch flesh with pink tones: none

Branch flesh red to magenta: 2, 27

Branch flesh white to cream: 4, 6, 14, 16, 18, 22, 23, 25, 26, 29, 30

Branch flesh brown: 6, 12, 24

Branch flesh tan to gray-orange: 6

Base of stem rusty colored: 1, 5

Base of stem rusty not colored: 2, 3, 4, 6, 7, 9, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 22, 23, 24, 25, 26, 27, 29, 30, 31

Yellow band across flesh of lower stem present: 3, 14, 15, 17, 31

Yellow band across flesh of lower stem not present: 1, 2, 4, 5, 6, 7, 9, 11, 12, 13, 16, 18, 19, 20, 22, 23, 24, 25, 26, 27, 29, 30

Surface bruising vinaceous: 19

Surface bruising red: 19, 20, 23, 24, 25

Surface bruising violet: 1, 9, 15, 25

Surface bruising brunescent: 7, 19, 25, 30

Surface bruising yellow or orange or tan: 3, 4

Surface not bruising: 2, 5, 6, 11, 12, 13, 14, 16, 17, 18, 22, 26, 27, 29, 31

Base fleshy: 1, 2, 3, 4, 5, 6, 7, 9, 11, 12, 13, 16, 18, 19, 20, 22, 23, 24, 25, 26, 27, 29, 30

Base gelatinous: 14, 15, 17, 31

Branch flesh fleshy: 1, 2, 3, 4, 5, 6, 7, 9, 11, 12, 13, 16, 18, 19, 20, 22, 23, 24, 25, 26, 27, 29, 30, 31

Branch flesh gelatinous: 14, 15, 17, 31

Terrestrial: 1, 2, 3, 4, 5, 6, 9, 11, 14, 20, 22, 24, 25, 26, 27, 29, 30, 31

On decayed wood: 7, 16, 23

Spring fruiting: 10, 19, 26, 30

Autumnal fruiting: 1, 2, 3, 4, 5, 6, 7, 8, 9, 11, 12, 13, 14, 15, 16, 17, 18, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 31

Rhizomorphs present: 7, 16, 23

Rhizomorphs absent: 1, 2, 3, 4, 5, 6, 9, 11, 12, 13, 14, 15, 17, 18, 19, 20, 22, 24, 25, 26, 27, 29, 30, 31

Microscopic characteristics

(underlined numbers reflect that particular number occurs within more than one character)

Spores striate: 4, 6, 7, 19, 23, 25, 26

Spores with warts: 1, 2, 3, 5, 6, 7, 9, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 22, 23, 24, 27, 29, 30, 31

Spores smooth: 9, 24

Maximum spore length >7 ≤10 µm: 1, 7, 9, 12, 16, 19, 22, 23, 27

Maximum spore length >10 µm, ≤15: 2, 3, 5, 6, 11, 13, 14, 15, 17, 18, 20, 24, 25, 26, 29, 31, 27, 29, 31

Maximum spore length >15 µm: 4, 30

Spore width (maximum) ≤4: 1, 16

Spore width (maximum) >4 µm, ≤5 µm: 2, 3, 6, 7, 12, 14, 15, 16, 17, 18, 20, 24, 25, 26, 27, 29, 30, 31

Spore width (maximum) >5 µm, ≤6 µm: 4, 5, 6, 11, 13, 19, 22, 23, 25, 31

Spore width (maximum) >6 µm: 6, 9, 31

Basidia with cyanophilous granules: 1, 6, 11, 12, 13, 24, 25, 26, 27, 31

Basidia without cyanophilous granules: 2, 6, 29, 31

Basidia with basal clamps: 1, 4, 16, 18, 20, 22, 23, 25, 26, 30

Basidia without basal clamps: 2, 3, 5, 6, 9, 11, 12, 13, 14, 15, 17, 19, 24, 27, 29, 31

Gleoplerous hyphae present: 1, 2, 3, 4, 5, 7, 11, 12, 13, 14, 15, 18, 19, 20, 24, 25, 26, 27, 30, 31

Gleoplerous hyphae absent: 1, 2, 3, 5, 6, 7, 9, 14, 16, 17, 19, 22, 24, 25, 29

True clamp connections present on generative hyphae: 1, 4, 7, 16, 18, 20, 22, 23, 25, 26, 30

True clamp connections absent on generative hyphae: 2, 3, 5, 6, 9, 11, 12, 13, 14, 15, 17, 19, 24, 27, 29, 31

False clamps present: 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31

Macrochemical test on sporocarp flesh

Melzer’s reagent turning flesh dark purple or blue-black: 1, 4, 5, 6, 20, 25, 26, 27

Melzer’s reagent nonreactive or some shade of brown but not dark brown: 2, 3, 4, 6, 10, 11, 12, 13, 14, 15, 16, 17, 18,

19, 20, 21, 22, 24, 25, 26, 29, 30, 31

F. Key to earth tongues

1. Top bright orange to pale orange, stem finely scaly ..... see ***Bryoglossum gracile*** (14)

G. Key to cups and allies

1. Cup yellow, red, or orange **2**

1. Cup dark brown to purple or black **5**

2. Cup with well-developed stem in youth, fruiting in fall ..... see ***Sowerbyella rhenana*** (135)

2. Cup without stem, or fruiting in spring **3**

3. Fruiting on twigs or foliage of *Chamaecyparis nootkatensis*, usually near melting snow ..... see ***Gelatinodiscus flavidus*** (48)

3. Fruiting on some other substrate, cup bright orange **4**

4. Cups 0.5 to 3.5 cm diam., on soil ..... see ***Pseudaleuria quinaultiana*** (97)

4. Cups 1-1.5 mm diam., on twigs or foliage of *Abies* spp., usually near melting snow ..... see ***Pithya vulgaris*** (94)

5. Interior of sporocarp gelatinized **6**

5. Interior of sporocarp not gelatinized **7**

6. Spores capsule shaped, interior not highly gelatinized ..... see ***Sarcosoma latahense*** (132)

6. Spores elliptical, interior highly gelatinized ..... see ***Sarcosoma mexicana*** (133)

7. Sporocarps flat or cup shaped, lacking a stem **8**

7. Sporocarp erect, ear shaped or stipitate **9**

8. Spores capsule shaped ..... see ***Sarcosoma latahense*** (132)

8. Spores elliptical; cup margin cracking in stellate pattern ..... see ***Plectania milleri*** (95)

9. Sporocarp more or less mule ear shaped, erect, sessile, brown to deep purple-brown ..... see ***Otidea smithii*** (84)

9. Sporocarps with (often immersed) stem, stem usually with abundant, white-colored rhizomorphs ..... see ***Neournula pouchetii*** (77)

H. Key to elfin saddles

1. Cap in youth with margins uplifted, underside of cap villose **2**

1. Cap margins never distinctly uplifted **3**

2. Stem round in cross section, hymenial surface dark gray-brown, even ..... see ***Helvella compressa*** (54)

2. Stem ridged, hymenial surface gray-brown, mottled ..... see ***Helvella maculata*** (57)

3. Cap saddle shaped, stem round in cross section ..... see ***Helvella elastica*** (56)

3. Cap cup shaped, stem with deep ribs, ribs rounded ..... see ***Helvella crassitunicata*** (55)

I. Key to sequestrate fungi

1. Sporocarp surface more or less evenly covered with round to angular warts (use hand lens) ..... **Ascomycetes**

1. Sporocarp surface not warty **2**

2. Sporocarp solid in cross section (use hand lens) **3**

2. Sporocarp with one to many empty or spore-filled canals or chambers **4**

3. Sporocarp interior gelatinous or exuding a sticky fluid ..... **Basidiomycetes and Zygomycetes**

3. Sporocarp interior firm to crisp, not exuding a sticky fluid ..... **Ascomycetes**

4. Chambers single to many, >3 mm broad ..... **Ascomycetes**

4. Chambers or canals <3 mm broad **5**

5. Sporocarp with a stem or stemlike tissue in vertical cross section ..... **Basidiomycetes**

5. Sporocarp lacking a stem or stemlike tissue in vertical cross section **6**

6. Sporocarp with rhizomorphs at base or appressed on surface ..... **Basidiomycetes**

6. Sporocarp lacking rhizomorphs **7**

7. Sporocarp interior with long, meandering canals ..... **Ascomycetes**

7. Sporocarp interior with rounded to slightly elongate or irregular chambers **8**

8. Sporocarp flesh soft, white to yellow or brown ..... **Basidiomycetes and Zygomycetes**

8. Sporocarp flesh firm to crisp, gray to brown or purple ..... **Ascomycetes**

I1. Key to sequestrate Ascomycetes

(spore measurements exclude ornamentation)

1. Sporocarp with one to many empty or spore-filled chambers or canals **2**

1. Sporocarp solid, often marbled with veins **6**

2. Peridium more than 3 mm thick, chambers one or a few, often broader than 3 mm **3**

2. Peridium less than 2 mm thick, chambers or canals many, generally less than 3 mm broad **4**

3. Peridium smooth, pale colored, spores 14-23 µm ..... see ***Elaphomyces subviscidus*** (36)

3. Peridium finely warty, nearly black, spores 21-25 µm ..... see ***Elaphomyces anthracinus*** (35)

4. Sporocarp surface coarsely and sharply verrucose ..... see ***Balsamia nigrens*** (9)

4. Sporocarp surface not coarsely verrucose but may be minutely roughened **5**

5. Spores with crowded, flexuous tapered spines 2-3 (-4) µm tall ..... see ***Hydnotrya inordinata*** (58)

5. Spores with crowded mucilage-embedded spines ±1 µm tall ..... see ***Hydnotrya subnix*** (59)

6. Gleba brown to black brown marbled with narrow, white veins **7**

6. Gleba white to pale yellow marbled with narrow, yellow-brown to brown veins **8**

6. Asci thin walled, mature gleba dark gray-brown marbled with off-white veins ..... see ***Tuber asa*** (139)

7. Asci thick walled, mature gleba brown to black-brown marbled with white veins ..... see ***Tuber pacificum*** (140)

8. Spores minutely pitted like a golf ball ..... see ***Choiromyces alveolatus*** (17)

8. Spores with irregular, spines and rods, 3-6 µm tall ..... see ***Choiromyces venosus*** (18)

I2. Key to sequestrate Basidiomycetes and Zygomycetes

(spore measurements exclude ornamentation)

1. Spores ornamented **2**

1. Spores smooth **25**

2. Spore ornamentation of ridges **3**

2. Spore ornamentation of cones, rods, warts, or reticulation **4**

3. Sporocarp staining blue, spores 13-22 x 10-16 µm ..... see ***Chamonixia caespitosa*** (16)

3. Sporocarps not staining blue, spores 17-24 x 8-12 µm, locules large ..... see ***Gautieria magnicellaris*** (46)

3. Sporocarps not staining blue, spores 13-18 x 5-7 µm, locules small ..... see ***Gautieria otthii*** (47)

4. Spores amyloid **5**

4. Spores inamyloid **15**

5. Sporocarp exuding latex from cut surface **6**

5. Sporocarp not exuding latex from cut surface **8**

6. Peridium orange-red, odor distinctly sweet of maple sugar ..... see ***Arcangeliella camphorata*** (6)

6. Peridium not orange-red, odor pleasant, not of maple sugar **7**

7. Peridium with nests of large sphaerocysts with thickened walls ..... see ***Arcangeliella crassa*** (7)

7. Peridium without sphaerocysts ..... see ***Arcangeliella lactarioides*** (8)

8. Sporocarp somewhat agaric in form or shape **9**

8. Sporocarp without distinct stem-columella, usually more or less potato shaped **11**

9. Spores globose 10-15 µm, gleba white to tan ..... see ***Macowanites mollis*** (66)

9. Spores ellipsoid, gleba with orange tones **10**

10. Spores 8-9.5 x 6.5-7.5 µm, gleba orange-brown, odor of chlorine ..... see ***Macowanites chlorinosmus*** (64)

10. Spores 7-13 x 7-12 µm, no chlorine odor ..... see ***Macowanites lymanensis*** (65)

11. Spores globose, 7-9 µm ..... see ***Gymnomyces nondistincta*** (52)

11. Spores ellipsoid **12**

12. Peridial epicutis an epithelium ..... see ***Martellia maculata*** (70)

12. Peridial epicutis not an epithelium **13**

13. Macrocystidia present ..... see ***Martellia idahoensis*** (69)

13. Macrocystidia absent **14**

14. Odor of vanilla, peridium with a turf of dermatocystidia ..... see ***Martellia fragrans*** (68)

14. Odor not distinctive, peridium without dermatocystidia ..... see ***Gymnomyces abietis*** (50)

15. Spores colorless in KOH **16**

15. Spores brown in KOH **17**

16. Sporocarps yellow, trama lacks inflated cells, spores 8-11 x 8-9 µm ..... see ***Leucogaster citrinus*** (62)

16. Sporocarps white with yellow stains, spores 6-10 x 5-6 µm ..... see ***Leucogaster microsporus*** (63)

17. Spores globose **18**

17. Spores ellipsoid **19**

18. Spores 13-18 µm, with cones up to 5 µm tall, peridium staining blue ..... see ***Octavianina cyanescens*** (79)

18. spores 14-17 µm, spines up to 3 µm tall, peridium not staining ..... see ***Octavianina papyracea*** (81)

19. Spores 17-23 x 12-16 µm with spines up to 1.5 µm tall ..... see ***Octavianina macrospora*** (80)

19. Spores smaller, ornamentation up to 1 µm tall **20**

20. Sporocarps agariclike, with a persistent veil **21**

20. Sporocarps potatolike, veil absent **24**

21. Spores large 14-18 x 9-10 µm ..... see ***Thaxterogaster pavelekii*** (136)

21. Spores not longer than 13 µm **22**

22. Sporocarp pale brown to yellow-brown, spores with coarse warts ..... see ***Cortinarius verrucisporus*** (29)

22. Sporocarp white to tan, spore ornamentation not coarse **23**

23. Basidia small 17-22 x 5.5-7 µm ..... see ***Cortinarius wiebeae*** (30)

23. Basidia large 27-40 x 7-10 µm ..... see ***Cortinarius magnivelatus*** (24)

24. Sporocarps staining pink, basidia 1-spored ..... see ***Destuntzia rubra*** (33)

24. Sporocarps not staining pink, basidia 4-spored ..... see ***Destuntzia fusca*** (32)

25. Spores large > 40 µm in diameter or basidia absent **26**

25. Spores smaller < 30 µm in length or diameter or basidia present **28**

26. Spores 77-150 x 44-120 µm, walls 5-7 µm thick ..... see ***Endogone oregonensis*** (38)

26. Spores less than 100 µm in diameter or length **27**

27. Spores 60-110 x 48-75 µm, walls 4-8 µm thick ..... see ***Glomus radiatum*** (49)

27. Spores 15 x 30-80 x 59 µm, walls ≤5 µm thick ..... see ***Endogone acrogena*** (37)

28. Spores honey-colored, smokey black or dark brown in KOH **29**

28. Spores colorless in KOH **31**

29. Spores 7.5-9 x 5.5-6.3 µm, with a germ pore ..... see ***Nivatogastrium nubigenum*** (78)

29. Spores ≥19 µm long, without a germ pore **30**

30. Gleba powdery, at maturity spores 23-26 x 13-16 µm ..... see ***Sedecula pulvinata*** (134)

30. Gleba lamellate-loculate, not powdery, at maturity spores 19-30 x 6-9 µm ..... see ***Chroogomphus loculatus*** (19)

31. Sporocarp boletelike with a distorted or reduced stem **32**

31. Sporocarp potatolike without a reduced stem but sometimes with a sterile base **36**

32. Peridium and stem pale buff to pale olive buff ..... see ***Gastroboletus subalpinus*** (42)

32. Peridium gray-yellow, rose to red-brown, bright yellow or dark sordid brown **33**

33. Stem with glandular dots, spores 7-10 x 3.5-4 µm ..... see ***Gastrosuillus umbrinus*** (45)

33. Stem without glandular dots **34**

34. Sporocarps bright yellow and red, staining red, spores 13-18 x 6-7 µm ..... see ***Gastroboletus vividus*** (43)

34. Sporocarps not bright yellow, if with red tones then staining blue **35**

35. Sporocarps rose to red-brown, spores 9-15 x 4-6 µm ..... see ***Gastroboletus ruber*** (41)

35. Sporocarps gray-yellow with dark olive tints, spores 7-10 x ±2.5 µm ..... see ***Gastroboletus imbellus*** (40)

36. Spores amyloid ..... see ***Rhizopogon chamaleontinus*** (123)

36. Spores inamyloid **37**

37. Gleba pink **38**

37. Gleba olive to brown or yellow-brown **39**

38. Spores 5-7 x 3-4 µm ..... see ***Alpova alexsmithii*** (4)

38. Spores 10-13 x 4-5 µm ..... see ***Fevansia aurantiaca*** (39)

39. Peridium staining red **40**

39. Peridium not staining red **41**

40. Peridium staining red then inky-fuscous, with amyloid globules in peridium, spores 3-3.5 µm in diameter ..... see ***Rhizopogon inquinatus*** (128)

40. Peridium staining ochraceous then red, without amyloid globules in peridium, spores ±2 µm in diameter ..... see ***Rhizopogon evadens*** var. ***subalpinus*** (125)

41. Peridium yellow when fresh; dull purple-red in KOH; spores 5.5-6.5 x 2.5-2.8 µm ..... see ***Rhizopogon flavofibrillosus*** (127)

41. Peridium not yellow when fresh; not dull purple-red in KOH; spores various **42**

42. Spores ≥8 µm long **43**

42. Spores ≤6.5 µm long **44**

43. Spores 7-8 x 5-5.5 µm ..... see ***Rhizopogon exiguus*** (126)

43. Spores 8-10 x 3-4 µm ..... see ***Alpova olivaceotinctus*** (5)

44. Spores 5-6.5 x 1.8-2.3 µm ..... see ***Rhizopogon brunneiniger*** (122)

44. Spores 4.5-6 x 3-4 µm ..... see ***Rhizopogon ellipsosporus*** (124)

J. Key to stalked polypores

1. Cap purple-brown, becoming orange to tan with small dark scales ..... see ***Albatrellus avellaneus*** (2)

1. Cap surface and pores gray to indigo blue, maturing to pale gray-brown ..... see ***Albatrellus caeruleoporus*** (3)

1. Cap often large (>50 cm), surface extremely shaggy, on dead *Abies* spp. ..... see ***Bridgeoporus nobilisimus*** (13)

1. Cap yellow-orange, purple-brown in age or on drying, amyloid spores with warts or ridges ..... see ***Bondarzewia mesenterica*** (12)

Species Information

Acanthophysium farlowii (Burt) Ginns & Lefebvre

ROD Name ***Aleurodiscus farlowii***

Family Aleurodiscaceae **Morphological Habit** resupinate

Description: **Sporocarps** discrete to confluent, discoid, with determinate up-raised margins, 0.5-1.5 mm diameter. **Hymenial surface** granular to subcoriaceous, pale yellow-brown drying pale tan. **Abhymenial surface** glabrous, dark-colored. **Acanthophyses** variable, cylindrical to subclavate, mostly swollen below, with aculeate thick-walled prongs covering the top 1/3-2/3 of the apex above narrow to inflated thin-walled base. **Gloeocystidia** inconspicuous, flexuous, cylindric, not apically moniliform. **Basidia** subclavate to clavate, 75-90 x 14-20 µm. **Spores** ovate to ellipsoid, (15-) 16-18 (-19) x (11-) 12-14 (-15) µm, apiculate, slightly flattened, thin-walled, smooth, amyloid.

Distinguishing Features: Characterized by the pale yellow-brown, disc-shaped sporocarps with dark brown underside growing on twigs and the wide acanthophyses. *Acanthophysium abietis* (Jackson & Lemke) Ginns & Lefebvre grows primarily on *Abies* spp., has a resupinate, pale orange-tan sporocarp with indeterminate radiate margins, narrower acanthophyses, subcylindric-ampulliform gloeocystidia, larger ovoid spores (18-20 x 16-18 µm), and larger basidia (to 24 µm wide). *Acanthophysium piceinus* (Lyon & Lemke) Ginns & Lefebvre grows on *Picea rubens*, has an brown to tan sporocarp with determinate margins and subclavate-ampulliform gloeocystidia with slightly larger ovoid to ovoid-ellipsoid spores (17-20 x 13-15 µm).

Distribution: Known from a single site within the range of the northern spotted owl: **WASHINGTON**, **Kittitas** Co., Wenatchee National Forest, Lake Kachess picnic area. Also known from several Canadian Provinces and the northeastern United States.

Substrate and habitat: Saprophyte, or possibly parasitic or endophytic, fruiting on recently dead twigs of live *Abies* spp., *Pseudotsuga menziesii*, and *Tsuga* spp.

Season: Fruits in May.

Reference: Lemke, P.A. 1964. The genus *Aleurodiscus* (*sensu stricto*) in North America. Can. J. Bot. 42:213-246.

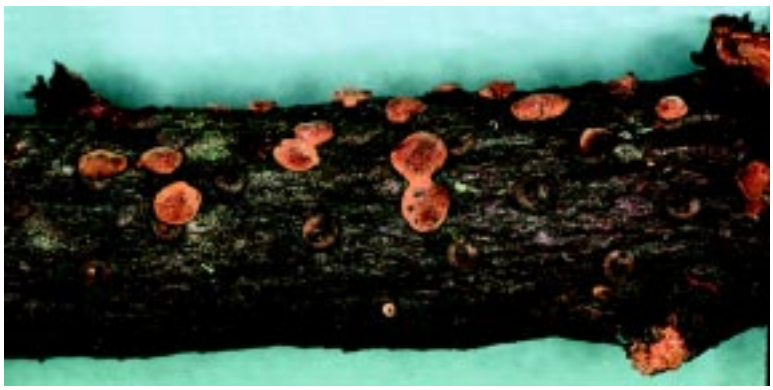
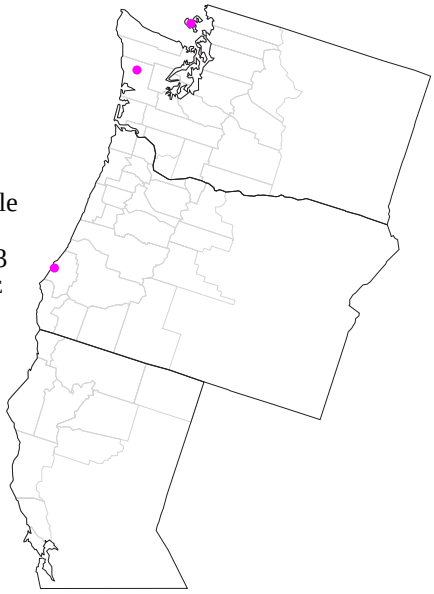


Photo courtesy of T. O'Dell

Albatrellus avellaneus Pouzar



ROD name *Albatrellus avellaneus*

Family Scutiegeraceae **Morphological Habit** polypore

Description: **Cap** 40-100 mm broad, circular to flabelliform, roughened, pale purple brown, becoming pale orange to tan with dark squamules in age. **Pore surface** initially white, staining yellow, drying pale brown. **Pores** angular, 2-3 mm in diameter. **Stem** 60-180 x 10-15 mm, central, white. **Context and tube layer** white, staining yellow when cut, drying brown. **Hyphal structure** monomitic**. Clamp connections** absent. **Spores** ovoid to broadly elliptical, 4.8-6 x 3.4-4.5 µm, thin-walled, smooth, hyaline, inamyloid.

Distinguishing Features: Characterized by a fleshy annual polypore with a squamulose, pale purple-brown to pale orange cap, white pore surface, and a white-spore print. *Albatrellus ovinus* (Schaeff.:Fr.) Murrill has a cream to buff cap which does not mature to pale orange to tan and it has smaller spores (4-5 x 3-3.5 µm).

Distribution: Endemic to the Pacific Northwest. Known from three sites within the range of the northern spotted owl: **OREGON**, **Coos** Co., Shore Acres State Park; **WASHINGTON**, **Grays Harbor** Co., Olympic National Forest, Quinault Research Natural Area; **San Juan** Co., Friday Harbor Biological Station. Other potential sites with vague locality data extend the range to Humboldt Co., California.

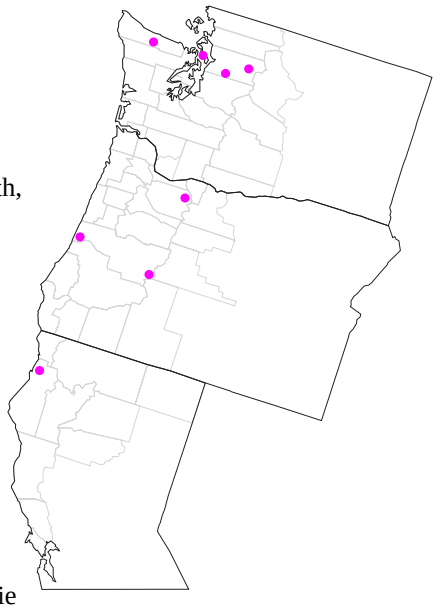
Substrate and habitat: This is a terrestrial polypore and is a presumed mycorrhiza former with Pinaceae spp.

Season: Fruits from October through January.

References: Gilbertson, R.L., and Ryvarden, L. 1986. North American Polypores. Vol. 1. Fungi Flora, Oslo. Smith A.H., Smith, H.V., and Weber, N.S. 1981. How to Know the Non-Gilled Mushrooms. Wm. C. Brown County, Dubuque.

Photo courtesy of J. Ammirati

Albatrellus caeruleoporus (Peck) Pouzar



ROD name *Albatrellus caeruleoporus*

Family Scutiegeraceae **Morphological Habit** polypore

Description: **Cap** to 6 cm broad, more or less circular, more or less smooth, gray to indigo blue maturing to pale gray brown. **Pore surface** gray to blue, drying brown to bright red-orange. **Pores** angular, (1-) 2-3 (-5) mm. **Stem** central, sometimes multiple, blue. **Flesh** cream to pale tan, tube layer losing blue coloration, becoming red-brown when dried. **Hyphal structure** monomitic**. Clamp connections** absent. **Spores** ovoid to subglobose, 4-6 x 3-5 µm, smooth, hyaline, inamyloid.

Distinguishing Features: Characterized by a fleshy annual polypore, gray-blue pore surface with a circular cap and white spore print. *Albatrellus flettii* is larger, and has a white pore surface (salmon colored at maturity), clamp connections, and smaller spores (3.5-4 x 2.5-3 µm).

Distribution: Known from eight sites within the range of the northern spotted owl: **CALIFORNIA**, **Humboldt** Co., Redwood National Park, Prairie Creek, Rhododendron trail; **OREGON**, **Clackamas** Co., Wemme; **Lane** Co., Honeyman State Park; Willamette National Forest, near O'Dell Lake; **WASHINGTON**, **Clallam** Co., Olympic National Park, Lake Mills trail; **Island** Co., Whidbey Island; **Snohomish** Co., Mount Baker-Snoqualmie National Forest, Barlow Pass; Lake Hannan. Also known from the northeastern United States.

Substrate and habitat: This is a terrestrial polypore and is a presumed mycorrhiza former with *Tsuga* spp.

Season: Fruits from September through November.

References: Gilbertson, R.L., and Ryvarden, L. 1986. North American Polypores. Vol. 1. Fungi Flora, Oslo. Smith A.H., Smith, H.V., and Weber, N.S. 1981. How to Know the Non-Gilled Mushrooms. Wm. C. Brown County, Dubuque.

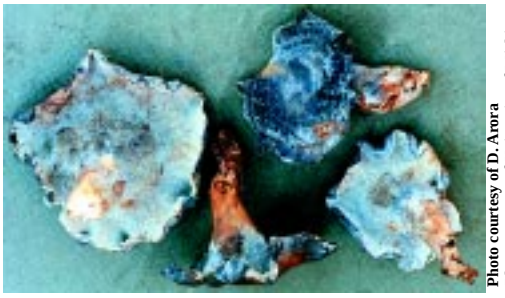


Photo courtesy of D. Arora
Photo courtesy of University of Michigan

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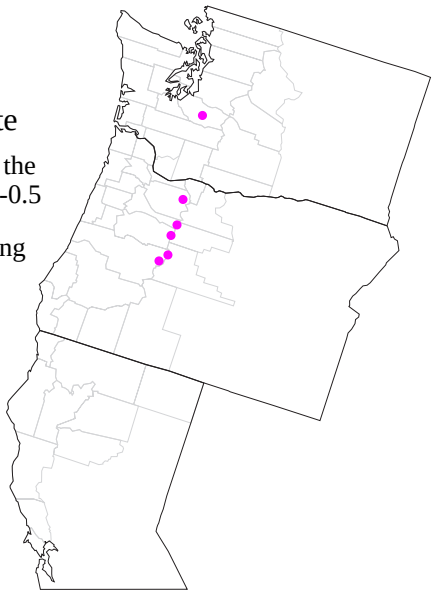
Alpova alexsmithii Trappe

ROD name *Alpova alexsmithii*



Family Boletaceae **Morphological Habit** sequestrate

Description: **Sporocarps** 4-40 mm broad, smaller specimens subglobose, the larger flattened to elongate or irregular with lobes and furrows. **Peridium** 0.2-0.5 mm thick, yellow-brown to dark brown, sometimes staining darker where bruised, felty to more or less scabrous and occasionally rimose-rugulose, drying dark olive to nearly black; large, concolorus rhizomorphs appressed on lower side, originating from a basal tuft of hyphae and rhizomorphs. **Gleba** firm to crisp, sticky gelatinous, in wet weather exuding sticky fluid from the locules. **Locules** rounded, gel-filled, 0.3-0.6 mm in diam, separated by white veins, the contents in youth pallid, at maturity gray-yellow-pink, when dried pale yellow-brown. **Odor** faint, pleasant. KOH on fresh and dried peridial surface, instantly dark brown, soon black; FSW, dark brown and soon black on fresh specimens, quickly olive on dried specimens. **Peridial epicutis** erratic in thickness, of tangled hyphae 2-4 µm in diam with pale yellow-brown walls, occasional versiform end cells 4-8 µm in diam present, no pigment diffusing in KOH mounts. **Peridial subcutis** 174-470 µm thick, near the epicutis often arranged in an erratic, obscurely radiate palisade (observable only in perfect, thin sections) of hyphae 8-20 µm in diam with brown walls 2-4 µm thick, this layer underlain by interwoven, hyaline, thinner-walled hyphae 4-10 µm at septa with most cells inflated to 8-30 µm. **Trama** of interwoven, hyaline, thin-walled hyphae 3-6 µm in diam with cells frequently inflated up to 12 (-30) µm, near the locules the hyphae highly gelatinized; locules lined with a palisade of subclavate to irregularly constricted, hyaline, thin-walled brachybasidiole cells or basidia but most extending as interwoven thin-walled, hyaline hyphae that fill the locules. **Basidia** borne among gelatinizing hyphae filling the locules, clavate, 21-29 x 4-5 µm, hyaline, thin-walled, readily collapsing and by maturity autolysed. **Clamp connections** absent or rare. **Spores** ellipsoid or a few subpyriform to obovoid, 5-7 (-8) x 3-4 (-5) µm, smooth, thin-walled, in KOH hyaline singly, gray-yellow in mass, in Melzer's reagent pale yellow singly, orange-yellow in mass, strongly cyanophilic in youth, acyanophilic at maturity.

Distinguishing Features: Characterized by the combination of a sticky gelatinous gleba with gel-filled locules, yellow-brown to dark brown peridium without pigments that dissolve in KOH, and thin-walled, short hyaline spores. Microscopic examination is necessary for definitive placement but the macroscopic characters, particularly when cut in half, alert the collector to study it further.

Distribution: Known from six sites within the range of the northern spotted owl: **OREGON**, **Clackamas** Co., Mount Hood National Forest, Still Creek forest camp; **Jefferson** Co., Mount Jefferson Wilderness Area, below Carl Lake; **Lane** Co., Willamette National Forest, Willamette Pass; Willamette National Forest, Waldo Lake trail; **Marion** Co., south shore of Breitenbush Lake, east of Lakeside camp shelter; **WASHINGTON**, **Pierce** Co., Mount Rainier National Park, Meadow Creek. Also known from British Columbia. Not known from California.

Substrate and habitat: Forms sporocarps beneath the soil surface associated with various Pinaceae spp., particularly *Tsuga heterophylla* and *T. mertensiana* from 1,200 to 3,200 m elevation.

Season: Fruits from August through December.

Reference: Trappe, J.M. 1975. A revision of the genus *Alpova* with notes on *Rhizopogon* and the Melanogastraceae. Nova Hedwigia Beih. 51:279-309.

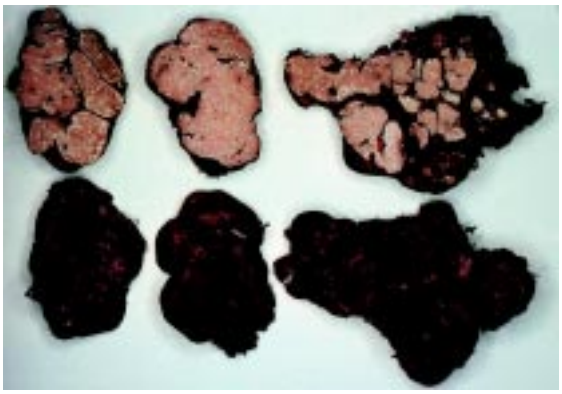
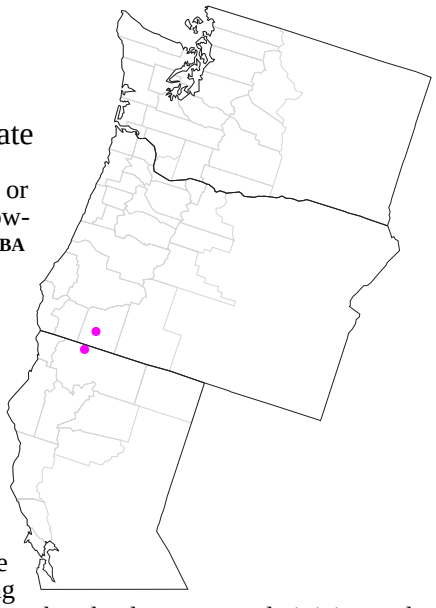


Photo courtesy of J. Trappe

Alpova olivaceotinctus (Smith) Trappe



ROD name *Alpova olivaceotinctus*

Family Boletaceae **Morphological Habit** sequestrate

DESCRIPTION: **SPOROCARPS** 15-25 x 20-45 mm, globose to lobed and irregular or elongated. **PERIDIUM** reviving to 0.2-0.3 mm thick, appressed-fibrillose, yellow-brown, when dried tinged olive over dull brown; rhizomorphs scattered. **GLEBA** exuding a latex when fresh, as dried the locules filled and separated by pallid veins, the locule contents yellow-brown. KOH on dried peridial surface instantly red-brown, soon darkening to black; FSW, quickly dark brown. **PERIDIAL EPICUTIS** ± 25 µm thick, of appressed, interwoven hyphae 2-5 µm in diam with scattered inflated cells, the walls yellow and thin to somewhat thickened, the contents brown-yellow and diffusing into the fluid of KOH mounts. **PERIDIAL SUBCUTIS** of interwoven, hyaline hyphae 2-10 µm diam with scattered, somewhat inflated cells, the walls 0.5-1.5 (-2) µm in diam. **TRAMA** of interwoven, hyaline, thin-walled hyphae 2-6 µm in diam with some slightly inflated cells, diverging to tightly interwoven, highly gelatinized cells from the tips of which grow very indistinct, thin-walled, interwoven, hyaline hyphae that fill the locules but soon autolyse, the palisade also autolysing about the time that spores begin to form. **BASIDIA** borne among tangled, gelatinized hyphae along the locule walls but not in a palisade and, less abundantly, among gelatinizing and indistinct at early stages of development. **CLAMP CONNECTIONS** absent. **SPORES** ellipsoid to oblong, a few subangular to subfusoid or irregular, (6-) 8-10 (-12) x 3-4 (-5) µm, the walls slightly thickened at maturity, smooth, in KOH pale green singly, yellow-gray in mass, in Melzer's reagent pale brown-yellow singly, yellow-brown in mass, strongly cyanophilic in youth, acyanophilic at maturity.

Distinguishing Features: Characterized by the combination of a sticky gelatinous gleba with gel-filled locules, yellow-brown peridium and spores which measure (6-) 8-10 (-12) x 3-4 (-5) µm.

Distribution: Endemic to California and Oregon. Known from two sites within the range of the northern spotted owl: **CALIFORNIA**, **Siskiyou** Co., Fruit Growers Supply Co. land, west of Hilt; **OREGON, Jackson Co.,** Bureau of Land Management, Medford District, Howard Prairie. Three other sites are known outside the assessment area from Plumas Co. (3 collections) and Riverside Co. (1 collection), California. Two additional collections were found in unspecified locations in coastal northern California.

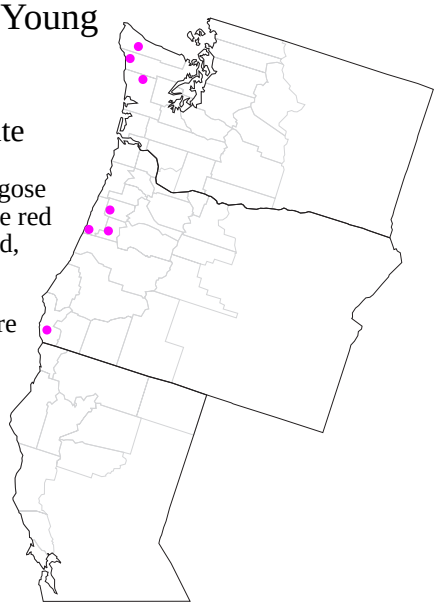
Substrate and habitat: Forms sporocarps beneath the soil surface associated with various *Abies* spp., *Arbutus menziesii*, *Pinus ponderosa*, *Pseudotsuga menziesii* and *Quercus kellogii*.

Season: Fruits in June, October, November and February.

Reference: TRAPPE, J.M. 1975. A revision of the genus *Alpova* with notes on *Rhizopogon* and the Melanogastraceae. Nova Hedwigia Beih. 51:279-309.

Photo courtesy of M.A. Castellano

Arcangeliella camphorata (Singer & Smith) Pegler & Young



ROD name *Arcangeliella sp. nov.* # Trappe 12359 & 12382

Family Russulaceae **Morphological Habit** sequestrate

Description: **Sporocarp** 3-10 x 4-17 mm, glabrous, even to somewhat rugose or pitted, the base indented around a slight basal protrusion. **Peridium** orange red to brown-orange, slowly becoming darkening to orange-brown where handled, the peridium meeting the basal protrusion or detaching to leave a gap up to 5 mm exposing underlying locules. **Gleba** with orange yellow to orange or brownish orange trama separating locules lined with pale orange yellow, spore deposit. **Columella** ranging from percurrent and protruding beyond the base, 1-2 mm broad, to absent and represented as a small basal pad, concolorous with the peridium. **Locules** tending to be sublamellate-radiating near the base, towards the peridium smaller and rounded. **Latex** white to watery white, unchanging. **Odor** when fresh ranging from slight to pronounced, on dried specimens strongly sweet (of maple syrup). **Taste** mild. **Peridial epicutis** a compact trichodermium of variously shaped, thin-walled hyphal elements, often with yellow walls, but this soon collapsing to form a more or less amorphous yellow layer over the subcutis of interwoven, hyaline, thin-walled hyphae with scattered greatly inflated cells. **Trama** of loosely interwoven, hyaline, thin-walled hyphae (4-) 8-12 µm in diam. **Subhymenium** of interwoven hyphae similar to mediostratum but also with isodiametric inflated cells. **Basidia** 28-36 x 8-9 µm, with 1-4 sterigmata up to 9-12 µm long. **Cystidia** not seen. **Spores** globose to subglobose, 7-10.5 x 7-10 µm excluding the ornamentation of amyloid lines that in youth have many short side-branches and often form a partial reticulum ≤ 0.5 µm tall, at maturity more strongly amyloid and commonly forming a partial to complete reticulum 0.5-1 µm tall, occasional minute, solitary, amyloid warts in spaces between lines, sterigmal attachment inconspicuous ±2 x 1 µm, oblique to axial.

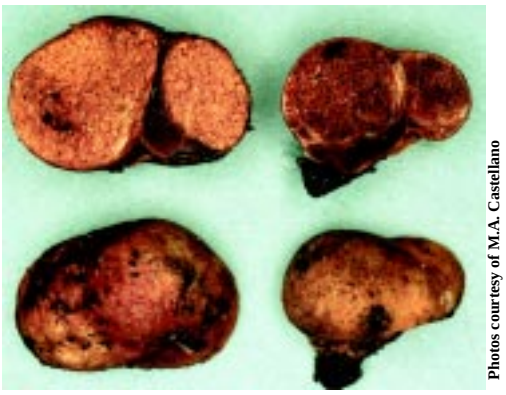
Distinguishing Features: Characterized by small, globose to subglobose spores that at maturity have a strongly amyloid partial to complete reticulum. These in combination with the various tones of orange in the peridium and gleba and the strong, maple-syrup odor of dried specimens set it apart from all other species.

Distribution: Endemic to Oregon and Washington. Known from seven sites within the range of the northern spotted owl: **OREGON**, **Benton** Co., Green Mountain; **Curry** Co., Siskiyou National Forest, Pistol River; **Lane** Co., Siuslaw National Forest, Cummins Creek Wilderness Area, Cummins Creek trail; **Polk** Co., near Valsetz; **WASHINGTON**, **Clallam** Co., Olympic National Forest, Lost Creek; **Grays Harbor** Co., Lake Quinault; **Jefferson** Co., Bogachiel State Park. Not known from California.

Substrate and habitat: Forms sporocarps beneath the soil surface associated with various Pinaceae spp., particularly *Pseudotsuga menziesii* and *Tsuga heterophylla* from 200 to 950 m elevation.

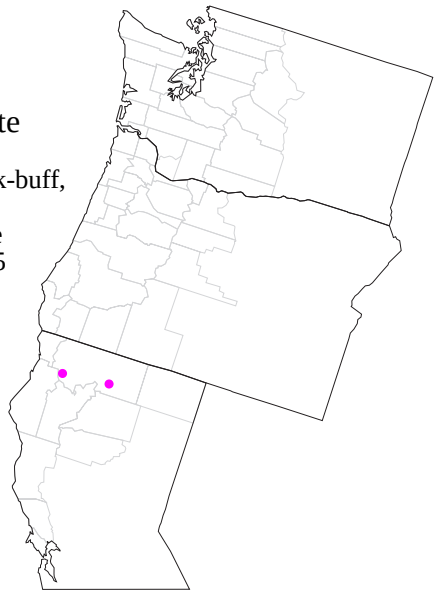
Season: Fruits from March through November.

References: Pegler, D.N., and Young, T.W.K. 1979. The gastroid Russulales. Trans. Brit. Mycol. Soc. 72:353-388. Singer, R., and Smith, A.H. 1960. Studies on secotiaceous fungi. IX. The astrogastraceous series. Mem. Torr. Bot. Club 21:1-112.



Photos courtesy of M.A. Castellano

Arcangeliella crassa Singer & Smith



ROD name *Arcangeliella crassa*

Family Russulaceae **Morphological Habit** sequestrate

Description: **Sporocarps** up to 3.5 cm broad, convex depressed, pale pink-buff, glabrous but unpolished. **Stipe-columella** 5-8 mm broad, about 1 cm high, becoming hollow in largest specimen, pallid, surface unpolished. **Gleba** pale pink-buff, varying lamellate to lacunose on same specimen. **Peridium** up to 5 mm thick as dried, pale pink-buff within, margin remaining attached to the stipe or not, reaching the stipe in places thus exposing the gleba (younger specimens). **Peridial epicutis** of appressed filamentose hyphae 3-6 µm broad, the outermost ochraceous in KOH but the walls smooth; context of interwoven, hyaline hyphae with nests of large sphaerocysts with refractive somewhat thickened walls hyaline in KOH. **Trama** of interwoven, hyphae yellow to hyaline, enlarged cells (8-12 µm) seen in groups, but these may represent cut ends of hyphae. **Laticiferous hyphae** abundant. **Cystidia** rare, pseudocystidial type, 52-65 x 7-12 µm, flexuous, often pointed at apex. **Subhymenium** cellular, some cells enlarged. **Basidia** 42-53 x 10-12 µm, pedicelate-clavate, 4-spored; sterigmata straight-conic, 4-7 µm long. **Clamp connections** absent. **Spores** ellipsoid, 8-11 x 6.5-8 µm (not including sterigmal attachment); sterigmal attachment oblique and prominent, with a nearly smooth but well marked plage with an amorphous mass of amyloid material on it; ornamentation in the form of a small-meshed reticulum or broken amyloid reticulum, prominences ± 0.25 µm high, spore wall slightly thickened and inamyloid.

Distinguishing Features: Characterized by a combination of sphaerocysts in the context of the peridium having thickened somewhat refractive walls, the ellipsoid, amyloid, reticulate spores, and the undifferentiated peridium.

Distribution: Endemic to California. Known from three sites within the range of the northern spotted owl: **CALIFORNIA**, **Siskiyou** Co., Klamath National Forest, junction of Cecilville Rd. and The Pacific Crest trail; Shasta-Trinity National Forest, flats just below Sand Flats; head of the south fork of the Salmon River. There are also 3 other sites on Federal land outside the assessment area in California: Stanislaus National Forest, Cow Creek; Lassen National Forest, at Mineral Ranger Station; Tahoe National Forest, San Francisco State University Field Station.

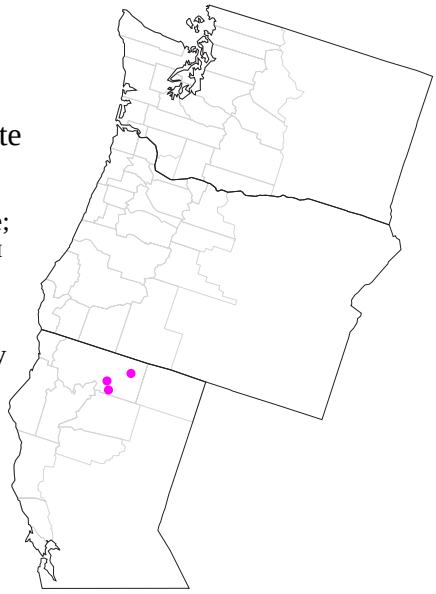
Substrate and habitat: Forms sporocarps beneath the soil surface associated with various Pinaceae spp. in mixed forests containing *Abies concolor, A. magnifica, Pinus contorta, P. jeffreyii* or *P. ponderosa* from 2,000 to 2,200 m elevation.

Season: Fruits from June through October.

References: Pegler, D.N., and Young, T.W.K. 1979. The gastroid Russulales. Trans. Brit. Mycol. Soc. 72: 353-388.
Singer, R., and Smith, A.H. 1960. Studies on secotiaceous fungi. IX. The astrogastraceous series. Mem. Torr. Bot. Club 21:1-112.

Photo courtesy of H. Saylor

Arcangeliella lactarioides Zeller



ROD name ***Arcangeliella lactarioides***

Family Russulaceae **Morphological Habit** sequestrate

Description: **Sporocarps** 2.5-3 cm broad, 1.5-2 cm high, subspherical becoming expanded, convex pileate, somewhat depressed at summit, stipitate; surface smooth, innately fibrillose, dry, pale yellow, drying brown. **Peridium** thin, especially below or at margins, where it breaks away from base of stem (columella), filamentous with lactiferous hyhae. **Columella** percurrent, becoming a stipe as the cap expands, 4-6 cm broad, exuding latex when cut. **Gleba** white, becoming creamy, drying brown, exposed below, adnexed, very ventricose, locules labyrinthiform, partially filled with white spores. **trama** white in section, filled with lactiferous hyphae. **Basidia** clavate, four-spored, with long sterigmata bearing the spores acrogenously. **Spores** ellipsoid, verrucose with protuberances of various sizes and somewhat connected by reticulate lines (as in *Russula* and *Lactarius*), pedicelate, 8-10.5 x 6-6.3 µm.

Distinguishing Features: Characterized by the sequestrate-agaricoid sporocarp with an innately fibrillose peridium which does not stain when bruised, the presence of latex on cut tissues, and the amyloid, verrucose spores.

Distribution: Endemic to California. Known from three sites within the range of the northern spotted owl: **CALIFORNIA**, **Siskiyou** Co., Shasta-Trinity National Forest, below timberline in Diller Canyon; Shasta-Trinity National Forest, McBride Springs campground. Another site on Mount Shasta, Bear Springs is on private land. A fourth site is outside the assessment area but on Federal land: **Plumas** Co., Lassen National Forest, Swain Mountain Experimental Forest, stand SG4.

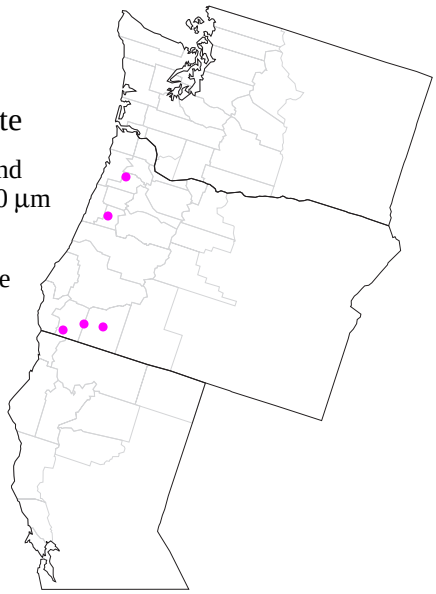
Substrate and habitat: Forms sporocarps beneath the soil surface associated with various Pinaceae spp., particularly *Abies magnifica* and *Pinus ponderosa* above 1,650 m elevation.

Season: Fruits from July through November.

References: Pegler, D.N., and Young, T.W.K. 1979. The gastroid Russulales. Trans. Brit. Mycol. Soc. 72:353-388. Singer, R., and Smith, A.H. 1960. Studies on secotiaceous fungi. IX. The astrogastraceous series. Mem. Torr. Bot. Club 21:1-112.

Photo courtesy of M.A. Castellano

Balsamia nigrens (Harkness) Gilkey



ROD name *Balsamia nigrens*

Family Helvellaceae **Morphological Habit** sequestrate

Description: **Sporocarps** black, somewhat depressed globose, coarsely and sharply verrucose. **Peridium** up to 400 µm thick. **Peridial epicutis** up to 300 µm thick, of radial rows of subrectangular cells 8-18 x 10-40 µm with red-brown walls thickened to often completely filling the cell. Cells readily separable. **Peridial subcutis** ±100 µm thick of cells similarly aligned and of similar size and shape but with brown-yellow walls 2-5 µm thick (change from thick-walled to thin-walled cells abrupt and at relatively uniform line). **Gleba** containing the asci of densely interwoven, hyaline, thin-walled hyphae 3-4 µm diam. Inner lining of empty locules of hyphae similar but 4-6 µm diam, with hyaline walls ±0.5 µm thick, and brown in mass. **Asci** saccate to ellipsoid, hyaline, tapered to a foot-like to straight base in youth, walls less than 0.5 µm thick, at maturity 30-40 x 40-60 µm, pale yellow in Melzer's reagent. **Spores** oblong, 20-37 x 12-15 µm, hyaline, with 1 or more guttulates, the walls thin and ornamented with minute, barely perceptible, hyaline meandering lines around the circumference.

Distinguishing Features: Characterized by the black, coarsely verrucose peridium and hyaline, oblong spores.

Distribution: Endemic to California and Oregon. Known from five sites within the range of the northern spotted owl: **OREGON**, **Benton** Co., Woods Creek Rd.; **Jackson Co.,** Bureau of Land Management, Medford District, Applegate; **Josephine** Co., near Grants Pass, Missouri Flats; Siskiyou National Forest, Waldo Hill; **Yamhill** Co., near Yamhill River, Flying M ranch. In addition, the original collection was from **CALIFORNIA, Placer** Co., near Auburn.

Substrate and habitat: Forms sporocarps beneath the soil surface associated with various Pinaceae spp., particularly *Pinus jeffreyi* and *Pseudotsuga menziesii* and at low to mid elevation.

Season: Fruits in March, May, June and October.

References: Gilkey, H. 1916. A revision of the Tuberales of California. Univ. Cal. Publ. Bot. 6:275-356. Gilkey, H. 1954. Tuberales. N. Am. Flora ser. 2, 1:1-36. Harkness, H.W. 1899. Californian hypogeous fungi. Proc. Calif. Acad. Sci. Third series 1(8) 241-292.

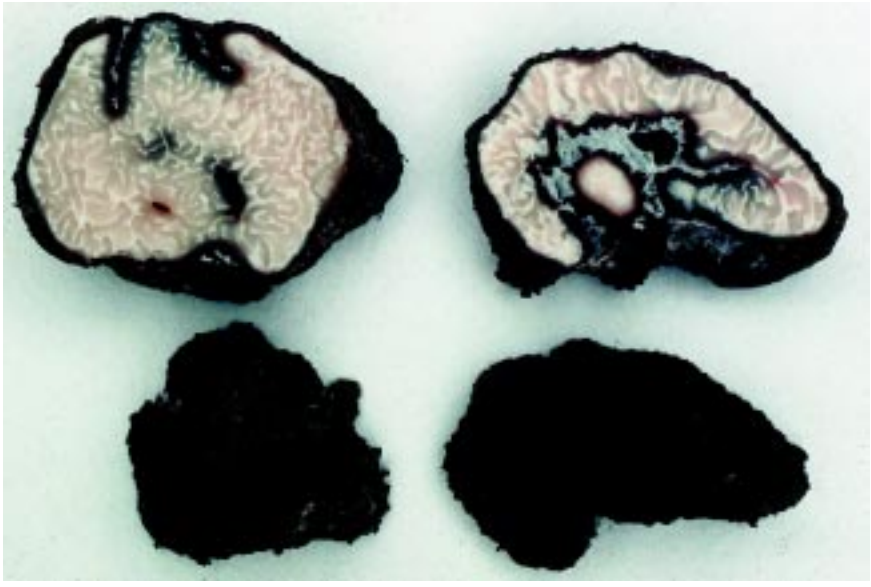
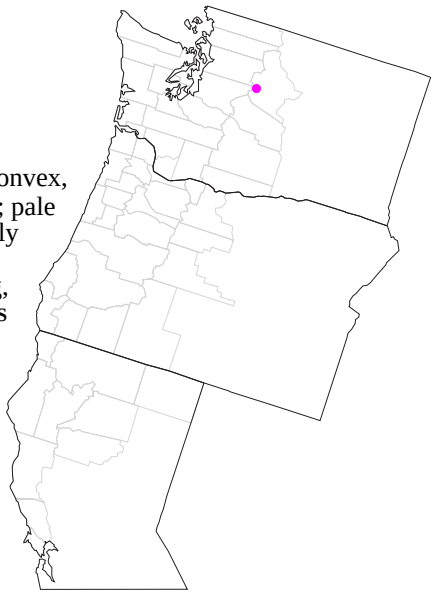


Photo courtesy of M.A. Castellano

Boletus haematinus Thiers & Halling

ROD name *Boletus haematinus*



Family Boletaceae **Morphological Habit** Bolete

Description: **Pileus** 110-160 (-250) mm diam, broadly convex or plano-convex, surface dry, glabrous becoming appressed-fibrillose to rimose-areolate in age; pale brown overall when young, developing darker brown areoles in age, frequently with red tints along margin. **Context** yellow to pale yellow, blueing upon exposure. **Odor and taste** mild. **Tubes** 10-15 mm long, yellow when young, becoming green-yellow to olive in age, blueing upon exposure. **Tube mouths** bright yellow when young, but soon becoming pale red to dark red in age but nearly always remain yellow near the pileus margin, bluing where bruised. **Stipe** 50-110 x 45-70 mm, clavate, dry, upper half finely reticulate, yellow to pale yellow overall. **Pileipellis** composed of tangled repent hyphae 4.5-7.5 µm diam, hyaline to pale ochraceous in KOH, heavily encrusted. **Basidia** 4-spored. **Cystidia** 40-45 x 7.5-9 µm, obclavate to ventricose-rostrate, hyaline. Hymenium inamyloid. **Clamp connections** absent. **Spores** subfusoid, 12-15 x 6-7.5 µm, inequilateral, smooth, brown to olive brown spore print.

Distinguishing Features: Characterized by the pale brown cap; pale yellow context that stains blue; tube mouths that are yellow when young and become red to dark red in age but nearly always remain yellow near the cap margin; a finely reticulate, clavate, pale yellow stipe; and an inamyloid hymenium. *Boletus santanus* Lenz is similar but has pink and gray tones to the cap, pink pores when young and a broadly bulbous stem.

Distribution: Endemic to California and Washington. Known from a single site within the range of the northern spotted owl: **WASHINGTON**, **Chelan** Co., Wenatchee National Forest, Smiths Brook, 0.5 mile east of Steven's Pass. It was originally described from Yuba Pass, **Sierra** Co., **CALIFORNIA** but this site has been severely impacted from logging and extirpation of this taxon at this site is likely. There are at least 12 other collections known from California but all these sites are outside the assessment area. Not known from Oregon.

Substrate and habitat: Sporocarps are scattered to gregarious, occasionally subcaespitose, in association with the roots of *Abies* spp., particularly, *A. magnifica* in the Sierra Nevada mountains, *A. lasiocarpa* in Washington and appears to be limited in distribution to subalpine forests. This habitat type is typically cool and wet.

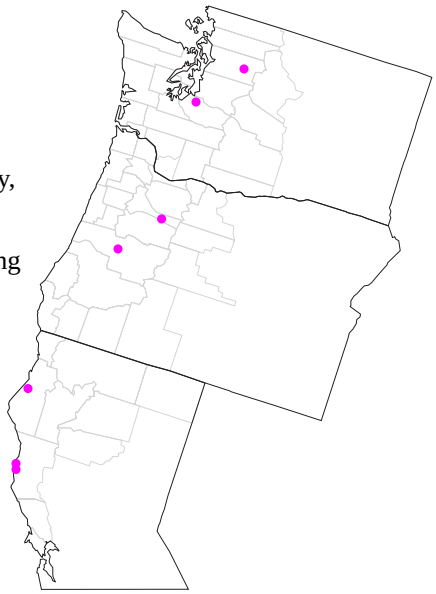
Season: Fruits from August through October.

Reference: Thiers, H. D., and Halling, R. E. 1976. California boletes V. Two new species of *Boletus*. Mycologia 68:976-983.

Photo courtesy of D. Arora

Boletus pulcherrimus Thiers & Halling

ROD name *Boletus pulcherrimus*



Family Boletaceae **Morphological Habit** Bolete

Description: **Cap** 80-200 mm diam, convex to broadly convex; surface dry, glabrous to subtomentose, when very old often becoming rimose-areolate to fibrillose-scaly; red-brown overall. **Context** bright yellow, changing to blue upon exposure. **Odor and taste** mild. **Tubes** 5-15 mm long, yellow, changing to blue upon exposure. **Tube mouths** dark red to red-brown throughout development, bluing where bruised. **Stem** 70-160 x 20-50 mm, clavate to clavate-bulbous (but not abruptly bulbous), dry, upper two-thirds distinctly reticulate, pale red brown overall with darker red reticulations, bluing where bruised. **Pileipellis** composed of tangled repent hyphae with pale ochraceous, roughened walls. **Hymenium** amyloid. **Basidia** 1-4 spored. **Cystidia** 33-60 x 8-12 µm, subclavate to fusoid-ventricose, hyaline. **Spores** subellipsoid to subfusoid, 13-16 x 5.5-6.5 µm, smooth, brown spore print.

Distinguishing Features: Characterized by the combination of the red-brown cap, a bright yellow cap flesh that stains blue , tube mouths that are dark red when young and remain so in age, a clavate, pale red-brown stem with dark red pronounced reticulations and a distinctly amyloid hymenium.

Distribution: Endemic to the Pacific Northwest. Known from 45 collections, 8 from Washington (3 sites), three from Oregon (2 sites), and 34 from northern California (5 sites). Thirty-five collections were from only 3 sites; **CALIFORNIA**, **Humboldt** Co., Freshwater State Forest; **Mendocino** Co., Jackson State Forest; **OREGON, Lane** Co., Spencer Butte; **Lane** Co., Willamette National Forest, Santiam River; **WASHINGTON**, **Pierce** Co., Mount Rainier National Park, lower Tahoma Creek. In Washington, *Boletus pulcherrimus* is also known from 1 site on the Mount Baker-Snoqualmie National Forest in Snohomish Co. *Boletus pulcherrimus* has been collected numerous times near the type locality.

Substrate and habitat: Sporocarps are usually solitary, never in groups, in humus in association with the roots of mixed conifers (*Abies grandis*, *Pseudotsuga menziesii*) and hardwoods (*Lithocarpus densiflorus*) in coastal forests.

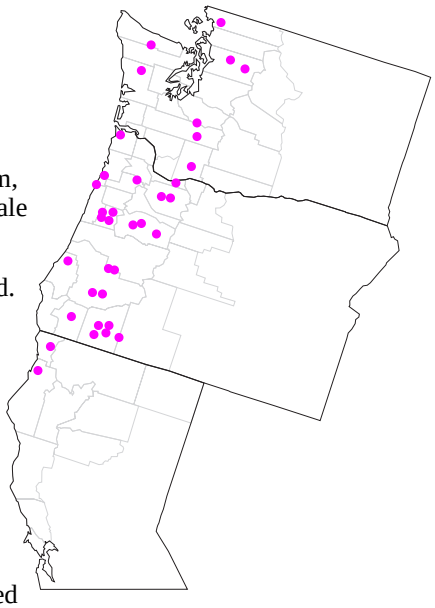
Season: Fruits from July through December.

References: Smith, A. H., and Thiers, H. D. 1971. The Boletes of Michigan. University of Michigan Press, Ann Arbor. 428 p. Thiers, H. D. 1975. California Mushrooms: a Field Guide to the Boletes. Hafner Press, London. 261 p.

Photo courtesy of D. Arora

Bondarzewia mesenterica (Schaeff.) Kreisel

ROD name *Bondarzewia montana*



Family Bondarzewiaceae **Morphological Habit** polypore

Description: **Cap** up to 25 cm broad, typically single to few from one stem, flabelliform, scurfy to finely tomentose, yellow-orange to orange-brown or pale purple-brown. **Pore surface** white, pores angular, becoming lacerate at the edges, 1-3 mm in diam. **Stem** up to 12 cm long and 11 cm wide. **Context** cream colored, firm. **Odor** pleasant, nut-like. **Taste** mild, occasionally acrid. **Spores** subglobose, 6-8 x 5-7 µm, amyloid, ridged.

Distinguishing Features: Characterized by a large, fleshy, annual polypore with a scurfy, yellow-orange to orange-brown or pale purple-brown cap and a white spore print. *Bondarzewia berkeleyi* (Fr.) Bondarzew & Singer is associated with angiosperms, appears restricted to eastern North America, fruits in imbricate clusters of tan to ochraceous caps, and has slightly larger (7-9 x 6-8 µm), amyloid, ridged, subglobose spores.

Distribution: Known from 35 sites within the range of the northern spotted owl: **CALIFORNIA**, **Del Norte Co.,** Six Rivers National Forest, junction of Rd. 15 and Rd. 13N17; **Humboldt** Co., Prairie Creek State Park; **OREGON**, **Benton** Co., Siuslaw National Forest, Marys Peak, summit loop trail, near campground; Siuslaw National Forest, Marys Peak Meadow Edge trail; Oregon State University Research Forest; **Clackamas Co.,** Bureau of Land Management (BLM), Salem District, north of Sandy River; BLM, Salem District, Wildcat Mountian, Rd. 2609; **Clatstop** Co., Fort Stevens State Park; **Coos** Co., Millicoma Myrtle State Park; **Douglas** Co., BLM, Roseburg District, near Lally Creek; BLM, Eugene District, Elk Meadows Research Natural Area; **Jackson Co.,** BLM, Medford District, Rd. 213 near Butte Falls Rd.; BLM, Medford District, Howard Prairie; BLM, Medford District, northeast edge of Hyatt Reservoir; BLM, Medford District, 1.6 km northeast of Soda Mountain on Rd. 39-3E-32; **Josephine Co.,** BLM, Medford District, off Rd. 35-8-2; **Lane** Co., BLM, Eugene District, near Rd. 23-3-12; BLM, Roseburg District, above Dutchman Creek; **Lincoln** Co., Siuslaw National Forest, Cascade Head Experimental Forest, near Tillamook Co. line on along Hwy. 12; **Linn** Co., Willamette National Forest, Pyramid trail; BLM, Salem District, near Rd. 11-2E-14; **Multnomah** Co., Mount Hood National Forest, Larch Mountain summit; **Tillamook Co.,** Siuslaw National Forest, Cascade Head Experimental Forest, along Rd. 1861, 1.1 km from hwy. 101. **Yamhill** Co., BLM, Salem District, near McLafferty Creek; **WASHINGTON**, **Grays Harbor** Co., Olympic National Forest, near Humptulips; Olympic National Park, Irely Lake trail; **Jefferson** Co., Olympic National Park, Hoh Recreation Area, Hoh River trail; **King Co.,** Mount Baker-Snoqualmie National Forest, Tunnel Creek; **Lewis** Co., Gifford Pinchot National Forest, Cispus Environmental Learning Center; **Pierce** Co., Mount Rainier National Park, Old Tahoma campground; Mount Rainier National Park, lower Tahoma Creek; **Snohomish** Co., Mount Baker-Snoqualmie National Forest, Barlow Pass; Mount Baker-Snoqualmie National Forest, Sloan Creek campground; **Whatcom** Co., Birch Bay State Park. Other potential sites with vague locality data extend the range to **Mendocino** Co., **CALIFORNIA**. Also known from British Columbia, Germany and Switzerland.

Substrate and habitat: Sporocarps occur in late successional conifer forests in Washington (O'Dell, unpublished data), Oregon and California. None of the collections examined included habitat data beyond indicating the presence of conifers (mixed with hardwoods in two cases). Sporocarps are often associated with stumps or snags.

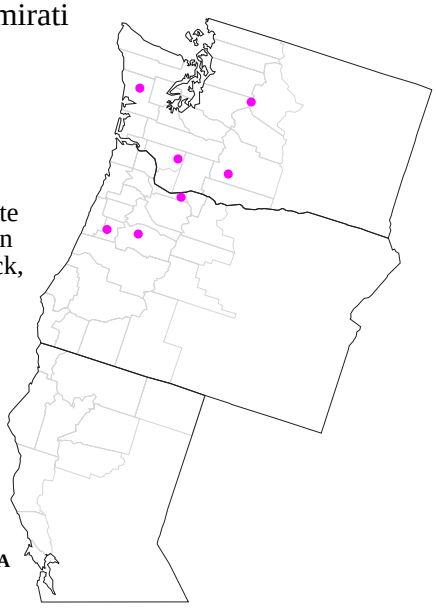
Season: Fruits from August through December.

References: Gilbertson, R.L. and Ryvarden, L. 1986. North American Polypores. Vol. 1. Fungi Flora, Oslo. Gilbertson, R.L. and Ryvarden, L. 1987. North American Polypores. Vol. 2. Fungi Flora, Oslo. Redhead, S. A. and Norvell, L. L. 1993. Notes on *Bondarzewia, Heterobasidion,* and *Pleurogala.* Mycotaxon 48:371-380.

Photo courtesy of T. O'Dell
Photo courtesy of M.A. Castellano

Bridgeoporus nobilissimus (W.B. Cooke) Volk, Burdsall & Ammirati

ROD name *Oxyporus nobilissimus*



Family Polyporaceae **Morphological Habit** polypore

Description: **Sporocarps** perennial, 30-140 x 25-95 x 30-100 cm, sessile, ungulate, imbricate, or centrally substipitate. Cap surface a dense mat of white mycelial fibers in youth, often matted, becoming cinnamon brown or darker in age, often appearing green due to epiphytic algae. **Context** up to 1.5 cm thick, white, tough, rubbery, and fibrous when fresh, cinnamon-buff or ochraceous. **Pores** concolorous with context, round, 2 per mm, 2-7 mm long in mature layers, not becoming stuffed, stratified, with a fleshy layer 2-3 mm thick between each successive pore layer. **Surface fibers** of the cap 10-30 x (50-) 60-75 µm, with frequent branching and anastomosing. The fibers are composed of bundles of simple-septate, parallel hyphae, 2-3 µm diam, hyline to yellow-brown, thin- to slighlty thick-walled, infrequently branching. **Context hyphae** 3-4 µm diam, thin-walled to thick-walled, simple-septate, hyaline to pale yellow-brown, smooth, rarley branched. **Tramal hyphae** like those of context, but some becoming thick walled and growing into and through the subhymenium, and giving rise to pseudocystidia. **Pseudocystidia** up to 125 µm x 6-12 µm, cylindrical to broadly subulate, arising deep in the tramal tissue, evident before formation of basidia, walls slightly thickened or up to 4 µm thick in age, the pseudocystidia often with a hyaline, crystalline cap. **Basidia** 12-18 x 4-10 µm, pyriforme, 4-spored, simple-septate at base, sterigmata 2-3 µm long. **Spores** broadly ovoid, 5.5-6.5 x 3.5-4.5 µm, hyaline, smooth, thin-walled, inamyloid.

Distinguishing Features: Characterized by the sissal door mat appearance of the sporocarp surface and the alternating white and brown tube layers in the sporocarp. The conspicuous and often extremely large size and fuzzy surface of the perennial sporocarp makes this species easily noticed and identifiable in the field.

Distribution: Endemic to Oregon and Washington, occuring in the Cascade Range from **Linn Co.,** Oregon north to **King Co.,** Washington and in the Olympic Mountains in **Grays Harbor Co.,** Washington. A single site has been found in the Coast Ranges of Oregon in **Benton Co**. All 10 known sites are on Federal land within the range of the northern spotted owl.

Substrate and habitat: Sporocarps occur in late successional conifer forests in the Pacific Silver fir zone and have *Abies procera* and possibly *A. amabilis* as the host.

Season: Forms new fertile tissue from August through November. The perennial sporocarp is observable throughout the year.

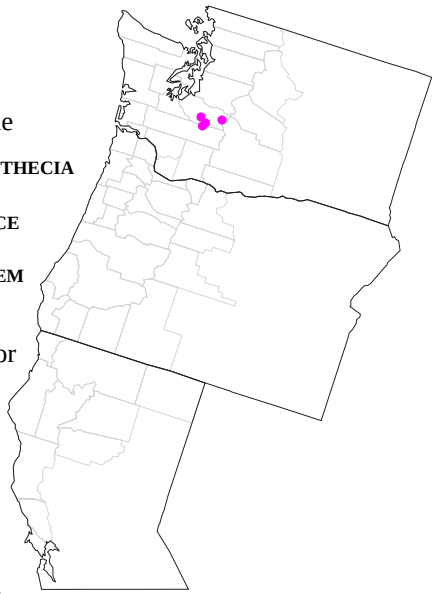
Reference: Burdsall, Jr., H.H., Volk, T.J., and Ammirati, Jr., J.F. 1996. *Bridgeoporus*, a new genus to accommodate *Oxyporus nobilissimus* (Basidiomycotina, Polyporaceae). Mycotaxon 60:387-395.

Photo courtesy of T. O'Dell
Photo courtesy of L.L. Norvell

PHOTO ONLY AVAILABLE IN PRINTED VERSION

Bryoglossum gracile (P. Karst.) Redhead

ROD name *Bryoglossum gracile*



Family Geoglossaceae **Morphological Habit** earth tongue

Description: **Sporocarps** stipitate, apotheciate, 10-30 (-50) mm tall. **Apothecia** irregular, varying from nearly flat to recurved to capitate, folded, ovoid, or ellipsoid, 2-6 x 1.5-7 mm, the margin distinct or indistinct. **Hymenial surface** rugose, smooth, or convoluted, bright orange to pale orange, orange-tan or ochraceous. **Abhymenial surface** seldom visible unless margin distinct. **Stem** terete, to 1 mm in diam, creamy white to tinged with color of hymenium but typically paler, invested with nearly hyaline minute scales and hairs. **Asci** inoperculate, bluing at the tip in Melzer's reagent. **Paraphyses** straight, not or only slightly enlarged at the apex. **Spores** fusiform to cylindric but tapered, (8-) 9-13 (-16) x 2-3 µm, hyaline, aseptate to uniseptate (septum when present transverse), minutely warty.

Distinguishing Features: Characterized by a bright orange to pale orange, orange-buff or ochraceous apothecium on a minutely scaly, pale orange to white stem. It is one of several "earth-tongues" that grow in association with mosses in the fall. *Mitrula sensu stricto* differs in fruiting in the spring, on organic material in very wet habitats (e.g., vernal pools, bogs) in subalpine to temperate regions; the stems lack scales. *Heyderia abietis* (Fr. : Fr.) Link differs in being smaller and slighter, in having a pale brown to pink buff, smooth head and pale to dark brown stem, and in fruiting on conifer needles in late summer and fall.

Distribution: Known from four sites within the range of the northern spotted owl: **WASHINGTON**, **Lewis** Co., Mount Rainier National Park, Narada Falls; **Pierce** Co., Mount Rainier National Park, Longmire; Mount Rainier National Park, Sunrise picnic area; Mount Rainier National Park, Andrews Creek. Also known from Canada and Switzerland. Not known from California or Oregon.

Substrate and habitat: Sporocarps occur in scattered to gregarious groups associated with mosses in the Northern Hemisphere in subalpine to arctic habitat. It is not clear whether it is strictly associated with forest habitat or whether it actually parasitizes moss.

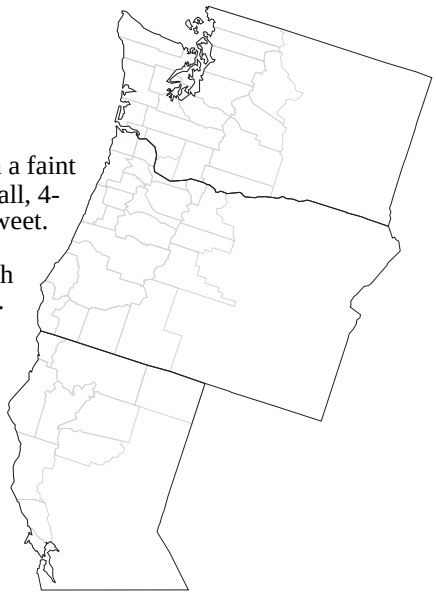
Season: Fruits from August through October.

References: Breitenbach, J., and Kränzlin, F. 1984. Fungi of Switzerland. Volume 1. Ascomycetes Luzern: Verlag Mykologia. 313 p. Redhead, S.A. 1977. The genus *Mitrula* in North America. Can. J. Bot. 5:307-325. Redhead, S.A. 1989. A biogeographical overview of the Canadian mushroom flora. Can. J. Bot. 67:3003-3062.

Photo courtesy of G. Gulden
Photo courtesy of J.A. Weber

PHOTO ONLY AVAILABLE IN PRINTED VERSION

Cantharellus formosus Corner



ROD name *Cantharellus formosus*

Family Cantharellaceae **Morphological Habit** chantrelle

Description: **Cap** 2-14 cm in diam, dull orange to orange, sometimes with a faint pink coloration, margin enrolled to flat to trumpet-shaped. **Stem** 40-80 mm tall, 4-22 mm in diam, equal to tapered downwards, concolorous with cap. **Odor** sweet. **Taste** pleasant. **Pileipellis** a turf of free hyphal ends, 4-9 µm in diam, with brown-colored contents. **Basidia** 4-6 spored, clavate, 86-120 x 4.5-6 µm, with long sterigmata up to 7 µm. **Cystidia** absent. **Clamp connections** abundant. **Spores** broadly ovoid to ellipsoid, 7-9 x 4.5-6 µm, smooth, thin-walled, hyaline, inamyloid.

Distinguishing Features: Characterized by the finely scaly, yellow-brown cap, yellow to orange hymenial ridges and a white to pink spore print. *Cantharellus formosus* was listed in the FEMAT and the ROD before the taxonomy was clearly understood. Further examination of collections labeled *C. formosus* and *C. cibarius* from within the range of the northern spotted owl revealed them to be conspecific. *Cantharellus cibarius* does not occur in western North America. The difficulty lies in the highly variable characters of *Cantharellus formosus.* The extra attention focused on *Cantharellus formosus* allowed Redhead et al. (1998) to clarify the species concept of *Cantharellus cibarius* and *Cantharellus formosus.*

Distribution: Known to be common and widespread throughout the region from coastal northern California, north to Vancouver, British Columbia, Canada.

Substrate and habitat: Forms solitaire to clustered sporocarps in association with various Pinaceae spp., particularly *Picea sitchensis, Pseudotsuga menziesii,* and *Tsuga heterophylla* in second-growth and old-growth forests.

Season: Fruits from September through November.

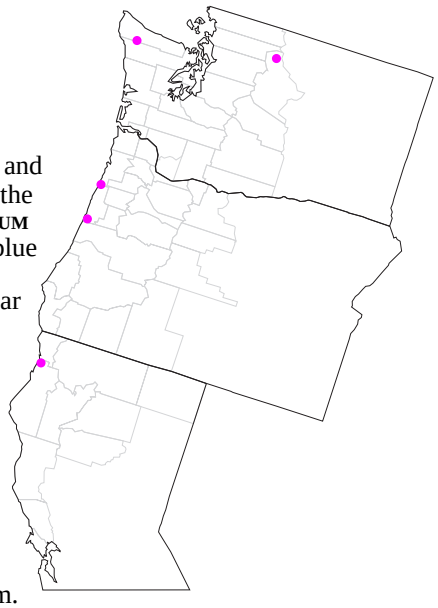
Reference: Redhead, S.A., Norvell, L.L., and Danell, E. 1998. *Cantharellus formosus* and the Pacific golden chanterelle harvest in western North America. Mycotaxon 65:285-322.

Photo courtesy of D. Pilz

Photo courtesy of C. Ardrey

Chamonixia caespitosa Rolland

ROD name *Chamonixia pacifica sp. nov.* # Trappe 12768



Family Boletaceae **Morphological Habit** sequestrate

Description: **Sporocarps** subglobose, 5-26 x 8-40 mm, the base indented and often with a stem-columella 2-3 mm thick that protrudes up to 5 mm beyond the gleba and is often recurved and appressed against the lower peridium. **Peridium** felty, white or, in well matured specimens olivaceous, quickly staining deep blue when exposed or cut, readily separable. **Gleba** with labyrinthine locules, nongelatinized, in youth white and staining blue when exposed, especially near the peridium, at maturity dark brown from spores massed on the locule surfaces. **Stem-columella** varying from percurrent, 2-3 mm thick and protruding from the sporocarp base to only a small basal pad, the context at first white but later often becoming yellow to pale orange-brown near and below the base, quickly blueing when exposed. **Odor** pleasant, slightly resinous. **Taste** not distinctive. **Peridial epicutis** of loosely interwoven to appressed, hyaline, thin-walled hyphae 7-9 µm in diam. **Peridial subcutis** of several tiers of more or less isodiametric, hyaline, thin-walled cells up to 30 µm in diam, often in radially aligned rows. **Trama** of hyaline, subparallel hyphae 3-5 µm in diam, the walls thin or slightly gelatinous thickened. Subhymenium of isodiametric cells. **Basidia** with 4-spored, 32-38 x 15-20 µm. **Cystidia** absent. **Clamp connections** absent. **Spores** broadly ellipsoid, 13-22 x 10-16 µm excluding the ornamentation of 6-14 straight to spiraling, often forked, dark brown, longitudinal ridges 3-5 µm tall, the lateral margins of the ridges ragged, the ridges not meeting at the spore apex, sterigmal attachment ±1 x 2 µm.

Distinguishing Features: Characterized by the blue staining peridium, dark brown spores with longitudinal ridges and nongelatinized sterile tissues of the sporocarp.

Distribution: Known from five sites within the range of the northern spotted owl: **CALIFORNIA**, **Humboldt** Co., Redwoods State Park, Prairie Creek; **OREGON**, **Lincoln** Co., Siuslaw National Forest, Cape Perpetua; **Tillamook** Co., Siuslaw National Forest, Cascade Head Experimental Forest, summit of old Hwy. 101; **WASHINGTON**, **Chelan** Co., Wenatchee National Forest, Rainy Pass; **Jefferson** Co., Olympic National Forest, Lost Creek. Also known from New York, France, and Germany.

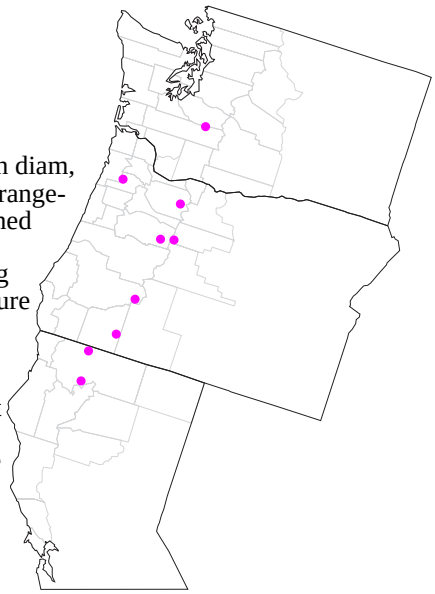
Substrate and habitat: Forms sporocarps beneath the soil surface associated with various Pinaceae spp., particularly *Abies amabilis* and *Tsuga* sp. at high elevation and *Picea sitchensis*, *Pseudotsuga menziesii*, and *Tsuga heterophylla* in coastal forests.

Season: Fruits from June through November.

Reference: Rolland, L. 1899. Excursion à Chamonix - été et automne 1898. Bull. Soc. Mycol. France 15:73-78.

Photo courtesy of M.A. Castellano

Choiromyces alveolatus (Harkness) Trappe



ROD name *Choiromyces alveolatus*

Family Tuberaceae **Morphological Habit** sequestrate

Description: **Sporocarps** white, becoming yellow or brown, up to 5 cm in diam, slightly lobed, surface scabrous, sometimes pubescent. **Gleba** yellow with orange-colored dots separated by pale-colored veins; outer cortical "tissue" of branched intermingled hyphae, often projecting from surface, forming hairs; structure beneath, becoming pseudoparenchymatous, of distinctly angled cells reaching 20 µm in diam, cells becoming smaller within, changing to subcortical structure of compactly arranged, sometimes connected hyphae running parallel to surface of ascocarp; thickness of peridium, 220-600 µm. **Venae externae** generally short, lined with paraphyses, filled with loose, branched hyphae similar to outer cortical layer. **Venae internae** much branched, broadened at angles, varying in width but mostly slender, of compact hyphal structure similar to subcortex, becoming pseudoparenchymatous in places. **Asci** borne in distinct large "nests", generally irregularly bent or variously shaped by inward extending branches of venae internae, generally long stipitate, crowded, club-shaped, more or less deformed, 80-104 x 64-72 µm, separated by fascicled, swollen-tipped paraphyses, 1- to 4-spored (generally 4-spored). **Spores** globose, 22-36 µm, yellow or brown, minutely alveolate, walls of alveoli half as wide as alveolar cavities, 10-14 alveoli across diam.

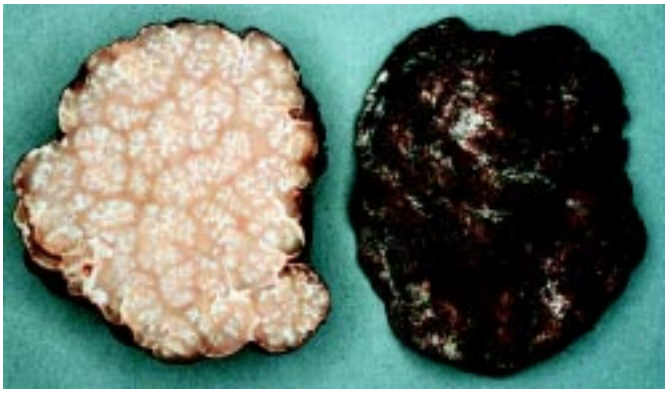
Distinguishing Features: Characterized by the lobed sporocarp, white to yellow or brown sporocarp; the gleba which is yellow-orange with pale colored veins and the unique golfball-like spores.

Distribution: Known from nine sites within the range of the northern spotted owl: **CALIFORNIA**, **Siskiyou** Co., Klamath National Forest, head of the south fork of Scott River, Hidden Lake trail; Fruit Growers Supply Co. land, Beaver Creek; **OREGON**, **Clackamas** Co., Mount Hood National Forest, High Rock; **Douglas** Co., Umpqua National Forest, Dog Prairie; **Jackson** Co., Rouge River National Forest, Daley Creek campground; **Linn** Co., Willamette National Forest, Deer Creek Rd., south of Tombstone Pass; **Jefferson** Co., Deschutes National Forest, 200 m west of FS Rd. 2076 off Hwy. 20; **Yamhill** Co., Meadow Lake Rd., 23 km west of Carlton; **WASHINGTON**, **Lewis** Co., Mount Rainier National Park, Eagle Peak trail. In addition, it is known from outside the assessment area from five sites, four on state land in **Placer Co.,** California and one on the Tahoe National Forest in **Sierra Co.,** California.

Substrate and habitat: Forms sporocarps beneath the soil surface associated with various Pinaceae spp., particularly *Abies procera, Abies* spp., *Pinus contorta, P. ponderosa, Pseudotsuga menziesii, Tsuga heterophylla,* and *T. mertensiana* above 1,300 m elevation.

Season: Fruits from May through November.

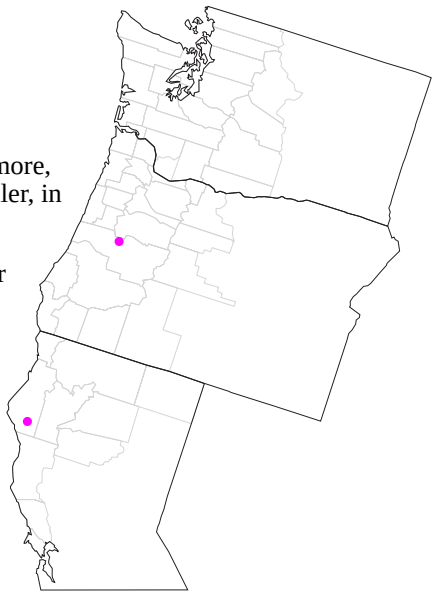
References: Gilkey, H. 1939. Tuberales of North America. Oregon State Monographs, 1:1-63. Trappe, J.M. 1975. Generic synonyms in the Tuberales. Mycotaxon 2:109-122.



Photos courtesy of M.A. Castellano

Choiromyces venosus (Fries) Th. Fries

ROD name *Choiromyces venosus*



Family Tuberaceae **Morphological Habit** sequestrate

Description: **Sporocarps** irregularly folded-lobed, up to 10 cm broad or more, almost smooth, slightly fibrillose, more so in the folds, pallid, pink-buff or paler, in places spotted vinaceous buff to fawn color, peridium thin. **Gleba** solid with gray-buff later brown, labyrinthine parts. **Odor** faint when fresh (like *Tuber rufum*), much stronger when decaying. **Peridium** 400 µm thick, with an outer pseudoparenchymatic layer, appearing faintly brown, main layer hyaline, of interwoven hyphae; sterile part of gleba of hyaline, loosely woven hyphae, 5 µm broad, a few up to 15 µm, fertile parts of similar hyphae more densely packed. **Asci** sack-shaped, often with a long stipe, sporiferous part 100-120 x 50-60 µm, stem up to 120 µm long, 8 spores (rarely fewer) in two rows or irregular. **Spores** globose, 22-30 µm broad including spine and rods, 3-6 µm high, 16-19 µm broad without ornamentation, pale brown at maturity.

Distinguishing Features: Characterized by the unique spore ornamentation of spines and rods that are up to 6 µm high and 1 µm wide.

Distribution: Known from two sites within the range of the northern spotted owl which is on Federal land: **CALIFORNIA, Humboldt Co.,** King Range National Conservation area; **OREGON**, **Lane** Co., Bureau of Land Management, Eugene District, Mohawk Research Natural Area. Also known from Europe and West Virginia.

Substrate and habitat: Forms sporocarps beneath the soil surface associated with various Pinaceae spp., particularly *Pseudotsuga menziesii* and *Tsuga heterophylla* at low elevation.

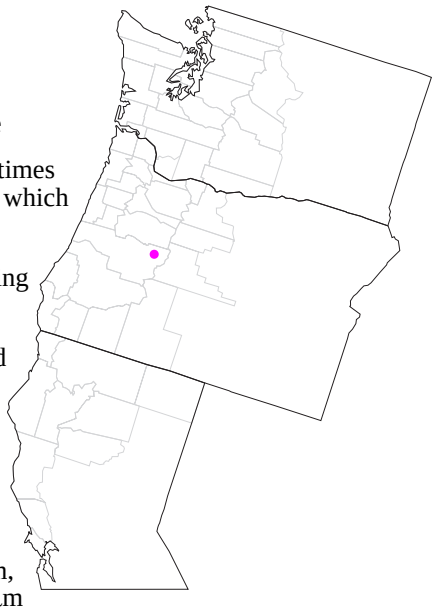
Season: Fruits in October.

References: Fries, E. 1830. In, Lindblom, Kongl. Vet. Ak. Handl. p. 248. Fries T.C.E. 1909. Skandinaviens trytflar och tryffelliknande svampar. Sv. Bot. Tidskr. 3:320.

Photo courtesy of E. Danell

Chroogomphus loculatus Trappe & Miller

ROD name *Chroogomphus loculatus*



Family Gomphidiaceae **Morphological Habit** sequestrate

Description: **Cap** 2.5-7.0 broad, convex, margin expanding fully or sometimes remaining almost unexpanded, dry, with appressed or repent fibrillose scales which are dark olive over a pale orange to pale yellow ground color, pale brown. **Hymenophore** very irregular forming enclosed locules due to numerous intervenose connections, clearly loculate, decurrent, pale pink at first darkening to brown orange in age. **Stem** 2.5-8 cm long, 1.5-3.5 cm wide, somewhat ventricose tapering to a dull pointed base, often fused to 3/4 or more of total length, dry, pale orange or vinaceous tinged above annular zone, below pallid to yellow, streaked with olivaceous fibrils, olive tomentose over the base. Mycelium surrounding the base of the sporocarp pink, hyphae 6.5-8.5 µm diam, thin- or thick-walled, amyloid. **Flesh** pale orange but often olive stained near the base. **Partial veil** fibrillose remaining in some as an obscure fibrillose zone. **Pileipellis** of nonviscid, innate, loosely tangled to erect, thin-walled hyphae (7-) 13-22 µm diam, walls somewhat roughened, either amyloid or nonamyloid to yellow brown, contents of all cells appear hyaline. **Trama of pileus** of more tightly interwoven hyphae 13-30 µm diam, thin-walled, amyloid. **Trama of locule walls** of interwoven hyphae 5-20 µm diam, thin-walled, darkly amyloid as in pileus trama. **Basidia** 48-72 x 11-15 µm, clavate, thin-walled, 4-spored, hyaline in Melzer's reagent and KOH. **Pleurocystidia and cheilocystidia** 108-200 (-260) x (13-) 17-29 µm, numerous, nearly cylindrical, long fusiform to elongate clavate, walls up to 1.5-3 µm, hyaline to pale yellow contents in Melzer's reagent, protruding 1/2 to 2/3 above the hymenium, sometimes partially covered with dingy yellow brown encrusted material. **Clamp connections** absent on sporocarp hyphae but present on hyphae of basal mycelium. **Spores** subfusiform in profile, ovate to elongate-ovate in face view, (15-) 19-30 x 6-9 µm, walls up to 1 µm thick, deep red, ochraceous to yellow contents in Melzer's reagent, in KOH brown-black.

Distinguishing Features: Characterized by the large, smoky black spores, its nongelatinous cuticle and pigmented pileus tissue which is amyloid, and the loculate to strongly intervenose nature of the hymenophore.

Distribution: Endemic to Oregon. Known from a single site within the range of the northern spotted owl: **OREGON**, **Lane** Co., Willamette National Forest, Lamb Butte Scenic Area, along trail to Potholes Creek.

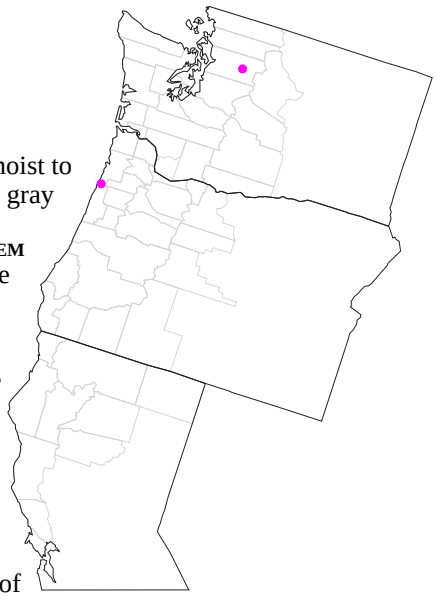
Substrate and habitat: Forms sporocarps beneath the soil surface associated with various Pinaceae spp., particularly *Tsuga mertensiana* at 1,400 m elevation.

Season: Fruits in October.

Reference: Miller, Jr., O.K., and Trappe, J.M. 1970. A new *Chroogomphus* with loculate hymenium and a revised key to section Floccigomphus. Mycologia 62:831-836.

Photo courtesy of M.A. Castellano
Photo courtesy of T. O'Dell

Clitocybe senilis (Fries) Gillet



ROD name *Clitocybe senilis*

Family Tricholomataceae **Morphological Habit** mushroom

Description: **Cap** 1.5-5.5 mm diam, convex to plane, nonstriate; surface moist to dry, matted fibrillose when young, becoming appressed fibrillose in age, dark gray at first, fading to gray-tan or pale ochraceous. **Odor and taste** strongly farinaceous. **Gills** decurrent, close, narrow, white at first then pale gray. **Stem** 20-45 x 3-7 mm, equal, glabrous, white at first but becoming gray in age, base with white tomentum and coarse white rhizomorphs. **Pileipellis** of young specimens a palisade of erect, cystidioid, terminal cells, these cylindric to clavate, 20-37 x 5-8 (-12.5) µm, with pale brown pigments, these elements becoming repent in mature caps. **Basidia** 4-spored. **Cystidia** absent. **Clamp connections** present. **Spores** ellipsoid, 4-6 x 2.5-3.5 µm, smooth, inamyloid, white spore print.

Distinguishing Features: Characterized by a dark gray cap that fades to gray-tan with a matted fibrillose surface when young; a strongly farinaceous odor and taste; decurrent pale gray gills; a gray, glabrous stem arising from coarse, white rhizomorphs; and a pileipellis with a thin palisade of cylindric to clavate cystidia-like elements. One of only two *Clitocybe* species with cystidia-like elements on the cap.

Distribution: Known from 2 sites within the range of the northern spotted owl; **OREGON**, **Tillamook** Co., Neskowin Creek; **WASHINGTON**, **Snohomish** Co., Mount Baker-Snoqualmie National Forest, Barlow Pass. Also known from eastern North America and Sweden. Not known from California.

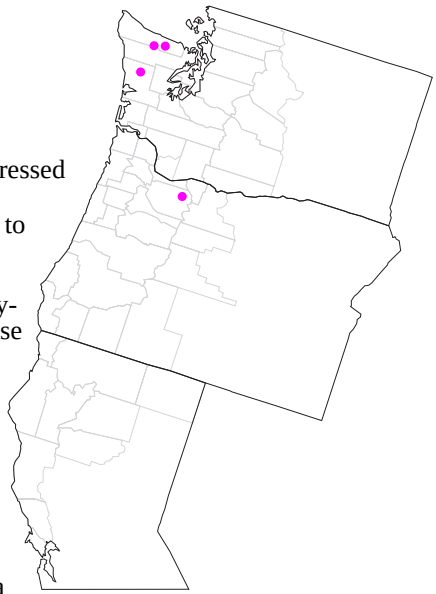
Substrate and habitat: Forms gregarious to subcaespitose sporocarps in duff, restricted to conifer forests.

Season: Fruits from July through October.

References: Bigelow, H.E. 1982. North America species of *Clitocybe*. Part I. Beih. Nova Hedwigia 72: 1-280. Bigelow, H.E. 1985. North America species of *Clitocybe*. Part II. Beih. Nova Hedwigia 81:281-471.

Photo courtesy of J. Ammirati

Clitocybe subditopoda Peck



ROD name *Clitocybe subditopoda*

Family Tricholomataceae **Morphological Habit** mushroom

Description: **Cap** 15-50 mm diam, convex at first, becoming plane to depressed in age, finely pellucid striate when moist; surface moist to dry, glabrous, hygrophanous; at first watery gray-brown with a slight vinaceous tint, fading to gray, vinaceous buff, to gray-buff in age and with moisture loss. **Odor and taste** strongly farinaceous. **Gills** adnate to moderately decurrent, close, narrow, gray with a vinaceous tint. **Stem** 20-60 x 3-6 mm, equal, watery gray-brown or when young covered with a thin layer of appressed white fibrils, base with watery gray tomentum. **Pileipellis** a cutis of repent, cylindric hyphae 2.5-5 µm diam, slightly gelatinous, with pale brown pigments. **Basidia** 4-spored. **Cystidia** absent. **Clamp connections** present. **Spores** ellipsoid, 3.5-6 x 2.5-4 µm, smooth, inamyloid, white spore print.

Distinguishing Features: Characterized by a relatively small, hygrophanous, glabrous cap colored watery gray-brown when fresh and fading to gray-tan in age, often striate when moist; a strong farinaceous odor and taste; close, adnate to moderately decurrent, gray to vinaceous tan gills; a relatively thick (3-6 mm), equal, watery gray-brown stem that lacks coarse white rhizomorphs; and growth in rings on needle beds under pine and spruce. Microscopically, this taxon is distinct because of relatively small, inamyloid, smooth, ellipsoid spores, presence of clamp connections, and a pileipellis composed of repent, cylindric hyphae with pale brown pigments.

Distribution: Known from six sites within the range of the northern spotted owl; **OREGON**, **Clackamas** Co., Mount Hood National Forest, near mile bridge; Mount Hood National Forest, above Welches; **WASHINGTON**, **Clallam** Co., Olympic National Park, Mount Angeles; **Jefferson** Co., Olympic National Park, near Hoh River; **Grays Harbor** Co., Olympic National Forest, Quinault Lake; Olympic National Forest, Quinault Research Natural Area. Also occurs in northeastern North America. Not known from California.

Substrate and habitat: Forms gregarious to subcaespitose sporocarps in fairy rings on needle beds of *Picea* spp. and *Pinus* spp., in coastal to mid-elevation conifer forests.

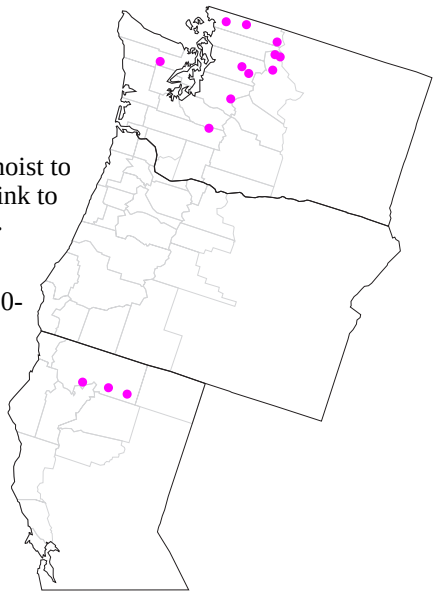
Season: Fruits from October through early December.

References: Bigelow, H.E. 1982. North America species of *Clitocybe*. Part I. Beih. Nova Hedwigia 72:1-280. Bigelow, H.E. 1985. North America species of *Clitocybe*. Part II. Beih. Nova Hedwigia 81:281-471.

Photos courtesy of T. Baroni

Collybia bakerensis A.H. Smith

ROD name *Collybia bakerensis*



Family Tricholomataceae **Morphological Habit** mushroom

Description: **Cap** 5-40 mm diam, convex to plano-convex; surface dull, moist to dry, glabrous to finely granulose, white overall, in age disc often becoming pink to pale gray-orange. **Gills** adnate to adnexed, close, white, flushed pink in age. **Stem** 10-25 (-40) x 2-3.5 mm, cylindric, often curved, dry, apex white and pruinose, base pubescent, pink to gray-red. **Odor and taste** not distinctive. **Pileipellis and tramal hyphae** inamyloid, nongelatinous. **Caulocystidia** 30-48 x 8-15 µm, cylindric to broadly clavate, or contorted. **Basidia** 2-4-spored. **Pleurocystidia** absent. **Cheilocystidia** 22.5-45 x 6-13.5 µm, of two types: 1) cylindric to broadly clavate and obtuse; 2) irregularly cylindric and nodulose to lobed. **Pileipellis** a trichodermium when young or cutis when mature, composed of hyaline, smooth, cylindric hyphae. **Clamp connections** present. **Spores** ellipsoid, 5.5-7.5 x 3-4.5 µm, smooth, inamyloid, hyaline.

Distinguishing Features: Characterized by a white convex cap; relatively narrow, close, adnate to adnexed white gills; a small, white stem; a tendency for sporocarps to blush pink in age; and abundant, cylindric to nodulose cheilocystidia.

Distribution: Known from 14 sites within the range of the northern spotted owl: **CALIFORNIA**, **Siskiyou** Co., Shasta-Trinity National Forest, Deadhorse summit; Shasta-Trinity National Forest, Sand Flat campground; Klamath National Forest, Carter Meadows; **WASHINGTON**, **Chelan** Co., Wenatchee National Forest, Lake Ann; Wenatchee National Forest, Glacier Peak Wilderness, Lyman Lake; **Jefferson** Co., Olympic National Park, Enchanted Valley; **King** Co., Mount Baker-Snoqualmie National Forest, Asahel Curtis nature trail; **Lewis** Co., Mount Rainier National Park, Eagle Peak; **Skagit** Co., Wenatchee National Forest, Lewis Lake; **Snohomish** Co., Mount Baker-Snoqualmie National Forest, Perry Creek, Forgotten Mountain trail; Mount Baker-Snoqualmie National Forest, Barlow Pass; **Whatcom** Co., Mount Baker-Snoqualmie National Forest, Silver Fir campground; near Anderson Creek; Ross Lake National Recreational Area, Panther Creek. Also known from several additional sites outside of the assessment area, including one site in British Columbia and several from non-owl habitat in northern California, Colorado, and Idaho. Not known from Oregon.

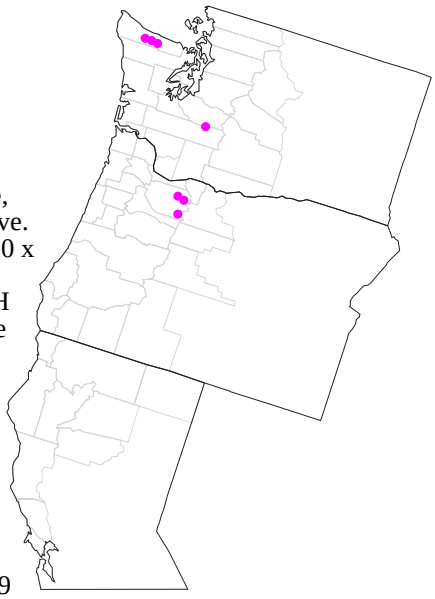
Substrate and habitat: Usually found scattered to gregarious on fallen conifer logs; in California on *Abies* logs soon after melting snow above 2,500 m elevation in the Sierra Nevada and Cascade Ranges; in Washington on *Tsuga* logs.

Season: Fruits from May through early October.

Reference: Desjardin, D. E., and Halling, R.E. 1987. California Collybias I. *Collybia bakerensis*: a common snowbank agaric. Mycotaxon 29:321-327.

Photo courtesy of T. O'Dell

Cortinarius boulderensis A.H. Smith



ROD name *Cortinarius boulderensis*

Family Cortinariaceae **Morphological Habit** mushroom

Description: **Cap** 20-40 mm broad, conic to campanulate/plane, silky in appearance, dull to violaceous brown, becoming darker in age. **Flesh** fragile, concolorous with cap, fading to vinaceous-tan. **Odor and taste** not distinctive. **Gills** adnate with a decurrent tooth, moderately close, gray-lilac. **Stem** 50-80 x 4-7 mm, with red veil (cortina) and annular zones, patches and zones of vinaceous red fibrils, apex dull violet, slightly bulbous base pale brown, KOH negative. **Spores** ellipsoid, 7-8 (-9) x 4-5.5 µm, verrucose, rusty brown spore print.

Distinguishing Features: Characterized by a small, silky, brown gilled mushroom with gray-lilac gills, a red veil, a rusty-brown spore print, and one or more rings or patches of red fibrils on the stem, particularly intense at the stem base. *Cortinarius paragaudis* are tinged with a deep brown red color (particularly the basal mycelium), the gill and cap trama become deep purple when mounted in KOH; fresh specimens are deep purple at the stem base. *Cortinarius spilomeus*(Fr.) Fries has a dry opaque cap and broader spores (6-9 x 6-7 µm). *Cortinarius subtestaceus* A.H. Smith has larger spores, a more tomentose cap, larger size, and differently colored gills and stem apex.

Distribution: Endemic to Oregon and Washington. Known from seven sites within the range of the northern spotted owl: **OREGON**, **Clackamas** Co., Zigzag; Mount Hood National Forest, Twin Bridges campground; **Wasco** Co., Mount Hood National Forest, Warm Springs River, Skyline Rd.; **WASHINGTON**, **Clallam** Co., Olympic National Park, Olympic Hot Springs; Olympic National Park, Soleduc campground B; Olympic National Park, Elwha River trail; **Lewis** Co., Mount Rainier National Park, Eagle Peak. Not known from California.

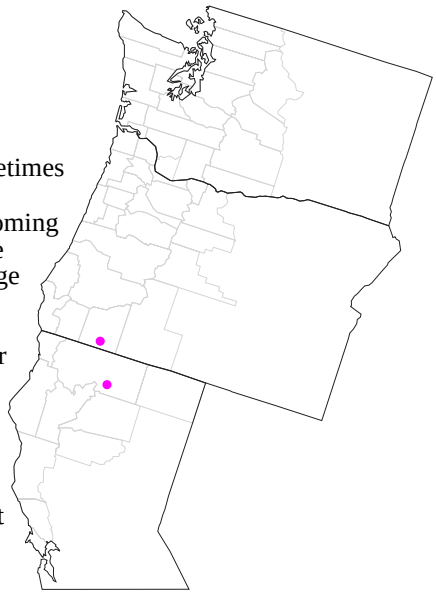
Substrate and habitat: Sporocarps usually occur in association with the roots of various Pinaceae spp.

Season: Fruits in May and from September through November.

Reference: Smith, A.H. 1944. New and interesting Cortinarii from North America. Lloydia 7:163-235.

Photos courtesy of T. O'Dell

Cortinarius magnivelatus Dearness ex Fogel



ROD name *Cortinarius magnivelatus*

Family Cortinariaceae **Morphological Habit** sequestrate

Description: **Cap** 30-65 mm broad, convex becoming plano-convex, sometimes becoming shallowly depressed to umbonate; surface moist to dry; usually appearing glabrous when young, occasionally silky-appressed fibrillose, becoming innately fibrillose to somewhat tomentose, white when young, becoming pale yellow to yellow, then moderate orange-yellow to dark orange-yellow with age or bruising; margin incurved to strongly decurved; attached to the stem by a membranaceous veil during all stages of development. **Gills** adnate to shallowly depressed; white to pale orange-yellow when young becoming near brown-orange to yellow-brown when mature, unchanging when bruised; thin, not fragile, even when dry; several tiers of gills present at margin; abundantly forked near and at the stem; margin entire becoming locally eroded at maturity, entirely covered by veil. **Veil** (cortina) persistent as a heavy, thick membrane, remaining attached to the stem, satiny-white, spores deposited inside. **Stem** 15-60 x 10-30 mm broad at apex, typically somewhat bulbous at base, occasionally equal to tapering slightly, flesh white, unchanging. **Odor and taste** not distinctive. **Pileus cuticle** differentiated only as a narrow layer of compactly interwoven hyphae 4-5 (-8) µm in diam obscured by organic debris. **Flesh** composed of interwoven, hyaline 4-10 (-15) µm in diam hyphae. **Stem** composed of dextrinoid, appressed parallel hyphae 3-5 µm in diam, a few 10 µm in diam. Veil composed of hyaline, dextrinoid, thin-walled, appressed, parallel hyphae 3-6 µ in diam. **Clamp connections** common. **Basidia** 4-spored, 27-40 x 7-10 µm, clavate, hyaline, thin-walled, base truncate. **Sterigmata** 2-4 x 1.5-2 µm, conical, straight to slightly curved. **Pleurocystidia** absent. **Cheilocystidia** reviving poorly, 18-23 x 4-6 µm hyaline, thin-walled, cylindric, ventricose or nearly filamentous. **Spores** ellipsoid, 8.5-11 (-14) x 5-8 µm, asymmetrical, minutely verrucose to rugulose, pale orange-yellow, thin-walled, immature spores dextrinoid.

Distinguishing Features: Characterized by white sporocarps and a white, membranous, persistent veil that darkens on handling. The veil tissue has numerous clamp conntions.

Distribution: Known from two sites within the range of the northern spotted owl: **CALIFORNIA**, **Siskiyou** Co., Bear Springs; **OREGON**, **Jackson** Co., along highway 5 at the pass near Mount Ashland. Also known from Lassen Volcanic National Park, through the southern Sierra Nevada mountains and into Nevada and Utah. Not known from Washington.

Substrate and habitat: Forms sporocarps beneath the soil surface associated with the roots of *Abies concolor, A. bifolia, A. magnifica, Picea engelmannii, Pinus lambertiana*, and *P. ponderosa* above 1,500 m elevation.

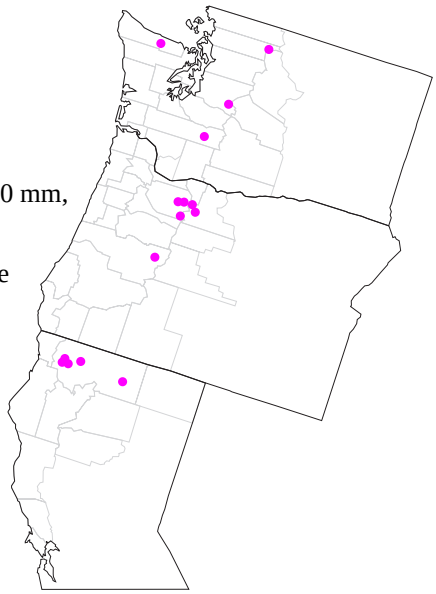
Season: Fruiting from May through August.

References: Fogel, R. 1994. Materials for a hypogeous mycoflora of the Great Basin and adjacent cordilleras of the western United States II. Two subemergent species *Cortinarius saxamontanus*, sp. nov., and *C. magnivelatus*, plus comments on their evolution. Mycologia 86:795-801. Thiers, H., and Smith, A.H. 1969. Hypogeous cortinarii. Mycologia 61:526-536.

Photo courtesy of M. Beug

PHOTO ONLY AVAILABLE IN PRINTED VERSION

Cortinarius olympianus A.H. Smith



ROD name *Cortinarius olympianus*

Family Cortinariaceae **Morphological Habit** mushroom

Description: **Cap** 30-70 (-100) mm broad, subviscid, violet or pale lilac, becoming white with a yellow disc. **Gills** pale pink lilac. **Stem** 40-60 x 8-10 mm, equal to marginate base (15-20 mm broad) and then tapering below, pale to medium lilac. KOH reaction pink to red in both fresh and dry cap surface. Immediate vivid pink to red KOH reaction in fresh or dried pileipellis (visible with a hand lens). **Spores** amygdaliform to slightly limoniform, 8-10 x 5-6 µm, moderately ornamented, rusty-brown spore print.

Distinguishing Features: Characterized by a violet or pale lilac sporocarp with pale pink-lilac gills, a subviscid cap, a rusty-brown spore print, and an immediate pink to red KOH reaction on fresh or dry cap surface. *Cortinarius caesiocyaneus* Britz. is a very similar European species with violaceous gray to ochraceous yellow gills and amygdaliform to slightly limoniform spores which are slightly narrower (8-10 x 4.5-5.5 µm).

Distribution: Endemic to the Pacific Northwest. Known from 17 sites within the range of the northern spotted owl: **CALIFORNIA, Siskiyou** Co., Klamath National Forest, trail to Haypress Meadows; Klamath National Forest, Stanshaw trail; Klamath National Forest, Cub Creek; Klamath National Forest, .2 km up Canyon Creek, trail to Lovers camp; **OREGON**, **Clackamas** Co., Rhododendron; Mount Hood National Forest, Twin Bridges campground; Mount Hood National Forest, east fork of the Salmon River; **Hood River** Co., Mount Hood National Forest, Pioneer Woman's grave; **Lane** Co., Willamette National Forest, Lamb Butte Scenic Area, Olallie trail; **Wasco** Co., Mount Hood National Forest, Bear Springs; Warm Springs Indian Reservation, Bear Springs at Beaver Creek; Warm Springs River, Skyline Rd.; **WASHINGTON**, **Clallam** Co., Olympic National Park, Deer Creek; Olympic National Park, Elwha campground loop trail; **Skagit** Co., North Cascades National Park, Easy Pass trailhead; **King** Co., Stampede Pass; **Lewis** Co., Rd. 125, 7 km south of Randle.

Substrate and habitat: Sporocarps usually occur in association with the roots of various Pinaceae spp.

Season: Fruits from September through November.

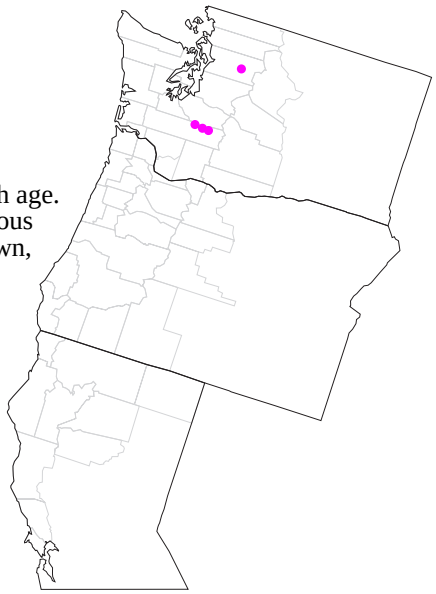
Reference: Smith, A.H. 1939. Studies in the genus *Cortinarius* I. Contrib. Univ. Mich. Herb. 2. University of Michigan Press, Ann Arbor.

PHOTO ONLY AVAILABLE IN PRINTED VERSION

Photo courtesy of University of Michigan
Photo courtesy of T. O'Dell

Cortinarius rainierensis A.H. Smith & Stuntz

ROD name *Cortinarius rainierensis*



Family Cortinariaceae **Morphological Habit** mushroom

Description: **Cap** 30-80 mm broad, orange-red, dry, innately fibrillose-squamulose. **Odor** radish-like. **Gills** ochraceous red-orange, darkening with age. **Stem** 50-80 (-100) x 10-12 (-15), pale to dark tawny, with fibrillose concolorous to yellow concentric belts. **Pileipellis** with fascicles of rusty- to yellow-brown, moderately encrusted hyphae projecting to form squamules. **Spores** broadly ovate**,** 9-11 x 6.5-8 µm, punctate-roughened, dark rusty brown spore print.

Distinguishing Features: Characterized by a dry, fibrillose, orange-red, gilled mushroom and a rusty-brown spore print. *Cortinarius speciosissimus* has very similar morphological characters, similar lightly punctate spores (8-11 x 6.5-8.5 µm). *Cortinarius rubellus* has subglobose and distinctly, densely verrucose spores. *Cortinarius distans* var. *olympianus* has narrower spores (5-6 µm). Fresh material has a hygrophanous cap with faintly striatulate margins when moist.

Distribution: Endemic to Washington. Known from four sites within the range of the northern spotted owl: **WASHINGTON**, **Snohomish** Co., Mount Baker-Snoqualmie National Forest, Barlow Pass; **Pierce** Co., Mount Rainier National Park, Lower Tahoma Creek; Mount Rainier National Park, Kautz Creek; Mount Rainier National Park, Longmire. All of these observations are historic; this taxon has not been collected since 1954.

Substrate and habitat: Sporocarps are usually occur in association with the roots of various Pinaceae spp.

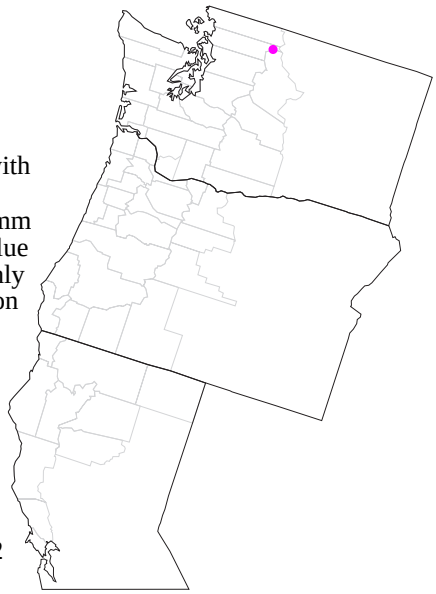
Season: Fruits from July through October.

Reference: Smith, A.H., and Stuntz, D.E. 1950. New or noteworthy fungi from Mt. Rainier National Park. Mycologia 42:80-134.

Photo courtesy of G. Gulden

Cortinarius umidicola Kauffmann

ROD name *Cortinarius canabarba*



Family Cortinariaceae **Morphological Habit** mushroom

Description: **Cap** 40-122 mm broad, hemispheric, dry, pale gray-brown with ochraceous to drab disc and violaceous margin, becoming very brown in age. **Gills** dull cinnamon drab, then gray- to dark-brown. **Stem** 60-120 x 10-21 mm (to 17-40 mm at the base), very stout, clavate, apex gray, sometimes with a blue cast. **Universal veil** (cortina) gray-white or pale gray brown, fibrillose, highly developed at first and fairly persistent, later remaining as incomplete belt(s) on lower stem. KOH reaction slowly gray-brown on cap surface, dark brown to black in cap flesh. **Basidia** 4-spored, 32-34 x 8-8.5 µm, clavate. **Clamp connections** present. **Spores** ellipsoid, 8-10 (-10.5) x 5.5-6 (-6.5), verrucose.

Distinguishing Features: Characterized by a highly developed gray-white or gray-brown cortina, often with pale brown fibrillose belts on the robust lower stem, and a rusty-brown spore print. The smaller *C. fuscoperonatus* Kühner has a scalier dark-brown cap and larger spores (10-12 x 6.5-8 µm). *Cortinarius plumiger* Fries has a white veil and a scalier, more strongly hygrophanous cap.

Distribution: Known from a single site within the range of the northern spotted owl: **WASHINGTON**, **Whatcom** Co., Okanogon National Forest, Easy Pass trailhead. Also known from New York and Europe.

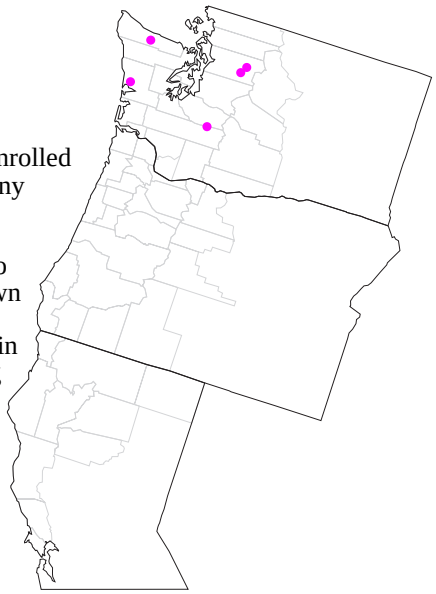
Substrate and habitat: Sporocarps usually occur in association with the roots of various Pinaceae spp.

Season: Fruits in September.

Reference: Kauffman, C.H. 1905. The genus *Cortinarius:* A preliminary study. Bull. Torr. Bot. Club 32:301-325.

Photo courtesy of T. O'Dell

Cortinarius variipes Henry



ROD name *Cortinarius variipes*

Family Cortinariaceae **Morphological Habit** mushroom

Description: **Cap** 35-72 mm broad, obtuse to broadly umbonate with an enrolled margin, edge becoming rimose in age, moist to dry, brown or ochraceous tawny with darker brown disc. **Gills** deeply notched, more or less subdistant, gray, becoming yellow-brown to orange-brown. **Stem** 47-73 x 11-15 x 16-21 mm, ventricose, pallid above (with slight gray-lilac tinge) with a pale yellow-tan to orange-tan base. **Veil** (cortina) scant. KOH reaction gray-brown with a brown edge on cap flesh, brown on cap surface. **Flesh** tan to pale tan with slight yellow discoloration. **Pileipellis** bright orange in KOH, suprapellis 4-8 µm in diameter, hyphae encrusted with yellow-orange pigments with ends emerging upwards in fascicles, pellis hyphae 8-28 µm diameter, slightly gelatinized, inflated and difficult to distinguish from subcuticular hyphae. **Clamp connections** present in suprapellis. **Spores** ovoid to subglobose, 6-7 (-8) x 4-5.5 µm, punctate to moderately roughened, brown spore print.

Distinguishing Features: Characterized by a brown, dry mushroom with gray gills, a pallid stem with tan flesh, a bright orange reaction of the pileipellis to KOH, a swollen base, and a rusty-brown spore print. *Cortinarius intentus* Fries has a white flesh and bright yellow gills.

Distribution: Endemic to Washington. Known from five sites within the range of the northern spotted owl: **WASHINGTON**, **Clallam** Co., Olympic National Park, Olympic Hot Springs; **Grays Harbor** Co., Wilderness State Park; **Pierce** Co., Mount Rainier National Park, Longmire; **Snohomish** Co., Mount Baker-Snoqualmie National Forest, North Fork Sauk River, 3.3 km from trailhead; Mount Baker-Snoqualmie National Forest, Barlow Pass.

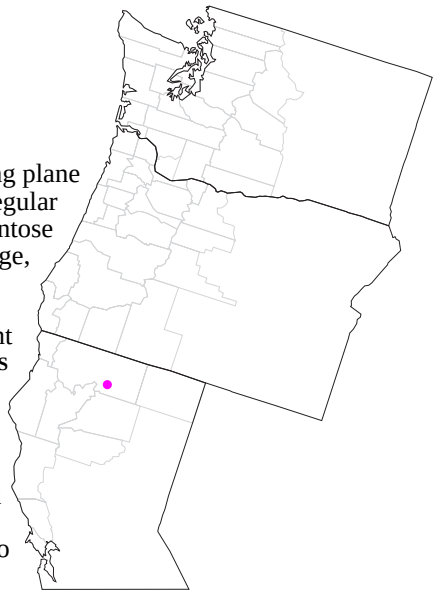
Substrate and habitat: Sporocarps usually occur in association with the roots of various Pinaceae spp.

Season: Fruits from August through October.

Reference: Henry, R. 1977. Bull. Soc. Mycol. France 93:369.

Photo courtesy of J. Ammirati

Cortinarius verrucisporus Thiers & A.H. Smith



ROD name *Cortinarius verrucisporus*

Family Cortinariaceae **Morphological Habit** sequestrate

Description: **Cap** 3-6 cm broad at maturity, convex when young, becoming plane to plano-convex to plane shallowly depressed with age, frequently highly irregular and undulating in outline, surface dry to moist, innately fibrillose to subtomentose when young, unchanging or becoming glabrous to obscurely fibrillose with age, when very young white to pale brown, very soon becoming rusty brown with some areas colored near yellow to pale brown to brown. **Margin** entire, concolorous, strongly incurved, attached to the stipe by a tenacious permanent veil during all stages of development. **Odor and taste** not distinctive. **Gills** subdecurrent to adnate, close to subdistant, pallid to pale olive when young becoming red brown as spores mature, thin, becoming noticeably crisped when dry, fragile, several tiers of reduced gills present, somewhat ventricose. **Stem** poorly developed and somewhat obscure, 1-1.5 cm long, 1-1.5 cm broad at the apex, equal to slightly bulbous, concolorus with the cap, covered with partial veil during all stages of development, solid. **Partial veil** (cortina) permanent, tough, fibrous, concolorus with cap surface. **Flesh** up to 1 cm thick, yellow, unchanging when exposed, firm. **Pelliopellis** differentiated as a layer of appressed hyphae which stain vinaceous in KOH, walls subgelatinous in KOH. **Basidia** 4-spored, hyaline in KOH, clavate, 27-30 x 7-9 µm. **Pleurocystidia and cheilocystidia** absent. **Clamp connections** present throughout, abundant in the veil tissue. **Spores** ovoid, 10.5-13 x 6.5-8.0 µm, thick-walled, conspicuously verrucose-roughened with large, coarse warts which often unite to form short reticulations.

Distinguishing Features: Characterized by the sequestrate habit, the presence of bright yellow stains on the cap and a strong development of warts on the spores.

Distribution: Endemic to California. Known from a single site within the range of the northern spotted owl: **CALIFORNIA**, **Siskiyou** Co., Horse Camp. Another site outside the assessment area is in Lassen Volcanic National Park.

Substrate and habitat: Forms sporocarps beneath the soil surface associated with the roots of *Abies magnifica* and possibly other *Abies* spp. above 1,00 m elevation.

Season: Fruits from June through September.

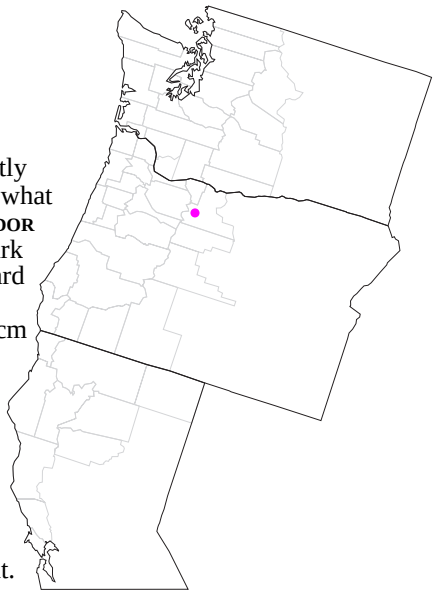
Reference: Thiers, H., and Smith, A.H. 1969. Hypogeous cortinarii. Mycologia 61:526-536.

Photo courtesy of S. Trudell

Photo only available in printed version

Cortinarius wiebeae Thiers & A.H. Smith

ROD name *Cortinarius wiebeae*



Family Cortinariaceae **Morphological Habit** sequestrate

Description: **Cap** 6-13 cm broadly convex becoming nearly plane to slightly depressed, surface dry and silky, with radiating fibrils, white, becoming somewhat tan colored on handling and on drying. **Margin** long remaining enrolled. **Odor** faintly radish-like. **Taste** mild. **Gills** ferruginous when fresh and young, dark rusty brown from spores in age, sinuate, broad (up to 13 mm), narrowed toward both extremities, crowded, numerous tiers of reduced gills present, very thin and very fragile, edges eroded. **Stem** 4-9 cm long, 2.4-4 cm at apex, up to 5 cm thick at base, clavate, white when fresh within and without, solid, surface dry and coated with white fibrils from the copious veil ending in a submembranous annulus. **Veil** (cortina) persistent, extending from pileus margin to stem, in age shredding radially. **Flesh** white, firm, confluent with stipe, 3 cm thick near stipe. **Pileipellis** lacking a differentiated cutis, hyphae at surface appressed, thin-walled, hyaline, smooth, 3-12 µm in diam, some cells inflated, others 4-9 µm broad and uninflated. **Gill trama** of parallel, hyaline, thin-walled, scarcely inflated hyphae 4-8 µm in diam. **Basidia** 4-spored, hyaline in KOH, 17-22 x 5.5-7 µm. **Pleurocystidia** absent. **Cheylocystidia** scattered, hyaline, filamentose, 3-4 µm in diam. **Clamp connections** rare and inconspicuous. **Spores** ellipsoid, 9-11 x 6-7.5 µm, somewhat asymmetrical, warty-rugulose.

Distinguishing Features: Characterized by sequestrate habit, ferruginous gills, small basidia and a heavy veil.

Distribution: Endemic to Oregon. Known from one site within the range of the northern spotted owl: **OREGON**, **Wasco** Co., Mount Hood National Forest, Camas Prairie. Another site is known from Oregon, near Mount Bachelor on the Deschutes National Forest.

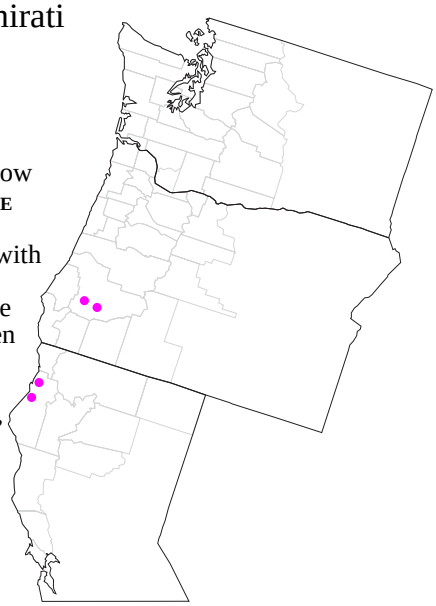
Substrate and habitat: Forms sporocarps beneath the soil surface associated with the roots of *Pseudotsuga menziesii* and *Pinus ponderosa* above 1,200 m elevation.

Season: Fruits in June.

Reference: Thiers, H., and Smith, A.H. 1969. Hypogeous cortinarii. Mycologia 61:526-536.

No photograph available

Dermocybe humboldtensis (Ammirati & A.H. Smith) Ammirati



ROD name *Dermocybe humboldtensis*

Family Cortinariaceae **Morphological Habit** mushroom

Description: **Cap** 30-50 mm broad, appressed fibrillose with an olive-yellow sheen when young, disc pale brown, margin pale yellow-tan. **Odor and taste** indistinct. **Gills** adnate, close, olive-yellow at first, then more or less ochre-yellow. **Stem** 60-120 x 4-8 mm, ±equal, fibrillose, dingy yellow to the base with a covering of brown fibrils. Cap surface dark inky violet, becoming slowly purple-brown in KOH. **Flesh** dingy-brown. **Pileipellis** brown-red with blue to blue-purple pigment particles in the cuticular and subcuticular hyphae when mounted in KOH. **Cheilocystidia** narrowly cylindrical, ±2 µm in diameter, some with yellow contents with red granules. **Clamp connections** present. **Spores** ellipsoid to ovate, 7-9.2 x 4.5-5.5 µm, pale brown to fulvous in KOH, verruculose.

Distinguishing Features: Characterized by a green-brown cap with an olive-yellow sheen, olive-yellow gills, dingy yellow stem, and rusty-brown spore print. *Dermocybe idahoensis* has rusty- to orange-ochraceous gills, slightly larger spores (but range overlapping that of *D. humboldtensis*) and clavate to broadly clavate cheilocystidia.

Distribution: Endemic to California and Oregon. Known from four sites within the range of the northern spotted owl: **CALIFORNIA**, **Humboldt** Co., Lamphere Dunes; Trinidad; **OREGON**, **Douglas** Co., Bureau of Land Management, Roseburg District, North Myrtle Creek; Irwin Rocks Research Natural Area. Not known from Washington.

Substrate and habitat: Sporocarps usually occur in association with the roots of various Pinaceae spp.

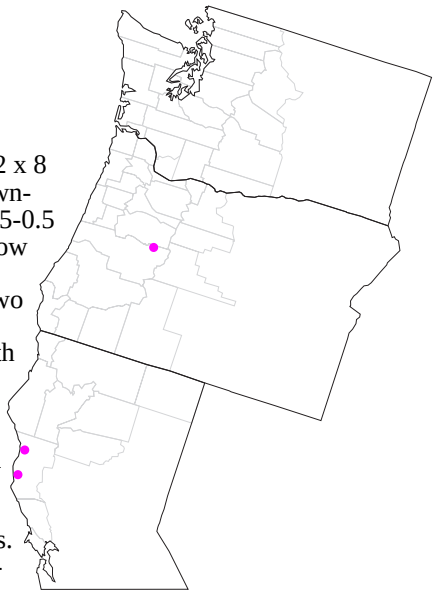
Season: Fruits in November and December.

Reference: Ammirati, J.F., and Smith, A.H. 1977. Studies in the genus *Cortinarius*, III: section *Dermocybe*, a new North American species. Mycotaxon 5:381-397.

Photo courtesy of M.A. Castellano

Destuntzia fusca Fogel & Trappe

ROD name *Destuntzia fusca*



Family Cortinariaceae **Morphological Habit** sequestrate

Description: **Sporocarps** pulvinate, up to 12-15 mm broad when fresh, 12 x 8 mm as dried, glabrous, pallid, in time becoming pale brown-rose, drying brown-orange. **Gleba** as dried composed of brown-black, elongate locules 0.7 x 0.25-0.5 mm in diam, filled with gel-embedded spores, separated by white to dull yellow veins. **Columella** a pulvinate base up to 3 x 5 mm with irregular branches. **Rhizomorphs** lacking. **Odor** not distinctive. **Peridium** 440-519 µm thick, two layered. **Peridial epicutis** 198-250 µm thick, of periclinal, hyaline, thin-walled hyphae 3-4 µm broad, cells not becoming inflated. One sporocarp with hyaline, thick-walled hyphae 5-10 µm in diam, attached to thick-walled, terminal, subglobose vesicles 50 x 40 µm in diam, subtending hyphae constricted at point of attachment to vesicle. **Peridial subcutis** 190-231 µm thick, confluent with trama, of periclinal, hyaline, thin-walled hyphae 3-4 µm broad at septa, cells becoming inflated to 8 µm. **Trama** 25-75 µm wide, of interwoven, hyaline, thin-walled, gelatinous, septate hyphae 3-4 in diam, cells inflated to 12 µm in diam, sphaerocysts common in axes of tramal plates. **Clamp connections** present. **Basidia** reviving poorly, 4-spored, obovate, 40-50 x 8-11 µm, hyaline, thin-walled, no clamp connection observed at basal septum, sterigmata tubular, 2-4 x 1.5-2 µm. **Basidioles** not rehydrating. **Spores** ellipsoid, 8-11 x 5-6 µm including ornamentation but not pedicel, dark gray-yellow in KOH, ornamentation warty-rugulose, 0.5 µm or less long, thin-walled, pedicel central, tubular, hyaline, 1-4 x 1.5 µm broad.

Distinguishing Features: Characterized by short spore ornamentation, presence of sphaerocysts in the tramal plates, and a dark brown to black gleba.

Distribution: Endemic to California and Oregon. Known from three sites within the range of the northern spotted owl: **CALIFORNIA**, **Mendocino** Co., 10 km west of Leggett, along highway 1; Van Damme State Park; **OREGON**, **Lane** Co., Willamette National Forest, H.J. Andrews Experimental Forest, stand 3. Not known from Washington.

Substrate and habitat: Forms sporocarps beneath the soil surface associated with the roots of *Lithocarpus densiflorus*, *Pseudotsuga menziesii*, and *Tsuga heterophylla* below 1,000 m elevation.

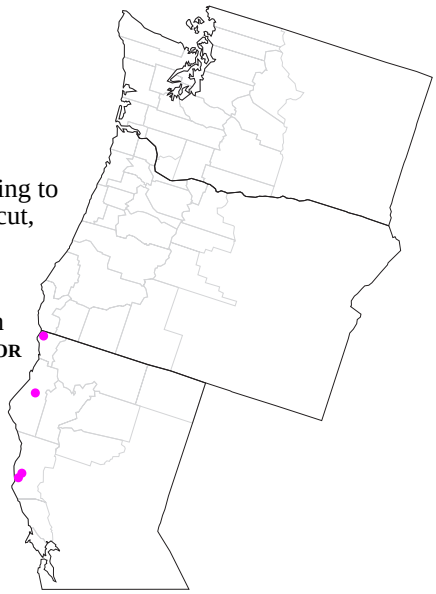
Season: Fruits in October and December.

Reference: Fogel, R., and Trappe, J.M. 1985. *Destuntzia*, a new genus in the Hymenogastraceae (Basidiomycotina). Mycologia 77:732-742.

No photograph available

Destuntzia rubra (Harkness) Fogel & Trappe

ROD name *Destuntzia rubra*



Family Cortinariaceae **Morphological Habit** sequestrate

Description: **Sporocarps** reniform to subglobose, up to 20-25 mm broad, pubescent, with adherent soil, white at first, becoming deep pink above, grading to white below at maturity, slowly staining blue-pink when bruised, pink when cut, drying red. **Gleba** composed of dark gray-yellow to olive-brown, spherical locules ca. 0.2 mm broad, filled with gel-embedded spores at maturity. **Columella** absent or a pulvinate base up to 6 x 3 mm with a few radiating branches. **Rhizomorphs** basal, concolorus with peridium. KOH, dark brown on epicutis, yellow-brown on subcutis; $FeSO_4$ negative; ETOH deep red. **Odor** strong, fishy. **Peridium** 875-1500 µm thick, two-layered. **Peridial epicutis** 250-470 µm thick, of tightly interwoven, hyaline, thin-walled hyphae 2-4 (-5) µm broad. **Peridial subcutis** 625-1030 µm thick, confluent with trama, of tightly interwoven, hyaline, thin-walled hyphae 3-4 µm broad at septa, inflated to 10 µm in diam. A band of interwoven, irregular, aseptate, thick-walled (1-2 µm) hyphae 4-12 (-18) µm broad occurs at the junction of the epicutis and subcutis. Associated with the thick-walled hyphae are hyaline, thick-walled (2 µm), subglobose to ellipsoid cells 29-54 x 22-48 µm which arise from the thin-walled hyphae. **Trama** 35-50 µm wide, of subparallel, hyaline, thin-walled, gelatinous, refractive hyphae 2-4 µm in diam, cells inflated to 8 µm in diam, clamp connections rare, occasional large (9 µm broad) hyphae present. **Basidia** cylindrical to clavate, 40-50 x 4-8 µm, hyaline, walls thickened slightly, single-spored, projecting into locules, not forming a euhymenium. **Basidioles** clavate, 40-50 x 8-10 µm, hyaline, walls thickened slightly. **Clamp connections** common. **Spores** subglobose to ellipsoid, 8-11 x 7-9 µm including ornamentation but not pedicel, pale olive in KOH, immature spores hyaline, cyanophilic; ornamented with conical, vertically striate warts 0.5-2 x ±1.5 µm broad, thin-walled, base truncate, pedicel of immature spores 2-3 x 2 µm.

Distinguishing Features: Characterized by monosporus basidia, a thick peridium, and the prominent, striate, conical warts ornamenting the spores.

Distribution: Endemic to California. Known from 4 sites within the range of the northern spotted owl: **CALIFORNIA**, **Del Norte** Co., 3.3 km south of Smith River; **Humboldt** Co., junction of Maple Creek Rd. and Simpson Rd. 4800; **Mendocino** Co., Jackson State Forest, Woodlands camp on hill above mess hall; near Albion bridge at junction of Rd. 409 and Rd. 408.

Substrate and habitat: Forms sporocarps beneath the soil surface associated with the roots of *Abies grandis*, *Arbutus menziesii*, *Lithocarpus densiflorus*, *Pseudotsuga menziesii*, and *Sequoia sempervirens* below 650 m elevation.

Season: Fruits in March, April, June, July, October and December.

Reference: Fogel, R., and Trappe, J.M. 1985. *Destuntzia*, a new genus in the Hymenogastraceae (Basidiomycotina). Mycologia 77:732-742.

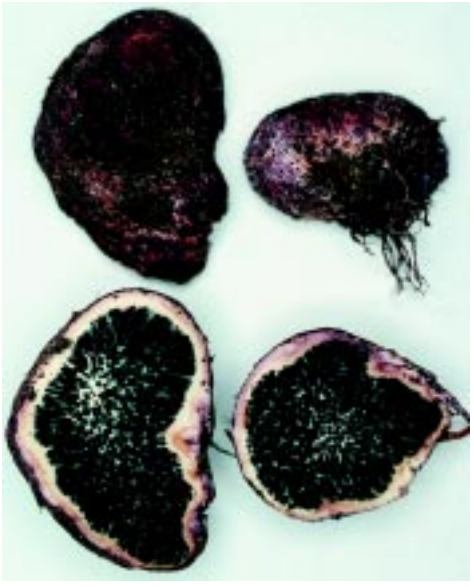
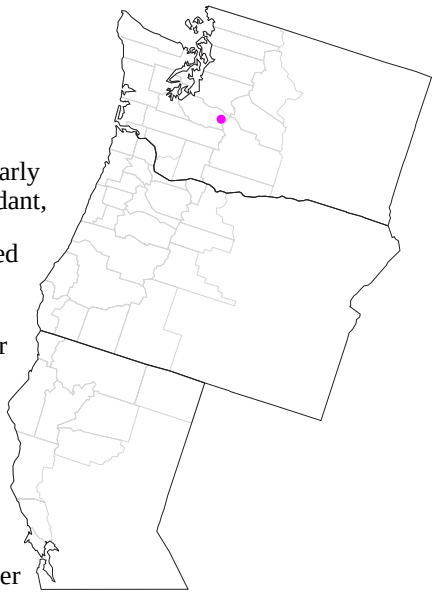


Photo courtesy of M.A. Castellano

Dichostereum boreale (Pouzar) Ginns & Lefebvre

ROD name *Dichostereum granulosum*



Family Dichostereaceae **Morphological Habit** resupinate

Description: **Sporocarps** resupinate, with a slightly tuberculate or irregularly warty hymenial surface, creamy-ochre in the herbarium. **Dichophyses** abundant, strongly dextrinoid, up to 5 µm in diam. **Gloeocystidia** present, filled with granular material. **Spores** ellipsoid, 4-6 x 3-4 µm, amyloid, subtly ornamented with small warts and ridges.

Distinguishing Features: Characterized by an ochraceous-buff granular resupinate crust on dead wood and a white spore print. *Dichostereum pallescens* has more highly ornamented, larger spores (6-7.5 x 5.5-6.5 µm), narrower dichophyses (up to 2 µm in diam), and lacks gloeocystidia. *Dichostereum effuscatum* has larger spores (6-8 x 5.5-7 µm), smaller dichophyses, and appears restricted to eastern North America.

Distribution: Known from a single site within the range of the northern spotted owl: **WASHINGTON**, **Pierce** Co., Silver Springs Forest Camp. Other collections with vague locality data potentially extend the range to **WASHINGTON**, **Snohomish** Co., and **OREGON, Tillamook** Co. Also occurs across the northern United States and in Europe.

Substrate and habitat: Forms resupinate sporocarps and is saprophytic on dead coniferous wood; associated with white-rot of fallen trees.

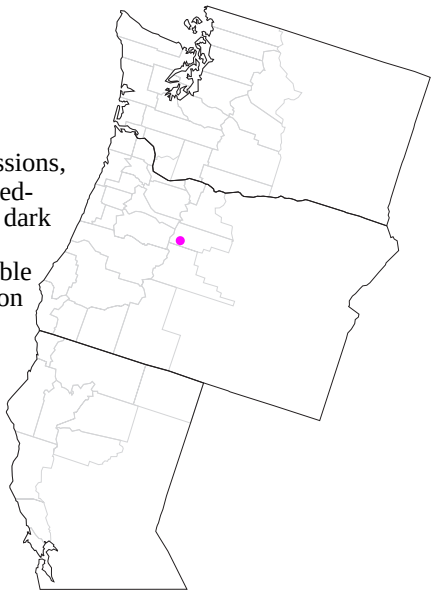
Season: Fruits in May, July, and October.

References: Ginns, J., and Lefebvre, M.N.L. 1993. Lignicolous Corticioid Fungi of North America, Mycol. Mem. 19. APS Press, St. Paul. Jülich, W., and Stalpers, J.A. 1980. The Resupinate Non-Poroid Aphyllophorales of the Temperate Northern Hemisphere. North-Holland Publishing Company, Amsterdam, Oxford, NY.

No photograph available

Elaphomyces anthracinus Vittadini

ROD name *Elaphomyces anthracinus*



Family Elaphomycetaceae **Morphological Habit** sequestrate

Description: **Sporocarps** 2-3 cm broad, slightly flattened with low depressions, covered by dark, firm earthy crust of blackened mycorrhiza and scanty dark red-brown mycelium. **Cortex** on mature specimens almost black with a flush of dark brown, obscurely and finely warty, in most specimens with one large smooth well-delimited spot with green discoloring mycelium, brittle and hard, separable from peridium. **Peridium** 1.5-2 mm thick, pale silver-gray when fresh but soon turning slate gray, soft. **Gleba** pulverulent at maturity, black with a distinct olivaceous sheen. **Odor** not distinctive. **Cortex** 250-350 µm thick with broad flat warts, protruding part 100 µm high, 200 µm broad, made up of pseudoparenchymatic tissue, dark brown, walls 1-2 µm thick, subparallel hyphae between warts 4-5 µm broad and slightly paler brown. **Peridium** well distinguished from cortex, hyphae pale brown, hyaline, thick-walled, 3-4 µm broad in outer part, more loosely woven and 6-7 µm broad within. **Asci** not seen**. Capillitium** scanty, of 2 µm in diam, hyaline hyphae encrusted with olivaceous pigment. **Spores** globose, 21-25 µm in diam, dark brown to almost black, densely set with crowded, low spines.

Distinguishing Features: Characterized by a finely warty, nearly black peridium and spores that are almost black with crowded, low spines.

Distribution: Known from a single site within the range of the northern spotted owl: **OREGON**, **Jefferson** Co., Deschutes National Forest, Riverside campground. Also known from Idaho and Europe. Not known from California and Washington.

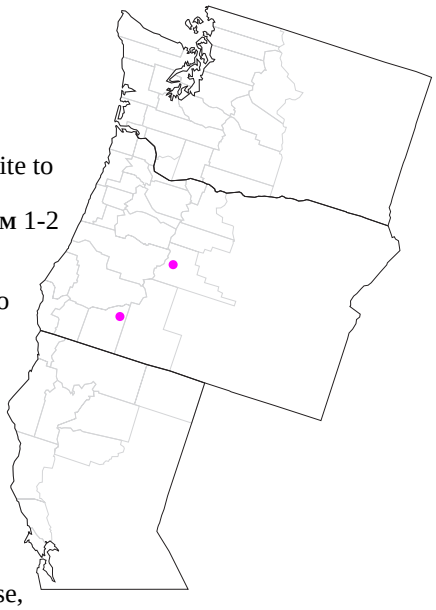
Substrate and habitat: Forms sporocarps beneath the soil surface associated with the roots of assorted Fagaceae in Europe and with *Pinus ponderosa* in Oregon.

Season: Fruits in May and August.

Reference: Vittadini, C. 1831. Monographia Tuberacearum. Mediolani, Italy. p. 66.

Photo courtesy of M.A. Castellano

Elaphomyces subviscidus (Zeller) Trappe & Guzmán



ROD name *Elaphomyces subviscidus*

Family Elaphomycetaceae **Morphological Habit** sequestrate

Description: **Sporocarps** subglobose, up to 3 x 5 cm, surface smooth, white to gray, drying yellow, nonreactive with KOH, encrusted with soil held by inconspicuous but abundant pale hyphae emerging from the surface. **Peridium** 1-2 mm thick when dry, reviving to a thickness of 2.5-3 mm, with a thin, yellow outer layer and a thick, pallid inner layer. **Gleba** dark brown, powdery. **Peridial Peridial epicutis** ±150 µm, of yellow, densely interwoven, single to fascicled hyphae 3-5 µm broad, with mostly hyaline, thin walls but in places thickened to 0.5 µm and often yellow, the entire stratum obscured by hyaline to yellow, amorphous debris, overlain with emergent superficial hyphae that are sinuous, hyaline, thin-walled, 2.5-4 µm in diam. **Peridial subcutis** ±2,500 µm thick, abruptly differentiated from the outer layer as more or less circumferentially aligned but interwoven fascicles of a few to nearly 100 hyaline, highly refractive hyphae 4-8 µm in diam with the walls mucilaginous-thickened, yellow, amorphous debris scattered throughout. **Glebal** hyphae dispersed among spores, thin-walled, hyaline to pale yellow-brown, mostly 1.5-3 µm in diam but a few 5-6 µm, dark brown, amorphous deposits scattered throughout between hyphae. **Asci** not seen. **Spores** globose, 12-21 µm in diam excluding ornamentation, 14-23 (-24) µm with ornamentation, the smaller spores very dark brown, the larger tending to be pale brown, larger spores thin-walled, smaller ones with walls up to 0.5 µm thick, ornamentation of crowded spines 1-2 µm long and ± 0.2 µm thick, separated by 0.2-0.5 µm or sometimes joined in two's and three's by ridges but never a partial reticulum, embedded in an inconspicuous, mucilaginous matrix.

Distinguishing Features: Characterized by the smooth surfaced, noncarbonaceous, pale peridium, brown spore mass, and relatively large spores.

Distribution: Known from two sites within the range of the northern spotted owl: **OREGON**, **Deschutes** Co., Deschutes National Forest, Three Creeks Lake; **Jackson** Co., near Prospect. The site near Prospect is indeterminable for locality and ownership. Also known from Idaho. Not known from California or Washington.

Substrate and habitat: Forms sporocarps beneath the soil surface associated with the roots of *Pinus contorta* and *Tsuga mertensiana* at high elevation (2,200 m).

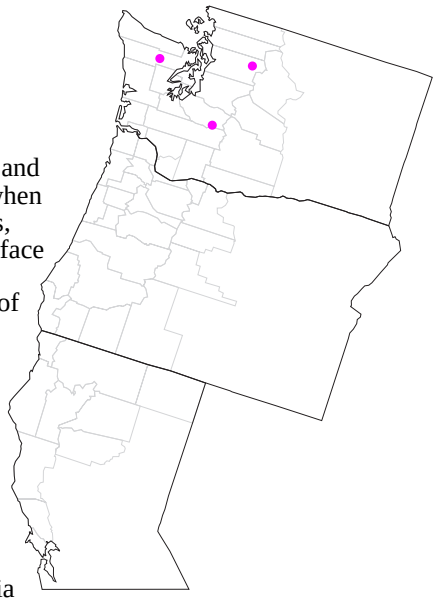
Season: Fruits in June and August.

Reference: Trappe, J.M., and Guzmán, G. 1971. A newly determined species of *Elaphomyces* from Oregon. Madroño 21:128-130.

Photo courtesy of M.A. Castellano

Endogone acrogena Gerdemann

ROD name *Endogone acrogena*



Family Endogonaceae **Morphological Habit** sequestrate

Description: **Sporocarps** up to 4 x 7 x 10 mm, greatly lobed, convoluted and irregular, formed from folded tissue up to 2 mm in thickness, bright yellow when fresh, light tan-yellow when dry. **Peridium** absent. In developing sporocarps, tufts of glebal hyphae radiate from the surface, becoming matted over the surface by maturity. **Gleba** developing acrogenously from a sterile or nearly sterile base of interwoven hyphae as radiate hyphae intermingled with radiate rows of zygospores that are often tightly appressed in chains, the oldest spores at the base, the youngest at the actively growing surface. **Gametangia** 15 x 7 µm, thin-walled and ephemeral, equal in size, parallel, uniting at their tips, with the zygospore forming above the point of union. **Spores** variable in size and shape, 15 x 30-80 x 59 µm, mature spores within a chain varying from a small to large, globose, ellipsoid, ovate or irregular, becoming flattened and angular from pressure, wall up to 5 µm thick, of two variable layers.

Distinguishing Features: Characterized by its apparent acrogenous development of the sporocarps that actually develop on ephemeral gametangia that are not visible on mature spores.

Distribution: Endemic to Washington. Known from three sites within the range of the northern spotted owl: **WASHINGTON**, **Jefferson** Co., Olympic National Park; **Pierce** Co., Mount Rainier National Park, Paradise Point; **Snohomish** Co., Mount Baker-Snoqualmie National Forest, White Chuck Rd.

Substrate and habitat: Forms sporocarps beneath the soil surface associated with the roots of *Abies lasiocarpa*.

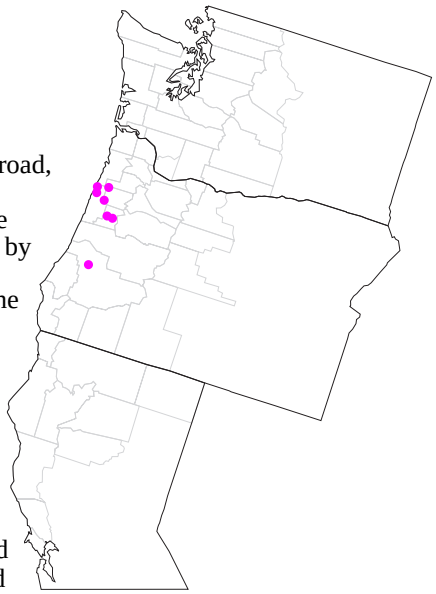
Season: Fruits in September and October.

Reference: Gerdemann, J.W., and Trappe, J.M. 1974. The Endogonaceae in the Pacific Northwest. Mycol. Mem. 5:1-76.

No photograph available

Endogone oregonensis Gerdemann & Trappe

ROD name *Endogone oregonensis*



Family Endogonaceae **Morphological Habit** sequestrate

Description: Sporocarps globose, ellipsoid, lobed or irregular, 6-20 mm broad, enclosed in a thin, white, cottony peridium with much adhering soil. **Gleba** exuding white latex when cut, containing pallid to pale sordid yellow, globose clusters of spores up to 2 mm broad, spore clusters separated from each other by bands of soil or white hyphae. **Gametangia** ephemeral, observed only on immature spores, equal or subequal in size, uniting at or near their tips with the zygospore budding from near the point of union or from one of the two gametangia. **Spores** globose to ellipsoid or ovoid, 77-150 x 44-120 µm, pale yellow, spore wall 5-7 µm thick, composed of two layers, the outer wall hyaline to pale yellow and generally slightly thicker than the hyaline inner wall, spores not enclosed in a hyphal mantle, separated from each other by thin-walled, vesicular hyphae which are often crushed between the thickly crowded spores.

Distinguishing Features: Characterized by sporocarps that are enclosed in a peridium, individual zygospores that are not enclosed in an envelope, and hyphae that are vesicular, thin-walled, and often crushed between the spores.

Distribution: Endemic to Oregon. Known from eight sites within the range of the northern spotted owl: **OREGON**, **Benton** Co., McDonald Forest; near Blodgett; **Douglas** Co., Bureau of Land Management, Roseburg District, Blue Ridge, near Old Blue lookout tower; **Lincoln** Co., Siuslaw National Forest, Cascade Head Experimental Forest, Green Point; **Polk** Co., Valsetz Lake; Van Duzer Corridor; **Tillamook** Co., Siuslaw National Forest, Cascade Head Experimental Forest.

Substrate and habitat: Forms sporocarps beneath the soil surface associated with the roots of *Picea sitchensis, Pseudotsuga menziesii,* and *Tsuga heterophylla* below 350 m elevation.

Season: Fruits in February, July, September, and November.

Reference: Gerdemann, J.W., and Trappe, J.M. 1974. The Endogonaceae in the Pacific Northwest. Mycol. Mem. 5:1-76.

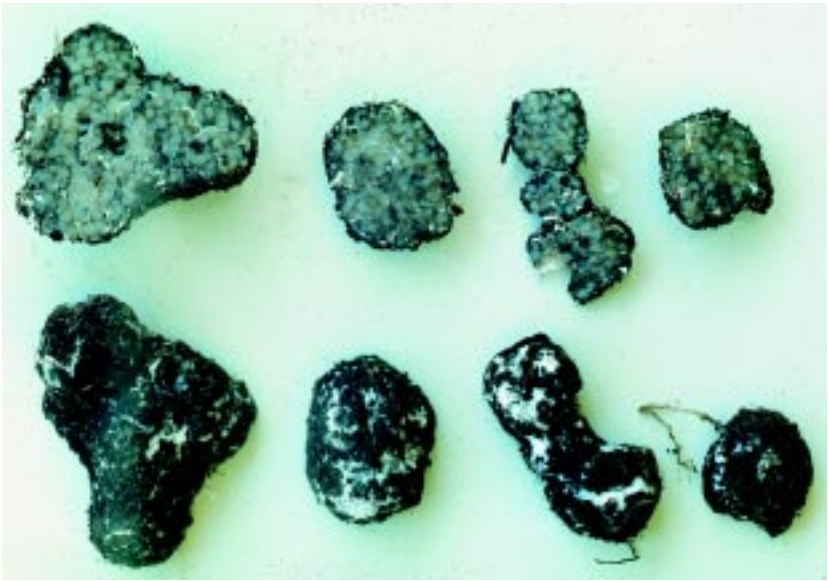
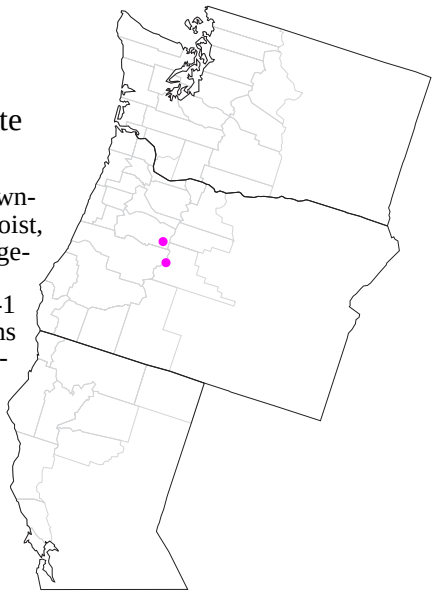


Photo courtesy of J.M. Trappe

Fevansia aurantiaca Trappe & Castellano in. ed.

ROD name *Alpova sp. nov.* # Trappe 1966

Family Boletaceae **Morphological Habit** sequestrate



Description: **Sporocarps** 17-19 x 20-23 mm, subglobose-lobed, pale brown-orange to orange-brown, with much adherent soil and debris. **Gleba** firm, moist, pale pink-orange to orange-brown, the color a combination of orange to orange-brown trama and pale yellow to pale brown-yellow spore masses filling the rounded locules 0.1-0.4 µm broad. **Columella** lacking, but sterile veins 0.2-1 mm broad, concolorous with trama, meandering through gleba; glebal sections of mature specimens cut when fresh, then dried, with dark red-orange, glassy-resinous deposits. **Odor** strongly oily-fruity. **Peridium** 100-200 mm thick. **Peridial epicutis** ± 25 µm thick, of appressed, hyaline, thin-walled hyphae 1.5-4 µm in diam, the cell contents pale olive-yellow to orange. **Peridial subcutis** 75-175 µm thick, of interwoven, hyaline, thin-walled hyphae 1.5-5 µm in diam at septa with occasional cells inflated to 5-10 µm, in youth with scattered, extracellular deposits of amorphous orange pigment in KOH, in Melzer's reagent the pigment dissolving into yellow to orange pigment globules, at maturity with massive extracellular deposits of orange to bright red pigment in KOH, in Melzer's reagent the pigment dissolving into orange to brown pigment globules. **Glebal trama** with a narrow, central strand of interwoven, hyaline, thin-walled hyphae 1.5-5 µm in diam; broad zones between central strand and locule margins of hyaline, thin-walled hyphae with most cells inflated to 6-20 µm in diam to appear nearly pseudoparenchymatous, pigment deposits throughout as in the peridial subcutis; sterile veins structured similarly to tramal central strand. **Subhymenium and hymenium** not observed. **Basidia** not observed**. clamp connections** not found. **Spores** fusoid, 10-13 x (3.5-) 4-5 µm, smooth, in KOH hyaline singly, gray-yellow in mass, thin-walled, inamyloid, cyanophilic.

Distinguishing Features: Characterized by the combination of a sticky gelatinous gleba with gel-filled locules, pale pink-orange to orange-brown gleba and peridium and large, inflated cells in the trama. Microscopic examination is necessary for definitive placement but the macroscopic characters, particularly when cut in half, alert the collector to study it further.

Distribution: Endemic to Oregon. Known from two sites within the range of the northern spotted owl: **OREGON**, **Deschutes** Co., Deschutes National Forest, Devils Lake; **Linn** Co., Willamette National Forest, head of Hackleman Creek.

Substrate and habitat: Forms sporocarps beneath the soil surface associated with various Pinaceae spp., particularly *Abies lasiocarpa* and *Pseudotsuga menziesii.*

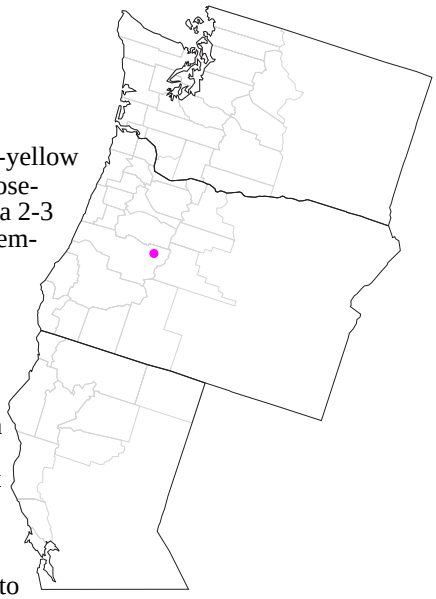
Season: Fruits in August.

References: Trappe, J.M., and Castellano, M.A. 1999. New Ascomycota and Basidiomycota associated with the Northwest Forest Plan. Mycotaxon (in press).

No photograph available

Gastroboletus imbellus Trappe

ROD name *Gastroboletus imbellus*



Family Boletaceae **Morphological Habit** sequestrate

Description: **Cap** 50 mm broad, convex. **Peridium** moist not viscid, gray-yellow overlain by dark olivaceous fibrils, ruptured by a few broad cracks, context rose-blushed where exposed. **Margin** raggedly membranous-appendiculate from a 2-3 mm broad extension of the peridium. **Flesh** 20 mm thick at attachment of stem-columella, soft, white with scattered pale yellow stained areas, a rosy zone above the gleba and a 2 mm thick olive-hygrophanous zone under the cap surface, slowly and erratically staining pale brown where cut. KOH on flesh quickly turns deep lilac adjacent to the peridium. **Gleba** exposed, tubulose, the tubes decurrent, readily separable from context, less than 2 mm in length, pale gray-olive. **Tube mouths** rotund, 0.25-1 mm broad, mostly blocked by folds and outgrowths of wall tissue. **Tubes** oriented at about 40 degrees from vertical. KOH on tube mouths turns dark brown, tube bases deep lilac. **Stipe-columella** 30 mm long, 15 mm thick at apex, equal except for a slight attenuation at the base, laterally attached to pileus; apical surface dry, pale yellow, the color grading to sordid creamy in the mid-portion to pale salmonaceous with copious dark brown stains at base; upper half with dark brown to black glandular dots which are minute singly but often coalesced into patches up to one-half mm broad; flesh pallid with a vinaceous blush near base, slowly sordid when cut. **Odor** pungent-farinaceous. **Taste** slightly bitter. **Peridial epicutis** of granulated, pale brown, thin-walled hyphae 3-6 µm broad. **Peridial subcutis** similar except that hyphae are 5-12 µm broad and yellow to pale vinaceous debris is present. In Melzer's reagent epicuticular hyphae are yellow and subcuticular hyphae more or less vinaceous stained, orange-brown pigment balls scattered throughout. **Flesh** of interwoven, hyaline, thin-walled hyphae 5-20 µm broad, with sparsely scattered vinaceous debris, in Melzer's reagent, the hyphae yellow but obscured by abundant, orange-brown pigment balls. Hyphae of stem-columella similar to those of peridial context but more or less parallel; **Glandular dots** are palisades of dark brown, much encrusted elements 5-9 µm broad, including scattered fertile basidia. Subglebal tissue bright lilac in KOH when fresh and diffusing a lilac pigment into the mounting medium, merely vinaceous when revived in KOH; in Melzer's reagent deep yellow with many brown, amorphous deposits, hyphae thin-walled, 3-8 µm broad, oleiferous hyphae present. **Trama of tubes** parallel, hyaline, thin-walled hyphae 4-14 µm broad, oleiferous hyphae few. **Basidia** 3-5 (7) x 20-30 µm, thin walled, hyaline and guttulate in KOH, sterigmata inconspicuous. **Cystidia** fascicled, 4-6 x 25-60 µm, hyaline to vinaceous to dark brown in KOH with much brown, amorphous material deposited at the base of the clusters, cylindric to fusoid-ventricose or irregularly constricted. **Clamp connections** absent. **Spores** narrowly to broadly ellipsoid to obovate, 2.5 x 7-10 µm, thin-walled, smooth, asymmetrical, hyaline in KOH, inamyloid.

Distinguishing Features: Characterized by its drab coloration, persistently membranous-appendiculate margin, rather unpleasant odor and taste and loculate gleba with very short tubes.

Distribution: Endemic to Oregon. Known from a single site within the range of the northern spotted owl: **OREGON**, **Lane** Co., Willamette National Forest, at crest of Olallie trail.

Substrate and habitat: Forms sporocarps beneath the soil surface associated with the roots of *Abies grandis, A. lasiocarpa*, *Tsuga mertensiana*, with an understory of *Antennaria lanata*, *Fragaria* sp., *Pachistima myrsinites*, *Sorbus sitchensis*, and *Vaccinium* sp. at 1,650 m elevation.

Season: Fruits in October.

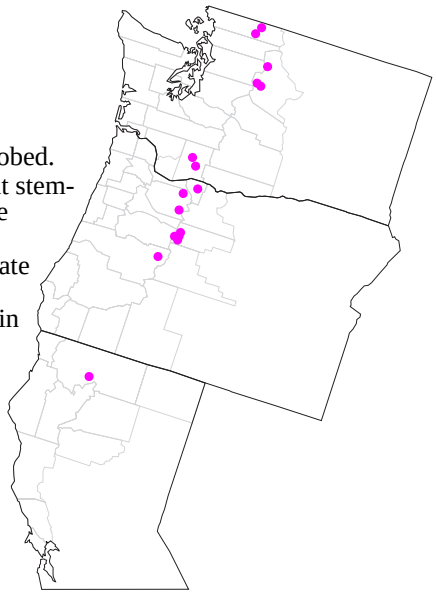
Reference: Thiers, H.D., and Trappe, J.M. 1969. Studies in the genus *Gastroboletus*. Brittonia 21:249-251.

No photograph available

Gastroboletus ruber (Zeller) Cázares & Trappe

ROD name *Gastroboletus ruber*

Family Boletaceae **Morphological Habit** sequestrate



Description: **Sporocarps** 20-40 x 20-55 mm, subglobose to turbinate or lobed. **Peridium** rose to brown-red or red-brown and persistent on apex of percurrent stem-columella, dingy pale yellow to dark red-brown and usually evanescent where covering tube mouths but sometimes partially persisting and then becoming yellow-brown to cinnamon and depressed in the tube mouths to give a reticulate appearance. **Gleba** pale yellow in youth, dark olive at maturity, initially of separable tubes 0.5-1 mm in diam divided into labyrinthine locules ±0.2 mm in diam. **Tube mouths** tinged red-orange to red at maturity, turning blue where bruised or cut, separable from the columella. **Stem-columella** pale yellow with a concolorous context, turning blue instantly where cut, columnar to dendroid, percurrent or not, with many branches reaching or nearly reaching the peridium, projecting as much as 1 cm below the glebal base, up to 1.5 cm broad at the apex when percurrent. **Odor** not distinctive. **Basal hyphae** white to pale yellow. **Stem-columella** of thin-walled, hyaline, branched hyphae, 3-12 (-15) µm in diam, laticiferous hyphae scattered near the peridium. **Peridial epicutis** initially differentiated as a palisade of cylindric to clavate dermatocystidia 15-30 (-70) x 3-10 µm, hyaline to pale yellow in KOH, becoming a disrupted turf over the gleba as the sporocarp expands but remaining a palisade over the percurrent columellar apices, in age the contents turning yellow to brown. **Trama** 25-170 µm thick, of hyaline, thin-walled, subparallel to interwoven hyphae 2-12 µm in diam, laticiferous hyphae occasional. **Subhymenium** cellular, 2-3 cells deep, cells 3-10 µm in diam. **Basidia** 26-40 x 7-11 µm, thin-walled, cylindrical to clavate, hyaline, 2- to 4- spored, sterigmata 4-5 µm long. **Cystidia** 25-50 x 4-14 µm, scattered, thin-walled, fusoid-ventricose, hyaline to pale olive in KOH, lacking encrustation. **Clamp connections** absent. **Spores** subfusiform, (8-) 9-15 (-20) x 4-6 µm, smooth, asymmetric, walls up to 0.5 µm thick, pale green to olive in KOH, inamyloid.

Distinguishing Features: Characterized by a much reduced stem, coloration of the peridium, and large spores.

Distribution: Endemic to Oregon and Washington. Known from 16 sites within the range of the northern spotted owl: **CALIFORNIA, Siskiyou Co.,** Mount Shasta; **OREGON**, **Clackamas** Co., Mount Hood National Forest, McNeil Point trail; Mount Hood National Forest, junction of trail 502 and Rd. 4614; **Hood River** Co., Mount Hood National Forest, Tillie Jane campground; **Jefferson** Co., Mount Jefferson Wilderness Area, 0.5 miles south of Cabot Lake; Mount Jefferson Wilderness Area, east end of Cabot Lake; Mount Jefferson Wilderness Area, Mount Shirley Lake; **Lane** Co., Willamette National Forest, English Mountain; **WASHINGTON**, **Chelan** Co., Wenatchee National Forest, Snowy Creek trail; Wenatchee National Forest, Lake Valhalla trail; Glacier Peak Wilderness, Lyman Lake campground; **Skamania** Co., Gifford Pinchot National Forest, Tombstone Lake; Gifford Pinchot National Forest, Taklakh Lake; **Whatcom** Co., Mount Baker-Snoqualmie National Forest, 4 miles north of Copper Lake; Mount Baker-Snoqualmie National Forest, Upper Chilliwack River; Mount Baker-Snoqualmie National Forest, Hannegan Pass Also known in California from Lassen National Park Yuba Pass area in Shasta Co.

Substrate and habitat: Forms sporocarps beneath the soil surface associated with the roots of assorted Pinaceae above 1,350 m in elevation, particularly *Abies amabilis, A. procera, A. magnifica var. shastensis, Pinus monticola,* or *Tsuga mertensiana*.

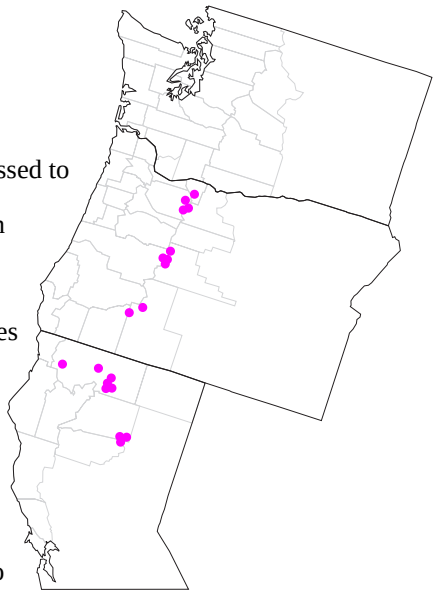
Season: Fruits from August through September.

Reference: Thiers, H.D., and Trappe, J.M. 1969. Studies in the genus *Gastroboletus*. Brittonia 21:249-251.

Photo courtesy of T. O'Dell

Gastroboletus subalpinus Trappe & Thiers

ROD name *Gastroboletus subalpinus*



Family Boletaceae **Morphological Habit** sequestrate

Description: **Sporocarps** 60-100 mm broad, convex, plane, deeply depressed to plano-convex. **Peridial upper surface** dry to moist, glabrous, velutinous to subtomentose, pale buff to pale olive-buff, unchanging or darkening to brown with age; peridium on lateral and undersides of gleba white, thin, velvety, persistent, peridial flesh in some sporocarps slowly staining pink to gray-lavender when cut. **Gleba** tubulose, 10-30 mm long, in youth gray-yellow, becoming olive-brown. **Tubes** oriented mostly curved and oriented 20 degrees from vertical to horizontal or angled upwards near edges of the sporocarp. **Tube mouths** less than 1 mm broad, concolorus with tubes, unchanging. **Stem-columella** 20-50 mm long, 20-45 mm thick at apex, subventricose or tapering downward. **Flesh** white, unchanging. **Odor** mild to farinaceous. **Taste** pleasant. **Peridial epicutis** covered with densely interwoven, much branched hyphae 4-15 µm broad, with erect, tapered, blunt-tipped terminal cells 7-12 x 25-45 µm. In KOH all hyphae hyaline, in Melzer's reagent hyphae pallid to pale yellow to bright red-brown. Peridial epicutis a trichodermium that collapses with age, of blunt-tipped, cylindric to tapered to occasionally subcapitate cells 8-12 x 27-65 µm, subtrichodermial hyphae interwoven, 4-10 µm broad, hyaline except for localized pale golden brown areas, oleiferous hyphae abundant. Flesh of upper peridium of thin-walled, often inflated, loosely interwoven hyphae (3) 8-25 µm broad. Hyaline, oleiferous hyphae 12-20 µm broad and with walls thickened to 1µm scattered throughout. **Stem-columella flesh** a palisade of hyaline, clavate cells 6-15 x 22-35 µm, with occasional fertile basidia, collapsing in age and then present only at remnant patches underlaid by hyaline, subparallel to interwoven hyphae 4-15 µm broad. Oleiferous hyphae abundant. **Trama of tubes** 60-80 µm wide, of hyaline, parallel hyphae 4-6 (8) µm broad, nondivergent. **Subhymenium** similar to trama but with inflated cells 5-15 µm broad scattered throughout. **Basidia** 4-spored, 8-13 x 40-48 µm, thin-walled, hyaline, clavate, sterigmata 3-4 µm long. **Cystidia** hyaline, thin-walled, subcylindric to clavate to tapered, 7-10 x 24-75 µm. **Clamp connections** absent. **Spores** ellipsoid, oblong to subovate, occasionally allantoid, 4.5-6 (8) x 10-16 (18) µm, smooth, asymmetrical, pale yellow to ochraceous in KOH, moderately thick-walled.

Distinguishing Features: Characterized by its smooth, generally white to pallid peridium and stem.

Distribution: Endemic to California and Oregon. Known from 22 sites within the range of the northern spotted owl: **CALIFORNIA**, **Siskiyou** Co., Shasta-Trinity National Forest, Panther Meadow; Shasta-Trinity National Forest, Panther Creek area, Shasta-Trinity National Forest, Horse camp, Shasta-Trinity National Forest, Bear Springs; Shasta-Trinity National Forest, Marble Mountain Wilderness Area, Haypress trail; Shasta-Trinity National Forest, near junction of Rd. 42N07 and Rd. 42N13; **OREGON**, **Clackamas** Co., Mount Hood National Forest, Timothy Lake; Mount Hood National Forest, Clackamas Lake; Bureau of Land management, Salem District, McIntrye Ridge; **Deschutes** Co., Deschutes National Forest, Elk Lake Deschutes National Forest, near Puppy Lake; **Douglas** Co., Umpqua National Forest, Bradley Creek; Umpqua National Forest, Cascade Pass; **Hood River** Co., Mount Hood National Forest, Cloud Cap; **Klamath** Co., Winema National Forest, 3.3 km east of Cascade Pass; Crater Lake National Park, Goodbye campground; **Lane** Co., Willamette National Forest, 1.4 km west of Frog camp; Willamette National Forest, Waldo Lake trail. Also known from outside the assessment area in Lassen Volcanic National Park in California. Not known from Washington.

Substrate and habitat: Forms sporocarps beneath the soil surface associated with the roots of various Pinaceae above 1,550 m elevation, particularly *Abies magnifica*, *Pinus albicaulis*, *P. contorta*, and *Tsuga mertensiana.*

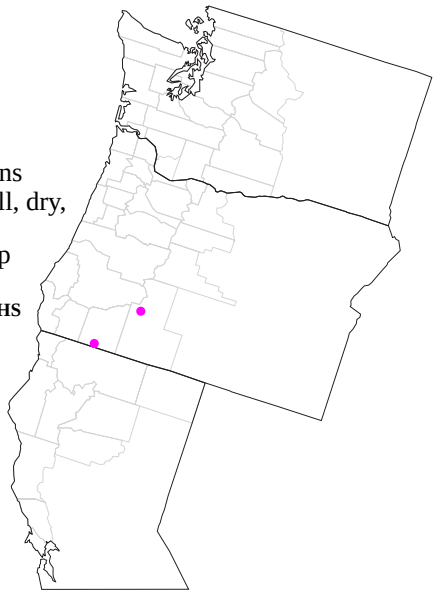
Season: Fruits in September and October.

Reference: Thiers, H.D., and Trappe, J.M. 1969. Studies in the genus *Gastroboletus*. Brittonia 21:249-251.

Photo courtesy of J.M. Trappe

Gastroboletus vividus Trappe & Castellano

ROD name *Gastroboletus sp. nov.* # Trappe 2897 and 7515



Family Boletaceae **Morphological Habit** sequestrate

Description: **Sporocarps** 30-50 x 35-65 mm, boletoid but with cap margins strongly upturned, the cap surface yellow with red areas or blushed red overall, dry, felty. **Flesh** pale yellow, very slowly staining pale red where exposed, with narrow, olive to red zones at tube attachment and immediately beneath the cap surface. **Tubes** adnate-seceding, aligned from slightly below horizontal to nearly vertically upward, often contorted, 10-20 mm long, olive. **Tube mouths** circular to ellipsoid and 0.5-2 mm broad, initially brilliant yellow but soon becoming olive and by maturity red-orange to dark red, not bluing where bruised. **Stem** 20-30 x 10-25 mm, red furfuraceous at apex, abruptly bulbous below tube layer and brilliant yellow to sordid yellow. **Context** red at apex, pale yellow below, not changing color when exposed. **Odor and taste** not distinctive. **Peridial epicutis** a loose tangle of hyaline, thin-walled hyphae 4-8 µm in diam at septa, the cells mostly slightly inflated. **Peridial flesh** of tightly interwoven, hyaline, thin-walled hyphae 3-8 µm in diam, the cells generally not or only slightly inflated. **Stem flesh** of hyphae similar to that of peridial flesh but tending to be parallel and with scattered cells inflated up to 25 µm. **Tube trama** parallel, of hyaline, thin-walled hyphae 2-4 µm in diam at septa, most cells slightly inflated. **Subhymenium** of hyphae similar to those of trama but interwoven. **Basidia** clavate, 30-45 x 9-11 µm with (2-) 4 sterigmata 3-4 x 1 µm. **Cystidia** absent. **Clamp connections** absent. **Spores** fusoid, symmetrical, smooth, (11-) 13-18 (-22) x 6-7 µm, thin-walled, in KOH golden yellow singly and bright brown-yellow in mass, inamyloid, in cotton blue moderate to deep blue.

Distinguishing Features: Characterized by the bright yellows and reds of fresh sporocarps and the inamyloid spores.

Distribution: Endemic to California and Oregon. Known from five sites within the range of the northern spotted owl: **OREGON**, **Jackson** Co., Rogue River National Forest, Jackson Gap; **Klamath** Co., Crater Lake National Park, Cleatwood picnic area. **CALIFORNIA, Siskiyou Co.,** Shasta-Trinity National Forest, Panther Creek area; Shasta-Trinity National Forest, Soda lake; Shasta-Trinity National Forest, near Kings Creek. Also known in California from Lassen National Park, Yuba Pass area in Sierra Co., and Sierra national Forest in **Fresno** Co. Not known from Washington.

Substrate and habitat: Forms sporocarps beneath the soil surface associated with the roots of various Pinaceae above 1,650 m elevation, particularly *Abies magnifica* and *Tsuga mertensiana.*

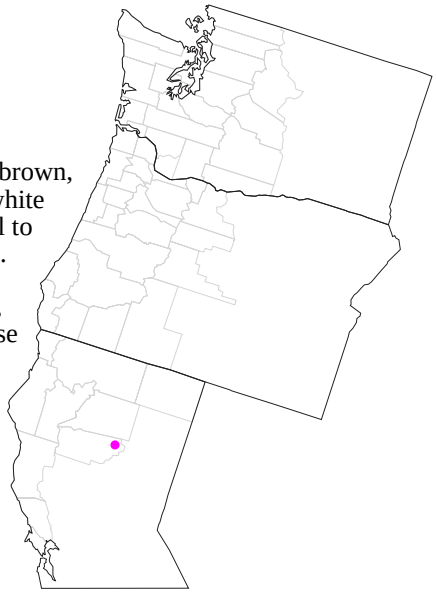
Season: Fruits in July through September.

Reference: Trappe, J.M., and Castellano, M.A. 1999. Some new Ascomycota and Basidiomycota associated with the Northwest Forest Plan. Mycotaxon (in press).

Photo courtesy of J.M. Trappe

Gastrosuillus amaranthii Thiers

ROD name *Gastrosuillus sp. nov.* # Trappe 7516



Family Boletaceae **Morphological Habit** sequestrate

Description: **Sporocarps** 10-35 mm broad, suilloid, the cap surface dark brown, glabrous, staining purple with KOH, no color change when bruised. **Flesh** white to pale yellow, not changing color when bruised. **Tubes** aligned from vertical to above horizontal, contorted and anastomosed, 3-8 mm long, white to pale tan. **Tube mouths** angular, <1 mm broad, white. **Stem** 1-2.5 x 1-1.5 mm, white with occasionally yellow tints, glandular dots present but sometimes obscure, turning purple with KOH. **Odor** mild. **Taste** mild. **Peridial epicutis** a loose tangle of hyaline to pale yellow, thin-walled hyphae. **Stipe flesh** of hyphae similar to that of peridium but tending to be parallel. **Tube trama** of interwoven, hyaline, thin-walled hyphae. **Pleurocystidia** fasiculate, at first purple at base in KOH, eventually entirely purple, thin-walled, cylindric to subclavate, 25-31 x 7-8 µm. **Spores** subellipsoid to subcylindric, apiculus eccentric, smooth, thin-walled, 6.5-8 x 3-4 µm, in KOH hyaline to pale brown singly, inamyloid, cyanophilic.

Distinguishing Features: Characterized by presence of glandular dots on the stem, dark brown cap, white to tan tubes, and small spores.

Distribution: Endemic to California. Known from a single site outside the range of the northern spotted owl: **CALIFORNIA**, **Tehama** Co., Lassen National Park, junction of Hwy 89 and Hwy 36.

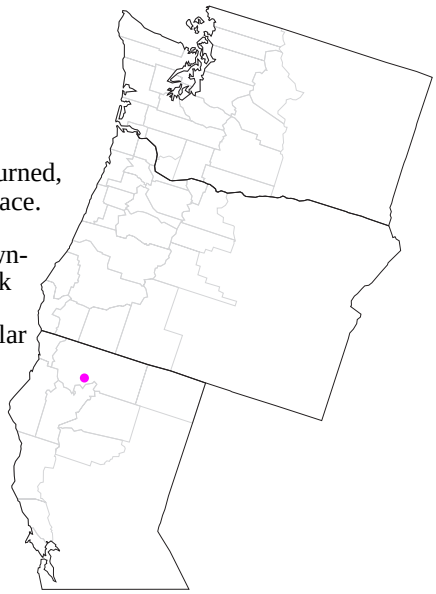
Substrate and habitat: Forms sporocarps beneath the soil surface associated with the roots of various Pinaceae at 1,650 m elevation.

Season: Fruits in June.

Reference: Theirs, H.D. 1989. *Gastroboletus* revisited. Memoirs of the New York Botanical Garden 49:355-359.

No photograph available

Gastrosuillus umbrinus Trappe & Castellano, in ed.



ROD name *Gastrosuillus sp. nov.* # Trappe 7516

Family Boletaceae **Morphological Habit** sequestrate

Description: **Sporocarps** 25-50 mm broad, boletoid, the cap margins upturned, the cap surface dark brown with a sparse tomentum over a shiny-smooth surface. **Flesh** brown-white to pale brown. **Tubes** adnate to decurrent, aligned from vertical to above horizontal, contorted and anastomosed, 8-17 mm long, brown-olive to dark brown. **Tube mouths** circular to ellipsoid, 0.5-2 mm broad, dark brown. **Stem** 10-20 x 7-15 mm, ventricose or tapering downward, barely protruding below the tubes, pale brown to brown with brown to black glandular dots from apex to base, the flesh pale brown with brown patches especially near the apex. **Odor** pleasant. **Peridial epicutis** a loose tangle of hyaline, thin-walled hyphae 3-8 µm in diam at septa, many cells slightly inflated, the tissue obscured by abundant, extracellular, brown granules. **Peridial flesh** of interwoven, hyaline, thin-walled hyphae 4-10 µm in diam at septa, most cells strongly inflated, with scattered, extracellular, brown granules. **Stipe flesh** of hyphae similar to that of peridium but tending to be parallel. **Caulocystidia** clustered, obscured by dense deposits of amorphous pigment that are vinaceous in KOH mounts of fresh specimens, brown in long-dried specimens rehydrated in KOH. **Tube trama** parallel, of hyaline, thin-walled hyphae 1.5-3 µm in diam at septa, a few cells slightly inflated. **Subhymenium** of ± isodiametric cells 5-8 µm in diam. **Basidia** (2-) 4-spored clavate, 18-28 (-35) x 7-9 µm. **Pleurocystidia** in clusters, hyaline, thin-walled, obtuse-cylindric, 60-90 x 6-9 µm, often with crystalline contents, the bases obscured by dense deposits of brown, amorphous material, single cystidia scattered in hymenium, hyaline, thin-walled, obtuse-cylindric, 25-35 x 6-8 µm. **Spores** ellipsoid, the apiculus eccentric, smooth, thin-walled, 7-10 x (3-) 3.5-4 µm, in KOH pale yellow singly and brown-yellow in mass, inamyloid, cyanophilic.

Distinguishing Features: Characterized by presence of glandular dots on the stem, dark brown tubes, and a small stem-columella.

Distribution: Endemic to California. Known from a single site within the range of the northern spotted owl: **CALIFORNIA**, **Siskiyou** Co., Klamath National Forest, Deadfall Meadows, west of Gazelle.

Substrate and habitat: Forms sporocarps beneath the soil surface associated with the roots of various Pinaceae above 2,350 m elevation, particularly *Pinus monticola*.

Season: Fruits in September.

Reference: Trappe, J.M., and Castellano, M.A. 1999. Some new Ascomycota and Basidiomycota associated with the Northwest Forest Plan. Mycotaxon (in press).

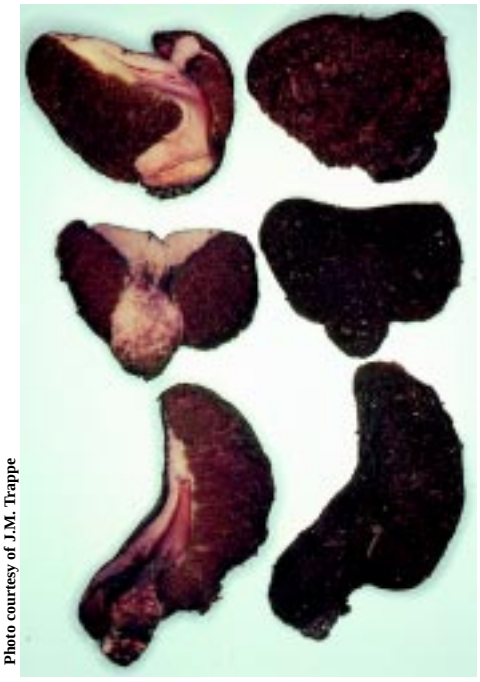
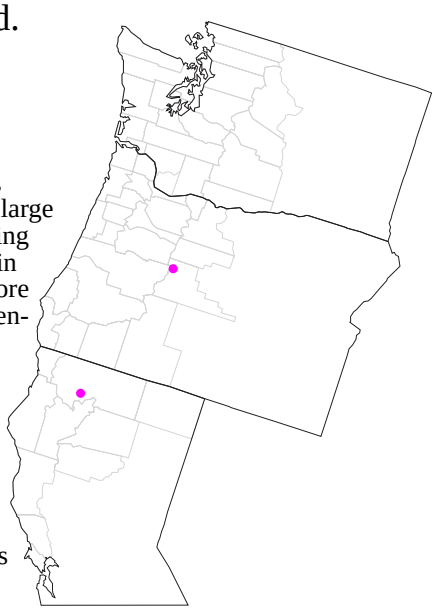


Photo courtesy of J.M. Trappe

Gautieria magnicellaris (Pilat) Stewart & Trappe, in ed.

ROD name *Gautieria magnicellaris*



Family Hysterangiaceae **Morphological Habit** sequestrate

Description: **Sporocarps** as dried 11-24 x 9-27 mm, globose, subglobose, irregularly lobed, flattened or depressed at the point of attachment. **Locules** large and fully exposed. **Rhizomorph** basal, single, ±1.5 mm diam. **Peridium** drying brown from the exposed spore mass. Exposed tramal tissue mostly drying thin and obscured by spores, where visible pale yellow to red brown. KOH on spore mass red-brown, quickly fading, trama no reaction; $FeSO_4$ on spore mass green-gray, gray-yellow-green; Melzer's reagent and ETOH, no reaction. **Glebal spore mass** drying brown to red-brown, trama tissue drying pale yellow and red brown. **Locules** 0.5-10 x 0.5-6 mm, labyrinthiform to rounded, some continuous through the entire sporocarp, empty. **Columella** in mature sporocarps not prominent, white, drying pale orange-yellow. **Peridium** (margins of exposed locules) of tiers of napiform cells 7-30 x 10-25 µm. **Columella** of hyaline hyphae inflated up to 10 µm, with spines ±1 µm projecting from the inner wall towards the interior. **Trama** of hyaline, thin-walled, septate hyphae, 2-7 µm broad, weakly gelatinized with age; oleiferous hyphae rare, detectable in Melzer's reagent. **Subhymenium** a palisade of subpolygonal cells 9-32 x 7-13 µm, thin-walled, merging into intertwined hyphae of the trama. **Basidia** 4-spored, 40-60 x 11-16 µm, thin-walled, broadly clavate, sterigmata 2-2.5 x 2-2.5 µm. **Brachybasidioles** 15-33 x 7-9 µm, cystidioid elements infrequent. **Clamp connections** absent. **Spores** ellipsoid to broadly ellipsoid, 17-24 x 12-15 (-18) µm including sterigmal appendage and epispore, 17-24 x 8-12 µm excluding epispore, wall ±1.5 µm thick, sterigmal appendage 2-3 µm at the base of epispore, 1-3 µm long, ornamentation of 9-13 forking and anastomosing, longitudinal to occasionally spiraling ridges, (1-) 2-3.5 (-4) µm tall, 3-5 µm broad, in KOH pale green-yellow singly, yellow in mass, slowly cyanophilic.

Distinguishing Features: Characterized by the ridged, ellipsoid to broadly ellipsoid, large spores, and exposed gleba.

Distribution: Known from two sites within the range of the northern spotted owl: **CALIFORNIA**, **Siskiyou** Co., Klamath National Forest, Deadfall Meadows; **OREGON**, **Deschutes** Co., Deschutes National Forest, Lava Lake campground. Also known from Michigan, New York, Europe, and México. Not known from Washington.

Substrate and habitat: Forms sporocarps beneath the soil surface associated with the roots of *Pinus* spp. in Mexico and *Abies concolor* in the western North America above 1,650 m elevation.

Season: Fruits from July through October.

Reference: Cázares, E., García, J., Castillo, J., and Trappe, J.M. 1992. Hypogeous fungi from northern México. Mycologia 84:341-359.

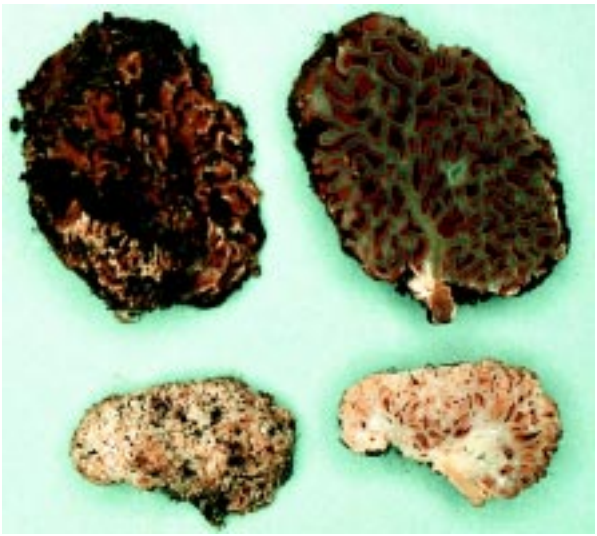
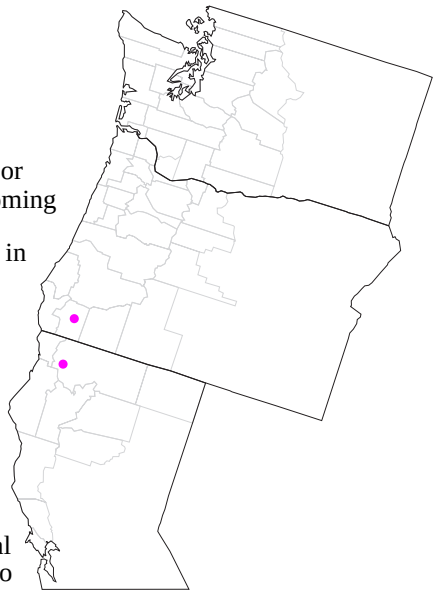


Photo courtesy of M.A. Castellano

Gautieria otthii Trog

ROD name *Gautieria otthii*



Family Hysterangiaceae **Morphological Habit** sequestrate

Description: **Sporocarps** up to 5 cm in diam, globose to subglobose, flat or depressed. **Peridium** white with red tones, but emergent apical surfaces becoming brown with patches of ochre to yellow. KOH immediately a faint dark red-orange; $FeSO_4$, pale green; Melzer's reagent, quickly red-brown, soon fading in intensity; ETOH, no reaction. **Gleba** pale brown to yellow brown. KOH on trama no reaction; $FeSO_4$, pale green; Melzer's reagent, immediately brown, fading in intensity; ETOH, no reaction. **Locules** up to 0.5 x 2 mm, labyrinthiform, generally radiating away from the stipe, empty. **Columella** gray white, cartilaginous, drying red-brown, up to 2 mm broad, branching near the base. **Peridium** 65-150 µm thick, of thick-walled, napiform cells 17-40 µm in diam. **Columella** of hyaline hyphae 1-5 µm in diam, inflated to 18 µm in diam adjacent to septa, inflated areas filled with granules and spines ±1 µm long, projecting from the inner wall surface toward the interior. **Trama** narrow, of hyaline, thin-walled, hyphae 3-5 µm in diam, gelatinizing in age, oleiferous hyphae present. **Subhymenium** of subpolygonal cells 10-30 x 5-13 µm, progressively smaller as the subhymenium merges into the linear hyphae composing the trama. **Basidia** 4-spored, (12-) 18-30 (-45) x 6-9 µm, thin-walled, clavate. **Spores** ellipsoid, 13-18 x 7-10 µm including sterigmal appendage and epispore, 13-18 x 5-7 µm excluding epispore, often somewhat flattened at the apex, wall ±1 µm thick, sterigmal appendage truncate, prominent, 1-2 µm wide, ornamentation of 9-12, sometimes forking, longitudinal ridges, 0.5-1.5 (-2) µm tall, 2-3 µm broad, ridge margins humped to cleft, grooves between ridges smooth to finely crenulate, in KOH pale green-yellow singly, yellow in mass, in Melzer's reagent, red-orange singly, dark red-orange in mass, slowly cyanophilic.

Distinguishing Features: Characterized by longitudinally ridged, small spores and short sterigmata.

Distribution: Known from two sites within the range of the northern spotted owl: **CALIFORNIA**, **Siskiyou** Co., Klamath National Forest, Marble Mountain Wilderness Area, trail to Haypress Meadows; **OREGON**, **Josephine** Co., Dutcher Creek. Also known from Switzerland.

Substrate and habitat: Forms sporocarps beneath the soil surface associated with the roots of *Pinus ponderosa* and other Pinaceae between 800 m and 1,650 m elevation.

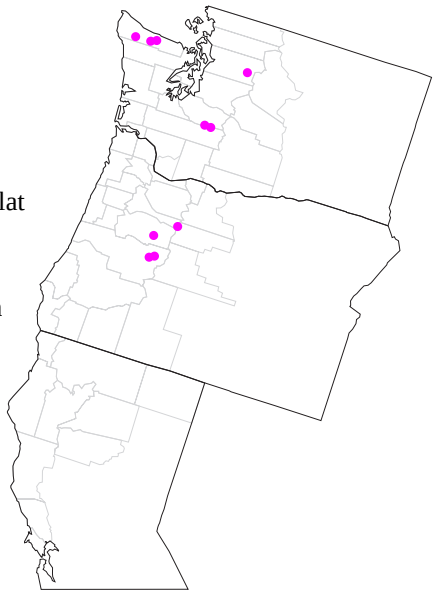
Season: Fruits in August and October.

Reference: Trog, J.G. 1857. Naturforsch. Ges. Bern Mitt. p. 43.

No photograph available

Gelatinodiscus flavidus Kanouse & A.H. Smith

ROD name *Gelatinodiscus flavidus*



Family Leotiaceae **Morphological Habit** cup fungus

Description: **Sporocarps** short-stipitate, apotheciate, to about 4 mm tall. **Apothecia** regular from above, 1-5 mm in diam, at first concave, becoming flat then convex at maturity. **Hymenium** bright yellow, even, opaque. **Margin** glabrous, not extending beyond hymenial surface. **Abhymenial surface** concolorous with hymenial surface, appearing translucent or gelatinous, glabrous except for short yellow fuzz at the very base. **Stem** slender, 2-5 mm long, about 1 mm thick. **Asci** opening by a broad pore, 8-spored, amyloid in part of the apical region, maturing simultaneously in nature. **Paraphyses** curved at the apices, branched, hyaline. **Spores** nearly ellipsoid to oblong-ellipsoid but with one end slightly broader than the other, 26-34 x 9-11 µm, biguttulate, smooth, hyaline to yellow at first, brown spore print.

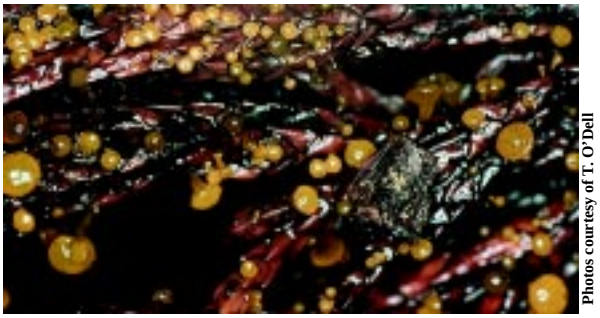
Distinguishing Features: Characterized by bright yellow apothecia on a short, bright yellow, gelatinous stem and spores that measure 26-34 x 9-11 µm contained within an inoperculate ascus.

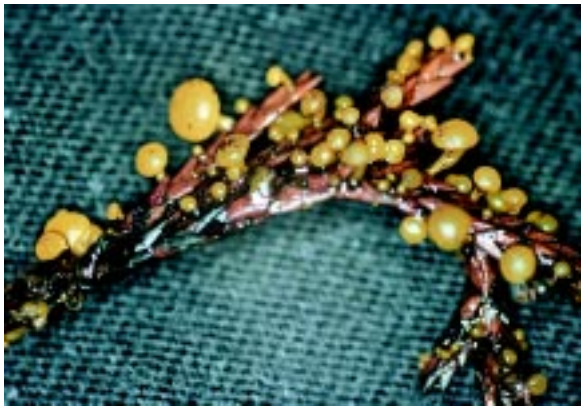
Distribution: Endemic to Oregon and Washington. Known from 10 sites within the range of the northern spotted owl: **OREGON**, **Linn** Co., Iron Mountain; **Lane** Co., Willamette National Forest, Lamb Butte Recreational Area, The Potholes; **Marion** Co., Mount Hood National Forest, 2 miles southwest of Breitenbush Lake; **WASHINGTON**, **Clallam** Co., Olympic National Park, Deer Lake; Olympic National Park, Hurricane Ridge Rd.; Olympic National Park, Sol Duc Park; **Lewis** Co., Mount Rainier National Park, Narada Falls; Mount Rainier National Park, Reflection Falls; **Pierce** Co., Mount Rainier National Park, Ricksetter Point; **Snohomish** Co., Mount Baker-Snoqualmie National Forest, Silver Tip Lake. Although reported by Carpenter (1976) from Lane Co. and Jefferson Co. in Oregon, these collections were not found. Not known from California.

Substrate and habitat: Forms scattered to gregarious sporocarps on cones, twigs and foliage of *Chamaecyparis nootkatensis*. It consistently fruits near or under melting snowbanks.

Season: Fruits from April through August.

References: Carpenter, S.E. 1976. Taxonomy, morphology and ontogeny of *Gelatinodiscus flavidus*. Mycotaxon 3:209-232. Kanouse, B.B., and Smith, A.H. 1940. Two new genera of Discomycetes from the Olympic National Forest. Mycologia 32:756-759.

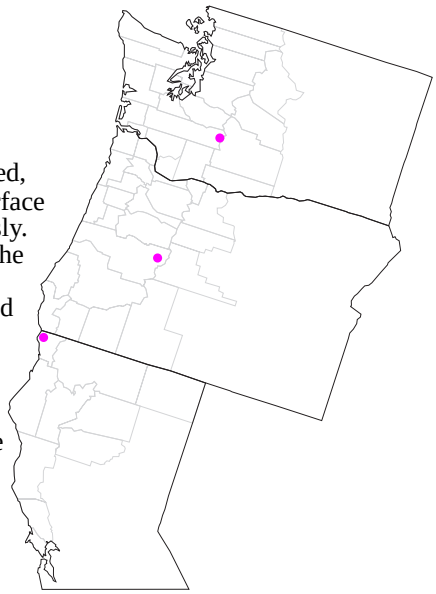




Photos courtesy of T. O'Dell

Glomus radiatum (Thaxter) Trappe & Gerdemann

ROD name *Glomus radiatus*



Family Glomaceae **Morphological Habit** sequestrate

Description: **Sporocarps** up to 9 x 7 x 3 mm, generally flattened and lobed, firm, attached to roots or organic matter, near white to gray-yellow where surface hyphae become matted. **Peridium** absent. Sporocarp developing acrogenously. **Subtending hyphae** somewhat coarser than glebal hyphae, the opening into the spore up to 6 µm wide, only partially occluded by spore wall thickening but occluded by a plug below the spore base. **Spores** ellipsoid to oblong, obovoid or rarely globose, at or near the surface thin-walled and vesicular, becoming progressively thicker walled in the direction of the sporocarp base, 60-110 (-120) x 48-75 (-90) µm, arranged in a distinct radial pattern, grouped or widely dispersed in a matrix of a coarse thin-walled hyphae, usually containing hyphae similar to those in gleba, wall 4-8 µm thick, laminate, pale yellow.

Distinguishing Features: Characterized by its large spores with thick walls and the striking radial arrangement of spores within the sporocarp.

Distribution: Endemic to California and Oregon. Known from three sites within the range of the northern spotted owl: **CALIFORNIA, Del Norte** Co., 3.3 km south of the city of Smith River; **OREGON**, **Lane** Co., Willamette National Forest, Lamb Butte Scenic Area, The Potholes; **WASHINGTON**, **Lewis** Co., Wenatchee National Forest, Goat Rocks Wilderness Area, Knuppenburg Lake. Also known from West Virginia.

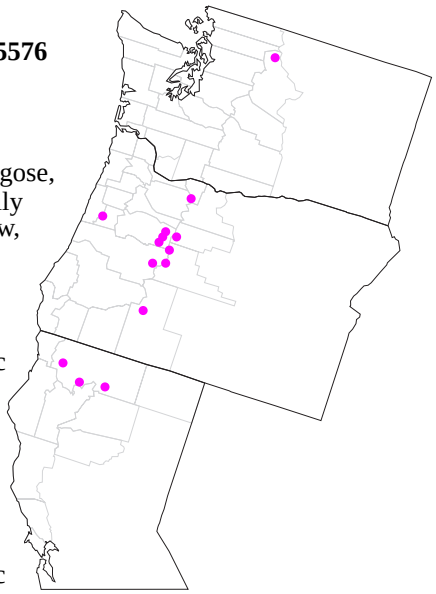
Substrate and habitat: Forms sporocarps beneath the soil surface associated with the roots of *Chamaecyparis nootkatensis* and *Sequoia sempervirens* below 1,650 m elevation.

Season: Fruits in June, October, and November.

Reference: Gerdemann, J.W., and Trappe, J.M. 1974. The Endogonaceae in the Pacific Northwest. Mycol. Mem. 5:1-76.

No photograph available

Gymnomyces abietis Trappe & Castellano, in ed.



ROD name *Gymnomyces sp. nov.* # Trappe 1690, 1706, 1710, 4703, 5052, 5576 7545, *Martellia sp. nov.* # Trappe 311, 1700, 5903

Family Russulaceae **Morphological Habit** sequestrate

Description: **Sporocarps** 6-28 x 10-40 mm, the base indented, radially rugose, and with soil attached by basal mycelium. **Peridium** 100-200 µm thick, readily separable, in youth thin, white, pubescent, soon becoming smooth, pale yellow, sometimes with rose-blushed to orange-brown areas, sometimes slowly becoming slightly brown, often rupturing to expose glebal locules. **Gleba** white in youth, soon pale orange-yellow. **Columella** white, small to prominent, basal pad of sterile tissue. **Odor and taste** not distinctive. **Peridial epicutis** a loose to tightly packed trichodermium of obtuse-cylindric to clavate or occasionally versiform, hyaline, thin-walled end cells (2-) 3-5 µm in diam, this in age collapsing to appear appressed-interwoven. **Peridial subcutis** of interwoven, hyaline, thin-walled hyphae 2-5 µm in diam with scattered cells inflated up to 10 µm in diam and occasional nests of sphaerocysts where subcutis and tramal intersections merge. **Trama** of subparallel, hyaline, thin-walled hyphae 2-5 µm in diam, at tramal junctions with occasional to many cells inflated up to 25 µm in diam and with occasional nests of sphaerocysts. **Subhymenium** with 3-4 tiers of isodiametric cells, those nearest the central stratum of the trama up to 6-15 (-25) µm in diam. **Basidia** 1-4-spored, clavate, 23-29 (-40) x (6-) 8-13 (-15) µm, sterigmata ± 5 x 1 µm. **Cystidia** absent. **Spores** globose to broadly ellipsoid, 8-10 (-14) x (7-) 7.5-9.5 (-11) µm, hyaline, ornamented in youth by unevenly amyloid rods and inamyloid lines ≤ 0.5 x 0.2-0.5 µm, rods sometimes joined in short rows, by maturity the rods evenly amyloid, (0.3-) 1 (-1.5) x 0.3-1 µm, often joined to form short, thick lines or connected by narrow, low, amyloid lines on the spore surface to form a partial to or sometimes nearly complete reticulum; sterigmal appendage with a strongly amyloid, basal collar or a large, amyloid deposit on one side.

Distinguishing Features: Varies strikingly with developmental stages. *Gymnomyces abietis* differs from *Martellia alba* (Harkness) Singer & Smith in lacking cystidia and gelatinized peridial hyphae. In addition, the spore ornamentation of *G. abietis* is evenly amyloid, with rods often joined to form short, thick lines. The spore ornamentation of *M. alba*, is erratically amyloid, and the rods are occasionally connected by low, inamyloid lines. The spores of *G. abietis* are nearly all 8-10 µm long, whereas those of *M. alba* are nearly all 10-15 µm long.

Distribution: Endemic to the Pacific Northwest. Known from 15 sites within the range of the northern spotted owl: **CALIFORNIA**, **Siskiyou** Co., Klamath National Forest, Carter Meadows summit; Marble Mountain Wilderness area, Haypress Meadows; Mount Shasta, Wagon camp; **OREGON**, **Benton** Co., Siuslaw National Forest, Marys Peak summit; **Clackamas** Co., Mount Hood National Forest, Phlox Point; **Deschutes** Co., Three Sisters Wilderness Area, trail up South Sister; **Jefferson** Co., Mount Jefferson Wilderness Area, south of Shirley Lake; **Klamath** Co., Crater Lake National Park, Mount Scott; **Lane** Co., Willamette National Forest, West Lava campground; Willamette National Forest, 1.4 km up Olallie trail; **Linn** Co., Willamette National Forest, Wildcat Mountain; Willamette National Forest, Bunchgrass Mountain; Willamette National Forest, Parish Lake trail; Willamette National Forest, Crescent Peak, on ridge just south of summit; **WASHINGTON**, **Chelan** Co., Mount Baker-Snoqualmie National Forest, Rainy Pass, trail to Lake Ann. Two sites are known from outside the assessment area; one in Lassen National Park, the other in Tehama Co., Mineral.

Substrate and habitat: Forms sporocarps beneath the soil surface associated with the roots of *Abies* spp. and possibly other Pinaceae above 1,000 m elevation.

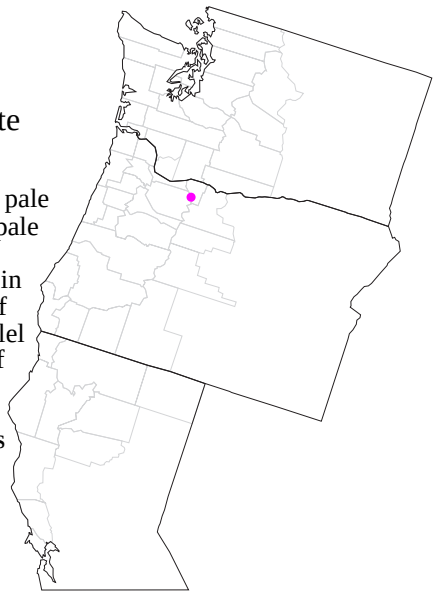
Season: Fruits from July through October.

Reference: Trappe, J.M., and Castellano, M.A. 1999. Some new Ascomycota and Basidiomycota associated with the Northwest Forest Plan. Mycotaxon (in press).

Photo courtesy of J.M. Trappe

Gymnomyces nondistincta Trappe & Castellano, in ed.

ROD name *Martellia sp. nov.* # Trappe 649



Family Russulaceae **Morphological Habit** sequestrate

Description: **Sporocarps** 4 x 5 cm, subglobose, indented base. **Peridium** pale tan, slowly turning pale red-brown where handled, smooth. **Gleba** loculate, pale brown-yellow. **Columella** absent. **Odor** of wine. **Taste** not recorded. **Peridial epicutis** 25-50 µm thick, of appressed, thin-walled hyphae 2-4 µm in diam, the cell contents yellow-brown. **Peridial subcutis** 75-125 µm thick, of interwoven, hyaline, thin-walled hyphae 2-4 µm in diam. **Trama** of subparallel to interwoven, hyaline, thin-walled hyphae 2-5 µm in diam. **Subhymenium** of interwoven, hyaline, thin-walled hyphae 2-5 µm in diam, with occasional cells inflated to 7-12 µm. **Basidia** clavate, 15-30 x 10-15 µm, 1-4 spored, sterigmata ±6 x 1 µm. **Cystidia** absent. **Clamp connections** absent. **Spores** globose, 7-9 (-11) µm in diam, in KOH hyaline to pale yellow, ornamented with strongly amyloid rods and spines (0.5-) 1-1.5 (-2) x 0.5-1 µm, these often merged in 2's or 3's to form short lines, in places the spore surface with minute amyloid granules.

Distinguishing Features: Of the other *Gymnomyces* or *Martellia* spp. with small, globose spores (Singer & Smith 1960, Smith 1963), *M. subochracea* Smith and *M. fragrans* Smith both have a peridial epicutis of dermatocystidia, which *M. nondistincta* lacks. *Martellia foetens* Singer & Smith has a spore ornamentation and peridial epicutis similar to that of *G. nondistincta* but has cystidia and a subhymenium of enlarged, isodiametric cells, both lacking in *G. nondistincta*.

Distribution: Endemic to Oregon. Known from a single site within the range of the northern spotted owl: **OREGON**, **Clackamas** Co., Mount Hood National Forest, Phlox Point.

Substrate and habitat: Found in association with the roots of *Abies amabilis* and *Tsuga mertensiana* at 1,850 m elevation.

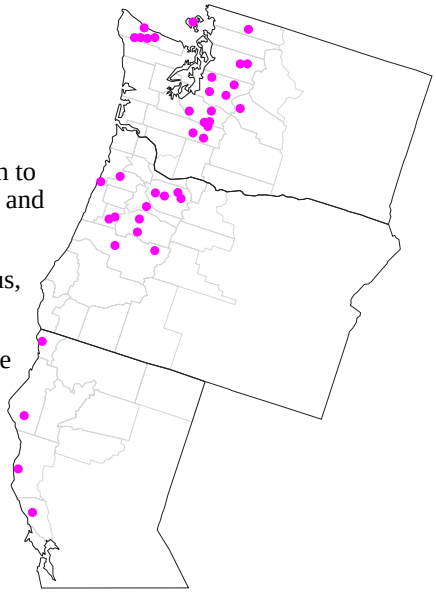
Season: Fruits in September.

Reference: Trappe, J.M., and Castellano, M.A. 1999. Some new Ascomycota and Basidiomycota associated with the Northwest Forest Plan. Mycotaxon (in press).

No photograph available

Gymnopilus punctifolius (Peck) Singer

ROD name *Gymnopilus punctifolius*



Family Cortinariaceae **Morphological Habit** mushroom

Description: **Cap** 25-100 mm broad, convex with enrolled margin, smooth to slightly scaly near the disc, moist to dry, color a variable blend of green, blue and yellow, (often a mixed blue-green) retained when dried. **Flesh** thick, green-ochraceous. **Gills** green-yellow becoming dirty brown-yellow, spotted with yellow or rusty-orange stains. **Stem** (25-) 100-150 X 5-10 (-14) mm, flexuous, striate, concolorous with cap, often with distinctive lavender mycelium at the base. **Veil** absent. **Odor** not distinctive. **Taste** very bitter. **Pileipellis** a cutis of repent brown hyphae with projecting narrow (1.3-3 µm diam) capitate pileocystidia. **Lamellar trama** subregular, with yellow pigment soluble in KOH. **Pleurocystidia and cheilocystidia** similar, 20-30 x 3-4 µm, capitate-ventricose to filiform, rare to abundant, hyaline. **Clamp connections** present. **Spores** subovoid to subellipsoid, 4-5.5 (-6) x 3.5-4 (-5) µm, punctate roughened, germ pore absent, dextrinoid.

Distinguishing Features: Characterized by green-blue-yellow gilled sporocarp with green-yellow gills, a twisted striate stem with lavender mycelium at the base, growing on brown cubicle rotted wood, and a rusty-orange spore print.

Distribution: Known from 42 sites within the range of the northern spotted owl: **CALIFORNIA**, **Del Norte** Co., Jedediah Smith State Park; **Humboldt** Co., Humboldt Redwoods State Park; Prairie Creek State Park; **Mendocino** Co., Jackson State Forest, junction of Rd. 408 and Rd. 409; **Sonoma** Co., Armstrong Redwoods State Park; **OREGON**, **Benton** Co., Bureau of Land Management (BLM), Salem District, Belfountain; BLM, Eugene District, between Rd. 15-6-18 and Rd. 15-6-7; **Clackamas** Co., Mount Hood National Forest, Still Creek; BLM, Salem District, off Rd. 3-5E-5; BLM, Salem District, off Rd. 7-2E-35; **Lane** Co., McKenzie Bridge; BLM, Eugene District, off Rd. 17-8-13.1; **Linn** Co., BLM, Salem District, east of Crabtree; BLM, Salem District, Shorter Creek; **Marion Co.,** BLM, Salem District, off Crooked Finger Rd.; **Tillamook** Co., Siuslaw National Forest, Cascade Head Experimental Forest; BLM, Salem District, Bald Mountain; **WASHINGTON**, **Clallam** Co., Joyce; Olympic National Park, Elwha campground; OIympic National Park, Olympic Hot Springs; Olympic National Park, Soleduc campground B; **Grays Harbor** Co., Olympic National Forest, Quinault Research Natural Area; Olympic National Forest, Quinault Research Natural Area, Humptulips ridge; **Jefferson** Co., Olympic National Park, Twin Creek; Mount Rainier National park, 4 km south of Stevens Canyon entrance; **King** Co., near Woodinville; Money Creek campground; near Snoqualmie Pass, Denny Creek forest camp; Lake Wilderness; **Kittitas** Co., Easton, Lake Kachess campground; **Lewis** Co., near Randle, Cispus Environmental Learning Center; **Pierce** Co., Mount Rainier National Park, Lower Tahoma Creek; Mount Rainier National Park, Green Lake; Mount Rainier National Park, Ipsut Creek campground; Kirkland Pass; Mount Rainier National Park, St. Andrews Park; Mount Rainier National Park, Rampart Ridge; Mount Rainier National Park, Longmire campground; Mount Rainier National Park, Kautz Creek; **San Juan** Co., Friday Harbor Biological Station; **Snohomish** Co., Mount Baker-Snoqualmie National Forest, Sloan Creek trail; Mount Baker-Snoqualmie National Forest, Barlow Pass; Mount Baker-Snoqualmie National Forest, Monte Cristo; **Whatcom** Co., Mount Baker-Snoqualmie National Forest, Ermine Creek. Also known from throughout the western United States, east to Wyoming.

Substrate and habitat: Forms sporocarps on well-decayed, large, conifer stumps, logs, and snags containing brown cubical rot.

Season: Fruits from August through January.

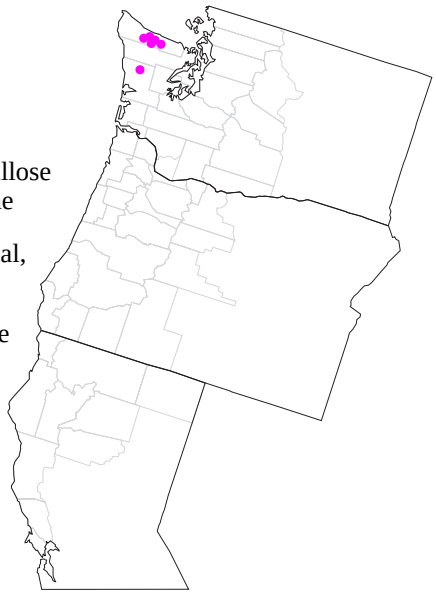
Reference: Hesler, L.R. 1969. North American Species of *Gymnopilus*. Mycol. Mem. 3:1-117.

Photo courtesy of M.A. Castellano

Photo courtesy of T. O'Dell

Hebeloma olympianum Smith, Evenson & Mitchel

ROD name *Hebeloma olympianum*



Family Cortinariaceae **Morphological Habit** mushroom

Description: **Cap** 10-25 mm broad, obtuse to convex, initially faintly fibrillose becoming smooth, viscid, dull cinnamon disc becoming more pale towards the margin. **Flesh** thin, brown. **Gills** pallid, becoming brown with age, neither beaded with droplets nor spotted with spores. **Stem** 20-40 x 2.5-3.5 mm, equal, faintly fibrillose, pale and silky at apex, more dark brown toward base. **Veil** faintly fibrillose, not forming an annular zone. **Odor and taste** mild, not distinctive. **Pileipellis** an ixotrichoderm with abundant 1.5 µm hyphae in the epicuticular layer, a hyphoid layer present beneath the epicuticular layer. **Cheilocystidia** (18-) 22-27 x 4-7 µm, relatively short, filamentous to narrowly clavate. **Spores** 7-9 x 4-5.5 µm, finely punctate roughened, asymmetrical, more or less dextrinoid, dull brown spore print.

Distinguishing Features: Characterized by the small inconspicuous gilled sporocarps with a viscid, brown cap with pallid gills, fibrillose stem at the darkening base and a dull brown spore print.

Distribution: Endemic to Washington. Known from five sites within the range of the northern spotted owl: **WASHINGTON**, **Clallam** Co., Olympic National Park, Soleduc Falls trail; Olympic National Park, Olympic Hot Springs; Olympic National Park, Whiskey Bend; Olympic National Park, Elwha River trail; Olympic National Park, Storm King Mountain; **Grays Harbor** Co., Olympic National Forest, Quinault Research Natural Area.

Substrate and habitat: Sporocarps usually occur in association with the roots of various Pinaceae spp.

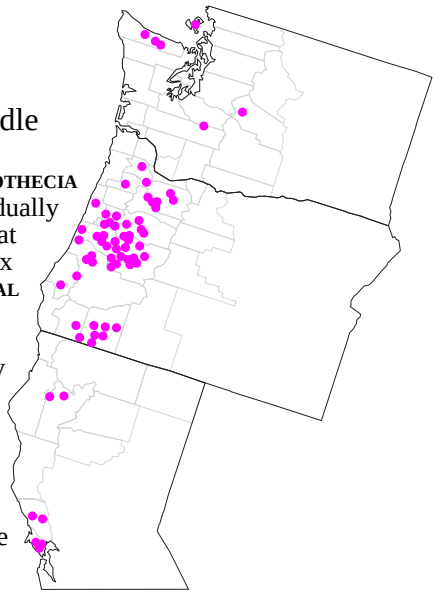
Season: Fruits in October and November.

Reference: Smith, A.H., Evenson, V.S., and Mitchel, D.H. 1983. Veiled Species of *Hebeloma* in the Western United States. 101 p.

Photos courtesy of T. O'Dell

Helvella compressa (Synder) N.S. Weber

ROD name *Helvella compressa*



Family Helvellaceae **Morphological Habit** Elfin Saddle

Description: **Sporocarps** stipitate, apotheciate, 20-80 (130) mm tall. **Apothecia** when young with margin curved over hymenial surface and obscuring it, gradually expanding, finally 2 (-3) prominent lobes usually separated by a acute sinus, at maturity compressed, in face view to 20-30 (-40) mm tall x 18-30 mm broad x 7-13 (-25) mm thick. **Hymenial surface** dark gray-brown, even. **Abhymenial surface** ivory to off-white, densely and persistently villose, even. **Margin** obscuring young hymenium, straight to flaring in age. **Stem** 15-120 x 3-10 mm, basically round in cross section, equal to tapering toward the apex, ivory to cream color or off-white. **Asci** operculate, inamyloid, thin-walled, 8-spored. **Spores** ellipsoid, 19.5-21 x 12-14 µm.

Distinguishing Features: Characterized by a stipitate, apotheciate sporocarp, the margins of the apothecium curve over and obscure the hymenial surface when young, the hymenial surface is dark gray-brown while the abhymenial surface ivory to off-white and densely villose.

Distribution: Known from 67 sites within the range of the northern spotted owl: **CALIFORNIA**, **Marin** Co., Samuel P. Taylor State Park, Lily Gulch; Audubon Canyon Ranch, gulch above Volunteer Canyon; Audubon Canyon Ranch, below Bolinas Ridge Rd.; Mount Tamalpais; **Sonoma** Co., Annadel State Park; Camp Meeker; **Trinity** Co., Gray Falls, Trinity campground; Shasta-Trinity National Forest, Hobo Gulch; **OREGON, Benton** Co., Siuslaw National Forest, Marys Peak; Bureau of Land Management (BLM), Salem District, near Finely Wildlife Refuge; BLM, Salem District, Marys Peak Resource Area; Corvallis, Beechwood Place; Witham Hill; **Clackamas** Co., Wilsonville; Rivermill Park, near Estacada; Peterson Rd., near Estacada; BLM, Salem District, Elk Prairie; BLM, Salem District, Cascades Resources Area; **Douglas** Co., BLM, Coos Bay District, Cedar Creek; **Jackson** Co., Rogue River National Forest, Camp Latagwa; Rogue River National Forest, Armstrong Gulch; Rogue River National Forest, Beaver/Newt Gulch; Rogue River National Forest, Haskins Gulch; Rogue River National Forest, French Gulch; Thompson Creek; BLM, Medford District, Round Mountain; BLM, Medford District, Wellington Butte; BLM, Medford District, Miller Mountain; **Josephine Co.,** Siskiyou National Forest, Meyer's campground; **Lane** Co., BLM, Eugene District, Swamp Creek; BLM, Eugene District, Little Fall Creek; BLM, Eugene District, Fox Hollow Research Natural Area; BLM, Eugene District, Harms Creek; BLM, Eugene District, Fish Creek; BLM, Eugene District, Jasper Creek; BLM, Eugene District, Cedar Flats; BLM, Eugene District, junction of Rd. 4086 and Rd. 19-6-13; BLM, Eugene District, Lost Creek; BLM, Eugene District, off Rd. 19-4-21; BLM, Eugene District, Anthony Creek; BLM, Eugene District, Rattlesnake Creek; BLM, Eugene District, Middle Creek; BLM, Eugene District, Lost Creek; BLM, Eugene District, Call Creek; BLM, Eugene District, Gosage Creek; BLM, Eugene District, Mill Creek; BLM, Eugene District, Badger Mountain; BLM, Eugene District, Martin Creek; BLM, Eugene District, Black Butte; **Lincoln** Co., near Siletz; Siuslaw National Forest, .4 km from junction of Rd. 37 and Rd. 3710; **Linn** Co., BLM, Salem District, Cascades Resources Area; BLM, Eugene District, Shotgun Creek; BLM, Eugene District, Parsons Creek; BLM, Eugene District, Cash Creek; near Scio; Peterson's Butte; **Marion** Co., BLM, Salem District, Crooked Finger; **Washington** Co., BLM, Salem District, Wirts Creek; **Yamhill** Co., BLM, Salem District, Tillamook Resource Area; **WASHINGTON**, **Clallam** Co., Olympic National Park, Lake Crescent; Olympic National Park, Sol Duc Park; Olympic National Park, Ennis Creek; **San Juan** Co., Friday Harbor Biological Station; Olympic National Park, La Poel campground; Olympic National Park, east side of Lake Mills; Olympic National Park, Mount Angeles; **Kittitas** Co., Easton; **Pierce** Co., Mount Rainier National Park, lower Tahoma Creek. Also known from throughout the western United States.

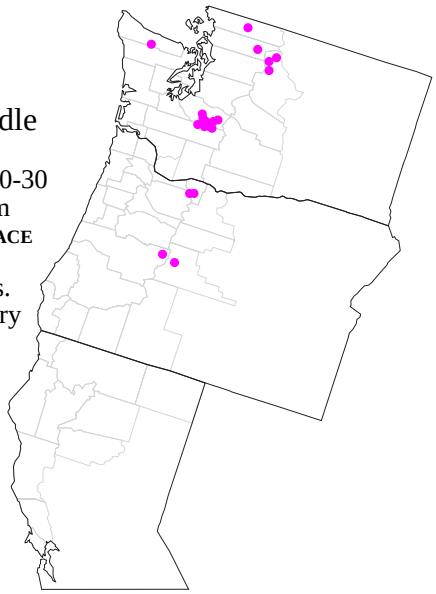
Substrate and habitat: On soil in low to mid-elevation, mixed woods often including *Pseudotsuga menziesii* or *Quercus* spp. and which may be subject to low levels of occasional disturbance.

Season: Fruits from March through July.

Reference: Weber, N.S. 1975. Notes on western species of *Helvella*. I. Beih. Nova Hedwigia 51:25-38.

Photo courtesy of M. Seidl/H. Thiers

Helvella crassitunicata N.S. Weber



ROD name *Helvella crassitunicata*

Family Helvellaceae **Morphological Habit** Elfin Saddle

Description: **Sporocarps** subsessile to short stipitate, apotheciate, up to 20-30 mm tall. **Apothecia** bowl-shaped when young, spreading in age, regular from above to slightly compressed, to 40 mm in diam at maturity. **Hymenial surface** some shade of brown to gray-brown. **Abhymenial surface** concolorous with hymenial surface near margin, paler toward the base, lacking extensive ridges. **Stem** up to 20 mm long, consisting of rounded ribs resembling soft folds, ivory to off-white. **Asci** operculate, inamyloid, 8-spored, with a single basal scar. **Paraphyses** straight, narrowly clavate, by maturity at least some with distinctly thickened walls. **Spores** ellipsoid, 23-28 (-30) x 13-15 µm, smooth.

Distinguishing Features: Characterized by a subsessile to short stipitate, apotheciate sporocarp. The apothecium is bowl-shaped, with a brown to gray-brown hymenium and abhymenial surface. The abhymenial surface is ridged and becomes paler toward the base, the ridges do not extend to the apothecium margin.

Distribution: Endemic to Oregon and Washington. Known from 20 sites within the range of the northern spotted owl: **OREGON**, **Deschutes** Co., Deschutes National Forest, Three Creek Lake; **Hood River** Co., Mount Hood National Forest, Timberline trail; Mount Hood National Forest, Tilly Jane campground; **Lane** Co., Willamette National Forest, Mount Washington Wilderness, trail near Benson Lake; **WASHINGTON**, **Chelan** Co., Wenatchee National Forest, 1.6 km south of Lake Valhalla; Wenatchee National Forest, Glacier Peak Wilderness, Lyman Lake; Okanogan National Forest, Lake Ann trailhead; Mount Baker-Snoqualmie National Forest, Rainy Pass; **Clallam** Co., Olympic National Park, Bogachiel Peak; **Lewis** Co., Mount Rainier National Park, Eagle Peak trail; Mount Rainier National Park, Mazama Ridge; Mount Rainier National Park, Narada Falls; Mount Rainier National Park, Pinnacle Peak; **Pierce** Co., Mount Rainier National Park, Green Lake; Mount Rainier National Park, Cushman Ridge; Mount Rainier National Park, Round Pass; Mount Rainier National Park, Gobbler's Knob; Mount Rainier National Park, Indian Henry's Hunting Ground; **Skagit** Co., Mount Baker-Snoqualmie National Forest, Hidden Lake Peak; **Whatcom** Co., Mount Baker-Snoqualmie National Forest, Austin Pass region. Not known from California.

Substrate and habitat: Scattered to gregarious on soil, especially along trails, in montane regions with *Abies* spp.

Season: Fruits from August through October.

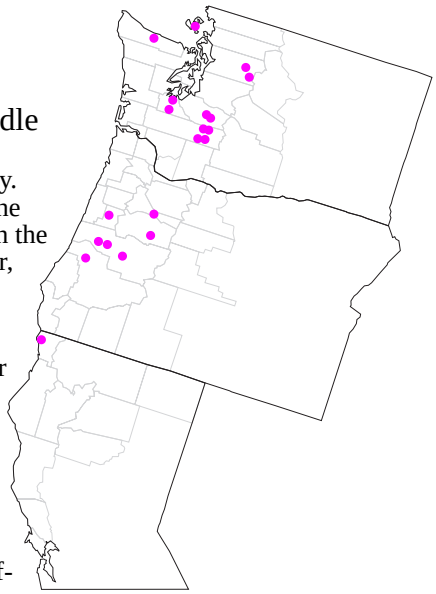
Reference: Weber, N.S. 1975. Notes on western species of *Helvella*. I. Beih. Nova Hedwigia 51:25-38.

Photo courtesy of T. O'Dell
Photo courtesy of J.A. Weber

PHOTO ONLY AVAILABLE IN PRINTED VERSION

Helvella elastica Bulliard:Fries

ROD name *Helvella elastica*



Family Helvellaceae **Morphological Habit** Elfin Saddle

Description: **Sporocarps** stipitate, apotheciate, 20-110 mm tall at maturity. **Apothecium** when very small broadly saddle-shaped, margins not covering the young hymenium, by maturity typically 2 (-3) lobed, often appearing tilted on the apex of the stem, margins of each lobe recurved and folded one over the other, lobes typically separated by a broad sinus. **Hymenial surface** pale to dark brown (black brown at high elevations, rarely white). **Abhymenial surface** ivory to cream-colored, glabrous. **Stem** rounded in cross section, often tapering slightly to the apex, ivory to cream-colored or tinged with ochre near the base. **Asci** operculate, inamyloid, thin-walled, 8-spored. **Spores** ellipsoid, 18-23 (-24) x 11.5-13.5 µm, smooth (occasionally with coarse warts on some spores in age).

Distinguishing Features: Characterized by a stipitate, apotheciate sporocarp, the margins never obscure the hymenial surface when young, the hymenial surface is pale to dark brown, the abhymenial surface is ivory to off-white and glabrous, and the stem is round. Several taxa have a rounded stem and brown hymenium on a lobed apothecium, *H. elastica* is the only one in this region with a glabrous abhymenial surface.

Distribution: Known from 21 sites within the range of the northern spotted owl: **CALIFORNIA, Del Norte** Co., Lake Earl Wildlife Area; **OREGON**, **Benton** Co., Siuslaw National Forest, Woods Creel Rd.; **Douglas** Co., Bureau of Land Management (BLM), Coos Bay District, near Sawyer's Bridge; **Lane** Co., BLM, Eugene District, Lost Creek; BLM, Eugene District, Dogwood Creek; BLM, Eugene District, Carr Creek; **Linn** Co., Willamette National Forest, Oxbow Organizational Area; **Marion** Co., BLM, Salem District, Sinker Creek; **WASHINGTON**, **Clallam** Co., Olympic National Park, lower Elwha River; **Lewis** Co., Gifford Pinchot National Forest, Falls trail; Gifford Pinchot National Forest, Iron Creek day use area; Gifford Pinchot National Forest, Cispus Environmental Center; **Pierce** Co., Mount Rainier National Park, Ipsut Creek campground; Mount Rainier National Park, Green Lake; Mount Rainier National Park, near southwest entrance; Mount Rainier National Park, lower Tahoma Creek; Mount Rainier National Park, Longmire; Mount Rainier National Park, lower Kautz Creek; **San Juan** Co., Friday Harbor Biological Station; **Snohomish** Co., Mount Baker-Snoqualmie National Forest, Barlow Pass; Mount Baker-Snoqualmie National Forest, San Juan campground; **Thurston** Co., Priest Point Park; Tacoma Prairies. This species is scarce in the PNW but widespread elsewhere.

Substrate and habitat: Typically gregarious on soil under conifers in damp areas. Although it does not routinely fruit in recently (within 2 years) heavily disturbed areas, it may fruit in open areas under conifers and in areas subject to limited foot traffic.

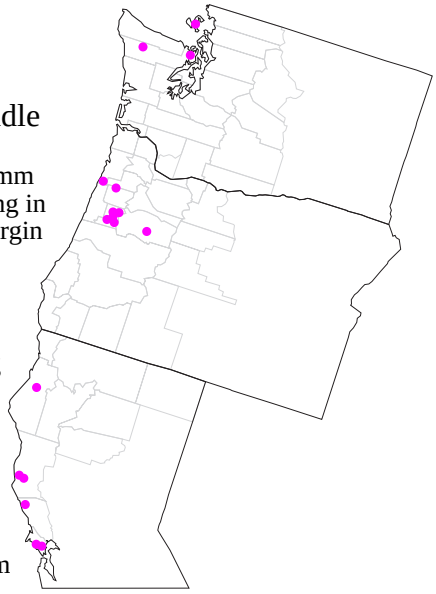
Season: Fruits from May through December.

Reference: Weber, N.S. 1975. Notes on western species of *Helvella*. I. Beih. Nova Hedwigia 51:25-38.

Photo courtesy of M.A. Castellano
Photo courtesy of G. Barron

Helvella maculata N.S. Weber

ROD name *Helvella maculata*



Family Helvellaceae **Morphological Habit** Elfin Saddle

Description: **Sporocarps** stipitate, apotheciate, at maturity (15-) 50-155 mm tall. **Apothecia** when young with margin obscuring the hymenium, expanding in age and then 2 (-3) lobed and slightly wrinkled over the apex of the stalk, margin straight to flaring. **Hymenial surface** gray-brown, obscurely mottled. **Abhymenial surface** cream colored at first then yellow, in age with gray to gray-brown areas, densely villose at all ages. **Stem** 15-125 x 2-3.5 mm at maturity, strongly ribbed with ribs not continuing on abhymenial surface of apothecium, lacunose, nearly white to very pale buff when young developing gray-brown patches in age. **Asci** operculate, inamyloid, 8-spored. **Spores** ellipsoid, 20-23.5 x 12-14 (-15) µm, smooth.

Distinguishing Features: Characterized by a stipitate, apotheciate sporocarp, the margins of the apothecium curve over and obscure the hymenial surface when young, the hymenial surface is gray-brown, abhymenial surface is cream at first, then yellow and densely villose, the stem is strongly ribbed. *Helvella crispa* (Scop. : Fr.) Fr. differs in being ivory to pale buff overall and not developing gray-brown discolorations; it also has slightly smaller spores, 17-21 (-24) x 10-13 (-14) µm. *Helvella compressa* differs in having a stem that is round and smaller spores.

Distribution: Known from 17 sites within the range of the northern spotted owl: **CALIFORNIA, Humboldt Co.,** Larabee Butte; **Marin** Co., Alpine Lake; Audobon Canyon Ranch, Galloway Canyon; Mount Tamalpias; **Mendocino** Co., Dimmick Memorial Grove State Park; Navarro River area, Masonite forest campground; **Sonoma** Co., Stewart Point Rd.; **OREGON**, **Benton** Co., Bureau of Land Management (BLM), Salem District, Bellfountain Rd.; BLM, Salem District, east of Reese Creek; Corvallis, Peavy Arboretum; Corvallis, Beechwood Place; Beldon Creek; **Linn** Co., Cascadia State Park; **Tillamook** Co., Siuslaw National Forest, Cascade Head Experimental Forest; Siuslaw National Forest, along Rd. 858 2 km from junction of Rd. 858 and Bible Creek Rd.; **Yamhill** Co., 5.8 km west of Willamina; **WASHINGTON**, **San Juan** Co., Friday Harbor Biological Station; **Jefferson** Co., Chimacum; Olympic National Park, Twin Creeks Natural Area. Also widespread across the North Temperate zone.

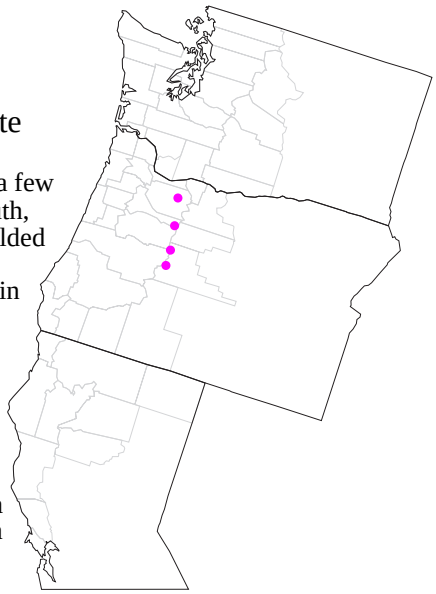
Substrate and habitat: Found scattered to gregarious at low to mid elevation under mixed conifers or hardwoods. This taxon is not restricted to old growth.

Season: Fruits from September through April.

Reference: Weber, N.S. 1975. Notes on western species of *Helvella*. I. Beih. Nova Hedwigia 51:25-38.

Photo courtesy of M.A. Castellano

Hydnotrya inordinata Trappe & Castellano, in ed.



ROD name *Hydnotrya sp. nov.* # Trappe 787 and 792

Family Discinaceae **Morphological Habit** sequestrate

Description: **Sporocarps** irregular, convoluted and enfolded with one or a few openings from the interior, 8-30 mm in diam, gray-pink and pubescent in youth, becoming dark red-brown and more or less smooth. **Gleba** complex, of enfolded tramal plates forming canals and locules 0.5-3 mm broad, trama concolorous with the sporocarp surface or paler, the locules lined with pale pink hymenia in youth, becoming dark red-brown as spores mature, the tips of the paraphyses exceeding the asci and white to pale red-brown, in deteriorating specimens sometimes pale yellow. **Odor and taste** not distinctive. **Ectal excipulum** 40-75 µm thick, of hyaline to yellow, globose to ellipsoid cells and obtuse to clavate, emergent hyphal tips 10-38 µm in diam, the walls 0.5-2.5 µm thick, the cells generally aligned in radiate rows. **Ental excipulum** 40-120 µm thick, of hyaline to yellow, interwoven, mostly thin-walled hyphae 5-12 µm in diam at the septa, the cells mostly inflated to 8-30 µm. **trama** up to 1 mm thick, of tightly interwoven, hyaline, mostly thin-walled hyphae 4-8 (-10) µm in diam at septa, occasional cells inflated to 5-15 (-30) µm. **Subhymenium** similar to trama except cells generally not inflated. **Asci** (6-) 8-spored, cylindric, mostly born in a hymenium but many also embedded in the subhymenium, hyaline, straight to sinuous, fragile and mostly breaking under pressure in microscope mounts, ±300 x 25-33 µm with a long-tapered base, the apex rounded, the lateral walls ±1 µm thick, the walls immediately below the apex thickened up to 3 µm, the apex itself thin-walled and neither pored nor operculate, inamyloid. **Paraphyses** crowded, 4-6 µm in diam, septate, hyaline, thin-walled, the cells below the tips not or only slightly inflated, the tips clavate and inflated to 5-8 (-10) µm, exceeding the asci by 70-100 µm and completely enclosing them. **Spores** uniseriate, globose to ellipsoid, subhyaline in youth and brown-yellow at maturity, 20-30 x 20-28 µm in water excluding ornamentation, 2-5 µm larger in KOH mounts, ornamentation of crowded, flexuous, tapered spines 2-3 (-4) x 0.2-1 µm, these sometimes erect and free but more often disorderly and mucilage embedded, aggregated into clusters or collapsed into indistinct mats, young spores often with surface deposits of brown, amorphous material, spore walls ±1 µm thick, young spores cyanophilic, mature spores cyanophilic or not.

Distinguishing Features: Characterized by small, convoluted to enfolded sporocarps and large spores with disorderly ornamentation.

Distribution: Endemic to Oregon. Known from four sites within the range of the northern spotted owl: **OREGON**, **Clackamas** Co., Mount Hood National Forest, Wildcat Mountain Rd.; **Deschutes** Co., Deschutes National Forest, Devils Lake; **Linn** Co., Willamette National Forest, West Lava campground; **Marion** Co., Willamette National Forest, Mount Jefferson Wilderness Area.

Substrate and habitat: Sporocarps usually occur in association with the roots of *Abies amabilis*, *Pinus contorta*, *Pseudotsuga menziesii*, and *Tsuga heterophylla* from 1,100 m to 2,000 m elevation.

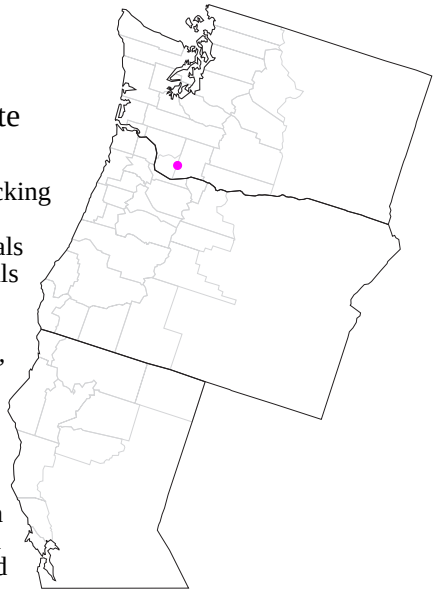
Season: Fruits in March, April, and July.

Reference: Trappe, J.M., and Castellano, M.A. 1999. Some new Ascomycota and Basidiomycota associated with the Northwest Forest Plan. Mycotaxon (in press).

Photo courtesy of J.M. Trappe

Hydnotrya subnix Trappe & Castellano, in ed.

ROD name *Hydnotrya subnix sp. nov.* # Trappe 1861



Family Discinaceae **Morphological Habit** sequestrate

Description: **Sporocarps** irregular to deeply convoluted and enfolded, lacking openings from the interior, 50 x 65 mm in diam, dark red-brown, glabrous to minutely roughened. **Gleba** complex, of enfolded tramal plates forming canals and locules 1-10 mm broad, concolorous with the sporocarp surface, the canals and locules lined with concolorous hymenia, the tips of the paraphyses exceeding the asci and white to pale red-brown. **Odor and taste** strongly of spicy garlic. **Peridium** 130-300 µm thick. **Ectal excipulum** 40-60 µm thick, a palisade of hyaline, obtuse to clavate, tapered, and irregular emergent hyphal tips 5-15 (-25) µm in diam, the walls up to 1 µm thick, occasional cells with brown contents. **Ental excipulum** 90-250 µm thick, of hyaline to brown, interwoven to radiate, mostly thin-walled hyphae 5-12 µm in diam at the septa, the cells mostly inflated to 8-30 (-40) µm, scattered cells and lengths of sparingly septate hyphae with brown contents. **trama** 300-500 µm thick, of tightly interwoven, hyaline, mostly thin-walled hyphae 4-8 (-10) µm in diam at septa, occasional cells inflated to 5-15 (-30) µm, scattered cells and lengths of hyphae with brown contents. **Subhymenium** similar to medullary excipulum except cells generally not inflated. **Asci** 8-spored, cylindric, mostly born in a hymenium but some also embedded in the subhymenium, hyaline, straight to sinuous, 300-340 x 25-40 µm with a long-tapered base, the apex rounded, the lateral walls ±0.5-1 µm thick, the walls immediately below the apex thickened up to 2 µm, the apex itself thin-walled and neither pored nor operculate, pale yellow in Melzer's reagent. **Paraphyses** crowded, 4-6 µm in diam, septate, hyaline, thin-walled, the tips clavate and inflated to 5-8 (-10) µm, exceeding the asci by 80-130 µm and completely enclosing them. **Spores** uniseriate, globose to rarely ellipsoid, in KOH brown-yellow in youth, brown at maturity, 23-20 µm in diam excluding ornamentation; ornamentation in youth of minute, crowded, mucilage-embedded spines ±1 µm tall, the spines soon covered by an amorphous, brown, irregular, warty partial reticulum 3-5 µm tall, the ridges and warts 0.5-4 µm broad, spore walls ±1 µm thick, inamyloid, young spores cyanophilic, older spores varying from cyanophilic to hardly staining.

Distinguishing Features: Macroscopically *Hydnotrya subnix* resembles robust specimens of *H. cerebriformis.* However, spores of the former are larger than those of the latter, and the spines become hidden under the mucilaginous reticulum of *H. subnix,* whereas those of *H. cerebriformis* remain prominent and visible at maturity.

Distribution: Endemic to Washington. Known from a single site within the range of the northern spotted owl: **WASHINGTON**, **Skamania** Co., Gifford Pinchot National Forest, junction of Gumboot Mountain Rd. and Canyon Rd.

Substrate and habitat: Sporocarps usually occur in association with the roots of *Abies amabilis* at 1,000 m elevation.

Season: Fruits in June.

Reference: Trappe, J.M., and Castellano, M.A. 1999. Some new Ascomycota and Basidiomycota associated with the Northwest Forest Plan. Mycotaxon (in press).

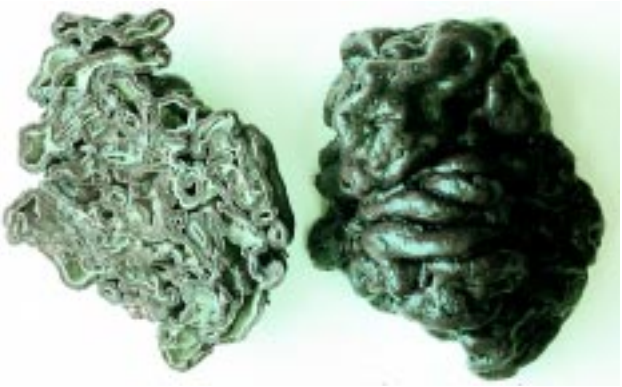
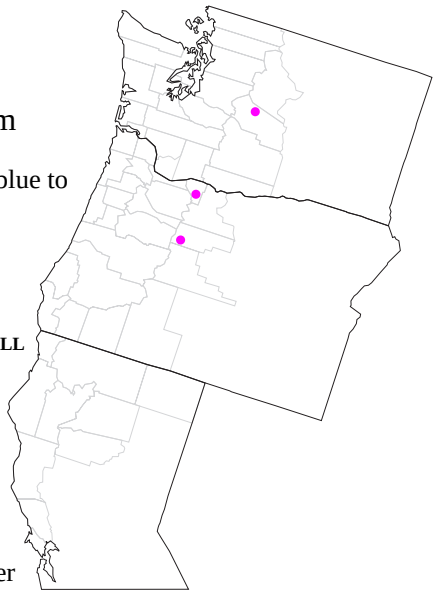


Photo courtesy of J.M. Trappe

Hygrophorus caeruleus Miller



ROD name *Hygrophorus caeruleus*

Family Hygrophoraceae **Morphological Habit** mushroom

Description: **Cap** 50-90 mm broad, moist, glabrous, rimose and cracked, blue to cream colored. **Flesh** dingy blue-green and cream. **Gills** blue-green, waxy. **Stem** 25-50 x 15-25 mm, tapering abruptly toward base, dry, apex pruinose, innately longitudinally fibrillose below, creamy toward apex, intensifying to blue-green to dirty pale brown below. **Veil** absent. **Rhizomorphs** white, numerous. **Odor** strongly farinaceous. **Taste** mild, becoming unpleasant. **Pileipellis** an ixocutis of thin-walled, hyaline hyphae 2.5-5 µm in diam. **Gill trama** of parallel hyphae. **Clamp connections** abundant. **Spores** ellipsoid, (6.5-) 7-9 x 4-5 µm, thin-walled, inamyloid.

Distinguishing Features: Characterized by its robust, blue-tinged, gilled mushroom with blue-green, waxy gills, a conspicuous basal rhizomorph and a distinctly farinaceous odor. It fruits near melting snowbanks with Pinaceae. *Hygrophorus canescens* and *H. pallidus* have similar stature and coloration, but have no odor, interwoven gill trama, smaller spores, and different plant associates. *Hygrophorus subviolaceus* is similarly colored but has interwoven lamellar trama, a cap cuticle with narrower (2-3 µm diam) hyphae, and a more fragile, slender stature.

Distribution: Endemic to Oregon and Washington. Known from three sites within the range of the northern spotted owl: **OREGON**, **Hood River** Co., Mount Hood National Forest, off trail 645; **Jefferson** Co., Deschutes National Forest, Jack Creek; **WASHINGTON**, **Kittitas** Co., Twenty-Nine Pines.

Substrate and habitat: Occurs in soil in association with roots of Pinaceae spp. near melting snowbanks.

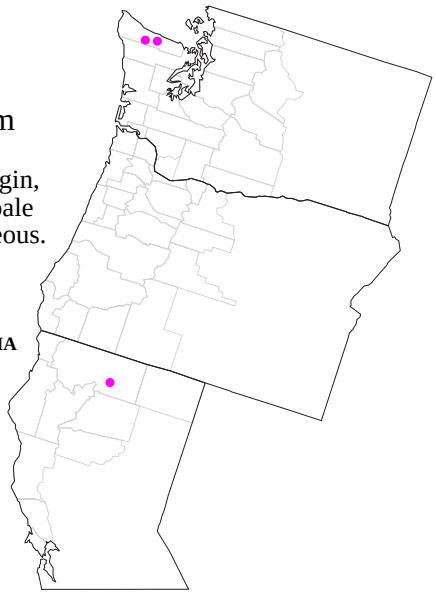
Season: Fruits from May through July and possibly fall.

References: Miller, Jr., O. K. 1984. A new taxa of *Hygrophorus* from North America. Mycologia 76:816-820. Largent , D. L. 1985. The Agaricales of California. 5. Hygrophoraceae. Eureka: Mad River Press, Inc. 208 p.

Photo courtesy of T. O'Dell

Hygrophorus vernalis A.H. Smith

ROD name *Hygrophorus vernalis*



Family Hygrophoraceae **Morphological Habit** mushroom

Description: **Cap** 30-50 mm broad, obtusely umbonate with incurved margin, viscid, moderate yellow-brown when young, becoming tinged with brighter pale vinaceous colors in age. **Flesh** thick, concolorous with cuticle or pale vinaceous. **Gills** arcuate, becoming long decurrent, white or paler than pileus margin. **Stem** 40-60 x 7-9 mm, equal to slightly bulbous, white, with the thin layer of gluten on the lower portion forming shiny dingy yellow patches. **Odor and taste** not distinctive. **Basidia** 50-70 x 7-11 µm, 2- and 4-spored. **Gill trama** divergent. **Pleurocystidia and cheilocystidia** absent. **Clamp connections** rare (cuticular hyphae) to relatively common (gill trama). **Spores** oblong-ellipsoid, 11-15.5 x 5.5-7 µm, smooth, inamyloid.

Distinguishing Features: Characterized by a white to yellow-brown or vinaceous, gilled mushroom with a viscid pileus, sordid white gills and stem with a thin glutinous layer on the base. *Hygrophorus variicolor* has a darker cap lacking vinaceous tones and much smaller spores (7-9 x 4.5-5.5 µm).

Distribution: Endemic to California and Washington. Known from three sites within the range of the northern spotted owl: **CALIFORNIA**, **Siskiyou** Co., Shasta-Trinity National Forest, Panther Creek Meadows; **WASHINGTON**, **Clallam** Co., Olympic National Park, near Deer Lake; Olympic National Park, Hell Creek; Olympic National Park, near Elwha campground. Not known from Oregon.

Substrate and habitat: Occurs in soil in association with roots of Pinaceae spp. near melting snowbanks.

Season: Fruits in April through July.

References: Hesler, L. R., and Smith, A. H. 1963. North American Taxa of *Hygrophorus.* Knoxville: The University of Tennessee Press. Largent, D. L. 1985. The Agaricales of California. 5. Hygrophoraceae. Eureka: Mad River Press, Inc. 208 p.

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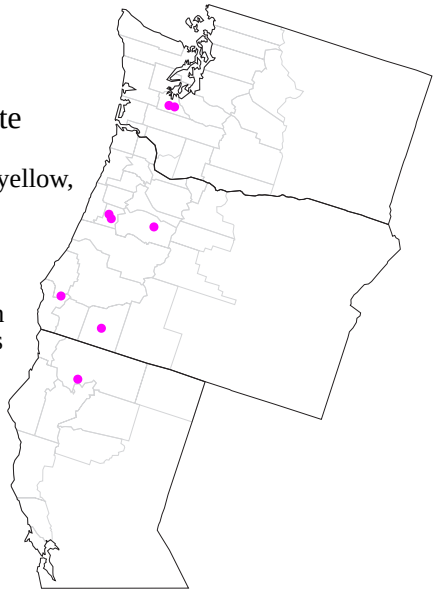
Photo courtesy of University of Michigan
Photo courtesy of S.A. Redhead

PHOTO ONLY AVAILABLE IN PRINTED VERSION

Leucogaster citrinus (Harkness) Zeller & Dodge



ROD name *Leucogaster citrinus*

Family Leucogastraceae **Morphological Habit** sequestrate

Description: **Sporocarps** up to 20-45 mm, reniform, pale yellow to dark yellow, with 1 to several coarse rhizomorphs emanating from base, concolorous with peridium. KOH on peridium pale brown-pink then brown, ETOH negative, FeSO4 faintly gray. **Gleba** white, trama white, locules spherical, 0.5-3 mm broad, empty, smaller toward peridium. **Peridium** 60-200 µm thick, of periclinal, compact, pallid yellow hyphae 2-4 µm diam, with a red pigment in KOH. **Trama** 60-80 µm thick, of subparallel, orange, thin-walled, gelatinous hyphae, 2-5 µm in diam. **Basidioles** 100-125 x 5 µm, claviform, hyaline, thin-walled. **Apobasidia** 100 x 5-7 µm, clavate, 4-spored, thin-walled, sterigmata lacking. **Spores** subglobose, 8-11 x (7-) 8-9 µm, including spinose-reticulate ornamentation, hyaline, enclosed in hyaline perisporal sac, ornamentation 1-1.5 µm high, 2-2.5 µm apart, spine base 0.2 µm wide, spore wall 1 µm thick, excluding ornamentation.

Distinguishing Features: Characterized by its yellow peridium, small spores with tall ornamentation and lack of inflated cells in the trama.

Distribution: Endemic to the Pacific Northwest. Known from eight sites within the range of the northern spotted owl: **CALIFORNIA**, **Siskiyou** Co., Klamath National Forest, Russian Wilderness Area, near Duck Lake; **OREGON**, **Benton** Co., Siuslaw National Forest, north fork of Rock Creek; just south of the Alsea summit on hwy. 34; **Curry** Co., Siskiyou National Forest, Wild Rouge Wilderness Area, Upper Stair Creek; **Jackson Co.,** Bureau of Land Management, Medford District, Howard Prairie; **Linn** Co., Willamette National Forest, Yellow Bottom campground; **WASHINGTON**, **Thurston** Co., Fort Lewis Military Reservation, Farley Block, stand 4; Fort Lewis Military Reservation, Stellar Block, stand 3.

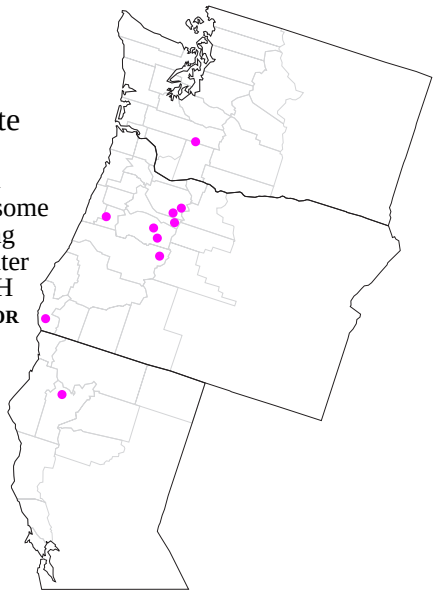
Substrate and habitat: Found in association with the roots of *Abies concolor, A. lasiocarpa, Pinus contorta, P. monticola, Pseudotsuga menziesii,* and *Tsuga heterophylla* from 280 to 2,000 m elevation.

Season: Fruits from August through November.

Reference: Zeller, S.M., and Dodge, C.W. 1924. *Leucogaster* and *Leucophleps* in North America. Ann. Mo. Bot. Gard. 11:389-410.

Photo courtesy of W. Colgan III

Leucogaster microsporus Fogel nov. prov.



ROD name *Leucogaster microsporus*

Family Leucogastraceae **Morphological Habit** sequestrate

Description: **Sporocarps** up to 40 x 50 mm, reniform, base indented with peridial tissue extending to the center of the sporocarp, glabrous, white with some yellow stains, drying pale red. **Gleba** white, drying pale yellow-pink, exuding white, sticky latex when cut, locules spherical, 0.5-1 mm broad, empty in center of sporocarp, filled with spores next to peridium. **Rhizomorphs** absent. KOH pale yellow on peridium, FSW negative, FSW + ETOH dull blue-violet. **Odor** sweet. **Peridium** 100-300 µm thick, of periclinal, pale yellow, thin-walled hyphae, 3-5 µm in diam, cells becoming inflated to 15 µm, some oleiferous, yellow, thin-walled hyphae, outer 60 µm obscured in KOH by yellow, amorphous, pigment balls in Melzer's reagent. **Trama** 60-125 µm thick, of subparallel, yellow, septate, thin-walled hyphae, 2-3 µm in diam, cells becoming inflated to 10 µm. **Basidioles** 30-35 x 3-4 µm, claviform, thin-walled, hyaline, some encrusted with a hyaline crystalline deposit in KOH. **Apobasidia** 30-60 x 6-7 µm, claviform, 4-spored, thin-walled, hyaline, sterigmata lacking. **Spores** subglobose, 6-10 x 5-6 µm, including reticulate ornamentation, enclosed in a hyaline perisporal sac, ornamentation of reticulate spines 0.25-0.5 µm high, 2 µm apart, with low connecting lines forming 5-6 sided alveoli.

Distinguishing Features: Characterized by its small spores, inflated cells in the peridium and trama, and a rather thick peridium.

Distribution: Endemic to Oregon and Washington. Known from 10 sites within the range of the northern spotted owl: **CALIFORNIA**, **Trinity** Co., Castle Crags State Park, Soda Creek; **OREGON**, **Benton** Co., Siuslaw National Forest, Marys Peak Rd.; **Clackamas Co.,** Mount Hood National Forest, southeast of Timothy lake; **Curry** Co., Siskiyou National Forest, Panther Lake, Long Term Ecosystem Productivity study site ESLW block; **Lane** Co., Willamette National Forest, H.J. Andrews Experimental Forest, Stand 11; **Linn** Co., Willamette National Forest, Sheep Creek Canyon; Willamette National Forest, Maude Creek; **Marion** Co., Mount Hood National Forest, headwaters of Clackamas River, along Cub Creek; **Wasco** Co., Mount Hood National Forest, near Summit Lake Rd.; **WASHINGTON**, **Lewis** Co., Gifford Pinchot National Forest, Quartz Creek Big Trees.

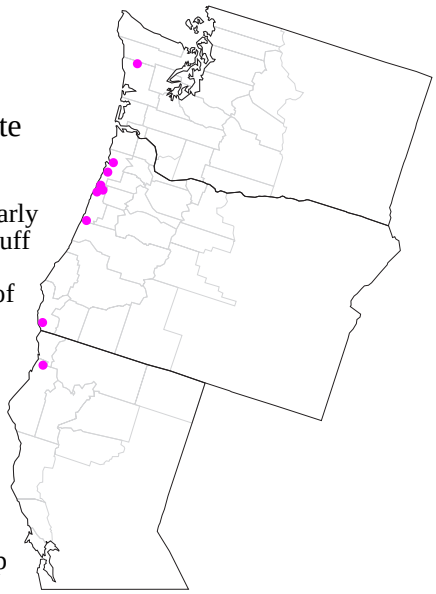
Substrate and habitat: Found in association with the roots of *Pseudotsuga menziesii* and *Tsuga heterophylla* at 330-1,000 m elevation.

Season: Fruits from August through November.

Reference: Zeller, S.M., and Dodge, C.W. 1924. *Leucogaster* and *Leucophleps* in North America. Ann. Mo. Bot. Gard. 11:389-410.

Photo courtesy of M.A. Castellano

Macowanites chlorinosmus A.H. Smith & Trappe



ROD name *Macowanites chlorinosmus*

Family Russulaceae **Morphological Habit** sequestrate

Description: **Cap** 2.5-5.5 cm broad, convex to broadly convex-depressed, surface at least subviscid when wet but soon dry, cutis in age splitting irregularly or merely somewhat rimose, ivory to pallid yellow over marginal area, disc buff to more dingy ochraceous, cutis separable to center. **Flesh** white. **Odor** of chlorine faint to strong. **Taste** unpleasant, not acrid. **Gleba** adnate to apex of stipe, up to 2 cm deep in widest part, sublamellate to labyrinthiform, pale ochraceous when young, becoming orange ochraceous in age. **Stem-columella** 1-3 cm long, 6-9 mm thick, equal or nearly so, solid, fragile, white within, surface white to pallid, unchanging on injury, pallid as dried. **Flesh of peridium** of heteromerous tissue, the sphaerocysts thin-walled. **Peridial subcutis** of appressed, interwoven hyphae with occasional greatly inflated isolated cells along the base of the epicuticular turf. **Peridial epicutis** of a compact subgelatinous trichodermium of versiform elements adhering together to form a layer with outlines of individual cells often not clear, the component elements of the hyphae with variously enlarged cells (up to 20 µm broad) clavate, cylindric, or fusoid end-cells showing clearly. **Dermatopseudocystidia** scattered to rare. **Subhymenium** with cells 6-12 µm in diam, this area grading imperceptibly into the central area which is composed of inflated cells and appears to be entirely pseudoparenchymatic in sections revived in KOH. **Basidia** 23-30 x 9-12 µm, clavate, 4-spored, hyaline. **Cystidia** abundant and voluminous, 50-65 x 10-15 µm, subclavate-mucronate, cylindric mucronate, or narrowly clavate, with a slight amount of refractive content, walls very thin and cystidia collapsing by late maturity and then hard to demonstrate in KOH mounts. **Clamp connections** absent. **Spores** broadly ellipsoid to subglobose, 8-9.5 x 6.5-7.5 µm, excluding ornamentation, strongly amyloid, ornamentation of small warts 0.3-0.5 (0.8) µm high, clumped or united into small groups but no semblance of a reticulum present.

Distinguishing Features: Characterized by the chlorine odor, subgelatinous epicutis of the peridium with its elements forming a distinct layer, a dark brown gleba, and the numerous thin-walled cystidia. *Macowanites chlorinosmus* is distinguished from the similar *Macowanites fulvescens* by its smaller spores.

Distribution: Endemic to the Pacific Northwest. Known from nine sites within the range of the northern spotted owl: **CALIFORNIA, Humboldt** Co., Redwoods State Park, Prairie Creek; **OREGON**, **Curry** Co., Boardman State Park; **Lane** Co., Neptune State Park; **Lincoln** Co., Devils Lake State Park; **Tillamook** Co., Cape Lookout State Park; Cape Meares State Park; Siuslaw National Forest, Cascade Head Experimental Forest, at summit along old highway 101; Camp Meriweather boy scout camp; **WASHINGTON**, **Grays Harbor** Co., Olympic National Forest, Willaby Creek, near Rain Forest trail on South Shore Rd.

Substrate and habitat: Found in association with the roots of *Picea sitchensis* and *Tsuga heterophylla* below 200 m elevation.

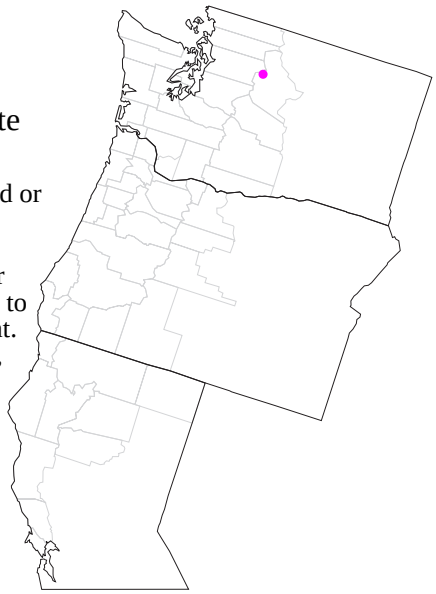
Season: Fruits in January, July, August, September, October, and November.

Reference: Smith, A.H. 1963. New astrogastraceous fungi from the Pacific Northwest. Mycologia 55:421-441.

Photos courtesy of M.A. Castellano

Macowanites lymanensis Cázares & Trappe

ROD name *Macowanites lymanensis*



Family Russulaceae **Morphological Habit** sequestrate

Description: **Sporocarps** 7-23 x 12-36 mm, subglobose to turbinate, lobed or depressed at the center. **Peridium** pale dull yellow with brown stains on cap, white towards margin, glabrous, recurved and often attached to stem but sometimes separated to reveal locules. **Gleba** loculate, pale orange yellow or slightly yellowed, locules 0.3-1 mm broad. **Stem-columella** inconspicuous to prominent, white, percurrent to truncated. **Flesh** white. **Rhizomorphs** absent. **Odor** strongly yeasty. **Taste** mild. **Stem-columella** of hyaline, thin-walled, tightly interwoven hyphae, 2-8 µm in diam, many cells inflated up to 10-20 µm in diam. **Peridial epicutis** 20-70 µm thick, composed of appressed, thin-walled hyphae 2-5 µm in diam, with most cells inflated up to 10-20 µm in diam, pale yellow in KOH and Melzer's reagent, and a subcutis composed of thin-walled, hyaline, inflated cells and sphaerocysts 10-40 µm in diam. **Trama** 35-140 µm wide, of thin-walled, hyaline sphaerocysts but occasionally with a central strand of interwoven, thin-walled hyphae 3-6 µm in diam. **Subhymenium** cellular, 1-3 (-5) cells deep, the cells 10-15 (-20) µm in diam, hyaline. **Basidia** 28-45 x 11-17 µm, thin-walled, clavate, 2-4 spored, hyaline. **Cystidia** absent. **Clamp connections** absent. **Spores** globose to subglobose, 7-13 (-17) x 7-12 (-14) µm, excluding ornamentation, symmetrical, amyloid, ornamentation 1-2 µm tall, of rods or warts, sometimes connected by lines, occasionally partially reticulate.

Distinguishing Features: Characterized by the thin peridial epicutis of appressed hyphae, the relatively large spores with ornamentation 1-2 µm tall, consisting of individual rods or warts often connected in lines or forming a partial reticulum, and a total absence of cystidia.

Distribution: Endemic to Washington. Known from a single site within the range of the northern spotted owl: **WASHINGTON**, **Chelan** Co., Wenatchee National Forest, Glacier Peak Wilderness Area, Lyman Lake, campsite on eastern shore near the inlet of Cloudy Pass Creek.

Substrate and habitat: Found in association with the roots of *Abies amabilis* and *A. lasiocarpa* at 1,700 m elevation.

Season: Fruits in September.

Reference: Cázares, E., and Trappe, J.M. 1991. Alpine and subalpine fungi of the Cascade and Olympic Mountains. 2. *Macowanites lymanensis* sp. nov. Mycotaxon 42:333-338.

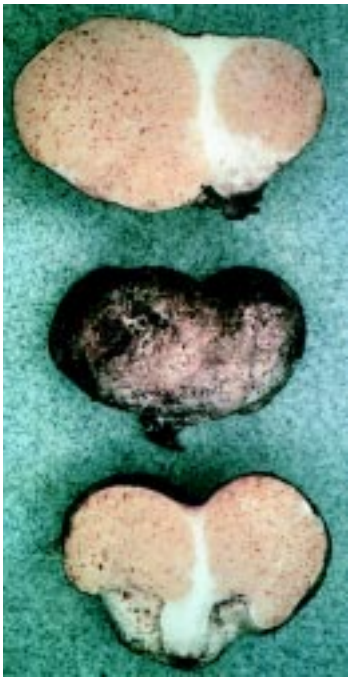
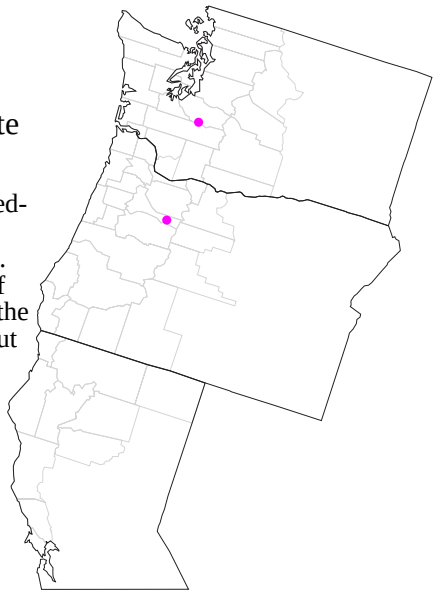


Photo courtesy of J.M. Trappe

Macowanites mollis A.H. Smith & Trappe

ROD name *Macowanites mollis*

Family Russulaceae **Morphological Habit** sequestrate



Description: **Sporocarps** 10-30 mm broad, depressed globose to depressed-pileate, surface white, lubricous, drying cinnamon tan. **Gleba** white to tan. **Stem-columella** reduced, percurrent or nearly so, stipe 4-6 x 2-3 mm, white. **Peridial epicutis** of inflated cells 8-15 µm diam. **Peridial subcutis** a turf of dermatopseudocystidia mixed with somewhat gelatinized, branched hyphae, the turf elements versiform-clavate, contorted, fusoid, capitate-pedicelate, etc., but generally under 30 µm long. Oleiferous hyphae absent. **Trama** at first (near margin of peridium) filamentose but at maturity greatly enlarged cells seen scattered throughout. **Subhymenium** of vesiculose elements which at maturity are 10-18 µm in diam and form a layer 2-3 cells deep. **Basidia** 1-2-spored, clavate, 24-33 x 10-13 µm, hyaline, readily collapsing. **Basidioles** numerous. **Cystidia** rare to scattered, 38-56 x 5-8 µm, filamentose-acuminate to narrowly clavate-mucronate, with a small amount of refractive content variously distributed (as seen in KOH). **Clamp connections** absent. **Spores** globose, 10-15 µm in diam or subglobose to ellipsoid, 11-14 (-16) x 9.5-13 µm, ornamentation of small spines unconnected or fused in groups of 2-3, 0.6-1 µm high and ±0.25 µm broad at base, completely covered with amylaceous material, spore wall thin to slightly thickened.

Distinguishing Features: Characterized by its white peridium and much reduced stem, extremely narrow elements of the spore ornamentation, and peridial structure.

Distribution: Endemic to Oregon and Washington. Known from two sites within the range of the northern spotted owl: **OREGON**, **Multnomah** Co., Columbia Gorge Recreational Area, Larch Mountain; **WASHINGTON**, **Pierce** Co., Mount Rainier National Park, Lower Tahoma Creek at junction of Nisqually River. Additional information is needed to ascertain if the two collections from Lower Tahoma Creek may in fact be one site.

Substrate and habitat: Found in association with the roots of *Abies grandis*, *Pseudotsuga menziesii*, and *Tsuga heterophylla* above 1,000 m elevation.

Season: Fruits in July and September.

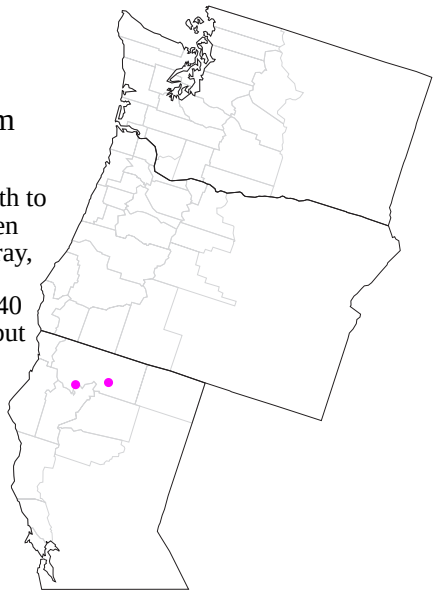
References: Pegler, D.N., and Young, T.W.K. 1979. The gastroid Russulales. Trans. Brit. Mycol. Soc. 72:353-388. Singer, R., and Smith, A.H. 1960. Studies on secotiaceous fungi. IX. The astrogastraceous series. Mem. Torr. Bot. Club 21:1-112.

Photo only available in printed version

Marasmius applanatipes Desjardin

ROD name *Marasmius applanatipes*

Family Tricholomataceae **Morphological Habit** mushroom



Description: **Cap** 10-18 mm diam, convex to plano-convex, surface smooth to rugulose-striate, dry, glabrous, subhygrophanous, dark red-brown overall when young, in age cap becoming dark brown to brown, margin fading to brown-gray, gray-brown, gray-orange or pink-tan. **Gills** adnate to adnexed, subdistant to distant, broad, at first tan to gray- orange, in age becoming brown. **Stem** 30-40 x 1.5-3 mm, gradually narrowed downward, typically compressed and cleft, but sometimes subcylindric, hollow, pubescent to velutinous overall, upper half buff to orange-white or brown-orange, lower half brown-gray to dark brown or dark red-brown. **Odor and taste** strongly garlic-like. **Pileipellis** a hymeniform layer of pyriform to broadly clavate erect cells, these ranging from hyaline or pale yellow and thin-walled, to dark brown and thick-walled. **Gill trama** of inamyloid, nongelatinous hyphae. **Caulocystidia** clustered, 42-78 x 5.5-9 µm, irregularly cylindric, rarely lobed, with moderately thick, hyaline walls. **Basidia** 2- and 4-spored. **Pleurocystidia** absent. **Cheilocystidia** 33-48 x 6-9 µm, cylindric to clavate, often bifid or with scattered knobs. **Clamp connections** present. **Spores** broadly ellipsoid to amygdaliform, 8.5-10 (-12) x 5-6 µm, smooth, hyaline, inamyloid.

Distinguishing Features: Characterized by a cap colored red-brown on the disc and brown-gray, gray-brown, gray-orange or pink-tan on the margin; a strong garlic-like odor and taste; a compressed and cleft, entirely pubescent bicolored stem; and growth associated with mixed conifers at elevations above 2,000 meters. Diagnostic microscopic features include: a hymeniform pileipellis of smooth, clavate cells; bifid cheilocystidia; absence of pleurocystidia; inamyloid gill trama; and relatively broad, amygdaliform spores.

Distribution: Endemic to California. Known from two sites within the range of the northern spotted owl: **CALIFORNIA**, **Siskiyou** Co. Shasta-Trinity National Forest, Sand Flat on the flanks of Mount Shasta; **Siskiyou** Co., Klamath National Forest, Carter Meadows. Two other sites with two collections each are known from Yuba Pass, Sierra Co., California and Placer Co., California (Desjardin 1985). The two populations from outside the assessment area have been heavily logged and this taxon has not been recollected from these areas since.

Substrate and habitat: Fruits on Pinaceae litter in forests above 2,000 m elevation.

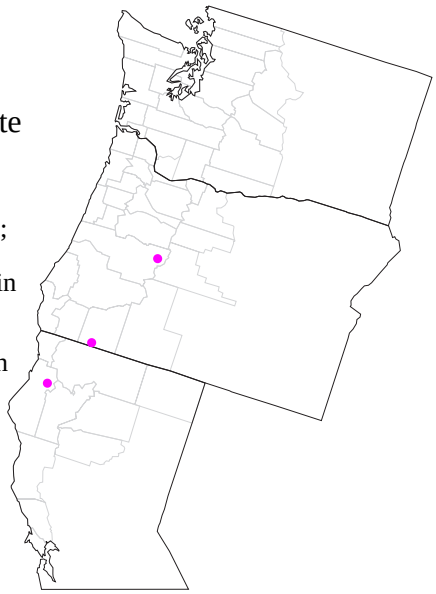
Season: Fruits in October.

Reference: Desjardin, D.E. 1985. New marasmioid fungi from California. Mycologia 77:894-902.

No photograph available

Martellia fragrans A.H. Smith

ROD name *Martellia fragrans*



Family Russulaceae **Morphological Habit** sequestrate

Description: **Sporocarps** 1-4.5 cm broad, globose or nearly so, surface glabrous and usually with much dirt adhering, pallid to pale cinnamon brown; FeSO4 on surface negative, KOH on surface red. **Odor** vanilla-like. **Rhizomorphs** absent. **Gleba** loculate, white to off white at first then brown in age. **Columella** absent. **Peridial epicutis** of dermatocystidia 18-27 x 4-8 µm, bluntly fusoid, and many brown to ochraceous in KOH, the layer almost obliterated in old specimens. **Peridial subcutis** ochraceous to rusty brown in KOH, of interwoven filaments, sphaerocysts absent. **Subhymenium** of interwoven hyphae 4-8 µm in diam, lacking sphaerocysts. **Basidia** 4-spored, clavate, thin-walled, hyaline, 23-38 x 8-11 µm. **Cystidia** in hymenium rare to scattered, filamentose with crooked apices. **Spores** globose to subglobose, 8-11 x 7.5-10 µm, amyloid, wall slightly thickened, ornamentation as separate rods and spines 0.7-1.5 (-2) µm high, some fused into small groups or lines.

Distinguishing Features: Characterized by the vanilla-like odor, brown gleba, spores with rods and spines that are somewhat connected, and the turf of dermatocystidia.

Distribution: Known from three sites within the range of the northern spotted owl: **CALIFORNIA**, **Humboldt** Co., near Big Hill; **OREGON**, **Jackson** Co., Rogue River National Forest, 1.4 km east of Dutchman's Peak along Siskiyou Summit Rd.; **Lane**, Co., Williamette National Forest, Lamb Butte Scenic Area, Ollalie trail. There are also three sites outside the assessment area but on Federal land located on the Swain Mountain Experimental Forest, Lassen National Forest, Plumas Co., California. Not known from Washington. Also known from Idaho.

Substrate and habitat: Found in association with the roots of or *Pseudotsuga menziesii* or *Tsuga mertensiana* from 1,500 to 2,500 m elevation.

Season: Fruits from June through November.

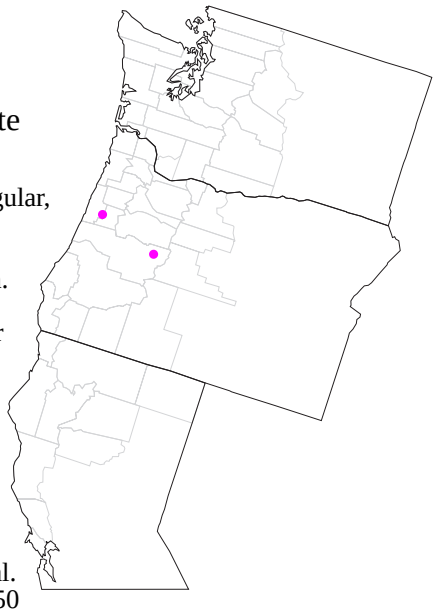
Reference: Smith, A.H. 1963. New astrogastraceous fungi from the Pacific Northwest. Mycologia 55:421-441.

No photograph available

Martellia idahoensis A.H. Smith

ROD name *Martellia idahoensis*

Family Russulaceae **Morphological Habit** sequestrate



Description: **Sporocarps** 8-40 (50) mm broad, globose-depressed or irregular, irregularly ridged or grooved, at first merely wrinkled, with little or no dirt adhering to the surface, white when young, finally pale brown in some areas, rarely overall, drying pallid. **Gleba** loculate, white at first, in age pale brown. **Columella** poorly developed, when present dendroid. **Flesh** of peridium white, unchanging. **Odor** none. **Taste** not recorded. **Peridial epicutis** over 200 µ thick consisting of a staggered palisade of hyphae with enlarged cells and ending in clavate end-cells, or these showing irregular proliferations, rarely with narrow or branched elements in the palisade. **Peridial subcutis** a layer of nongelatinized, repent, interwoven hyphae with pockets of slightly inflated cells. **Trama** composed entirely of hyaline, subparallel to slightly interwoven hyphae extending. **Laticiferous hyphae** rare, brown in KOH, crooked. **Subhymenium** broad, cellular, of large and small sphaerocysts. **Basidia** 29-45 x 11-16 µm, clavate, hyaline, (1-) 2-4 spored, sterigmata 5-8 µm long, narrowly conic, erect or slightly oblique, straight or nearly so, apical. **Macrocystidia** arising from deeper in the tramal tissue than the basidia, 40-50 x 9-10 µm, with banded to granular pale yellow content, clavate to subcylindric, obtuse, scattered. **Leptocystidia** rare, 30-37 x 12-15 µm, clavate-mucronate; a second type (76-90 x 9-14 µm) present and narrowly clavate, found on fresh material but not demonstrated again from dried material. **Clamp connections** absent. **Spores** globose to broadly ellipsoid, 10-13 x 9-11.5 µm, amyloid, ornamentation echinate to verrucose, 1-1.5 (-2) µm tall, elements unconnected or anastomosing to form compound warts, very few lines or ridges.

Distinguishing Features: Characterized by the relatively large, echinate to verrucose spores and the presence of macrocysitida.

Distribution: Known from two sites within the range of the northern spotted owl: **OREGON**, **Benton** Co., Siuslaw National Forest, Marys Peak campground; **Lane** Co., Willamette National Forest, Lamb Butte Scenic Area, Ollalie trail. Not known from California or Washington. Also known from Idaho.

Substrate and habitat: Found in association with the roots of *Abies amabilis, A. lasiocarpa, A. procera, Picea engelmannii,* and *Tsuga mertensiana* from 1,200 to 1,650 m elevation.

Season: Fruits from August through October.

Reference: Singer, R., and Smith, A.H. 1960. Studies on secotiaceous fungi. IX. The astrogastraceous series. Mem. Torr. Bot. Club 21:1-112.

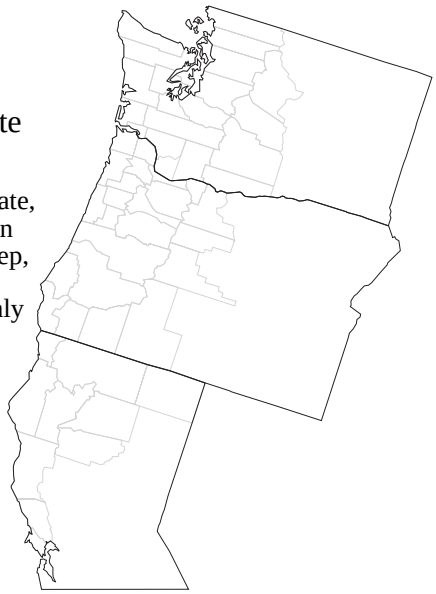
Photo courtesy of University of Michigan

PHOTO ONLY AVAILABLE IN PRINTED VERSION

Martellia maculata Singer & A.H. Smith

ROD name *Elaphomyces sp. nov.* # Trappe 1038

Family Russulaceae **Morphological Habit** sequestrate



Description: **Sporocarps** 1-2 cm thick, globose, surface uneven to alveolate, pallid, with brown stains in places. **Gleba** pallid but also with brown stains in places. **Columella** absent. **Peridial epicutis** an epithelium several cells deep, the walls hyaline to yellow, smooth, nongelatinous. **Peridial subcutis** of interwoven, hyaline, subgelatinous hyphae. **Trama** subgelatinous, hyphae only slightly inflated, hyaline, thin-walled. **Sphaerocysts** absent. **Subhymenium** gelatinous, hyaline, the cells badly collapsed but short and more or less isodiametric. **Basidia** clavate, 20-24 x 10-12 µm, yellow, 2- and 4-spored. **Basidioles** numerous, yellow. **Cystidia** absent. **Clamp connections** absent. **Spores** subglobose to ellipsoid, 10-15 x 8.5-11 µm, wall about 1-1.5 µm thick, in KOH cinnamon-tan in KOH, ornamentation of spines up to 1 µm high and 0.5 µm broad which are amyloid only at the tip or on one side near the tip, smaller amyloid granules also present on the spore surface but for the most part all elements unconnected.

Distinguishing Features: Characterized by the cellular peridial epicutis, large spores with unique amyloid reaction and lack of cystidia.

Distribution: Endemic to Oregon and Washington. Known from many dozens of locations in western Oregon, and western Washington. It occurs from sea level to high elevation. This taxon was inadvertently added to the list.

Substrate and habitat: Found in association with the roots of various Pinaceae from sea level to high elevation.

Season: Fruits September through November.

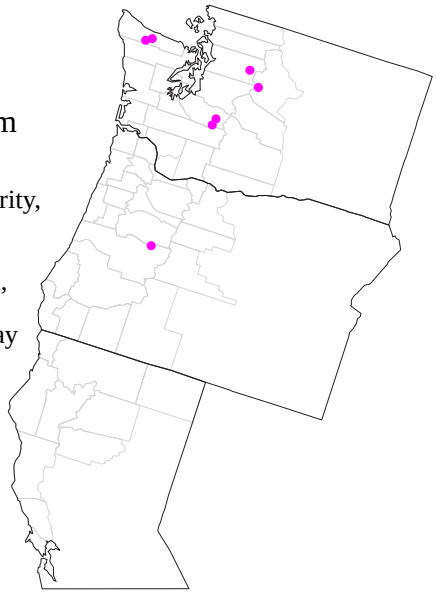
Reference: Singer, R., and Smith, A.H. 1960. Studies on secotiaceous fungi. IX. The astrogastraceous series. Mem. Torr. Bot. Club 21:1-112.

No photograph available

Mycena hudsoniana A.H. Smith

ROD name *Mycena hudsoniana*

Family Tricholomataceae **Morphological Habit** mushroom



Description: **Cap** 20-50 mm diam, obtusely conic to campanulate at maturity, pellucid-striate, nonviscid, glabrous, nearly black or dark gray towards the margin, margin pale gray to white, fading to pale smoky gray overall. **Gills** ascending-adnate, often with a short decurrent tooth, close, moderately broad, pale smoky gray with paler edge. **Stem** 30-50 x 1.5-3 mm, cylindric, fragile, hollow, minutely prunose when young, glabrescent, pale gray above, dark gray below, base covered with coarse white fibrils. **Odor** faintly fragrant. **Pileipellis** of repent hyphae 1.5-3.5 µm diam with numerous diverticula, these ranging from wart-like to long and branched. **Trama** dextrinoid. **Stipitipellis** a cutis of diverticulate hyphae. **Basidia** 2-4 spored. **Cheilocystidia** numerous, 21-45 x 8-22 µm, clavate to broadly clavate, densely covered with evenly spaced, cylindrical spinulae 1-3.5 x 0.8-1.4 µm, hyaline. Also there are less numerous, irregularly shaped, contorted to constricted cells with unevenly spaced, longer and coarser excrescences. **Pleurocystidia** similar to cheilocystidia. **Clamp connections** present. **Spores** pip-shaped, 8-10 x 5-6 µm, smooth, amyloid, white spore print.

Distinguishing Features: Characterized by the large, nearly black to dark gray, nonviscid, glabrous, striate cap, the pale smoky gray gills, a gray to dark gray, dry stem, the faintly fragrant (not farinaceous nor raphanoid) odor, the relatively large, pip-shaped, amyloid spores, the distinctive cheilocystidia of two types, broadly clavate, spinulose pleurocystidia, a nongelatinous pileipellis and stipitipellis of diverticulate hyphae and growth on conifer needles.

Distribution: Endemic to Oregon and Washington. Known from seven sites within the range of the northern spotted owl: **OREGON**, **Lane** Co., Willamette National Forest, H.J. Andrews Experimental Forest, watershed II; **WASHINGTON**, **Clallam** Co., Olympic National Park, just below Deer Lake; Olympic National Park, Boulder Lake trail; **King** Co., Wenatchee National Forest, Smith Brook Rd. , near Steven's Pass; **Lewis** Co., Mount Rainier National Park, Reflection Lakes; Mount Rainier National Park, Narada Falls; **Snohomish** Co., Mount Baker-Snoqualmie National Forest, Barlow Pass, south fork of the Sauk River.

Substrate and habitat: Restricted to conifer forests and usually found on woody debris or duff near snow banks above 700 m elevation.

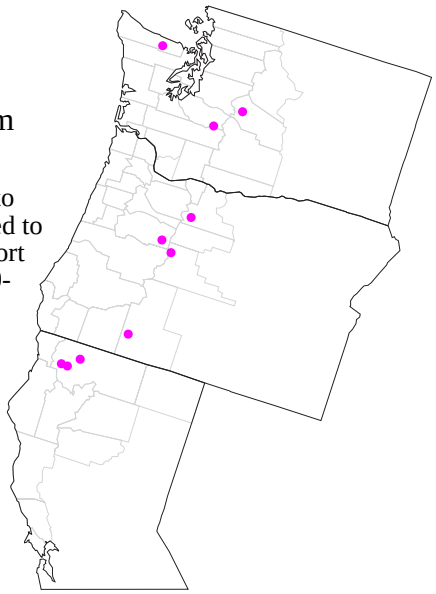
Season: Fruits from April through July.

Reference: Smith, A.H. 1947. North American species of *Mycena*. University of Michigan Press, Ann Arbor. 521 p.

PHOTO ONLY AVAILABLE IN PRINTED VERSION

Mycena monticola A.H. Smith

ROD name ***Mycena monticola***



Family Tricholomataceae **Morphological Habit** mushroom

Description: **Cap** 10-30 mm diam, conic to campanulate, pellucid-striate to slightly sulcate, nonviscid, hygrophanous, glabrous, disc red, margin flame red to pink-red, fading to pink at maturity. **Gills** ascending-adnate, often with a short decurrent tooth, close, broad, white to pink with concolorous edges. **Stem** 40-75 x 1-2.5 mm, cylindric, prunose at apex, glabrous elsewhere, base covered with coarse white fibrils, pink overall at first, turning dingy brown from the base upwards in age. **Odor and taste** not distinctive. **Pileipellis** of repent hyphae 2-3.5 µm in diam, covered with simple to branched diverticula 2-23 µm long, these often in dense clusters. **Hypodermium** of dextrinoid hyphae inflated up to 45 µm in diam. **Stipitipellis** a layer of repent hyphae with scattered diverticula 1-10 µm long, and terminal cells similar to cheilocystidia but smaller. **Basidia** 4-spored. **Cheilocystidia** 14.5-35 (-49) x 4.5-18 µm, forming a sterile band on lamellae edge, subcylindric to clavate or irregular in outline with fairly numerous, unevenly spaced, simple to branched diverticula 5-18 µm long, hyaline. **Pleurocystidia** absent. **Clamp connections** present. **Spores** pip-shaped, 8-10.5 x 5-5.8 µm, smooth, weakly amyloid, white spore print.

Distinguishing Features: Characterized by a cap that is red on the disc and pink on the margin (dries pink overall), has white to pale pink, nonmarginate lamellae, and a stem that is initially pink overall but becomes brown from the base upwards through maturation and handling. Microscopically, pleurocystidia are absent, the cheilocystidia are covered apically with numerous, fine, relatively long branched diverticula, the pileipellis is composed of cylindric, nongelatinous hyphae with numerous fine, branched diverticula, and the stipitipellis is composed of sparsely diverticulate hyphae.

Distribution: Endemic to the Pacific Northwest. Known from 10 sites within the range of the northern spotted owl: **CALIFORNIA, Siskiyou** Co., Klamath National Forest, trail to Haypress Meadows; Klamath National Forest, Marble Mountain Wilderness Area, Stansha trail; Klamath National Forest, Canyon Creek trail; **OREGON**, **Deschutes** Co., Willamette National Forest, McKenzie Pass; **Klamath** Co., Winema National Forest, near Lake of the Woods; **Linn** Co., Willamette National Forest, Lost Prairie campground; **Wasco** Co., Mount Hood National Forest, Bear Springs campground; **WASHINGTON**, **Clallam** Co., Olympic National Park, Hurricane Ridge; **Kittitas** Co., Wenatchee National Forest, Kachess campground; **Lewis** Co., Mount Rainier National Park, Reflection Lakes.

Substrate and habitat: Restricted to conifer forests above 1,000 m elevation, particularly those with *Pinus* spp. and usually found in gregarious, caespitose clusters in duff.

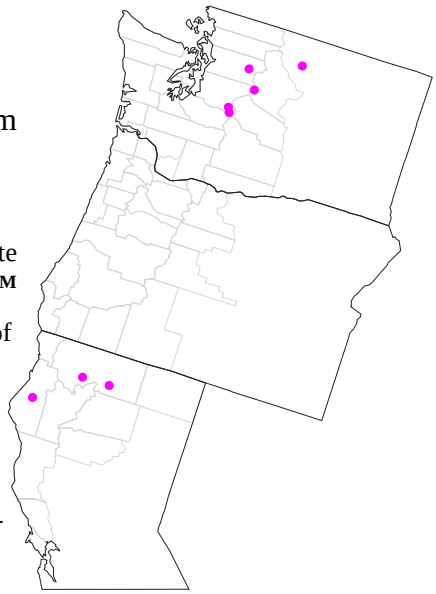
Season: Fruits from August through November and also in March.

Reference: Smith, A.H. 1947. North American species of *Mycena*. University of Michigan Press, Ann Arbor. 521 p.

PHOTO ONLY AVAILABLE IN PRINTED VERSION

Photo courtesy of University of Michigan
Photo courtesy of T. O'Dell

Mycena overholtsii A.H. Smith & Solheim



ROD name *Mycena overholtsii*

Family Tricholomataceae **Morphological Habit** mushroom

Description: **Cap** 20-50 mm diam, convex, becoming plano-convex and pellucid-striate in age, subhygrophanous, glabrous, sooty gray when young, fading in age to pale gray, margin becoming gray-white. **Gills** broadly adnate to subdecurrent, broad, white to pale gray, often staining yellow or gray. **Stem** 40-100 x 2-6 mm, cylindric or enlarged and connate at the base, terete or compressed, puberulous to glabrous above, base covered with a dense layer of white to tan downy tomentum, apex white to tan, base concolorous but becoming dingy red-brown under the tomentum in age. **Odor** yeast-like. **Taste** mild. **Pileipellis** an ixocutis of repent hyphae 1.5-3.5 µm diam, smooth or with a few scattered simple diverticula, embedded in a gelatinous matrix. **Pileus trama** dextrinoid. **Stipitipellis** a layer of repent smooth (or with few scattered diverticula) hyphae, with irregularly cylindric and often lobed terminal cells occurring in dense tufts and curving outward. **Basidia** 4-spored. **Cheilocystidia** (30-) 45-65 x 2-5.5 (-8) µm, scattered, subcylindric to subfusoid, smooth, hyaline. **Pleurocystidia** uncommon, similar to cheilocystidia. **Clamp connections** present. **Spores** narrowly pip-shaped, 6-7.5 x 3-4.5 µm, smooth, amyloid, white spore print.

Distinguishing Features: Characterized by forming some of the largest sporocarps of any *Mycena*, with caps up to 50 mm in diameter and a stem up to 100 mm long. It forms a dark gray cap that fades to pale gray in age and with exposure, gills that are white to pale gray and often subdecurrent, and a pallid stem that has the lower half covered in downy white to tan tomentum.

Distribution: Known from eight sites within the range of the northern spotted owl; **CALIFORNIA**, **Humboldt Co.,** Six Rivers National Forest, intersection of Rd. 30 and rd. 2; **Siskiyou** Co., Mount Shasta, near Horse Camp; Klamath National Forest, Russian Wilderness Area, near Sugar Lake; **WASHINGTON**, **Chelan** Co., Wenatchee National Forest, Steven's Pass; **Pierce** Co., Mount Rainier National Park, along Kotsuck Creek; Mount Rainier National Park, Ghost Lake; Mount Rainier National Park, Yakima Park Rd., below Sunrise Point; **Snohomish** Co., Mount Baker-Snoqualmie National Forest, Barlow Pass. It is also found outside the assessment area on the Okanogan National Forest in Washington. Not known from Oregon. Also known from Wyoming.

Substrate and habitat: Restricted to conifer forests above 1,000 m elevation, particularly those with *Abies* spp. and usually found in gregarious, caespitose clusters on decayed wood near snow banks or just after snow melt.

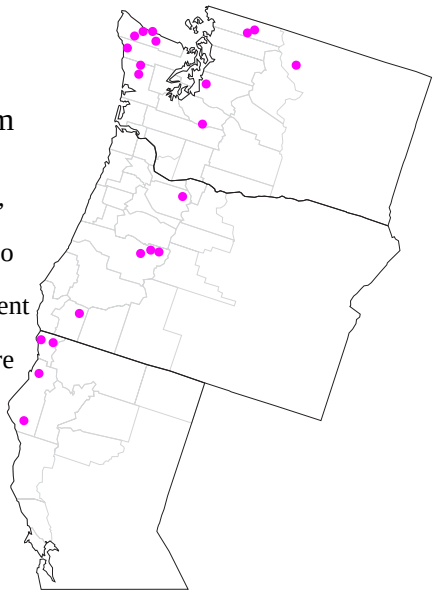
Season: Fruits from March through July.

Reference: Smith, A.H. 1947. North American species of *Mycena*. University of Michigan Press, Ann Arbor. 521 p.

Photo courtesy of T. O'Dell
Photo courtesy of S. Trudell

Photo only available in printed version

Mycena quinaultensis Kauffman



ROD name ***Mycena quinaultensis***

Family Tricholomataceae **Morphological Habit** mushroom

Description: **Cap** 10-25 (-40) mm in diam, obtusely conic to campanulate, becoming obtusely umbonate and often with a small papilla on top of umbo, wrinkled, pellucid-striate to sulcate, surface glabrous, viscid, entirely brown to black when young, disc remaining so or fading slightly in age, margin fading through brown to pale brown. **Gills** ascending-adnate or with a short decurrent tooth, subdistant to distant, brown, white at first then gray in age with concolorous edges. **Stem** 40-70 x 1.5-3 mm, cylindric, finely prunose or more commonly glabrous, base with coarse white fibrils, viscid, brown to pale brown overall. **Odor and taste** not distinctive. **Pileipellis** an ixocutis of repent, smooth hyphae 2-4.5 µm diam, embedded in a gelatinous matrix. **Trama** inamyloid. **Stipitipellis** similar to the pileipellis with curved, poorly differentiated terminal cells. **Basidia** 4-spored. **Cheilocystidia and pleurocystidia** conspicuous, 58-95 x 10-18 µm (centrally), fusiform to subcylindric, frequently long-pedicellate, hyaline. **Clamp connections** present. **Spores** pip-shaped, 8-9.5 x 4.5-5 µm, smooth, amyloid, white spore print.

Distinguishing Features: Characterized by forming obtusely umbonate, sulcate to wrinkled, viscid caps colored brown to black on the disc with pale brown margins, white lamellae that are ascending-adnate, and a viscid, brown stem covered on the base with white fibrils. Microscopically, the pleurocystidia and cheilocystidia are fusiform to subcylindric and quite large, pileipellis and stipitipellis hyphae are nondiverticulate, and the pileus and lamellar trama are nondextrinoid (an unusual feature in *Mycena*).

Distribution: Endemic to the Pacific Northwest. Known from 21 sites within the range of the northern spotted owl: **CALIFORNIA**, **Del Norte** Co., Six Rivers National Forest, Patrick Creek; **Humboldt** Co., near Orick; Humboldt Redwoods State Park; **OREGON**, **Clackamas** Co., Mount Hood National Forest, Still Creek; Mount Hood National Forest, near Rhododendron; **Josephine** Co., near Grants Pass; **Lane** Co., Willamette National Forest, near McKenzie Bridge; near Blue River; **WASHINGTON**, **Clallam** Co., Crescent Beach; Olympic National Forest, Klahanie campground; Olympic National Forest, Quinault Lake; Olympic National Park, near Quinault Lake; Olympic National Park, lower Soleduc River; Olympic National Park, Lake Mills; **Grays Harbor** Co., Olympic National Forest, Quinault Research Natural Area; **Jefferson** Co., Olympic National Park, Hoh River; **King** Co., Schmitz Park; **Pierce** Co., Mount Rainier National Park, lower Tahoma Creek; **Okanogan** Co., Okanogan National Forest, near Wolf Creek; **Whatcom** Co., Mount Baker-Snoqualmie National Forest, Shuksan Arm; Mount Baker-Snoqualmie National Forest, Baker Lake.

Substrate and habitat: Found in gregarious, caespitose clusters on senescent conifer needles or uncommonly on decayed wood in conifer forests.

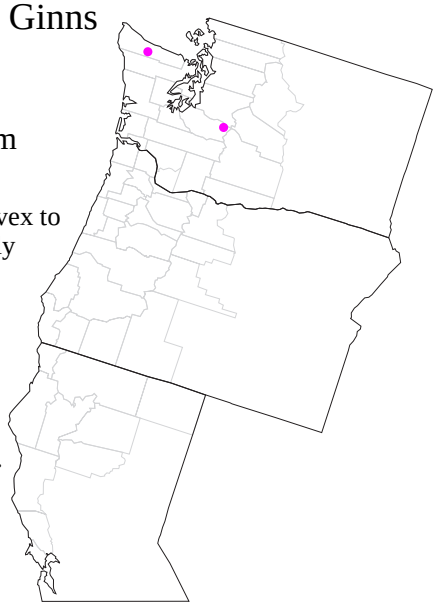
Season: Fruits from late May through December.

Reference: Smith, A.H. 1947. North American species of *Mycena*. University of Michigan Press, Ann Arbor. 521 p.

Photo courtesy of University of Michigan

Photo only available in printed version

Neolentinus adhaerens (Alb. & Schw.:Fr.) Redhead & Ginns



ROD name *Neolentinus adherens*

Family Lentinaceae **Morphological Habit** mushroom

Description: **Cap** 20-50 mm in diam, slightly depressed or umbonate convex to applanate, viscid in patches, pale gray-brown to dark yellow-red-brown, finely scaly, progressively covered with an amber resin which darkens and hardens with age. **Flesh** tough, beige. **Gills** subdistant with smooth to uneven flocculose edges, pale brown. **Stipe** 30-70 x 6-16 mm, central to eccentric, hirsute-tomentose at apex, becoming glabrous at base, pale yellow-brown darkening to dark gray-brown at clavate base. **Odor** pleasant. **Taste** bitter, astringent. **Gill trama** parallel. **Pleurocystidia** 60-125 µm, lageniform, thin- to slightly thick-walled. **Cheilocystidia** to 150 µm long, filiform to subclavate, frequently in bundles, covered with a yellow, encrusting pigment. **Clamp connections** present. **Spores** cylindrical to bacilliform, 7-10.5 (-11.5) x 3-3.5 µm, inamyloid.

Distinguishing Features: Characterized by pale gray-brown to dark yellow-red-brown cap with subdistant, finely fimbriate, pale brown gills, the entire mushroom gradually covered by a red-brown resinous coating. *Neolentinus kauffmanii* (Smith) Redhead & Ginns has a red-brown cast when dried, does not secrete a red-brown resinous coating, and has more crowded, more fimbriate gills, and smaller, shorter spores (4.5 -6.7 x 2.5-3.5 µm).

Distribution: Known from a single site within the range of the northern spotted owl: **WASHINGTON**, **Clallam** Co., Olympic National Park, Soleduc Falls trail. Also known from **WASHINGTON**, **Pierce** Co., Dalles Recreational Area but without specific locality information. Also known from Europe. Not known from Oregon and California.

Substrate and habitat: Saprophytic on conifer logs.

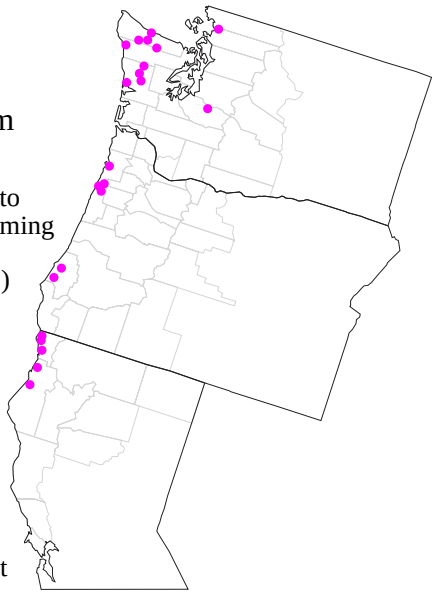
Season: Fruits in October and November.

Reference: Redhead, S. A., and Ginns, J. H. 1985. A reappraisal of agaric genera associated with brown rots of wood. Trans. Mycol. Soc. Japan 26:349-381.

Photo courtesy of S.A. Redhead

PHOTO ONLY AVAILABLE IN PRINTED VERSION

Neolentinus kauffmanii (Smith) Redhead & Ginns



ROD name ***Neolentinus kauffmanii***

Family Lentinaceae **Morphological Habit** mushroom

Description: **Cap** 22-45 (-80) mm in diam, convex to applanate, pruinose to glabrous, dry (but can be tacky), white to pale pink-yellow or vinaceous becoming dull tan in age. **Flesh** tough, pale pink-tan. **Gills** moderately crowded with uneven denticulate edges, white or pale pink-tan. **Stem** 10-30 (-60) x 2-5 (12) mm, usually curved and eccentric, hirsute-tomentose at apex, becoming glabrous at base, concolorous with cap. **Odor** not distinctive. **Taste** bitter, then acrid. **Gill trama** parallel. **Pleurocystidia** 60-100 x 7-12 µm, lanceolate to ventricose fusoid with a rounded apex, **Cheilocystidia** up to 125 µm long, similar to pleurocystidia in shape. **Clamp connections** present. **Spores** cylindrical, 4.5 -6.7 x (2-) 2.5-3 (-3.5) µm, inamyloid.

Distinguishing Features: Characterized by a pale-pink to pink-tan tricholomatoid mushroom on *Picea sitchensis* logs with crowded denticulate gills. *Neolentinus adhaerens* secretes a red-brown resin, has a gray dingy cast when dried, less crowded gills and longer spores (7-11 x 3-3.5 µm).

Distribution: Endemic to the Pacific Northwest. Known from 23 sites within the range of the northern spotted owl: **CALIFORNIA**, **Del Norte** Co., Fort Dick; Jedediah Smith State Park, Rugg Grove; near Klamath, Wilson Creek rd.; **Humboldt** Co., Redwood National Park, Fern Canyon near mouth west of spillway; Patrick's Point State Park; **OREGON**, **Coos** Co., Beaver Hill Forest; north Bandon; **Lincoln** Co., Siuslaw National Forest, Cascade Head; Van Duzer Wayside; Siuslaw National Forest, Otis; **Tillamook** Co., Cape Meares State Park; Siuslaw National Forest, Cascade Head Experimental Forest, Neskowin Creek campground; **WASHINGTON**, **Clallam** Co., Olympic National Park, Whiskey Creek Beach; Olympic National Park, Soleduc Falls trail; **Grays Harbor** Co., Lake Quinault, North Rd.; Quinault Research Natural Area; Humptulips; **Jefferson** Co., Olympic National Park, Hoh River trail; Olympic National Park, West Twin Creek Research Natural Area; 8.3 km south of Lake Quinault on South Rd.; **Pierce** Co., Buckley crossroads; near Copalis Beach, the Pines; **Skagit** Co., Alger Bog.

Substrate and habitat: Saprophytic, causing brown pocket rot in *Picea sitchensis.*

Season: Fruits throughout the year.

Reference: Redhead, S. A., and Ginns, J. H. 1985. A reappraisal of agaric genera associated with brown rots of wood. Trans. Mycol. Soc. Japan 26:349-381.

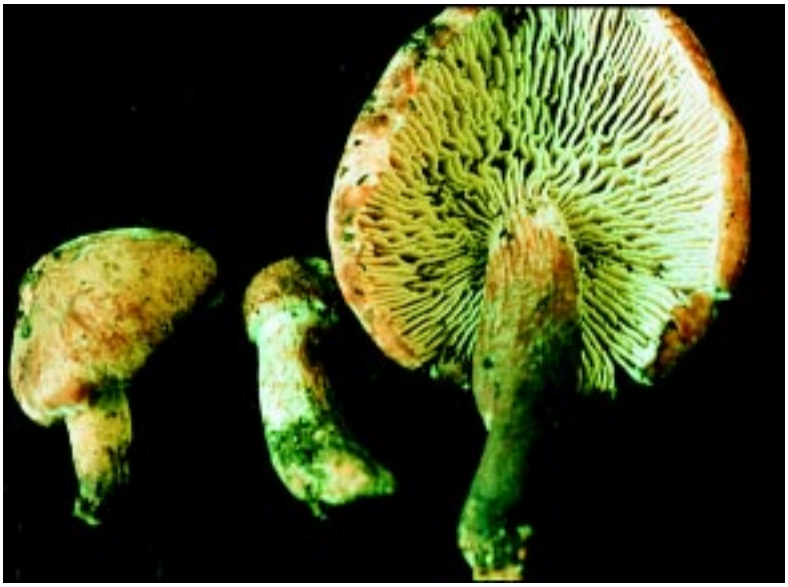
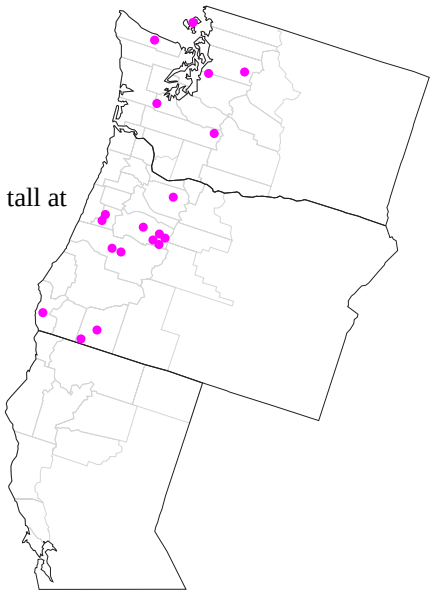


Photo courtesy of E. Butler

Neournula pouchetii (Berthet & Riousset) Paden

ROD name *Neournula pouchetii*

Family Sarcosomataceae **Morphological Habit** cup



Description: **Sporocarps** subsessile to short stipitate apothecia, to 40 mm tall at maturity, when very young clavate, hollow in upper portion, expanding and spreading to urnulate or margin splitting and spreading in age, from above regular, 20-30 mm in diam. **Hymenial surface** varying from pale pink-gray, gray touched with purple, or dingy pink before exposure to gray at maturity, even to slightly irregular. **Abhymenial surface** at first nearly white to very pale gray, darkening to brown-gray to gray in age, discoloring on handling to brown or brown-black, when fresh with a pale gray felted layer, paler to nearly white at the base. **Stem** expanding smoothly or more or less distinct, rounded in cross section, paler than the abhymenial surface. **Asci** operculate, inamyloid, relatively thick-walled, base narrow and curving. **Spores** subcylindric to obscurely fusoid, the majority narrowly ellipsoid, 23-32 x 8-10.5 µm, ornamented with low random ridges and warts.

Distinguishing Features: Characterized by a subsessile to stipitate sporocarp, which when young is hollow and club-shaped, it expands to become urn-shaped or irregularly split. The hymenium is dingy pink, pale pink-gray, gray tinged with purple, or gray; the abhymenial surface is white to pale gray or brown. Typically the stem is immersed in soil, litter or duff and is round in cross section with basal rhizomorphs. *Urnula craterium* (Schwein. : Fr.) Fr. differs in having dark gray urn-shaped sporocarps, appears to be associated with *Quercus*, and has smooth spores 25-25 x 12-14 µm.

Distribution: Known from 18 sites within the range of the northern spotted owl: **OREGON**, **Benton** Co., Woods Creek rd. at gate junction; Siuslaw National Forest, milepost 50.8 on hwy. 34 near Marys Peak Rd.; **Clackamas** Co., Bureau of Land Management (BLM), Salem District, Cascades Resource Area, north of 3-53-4 Rd.; **Curry** Co., Umpqua National Forest, Pistol River; Siskiyou National Forest, Fairview Mountain; **Jackson** Co., BLM, Medford District, Slagel Creek; Rogue River National Forest, Seattle trailhead; **Lane** Co., H.J. Andrews Experimental Forest, Stand L202; BLM, Eugene District, Anthony Creek; **Linn** Co., BLM, Salem District, Cascades Resource Area, near Trout Creek; Willamette National Forest, Iron Mountain, 1/4 mile from trailhead; Willamette National Forest, 1 mile west of Lost Prairie campground; Willamette National Forest, Tombstone Pass; Willamette National Forest, H.J. Andrews Experimental Forest, Carpenter Mountain; **WASHINGTON**, **Clallam** Co., Olympic National Park, Elwha campground loop trail; **Lewis** Co., Mount Rainier National Park, along State hwy. 123, 4 miles north of hwy. 12; **San Juan** Co., Friday Harbor Lake, near Beaverton Valley; **Snohomish** Co., Mount Baker-Snoqualmie National Forest, above Monte Cristo campground; **Thurston** Co., Capitol State Forest, 3.5 miles up D2000 Rd. from Sherman Valley campground. Also known from Idaho.

Substrate and habitat: Fruits in conifer stands ranging from about 35 to over 200 years old.

Season: Fruits from March through July.

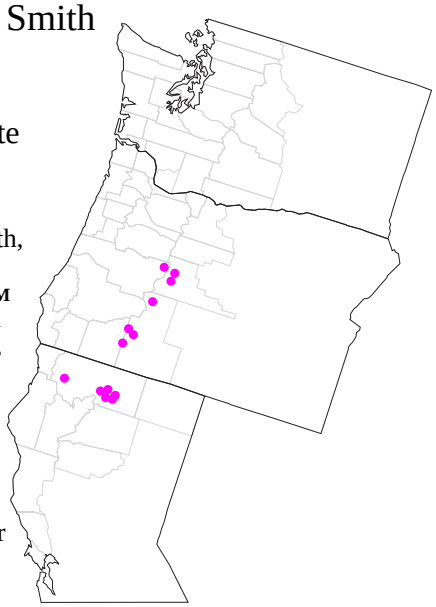
Reference: Paden, J.W., and Tylutki, E.E. 1968[1969]. Idaho Discomycetes. I. A new genus of the Sarcoscyphaceae. Mycologia 60:1160-1168.

Photo courtesy of T. O'Dell

Nivatogastrium nubigenum (Harkness) Singer & A.H. Smith

ROD name ***Nivatogastrium nubigenum***

Family Strophariaceae **Morphological Habit** sequestrate



Description: **Sporocarps** 10-24 mm broad, 15-40 mm tall, subglobose to truncate, margin abruptly decurved, rarely umbonate, surface glabrous, smooth, somewhat viscid, evenly ochraceous or with streaks or darker areas of tawny, fading to white in age. **Gleba** loculate to sublamellate, pale red-brown. **Stem** 5-25 mm long, 5-12 mm thick, equal to somewhat bulbous, somewhat matted fibrillose, dry and unpolished, solid or rarely tubular. **Columella** percurrent, solid, white. **Veil** white or off-white, cortina-like, causing the margin of the peridium and the apex of the stipe to be silky-shining in age, evanescent. **Odor** fragrant sweet. **Taste** mild. **Peridial epicutis** of gelatinous, narrow, interwoven, hyaline hyphae. **Peridial subcutis** of subparallel, thin-walled, irregularly enlarged hyphae, up to 12 µm in diam. **Veil** consisting of slightly gelatinized hyphae. **Flesh** of stem and columella of interwoven hyphae with cells up to 25 µm in diam, hyphae in the columella hyaline, those in the lower portion of the stem colored, throughout, both structures loosely arranged, nongelatinized. All hyphae inamyloid. **Clamp connections** present. **Trama** of regularly arranged, subhyaline to yellow, interwoven hyphae, some cells irregularly enlarged. **Subhymenium** up to 50 µm thick, of inflated to subisodiametric cells 10-25 (-33) x 8-18.5 (-25) µm, interior to this layer occurs a layer of somewhat gelatinized hyphae, up to 15 µm in diam. **Basidia** 17-21 x 6-8.2 µm, hyaline, clavate, 2-4-spored. **Basidioles** common, vesiculose, about 16 x 12.5 µm. **Cystidia** 60-100 x 15-25 µm, pale brown-yellow to brown, thin-walled, fusoid-ventricose, the neck long and in optical section with undulating walls, the apex obtuse to subacute. **Spores** ellipsoid, (3-) 7.5-9 (-12) x (3-) 5.5-6.3 µm, smooth, asymmetrical, germ pore present, apex not truncate, thick-walled, golden ochraceous to honey colored, inamyloid.

Distinguishing Features: Characterized by its agaricoid, sweet-smelling sporocarps and inamyloid, honey colored spores which possess a germ pore.

Distribution: Endemic to California and Oregon. Known from 13 sites within the range of the northern spotted owl: **CALIFORNIA**, **Siskiyou** Co., Klamath National Forest, Marble Mountain Wilderness Area, English Peak; Mount Shasta, Horse camp; Shasta-Trinity National Forest, Bunny Flat; Shasta-Trinity National Forest, Sand Flats; Shasta-Trinity National Forest, Panther Meadow; Shasta-Trinity National Forest, Red Butte; **OREGON**, **Deschutes** Co., Deschutes National Forest, Tumalo Mountain trail; Deschutes National Forest, Three Creeks Lake; Deschutes National Forest, Odell Butte; **Klamath** Co., Crater Lake National Park, below Goodbye Creek campground; Crater Lake National Park, Mazama campground; Crater Lake National Park, Lost Pond; **Lane** Co., Willamette National Forest, near McKenzie Pass, Frog Camp. There are also five sites outside the assessment area located in Lassen Volcanic National Park in California. Not known from Washington.

Substrate and habitat: Fruits on the surface of rotten *Abies* logs at high elevation (above 1,300 m).

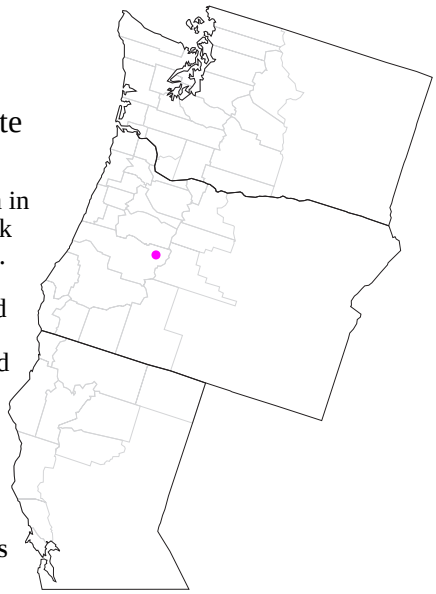
Season: Fruits from May through early October.

Reference: Singer, R. and Smith, A.H. 1959. Studies on secotiaceous fungi – V. *Nivatogastrium* gen. nov. Brittonia 11:224-228.

Photo only available in printed version

Photo courtesy of S. Trudell
Photo courtesy of M. Seidl

Octavianina cyanescens Trappe & Castellano, in ed.



ROD name *Octavianina sp. nov.* # Trappe 7502

Family Octavianinaceae **Morphological Habit** sequestrate

Description: **Sporocarps** subglobose to more or less flattened, 12-25 mm in diam, felty, yellow-white to pale yellow, in places with a scant overlay of dark brown fibrils, overnight collection developing dark blue stains where bruised. **Rhizomorphs** lacking. **Gleba** loculate, moist, dark gray-brown to brown-black, with gray tramal plates separating minute, rounded, mostly spore-filled locules. **Odor** not distinctive. **Taste** not recorded. **Peridium** 150-300 µm thick. **Peridial epicutis** a narrow layer of appressed, pale brown, thin-walled hyphae 2-7 µm in diam, occasional cells inflated to 5-10 µm. **Peridial subcutis** with pale brown, thin-walled hyphae near the epicutis grading to hyaline near the gleba, 2-6 µm in diam but commonly inflated to 10-30 µm. **Trama** of hyaline, thin-walled hyphae 2-4 µm in diam, the cells often inflated to 4-8 µm. **Subhymenium** of hyaline, thin-walled, more or less isodiametric cells 5-10 µm in diam. **Basidia** clavate, hyaline, thin-walled, 30-35 x 11-14 µm, sterigmata up to 5-7 x 1.5-2 (-3) µm. **Clamp connections** absent. **Spores** globose to occasionally broadly ellipsoid, 13-18 (-20) µm in diam excluding the ornamentation of subangular cones (3-) 4-5 (-7) x 1-6 µm in KOH, 2-4 x 1-6 µm in water, with occasional interspersed spines and smaller cones, all cones composed of agglutinated spines and forming 4-7 sided polygons at the base, dark brown, sterigmata often remaining attached as an inconspicuous pedicel, in Melzer's reagent spore walls deep orange red, ornamentation hyaline and only 2-4 µm tall, heated in cotton blue the spines forming the cones separating and becoming erect, 4-8 x 1.5-3 µm.

Distinguishing Features: Characterized by the bluing reaction of the peridium and its relatively darkly pigmented spores with tall spore ornamentation.

Distribution: Endemic to Oregon. Known from a single site within the range of the northern spotted owl: **OREGON**, **Lane** Co., Willamette National Forest, English Mountain, above The Potholes.

Substrate and habitat: Found with *Tsuga mertensiana* at 1,900 m elevation.

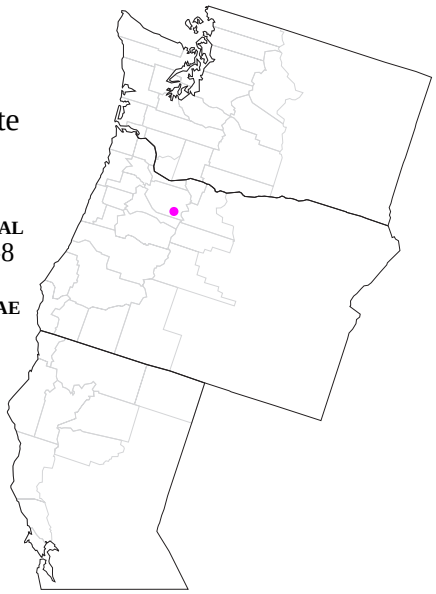
Season: Fruits in September.

Reference: Trappe, J.M., and Castellano, M.A. 1999. Some new Ascomycota and Basidiomycota associated with the Northwest Forest Plan. Mycotaxon (in press).

No photograph available

Octavianina macrospora Singer & A.H. Smith

ROD name *Octavianina macrospora*



Family Octavianinaceae **Morphological Habit** sequestrate

Description: **Sporocarps** up to 2 cm in diam, white when fresh, glabrous. **Gleba** loculate, presumably white when fresh. **Sterile base** present. **Peridial epicutis** consisting of a collapsed turf of clavate to cystidioid cells 18-27 x 4-8 µm or 20-30 x 3.5 µm if fusoid. **Peridial subcutis** of hyaline, interwoven, subgelatinous hyphae, 3-6 µm in diam. **Sphaerocysts and oleiferous hyphae** absent. **Trama** of thin-walled, hyaline, hyphae. **Subhymenium** hyphal about the diameter of the base of the basidium, 1-2 cells below the basidium the cells enlarging in age to sphaerocysts. **Basidia** 1-2 spored, 29-37 x 10-13 µm, clavate, thin-walled, content granular and ochraceous in KOH. **Cystidia** absent. **Clamp connections** absent. **Spores** broadly ellipsoid, 17-23 x 12-16 µm, wall 1.5-2 µm thick, in KOH pale tan, inamyloid, ornamentation of spines 1-1.5 (2.5) x 0.5 µm, the spines distinct but often touching at the base.

Distinguishing Features: Characterized by thick-walled, inamyloid spores and a peridial turf of cystidioid elements.

Distribution: Endemic to Oregon. Known from a single site within the range of the northern spotted owl: **OREGON**, **Clackamas** Co., Mount Hood National Forest, Twin Bridges campground.

Substrate and habitat: Found in association with the roots of *Tsuga heterophylla*.

Season: Fruits in August.

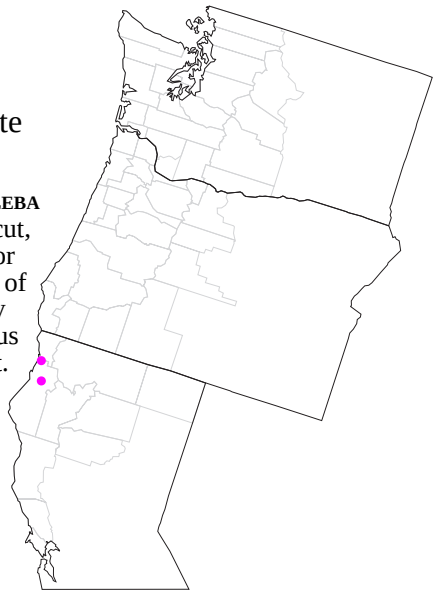
Reference: Singer, R., and Smith, A.H. 1960. Studies on secotiaceous fungi. IX. The astrogastraceous series. Mem. Torr. Bot. Club 21:1-112.

No photograph available

Octavianina papyracea Singer & A.H. Smith

ROD name *Octavianina papyracea*

Family Octavianinaceae **Morphological Habit** sequestrate



Description: **Sporocarps** 1 cm in diam, brown, globose, unchanging. **Gleba** loculate, near pink-tan as dried, with an abundant cream colored latex when cut, **Columella** absent. **Peridium** as dried almost like a thin nut shell, the exterior surface pale red-brown. **Odor** not recorded. **Taste** mild. **Peridial epicutis** of appressed, tan hyphae with some free hyphal ends at surface as a rudimentary turf, hyphal ends 3-4 µm in diam. **Peridial subcutis** of hyaline, subgelatinous hyphae with slightly thickened walls, interwoven, laticiferous hyphae present. **Sphaerocysts** absent. **Clamp connections** absent. **Trama** of interwoven, hyaline, inamyloid, subgelatinous hyphae with slightly thickened walls. **Subhymenium** of cells 10-13 µm in diam. **Basidia** 20-32 x 9-13 µm, thin-walled, hyaline, 1-2 spored, sterigmata 10 µm or more long. **Cystidia** scattered, 46-60 x 10-13 µm, thin-walled, hyaline, subcylindric to enlarged near apex and with an apical projection. **Spores** globose to subglobose, 14-17 µm, hyaline, inamyloid, thick-walled ±1 µm, ornamentation of dense, unfused spines 2-3 µm long and 0.5-1 µm at the base.

Distinguishing Features: Characterized by inamyloid spores and a sporocarp that exudes a latex when cut.

Distribution: Endemic to California. Known from two sites within the range of the northern spotted owl: **CALIFORNIA**, **Humboldt** Co., near Trinidad, Spruce Cove; Redwoods State Park, near Orick, Fern Canyon.

Substrate and habitat: Found in association with the roots of Pinaceae in forests dominated by *Sequoia sempervirens* below 650 m elevation.

Season: Fruits in November and December.

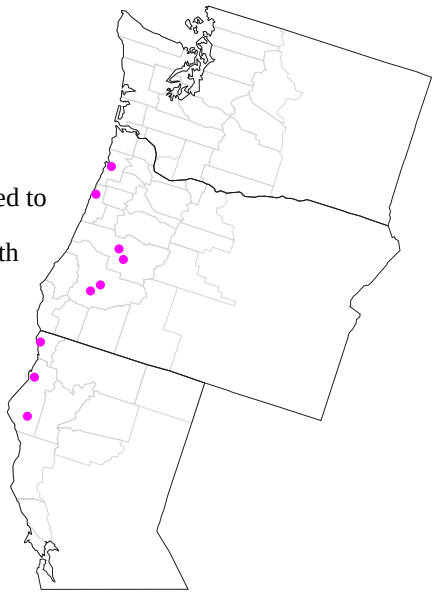
Reference: Singer, R., and Smith, A.H. 1960. Studies on secotiaceous fungi. IX. The astrogastraceous series. Mem. Torr. Bot. Club 21:1-112.

No photograph available

Otidea leporina (Batsch:Fries) Fuckel

ROD name *Otidea leporina*

Family Otideaceae **Morphological Habit** cup



Description: **Sporocarps** are substipitate to short stipitate, short-ear shaped to occasionally long-eared shaped, 2-6 cm tall. **Hymenial surface** dull yellow-brown to brown-yellow, margin entire. **Abhymenial surface** concolorous with hymenial surface or sometimes red-brown to dingy ochre. **Stem** up to 6 mm long, white covered with hyphae. **Asci** operculate, inamyloid, 8-spored. **Paraphyses** hyaline, curved to hooked at the apex. **Spores** ellipsoid, 12-13 (-14) x (6-) 7 (-8) µm, smooth, biguttulate.

Distinguishing Features: This is not a strategy 1 fungal species but is included in this handbook because it was listed as a species needing protection under the protection buffer status of the ROD. Characterized by the short ear-shaped, yellow-colored sporocarps and long spores.

Distribution: Known from nine sites within the range of the northern spotted owl: **CALIFORNIA**, **Del Norte** Co., Lake Earl Wildlife Refuge; **Humboldt** Co., King Range Conservation park; Big Lagoon State Park; **OREGON**, **Douglas** Co., Bureau of Land Management (BLM), Roseburg District, north of Cooper Creek; BLM, Coos Bay District, .5 km north of Rd. 21-8-35.1; **Lane Co.,** BLM, Eugene District, off Rd. 18-8-21; Willamette National Forest, Mill Creek; **Lincoln** Co., Fogarty Creek State Park; **Tillamook Co.,** Cape Lookout State Park. Not known from Washington. Also widespread in the North Temperate zone.

Substrate and habitat: Associated with *Picea* spp., *Pseudotsuga menziesii*, and *Tsuga heterophylla*.

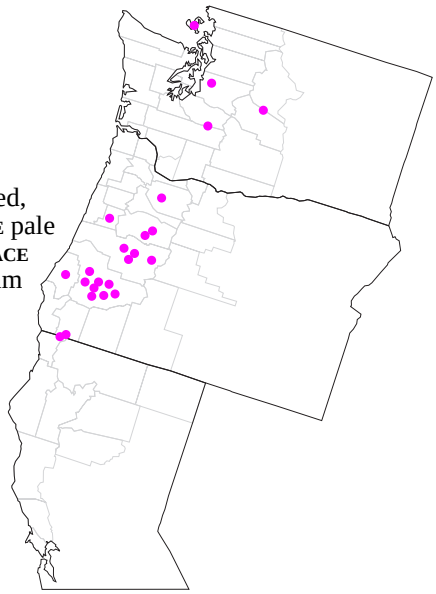
Season: Fruits from October through December.

Reference: Kanouse, B.B. 1949 [1950]. Studies in the genus *Otidea*. Mycologia 41:660-677.

Photo courtesy of T. O'Dell

Otidea onotica (Persoon:Fries) Fuckel

ROD name *Otidea onotica*



Family Otideaceae **Morphological Habit** cup

Description: **Sporocarps** substipitate to short stipitate, spoon to ear-shaped, taller than broad, 60-100 mm tall, 10-40 (-60) mm broad. **Hymenial surface** pale yellow with touches of pink-apricot to rose, margin even. **Abhymenial surface** pale brown-orange to dull yellow. **Stem** irregular, covered with white to cream hyphae. **Asci** operculate, inamyloid, 8-spored. **Paraphyses** hyaline, slender, typically strongly curved at the apex. **Spores** ellipsoid, (9-) 11-12 (-13) x (5.5-) 6 (-8.5) µm, smooth, biguttulate.

Distinguishing Features: This is not a strategy 1 fungal species but is included in this handbook because it was listed as a species needing protection under the protection buffer status of the ROD. Characterized by the relatively bright yellow sporocarps with pink to rose tints in the hymenium. The colors are not obvious, however, in dried specimens.

Distribution: Known from 23 sites within the range of the northern spotted owl: **CALIFORNIA, Del Norte** Co., near stateline off hwy. 199; **OREGON**, **Benton** Co., Woods Creek Rd.; **Coos Co.,** Bureau of Land Management (BLM), Coos Bay District, Burnt Ridge; **Clackamas Co.,** BLM, Salem District, Pine Rockcut; **Dougals Co.,** BLM, Coos Bay District, west of Paradise Creek Rd.; BLM, Coos Bay District, off Rd. 2.1; BLM, Roseburg District, Beaver Creek; BLM, Roseburg District, Elk Creek; BLM, Roseburg District, North Myrtle Creek; BLM, Roseburg District, west of Rd. 29-8-29.2; BLM, Roseburg District, near junction of Rd. 31-3-10.3 and Rd. 31-3-11.0; BLM, Roseburg District, Bear Gulch; **Josephine** Co., Siskiyou National Forest, near Takilma, Oregon Caves Rd.; **Lane** Co., Willamette National Forest, Lamb Butte Scenic Area; Willamette National Forest, Brush Creek; Willamette National Forest, northwest of Rd. 1928; BLM, Eugene District, end of Rd. 17-7-43; **Linn Co.,** Willamette National Forest, east of Major Creek; Willamette National Forest, junction of hwy. 20 and Rd. 2047; **WASHINGTON**, **Chelan** Co., near Blewett; **King** Co., near Redmond; **Pierce** Co., Mount Rainier National Park, lower Tahoma Creek, near hwy. 709; **San Juan** Co., Friday Harbor Biological Station. Also widespread in the North Temperate zone.

Season: Fruits from August through December.

Substrate and habitat: Associated with *Pseudotsuga menziesii* dominated forests.

Reference: Kanouse, B.B. 1949 [1950]. Studies in the genus *Otidea*. Mycologia 41:660-677.

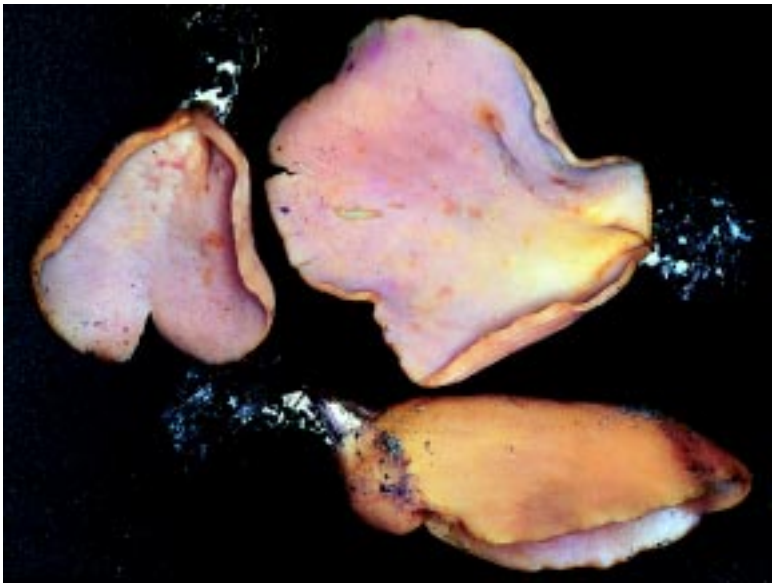
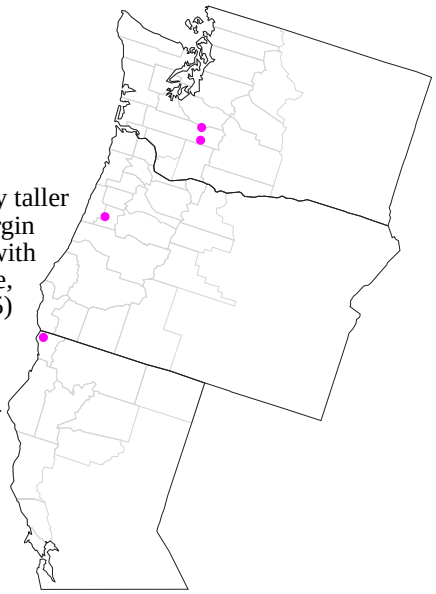


Photo courtesy of T. O'Dell

Otidea smithii Kanouse

ROD name *Otidea smithii*

Family Otideaceae **Morphological Habit** cup



Description: **Sporocarps** are subsessile, apotheciate, 3-9 cm tall, typically taller than broad, brown to deep purple-brown when fresh. **Hymenial surface** margin even. **Abhymenial surface** somewhat darker purple-brown. **Stem** covered with off-white hyphae. **Asci** operculate, inamyloid, 8-spored. **Paraphyses** hyaline, curved to hooked at their apices. **Spores** narrowly ellipsoid, (12-) 13.5 (-15.5) x (6-) 6.5 (-8) µm, smooth, biguttulate.

Distinguishing Features: Characterized by the medium to deep purple-brown hymenial surface both when fresh and dry and the spoon-shaped to more or less ear-shaped sporocarps.

Distribution: Known from four sites within the range of the northern spotted owl: **CALIFORNIA**, **Del Norte** Co., Earl Lake State Park; **OREGON**, **Benton** Co., Woods Creek Rd.; **WASHINGTON**, **Pierce** Co., Mount Rainier National Park, Lower Tahoma Creek; **Lewis** Co., Gifford-Pinchot National Forest, Camp Creek Falls trail. Also known from Idaho.

Substrate and habitat: Solitary to gregarious on exposed soil, duff or moss under *Populus trichocarpa*, *Pseudotsuga menziesii*, and *Tsuga heterophylla*.

Season: Fruits from August through December.

Reference: Kanouse, B.B. 1938 [1939]. Notes on new or unusual Discomycetes. Pap. Michigan Acad. Sci. 24 (pt.1):25-29.

Photo only available in printed version

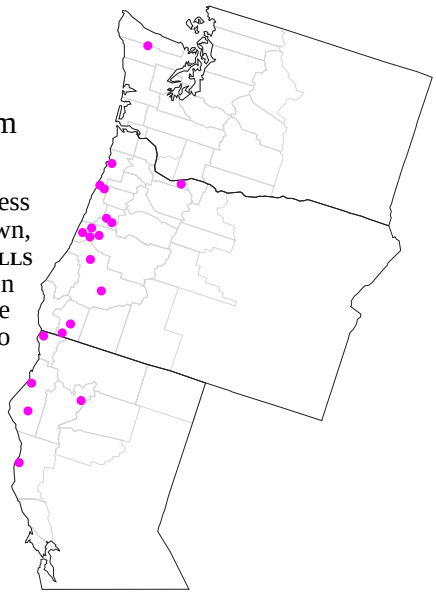
Photo courtesy of University of Michigan

Photo only available in printed version

Phaeocollybia californica A.H. Smith

ROD name *Phaeocollybia californica*

Family Cortinariaceae **Morphological Habit** mushroom



Description: **Cap** 20-80 x 10-30 mm, convex-campanulate with more or less acute umbo, glabrous, glutinous, some shade of yellow-brown to orange-brown, becoming red-brown in age. **Context** white in central disc, staining red. **Gills** pink-brown or yellow-brown aging to bright rusty-brown. **Stem** aerial portion (15-) 20-80 x 4-8 mm, cartilaginous, stuffed soon becoming hollow, apex pale brown at first, becoming dark orange to red-brown in age. **Pseudorhiza** up to 200 mm, red-brown ending in a salmon-colored thready rhizomorph. **Odor** faint or not distinctive. **Taste** occasionally faintly bitter. **Cheilocystidia** a mixture of hyaline, thin-walled lageniform and thick-walled secretory tibiiform elements, the later with 2 µm capituli, elongated 1-1.5 µm necks and widely inflated bases. **Clamp connections** absent. **Spores** limoniform or elongated amygdaliform with pronounced straight apical beak, 8-10 x 4.8-6 µm, heavily ornamented, in KOH dark orange-amber.

Distinguishing Features: Characterized by a cartilaginous stem extending well below ground level as a pseudorhiza, a pale amber-brown to dark orange brown cap with a hollow stem, a long thready pseudorhiza, and a dark cinnamon-brown spore print. *Phaeocollybia kauffmanii* is much larger, has a densely stuffed stem which does not become hollow, and it has clavate cheilocystidia. *Phaeocollybia piceae* is uniformly orange colored, has a stuffed stem, and clavate cheilocystidia. *Phaeocollybia sipei* is uniformly orange colored, has smaller, less ornamented spores, and clavate cheilocystidia. *Phaeocollybia spadicea* is larger, lacks amber or orange tones to the cap, has a densely stuffed stem covered with dense fibrillose patches, and smaller spores.

Distribution: Endemic to the Pacific Northwest. Known from 20 sites within the range of the northern spotted owl: **CALIFORNIA**, **Del Norte** Co., near Crescent City; **Humboldt** Co., near McKinleyville, Murray Rd.; King Range Conservation Park; **Mendocino** Co., Van Damme State Park, Fern Canyon trail; **Shasta** Co., Castle Crags State Park; **OREGON**, **Benton** Co., Dinner Creek; Bureau of Land Management (BLM), Salem District, Bellfountain Rd.; **Douglas** Co., BLM, Roseburg District, near Elk Creek; BLM, Roseburg District, Myrtle Creek; **Josephine** Co., Grants Pass; Takilma; **Lane** Co., Bunker Hill; Cedar Creek; Elmira; Siltcoos; **Lincoln** Co., Van Duzer wayside; **Multnomah** Co., Mount Hood National Forest, Larch Mountain; **Tillamook** Co., Cape Meares State Park; Siuslaw National Forest, Cascade Head Experimental Forest; **WASHINGTON**, **Jefferson** Co., Olympic National Park, Twin Creek Research Natural Area.

Substrate and habitat: Associated with the roots of *Abies amabilis*, *Picea sitchensis*, *Pseudotsuga menziesii*, and *Tsuga heterophylla*.

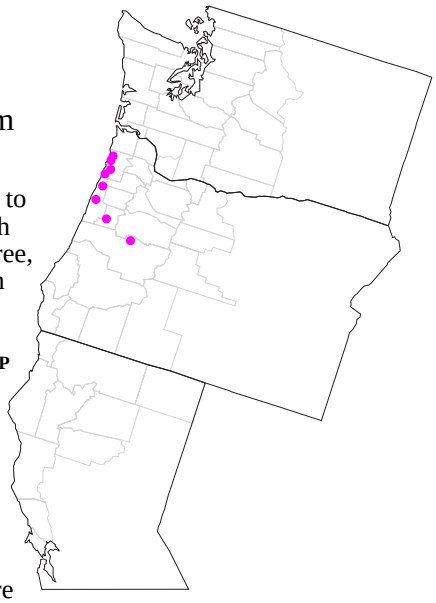
Season: Fruits in March, May, October and November.

Reference: Smith, A.H. 1957. A contribution toward a monograph of *Phaeocollybia*, Brittonia 9:195-216.

Photo courtesy of L.L. Norvell

PHOTO ONLY AVAILABLE IN PRINTED VERSION

Phaeocollybia dissiliens A.H. Smith & Trappe



ROD name *Phaeocollybia dissiliens*

Family Cortinariaceae **Morphological Habit** mushroom

Description: **Cap** 30-60 mm in diam, obtusely conic with enrolled margin to expanded umbonate, glutinous, orange to brown-orange or yellow-brown with cinnamon tones, hygrophanous. **Flesh** watery, tan. **Gills** crowded, nearly free, pale yellow, becoming cinnamon-brown from spores. **Stem** overall >180 mm long including pseudorhiza, aerial portion 70-120 x 8-18 mm, apex initially pale but darkening with age, hollow, readily splitting lengthwise. **Odor and taste** not distinctive. **Cheilocystidia** 28-37 x 3.5-6 µm, filamentous. **Clamp connections** present on terminal elements, cheilocystidia, and in pileipellis. **Spores** ovate, 6-7.5 x 3.7-4.5 µm, apex blunted and not beaked, minutely punctate roughened, asymmetrical, in KOH red-brown.

Distinguishing Features: Characterized by a cartilaginous stem extending well-below ground level as a pseudorhiza, a capthat is orange to brown-orange or yellow-brown with cinnamon tones with pale orange-white gills, a very pale orange-white hollow stem, and a dark cinnamon-brown spore print. *Phaeocollybia radicata*, another small-spored species with clamp connections, has a smaller cap (only to 30 mm broad), narrower stem (2-3 mm broad), and tibiiform cheilocystidia with refractive necks. *Phaeocollybia sipei* has slightly smaller spores and lacks clamp connections.

Distribution: Endemic to Oregon. Known from eight sites within the range of the northern spotted owl: **OREGON**, **Benton** Co., MacDonald State Forest; **Lane** Co., Bureau of Land Management, Eugene District, Bunker Hill; **Lincoln** Co., Siuslaw National Forest, Cascade Head Experimental Forest; Fogarty Creek State Park; **Tillamook** Co., Cape Lookout State Park; Oswald West State Park; Pacific City; Point Lookout State Park.

Substrate and habitat: Associated with the roots of *Abies amabilis*, *Picea sitchensis*, *Pseudotsuga menziesii*, and *Tsuga heterophylla*.

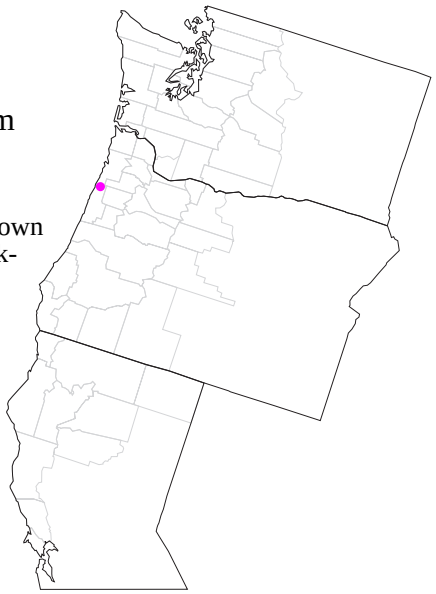
Season: Fruits in October and November.

Reference: Smith , A.H. and Trappe, J.M. 1972. The higher fungi of Oregon's Cascade Head Experimental Forest and vicinity I. The genus *Phaeocollybia* (Agaricales) and notes and descriptions of other species in the Agaricales. Mycologia 64:1138-1153.

Photo courtesy of L.L. Norvell

PHOTO ONLY AVAILABLE IN PRINTED VERSION

Phaeocollybia gregaria A.H. Smith & Trappe



ROD name *Phaeocollybia gregaria*

Family Cortinariaceae **Morphological Habit** mushroom

Description: **Cap** 30-60 mm in diam, conic to broadly conic, glabrous, glutinous, gray-brown. **Flesh** thin, pliant. **Gills** pale gray, becoming red-brown from spores. **Stem** aerial portion 80-180 x 8-15 mm, apex glabrous, pale pink-gray. **Odor and taste** not distinctive. **Cheilocystidia** 20-35 x 2-5 µm, filamentous to narrowly clavate, somewhat irregular in outline. **Clamp connections** absent. **Spores** limoniform with prominent apical beak, 9-11 x 5.5-6 µm, obscurely punctate-roughened, in KOH pale red-brown.

Distinguishing Features: Characterized by a cartilaginous stem extending well-below ground level as a pseudorhiza, a glutinous, gray-brown cap , a pink-gray stem, and a dark red-brown spore print. *Phaeocollybia spadicea* has a dark brown to black cap, fibrillose patches on the apical stem, smaller more coarsely ornamented spores, and tibiiform cheilocystidia. *Phaeocollybia piceae* has an orange-red cap, bitter taste, spores lacking an apical beak, and wider clavate cheilocystidia.

Distribution: Endemic to Oregon. Known from a single site within the range of the northern spotted owl: **OREGON**, **Tillamook** Co., Siuslaw National Forest, Cascade Head Experimental Forest.

Substrate and habitat: Associated with the roots of *Picea sitchensis* and *Pseudotsuga menziesii*.

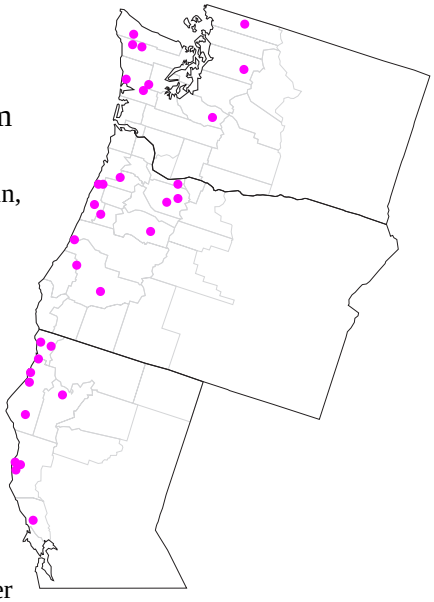
Season: Fruits in October and November.

Reference: Smith , A.H. and Trappe, J.M. 1972. The higher fungi of Oregon's Cascade Head Experimental Forest and vicinity I. The genus *Phaeocollybia* (Agaricales) and notes and descriptions of other species in the Agaricales. Mycologia 64:1138-1153.

Photo courtesy of E. Butler

Phaeocollybia kauffmanii (A.H. Smith) Singer

ROD name *Phaeocollybia kauffmanii*



Family Cortinariaceae **Morphological Habit** mushroom

Description: **Cap** 8-15 (-25) cm in diam, campanulate with enrolled margin, glabrous, viscid to glutinous, orange to brown. **Flesh** firm, creamy white, frequently staining orange. **Gills** more or less free, crowded, pale pink-tan becoming red-brown from spores. **Stem** aerial portion 200-400 x 15-35 (40) mm, gradually tapered to a long pseudorhiza, dry, longitudinally striate, pale pink-tan, becoming darker to nearly black in age, thick cartilaginous rind densely packed with a pallid pith. **Odor** faintly farinaceous. **Taste** farinaceous. **Cheilocystidia** 30-40 x 5-9 µm, narrowly clavate; clamp connections absent. **Spores** limoniform to amygdaliform with a small apical beak, 8-10 (-11) x 4.5-6 (-7) µm, rugulose-roughened, amber in KOH.

Distinguishing Features: Characterized by a viscid, orange- to chestnut-brown, involute campanulate cap, a cucumber-farinaceous odor, and a massive cartilaginous pink stem filled with dense, firm, white pith. *Phaeocollybia californica* is much smaller and more fragile, has longer, darker spores, and tibiiform cheilocystidia. *Phaeocollybia oregonensis* has a drab colored cap, small bullet-shaped, pale, punctate-roughened spores, and occasional clamp connections. *Phaeocollybia piceae* is smaller and more fragile and lacks the dense, firm stipitipith.

Distribution: Endemic to the Pacific Northwest. Known from 34 sites within the range of the northern spotted owl: **CALIFORNIA**, **Del Norte** Co., Jedediah Smith State Park, Stout Grove; Six Rivers National Forest, Smith River National Recreation Area, Dry Lake; **Humboldt** Co., King Range Conservation Park; Prairie Creek State Park; Patrick's Point State Park; McKinleyville; **Mendocino** Co., Russian Gulch State Park; Jackson State Forest; Van Damme State Park; **Shasta** Co., Castella; **Sonoma** Co., Camp Meeker; **OREGON**, **Benton** Co., Siuslaw National Forest, Marys Peak, Chintimini Creek; Siuslaw National Forest, Marys Peak campground loop trail; **Clackamas** Co., Mount Hood National Forest, Wildcat Mountain; Estacada; **Coos** Co., Winchester Forest; **Douglas** Co., Lake Tahkenitch; Bureau of Land Management (BLM), Roseburg District, Johnson Creek; **Lincoln Co.,** Siuslaw National Forest, 7.5 km from Dolph junction; **Linn** Co., BLM, Salem District, Quartzville Rd., near Dogwood picnic area; **Multnomah** Co., Mount Hood National Forest, Larch Mountain; **Tillamook** Co., BLM, Salem District, Bald Mountain, Camp Cooper; Siuslaw National Forest, lower Cascade Head rd.; Siuslaw National Forest, Cascade Head Experimental Forest; **WASHINGTON**, **Clallam** Co., Olympic National Park, Rugged Ridge trail; **Grays Harbor** Co., near Copalis; Sylvia Lake State Park; **Jefferson** Co., Olympic National Park, between Twin Creeks; Spruce Creek; **Mason** Co., Schafer State Park; **Pierce** Co., Mount Rainier National Park, upper Tahoma campground; Mount Rainier National Park, Ipsut Creek; **Snohomish** Co., Mount Baker-Snoqualmie National Forest, Barlow Pass; **Whatcom** Co., Mount Baker-Snoqualmie National Forest, Silver Fir campground. Also known from British Columbia and Idaho.

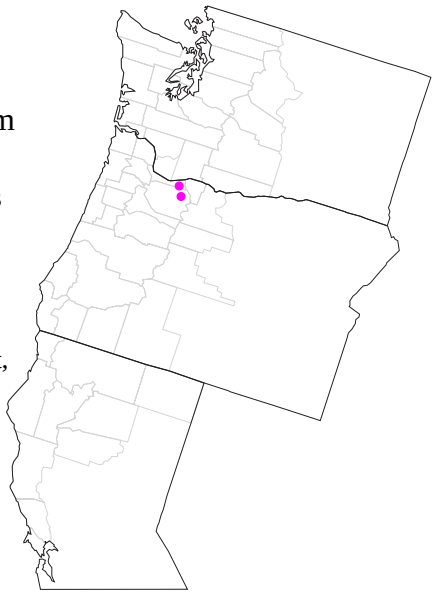
Substrate and habitat: Associated with the roots of *Abies amabilis*, *Picea sitchensis*, *Pseudotsuga menziesii*, and *Tsuga heterophylla*.

Season: Fruits from late September through early January.

Reference: Smith, A.H. 1957. A contribution toward a monograph of *Phaeocollybia*. Brittonia 9:195-217.

Photo courtesy of C. Ardrey

Phaeocollybia oregonensis A.H. Smith & Trappe



ROD name *Phaeocollybia oregonensis*

Family Cortinariaceae **Morphological Habit** mushroom

Description: **Cap** 20-70 (110) mm in diam, convex with incurved margins becoming plane with acute umbo and straight margin, glabrous, viscid to glutinous, some shade of drab-brown or gray-brown. **Flesh** creamy to pink-white, stipitipith generally firm and dense, unchanging or staining slightly brown. **Gills** free, gray-white, becoming more drab in age and darker when covered with spores. **Stem** including pseudorhiza to 304 mm, stuffed, aerial portion 20-60 (-75) x 7-12 (-16) mm, more or less equal, dry to slightly moist, apex gray-tan grading into brown and orange-brown or purple-brown below. **Odor** mild, of cucumbers, or raw potatoes. **Taste** mild, sometimes quite bitter. **Cheilocystidia** 24-34 x (2-) 3-6 µm, cylindrical to narrowly clavate, gelatinized. **Clamp connections** sporadic to frequent. **Pileipellis** suprapellis up to 300 µm thick, composed of gelatinized hyphae 2-4 µm in diameter, overlying a pellis of slightly inflated 5-10 µm in diam, amber hyphae. **Spores** ellipsoid, 5.2-7.5 (-8) x (3-) 3.5-4.5 µm, asymmetrical, virtually smooth to sparsely punctate roughened, in KOH pale red-brown.

Distinguishing Features: Characterized by a cartilaginous, slender, smoky-tan, stuffed stem extending well-below ground level as a pseudorhiza, a drab-brown to gray-brown cap, gray-white lamellae, and a dark red-brown spore print. *Phaeocollybia carmanahensis* is smaller, has a thinner, glassy suprapellis (less than 50 µm thick) and lacks clamp connections.

Distribution: Known from two sites within the range of the northern spotted owl: **OREGON**, **Clackamas** Co., Mount Hood National Forest, Wildcat Mountain; **Multnomah** Co., Mount Hood National Forest, Larch Mountain. Also known from British Columbia.

Substrate and habitat: Associated with the roots of *Abies amabilis*, *Pseudotsuga menziesii*, and *Tsuga heterophylla*.

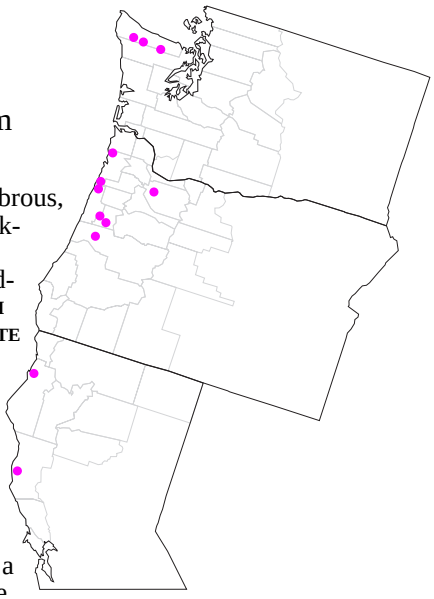
Season: Fruits in October and November.

Reference: Smith , A.H. and Trappe, J.M. 1972. The higher fungi of Oregon's Cascade Head Experimental Forest and vicinity I. The genus *Phaeocollybia* (Agaricales) and notes and descriptions of other species in the Agaricales. Mycologia 64:1138-1153.

Photo courtesy of L.L. Norvell

PHOTO ONLY AVAILABLE IN PRINTED VERSION

Phaeocollybia piceae A.H. Smith & Trappe



ROD name *Phaeocollybia piceae*

Family Cortinariaceae **Morphological Habit** mushroom

Description: **Cap** (11-) 15-40 (-55) mm in diam, convex-campanulate, glabrous, moist to subviscid, bright orange to red-orange. **Flesh** pale orange-tan to pink-tan, thin. **Gills** pale orange-tan, becoming clay-colored from spores. **Stem** aerial portion 20-98 x 3-10 mm, apex glabrous or covered with short, dark red-brown fibrils, apex orange intensifying to deep orange-red in age. **Stipitipith** usually insect-eaten in mature sporocarps. **Odor** variable, usually faint. **Taste** usually slightly to intensely bitter. **Cheilocystidia** 16-38 x 4-5 (-6) µm, narrowly clavate, regular to slightly irregular in outline. **Clamp connections** absent. **Spores** limoniform with a slightly blunted apical beak, 8.7-10.2 (-11) µm, slightly to moderately ornamented, in KOH red-brown.

Distinguishing Features: Characterized by a cartilaginous stem extending well-below ground level as a pseudorhiza, a bright orange to red-orange, subviscid, broadly to acutely convex-campanulate cap, free gills, and a dark red-brown spore print. *Phaeocollybia californica* lacks the bright orange coloration on the cap and has tibiiform cheilocystidia. *Phaeocollybia gregaria* has a gray-brown, glutinous cap, mild taste, more prominently beaked spores, and cylindrical to more narrowly clavate cheilocystidia. *Phaeocollybia kauffmanii* is a much more robust mushroom with a browner cap and dense firm stipitipith rarely consumed by insects.

Distribution: Endemic to the Pacific Northwest. Known from 12 sites within the range of the northern spotted owl: **CALIFORNIA**, **Humboldt** Co., Trinidad; **Mendocino** Co., Jackson State Forest; **OREGON**, **Benton** Co., Siuslaw National Forest, Marys Peak Scenic Botanical Area; Bureau of Land Management, Salem District, Reese Creek; **Clackamas** Co., Wildcat Mountain; **Lane** Co., Bunker Hill; **Tillamook** Co., Oswald West State Park; Siuslaw National Forest, Cascade Head Experimental Forest; **WASHINGTON**, **Clallam** Co., La Push, Third Beach parking lot; La Push; Olympic National Park, Rugged Ridge trail; **Jefferson** Co., Olympic National Park, Twin Creek Research Natural Area. Also known from British Columbia.

Substrate and habitat: Associated with the roots of *Abies amabilis*, *Pseudotsuga menziesii*, and *Tsuga heterophylla*.

Season: Fruits in October and November.

Reference: Smith , A.H. and Trappe, J.M. 1972. The higher fungi of Oregon's Cascade Head Experimental Forest and vicinity I. The genus *Phaeocollybia* (Agaricales) and notes and descriptions of other species in the Agaricales. Mycologia 64:1138-1153.

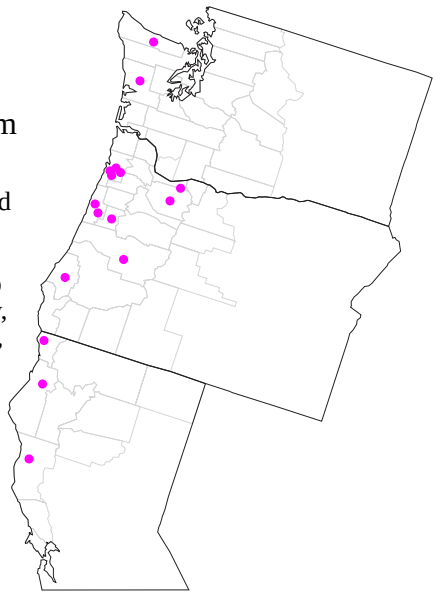
Photo courtesy of L.L. Norvell

PHOTO ONLY AVAILABLE IN PRINTED VERSION

Phaeocollybia scatesiae A.H. Smith & Trappe

ROD name *Phaeocollybia scatesiae*

Family Cortinariaceae **Morphological Habit** mushroom



Description: **Cap** 30-65 mm broad, acutely to obtusely conic with enrolled margin becoming broadly campanulate with straight, decurved margin, umbo often acute, glabrous, viscid to glutinous, some shade of yellow-brown to orange-brown, becoming red-brown to brown-black in age. **Context** gray to olive in central disc. **Gills** pale yellow, pink or yellow-brown. **Stem** hollow, aerial portion 40-65 x 4-8 (12) mm, cartilaginous, pale pink to orange-brown, becoming dark orange-brown in age. **Pseudorhiza** up to 200 mm, salmon-colored. **Odor** faintly floral when young, sometimes raphanoid, farinaceous, pungent or not distinctive. **Taste** faintly bitter when young, later mild. **Cheilocystidia** relatively abundant, 20 x 2-3 x 1.5-2 µm, lageniform to capitulate tibiform with narrow necks, hyaline, thick refractive walls. **Clamp connections** absent. **Basidia** 4-spored, 26-34 x 5-6.5 µm hyaline. **Spores** ovate to limoniform with pronounced straight apical beak, 7-9.5 x 4.5-5.5 µm, heavily ornamented except apical beak, in KOH dark rusty-brown.

Distinguishing Features: Characterized by its extremely densely fasiculate habit, moderately sized, glutinous, pale yellow-brown to brown-black cap and smooth, cartilaginous, hollow stems. *Phaeocollybia scatesiae* is distinguished from *P. californica* by its ceaspitose habit, slightly smaller stature, glutinous yellow-brown to brown-black cap. *Phaeocollybia californica* is not usually ceaspitose but is found in close to crowded "loose" bundles and is generally more robust and has more distinct orange colors in the cap.

Distribution: Endemic to the Pacific Northwest. Known from 16 sites within the range of the northern spotted owl: **CALIFORNIA**, **Del Norte** Co., near Crescent City; **Humboldt Co.,** King Range Conservation Area, along King Peak Rd.; **Mendocino** Co., Van Damme State Park; **OREGON**, **Benton** Co., Dinner Creek, Alsea summit; **Clackamas Co.,** Wildcat Mountain; **Coos Co.,** Cape Mountain; **Lane** Co., Bunker Hill; **Lincoln Co.,** Fogarty Creek State Park; Van Duzer wayside; **Multnomah** Co., Mount Hood National Forest, Larch Mountain; **Tillamook** Co., Lonfibre tree farm; Nestucca; Coral Mountain; Siuslaw National Forest, Cascade Head Experimental Forest; **WASHINGTON**, **Grays Harbor Co.,** Copalis Beach; **Jefferson** Co., Olympic National Park, Twin Creek Research Natural Area, Hoh River Valley.

Substrate and habitat: Associated with the roots of *Abies* spp., *Picea sitchensis*, and *Vaccinium* spp. from sea level to 1,250 m elevation.

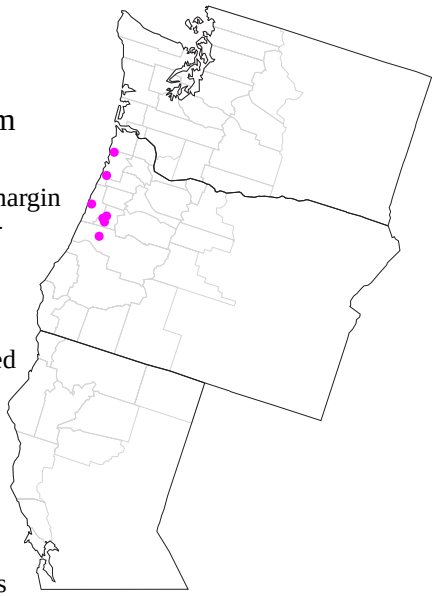
Season: Fruits in March, May, October and November.

Reference: Smith, A.H. 1957. A contribution toward a monograph of *Phaeocollybia*, Brittonia 9:195-216. Norvell, L.L. 1998. The biology and taxonomy of Pacific Northwest species of *Phaeocollybia* Heim (Agaricales, Cortinariaceae). University of Washington. Ph.D thesis. 391 p.

Photo courtesy of L.L. Norvell

PHOTO ONLY AVAILABLE IN PRINTED VERSION

Phaeocollybia sipei A.H. Smith



ROD name *Phaeocollybia sipei*

Family Cortinariaceae **Morphological Habit** mushroom

Description: **Cap** 25-120 mm in diam, obtusely umbonate with enrolled margin expanding to broadly umbonate, glutinous to viscid, brown-orange to orange-brown. **Flesh, odor and taste** not recorded. **Gills** pale yellow-buff when young becoming pink-buff and then deep yellow-brown. **Stem** aerial portion 60-120 x 3-6 mm, soon hollow, apex yellow, darkening to ferruginous or purple-red from the base up. **Cheilocystidia** 30-40 x 7-9 µm, cylindrical to broadly clavate. **Clamp connections** absent. **Spores** subelliptic with rounded apex, lacking an apical beak, 5.5-6.5 x 3.5-5 µm, faintly ornamented, in KOH ochraceous tawny.

Distinguishing Features: Characterized by a cartilaginous stem extending well-below ground level as a pseudorhiza, an orange cap with orange gills, a yellow stem, and a dark red-brown spore print. *Phaeocollybia californica* lacks the intense orange coloration on the cap, has larger, heavily ornamented spores, and tibiiform cheilocystidia. *Phaeocollybia dissiliens* has slightly larger spores and definite clamp connections. *Phaeocollybia piceae* has much larger, more heavily ornamented spores.

Distribution: Endemic to Oregon. Known from seven sites within the range of the northern spotted owl: **OREGON**, **Benton** Co., Bellfountain; Dinner Creek; Siuslaw National Forest, Marys Peak campground; **Lane** Co., Eugene; **Lincoln** Co., Fogarty Creek State Park; **Tillamook** Co., Siuslaw National Forest, 1.5 miles north of Oswald West State Park; Cascade Head Experimental Forest.

Substrate and habitat: Associated with the roots of *Abies amabilis*, *Pseudotsuga menziesii*, and *Tsuga heterophylla*.

Season: Fruits in October and November.

Reference: Smith , A.H. 1957. A contribution toward a monograph of *Phaeocollybia*. Brittonia 9:195-216.

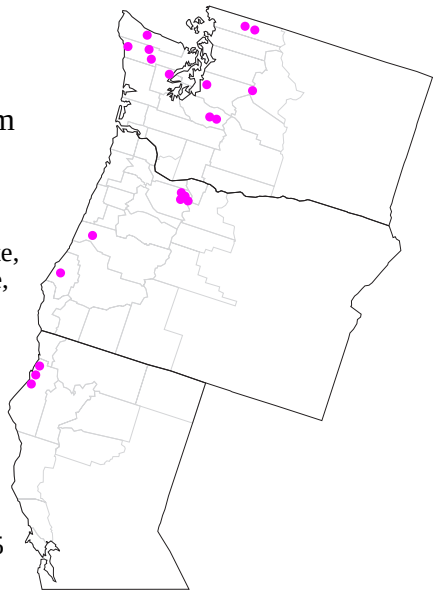
Photo courtesy of L.L. Norvell

PHOTO ONLY AVAILABLE IN PRINTED VERSION

Pholiota albivelata Murrill

ROD name *Pholiota albivelata*

Family Strophariaceae **Morphological Habit** mushroom



Description: **Cap** 40-80 mm in diam, broadly convex to plano-convex, glabrous, smooth to rugulose overall, viscid, pale vinaceous brown to dark vinaceous brown, margin slightly paler. **Flesh** white. **Gills** adnate to arcuate, close, dark brown. **Stem** 50-100 x 4-10 mm, cylindric, slightly enlarged base, dry, appressed-fibrillose or floccose above annulus, scurfy to nearly glabrous below annulus, white overall or yellow at the base. **Partial veil** persistent, membranous, white, striate on upper surface, floccose on lower surface. **Odor and taste** not distinctive. **Pileipellis** 100 µm thick, an ixocutis of repent hyphae 1.5-3 µm in diam embedded in a gelatinous matrix. **Gill trama** inamyloid. **Basidia** 4-spored. **Cheilocystidia** 20-56 x 3-7 µm, filamentous-capitate. **Pleurocystidia** (chrysocystidia) abundant, 30-50 x 5-12 µm, clavate to mucronate, hyaline but with coagulated, amorphous, refractive, yellow to golden contents in KOH, or ochraceous to red in Melzer's reagent. **Clamp connections** present. **Spores** ellipsoid, 7-9 x 4-5.5 µm, smooth, germ pore minute, dark yellow-brown spore print.

Distinguishing Features: Characterized by a conspicuous, persistent, white, membranous annulus, smooth, ellipsoid spores 7-9 x 4-5.5 µm, abundant, clavate to mucronate pleurocystidia with yellow, globular to amorphous refractive contents (i.e., chrysocystidia), filamentous, subcapitate cheilocystidia, and a distinctly gelatinous pileipellis. *Pholiota albivelata* is most closely related to *P. sipei* A. H. Smith & Hesler, described from the Willamette Valley in Oregon. *Pholiota sipei* has a slightly more yellow annulus, and differs considerably in micromorphology. *Pholiota sipei* has larger spores (9-12 x 4.5-6 µm) and has two types of pleurocystidia, i.e., chrysocystidia like those of *P. albivelata* but smaller, plus large leptocystidia that are fusoid ventricose and measure 50-75 x 10-20 µm. Distinguished from *Stropharia hormanii* by spore color.

Distribution: Endemic to the Pacific Northwest. Known from 38 sites, all within the range of the northern spotted owl. Of the total of 52 collections, most sites have scant information that does not allow specific land allocation to be determined. The sites with nonvague information include: **CALIFORNIA, Humboldt** Co., near Trinidad; Near Orick; Prairie Creek Redwoods State Park; **OREGON, Coos** Co., Coos County Forest, Beaver Hill area; **Clackamas** Co., Mount Hood National Forest, near Mile Bridge; Mount Hood National Forest, Still Creek; Mount Hood National Forest, Camp Creek campground; Mount Hood National Forest, near Welches; **Lane Co.,** Siuslaw National Forest, Indian Creek; **WASHINGTON**, **Clallam** Co., Olympic National Park, Lake Crescent; **Jefferson** Co., Olympic National Park, Graves Creek; Olympic National Park, Hoh River; Olympic National Park, Mount Angeles; **King** Co., Mount Baker-Snoqualmie National Forest, Tunnel Creek; **Mason** Co., Olympic National Forest, headwaters of Lilliwayup Creek; **Pierce** Co., Mount Rainier National Park, Tahoma Creek; Mount Rainier National Park, Ipsut Creek; **Whatcom** Co., Mount Baker-Snoqualmie National Forest, Hannegan Pass, Mount Baker-Snoqualmie National Forest, Stevens Pass; Mount Baker-Snoqualmie National Forest, Silver Fir campground. Vague sites are located in **CALIFORNIA, Trinity** Co.; **OREGON, Benton** Co.; **Coos** Co.; **Clackamas** Co.; **Josephine** Co.; **Lane** Co.; **Lincoln** Co.; **Polk** Co.; **WASHINGTON**, **Grays Harbor** Co.; **King** Co.; **Thurston** Co.; **Whatcom** Co.

Substrate and habitat: Apparently restricted to conifer forests and usually found as scattered, single sporocarps on fallen branches or other conifer debris.

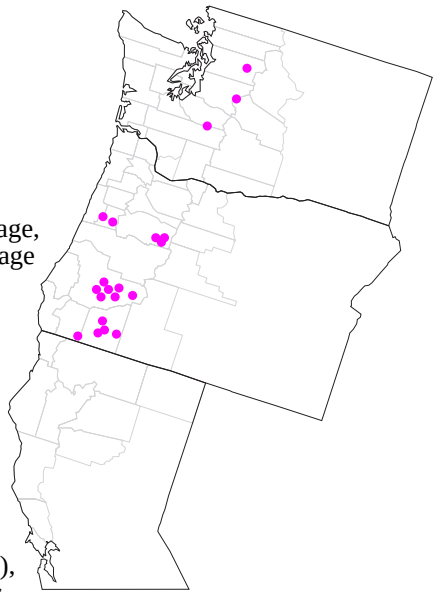
Season: Fruits from late April through early January.

Reference: Smith, A.H., and Hesler, L.R. 1968. The North American species of *Pholiota*. Lubrecht & Cramer, Monticello, New York. 402 p.

Photo only available in printed version

Pithya vulgaris Fuckel

ROD name *Pithya vulgaris*



Family Sarcoscyphaceae **Morphological Habit** cup

Description: **Sporocarps** sessile to short-stipitate, pulvinate, apotheciate. **Hymenial surface** regular at first, sometimes becoming slightly irregular in age, 1-6 (-15) mm in diam, 1-2 mm in profile, at first subcylindric, broadening in age to discoid, even, flat to slightly convex, bright orange. **Abhymenial surface** glabrous near margin with white, anchoring hyphae toward the base, tinged with color of hymenium at margin and paler and whiter toward base. **Asci** operculate, inamyloid, to 300-325 µm long. **Spores** globose, 12-14 µm in diam, hyaline, eguttulate.

Distinguishing Features: Characterized by pulvinate, sessile to short-stipitate sporocarps, 1-15 mm in diam, with a bright orange hymenium, occurring on leaves and twigs of conifers (particularly *Abies* sp. and *Sequoia* sp.) near melting snow. *Pithya cupressina* (Batsch : Fr.) Fr. differs in having smaller sporocarps, typically less than 4 mm in diam, shorter asci (to 250 µm), and slightly smaller ascospores (10-12 µm). It fruits on species of *Juniperus*, *Thuja*, and *Sequoiadendron*. *Pithya lacunosa* (Ellis & Ev.) Seaver has similar morphology as *P. vulgaris*, it fruits on *Abies* species and is separated from *P. vulgaris* on the basis of asci that are 200-225 µm long. *Pithya lacunosa* was described from Maine. Based on Seaver's (1928) descriptions, a key difference between *P. vulgaris* and *P. lacunosa* is the smooth vs. lacunose hymenium, potentially a developmental character.

Distribution: Known from 20 sites within the range of the northern spotted owl: **OREGON**, **Benton** Co., Siuslaw National Forest, Marys Peak, Meadow Edge trail; Bureau of Land Management (BLM), Salem District, Bellfountain Rd.; **Douglas** Co., Umpqua National Forest, DEMO study, Dog Prairie block; BLM, Roseburg District, Little Wolf Creek; BLM, Roseburg District, Buck Creek; BLM, Roseburg District, near junction of Olalla Creek and Thompson Creek; BLM Roseburg District, Dice Creek; BLM Roseburg District, Stouts Creek, BLM, Roseburg District, near junction of Rd. 30-7-22.1 and Rd. 30-7-27.1; **Jackson** Co., BLM, Medford District, Butte Falls; BLM, Medford District, 1.6 km east of Howard Prince Reservoir; Rogue River National Forest, near Camp Latgawa; **Josephine** Co., Rogue River National Forest, 1.8 km west of Steve Peak; Rogue River National Forest, Miller Lake; **Linn** Co., Willamette National Forest, Lost Prairie; Willamette National Forest, Tombstone Pass; Willamette National Forest, H.J. Andrews Experimental Forest, Carpenter Mountain; **WASHINGTON**, **Kittias** Co., Snoqualmie Pass; **Lewis** Co., Mount Rainier National Park, Eagle Peak; **Snohomish** Co., Mount Baker-Snoqualmie National Forest, Barlow Pass. Several vague localities occur in California. Also widespread in boreal forests of the North Temperate zone.

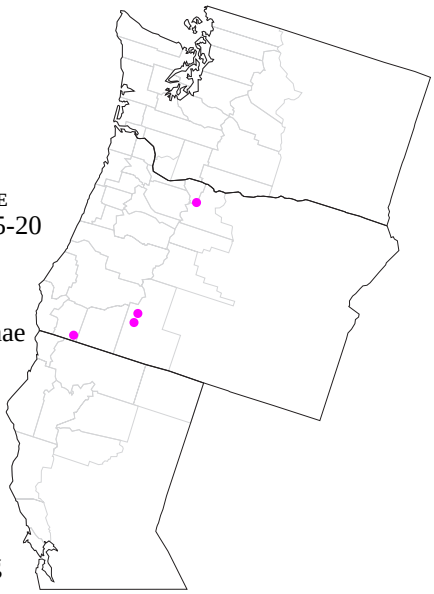
Substrate and habitat: Saprophyte or a needle endophyte. It fruits on wet, dead, usually detached branch tips (with needles) and twigs of *Abies* and *Sequoia*, in montane areas often within several yards of snowbanks or within a few weeks of snow melt.

Season: Fruits from March through May, also in November.

Reference: Seaver, F.J. 1928. The North American Cup-Fungi (Operculates). New York: Seaver. 284 p.

Photos courtesy of M.A. Castellano

Plectania milleri Paden & Tylutki



ROD name *Plectania milleri*

Family Sarcosomataceae **Morphological Habit** cup

Description: **Sporocarps** sessile, discoid, apotheciate. **Hymenial surface** more or less regular, varying to compressed from above, 10-40 mm in diam, 5-20 mm in profile, cupulate to broadly bowl shaped or in age nearly discoid, dark brown to purple-brown or nearly black, drying black, even. **Abhymenial surface** black, covered with appressed dark brown to black hyphae, lacking orange granules near the margin. **Medullary excipulum** of interwoven hyphae with ramifying, dark brown hyphae extending from the ectal excipulum toward the hymenium. **Asci** operculate, inamyloid, 8-spored, walls slightly thickened. **Spores** ellipsoid, 21-25.5 x 9-10.5 µm (Paden & Tylutki) [(24.4-) 26.3-27.6 (-28.9) x 10.5-12.5 µm in fresh material from Oregon], with homogeneous contents, smooth.

Distinguishing Features: Characterized as a sessile, black cup with a black, stellate margin and hirsute abhymenial surface and occurs in the spring and summer. *Pseudoplectania melaena* (Pers.:Fr.) Sacc. differs in having globose spores, and fruiting on dead twigs and branches of conifers in early spring. *Sarcosoma mexicana* is much more gelatinized.

Distribution: Known from four sites within the range of the northern spotted owl: **OREGON**, **Josephine** Co., Rogue River National Forest, Miller Lake; **Klamath Co.,** Bureau of Land Management (BLM), Lakeview District, east of Miner's Creek; BLM, Lakeview District, near junction of Clover Creek Rd. and Rd. 38-6E-33; **Wasco** Co., Mount Hood National Forest, trail to Little Boulder Lake. Also known from Idaho.

Substrate and habitat: Associated with mixed conifers.

Season: Fruits in May.

Reference: Paden, J.W., and Tylutki, E.E. 1969. Idaho Discomycetes. II. Mycologia 61:683-693.

Photo courtesy of M. Beug

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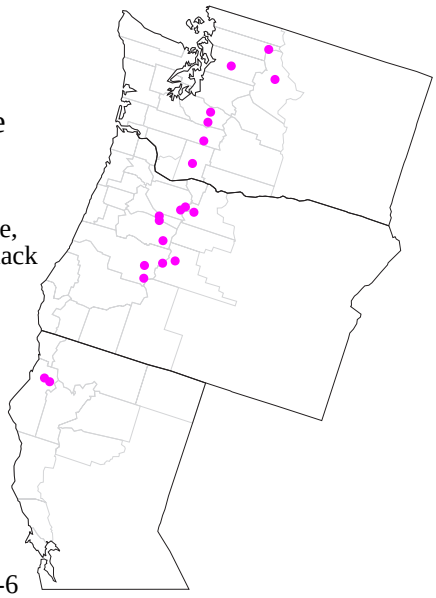
Polyzellus multiplex (Underwood) Murrill



ROD name *Polyzellus multiplex*

Family Thelephoraceae **Morphological Habit** chantrelle

Description: **Cap** 5-15 cm in diam, often in multiples, plano-convex to flabelliform, occasionally becoming slightly to deeply depressed when mature, slightly fibrillose to rough-glabrous, dry, dark purple-violaceous to purple-black or paler with violet tones predominating. **Flesh** somewhat brittle, violet to black, becoming dark black-green in KOH. **Odor** mild to faintly pungent. **Taste** not distinctive. **Hymenial** ridges strongly decurrent, forked, often anastomosing, more or less blunt, concolorous with cap but frequently becoming gray-violet when dried. **Stem** 30-50 (-70) x 8-25 mm, compound, more or less eccentric to lateral, upper portion covered by decurrent ridges, dark violaceous-black. **Trama** green-black in KOH. **Spores** tuberculate to angular tuberculate, 4.5-9 x 4.5-8 µm, inamyloid, spore print white.

Distinguishing Features: Characterized by the dark purple sporocarps with blunt gray-violet hymenial ridges and a white spore print. *Craterellus cinereus* var. *multiplex* is more brown, has ellipsoid, smooth spores (8-11 x 5-6 µm) and tissues which do not stain green in KOH. *Gomphus clavatus* is paler, has ellipsoid, smooth spores (9-12 x 5-6 µm) and tissues which also do not stain green in KOH.

Distribution: Known from 19 sites within the range of the northern spotted owl: **CALIFORNIA**, **Humboldt** Co., Hoopa Indian Reservation, South Mill Creek Rd.; Hoopa Indian Reservation, Big Hill Rd., behind summer cabins; **OREGON, Clackamas** Co., Mount Hood National Forest , Little Crater Lake; Mount Hood National Forest, intersection of Rd. 5810 and Rd. 5820; **Deschutes** Co., Deschutes National Forest, Elk Lake, south of campground; Deschutes National Forest, between upper Snowshoe Lake and Long Lake; **Lane** Co., near Mule Prairie; Willamette national Forest, Smith Lake; **Linn** Co., Willamette National Forest, Lost Prairie campground; **Marion** Co., Willamette National Forest, Battle Axe Creek drainage, 1.6 km east of Jawbone Flat; Willamette National Forest, Opal Creek; **Wasco Co.,** Mount Hood National Forest, off Barlow rd.; **WASHINGTON**, **Chelan Co.,** Wenatchee National Forest, Indian Creek trail; **Pierce** Co., Mount Rainier National Park, St. Andrews Creek; Mount Rainier National Park, near Carbon River Ranger Station; **Skagit** Co., Okanogan National Forest, Easy Pass trailhead; **Lewis** Co., Gifford Pinchot National Forest, Cispus Environmental Center; **Skamania Co.,** Gifford Pinchot National Forest, off Rd. 43; **Snohomish** Co., Mount Pilchuck State Park. Also occurs elsewhere in the United States (south to New Mexico and east to Maine).

Substrate and habitat: Occurs in association with roots of *Abies* spp. in late-successional, mid-elevation, montane, conifer forests.

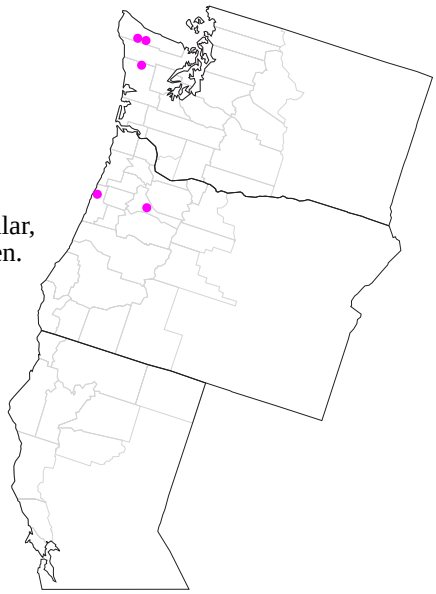
Season: Fruits in June through November.

Reference: Corner, E.J.H. 1966. A Monograph of Cantharelloid Fungi. Oxford University Press, Cambridge.

Photo courtesy of M. Beug

Photo only available in printed version

Pseudaleuria quinaultiana Lusk



ROD name *Pseudaleuria quinaultiana*

Family Otidiaceae **Morphological Habit** cup

Description: **Sporocarps** sessile to substipitate, apotheciate. **Hymenial surface** broadly bowl-shaped to repand, from above regular to slightly irregular, 7-35 mm in diam, in profile 5-15 mm tall, bright red-orange, more or less even. **Abhymenial surface** concolorous to somewhat paler, invested with long somewhat matted hairs less dense toward point of attachment. **Margin** somewhat enrolled at first, straight to flaring in age, invested with pale tan to very pale brown hairs. **Asci** operculate, inamyloid, thin-walled, 8-spored, with paired basal scars and apparently arising from croziers. **Paraphyses** straight. **Spores** ellipsoid, 15.5-19.5 x 7.5-10.5 µm (Lusk, 1987) or fresh spores in water 18.2-21.5 x (8.5-) 9.1-10.4 µm, smooth.

Distinguishing Features: Characterized by a vernally fruiting bright red-orange, sessile to substipitate cup fungus with a hairy, red-orange, abhymenial surface. *Pseudoplectania nigrella* (Pers. : Fr.) Fuckel differs in having globose spores and in fruiting on the ground in late spring to early summer. *Plectania melastoma* (Sowerby : Fr.) Fuckel differs in having orange granules on the abhymenial surface near the margin and in releasing pink to rose pigments when sections of that region are mounted in KOH. *Sarcoscypha coccinea* (Fr.) Lambotte differs in typically having a rosy red (rarely nearly white) hymenium, fruiting on or adjacent to hardwood twigs and branches especially *Acer macrophyllum* Pursch, multiguttulate spores 25-35 x 11-14 µm, asci with thickened walls and long, narrow bases. *Aleuria aurantia* has a orange hymenium, reticulate, ornamented spores, and fruits in heavily disturbed areas from fall into early spring.

Distribution: Endemic to Oregon and Washington. Known from five sites within the range of the northern spotted owl: **OREGON**, **Lincoln** Co., Siuslaw National Forest, Drift Creek Wilderness; **Marion** Co., Silver Falls State Park; **WASHINGTON**, **Clallam** Co., Olympic National Park, east of Forks; Olympic National Park, Rugged Ridge trail; **Grays Harbor** Co., Olympic National Forest, Quinault rainforest trail. Not known from California.

Substrate and habitat: Occurs on disturbed microsites (trail sides, recent windthrow mounds) in low elevation old-growth forest that includes *Picea sitchensis*, *Pseudotsuga menziesii,* and *Tsuga heterophylla*.

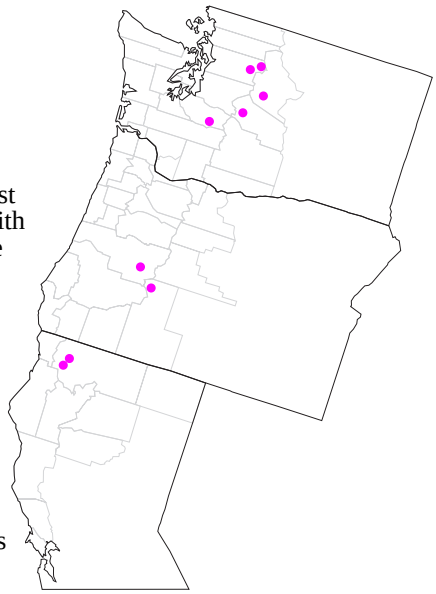
Season: Fruits from March through May.

Reference: Lusk, D.E. 1987. *Pseudaleuria quinaultiana*, a new genus and species of operculate Ascomycete from the Olympic Peninsula. Mycotaxon 30:417-431.

Photo courtesy of J. Weber

PHOTO ONLY AVAILABLE IN PRINTED VERSION

Ramaria amyloidea Marr & Stuntz



ROD name *Ramaria amyloidea*

Family Ramariaceae **Morphological Habit** coral

Description: **Sporocarps** 7-13 x 7-15 cm, white to orange-white with subareolate regions of brown superficial hyphae, when mature the stem almost entirely brown, branches pale orange with a tinge of pale red, occasionally with small violet-gray bruised spots, apices concolorous, a distinctive band of pale camel brown hyphae visible in the basal region of a radially sectioned stem. **Flesh** of stem similar to that of fresh material, flesh of the branches yellow-white. **Stem** single, conical to cylindrical, stout, 2-6.5 x 2-4.5 cm, branching from the base up to 8 times, lower nodes commonly polychotomous, axils frequently acute or turbinate, branches slight to moderately divergent, lower branches sometimes connate, up to 4 cm diam, primary and secondary internodes lengthening up to 3 cm, upper branches generally short, numerous and compacted on the primary branches, the more congested sporocarps cauliflower-like in form, pluridigitate or plurinodulose near the apices; apices rounded. Consistency fleshy fibrous when fresh, drying hard, brittle, and slightly chalky-friable. **Flesh of stem** amyloid; flesh of fresh sporocarps instantly turquoise green with FSW; the brown band in the stem darkening with KOH; PYR, ANW, GUA, PHN or ANO negative. **Odor** slightly sweet. **Taste** not distinctive. **Context hyphae** forming a densely stratified subparallel layer about 60 µm thick, the underlying context compactly interwoven, context of the branches of parallel hyphae, 4-19 µm in diam, moderately cyanophilic, thick-walled, ampulliform swellings near septa rare in the branches, sparse in the stem, 8-22 µm in diam, walls of the swellings moderately ornamented in the stem, nearly smooth in the branches. **Gleoplerous hyphae** sparse, 3.5-4 µm in diam or up to 9 µm in localized bulbous regions. **Subhymenia** of thin-walled, loosely interwoven hyphae, 2-4 µm in diam, cyanophilic globular inclusions common. **Basidia** clavate, 47-82 x 7-10 µm, cyanophilic, 2-4 spored. **Sterigmata** 4-6 µm long, slightly incurved or straight, not divergent. **Clamp connections** common. **Spores** narrowly cylindrical, 7-10 x 3-4 µm, (mean = 8.9 x 3.6), finely ornamented, warts cyanophilic, apricot yellow spore print.

Distinguishing Features: Characterized by a flesh which instantly turns blue-green with FSW, a band of pale brown hyphae visible in the basal region of a radially sectioned stem, amyloid flesh, and short, narrowly cylindrical, nearly smooth spores. *Ramaria velocimutans*, *R. celerivirescens*, *R. claviramulata*, and *R. rubiginosa* are other species which have one or more of the first three features. None of these species, however, resembles *R. amyloidea* with respect to the short, narrowly cylindrical, nearly smooth spores, and they differ further either in sporocarp color or in lacking clamp connections.

Distribution: Endemic to California and Washington. Known from nine sites within the range of the northern spotted owl: **CALIFORNIA**, **Siskiyou** Co., Klamath National Forest, Haypress Meadows; Klamath National Forest, just past turnoff to Ten Bears trail; **OREGON, Klamath Co.,** Willamette National Forest, Trapper Creek trailhead; **Lane Co.,** Willamette National Forest, Waldo Lake; **WASHINGTON**, **Chelan Co.,** Wenatchee National Forest, Indian Creek trail; **Kittitas** Co., Lake Kachess; **Pierce Co.,** Mount Baker-Snoqualmie National Forest, near junction of Rd. 37 and Rd. 59; **Snohomish** Co., Mount Baker-Snoqualmie National Forest, Glacier Peak Wilderness, Sulphur Creek; Mount Baker-Snoqualmie National Forest, Sloan Creek trail.

Substrate and habitat: Fruits in humus or soil and matures above the surface of the ground. Associated with *Abies* spp., *Pseudotsuga menziesii* and *Tsuga heterophylla.*

Season: Fruits in September and October.

Reference: Marr, C.D. and Stuntz, D.E. 1973. *Ramaria* of Western Washington. Biblio. Mycol. 38:1-232.

Photo courtesy of C. Marr

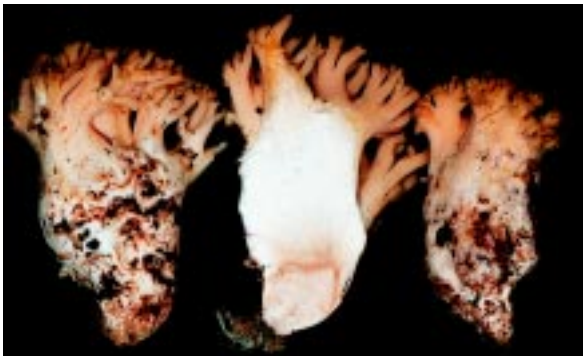
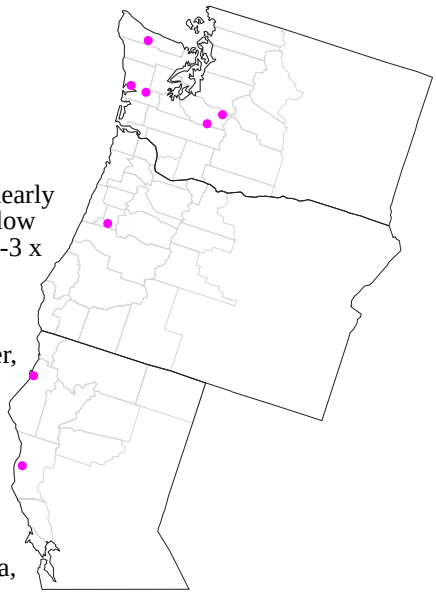


Photo courtesy of M.A. Castellano

Ramaria araiospora Marr & Stuntz

ROD name *Ramaria araiospora*



Family Ramariaceae **Morphological Habit** coral

Description: **Sporocarps** 5-13 x 2-8 cm, base white to yellow-white, or discoloring brown-white, branches red in youth, pale red at maturity, apices nearly concolorous in primordial sporocarps, apices of mature sporocarps maize yellow or pale to deep orange, context concolorous. **Stem** single, slightly bulbous, 2-3 x 1.5 cm, sometimes nearly fasciculate, covered with a thin white basal tomentum; branching up to 6 times from the base, polychotomous to dichotomous, axils acute or turbinate and branches slight to moderately divergent, internodes elongated in mature sporocarps, branches mostly slender, 1-5 mm diam, some basal branches up to 4 cm diam, forked or finely divided near apices; apices acute to subacute. Consistency fleshy-fibrous when fresh, brittle when dried. **Flesh** of stem inamyloid; PYR, ANW, GUA, PHN, or ANO negative; occasionally exceptions occurring with GUA, and ANW. **Odor** not distinctive. **Taste** not distinctive. **Flesh hyphae** parallel near the surface to interwoven towards the base, parallel in the branches, mostly uninflated, some moderately inflated, 4-14 µm in diam, walls smooth to slightly fluted, cyanophilic, thin, 0.25-1 µm, ampulliform swellings near septa, 8-15 µm in diam, walls of the vesicles moderately ornamented in the stem, slightly ornamented in the branches, crystalline masses occurring in the stem. **Gleoplerous hyphae** present but infrequent, 3-4.5 µm in diam. **Subhymenia** of interwoven hyphae, 2-3 µm in diam, thin-walled. **Basidia** clavate, 43-75 x 7-12 µm, contents not granulate, 1-4 spored. **Sterigmata** 4-8 µm long, straight, erect or slightly divergent. **Clamp connections** absent. **Spores** subcylindrical, 8-13 x 3-4.5 µm, (mean = 9.9 x 3.7), finely ornamented with cyanophilic warts.

Distinguishing Features: The two varieties of *R. araiospora* are separated on the sole characteristic of the presence or absence of yellow apices at maturity. *Ramaria subbotrytis* is coral pink when young, fading to creamy ochraceous when mature. The apices of *R. subbotrytis* tend to be rounded and those of *R. araiospora* subacute to acute.

Distribution: Endemic to the Pacific Northwest. Known from eight sites within the range of the northern spotted owl: **CALIFORNIA**, **Humboldt** Co., Big Lagoon; **Mendocino** Co., Jackson State Forest; **OREGON**, **Benton** Co., Bureau of Land Management, Salem District, Reese Creek; **WASHINGTON**, Clallam Co., Olympic National Park, Soleduc Falls; **Pierce** Co., Dalles Recreation Area; Mount Rainier National Park, Lower Tahoma Creek; **Grays Harbor** Co., 16.5 km west of Hoquiam; Lake Sylvia State Park.

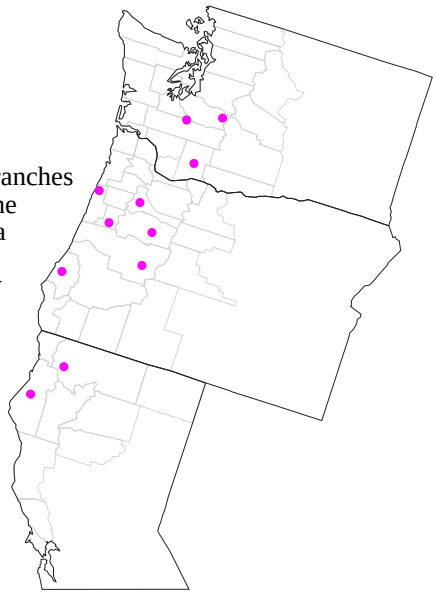
Substrate and habitat: Fruits in humus or soil and matures above the surface of the ground. Associated with *Abies* spp., *Pseudotsuga menziesii* and *Tsuga heterophylla.*

Season: Fruits in October and November.

Reference: Marr, C.D. and Stuntz, D.E. 1973. *Ramaria* of Western Washington. Biblio. Mycol. 38:1-232.

Photo courtesy of C. Marr

Ramaria aurantiisiccescens Marr & Stuntz



ROD name *Ramaria aurantiisiccescens*

Family Ramariaceae **Morphological Habit** coral

Description: **Sporocarps** 8-10 x 2-8 cm, white, upper base and lowest branches pale yellow to yellow, shading upwards into pale orange or orange-yellow, the apices nearly dark orange. **Stem** single to nearly compound, 1-4 x 1-2 cm, a thin, white basal tomentum present, branching 4-7 times from the base, polychotomous or dichotomous, axils acute to rounded and branches slightly divergent, internodes elongated up to 5 cm in length, branches 0.2-1 cm in diam, bifid to finely divided near apices; apices subacute. **Flesh** of stem fleshy-fibrous when fresh, inamyloid, ANW, GUA, PHN and ANO positive; PYR negative. **Odor** slightly sweet. **Taste** not distinctive. **Flesh hyphae** interwoven in the stem, parallel in the branches, uninflated to moderately inflated, 4-16 µm in diam, thin-walled, smooth, nongelatinized, strongly cyanophilic, hyphae infrequently vesicular near a septum, up to 12 µm in diam, walls of swellings nearly smooth in the branches, moderately ornamented in the stipe. **Gleoplerous hyphae** rare, slender, 2-3 µm in diam. **Subhymenia** of thin-walled, interwoven hyphae, 3-4 µm in diam. **Basidia** clavate, 45-60 x 8-12 µm, l-4-spored. **Sterigmata** variable, mostly 4-7 µm, up to 22 µm. **Clamp connections** absent. **Spores** cylindrical to subpip-shaped, 8.5-14 x 3-5 µm, (mean = 10.8 x 4), ornamented with fine, lobed, cyanophilic warts.

Distinguishing Features: Characterized by the yellow to orange sporocarps which lack clamp connections and red tones, fleshy-fibrous consistency, positive reactions of ANW, GUA, PHN and ANO, and spores averaging 10.8 x 4.0 µm. In the field it is difficult to distinguish *R. aurantiisiccescens* from several other orange-colored *Ramaria* species of similar habit, *R. gelatiniaurantia*, *R. 1ongispora* and *R. sandaracina* except by the positive macrochemical tests. In addition *R. sandaracina* has clamp connections on the hyphae, *R. gelatiniaurantia* has a gelatinous consistency, and *R. 1ongispora* has longer, more coarsely warted spores.

Distribution: Endemic to the Pacific Northwest. Known from 11 sites within the range of the northern spotted owl: **CALIFORNIA**, **Siskiyou** Co., Klamath National Forest, Marble Mountain Wilderness Area, Haypress Meadows; **Humboldt** Co., Fickle Hill Rd.; **OREGON, Benton** Co., Bureau of Land Management (BLM), Salem District, Reese Creek; **Coos Co.,** BLM, Coos Bay District, Sandy Creek; **Lincoln** Co., Siuslaw National Forest, junction of Rd. 1929 and Rd. 17; **Lane Co.,** Willamette National Forest, Waldo Lake trail; **Linn Co.,** Willamette National Forest, near Iron Mountain trailhead; **Marion Co.,** BLM, Salem District, off Rd. 782; **WASHINGTON**, **Lewis** Co., Pleasant Valley; **Pierce** Co., Dalles Recreation Area; **Skamania Co.,** Gifford Pinchot National Forest, Forlorn lakes.

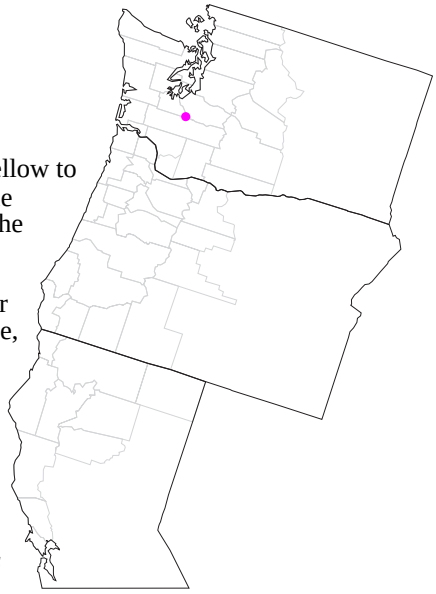
Substrate and habitat: Fruits in humus or soil and matures above the surface of the ground. Associated with *Abies* spp., *Pseudotsuga menziesii* and *Tsuga heterophylla.*

Season: Fruits in October.

Reference: Marr, C.D. and Stuntz, D.E. 1973. *Ramaria* of Western Washington. Biblio. Mycol. 38:1-232.

Photo courtesy of C. Marr

Ramaria botrytis var. *aurantiramosa* Marr & Stuntz



ROD name *Ramaria botrytis* var. *aurantiramosa*

Family Ramariaceae **Morphological Habit** coral

Description: **Sporocarps** 8-15 x 6-17 cm, opaque white, bruising pale yellow to gray-orange, primary branches concolorous with stem, terminal branches pale orange or a shade more brown. **Flesh** white. **Stem** single or fasciculate, if the latter then 2 or 3 stems present, tapering, massive, 3.5-8 x 3.5-6 cm, primary branches few, mostly 2 or 3, short to moderately elongate, thick, up to 3 cm diam, upper branch systems compacted on primary branches or stem, 3 cm or less in length, pluridigitate near apices; apices subacute, rounded, or nodulose, fleshy-fibrous when fresh, drying hard. **Flesh** of stem slowly and weakly amyloid; PYR, PHN and ANO negative; slight color changes with application of ANW, GUA, of thin to moderately thick-walled, hyphae. **Spores** 12-16 x 4-6 µm, (mean = 13.5 x 4.7), with a suprahilar depression and a dorsal and ventral convexity, striae steeply oblique, cyanophilic.

Distinguishing Features: The striate spores help distinguish *R. botrytis* var. *aurantiiramosa* from most other *Ramaria* taxa. *Ramaria botrytis* var. *aurantiiramosa* is distinguished from *Ramaria botrytis* var. *botrytis* by the orange coloration of the upper branches. It is separated from *R. rubripermanens* by its larger spores.

Distribution: Endemic to Washington. Known from a single site within the range of the northern spotted owl: **WASHINGTON**, **Lewis** Co., Pleasant Valley.

Substrate and habitat: Fruits in humus or soil and matures above the surface of the ground. Associated with *Pseudotsuga menziesii* and *Tsuga heterophylla*.

Season: Fruits in October.

Reference: Marr, C.D. and Stuntz, D.E. 1973. *Ramaria* of Western Washington. Biblio. Mycol. 38:1-232.

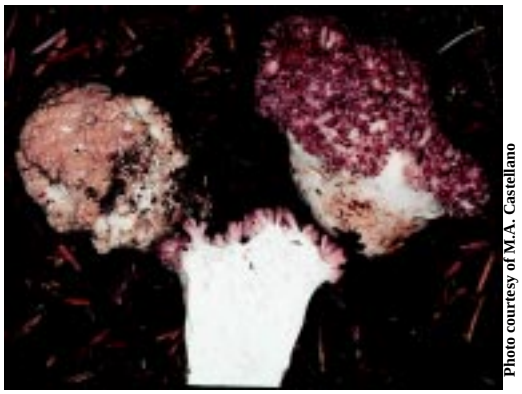
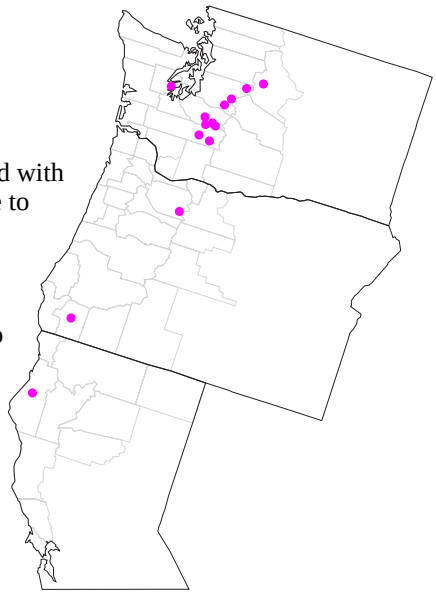


Photo courtesy of M.A. Castellano

Photo courtesy of C. Marr

Ramaria celerivirescens Marr & Stuntz

ROD name *Ramaria celerivirescens*



Family Ramariaceae **Morphological Habit** coral

Description: **Sporocarps** 6-18 x 3-10 cm, white or yellow-white, covered with subareolate patches of brown to red-brown superficial hyphae, branches pale to pale orange, apices pale to yellow, a distinctive band of pale brown hyphae visible in the basal region of a radially section stem, flesh of the branches subconcolorous or slightly more red than surface. **Stem** single, roughened, cylindrical or tapered, 2-7 x 1-3 cm, branching up to 10 times, axils acute to turbinate and branches slightly divaricate, lower branches with internodes up to 5 cm long and up to 1.3 cm in diam, upper branches bifid or multifid near apices, apices subacute to rounded, fleshy-fibrous. **Flesh** of stem slowly amyloid, instantly dark green with FSW, the brown band in the stem darkening with KOH; PYR, ANW, GUA, PHN and ANO negative; with more time GUA may become weakly positive. **Flesh** of interwoven hyphae, 6-l1 µm in diam in the stem, parallel hyphae, 3-20 µm in diam in the branches, walls smooth or slightly fluted, moderately cyanophilic, thin-walled, cyanophilic inclusions sometimes conspicuous, hyphae frequently vesicular near a septum, 10-18 µm in diam, vesicle walls distinctively ornamented in the stem, moderately so in the branches. **Gleoplerous hyphae** rare, mostly 2.5-3.5 µm in diam. **Subhymenia** of thin-walled, interwoven hyphae, 3-5 µm in diam. **Basidia** clavate, 41-70 x 7-11 µm, 2-4-spored. **Sterigmata** 3-8 µm long, mostly straight, occasionally incurved, not divergent. **Clamp connections** absent. **Spores** subcylindrical with a prominent lateral apiculus, 8-11 x 4-6 µm, (mean = 9.5 x 4.6), subcylindrical with a prominent lateral apiculus, apiculus up to 2 x 2 µm, ornamented with coarse, irregularly shaped, cyanophilic warts, gray-yellow-orange spore print.

Distinguishing Features: Characterized by a flesh which instantly turns blue-green after application of FSW, a distinctive band of pale brown hyphae visible in the basal region of a radially sectioned stem, and amyloid flesh. *Ramaria celerivirescens* differs from *R. amyloidea* with respect to the occurrence of clamp connections, sporocarp form and spore ornamentation. *Ramaria velocimutans* is a third species which has a band of pale brown hyphae in the stem and reacts quickly with FSW, but it differs in its larger size and white sporocarps. *Ramaria formosa* discolors with handling and the hyphae have clamp connections.

Distribution: Endemic to California and Washington. Known from 14 sites within the range of the northern spotted owl: **CALIFORNIA**, **Humboldt** Co., Fickle Hill Rd.; **OREGON, Clackamas Co.,** Mount Hood National Forest, Hoodview campground; **Josephine Co.,** Bureau of Land Management, 3 km south of Cave Junction; **WASHINGTON**, **Chelan Co.,** Wenatchee National Forest, Little Wenatchee Rd., 1.5 km from Little Wenatchee Ford trailhead; **King Co.,** Mount Baker-Snoqualmie National Forest, Tunnel Creek; **Lewis Co.,** Pleasant Valley, along Rd. 74; Gifford Pinchot National Forest, North Fork campground; **Mason** Co., Mason Lake; **Pierce** Co., Mount Rainier National Park, lower Tahoma Creek; Mount Baker-Snoqualmie National Forest, 6 km along Rd. 59 from hwy. 706; Mount Baker-Snoqualmie National Forest, near junction of Rd. 37 and Rd. 59; Mount Rainier National park, 2.8 km from Stevens Canyon entrance; **Snohomish** Co., Mount Baker-Snoqualmie National Forest, Glacier Peak Wilderness, Sulphur Creek; **King** Co., 16.5 km east of Enumclaw.

Substrate and habitat: Fruits in humus or soil and matures above the surface of the ground. Associated with *Abies* spp., *Pseudotsuga menziesii*, and *Tsuga heterophylla.*

Season: Fruits in October and November.

Reference: Marr, C.D. and Stuntz, D.E. 1973. *Ramaria* of Western Washington. Biblio. Mycol. 38:1-232.

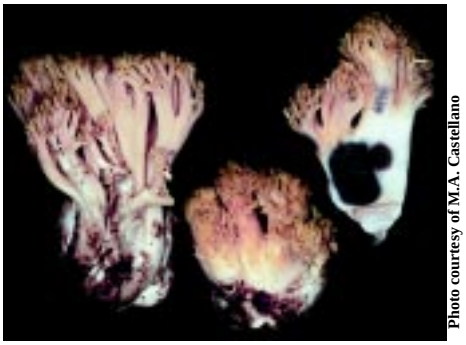
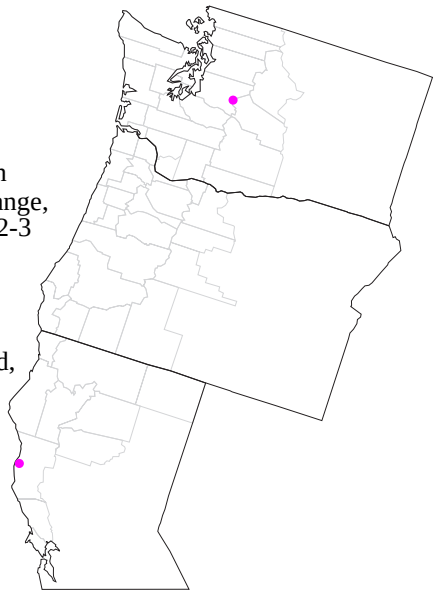


Photo courtesy of M.A. Castellano
Photo courtesy of C. Marr

Ramaria claviramulata Marr & Stuntz

ROD name *Ramaria claviramulata*



Family Ramariaceae **Morphological Habit** coral

Description: **Sporocarps** 5-9 x 3.5-4.5 cm, brown-white, sometimes with subareolate regions of superficial hyphae of darker brown, branches gray-orange, apices mostly concolorous, flesh brown-white. **Stem** single or occasionally 2-3 in a fascicle, tapering, slender, 1.4 x 0.5-2 cm, branching dichotomous, axils acute and branches moderately divergent, internodes distinct but not greatly elongated, up to 3 cm, branches generally not diminishing greatly in diam upwards, some terminal branches distinctively enlarged, up to l.5 cm broad, resembling some of the irregular clubs of *Clavariadelphus*, forked to antlered, apices rounded or blunt, fleshy-fibrous when fresh, drying hard. **Flesh** of stem inamyloid, FSW positive, KOH positive on fresh and dried specimens, dried sporocarps turning red; PYR, ANW, GUA, PHN and ANO negative. **Odor** musty. **Taste** bitter. **Flesh** thick-walled (1-4 µm), subparallel to interwoven hyphae, 5-9 µm in diam in stem, thick-walled (0.25-2.5 µm), parallel hyphae 5-22 µm in diam in branches, walls smooth or fluted, moderately cyanophilic, ampulliform inflations near septa rare, 13-20 µm in diam, walls of swellings distinctly ornamented in the stem, less so in the branches. **Gleoplerous hyphae** absent. **Subhymenia** of thin-walled, interwoven hyphae 3-6 µm in diam. **Basidia** clavate, 65-75 x 8-8.5 µm, 2-4-spored. **Sterigmata** 5-8 µm long, straight, not divergent. **Clamp connections** absent. **Spores** elongate to ellipsoid, 9-10.5 x 4-5 µm, (mean = 9.3 x 4.7), apiculus prominent up to 3 x 2 µm, ornamented with fine, lobed, cyanophilic warts, some spores nearly smooth.

Distinguishing Features: Characterized by branches similar to the apices of *Clavariadelphus* species, positive reaction of the context to FSW, red reaction of the hymenium to KOH, the brown-colored sporocarps, thick-walled hyphae, and spores with a large apiculus.

Distribution: Endemic to California and Washington. Known from two sites within the range of the northern spotted owl: **CALIFORNIA**, **Mendocino** Co., Van Damme State Park; **WASHINGTON**, **King** Co., Mount Baker-Snoqualmie National Forest, Goldmyer Hot Springs trail. Not known from Oregon.

Substrate and habitat: Fruits in humus or soil and matures above the surface of the ground. Associated with *Abies* spp., *Pseudotsuga menziesii*, and *Tsuga heterophylla*.

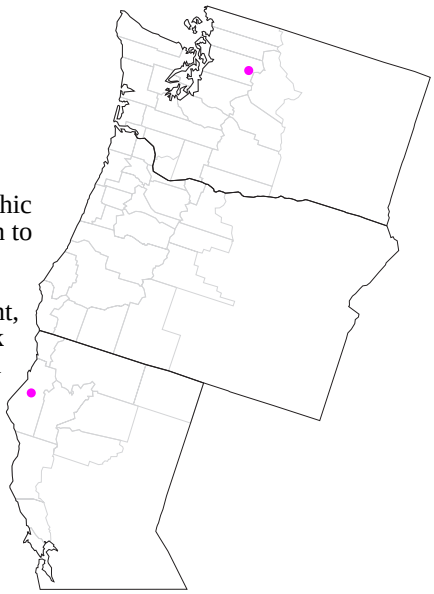
Season: Fruits in October.

Reference: Marr, C.D. and Stuntz, D.E. 1973. *Ramaria* of Western Washington. Biblio. Mycol. 38:1-232.

Photo courtesy of C. Marr

Ramaria concolor f. marrii Petersen

ROD name *Ramaria concolor f. marrii*



Family Ramariaceae **Morphological Habit** coral

Description: **Sporocarps** up to 6 cm high, up to 4.5 cm broad, stipitate, repeatedly branched, arising from a white mycelial mat and white rhizomorphic strands. **Stem** red-tan, up to 1.5 cm long, bruising brown, branches lax, open to somewhat divaricate, mostly dichotomous, red-tan, axils open to lunate, concolorous to surrounding branches; apices delicate, digitate, cream tan to pale tan. **Odor** indistinct or weakly of anise. **Taste** bitter, weakly astringent, not acrid. **Hymenium** in FSW slowly slate green, purple-blue to purple-black with added ETOH; bright deep blue in GUA, yellow-brown to copper-brown in KOH; ANW, PYR, ANO negative. **Cystidioid structures** in hymenium hyphal, 1.5 µm in diam, projecting from hymenial surface up to 40 µm, thin-wall, gnarled, often once-branched, leptocystidial. **Spores** elongate, ovoid to ellipsoid, 7.8-10 x 3.7-4.8 µm, thin-walled, moderately cyanophilic, apiculus prominent, eccentric, truncate, ornamentation of obscure, low warts or ridges.

Distinguishing Features: Characterized by the distinct sporocarp form, the white rhizomorphs arising from a mycelial mat and the size of the spores.

Distribution: Known from a single site within the range of the northern spotted owl: **WASHINGTON**, **Snohomish** Co., Mount Baker-Snoqualmie National Forest, Sloan Creek campground. It is also reported from one site in northern California with vague locality data. Also known from Idaho.

Substrate and habitat: Fruits in humus or soil and matures above the surface of the ground. Associated with *Abies* spp., *Pseudotsuga menziesii* and *Tsuga heterophylla.*

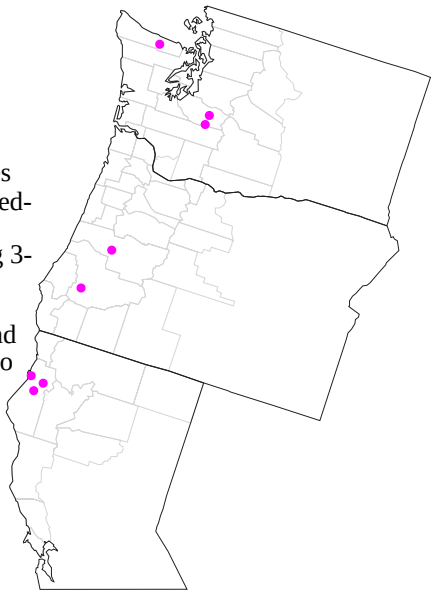
Season: Fruits in October.

Reference: Petersen, R.H. 1975. *Ramaria* subgenus *Lentoramaria* with emphasis on North American taxa. Biblio. Mycol. 43:1-161.

Photo courtesy of C. Marr

Ramaria cyaneigranosa Marr & Stuntz

ROD name *Ramaria cyaneigranosa*



Family Ramariaceae **Morphological Habit** coral

Description: **Sporocarps** 4-12 x 2-11 cm, white, branches pale red, apices sometimes nearly concolorous, usually minutely dotted with pale yellow or red-yellow. **Stem** single or branched at base, 0.5-3.5 x 0.4-3 cm, arising from a slender, taproot-like structure, frequently thick or slightly bulbous; branching 3-5 times from base, lower nodes usually polychotomous, branches frequently connate, axils acute to u-shaped and branches slightly divergent, internodes often short, especially upper ones, branches slender to somewhat flattened and wider, shortly furcate, polydigitate or nodulose near apices, apices subacute to rounded, fleshy-fibrous when fresh, drying brittle. **Flesh** of stem inamyloid, PHN and ANO positive; occasional weak reactions with GUA, PYR, and ANW. **Odor and taste** not distinctive. **Flesh** of parallel to interwoven hyphae 3-10 µm in diam with crystalline masses, of thin-walled, parallel, inflated hyphae 3-20 µm in diam in the branches, all walls smooth and cyanophilic, ampulliform inflations near septa, 9-14 µm in diam, walls of the swellings slightly ornamented, false clamp connections sometimes present. **Subhymenia** of thin-walled, interwoven hyphae, 2-5 µm in diam. **Basidia** clavate, 49-80 x 6.12 µm, cyanophilic, l-4-spored. **Sterigmata** 4-10 µm long, straight or slightly incurved, slightly divergent or erect. **Gleoplerous hyphae** present, 2-4 (-6) µm in diam. **Clamp connections** absent. **Spores** subcylindrical, 8-15 x 4-6 µm, (mean = 11.0 x 4.6), ornamented with distinct, irregularly shaped cyanophilic warts, pale yellow spore print.

Distinguishing Features: Characterized by its red sporocarp, spores 4.5 µm or wider, with verrucose ornamentations, and red to violet brown reactions with PHN and ANO. *Ramaria stuntzii* is bright scarlet in youth, and is easily distinguished by its robust habit and amyloid context. *Ramaria cyaneigranosa* is red to salmon, and *R. araiospora* is magenta red, at least in var. *rubella*. The three varieties of *R. cyaneigranosa* are separated on sporocarp color, form, and spore length. *Ramaria cyaneigranosa* var. *cyaneigranosa* has the longest spores, the most intensely red branches, and yellow tips.

Distribution: Endemic to the Pacific Northwest. Known from eight sites within the range of the northern spotted owl: **CALIFORNIA**, **Humboldt** Co., Big Lagoon; Big Hill Rd.; Lord Ellis Summit; **OREGON, Douglas** Co., Bureau of Land Management (BLM), Roseburg District, Irwin Rocks Reseach Natural Area; **Lane** Co., BLM, Salem District, Scattered Tracts South; **WASHINGTON**, **Clallam** Co., Olympic National Park, Lake Creek trail; **Pierce** Co., Mount Rainier National Park, lower Tahoma Creek; Mount Rainier National Park, Ipsut Creek.

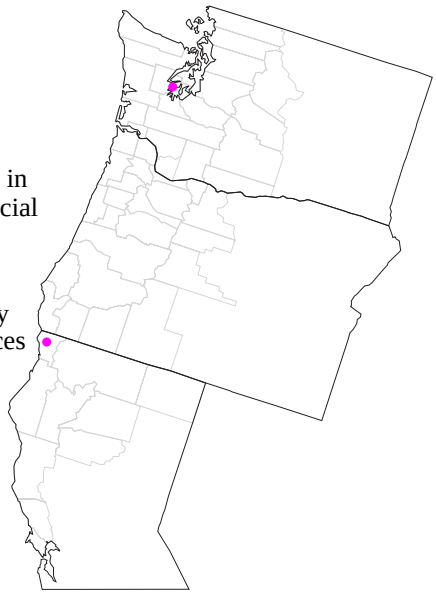
Substrate and habitat: Fruits in humus or soil and matures above the surface of the ground. Associated with *Abies* spp., *Pseudotsuga menziesii* and *Tsuga heterophylla.*

Season: Fruits in October.

Reference: Marr, C.D. and Stuntz, D.E. 1973. *Ramaria* of Western Washington. Biblio. Mycol. 38:1-232.

Photo courtesy of C. Marr

Ramaria fasciculata var. *sparsiramosa* Coker



ROD name *Ramaria fasciculata* var. *sparsiramosa*

Family Ramariaceae **Morphological Habit** coral

Description: **Sporocarps** up to 6 x 4 cm, subspherical to broadly obovate in outline. **Stem** fasciculate with up to 10 individuals, loosely bound by superficial white tomentum, slender, up to 4 mm thick, rooting somewhat, white where protected. Branches of individual sporocarps in 2-4 ranks, up to 3 mm thick below, 2 mm or less above, terete, fleshy pallid salmon to salmon colored to pale tan, flesh solid to locally hollow, white, somewhat stringy, axils narrowly rounded, internode ratio diminishing rather abruptly apically in maturity, apices pale yellow, minutely double-dichotomous when young, minutely digitate by maturity. **Odor** negligible to mildly aromatic. **Taste** negligible to mildly fabaceous. **Macrochemical reactions** not recorded. **Flesh** of parallel, thin-walled, hyaline hyphae up to 10 µm in diam in branches. **Basidia** 45-55 x 6-7 µm, clavate, 4-spored. **Clamp connections** absent. **Spores** broadly ovate to broadly cylindrical, 7.2-9.7 x 4.7-5.8 µm, obscurely roughened, small warts often indiscernable.

Distinguishing Features: *Ramaria conjunctipes* produces smaller, more slender, less branched sporocarps, and has smaller spores (6-10 x 4-6.5 µm). Spores of *R. fasciculata* var. *tsugensis* are apparently identical with spores of *R. fasciculata* var. *sparsiramosa* associated with western hemlock. It is likely that *R. fasciculata* var. *tsugensis* does not differ significantly from *R. fasciculata* var. *sparsiramosa* and that further study will conclude that they are synonymous.

Distribution: Endemic to California and Washington. Known from two sites within the range of the northern spotted owl: **CALIFORNIA**, **Del Norte** Co., Jedediah Smith Redwoods State Park; **WASHINGTON**, **Mason** Co., Mason Lake. Not known from Oregon.

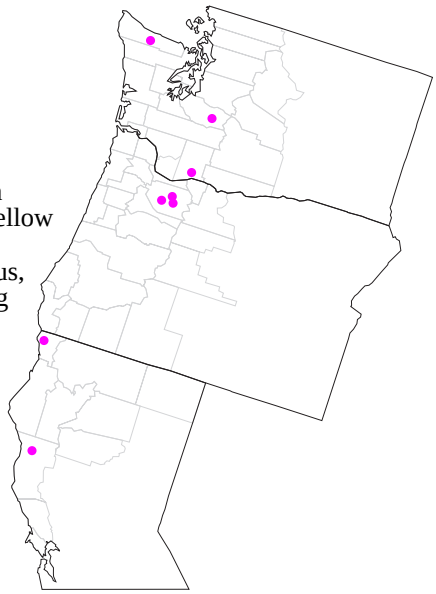
Substrate and habitat: Fruits in humus or soil and matures above the surface of the ground. Associated with *Abies* spp., *Pseudotsuga menziesii*, and *Tsuga heterophylla*.

Season: Fruits in November.

Reference: Petersen, R.H. 1982. Contributions toward a monograph of *Ramaria*. V. Type specimen studies of taxa described by W.C. Coker. Sydowia 35:176-205.

Photo courtesy of C. Marr

Ramaria gelatiniaurantia Marr & Stuntz



ROD name *Ramaria gelatiniaurantia*

Family Ramariaceae **Morphological Habit** coral

Description: **Sporocarps** 6-22 x 4-11 cm, white, pale yellow to yellow immediately above substrate, exposed branches and apices orange, stem flesh marbled, translucent gray-white alternating with waxy opaque-white areas, yellow at least in the ultimate branches. **Stem** compound, up to 9 branches, connate, gelatinous primary axes in various stages of development, mostly dichotomous, axils acute to turbinate and branches scarcely divergent, internodes elongating up to 4 cm in length, lower branches sometimes laterally fused, up to 2 cm in diam, upper branches slender, commonly 1-4 mm in diam, forked to finely divided near the apices; apices mostly acute, gelatinous, especially in the base when fresh. **Flesh** in stem inamyloid, PYR, ANW, GUA, PHN and ANO negative. **Odor** fabaceous. **Taste** not distinctive. **Flesh** of interwoven hyphae, 3-5 µm in diam in the stem, of thin-walled, parallel hyphae 3-12 µm in diam in the branches, walls smooth, surrounded by gelatinous matrix, cyanophilic globular inclusions common, hyphae frequently vesicular near septa, 9-17 µm in diam, walls of the swellings up to 2 µm in diam, ornamented in the stipe, less ornamented in the branches. **Gleoplerous hyphae** rare, 2-3.5 µm diam. **Subhymenia** of thin-walled, interwoven, 2-3 µm in diam. **Basidia** clavate, 70-82 x 8-11 µm, 4-spored. **Sterigmata** 4-5 µm long, straight. **Clamp connections** absent. **Spores** subcylindrical, 8-11 x 3.5-5 µm, (mean = 9.3 x 4.1), ornamented with small, cyanophilous warts.

Distinguishing Features: Characterized by a gelatinous, orange sporocarp that does not bruise or when it does it is dull violet, with a yellow band on the stem, and with spores averaging 9.3 x 4.1 µm. *Ramaria sandracina* differs by having clamp connections. *Ramaria gelatiniaurantia* var. *gelatiniaurantia* and *R. gelatiniaurantia* var. *violeitinges* are separated from each other by the color of the apices, the macrochemical reaction with GUA, and the prominence or rarity of gleoplerous hyphae in the base.

Distribution: Endemic to the Pacific Northwest. Known from eight sites within the range of the northern spotted owl: **CALIFORNIA**, **Del Norte** Co., Jedediah Smith State Park, Howland Hill Rd.; **Mendocino** Co., Northern California Coast Range Preserve, Elder Creek; **OREGON**, **Clackamas** Co., Mount Hood National Forest, near south fork of Eagle Creek; Mount Hood National Forest, junction of Rd. 4610 and Rd. 150; Mount Hood national Forest, Fish Creek Rd.; **WASHINGTON**, **Clallam** Co., Olympic National Park, Soleduc Falls; **Pierce** Co., Mount Rainier National Park, Ipsut Creek; **Skamania Co.,** Gifford Pinchot National Forest, off Rd. 43.

Substrate and habitat: Fruits in humus or soil and matures above the surface of the ground. Associated with *Abies* spp., *Pseudotsuga menziesii*, and *Tsuga heterophylla.*

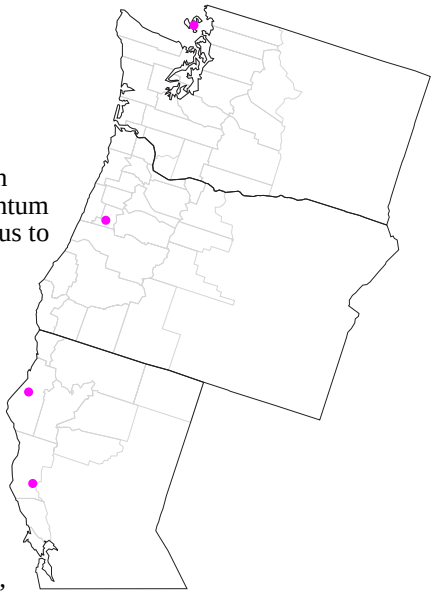
Season: Fruits in October.

Reference: Marr, C.D. and Stuntz, D.E. 1973. *Ramaria* of Western Washington. Biblio. Mycol. 38:1-232.

Photo courtesy of M.A. Castellano
Photo courtesy of C. Marr

Ramaria gracilis (Pers. ex Fries) Quélet

ROD name *Ramaria gracilis*



Family Ramariaceae **Morphological Habit** coral

Description: **Sporocarps** 2.5 x 2 cm, pale orange, apices milk white, flesh white. **Stipe** single, slender, 3 x 2 mm, with a distinct felty white basal tomentum and rhizomorphic strands, branching about 5 times from the stem, dichotomous to polychotomous, axils mostly acute and branches slightly divergent, lower internodes elongated to approximately 0.6 cm, branches maximum diameter about 2 mm, sometimes flattened at nodes and terminal nodes slightly flabellate, bifid to cristate near apices; apices acute, coriaceous when fresh. **Flesh** of stem inamyloid, PYR, ANW, GUA, PHN, and ANO negative. **Odor and taste** not recorded. **Rhizomorphs and mycelial strands** dimitic, thin-walled, clamped, generative hyphae, 2-3 µm in diam, skeletal hyphae straight, l.2-2.5 µm in diam, thick-walled to the point of closing the lumen; hyphae of the tomentum narrow, about 2 µm in diam. **Flesh** of interwoven hyphae in the stem, of parallel hyphae in the branches, dimitic, generative hyphae , thin-walled, 3-10 µm in diam, ampulliform inflations near septa 9-13 µm in diam, walls of the swellings smooth to delicately ornamented, skeletal hyphae 3-6 µm in diam, straight to undulated in outline, thick-walled, 0.5-2 (-3) µm in diam, strongly cyanophilic and conspicuously differentiated from generative hyphae when stained in cotton blue. **Gleoplerous hyphae** not observed. **Subhymenia** of thin-walled, compactly interwoven, 2-3 µm in diam. **Basidia** clavate, 37-48 x 5-7 µm, 4-spored. **Sterigmata** 4-6 µm long, straight, not divergent. **Clamp connections** common. **Spores** ellipsoid to ovoid with a prominent apiculus, 5-6.5 x 3.5-4 µm, (mean = 5.3 x 3.5), delicately ornamented with shallow, lobed, cyanophilic warts in subspiral arrangement.

Distinguishing Features: Characterized by possession of small, delicately ornamented, broadly cylindrical to ovoid spores, and skeletal hyphae with strongly cyanophilic walls.

Distribution: Known from four sites within the range of the northern spotted owl: **CALIFORNIA**, **Mendocino** Co., Jackson State Forest; **Humboldt** Co., near Arcata, Fickle Hill; **OREGON**, **Benton** Co., Beaver Creek; **WASHINGTON**, **San Juan** Co., Friday Harbor. Also known from New York and Europe.

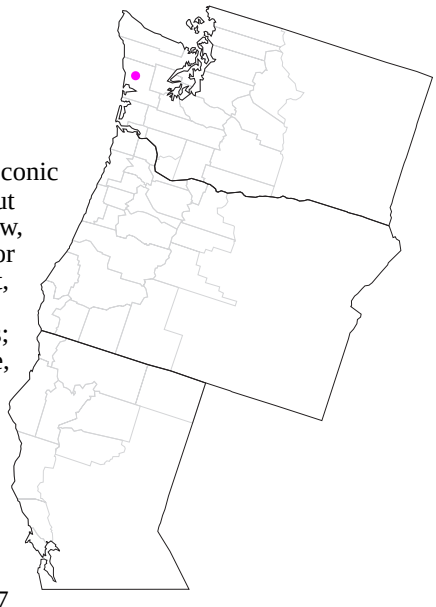
Substrate and habitat: Fruits in humus or soil and matures above the surface of the ground. Associated with *Abies* spp., *Pseudotsuga menziesii*, and *Tsuga heterophylla.*

Season: Fruits in October and November.

Reference: Marr, C.D. and Stuntz, D.E. 1973. *Ramaria* of Western Washington. Biblio. Mycol. 38:1-232.

Photo courtesy of C. Marr

Ramaria hilaris var. *olympiana* Petersen



ROD name *Ramaria hilaris* var. *olympiana*

Family Ramariaceae **Morphological Habit** coral

Description: **Sporocarps** up to 10 x 6 cm, broadly fusiform to broadly obconic in outline. **Stem** up to 17 x 13 mm, single, tapering to a point, smooth, without abortive branchlets, rubbery in texture, off-white at base, upward bright yellow, surface slippery although not moist, flesh firm-gelatinous, translucent, more or less hyaline, white outward, branches ascending, erect to somewhat divergent, more or less terete, bright yellow below, upward a lively pallid salmon, flesh firm-gelatinous, brittle, progressively more yellow upward, with no pink tints; internodes diminishing gradually upward; axils rounded to minutely turbinate, apices minutely digitate when young, usually dichotomous, elongating somewhat by maturity, bright yellow, hardly fading in maturity. **Odor** faintly fabaceous. **Taste** indistinct. **Flesh** of stem SYR weakly positive, FCL positive, ANW, PHN, PYR equivocal to weakly positive, ANO, GUA, NOH, IKI, TYR, KOH negative. **Trama** of stem of hyaline, thin-walled, tightly interwoven hyphae 4-16 µm in diam, with occasional lacunae of agglutinating material, ampulliform inflations usually at septa, up to 21 µm broad, wall up to 1 µm thick, with extensive stalactitiform ornamentation. **Trama** of upper branches, of tightly packed, thin-walled, parallel hyphae 4-17 µm in diam, inflated (especially inward), wall occasionally torulose, especially near septa, ampulliform inflations at septa, symmetrical, thin-walled, occasionally with delicate stalactitiform ornamention. **Gloeoplerous hyphae** occasional, 3-4 µm in diam, equal, yellow, tortuous. **Basidia** 57-68 x 8-9 µm, clavate, contents with scattered minute granules and small guttules, 4-spored. **Sterigmata** slender, straight. **Clamp connections** absent**. Spores** ellipsoid, 9.4-11.2 x 4.0-5.0 µm, yellow, thin-walled, ornamentation of scattered small, flat, occasionally lobed warts.

Distinguishing Features: Characterized by a gelatinous trama and the lack of clamp connections on the basidia. Similar to *R. gelatinaurantia.*

Distribution: Endemic to Washington. Known from a single site within the range of the northern spotted owl: **WASHINGTON**, **Grays Harbor** Co., near Humtulip. Also known from one report with vague locality data from Jefferson Co., Washington.

Substrate and habitat: Fruits in humus or soil and matures above the surface of the ground. Associated with *Abies* spp., *Pseudotsuga menziesii* and *Tsuga heterophylla.*

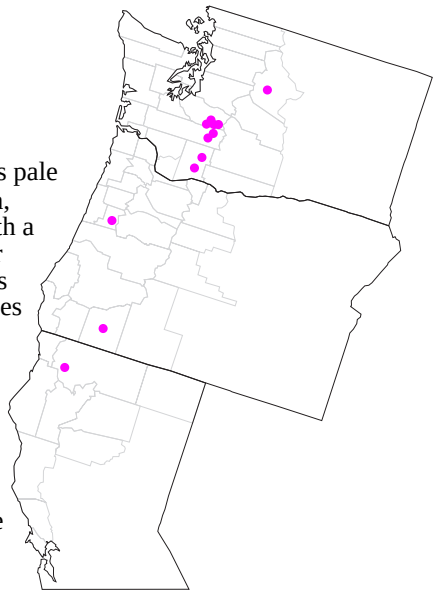
Season: Fruits in October.

Reference: Petersen, R.H. and Scates, C. 1988. Vernally fruiting taxa of *Ramaria* from the Pacific Northwest. Mycotaxon 33:101-144.

No photograph available

Ramaria largentii Marr & Stuntz

ROD name *Ramaria largentii*



Family Ramariaceae **Morphological Habit** coral

Description: **Sporocarps** 12-15 x 7-14 cm, white to pale yellow, branches pale orange, concolorous or more orange towards the apices. **Stem** up to 4 x 5 cm, single or subfasciculate (up to 9 branches), cylindrical or broadly conical, with a basal tomentum, small abortive branches frequently diverging from the upper base, mostly polychotomous in the lower nodes and dichotomous above, axils subacute to u-shaped, branches subparallel to moderately divaricate, internodes of mature sporocarps elongated, the lower ones up to 4 cm long, branches slender, generally less than 1 cm in diam, bifid to multifid near the rounded apices, fleshy-fibrous when fresh, drying brittle with chalky-friable properties. **Flesh** of stem white, the subsurface of branches concolorous becoming paler towards the center. **Odor** slightly sweet. **Taste** not distinctive. **Flesh** inamyloid, ANW and GUA positive, PYR, PHN, and ANO negative. **Flesh** a loosely interwoven tomentum covering stem, cells 2.5-3.5 µm in diam, context of the stem compactly interwoven, parallel in the branches, 4-15 µm in diam, walls smooth, cyanophilous, thin-walled, occasionally hyphae ampulliform near septa, 7-20 µm in diam, walls of the swellings slightly ornamented in the stem. **Gleoplerous hyphae** common, 2.5-4 (-9) µm in diam. **Subhymenia** of thin-walled, compactly interwoven hyphae, 2.5-5 µm in diam. **Basidia** clavate, 65-102 x 9-13 µm, mostly 4-spored. **Sterigmata** 3-8 µm long, incurved or straight, slightly divergent. **Clamp connections** present. **Spores** subcylindrical, 11-15 x 3.5-5 µm, (mean = 13.4 x 4.5), ornamented with conspicuous, irregularly shaped, cyanophilic warts, golden yellow spore print.

Distinguishing Features: Characterized by the large, conspicuously ornamented spores 11-15 x 3.5-5 µm. *Ramaria longispora* differs in the lack of clamp connections, and in its slender habit, compound stem.

Distribution: Endemic to the Pacific Northwest. Known from 12 sites within the range of the northern spotted owl: **CALIFORNIA**, **Siskiyou** Co., Klamath National Forest, Marble Mountain Wilderness Area, Haypress Meadows; **OREGON, Benton Co.,** Siuslaw National Forest, Marys Peak; **Jackson Co.,** Bureau of Land Management, Medford District, Howard Prairie; **WASHINGTON**, **Chelan Co.,** Wenatchee National Forest, Smith Brook; **Lewis Co.,** Gifford Pinchot National Forest, North Fork campground; Pleasant Valley, along Rd. 74; **Pierce** Co., Mount Rainier National Park, lower Tahoma Creek; Mount Baker-Snoqualmie National Forest, along Rd. 59 6 km from hwy 706; Mount Rainier National park, along hwy. 706, 8 km from southwest entrance; Mount Rainier National Park, 2.6 km from Stevens Canyon entrance; **Skamania Co.,** Gifford Pinchot National Forest, junction of Rd. 23 and Rd. 2328; Gifford Pinchot National Forest, DEMO study block PH-U3.

Substrate and habitat: Fruits in humus or soil and matures above the surface of the ground. Associated with *Abies* spp., *Pinus monticola*, *Pseudotsuga menziesii*, and *Tsuga heterophylla.*

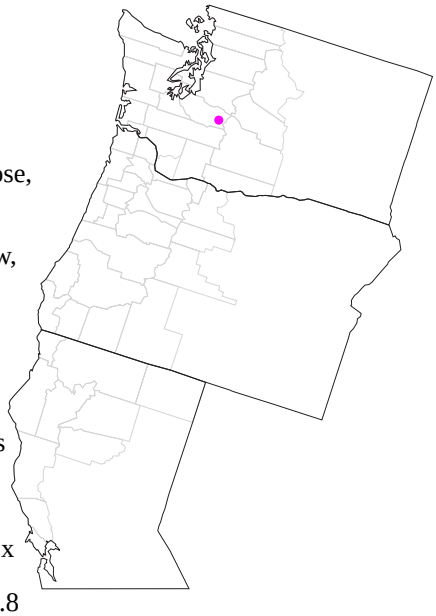
Season: Fruits in October.

Reference: Marr, C.D. and Stuntz, D.E. 1973. *Ramaria* of Western Washington. Biblio. Mycol. 38:1-232.

Photo courtesy of M.A. Castellano
Photo courtesy of C. Marr

Ramaria lorithamnus (Berk.) Petersen

ROD name *Ramaria lorithamnus*



Family Ramariaceae **Morphological Habit** coral

Description: **Sporocarps** up to 8 x 4.5 cm, fasciculate or densely ceaspitose, branched, individual sporocarps branched once or twice (rarely three times), slender. **Stem** almost absent, up to 1 x 4 mm, smooth, white where protected, cream colored. Major branches 2, terete, erect, yellow to slightly green-yellow, brighter below when young, axils narrowly rounded, internodes diminishing gradually, apices awl-shaped, pale yellow, especially when young, bruises sometimes vinescent, then rusty brown. **Odor** faintly fabaceous. **Taste** indistinct to weakly fabaceous. **Flesh** of stem inamyloid, PYR negative; KOH, NOH, PHN rusty brown; GUA slowly, weakly positive; FCL slowly green-black; ANO ambiguous. **Trama** of branches of hyphae 3-7.5 µm in diam, thin-walled, parallel, somewhat inflated, of two types: (i) homogeneous in content, and (ii) with submottled contents under phase contrast, suggestive of gloeoplerous consistency. **Trama** of stem similar to branches, ampulliform septa common, up to 10 µm wide, somewhat thick-walled, unornamented. **Subhymenium** of hyphae 1.5-2.5 µm in diam. **Basidia** 60-70 x 9-12 µm, clavate, 4-spored. **Sterigmata** up to 7 µm long, somewhat curved, erect. **Clamp connections** absent. **Spores** ovate to ellipsoid, 7.9-9.4 x 4.7-5.8 µm, thin-walled, hilar appendix papillate, ornamentation of meandering low warts and ridges.

Distinguishing Features: Characterized by the lack of clamp connections, and the fasciculate, sparingly branched sporocarp that lacks any pink or salmon coloration.

Distribution: Known from a single site within the range of the northern spotted owl: **WASHINGTON**, **Pierce** Co., Mount Rainier National Park, Frying Pan Creek trail. Also known from Australia and New Zealand.

Substrate and habitat: Fruits in humus or soil and matures above the surface of the ground. Associated with *Abies* spp., *Pseudotsuga menziesii*, and *Tsuga heterophylla*.

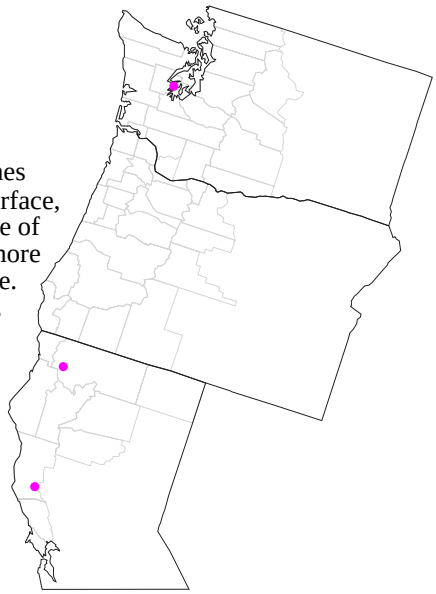
Season: Fruits in September.

Reference: Petersen, R.H. 1988. Contributions toward a monograph of *Ramaria* VII: New taxa and miscellany. Mycologia 80:223-234.

Photo courtesy of C. Marr

Ramaria maculatipes Marr & Stuntz

ROD name *Ramaria maculatipes*



Family Ramariaceae **Morphological Habit** coral

Description: **Sporocarps** 10 x 6 cm, orange white, base and lower branches staining red, branches peach, apices pale yellow, context concolorous with surface, generally drying paler than gray-orange, upper branches retaining a faint tinge of salmon and stained areas dark red-brown, the flesh orange white or slightly more salmon in the upper branches, water-marbled. **Odor and taste** not distinctive. **Stem** single, tapering, 2-4 x 1.5-2 cm, branching up to 7 times from the stem, nodes frequently polychotomous, axils acute or turbinate and branches moderately divergent, internodes elongated up to 3 cm, lower branches up to 2.5 cm in diam, upper branches mostly 2-6 mm in diam; polydigitate or polynodulose near rounded apices, fleshy-fibrous. **Flesh** of stem slowly amyloid, GUA blue; PYR, ANW, PHN and ANO negative. **Flesh** of the stem of compactly interwoven, parallel in the branches, 4-13 µm in diam, walls of the branches slightly fluted, thin-walled in the branches, slightly thicker in the stem, cyanophilic, vesiculation of cells near septa rare. **Gleoplerous hyphae** abundant in the stem, rare in the branches, forming bulbous regions 8-20 µm in diam, except for these localized regions the diameter 4-6 µm. **Subyhmenia** thin-walled, interwoven hyphae, 2-4 µm in diam. **Basidia** clavate, 57-80 x 8-9 µm, 4-spored. **Sterigmata** 2-5 µm long, straight or slightly incurved, slightly divergent. **Clamp connections** present. **Spores** subcylindrical, 9-11 x 4-5 µm, (mean = 10.2 x 4.3), ornamented with fine, cyanophilic warts in subspirals, gray-orange spore print.

Distinguishing Features: Characterized by the presence of clamp connections, an amyloid context, red-brown stains or bruises, and negative macrochemical tests. *Ramaria maculatipes* is readily distinguished by sporocarp color or macrochemical reactions other than amyloidity. *Ramaria rubribrunnescens* has approximately the same sporocarp color and staining as *R. maculatipes*, but has an inamyloid context, lacks clamp connections, and has large, striate spores.

Distribution: Endemic to California and Washington. Known from three sites within the range of the northern spotted owl: **CALIFORNIA**, **Siskiyou** Co., Klamath National Forest, Marble Mountain Wilderness Area, Haypress Meadows; **Mendocino** Co., Jackson State Forest; **WASHINGTON**, **Mason** Co., Mason Lake. Not known from Oregon.

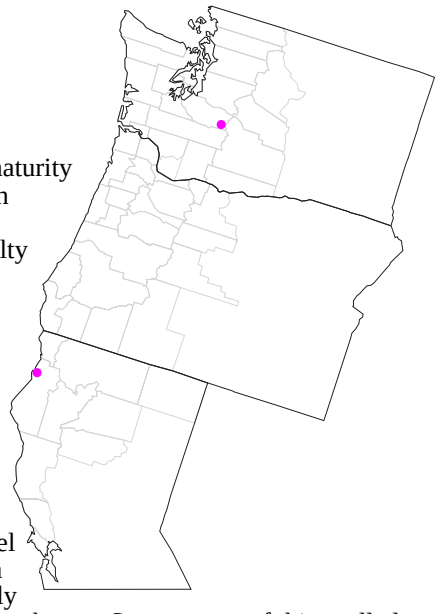
Substrate and habitat: Fruits in humus or soil and matures above the surface of the ground. Associated with *Abies* spp., *Pseudotsuga menziesii*, and *Tsuga heterophylla*.

Season: Fruits in November.

Reference: Marr, C.D. and Stuntz, D.E. 1973. *Ramaria* of Western Washington. Biblio. Mycol. 38:1-232.

Photo courtesy of C. Marr

Ramaria rainierensis Marr & Stuntz



ROD name *Ramaria rainierensis*

Family Ramariaceae **Morphological Habit** coral

Description: **Sporocarps** 2-8 x 0.4-7 cm, yellow-white when young, at maturity pale gray-orange, basal tomentum white, terminal branches slightly paler than lower ones, flesh orange-white to brown, dried sporocarps pale gray-orange, context orange-white. **Stem** single, slender, 0.5-3.5 x 0.2-1 cm, with basal felty tomentum, surface scurry; branching mostly dichotomous, axils subacute to narrowly u-shaped, branches slightly divergent, slender, 2-8 mm in diam, slightly flattened especially at nodes, internodes varying from 0.2-2.5 cm in length, shortly forked, cristate or rarely single near acute apices, consistency coriaceous when fresh, drying brittle. **Odor** negligible in young sporocarps, in older sporocarps resembling anise. **Taste** bitter. **Flesh** of stem inamyloid; PYR, ANW, GUA and ANO positive. **Rhizomorphs** dimitic, generative hyphae 2-3.5 µm in diam, ampulliform inflations near septa common, 8-16 µm in diam, walls of the swellings ornamented, skeletal hyphae 2-6 µm in diam, straight, walls 1-3 µm thick, acyanophilic. **Flesh** of the stem of parallel hyphae near the surface, otherwise interwoven, subparallel in the branches, dimitic, branches mostly with generative hyphae, 3-10 µm in diam, walls smooth, slightly cyanophilic, thin-walled, skeletal hyphae sparsely distributed in the stem, thick-walled, 1.5-3 µm in diam. **Gleoplerous hyphae** absent. **Subhymenia** of thin-walled, intewrwoven hyphae 2-3.5 µm in diam. **Basidia** clavate, 50-77 x 7-11 µm, cyanophilic, l-5-spored. **Sterigmata** 4-9 µm long, straight or slightly incurved, slightly divergent. **Clamp connections** present. **Spores** ellipsoid with a prominent lateral apiculus that is commonly 1 x 1.5 µm, 7-10 x 4.5-6 µm, (mean = 8.5 x 5), ornamented with distinct, cyanophilic warts arranged in subspirals, apricot yellow spore print.

Distinguishing Features: Characterized by a terrestrial habit, cream to tan-colored sporocarps, and skeletal hyphae with nearly acyanophilic walls.

Distribution: Endemic to California and Washington. Known from two sites within the range of the northern spotted owl: **CALIFORNIA**, **Humboldt** Co., Patrick's Point State Park; **WASHINGTON**, **Pierce** Co., Mount Rainier National Park, Panther Creek, near intersection of Rd. 123.

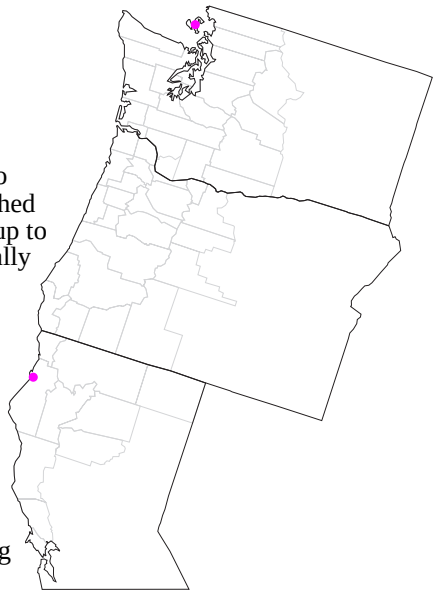
Substrate and habitat: Fruits in humus or soil and matures above the surface of the ground. Associated with *Abies* spp., *Pseudotsuga menziesii*, and *Tsuga heterophylla.*

Season: Fruits in December and March.

Reference: Marr, C.D. and Stuntz, D.E. 1973. *Ramaria* of Western Washington. Biblio. Mycol. 38:1-232.

No photograph available

Ramaria rubella var. *blanda* Petersen



ROD name *Ramaria rubella* var. *blanda*

Family Ramariaceae **Morphological Habit** coral

Description: **Sporocarps** up to 8 cm high, up to 5.5 cm broad, fusiform to subspherical, lignicolous. **Odor** indistinct. **Taste** acrid. **Stem** almost branched from base, up to 1 cm thick, with basal mycelium, white at base. **Branches** up to 4 mm thick, more or less strict to open and spreading, often flattened, especially at axils, and then branching somewhat antler-like, pink-tan, pale pink-cinnamon, pale vinaceous cinnamon, to avellaneous, internodes diminishing gradually, axils narrowly to broadly rounded, usually sterile. **Flesh** white, tough. **Hymenium** usually unilateral, smooth, sterile surface rugulose, apparently somewhat paler than hymenium, apices delicate and erect to open and rounded, white to pale cream color, FSW deep olive-grey. **Basidia** 45-50 x 7.4-8.9 µm, clavate, 4-spored. **Sterigmata** straight, divergent, peripheral. **Clamp connections** present. **Spores** broadly ovoid to broadly ellipsoid, 6.3-8.1 x 4.4-5.9 µm, ornamentation of scattered prominent warts or short meandering ridges, red-tan spore print, thin-walled, apiculus prominent, eccentric, over 1 µm long, often with hump at upper base, tapering distally.

Distinguishing Features: Characterized by the absence of bright pink coloration of the rhizomorphic strands in KOH, slightly smaller spores than variety *rubella*, and a distinctly unilateral hymenium. *Ramaria rubella* f. *blanda* is similar to *R. polonica*, but *R. polonica* usually has cystidioid elements in the hymenium.

Distribution: Known from two sites within the range of the northern spotted owl: **CALIFORNIA**, **Humboldt** Co., Patrick's Point State Park; **WASHINGTON**, **San Juan** Co., Friday Harbor. Also known from the Appalachian Mountains. Not known from Oregon.

Substrate and habitat: Fruits on wood in conifer forests.

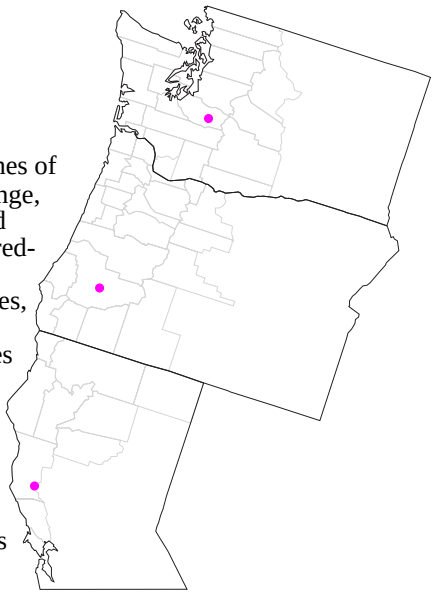
Season: Fruits in October.

Reference: Petersen, R.H. 1975. *Ramaria* subgenus *Lentoramaria* with emphasis on North American Taxa. Biblio. Mycol. 43:1-161.

Photo courtesy of C. Marr

Ramaria rubribrunnescens Marr & Stuntz

ROD name *Ramaria rubribrunnescens*



Family Ramariaceae **Morphological Habit** coral

Description: **Sporocarps** 7-16 x 5.5-11 cm, white to orange-white, branches of immature sporocarps red with pale yellow apices, in age than pale brown-orange, base and lower branches stain red, context concolorous with the surface, dried sporocarps generally gray-pale yellow, stained regions retaining some of the red-brown color, flesh pale yellow. **Stem** single, frequently slender and tapering, older sporocarps a subfascicle of several to numerous slender primary branches, mostly dicotomous at least in the upper nodes, axils subacute or narrowly u-shaped, branches slightly divergent, internodes elongated at maturity, branches generally slender, mostly 1-5 mm in diam, bifid to finely divided near acute to rounded apices, consistency fleshy-fibrous when fresh, drying brittle and chalky-friable. **Odor** sweet in age, resembling anise. **Taste** indistinct. **Stipe context** inamyloid; weak reaction to ANW and GUA; PYR, PHN and ANO negative. **Flesh** of interwoven hyphae in the stem, parallel in the branches, 2-6 µm in diam in the stem, 4-13 µm in diam in the branches, conspicuous cyanophilic globules present in hyphae of branches, hyphal walls smooth or fluted, moderately cyanophilic, walls 0.25-1.5 (-2) µm thick, ampulliform inflations near septa infrequent, 9-12 µm, walls of the swellings moderately ornamented in the stipe, nearly smooth in the branches. **Gleoplerous hyphae** not abundant, mostly 2-4.5 µm diam. **Subhymenia** of thin-walled, interwoven hyphae, 2.5-4 µm in diam. **Basidia** clavate, 41-67 x 8-11 µm, hymenial cells strongly cyanophilic, 2-4-spored. **Sterigmata** 5-7 µm long, slightly incurved and divergent. **Clamp connections** absent. **Spores** subcylindrical, 10-14 x 3.5-5 µm, (mean = 12.3 x 4.4), cyanophilic, ornamentation very fine, some spores smooth or nearly so, gray-yellow spore print.

Distinguishing Features: Characterized by red-brown stains and lack of clamp connections. *Ramaria cystidiophora* var. *maculans*, *R. maculatipes*, *R. vinosimaculans*, and *R. rubiginosa* also develop these red-brown stains. *Ramaria rubribrunnescens* differs from these species by it lack of clamp connections and longer spores.

Distribution: Endemic to California and Washington. Known from three sites within the range of the northern spotted owl: **CALIFORNIA**, **Mendocino** Co., Jackson State Forest; **OREGON, Douglas Co.,** Bureau of Land Management, Roseburg District, Tater Hill; **WASHINGTON**, **Pierce** Co., Mount Rainier National Park, Ipsut campground. It is also reported from the Olympic Peninsula with vague locality data.

Substrate and habitat: Fruits in humus or soil and matures above the surface of the ground. Associated with Pinaceae spp.

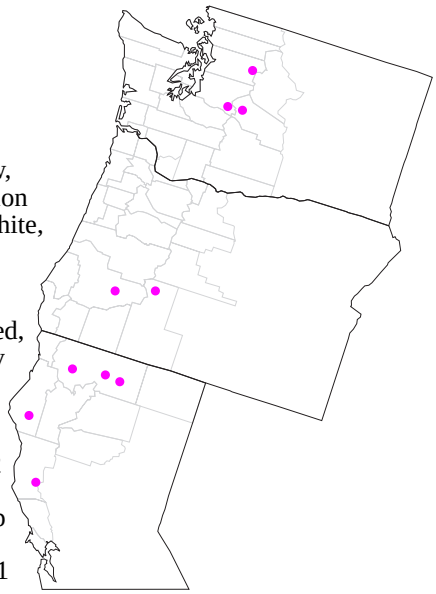
Season: Fruits in October and November.

Reference: Marr, C.D. and Stuntz, D.E. 1973. *Ramaria* of Western Washington. Biblio. Mycol. 38:1-232.

Photo courtesy of C. Marr

Ramaria rubrievanescens Marr & Stuntz

ROD name *Ramaria rubrievanescens*



Family Ramariaceae **Morphological Habit** coral

Description: **Sporocarps** 7-8 x 6.5-8.5 cm, milk-white discoloring yellow, bruising brown-violet, primordial branch tips flushed with pink, pink coloration fades during maturation and soon after collecting, mature branches yellow-white, flesh white. **Stipe** single, massive, 3.5-9 x 2-4.5 cm, branches crowded, vertically compressed on the stipe and curving inwards about 1-4 cm long, lower branches usually very short and broad, 2-4 cm in diam, connation frequent in lower parts, upper branches mostly 1-4 mm in diam, axils u-shaped, slightly divergent, bifurcate to pluridigitate near obtuse, rounded or decidedly blunt apices, consistency punky firm when fresh. **Odor** faintly sweet. **Taste** slightly similar to nuts. **Flesh** of stem slowly amyloid; PYR, ANW, GUA, PHN, and ANO negative. **Flesh** of interwoven, mostly thin-walled hyphae, wall surface smooth to fluted, ampulliform swellings near septa 9-12 µm diam, walls of the swellings distinctly ornamented. **Gleoplerous hyphae** throughout context, generally 3-5 µm in diam, in vesicular regions up to 12 µm in diam. **Subhymenia** of thin-walled, interwoven hyphae, 2.5-4.5 µm diam, with globular cyanophilic inclusions. **Basidia** clavate, 55-87 x 8-11 µm, (2-) 4-spored. **Sterigmata** 3-7 µm long, straight, not divergent, also containing cyanophilic inclusions. **Clamp connections** present. **Spores** mummy-shaped, 11-13 x 4-5.5 µm, (mean = 11.7 x 4.9), ornamented with conspicuous, cyanophilic striae, pale yellow spore print.

Distinguishing Features: Characterized by the striate spores, evanescence of the pink color, present only in primordial branch tips and the presence of clamp connections.

Distribution: Known from 10 sites within the range of the northern spotted owl: **CALIFORNIA**, **Mendocino** Co., Elder Creek Bottoms; **Humboldt Co.,** King Range Conservation park; **Siskiyou** Co., Duck Lake; Six Rivers National Forest, junction of Rd. 15 and Rd. 12N55; Klamath National Forest, just past turnoff to Ten Bears trail; **OREGON**, **Douglas Co.,** Bureau of land management, Roseburg District, Rock Creek; **Klamath** Co., Deschutes National Forest, Odell Butte; **WASHINGTON**, **King** Co., Greenwater Rd. 16.5 km east of Enumclaw; **Kittitas** Co., Lake Kachess State Park; **Snohomish** Co., Mount Baker-Snoqualmie National Forest, Sloan Creek campground. There is also a report from the east slope of the Oregon Cascades with vague locality data. Also known from eastern North America and eastern Oregon.

Substrate and habitat: Fruits in humus or soil and matures above ground, associated with Pinaceae spp.

Season: Fruits in June, September and October.

Reference: Marr, C.D. and Stuntz, D.E. 1973. *Ramaria* of Western Washington. Biblio. Mycol. 38:1-232.

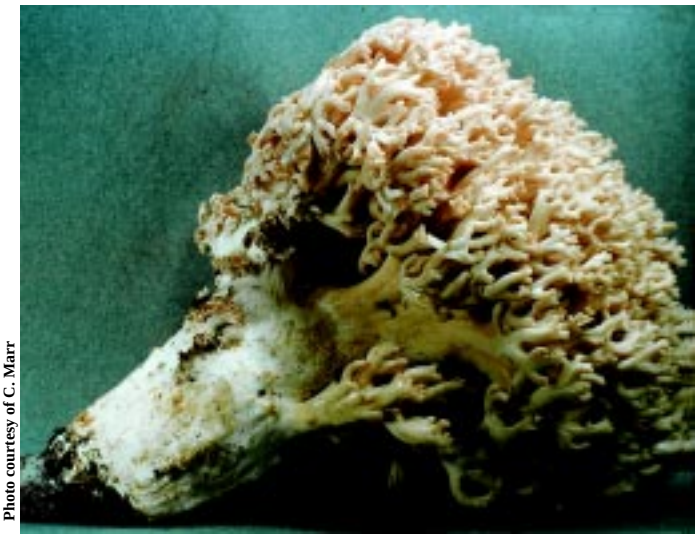
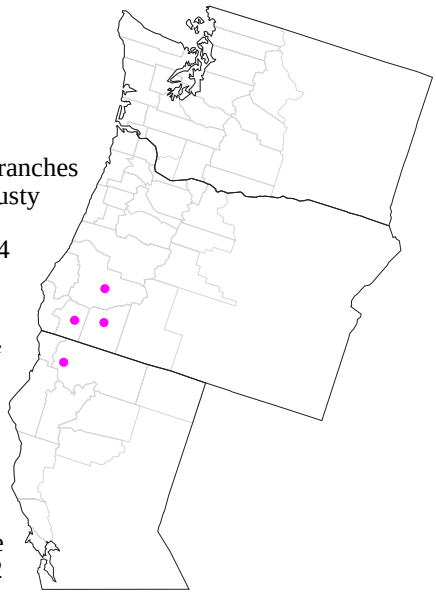


Photo courtesy of C. Marr

Ramaria rubripermanens Marr & Stuntz



ROD name *Ramaria rubripermanens*

Family Ramariaceae **Morphological Habit** coral

Description: **Sporocarps** 9-13 x 9-16 cm, white to yellow-white, lower branches orange to red-white, apices pink-white to dull red. **Context** white. **Odor** musty sweet. **Taste** indistinct. **Stem** single, massive, 3-8 x 4 cm branch systems crowded, about 2-4 cm long, lower branches usually very short and broad, 2-4 cm diam, connation frequent in lower parts, upper branches mostly 1-4 mm diam, axils mostly acute to subacute, slightly divaricate, pluridigitate near subacute to rounded apices, consistency punky-firm when fresh. **Flesh** of stem slowly amyloid; PYR, ANW, GUA, PHN, and ANO negative. **Flesh** of interwoven hyphae in stem, parallel in branches, 4-15 µm in diam, hyphae of the stipe 0.25-2.5 µm in diam, hyphae of the branches mostly 0.25-1 µm in diam, numerous cyanophilic globules conspicuous in the hyphae of the branches, ampulliform inflations near septa, 11-23 µm in diam, walls of the swellings distinctly ornamented, especially those in the stipe. **Gleoplerous hyphae** interweaving throughout context, 3.5-5 µm in diam or in vesicular regions up to 20 µm in diam. **Subhymenia** of thin-walled, interwoven hyphae 2-4 µm in diam, with cyanophilic globular inclusions. **Basidia** clavate, 31-62 x 7-11 µm, cyanophilic, mostly (2-) 4-spored. **Sterigmata** 3-6 µm long, straight, not divergent. **Clamp connections** present. **Spores** subellipsoid to mummy-shaped, 8-13 x 3.5-4.5 µm, (mean = 10.3 x 3.8), ornamented with oblique to longitudinal striae, striae distinctly more cyanophilic than wall.

Distinguishing Features: Characterized by its short, striate spores, red color of terminal branches which persists at maturity and sporocarps that do not bruise red to violet brown.

Distribution: Endemic to the Pacific Northwest. Known from four sites within the range of the northern spotted owl: **CALIFORNIA**, **Siskiyou** Co., Klamath National Forest, Marble Mountain Wilderness Area, Haypress Meadows; **OREGON, Douglas** Co., Bureau of Land Management, Roseburg District, Red Ponds Research Natural Area; Jackson Co., Bureau of Land Management (BLM), Medford District, off Rd. 34-2E-29; **Josephine Co.,** BLM, Medford District, east of hwy. 199. It is reported with vague locality data from the Olympic Peninsula in Washington and the Oregon Cascades.

Substrate and habitat: Fruits in humus or soil and matures above the ground, associated with Pinaceae spp.

Season: Fruits in June and October.

Reference: Marr, C.D. and Stuntz, D.E. 1973. *Ramaria* of Western Washington. Biblio. Mycol. 38:1-232.

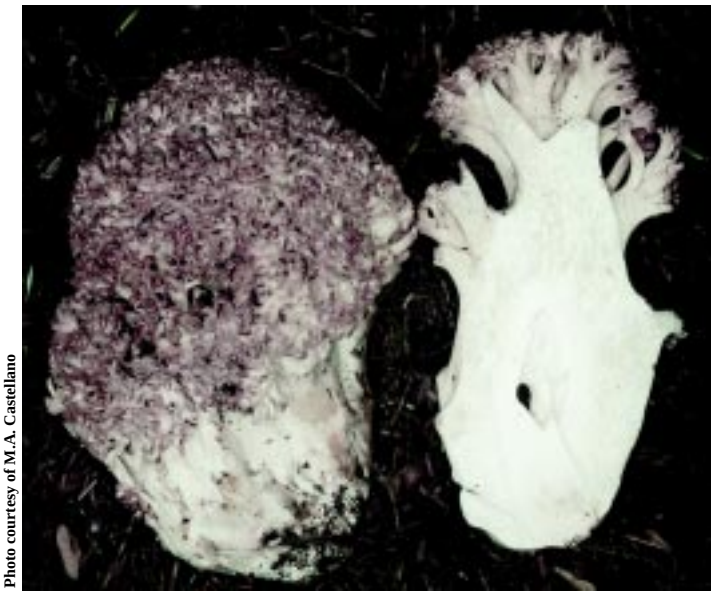
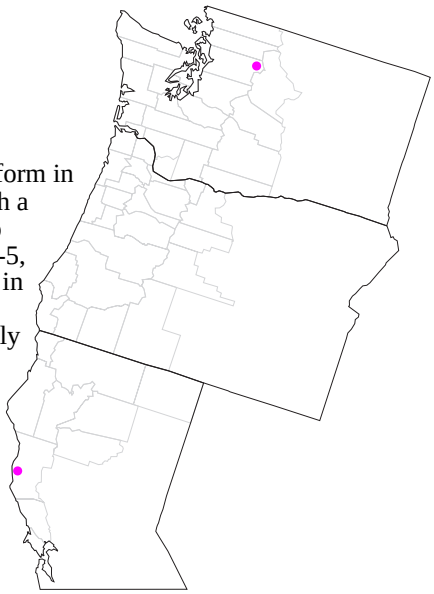


Photo courtesy of M.A. Castellano

Ramaria spinulosa var. *diminutiva* Petersen



ROD name *Ramaria spinulosa* var. *diminutiva*

Family Ramariaceae **Morphological Habit** coral

Description: **Sporocarps** up to 13 x 10 cm, usually much smaller, obpyriform in outline. **Stem** up to 5 x 2.3 cm, usually much narrower, gnarled, smooth, with a few abortive branchlets upward, sometimes mycelial at very base, deep tan to brown overall, often orange-brown below, staining brown. Major branches 3-5, more or less terete, up to 1.5 cm thick, concolorous with branches. Branches in 3-6 ranks, ascending, often rugulose longitudinally, brown to somewhat violaceous brown; internodes diminishing gradually at maturity; axils narrowly rounded; upper branches 1-1.5 mm thick, equal, erect, giving a delicate appearance, apices subcristate to irregularly digitate when young, extending to digitate by maturity, rounded, not inflated, violaceous brown when young, concolorous with branches at maturity. **Odor** negligible or faintly of chocolate. **Taste** faintly sour. **Flesh** of stem dull brown, streaked as though with wood grain; FCL positive; inamyloid, SYR, PHN, PYR, GUA, ANO, and ANW negative. **Spores** broadly cylindrical to ovoid, 7.2-10.1 x 4.7-6.1 µm, ornamentation of small streaks or ridges and small warts, thin-walled, hilar appendage blunt, papillate.

Distinguishing Features: This particular variety is not listed in the ROD but is the only variety of *R. spinulosa* that occurs in our region. Characterized by the brown base, lack of clamp connections and wide spores.

Distribution: Known from two sites within the range of the northern spotted owl: **CALIFORNIA**, **Mendocino** Co., Van Damme State Park; **WASHINGTON**, **Snohomish** Co., Mount Baker-Snoqualmie National Forest, Glacier Peak Wilderness, Sulphur Creek. Also known from Europe. Not known from Oregon.

Substrate and habitat: Fruits in humus or soil and matures above the ground, associated with Pinaceae spp.

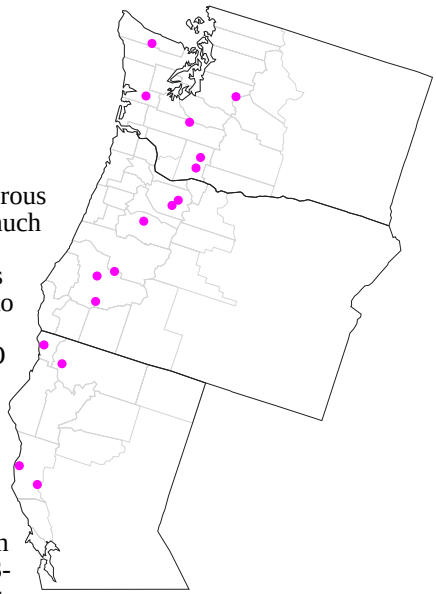
Season: Fruits in October and November.

Reference: Petersen, R.H. 1988. Contributions toward a monograph of *Ramaria* VII: New taxa and miscellany. Mycologia 80:223-234.

Photo courtesy of C. Marr

Ramaria stuntzii Marr

ROD name *Ramaria stuntzii*



Family Ramariaceae **Morphological Habit** coral

Description: **Sporocarps** 6-17 x 4-14 cm, white to pale orange near base, branches scarlet in youth, fading to pale orange-red at maturity, flesh concolorous or paler near the center of branches. **Stem** single, massive, 2-7 x 2.5-7 cm, much branched, internodes elongated up to 5 cm, polychotomous to mostly dichotomous, axils frequently turbinate and nodes slightly flattened, branches slightly to moderately divergent, primary branches up to 4 cm in diam, bifid to multifid near rounded or nodulose apices, consistency punky fibrous. **Odor** indistinct. **Taste** slightly bitter. **Flesh** of stem strongly amyloid; PHN, ANO and GUA, positive; PYR sometimes reactive; ANW negative. **Flesh** subparallel to interwoven in stem, parallel in branches, 2-15 µm in diam, a few hyphae highly inflated up to 22 µm in diam, walls smooth, cyanophilic, thin ampulliform inflations near septa, 9-15 µm in diam, wall of the swellings slightly ornamented in the branches, moderately ornamented in the stem. **Gleoplerous hyphae** 2-4 µm in diam with localized bulbous regions up to 16 µm in diam. **Subhymenia** thin-walled, interwoven hyphae, 2-4 µm in diam. **Basidia** clavate, 45-75 x 7-10 (-12) µm, (l or) 4-spored. **Sterigmata** 3-10 µm long, straight, slightly divergent. **Clamp connections** absent. **Spores** subcylindrical, 7-10 x 3-5 µm, (mean = 8.3 x 4), ornamented with small lobed warts, apricot yellow spore print.

Distinguishing Features: Characterized by the intense scarlet branches of young sporocarps, its robust habit and the strong amyloid reaction of the stem (even when dried).

Distribution: Endemic to the Pacific Northwest. Known from 11 sites within the range of the northern spotted owl: **CALIFORNIA**, **Del Norte** Co., Jedediah Smith State Park; **Mendocino** Co., Jackson State Forest; **Siskiyou** Co., Klamath National Forest, Marble Mountain Wilderness Area, Haypress Meadows; **OREGON**, **Clackamas** Co., Mount Hood National Forest, near south fork of Eagle Creek; Mount Hood National Forest, Salmon River trail; **Douglas** Co., Bureau of Land Management (BLM), Eugene District, Upper Elk Meadows Research Natural Area; BLM, Roseburg District, above Dutchman Creek; BLM, Medford District, Mount Gurney; **Linn** Co., BLM, Salem District, east of Crabtree on Rd. 226; **Marion** Co., BLM, Salem District, Clear Down; **WASHINGTON**, **Clallam** Co., Olympic National Park, Soleduc Falls; **Grays Harbor** Co., Lake Sylvia Sate Park; **King** Co., Mount Baker-Snoqualmie National Forest, Goldmeyer Hot Springs trail; **Lewis** Co., Pleasant Valley; **Skamania Co.,** Gifford Pinchot National Forest, off Rd. 43; Gifford Pinchot National Forest, junction of trail 199 and Rd. 41.

Substrate and habitat: Fruits in humus or soil and matures above the ground, associated with Pinaceae spp.

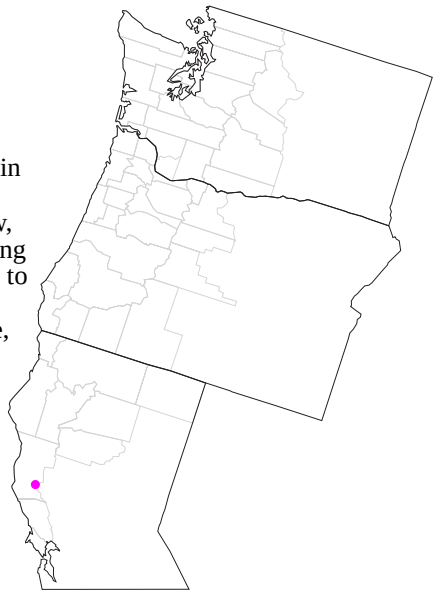
Season: Fruits in October and November.

Reference: Marr, C.D. and Stuntz, D.E. 1973. *Ramaria* of Western Washington. Biblio. Mycol. 38:1-232.

Photo courtesy of T. O'Dell
Photo courtesy of C. Marr

Ramaria thiersii Petersen & Scates

ROD name *Ramaria thiersii*



Family Ramariaceae **Morphological Habit** coral

Description: **Sporocarps** up to 15 x 8 cm, obpyramidal to subcylindrical in outline, stem up to 7 x 6 cm, obpyramidal, white, smooth, weakly to strongly brown where bruised, 3-5 branches, ascending to flaring, white to pale yellow, white when hypogeous, salmon-colored when epigeous, internodes diminishing upward gradually at maturity, axils rounded, often split below, apices digitate to molar-like when young, coarsely digitate by maturity, white where protected, pallid green-yellow where exposed. **Odor and taste** indistinct. **Flesh** white, not mottled, soft to spongy. ANO, ANW, PYR, PHN, FCL positive; KOH darkening on hymenium; inamyloid, NOH, negative. **Flesh** of stem of hyphae 3-12 µm in diam, hyaline, tightly interwoven, wall up to 1 µm thick, with extensive and coarse stalactitiform ornamentation, context of branches of upper branches 4-12 µm in diam, hyaline, wall up to 1 µm thick, more or less parallel, extensively but not exclusively adherent, ampulliform inflations rare, thin-walled, with extensive but delicate stalactitiform ornamentation. **Gloeoplerous hyphae** of yellow-refringent hyphae 3-5 µm in diam. **Subhymenia** rudimentary. **Basidia** 45-50 x 7-8 µm, clavate, 4-spored. **Sterigmata** stout, straight. **Clamp connections** present. **Spores** cylindrical to narrowly ellipsoid, occasionally subsigmoid, 11.6-15.8 x 4-5 µm, ornamentation of small, discrete low warts, thin-walled.

Distinguishing Features: Characterized by a context that reacts with most reagents, inamyloid stem flesh, and roughened spores that average over 13 µm in length.

Distribution: Known from a single site within the range of the northern spotted owl: **CALIFORNIA**, **Mendocino** Co., Jackson State Forest. It also is known from one site in the Sierra Nevada Range in California, outside of the assessment area. Also known from Idaho. Not known from Oregon or Washington.

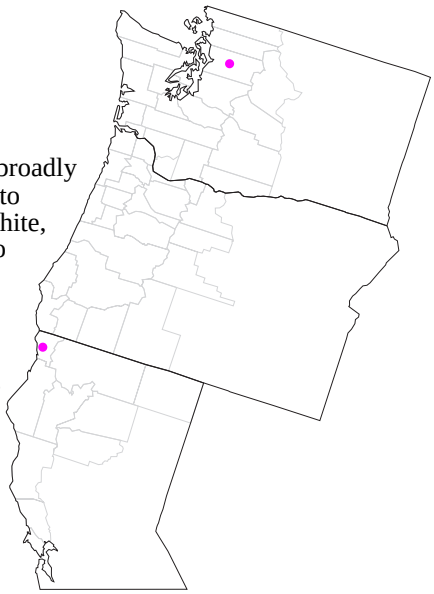
Substrate and habitat: Fruits in humus or soil and matures above the ground, associated with Pinaceae spp.

Season: Fruits in June.

Reference: Petersen, R.H. 1988. Contributions toward a monograph of *Ramaria* VII: New taxa and miscellany. Mycologia 80:223-234.

Photo courtesy of M. Seidl

Ramaria verlotensis Marr & Stuntz



ROD name *Ramaria verlotensis*

Family Ramariaceae **Morphological Habit** coral

Description: **Sporocarps** up to 13 x 9 cm, apparently broadly obovate to broadly pyriform, stem single, small, branches almost from base, white below, mealy to densely but superficially pruinose at base, yellow above; consistency solid, white, firm-gelatinous to hard-rubbery, watery when fresh, branches pallid salmon to salmon, dichotomous, flattened, internodes diminishing gradually at maturity, axils often flattened, acute. **Flesh** of stem FCL positive; inamyloid, ANO, ANW, GUA, PHN, and PYR negative. **Flesh** of stem of hyphae 3-14 µm in diam, hyaline, thin-walled, usually inflated, tightly interwoven, adherent to very locally free, agglutinating substance intercellular, ampulliform inflations abundant, wall up to 0.5 µm thick, scallion-shaped, with extensive, coarse stalactitiform ornamentation. Tramal hyphae of upper branches hyaline, thin-walled, of cigar-shaped cells, 3-15 µm in diam, adherent, parallel, ampulliform inflations occasional, up to 15 µm broad, thin-walled, unornamented, also some hyphae 3-5 µm in diam, straight, freely branched, not adherent, loosely arranged. **Gloeoplerous hyphae** common in stem, 3-8 µm in diam, refringent, with abrupt inflations, uncommon in subhymenium, undelimited, often with tibiiform termination. **Subhymenium** extensive, of tightly interwoven hyphae. **Basidia** 70-80 x 8-10 µm, clavate, inflated apically only at maturity; contents homogeneous to obscurely vacuolate, weakly cyanophilous, 4-spored; sterigmata straight, long and slender. **Clamp connections** absent. **Spores** broadly ellipsoid to subovate, 9.0-11.2 x 4.7-6.1 µm, (mean = 10.1 x 4.9), thin-walled, ornamentation of large warts or low, discrete plates covering extensive wall area.

Distinguishing Features: Characterized by a broad, cauliflowerlike, pale yellow-pink sporocarp, long basidia, warty spores, averaging 10.1 x 4.9 µm, and gelatinized, thin-walled hyphae that lack clamp connections.

Distribution: Endemic to California and Washington. Known two sites within the range of the northern spotted owl: **CALIFORNIA**, **Del Norte** Co., Jedediah Smith State Park; **WASHINGTON**, **Snohomish** Co., Mount Baker-Snoqualmie National Forest, Verlot (old campground).

Substrate and habitat: Fruits in humus or soil and matures above the ground, associated with Pinaceae spp.

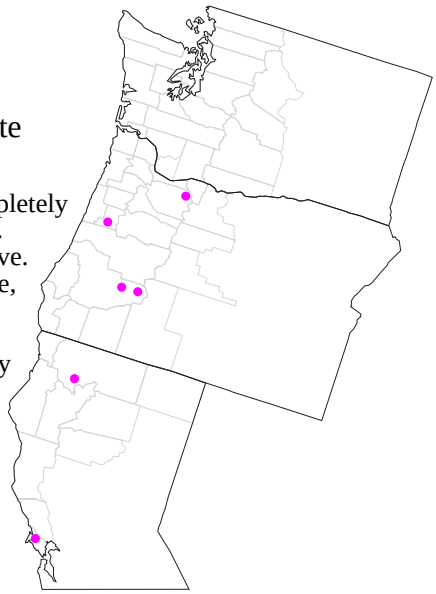
Season: Fruits in November.

Reference: Marr, C.D. and Stuntz, D.E. 1973. *Ramaria* of Western Washington. Biblio. Mycol. 38:1-232.

Photo courtesy of C. Marr

Rhizopogon brunneiniger A.H. Smith

ROD name *Rhizopogon brunneiniger*



Family Boletaceae **Morphological Habit** sequestrate

Description: **Sporocarps** 1-2 cm diam, globose to subglobose and some ellipsoid, lacunose at times, dark red-brown to black-brown, blackening completely upon drying, with a group of basal rhizomorphs or a single basal rhizomorph. **Gleba** loculate, white at first, becoming olivaceous, drying pale brown to olive. **Columella** absent (as seen on dried material). **Trama** of interwoven, hyaline, gelatinous, smooth, narrow hyphae. **Subhymenium** of thick-walled cells. **Basidia** 8-spored. **Basidioles** hyaline, becoming thick-walled, amorphous content amyloid. **Peridium** a single layer of hyaline, thin-walled, very closely interwoven hyphae, no green visible in mounts revived in KOH. **Clamp connections** absent. **Spores** cylindric to narrowly oblong, 5-6.5 (-7) x 1.8-2.3(-2.5) µm, smooth, thin-walled, in KOH hyaline singly, yellow-brown in mass, inamyloid.

Distinguishing Features: Characterized by the basal attachment of rhizomorphs, and a glabrous, black, shiny peridium.

Distribution: Endemic to California and Oregon. Known from six sites within the range of the northern spotted owl: **CALIFORNIA**, **Marin** Co., near Inverness; **Siskiyou** Co., Klamath National Forest, Deadfall Meadows; **OREGON, Benton** Co.,10.8 km west of Philomath on Alsea hwy.; **Clackamas** Co., Mount Hood National Forest, Barlow Forest camp; **Douglas** Co., Umpqua National Forest, Limpy Rock Research Natural Area; Umpqua National Forest, 3.3 km west of Basket Butte.

Substrate and habitat: Found in association with roots of assorted Pinaceae including *Abies concolor*, *Pinus contorta, P. monticola, P. muricata, Pseudotsuga menziesii*, *Tsuga heterophylla,* and *T. mertensiana,* from sea level to 2,350 m elevation.

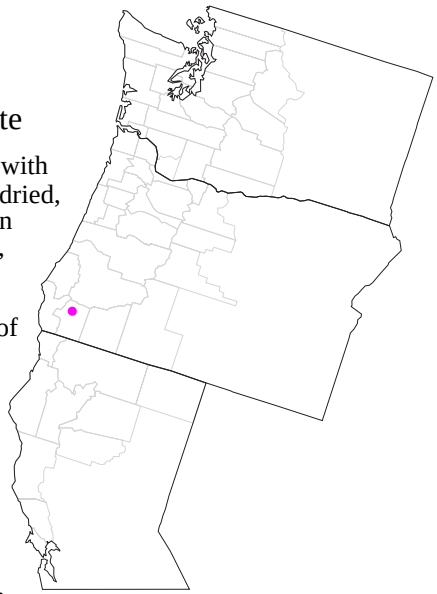
Season: Fruits in September and October.

Reference: Smith, A.H., and Zeller, S.M. 1966. A preliminary account of the North American species of *Rhizopogon*. Mem. New York Bot. Gard. 14:1-177.

No photograph available

Rhizopogon chamaleontinus A.H. Smith

ROD name *Rhizopogon sp. nov.* #Trappe 9432



Family Boletaceae **Morphological Habit** sequestrate

Description: **Sporocarps** 1-2 cm diam, globose to irregular, when young with numerous appressed fibrils and rhizomorphs but nearly glabrous in age or as dried, white when young, staining fuscous to vinaceous fuscous, fuscous black when dried; FSW on surface quickly black, KOH olive then black. **Gleba** loculate, pallid, becoming brown as dried. **Columella** absent. **Odor and taste** not recorded. **Peridium** of elongate cells 5-12 µm in diam, some vinaceous red when mounted in KOH, at times hyphae of the outer trama also red. **Trama** of gelatinous, interwoven hyphae 4-7 µm in diam. **Subhymenium** of hyaline, subgelatinous hyphae, branching candelabra-like (not filamentose interwoven or cellular). **Basidia** 4-6-spored, 7-9 µm broad at apex, clavate, length variable. **Basidioles** apparently not thick-walled. **Clamp connections** absent. **Spores** elongate, drop-shaped to subelliptic or at times somewhat irregular, 6-9 x 3-4.5 (-5) µm, wall slightly thickened, spores in outer locules amyloid, those in the interior inamyloid.

Distinguishing Features: Characterized by the white peridium that stains vinaceous to fuscus, an olive to black reaction of KOH on the peridium, lack of any yellow tones to the peridium and an unusual amyloid pattern of the spores, immature spores are dark violet, mature spores are inamyloid.

Distribution: Known from a single site within the range of the northern spotted owl: **OREGON**, **Josephine** Co., Siskiyou National Forest, at saddle near Chinaman Hat. Also known from Idaho.

Substrate and habitat: Found in association with the roots of *Pseudotsuga menziesii* and scattered *Pinus lambertiana* at 1,100 m elevation.

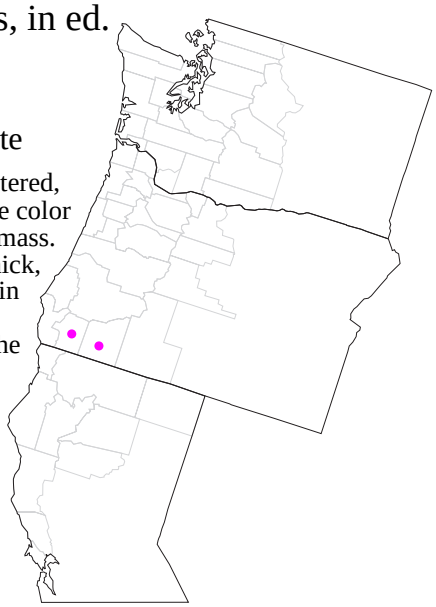
Season: Fruits in June and September.

Reference: Smith, A.H., and Zeller, S.M. 1966. A preliminary account of the North American species of *Rhizopogon*. Mem. New York Bot. Gard. 14:1-177.

No photograph available

Rhizopogon ellipsosporus Trappe, Cast. & Amaranthus, in ed.

ROD name *Alpova sp. nov.* #Trappe 9730



Family Boletaceae **Morphological Habit** sequestrate

Description: **Sporocarps** up to 15 x 24 mm, subglobose, brown with scattered, appressed, concolorous rhizomorphs. **Gleba** loculate, pale yellow-brown, the color a combination of the white to brown trama and the pale brown-yellow spore mass. **Columella** absent. **Odor and taste** not recorded. **Peridium** 120-160 µm thick, of appressed-interwoven, hyaline to pale yellow, thin-walled hyphae 3-4 µm in diam, many cells inflated to 4-6 µm in diam, with abundant, extracellular deposits of amorphous yellow-brown pigment in KOH, in Melzer's reagent the pigment orange-brown. **Trama** with a central strand of loosely interwoven, hyaline hyphae 2-3 µm in diam with gelatinous-thickened, glassy-appearing walls, the broad zones between the central strand and locule margins of similar but tightly interwoven hyphae that diverge to form a filamentous subhymenium. **Basidia** thin-walled, clavate, 12-24 x 4-10 µm. **Brachybasidioles** ellipsoid, hyaline 13-20 (-30) x 8-11 (-20) µm with walls gelatinous-thickened up to 5 µm. **Clamp connections** absent. **Spores** ellipsoid to obovoid or occasionally irregular, (4-) 4.5-6 x 3-4 µm, smooth, thin-walled, sterigmal attachment ± 1 µm broad, in KOH hyaline singly and brown-yellow in mass, inamyloid, slightly cyanophilic.

Distinguishing Features: Characterized within *Rhizopogon* by short, broad spores.

Distribution: Endemic to Oregon. Known from a two sites within the range of the northern spotted owl: **OREGON**, **Jackson Co.,** Bureau of Land Management, Medford District, above Cantrell-Buckley Park; **Josephine** Co., Siskiyou National Forest, on spur road off Rd. 2800.

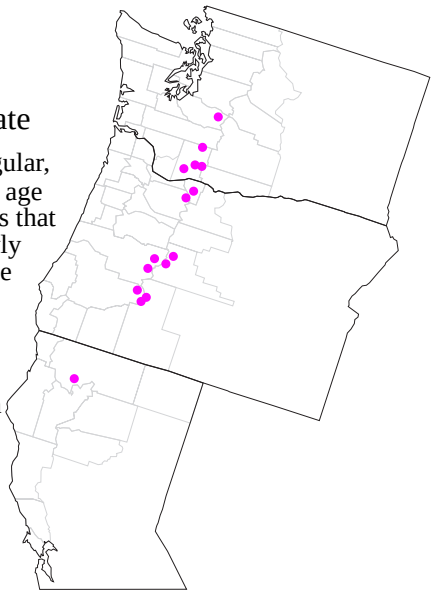
Substrate and habitat: Found in association with the roots of *Pseudotsuga menziesii* and scattered *Pinus lambertiana* at 850 m elevation.

Season: Fruits in October.

Reference: Trappe, J.M., and Castellano, M.A. 1999. Some new Ascomycota and Basidiomycota associated with the Northwest Forest Plan. Mycotaxon (in press).

No Photograph Available

Rhizopogon evadens var. *subalpinus* A.H. Smith



ROD name *Rhizopogon evadens* var. *subalpinus*

Family Boletaceae **Morphological Habit** sequestrate

Description: **Sporocarps** 10-30 mm in diam, globose, subglobose or irregular, white when fresh, fibrillose under a lens, staining ochraceous and then red, in age yellow-brown, with appressed rhizomorphs over the surface, in age specimens that have remained uninjured are merely dingy pallid; KOH dark red, ETOH slowly pink-brown and FSW distinctly olive. **Odor** indistinct. **Gleba** loculate, white becoming pale and then darker olivaceous. **Columella** absent. **Peridium** somewhat separable, when cut at first pallid but soon red, of appressed-interwoven hyphae 4-12 µm in diam, many scattered inflated cells present in the lower portion, pink next to gleba on fresh sections mounted in KOH, when sections of dried material are revived in KOH the layer is evenly brown with numerous amorphous pigment deposits. **Trama** of hyaline, refractive, gelatinous hyphae. **Subhymenium** cellular. **Basidia** 6-8 spored, subcylindric, hyaline, thin-walled. **Basidioles** 6-12 µm broad, subglobose to oval, thin-walled. **Cystidia** absent. **Clamp connections** absent. **Spores** narrowly oblong, 6.5-7.5 x 2 µm, smooth, in KOH hyaline singly and in mass, inamyloid, thin-walled.

Distinguishing Features: Characterized by yellow-brown peridium that stains red when handled, the small narrow spores, and the inflated cells in the lower portion of the peridium.

Distribution: Known from 15 sites within the range of the northern spotted owl: **CALIFORNIA**, **Siskiyou** Co., Klamath National Forest, Deadfall Meadows; **OREGON**, **Clackamas** Co., Mount Hood National Forest, Still Creek campground; **Deschutes** Co., Deschutes National Forest, Soap Creek; Deschutes National Forest, Wickiup Plains; **Douglas** Co., Umpqua National Forest, Cascade Pass; Umpqua National Forest, Windigo Pass; **Hood River** Co., Mount Hood National Forest, Tillie Jane campground; **Klamath** Co., Winema National Forest, Miller Lake, Digit Point campground; **Lane** Co., Willamette National Forest, 1 km north of Waldo Lake; Willamette National Forest, The Potholes; **WASHINGTON**, **Pierce** Co., Mount Baker-Snoqualmie National Forest, northeast slope of Sun Top Mountain; **Skamania** Co., Gifford Pinchot National Forest, Indian Prairie; Gifford Pinchot National Forest, Juniper Peak; Gifford Pinchot National Forest, Peterson Prairie; Gifford Pinchot National Forest, Trapper Creek Wilderness Area. Also known from Idaho.

Substrate and habitat: Usually found in association with the roots of *Tsuga mertensiana* or *Abies* spp. from 1250 to 2,350 m elevation.

Season: Fruits from August through October.

Reference: Smith, A.H., and Zeller, S.M. 1966. A preliminary account of the North American species of *Rhizopogon*. Mem. New York Bot. Gard. 14:1-177.

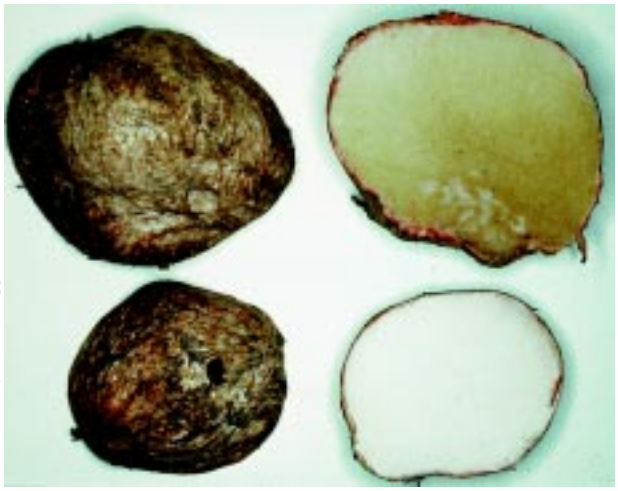
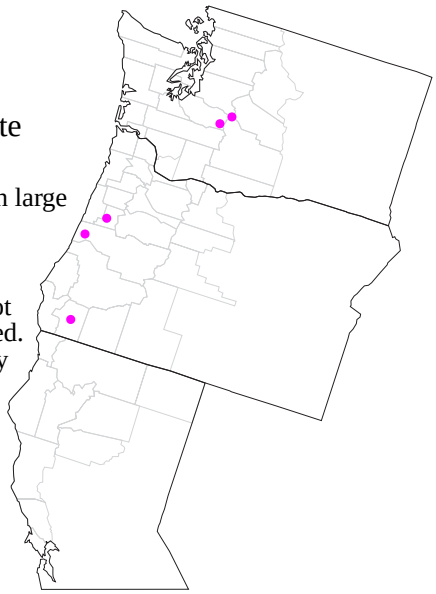


Photo courtesy of J.M. Trappe

Rhizopogon exiguus Zeller

ROD name *Rhizopogon exiguus*

Family Boletaceae **Morphological Habit** sequestrate



Description: **Sporocarps** 2-10 mm broad, globose to subglobose, lobed in large specimens, white with ochraceous mottling, becoming brown, fibrils scanty above, rhizomorphic below. **Gleba** loculate, white then brown. **Odor** farinaceous. **Peridium** of compactly interwoven hyphae in mass bright red-brown in KOH, at the exterior with yellow, loosely interwoven hyphae but not forming a distinct epicutis, hyphae thin-walled or walls very slightly thickened. **Trama** of hyaline, refractive, subparallel to interwoven hyphae, not obviously gelatinous. **Subhymenium** of branched filaments. **Basidia** 20-40 x 6-7.5 µm, narrowly clavate, walls may be thickened slightly as well as colored pale cinnamon in KOH. **Basidioles** 14-20 x 7-10 µm, hyaline, thin-walled, nongelatinous. **Cystidia** absent. **Clamp connections** absent. **Spores** oval to ellipsoid, base truncate from broad basal scar, 7-8 x 5-5.5 µm, yellow singly, red-brown in mass, inamyloid, wall smooth and slightly thickened.

Distinguishing Features: Characterized by a farinaceous odor, long basidia, the oval to ellipsoid, red-brown spores and the bright red-brown peridium in KOH.

Distribution: Endemic to Oregon and Washington. Known from five sites within the range of the northern spotted owl: **OREGON**, **Benton** Co., Siuslaw National Forest, Marys Peak; **Josephine** Co., Siskiyou National Forest, Waters Creek; **Lane** Co., approximately 1.6 km south of Mapleton; **WASHINGTON**, **Pierce** Co., Mount Baker-Snoqualmie National Forest, Silver Springs campground; **Kittitas** Co., Mount Baker-Snoqualmie National Forest, just east of Naches Pass.

Substrate and habitat: Found in association with the roots of *Pseudotsuga menziesii* and *Tsuga heterophylla* at 950 m elevation.

Season: Fruits in March, August, September, and November.

Reference: Zeller, S.M. 1939. New and noteworthy Gasteromycetes. Mycologia 31:1-32.

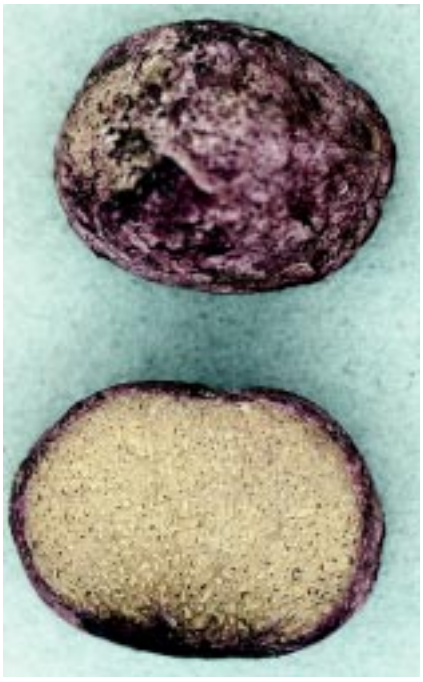
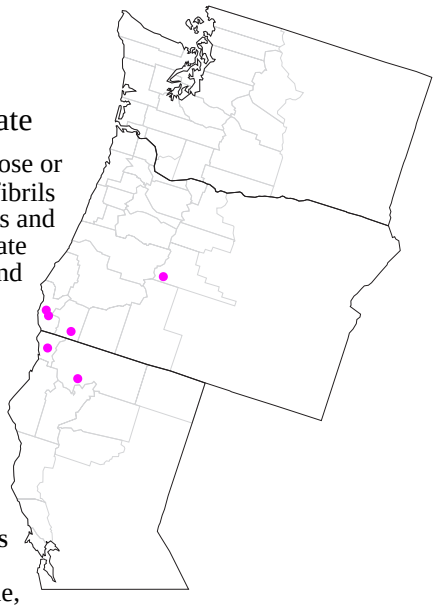


Photo courtesy of M.A. Castellano

Rhizopogon flavofibrillosus A.H. Smith



ROD name *Rhizopogon flavofibrillosus*

Family Boletaceae **Morphological Habit** sequestrate

Description: **Sporocarps** 3-5.5 2.2-5.5 cm, globose to depressed-subglobose or irregular, pallid when very young but soon overlaid with pale brown-yellow fibrils and rhizomorphs, at maturity variously colored, green-yellow over some areas and rose tinted over others but remaining pallid in the most protected places, virgate from appressed fibrils, attached by a basal cluster of rhizomorphs which extend up toward the surface; KOH on fresh peridium dull purple-red, FSW slowly pale olivaceous, ETOH negative. **Gleba** loculate, white becoming pale olivaceous. **Columella** absent. **Peridial epicutis** in the form of a trichodermium of short branched hyphae with end cells 26-40 x 5-9 µm and subcylindric to clavate, hyaline and thin-walled. **Peridial subcutis** of appressed, parallel to interwoven hyphae, red in KOH from dissolved pigment, some encrusting pigment present on surface or near it; scattered groups of enlarged cells present. **Trama** of nongelatinous, refractive, hyaline, subparallel to interwoven hyphae 2-4 µm in diam. **Subhymenium** reduced. **Basidia** 6-spored, 16-20 x 6-7 µm, hyaline, thin-walled. **Basidioles** resembling basidia. **Clamp connections** absent. **Spores** narrowly elliptic to nearly oblong, 5.5-6.5 (-7) x 2.5-2.8 µm, smooth, thin-walled, in KOH hyaline, inamyloid.

Distinguishing Features: Characterized by the yellow peridium that stains dull purple-red in KOH and the spores that are narrowly ellipsoid to nearly oblong.

Distribution: Known from six sites within the range of the northern spotted owl: **CALIFORNIA**, **Del Norte Co.,** Six Rivers National Forest, junction of Rd. 15 and Rd. 13N27; **Siskiyou** Co., Klamath National Forest, Deadfall Meadows; **OREGON**, **Curry** Co., Siskiyou National Forest, LTEP study, Pistol River block, control plot; Siskiyou National Forest, LTEP study, Fairview Block, LSLW plot; **Deschutes** Co., Deschutes National Forest, Cultus Lake, along southeast side of Rd. 4630; **Josephine** Co., Siskiyou National Forest, on Illinois Valley rd. across from Rd. 011. Also known from Idaho, Channel Islands National Park, California and Montana. Not known from Washington.

Substrate and habitat: Found in association with the roots of various Pinaceae, including *Abies concolor, A. lasiocarpa, Picea engelmannii*, *Pinus attentuata, P. contorta, P. lambertiana, P. muricata*, or *Pseudotsuga menziesii* from 950 to 2350 m elevation.

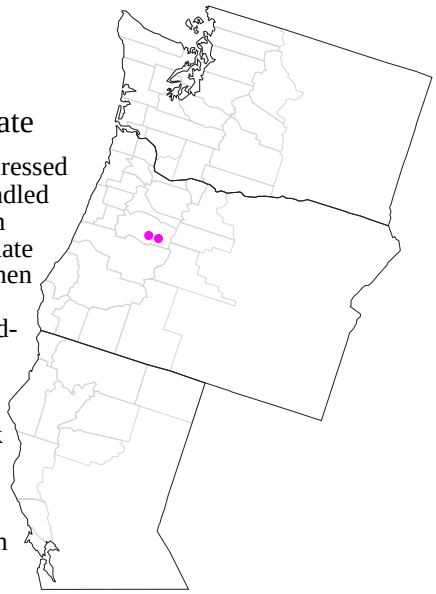
Season: Fruits from July through November.

Reference: Smith, A.H., and Zeller, S.M. 1966. A preliminary account of the North American species of *Rhizopogon*. Mem. New York Bot. Gard. 14:1-177.

Photo courtesy of J.M. Trappe

Rhizopogon inquinatus A.H. Smith

ROD name *Rhizopogon inquinatus*



Family Boletaceae **Morphological Habit** sequestrate

Description: **Sporocarps** about 2 cm in diam, globose to subglobose, appressed fibrillose when fresh, white at first, on exposure to air pale tan and where handled slowly staining inky-fuscous but with an intervening red stage; KOH red then fuscous-black, FSW olivaceous but finally black. **Odor** absent. **Gleba** loculate to labyrinthform, olive, when cut soon becoming olive-brown to black but when dried dark olivaceous. **Columella** absent. **Peridium** of loosely interwoven, hyaline, thin-walled hyphae 3-5 µm in diam, as revived in KOH with dark red-brown granules of amorphous pigment, in Melzer's reagent, (both fresh and dried) with amyloid globules up to 30 µm or more in diam, no large inflated cells present. **Trama** of gelatinous, branched, interwoven hyphae 3-5 µm in diam. **Subhymenium** of gelatinous-filamentous branches extending to a weak cellular region below hymenium. **Basidia** 4-6- spored. **Basidioles** hyaline, thin-walled, subgelatinous, 6-9 µm in diam. **Clamp connections** absent. **Spores** elliptic to oval and with a distinct cup-like truncation at base, 6.5-7.5 (-8) x 3-3.5 µm, smooth, thin-walled, in KOH dingy yellow singly, red-brown in mass, inamyloid.

Distinguishing Features: Characterized by the fuscus stains on the peridium and the large amyloid globules in the peridium.

Distribution: Known from two sites within the range of the northern spotted owl: **OREGON**, **Linn** Co., Willamette National Forest, Longbow campground; Willamette National Forest, Tombstone Pass. Also known from Idaho. Not known from California or Washington.

Substrate and habitat: Found in association with the roots of *Pinus jeffreyi*, *Pseudotsuga menziesii* and *Tsuga heterophylla* from 500 to 1,400 m elevation.

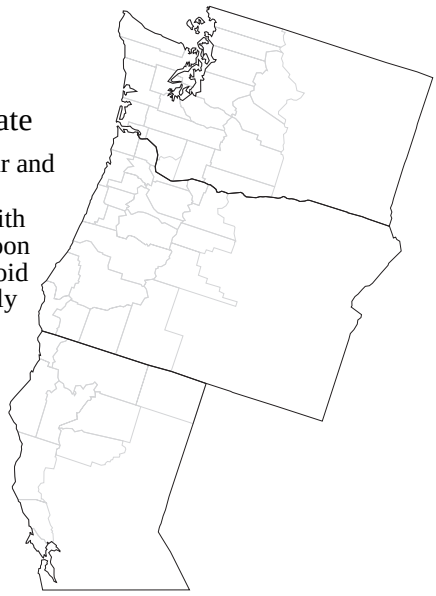
Season: Fruits in September and October.

Reference: Smith, A.H., and Zeller, S.M. 1966. A preliminary account of the North American species of *Rhizopogon*. Mem. New York Bot. Gard. 14:1-177.

No photograph available

Rhizopogon parksii A.H. Smith

ROD name *Rhizopogon sp. nov.* #Trappe 1692 & 1698



Family Boletaceae **Morphological Habit** sequestrate

Description: **Sporocarps** up to 10-40 mm in diam, subglobose to irregular and lobed, felty, in youth white, staining pink to violet where bruised, with age developing an covering of dark hyphae, at maturity dark gray to dark olive with brown to brown-black areas overlying sordid white. **Gleba** white in youth, soon becoming gray to olive, at maturity dark olive-gray to dark olive. **Odor** fungoid to pungent. **Taste** not distinctive. **Peridium** with an epicutis of brown, loosely interwoven hyphae with thin to somewhat thickened walls, flagellate hyphal ends often common, in water or Melzer's reagent with scattered to abundant black granules that dissolve in KOH to form a green fluid; subcutis a relatively thick layer of interwoven, hyaline, thin-walled hyphae, the layer pink to red in KOH and often with red to orange amorphous debris. **Trama** of interwoven hyphae with walls that become gelatinous-thickened at maturity. **Subhymenium** cellular. **Basidia** hyaline, 14-16 x 4-6 µm. **Clamp connections** lacking. **Spores** ellipsoid to ovoid, 5-7 x 2.5-3 µm, smooth, hyaline, thin-walled.

Distinguishing Features: Characterized characterized by its dark olive gleba, distinct reaction of the peridium to bruising, and its relatively short spores.

Distribution: Known from literally hundreds of locations in northern California, western Oregon, and western Washington and into British Columbia. It occurs from sea level to high elevation.

Substrate and habitat: Usually found in small or large groups in duff under *Pseudotsuga menziesii* forests.

Season: Fruits in August through December.

Reference: Smith, A.H., and Zeller, S.M. 1966. A preliminary account of the North American species of *Rhizopogon*. Mem. New York Bot. Gard. 14:1-177.

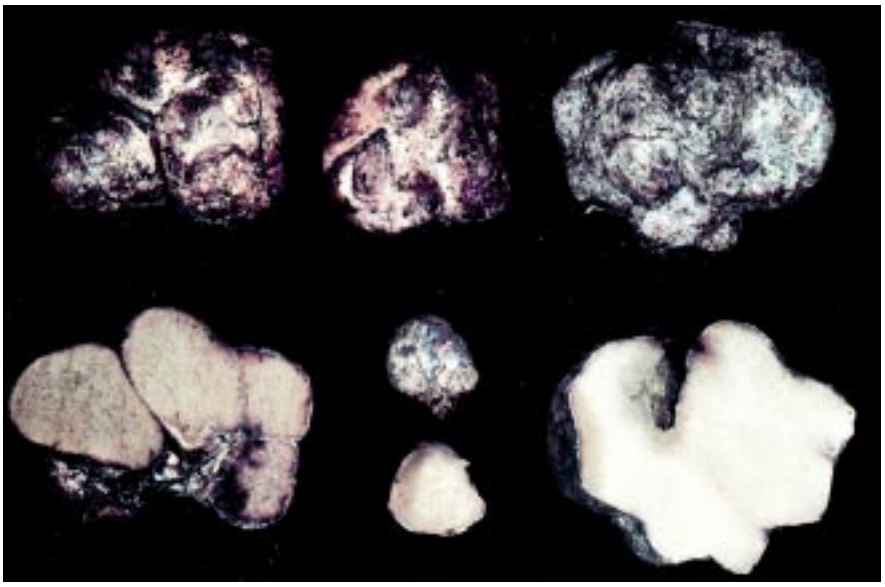
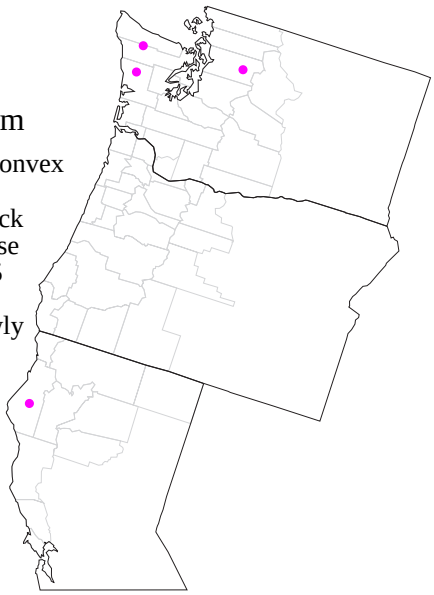


Photo courtesy of J.M. Trappe

Rhodocybe nitida (Quélet) Baroni & Largent, in ed.

ROD name *Entoloma nitidum*



Family Entolomataceae **Morphological Habit** mushroom

Description: **Cap** 20-45 mm diam, conic, expanding with age to broadly convex with a conic umbo or broadly campanulate, surface smooth, shiny, radially appressed-fibrillose, not pellucid-striate, dark blue or blue-black to nearly black overall, fading only slightly in age. **Gills** nearly free to narrowly adnate, close to crowded, broad, buff or dingy white at first, then pink. **Stem** 30-85 x 2.5-5 mm, cylindric or slightly tapering downward, sometimes almost rooting, longitudinally fibrillose-striate, sometimes twisted, dry, shiny, solid or narrowly fistulose, dark blue to blue-black, base white or dingy yellow. **Odor** slightly farinaceous or raphanoid. **Taste** mild. **Pileipellis** a thin ixocutis of repent, cylindric hyphae 2.5-6 µm in diam, densely entangled and embedded in a thin, gelatinous matrix. **Hypodermium** of inflated cells 25-60 x 20-25 µm. **Stipitipellis** of repent, parallel hyphae. **Basidia** 4-spored. **Cystidia** absent. **Clamp connections** present. **Spores** subisodiametric, 6-8 angled in side view but angles rounded and almost nodulose, angled in end view, 6.5-9 x 6.5-7.5 µm, deep pink to pink-brown spore print.

Distinguishing Features: Characterized by a moderately large, broadly campanulate, shiny, nonstriate cap colored dark blue to almost black, a close, broad, pallid gills, a long and slender, dark blue, fibrillose-striate stem, subisodiametric, angled-nodulose, pink spores, lack of cystidia, and a thin pileipellis of densely entangled, subgelatinized hyphae. *Rhodocybe trachyspora* var. *purpureoviolacea* differs in forming a cap that is distinctly translucent-striate when moist and colored purple-gray or dark brown-gray with purple tints and typically fades to shades of brown, lacks a farinaceous or raphanoid odor, and has a pileipellis of loosely interwoven, gelatinized hyphae. *Leptonia carnea* is macromorphologically nearly indistinguishable from *R. nitida* but differs in forming much larger and less nodulose spores (8.8-13.3 x 6-10.4 µm), and a stipitipellis with clusters of loosely entangled to interwoven hyphae. Personal communications with Drs. David Largent and Tim Baroni revealed that this taxon belongs in *Rhodocybe* and they intend to make the formal transfer in the near future.

Distribution: Known from four sites within the range of the northern spotted owl: **CALIFORNIA, Humboldt Co.,** South Fork Eel Watershed; **WASHINGTON**, **Grays Harbor** Co., Olympic National Forest, Quinault Research Natural Area; **Jefferson** Co., Olympic National Park, Hoh River; **Snohomish** Co., Mount Baker-Snoqualmie National Forest, Barlow Pass. Also known from Europe.

Substrate and habitat: Usually found as single sporocarps or in small groups in duff under conifer or mixed conifer-hardwood forests.

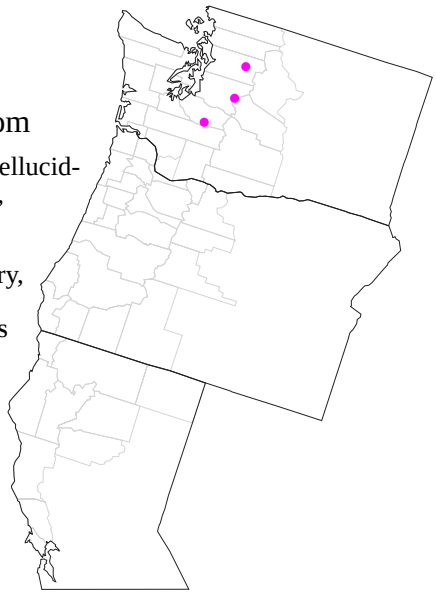
Season: Fruits in July through November.

References: Quélet, L. 1883. Quelques espéces critiques ou nouvelles de la flore mycologique de France. Assoc. Franç. Avan. Sci. (La Rochelle, 1882). 1:387-412. Quélet, L. 1886. Enchridion fungorum in europa media et præsertim in Gallia vigentium. Lutatiae, 264 p.

Photos courtesy of T. Baroni

Rhodocybe speciosa Lennox ex Baroni

ROD name *Rhodocybe speciosa*



Family Entolomataceae **Morphological Habit** mushroom

Description: **Cap** 15-40 mm in diam, convex to nearly plane in age, not pellucid-striate, surface dry, glabrous or appearing somewhat powdery, hygrophanous, uniformly tan or honey brown, fading with moisture loss to pale tan. **Gills** sinuate, horizontal, crowded, broad, white but becoming pink to pale pink-orange. **Stem** 30-45 x 3-8 mm, cylindric, apex prunose, central portion silvery, fibrillose-streaked, base with matted white mycelium, pale yellow to pale orange above, base slightly darker. **Odor and taste** farinaceous. **Pileipellis** of repent, cylindric hyphae 3-14 µm in diam, with procumbent versiform pilocystidia 18-65 x 8-14 µm, cells hyaline, nonencrusted, nongelatinous. **Stipitipellis** of repent, parallel hyphae giving rise to clusters of erect, versiform caulocystidia 40-70 x 6.5-24 µm. **Basidia** 4-spored. **Clamp connections** present. **Spores** subglobose to obovoid, slightly angular and wrinkled in side view, angular in end view, 5.5-7 x 5-5.5 µm, pink to pink-brown spore print.

Distinguishing Features: Characterized by a tan colored, dry, nonstriate, convex cap, the pink, sinuate gills, a yellow-orange, fibrillose-streaked stem, the slightly wrinkled and angular pink spores, a lack of hymenial cystidia, the presence of procumbent pilocystidia, clamp connections, and habit on conifer wood. *Rhodocybe speciosa* may be confused in the field with several other pink-spored taxa, such as *Leptonia formosa* (Fr. : Fr.) Gillet, *Nolanea fructifragrans* Largent & Thiers, and *Nolanea cetrata* (Fr.) Kummer. All of the latter taxa differ from *R. speciosa*, however, in forming distinctly pellucid-striate caps when fresh and moist, in lacking clamp connections, and in having nonwrinkled, more strongly angular spores that are much larger (in the range 8-11 x 6-8.5 (-10) µm).

Distribution: Endemic to Washington. Known from three sites within the range of the northern spotted owl: **WASHINGTON**, **King** Co., Mount Baker-Snoqualmie National Forest, Denny Creek campground; **Pierce** Co., Mount Rainier National Park, Tahoma Creek; **Snohomish** Co., Mount Baker-Snoqualmie National Forest, Barlow Pass.

Substrate and habitat: Usually found in gregarious, caespitose clusters on rotten conifer wood at high elevation.

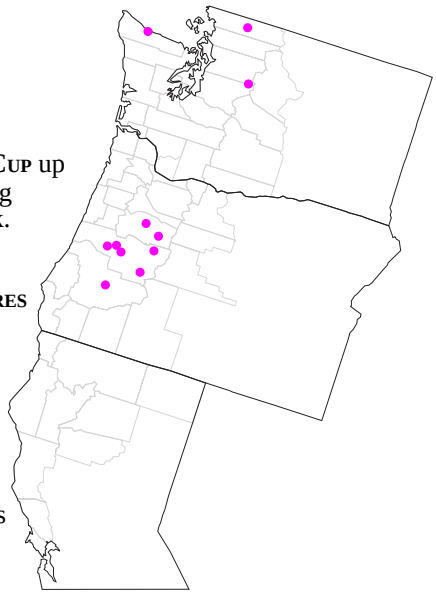
Season: Fruits in October and November.

Reference: Baroni, T. J. 1981. A revision of the genus *Rhodocybe* Maire (Agaricales). Beih. Nova Hedwigia 67:1-194.

Photo courtesy of T. Baroni

Sarcosoma latahense Paden & Tylutki

ROD name *Plectania latahensis*



Family Sarcosomataceae **Morphological Habit** cup

Description: **Sporocarps** turbinate to discoid, substipitate, apotheciate. **Cup** up to 75 mm broad, several mm thick when young but relatively plane, becoming discoid with age and thinner. **Hymenium** at first deep purple, becoming black. **Abhymenial surface** gray to black, clothed with an extensive tomentum of subhyaline to olivehyphae. **Paraphyses** with irregular apices, sometimes curved, slender, much branched. **Asci** operculate, inamyloid, 8-spored. **Spores** elliptical, 24-38 x 9-12 µm, smooth.

Distinguishing Features: Characterized by a substipitate, black cup with a tomentose abhymenial surface and lacking a highly gelatinized interior. *Sarcosoma mexicana* (Ellis & Holway) Paden & Tylutki is the common *Sarcosoma* in the Cascade and Coast Ranges from California to Washington. It has a well-developed and persistent gelatinous interior, spores that measure 23-34 x 10-14 µm, heavily pigmented hairs on the abhymenial surface of the apothecia and occurs from November into April.

Distribution: Also known from Idaho. Known from 10 sites within the range of the northern spotted owl: **OREGON, Douglas Co.,** Bureau of Land Management (BLM), Roseburg District, Thunder Bod; **Lane** Co., Willamette National Forest, Hemlock Butte; Willamette National Forest, Lowder Mountain trail; BLM, Eugene District, near Gosage Creek; BLM, Eugene District, 1.6 km north of Bear Mountain; BLM, Eugene District, east of Round Mountain; **Linn** Co., Willamette National Forest, Iron Mountain, .4 km up trail; BLM, Salem District, near Trout Creek; **WASHINGTON**, **Clallam** Co., Olympic National Park, Barnes Point; **King** Co., Mount Baker-Snoqualmie National Forest, Deception Falls; **Whatcom** Co., Mount Baker-Snoqualmie National Forest, intersection of road to Baker Lake and Rd. 3707. Another site with vague locality data was found at Oregon, Benton Co., Marys Peak. Not known from California.

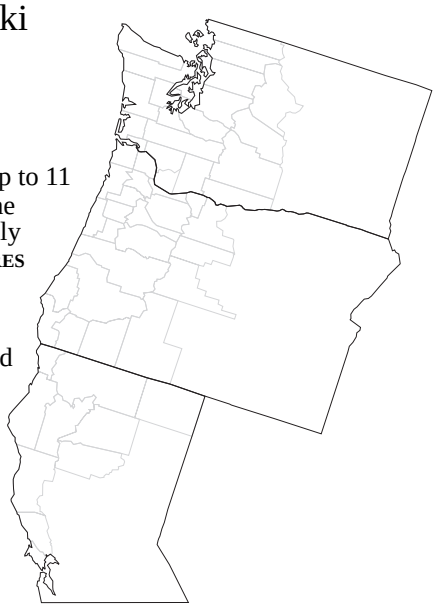
Substrate and habitat: Solitary to gregarious on or near decaying wood, or on litter and soil. Often fruiting near melting snowbanks in montane regions, also in low elevation conifer forests.

Season: Fruits from April through May.

Reference: Paden, J.W., and Tylutki, E.E. 1969. Idaho Discomycetes. II. Mycologia 61:683-693.

Photo courtesy of D. Arora

Sarcosoma mexicana (Ellis & Holway) Paden & Tylutki



ROD name *Sarcosoma mexicana*

Family Sarcosomataceae **Morphological Habit** cup

Description: **Sporocarps** wedge-shaped, substipitate, apotheciate. **Cup** up to 11 cm broad, many mm thick, with age becoming thinner from the collapse of the gelatinous interior. **Hymenium** black. **Abhymenial surface** black with heavily pigmented hairs. **Asci** curved at base, operculate, inamyloid, 8-spored. **Spores** elliptical, 23-26 x 10-14 µm, smooth.

Distinguishing Features: Characterized by a substipitate, black cup and distinctly gelatinized interior. *Sarcosoma mexicana* is the common *Sarcosoma* in the Cascade and Coast Ranges from northern California to central Oregon. It has a well-developed and persistent gelatinous interior, and smaller spores than *S. latahense*.

Distribution: Also known from Mexico and India. Known from 116 sites within the range of the northern spotted owl. It is particularly abundant in Oregon within **Benton Co., Douglas Co., Jackson Co., Lane Co.,** and **Linn Co.** This is probably an artifact of the intensity of survey for it by BLM personnel. It also occurs in four historic sites in Washington and a number of sites in northern **Mendocino Co**. as well as **Del Norte Co**. and **Siskiyou Co**. in northern California.

Substrate and habitat: Solitary to gregarious on or near decaying wood, or on litter and soil. Fruiting in conifer forests from low to high elevation.

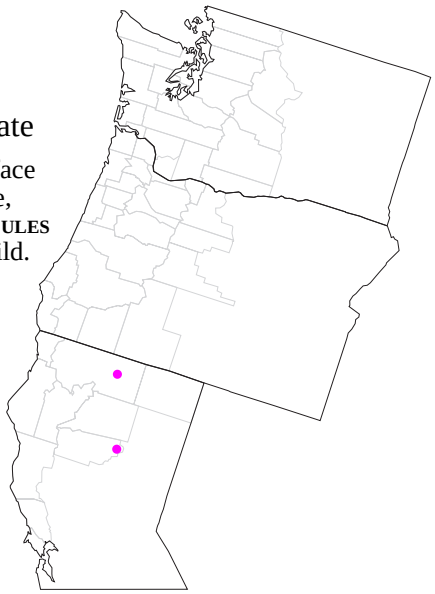
Season: Fruits from November through May.

Reference: Paden, J.W., and Tylutki, E.E. 1969. Idaho Discomycetes. II. Mycologia 61:683-693.

Photo courtesy of E. Butler

Photo courtesy of M.A. Castellano

Sedecula pulvinata Zeller



ROD name *Sedecula pulvinata*

Family Sedeculaceae **Morphological Habit** sequestrate

Description: **Sporocarps** pulvinate, up to 6 cm wide, up to 4 cm tall, surface smooth to granular with adherent soil, white to gray. **Gleba** coarsely loculate, black except for the white to gray trama becoming powdery at maturity. **Locules** labyrinthine, 1-12 x 1-3 mm, lined with powdery spores. **Odor and taste** mild. **Peridium** tough, leathery, 2-3 mm thick above, thin and almost evanescent below, margin of thicker peridium usually somewhat rolled under so as sometimes to elevate the basal or under side, composed of large cells with strongly gelatinized walls. **Trama** 1-2 mm thick, extends centipetally to unequal depths toward the base. **Basidia** narrow-clavate, 2-spored. **Sterigmata** about as long as the spores, slender. **Spores** ovoid to somewhat ellipsoid or irregular, usually very short-pedicelate, 23-26 x 13-16.2 µm, in KOH dark brown, inamyloid.

Distinguishing Features: Characterized by the large, brown, ellipsoid to irregular spores, powdery gleba at maturity, and pulvinate sporocarp.

Distribution: Known from a single site within the range of the northern spotted owl: **CALIFORNIA**, **Siskiyou** Co., Mount Shasta. Also known from Lassen Volcanic National Park, Lassen National Forest and Sierra National Forest in California, and from Colorado and Idaho.

Substrate and habitat: Found in association with the roots of *Abies concolor, A. lasiocarpa, A. magnifica*, *Picea engelmannii*, and *Pinus contorta* above 2,000 m elevation.

Season: Fruits from June through September.

Reference: Zeller, S.M. 1941. Further notes on fungi. Mycologia 33:196-214.

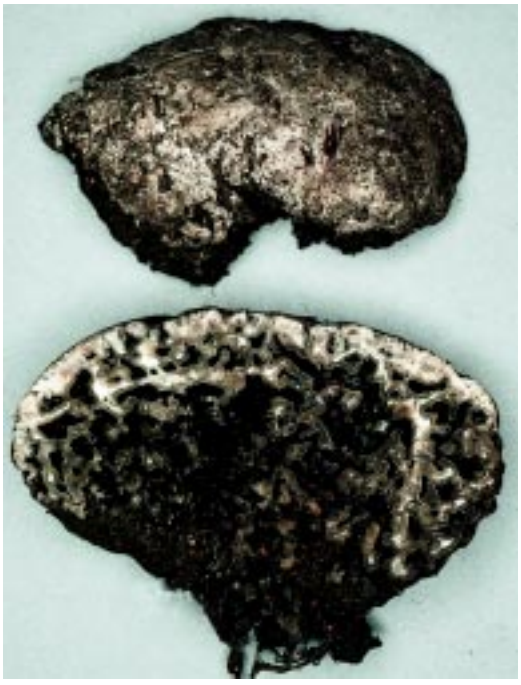
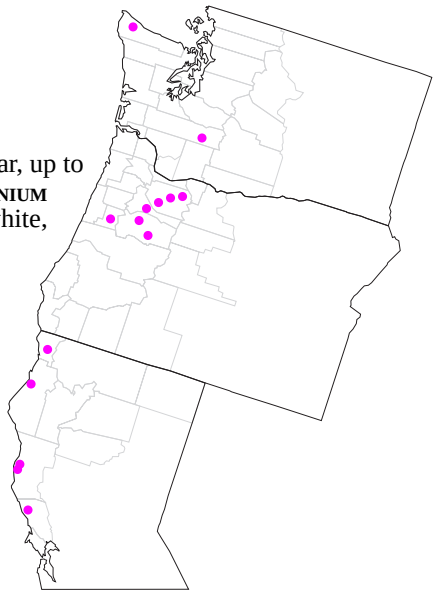


Photo courtesy of M.A. Castellano

Sowerbyella rhenana (Fuckel) J. Moravec

ROD name *Aleuria rhenana*



Family Otidiaceae **Morphological Habit** cup

Description: **Sporocarps** stipitate, apotheciate. Cup compressed to regular, up to 10-25 mm in diam, shallowly broadly cupulate to nearly plane in age. **Hymenium** bright orange to yellow-orange, even. **Abhymenial surface** pale orange to white, typically with hyaline, appressed, inconspicuous hairs. **Margin** incurved becoming straight to flaring in age, sometimes cracking in age, lacking prominent hairs. **Stem** tapered, up to 5-20 mm long, up to 2-5 mm thick , concolorous with abhymenial surface, also invested with hairs, often several stems together. **Paraphyses** curved or straight, containing orange granules, fleetingly green when mounted in Melzer's reagent. **Asci** operculate, 8-spored, thin-walled. **Spores** ellipsoid, 18-23.6 (-26.3) x 9-11.8 µm without ornamentation, ornamented with a reticulum, the meshes 1.5-4 µm broad, mostly 6-sided, ridges to 1.5 µm tall, apiculus absent.

Distinguishing Features: Characterized by a stipitate cup with an orange to yellow-orange hymenium and pale orange to white underside and stem, and guttulate, reticulate spores that lack an apiculus. Although often confused with *Aleuria* spp., the combination of a stem and nonapiculate spores makes it quite distinctive. Other *Sowerbyella* species share the yellow or yellow-orange or orange stipitate, cup sporocarp; however, they have smaller spores and have less reticulation on the spores.

Distribution: Known from 14 sites within the range of the northern spotted owl: **CALIFORNIA**, **Del Norte** Co., Six Rivers National Forest, Big Flat campgound; **Humboldt** Co., Redwood National Park, Lady Bird Johnson Grove; **Mendocino** Co., Jackson State Forest, .8 km from Little Lake Rd., alongside Rd. 409; Van Damme State Park; **Sonoma** Co., Salt Point State Park; **OREGON**, **Benton Co.,** Siuslaw National Forest, along Rd. 3405; **Clackamas** Co., near Rhododendron; Mount Hood National Forest, near south fork of Eagle Creek; Bureau of Land Management (BLM), Salem District, 8.3 km south of Estacada; **Linn** Co., BLM, Salem District, east of Crabtree on Rd. 226; Willamette National Forest, Moose Ridge; **Marion** Co., BLM, Salem District, Sinker Creek; **WASHINGTON**, **Clallam** Co., near Forks, Bear Creek campground; **Lewis** Co., Gifford Pinchot National Forest, near Cispus Environmental Learning Center. Also known from Europe and Japan.

Substrate and habitat: Fruits in scattered to gregarious or caespitose groups in duff of moist, relatively undisturbed, older conifer forests. One collection was noted to occur under *Lithocarpus* sp.

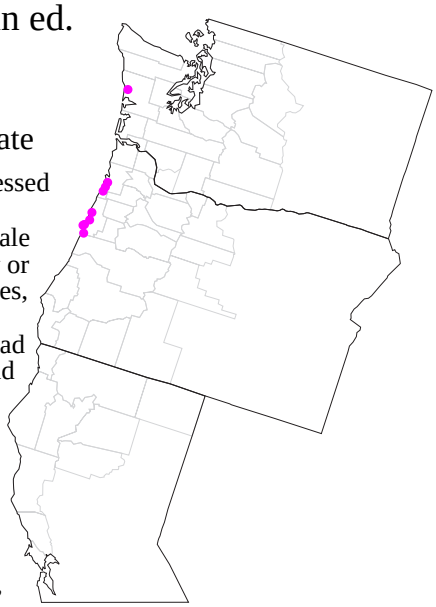
Season: Fruits October through December.

References: Moravec, J. 1986. A new species and two new combinations in the genus *Sowerbyella*. Mycol. Helv. 2:93-102. Moravec, J. 1988. A key to the species of *Sowerbyella* (Discomycetes, Pezizales). Ceská Mykol. 42:193-199.

Photo courtesy of T. O'Dell

Photo courtesy of G.L. Barron

Thaxterogaster pavelekii Trappe, Cast. & Rawlinson, in ed.



ROD name *Thaxterogaster sp. nov.* #Trappe 4867, 6242, 7427, 7962, 8520

Family Cortinariaceae **Morphological Habit** sequestrate

Description: **Cap** 7-40 x 12-35 mm, convex to turbinate, the margin appressed against protruding base or seceded up to a mm to expose underlying locules, surface thickly slimy-viscid when wet, shiny when dry, pale yellow-gray to pale brown-gray on disc, towards the margin concolorous or grading to olive-gray or brown-gray, often radially streaked. **Gleba** with radiate-labyrinthiform locules, dark red-brown to dark brown, with a percurrent stem-columella that often protrudes beyond the sporocarp base. **Columella** columnar and 1-2 mm broad or often greatly enlarged near the base, white to gray, in wet weather subviscid or with a viscid zone where the cap margin is appressed, the flesh white throughout or in age becoming brown-yellow below. **Odor** faint or sometimes musty-raphanoid to sweet-medicinal. **Taste** indistinct. **Peridium** a tangled ixotrichodermium of thin-walled, hyaline hyphae 3-4 µm in diam, these becoming appressed to the surface on dried material. **Flesh** of loosely interwoven, thin-walled, hyaline hyphae 3-10 µm in diam, the cells mostly inflated to 5-20 (-30) µm in diam, many isodiametric. **Trama** of subparallel, thin-walled, hyaline hyphae 3-6 µm in diam, some cells inflated up to 15 µm, infrequent brown-golden laticiferous hyphae present. **Subhymenium** of more or less isodiametric cells 5-15 (-20) µm in diam. **Basidia** hyaline to brown-golden, 30-40 x 9-11 µm, 2-4-spored. **Sterigmata** ± 5 x 1.5 µm. **Clamp connections** absent. **Spores** ellipsoid, 14-18 (-21) x (8-) 9-10 (-11) µm excluding the ornamentation of narrow lines and warts 0.1-0.5 (-1) µm tall and broad, sometimes nearly partially reticulate, length:width ratio 1.5-2, asymmetric appendage ±1 x 1.5 µm, spore wall ±1.5 µm thick, in KOH brown, inamyloid.

Distinguishing Features: Characterized by the pale yellow-gray to pale brown-gray sporocarp and narrow, warty, brown spores.

Distribution: Endemic to coastal forests in the Pacific Northwest. Known from 10 sites within the range of the northern spotted owl: **OREGON**, **Lincoln** Co., Siuslaw National Forest, Cape Perpetua, at top of auto tour; near Yachats; near Otter Rock; near Agate Beach; 100 meters north of Beachside State Park; **Tillamook** Co., Cape Lookout State Park, south of parking area; near junction of Tierra del Mar Rd. and Haystack Rock Rd.; 2.5 km north of Pacific City on Three Capes Loop; **WASHINGTON, Grays Harbor Co.,** Copalis Beach. Also known from vague locality in **Humboldt Co.,** California.

Substrate and habitat: Found in association with the roots of *Picea sitchensis* and *Pinus contorta* below 270 m elevation.

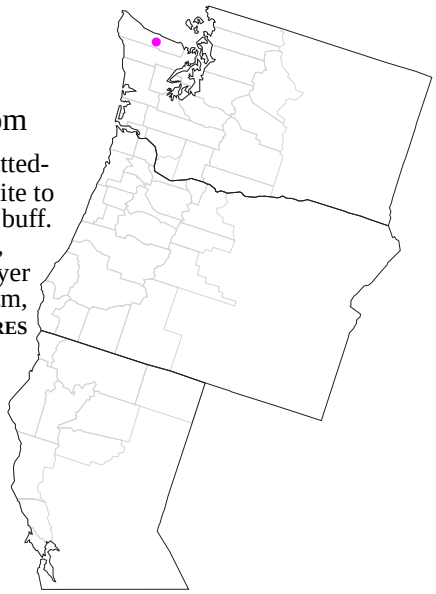
Season: Fruits from March through June, also November.

Reference: Trappe, J.M., and Castellano, M.A. 1999. Some new Ascomycota and Basidiomycota associated with the Northwest Forest Plan. Mycotaxon (in press).

Photo courtesy of M.A. Castellano

Tricholoma venenatum Atkinson

ROD name *Tricholoma venenatum*



Family Tricholomataceae **Morphological Habit** mushroom

Description: **Cap** 25-130 mm in diam, convex-umbonate, dry, densely matted-fibrillose over the center with scattered pale tan squamules elsewhere, off-white to pale tan. **Flesh** white or watery gray. **Gills** sinuate attached, white to ivory buff. **Stipe** 30-100 x 7-25 mm, equal to slightly clavate or bulbous, silky-fibrillose, overall pale buff. **Odor and taste** indistinct or farinaceous. **Pileipellis** a layer of hyaline to pale brown hyphae 2.5-9.5 µm in diam. **Basidia** 40-48 x 7-10 µm, clavate, hyaline. **Cheilocystidia** absent. **Clamp connections** present. **Spores** ellipsoid, 7.2-10.7 x 4.8-7.2, smooth, thin-walled, hyaline, inamyloid, white spore print.

Distinguishing Features: Characterized by its white spore print; dry, squamulose, pale tan cap; and white gills. *Tricholoma pardinum* and *T. huronense* also have squamulose caps. However, *T. pardinum* has a gray to gray-brown cap, has larger spores (8.6-9.5 x 5.7-6.7 µm), and has large sphaero-pedunculate, thin-walled, hymenial cystidia. *Tricholoma huronense* has a smoky gray cap often streaked pink on the margin, hymenial cystidia, and grows in association with hardwoods. *Tricholoma serratifolium* also is occasionally mistaken for *T. venenatum* due to its overall pale coloration, frequent brown tinges on the cap and occasional squamules on the cap. However it lacks clamp connections, has a bitter taste, broader spores, cheilocystidia, and in general a smoother cap surface.

Distribution: Known from a single site within the range of the northern spotted owl: **WASHINGTON**, **Clallam** Co., Olympic National Park, Olympic Hot Springs trail. Also known from the Sierra Nevada in California and Michigan. Not known from Oregon

Substrate and habitat: Found associated with roots of Pinaceae.

Season: Fruits in November.

Reference: Shanks, K.M. 1997. The Agaricales (Gilled Fungi) of California 11. Tricholomataceae II. Mad River Press, Eureka, CA. 54 p.

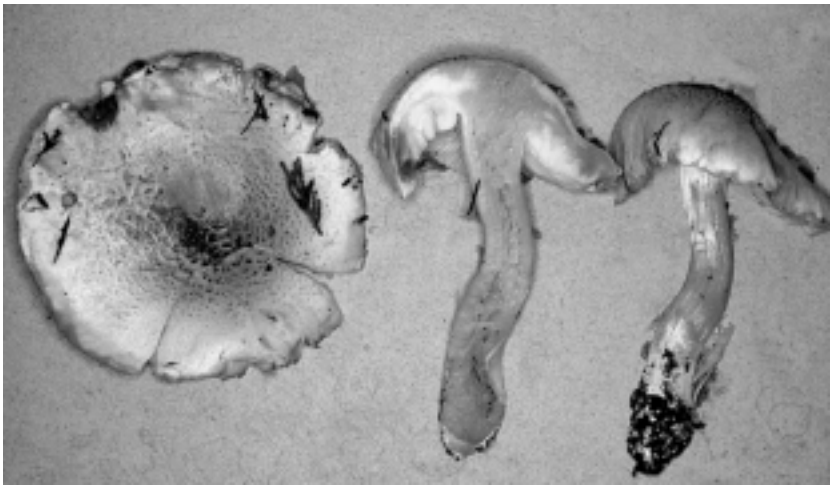
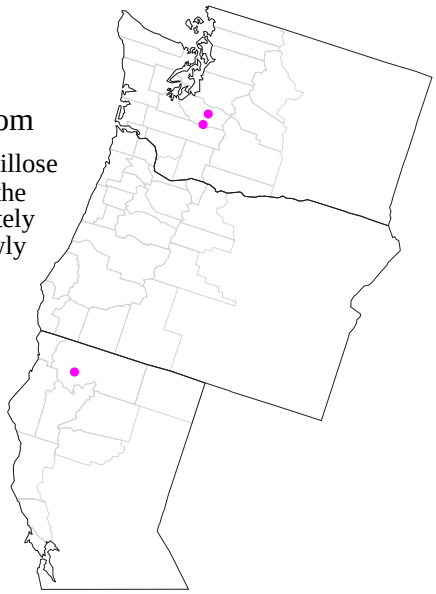


Photo courtesy of T. O'Dell

Tricholomopsis fulvescens A.H. Smith

ROD name *Tricholomopsis fulvescens*



Family Tricholomataceae **Morphological Habit** mushroom

Description: **Cap** 30-50 mm in diam, broadly convex, dry, appressed-fibrillose with the fibrils in fascicles near the margin, orange-yellow to yellow-tan on the disc with tawny fibrils, margin cream tan. **Gills** adnate, horizontal, moderately close, broad, pale yellow, drying red-brown. **Stem** 60-90 x 8-10 mm, narrowly clavate, hollow, dry, appressed-fibrillose, yellow-brown, darkening to rusty brown where handled. **Odor and taste** indistinct. **Pileipellis** a layer or lattice of tangled, yellow, thick-walled hyphae 3-8 µm in diam. **Basidia** 4-spored. **Cheilocystidia** abundant, 28-40 x 6-9 µm, clavate to fusoid-ventricose, hyaline. **Pleurocystidia** abundant, 50-80 x 6-9 µm, subcylindric to subfusoid, arising from the gill trama and not projecting very much above the hymenium. **Clamp connections** present. **Spores** broadly ellipsoid, 8-10 x 6-7 µm, smooth, inamyloid, white spore print.

Distinguishing Features: Characterized by yellow-orange cap with tawny fibrils, yellow lamellae, white spore print, a yellow-brown stem that darkens to rusty brown where handled, relatively large, broadly ellipsoid spores, relatively small, clavate cheilocystidia, abundant pleurocystidia, and thick-walled, yellow pileipellis cells. Similar to *T. flavissima* (A.H. Smith) Singer, which differs by its long, filamentous cheilocystidia (40-200 x 3-5 µm), having globose to subglobose spores, absence of pleurocystidia and having a stem that does not discolor rusty brown when handled.

Distribution: Known from three sites within the range of the northern spotted owl; **WASHINGTON**, **Pierce** Co., Mount Rainier National Park, lower Tahoma Creek; Mount Rainier National Park, Green Lake; **CALIFORNIA, Siskiyou Co.,** Klamath National Forest, Marble Mountain Wilderness, Stanishaw trail. Another collection without specific locality information is noted from **OREGON**, **Clackamas** Co., Mount Hood National Forest, along the Salmon River.

Substrate and habitat: Found solitary on decayed conifer wood above 1,000 m elevation.

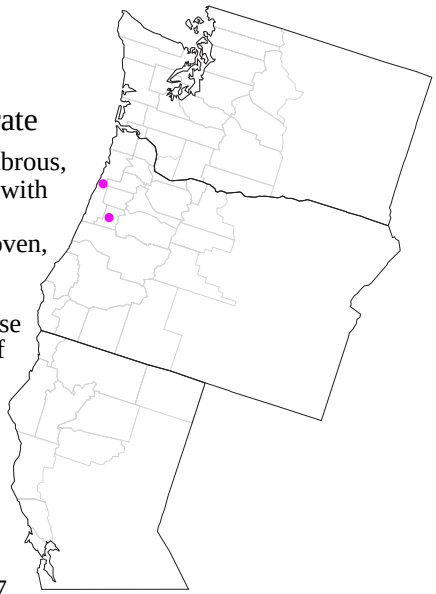
Season: Fruits in September and October.

Reference: Smith, A.H. 1960. *Tricholomopsis* (Agaricales) in the western hemisphere. Brittonia 12:41-70.

Photo courtesy of J. Ammirati

Tuber asa Tulasne & Tulasne

ROD name *Tuber sp. nov.* #Trappe 2302



Family Tuberaceae **Morphological Habit** sequestrate

Description: **Sporocarps** subglobose, convoluted, 10-15 mm in diam, glabrous, dark olive with white furrows and patches. **Gleba** dark gray-brown marbled with narrow, off-white veins. **Odor and taste** indistinct. **Peridium** olive, hygrophanous in cross section. **Peridial epicutis** 30-50 µm thick, of interwoven, pale yellow to yellow-brown hyphae 4-10 µm in diam, walls up to 1 µm in diam, many cells inflated up to 30 (-40) µm in diam, appears pseudoparenchymatous in places, other places with abundant, emergent, obtuse to tapered, bulbous, cystidioid or versiform hyphal tips. **Peridial subcutis** of tightly interwoven, hyaline, thin-walled hyphae 2-5 µm in diam, occasional cells inflated up to 10 µm in diam. **Trama** of tightly interwoven, hyaline, thin-walled hyphae 3-8 µm in diam, the cells not or only slightly inflated. **Paraphyses** absent. **Asci** ellipsoid to subglobose, 70-85 x 50-70 µm, thin-walled, hyaline, sessile or with a short stem up to 15 x 8 µm, inamyloid. **Spores** globose to subglobose, 1-4 per ascus, in 1-spored asci 36-45 x 35-40 µm in diam excluding ornamentation, in 2-spored asci 25-35 x 25-34 µm, in 3-spored asci 20-31 x 19-29 µm, in 4-spored asci 20-28 x 19-26 µm, brown, ornamentation an alveolate reticulum (2-) 3 (-4) µm tall, the alveolae with 4-7 sides and (4-) 5-7 (-9) across the spore, spore walls 2-3 µm thick.

Distinguishing Features: Characterized by the convoluted sporocarp which is dark olive with white furrows and the subglobose spores ornamented with a tall reticulum.

Distribution: Known from two sites within the range of the northern spotted owl: **OREGON**, **Benton**, Siuslaw National Forest, Woods Creek Rd. at watershed gate; **Tillamook** Co., Cascade Head Experimental Forest, at summit along old highway 101. Also known from France and Nebraska. Not known from California or Washington.

Substrate and habitat: Found in association with the roots of *Pseudotsuga menziesii* and *Tsuga heterophylla* at 170 to 500 m elevation in Oregon; *Pinus ponderosa* in Nebraska.

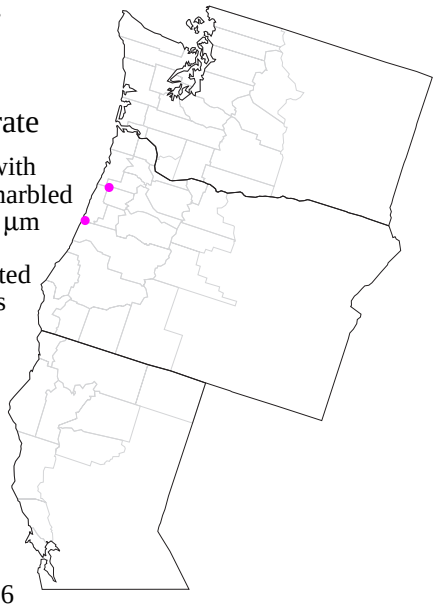
Season: Fruits in July and October.

Reference: Tulasne, L.R., and Tulasne, C. 1851. Fungi hypogaei. Histoire et monographie des champignons hypogés. Friedrich Klincksieck, Paris. 222 p.

No photograph available

Tuber pacificum Trappe, Castellano & Bushnell, in ed.

ROD name *Tuber sp. nov.* #Trappe 12493



Family Tuberaceae **Morphological Habit** sequestrate

Description: **Sporocarps** subglobose, convoluted, 6-9 x 4-9 mm, white with pale brown areas, shallowly furrowed, felty. **Gleba** brown to black-brown marbled with narrow, white veins. **Odor and taste** not recorded. **Peridium** 250-400 µm thick. **Peridial epicutis** 20-30 µm thick, of appressed to tangled, hyaline to pale yellow hyphae 2-5 µm in diam, walls up to 1 µm thick, many cells inflated to 8-10 µm in diam, appearing pseudoparenchymatous in places, other places with abundant, emergent, obtuse to tapered, bulbous, cystidioid or versiform hyphal tips. **Peridial subcutis** of tightly interwoven, hyaline, thin-walled hyphae 1.5-3 µm in diam. **Trama** of tightly interwoven, hyaline hyphae 2-5 µm in diam, occasional cells inflated up to 10 µm in diam, walls up to 1.5 µm thick, internal veins similar but of less tightly interwoven tissue. **Paraphyses** absent. **Asci** ellipsoid to subglobose, 70-85 x 55-70 µm, thin-walled in youth but at maturity the walls up to 2 µm thick, hyaline, sessile, inamyloid. **Spores** ellipsoid, 1-4 per ascus, in 1-spored asci 39-45 x 29-35 µm in diam excluding ornamentation, in 2-spored asci 36-43 x 28-32 µm, in 3-spored asci 31-35 x 20-26 µm, in 4-spored asci 23-35 x 16-26 µm; ornamentation an alveolate reticulum (2-) 3 (-4) µm tall, the alveolae with 5-6 sides and (4-) 6-10 along the spore length, spore walls 2-3 (-3.5) µm thick, brown.

Distinguishing Features: Differs from *Tuber rapaeodorum* Tul. & Tul. in lacking the erect, tapered, hyphal tips on peridial surface and the pseudoparenchymatous epicutis that characterize the latter. The peridium of *T. separans* Gilkey is minutely verrucose and regularly pseudoparenchymatous, in contrast to the smooth, largely prosenchymatous peridium of *T. pacificum.* The thick-walled asci of *T. pacificum* further distinguish if from the other two species.

Distribution: Endemic to Oregon. Known from two sites within the range of the northern spotted owl: **OREGON**, **Lane** Co., Siuslaw National Forest, Cummins Creek Wilderness Area, Cummins Creek trail; **Polk** Co., Van Duzer Corridor.

Substrate and habitat: Found in association with the roots of *Pseudotsuga menziesii* and *Tsuga heterophylla* at 235 m elevation.

Season: Fruits in February, June, and July.

Reference: Trappe, J.M., and Castellano, M.A. 1999. Some new Ascomycota and Basidiomycota associated with the Northwest Forest Plan. Mycotaxon (in press).

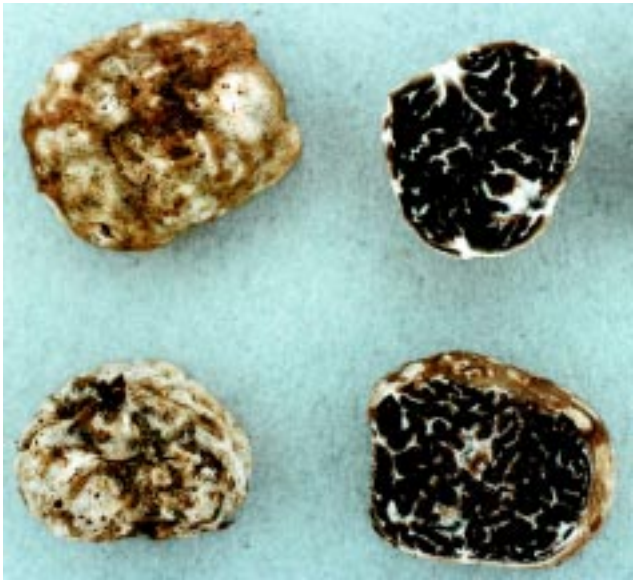
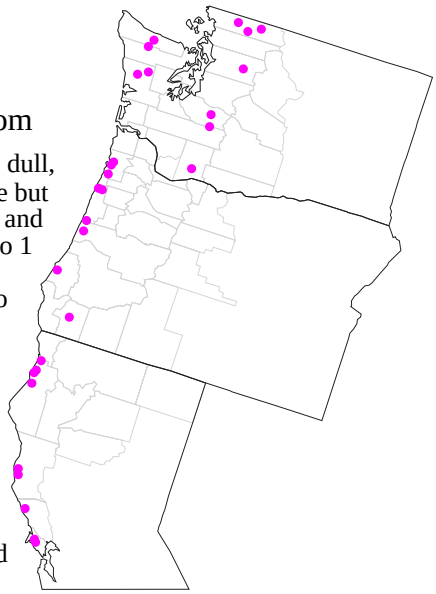


Photo courtesy of M.A. Castellano

Tylopilus porphyrosporus (Fries) A.H. Smith & Thiers



ROD name *Tylopilus pseudoscaber*

Family Boletaceae **Morphological Habit** mushroom

Description: **Cap** 60-150 mm in diam, convex to broadly convex, surface dull, dry, velutinous to tomentose, smooth, very dark brown to black. **Flesh** white but staining blue then pink in spots. **Tubes** 15-20 mm long, dark brown to black and bruising blue. **Tube mouths** dark brown to black and bruising similarly, up to 1 mm in diam. **Stem** 130-200 x 15-20 mm, cylindric to clavate, dull, dry, glabrous, longitudinally ridged and often reticulate at the apex, dark brown to black with a white base. **Odor** strong. **Taste** mild. **Pileipellis** a trichodermium. **Basidia** 4-spored. **Cystidia** abundant, 35-50 x 12-15 µm, fusoid-ventricose to mucronate, red-brown in KOH. **Clamp connections** absent. **Spores** subfusoid to subcylindric, 13.8-17.6 x 6-9.6 µm, asymmetrical, smooth, deep red-brown spore print.

Distinguishing Features: Characterized by a dry, velutinous, black to very dark brown cap, dark brown to black tubes and tube mouths, a dark brown, longitudinally ridged, smooth to reticulate stem with a white base, and flesh that stains blue.

Distribution: Endemic to the Pacific Northwest. Known from 28 sites within the range of the northern spotted owl: **CALIFORNIA**, **Humboldt** Co., near McKinleyville; Prairie Creek State Park; Patricks Point State Park, Big Lagoon County Park; **Marin** Co., Point Reyes National Seashore, Inverness Ridge; Tomales State Park; **Mendocino** Co., Little River; Jackson State Forest; **Sonoma** Co., Salt Point State Park; **OREGON**, **Coos** Co., Coos County Forest, Beaver Hill; **Josephine** Co., Siskiyou National Forest, Big Pine campground; **Lane** Co., Siuslaw National Forest, near Stilicoos River bridge; Neptune State Park; **Lincoln** Co., Van Duzer Corridor State Wayside; Siuslaw National Forest, Cape Perpetua; Siuslaw National Forest, Cascade Head Experimental Forest, Neskowin camp; Siuslaw National Forest, Cascade Head Experimental Forest, near headquarters; **Tillamook** Co., Siuslaw National Forest, junction of hwy 101 and Rd. 1861; Cape Meares State Park; Cape Lookout State Park; **WASHINGTON**, **Clallam** Co., Olympic National Park, Solduc Valley, Lovers Lane; Olmpic National Park, Solduc hot springs; **Grays Harbor** Co., Olympic National Park, Quinault Research Natural Area; **Pierce** Co., Mount Rainier National Park, entrance, Mount Rainier National Park, Green Lake; Mount Rainier National Park, lower Tahoma Creek; **Skamania** Co., Gifford Pinchot National Forest, Wind River valley, Government mineral springs; **Snohomish** Co., Mount Baker-Snoqualmie National Forest, Barlow Pass; **Whatcom** Co., North Cascades National Park, Chilliwack River, near cabin; Mount Baker-Snoqualmie National Forest, Boulder Creek trail.

Substrate and habitat: Solitary to scattered in soil, duff or on well-decomposed logs in association with the roots of *Picea sitchensis* and *Pseudotsuga menziesii* in coastal to mid-elevational forests.

Season: Fruits from August through December.

Reference: Wolfe, Jr., C.B. 1979. *Austroboletus* and *Tylopilus* subgenus *Porphyrellus* with emphasis on North American Taxa. Bibliotheca Mycologica 69:1-148.

Photo courtesy of G. Barron
Photo courtesy of S. Trudell

PHOTO ONLY AVAILABLE IN PRINTED VERSION

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English Equivalents	When you know:	Multiply by:	To find:
	micrometers (μm)	25400	inches
	millimeters (mm)	25.40	inches
	centimeters (cm)	2.540	inches
	meters (m)	3.281	feet

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Appendix 1

Helpful Hints to Working With the Synoptic Key to *Ramaria* Species

A synoptic key to the ROD-listed *Ramaria* species, in addition to a dichotomous key, is provided. Although learning to use a synoptic key requires patience and persistence, synoptic keys often are easier to use than dichotomous keys, particularly for the novice. Species identification with a synoptic key requires evaluating a sequence of characters to continually narrow the list of potential species, thereby allowing comparison of morphological similarities between species. Synoptic keys are easily expanded and less likely to lead the user astray than dichotomous keys (Castellano et al. 1989).

Each species in a synoptic key is assigned a number and arranged in alphabetical order. In addition to ROD-listed *Ramaria* species, a few additional *Ramaria* species have been included in our key to facilitate accurate identification of those on the ROD. The key is divided into two sections: macroscopic and microscopic characters. Each section contains numerous categories of characters; for example, stem, branch and flesh colors. Each character is followed by a list of numbers corresponding to *Ramaria* species with that character. The number is underlined if the character is variable and thus is found under more than one character state. Multiple tallies per character indicate a range of characters, or a character and its modifier, or weak characters that may be present or absent.

Ramaria species identification requires precise microscopic examination. To observe the necessary features, it is necessary to mount on a microscope slide a thin piece of sporocarp tissue in a drop of Melzer's reagent or KOH. Too thick a mount will result in frustration and unnecessary time spent focusing up and down through the material. A sharp razor blade is essential for achieving thin mounts, especially with fresh or dried gelatinized material. The ability to distinguish between similar characters microscopically, such as slightly rounded versus rod-shaped spore ornamentation, initially is difficult and requires practice. Success with microscopy requires familiarity with a properly adjusted and calibrated microscope. An improperly adjusted microscope can distort the image of spores or tissue measurements by as much as 10 percent. Such imprecision could lead to the selection of an incorrect set of characters and result in incorrect species identification.

Categorizing color variation is subjective and therefore difficult. Because *Ramaria* spp. often change color with age, specimens may be described differently at different phenological stages. A minimal list of color headings, common to *Ramaria* species, is provided.

Appendix 2

Collection, Preservation and Mailing, Tips, Suggestions, and Information and Data Forms

Collecting tips

It is very important to collect the entire specimen. Some ROD species like *Phaeocollybia* have an extremely long, radicate stem that can extend more than .3 meters into the soil. Others like *Cortinarius* have bulbous bases. And still others, such as *Ramaria,* can have multiple bases, mycelial mats, and rhizomorphs that can be important in identification. *Cordyceps* grow from a buried larvae or truffle, and the ROD listed *Asterophora lycoperdoides* and *Collybia racemosa* grow on other rotting mushrooms.

It is best to use some sort of digging tool when excavating specimens to preserve integrity and fragile characters such as veil remnants and cortina.

Collect individuals of all ages when possible, particularly *Cortinarius* and *Ramaria* whose colors fade rapidly with maturation.

It is very important to know the substrate: wood, litter-duff, moss, soil, rotten fungi. Along with color notes, this is best noted at the time of collection. Use the field tag provided.

It is critical to describe the colors present on ALL fresh specimens! Detailed notes are needed for *Ramaria* and all Agarics, particularly *Phaeocollybia* and *Cortinarius*. Color guides can be helpful. Be as detailed as possible. Use other colors as modifiers; for example; red-brown, pale salmon with yellow tints, drab olive with violet tones, bright yellow, chalk white, slightly darker than ivory, dusty tan, etc.

Place specimens into heavy weight foil, wax bags, or plastic boxes. Some moisture must be preserved, but plastic bags will cause the fungus to rot quickly. We prefer using foil for larger fungi because when packaged loosely it protects the specimen better than paper.

We have found that plastic tackle and craft boxes with movable dividers work well for collecting small fungi and also allow ready storage in the refrigerator.

Place individually wrapped specimens into a sturdy container such as a 5-gallon bucket or basket to avoid squashing them.

Do not mix collections when collecting and storing specimens. Regularly clean your collecting materials (stray spores can hinder identification).

Spores must be mature when measured for species determination. Sometimes spore maturation in ascomycetes can be induced by placing a damp paper towel in the container with the specimen in the refrigerator. Allow a few days or even a week or two, checking regularly for decay, for maturation to occur.

What to send and how to send it

We accept vouchers of any fungus species from table C-3 of the ROD. Due to the ephemeral nature of fungi and the unsettled nature of fungal taxonomy, we must have a physical specimen for it to be recorded as a known site.

Even professional mycologists make errors in determining fungi in the field. It is important to send us collections for verification.

If possible, take a photo (preferably a slide) of the fungus before drying it. A photographic record can be extremely useful in making species determinations as well as for educational use. The optimal setup is to use a macro lens and ring flash with 64 ISO film (or 200 if nothing else is available) with a neutral gray background and something for scale.

<u>Specimens must be sent completely dried, unless prior arrangements are made.</u>

Use a food dehydrator that has a fan, at low to medium temperature (90-125 °F). Cut at least one specimen in half, particularly truffles. It is preferable to cut large specimens such as *Ramaria, Gomphus, Phaeocollybia, Bondarzewia* , etc., to facilitate dehydration and storage.

Package dried specimens individually, then package securely, and mail in cardboard boxes. Do not send fungi in unpadded envelopes! Include your determination, the site form, maps, and descriptive notes on a field tag or one of the five fungi description forms. The lot form is optional but you may find it useful for your record keeping.

Each specimen should be accompanied by complete location data, habitat information, notes describing the specimen when fresh (color, texture, taste, odor), collection date and person to contact. Without this information specimens will be extremely difficult to identify and it will be hard to relocate sites.

Please try to make a preliminary determination. When you make your determination, note on the field tag accompanying each specimen what characters led you to this conclusion**.** Was it spore length or shape? Colored granules on the abhymenium? Cap color? Hairs on the hymenium? These notes help us with the verification process. They also help us track mistakes so we can be better teachers. If you have doubts or have a particularly rare species, please use one of the five Fungi Description Forms to describe it in greater depth.

Collections will be accessioned into the herbarium at Oregon State University. Upon request, a portion can be returned to you if you maintain an herbarium. An optimal collection would consist of multiple specimens both young and mature, properly dried with at least one specimen cut in half. Even if you have only one specimen, send it anyway.

Completing the site form

This form provides locality and habitat data for each collection site as well as documentation for ROD species found during your survey. Use this form similarly to a TE&S plant sighting form and anytime specimens of potential interest are collected. You need fill out only one form per area and list all the fungi collected from that area or site.

Fill out the form completely. Our team cannot personally visit every site, and we lack the expert knowledge that you have of the areas where you work.

Fill out one site form per collection site (not per collection). Instructions are found on the back of the form. A "site" is (1) at least 1.6 km apart, or (2) different habitat/ecotypes within a forested area (e.g., sale unit). Likewise, if you are confident with your field recognition, it is not absolutely necessary to collect a specimen every time it is encountered at a site; once or twice per site is adequate. Differences in habitat or substrate per species should be noted on the field tag.

Completing the field tag

Field tags are very useful while foraying or surveying. They are designed to fit into our collection boxes. Complete one per collection.

The tag's main function is to ensure that critical data such as location, substrate, and color notes are not lost in the bustle of a field day.

The field tag is used in addition to the site form; it is not a substitute.

The following are the fields on the field tag with an explanation of the information asked for.

Date: Collection date
Genus and species: Tentative identification of fungus
Collector: Collector of the specimen
Collection number: Collection identification number: O'Dell 4756 or M.M2-12-98-a, etc.
County and State where collection was made:
Land owner: Name of Federal agency and subunit: Siuslaw NF, Alsea RD, etc.
Location and T.R.S.: A geographical place name, road number; as specific as possible.

Substrate: Circle appropriate category
Habitat: Dominant trees, herbs, and shrubs and related notes.
Notes: Fresh specimen notes: color, taste, odor, shape, detail of habitat or substrate, or other site and specimen information. Use the back as necessary.

Completing the optional lot form

This is an optional form developed for the Corvallis Survey and Manage Team's recordkeeping. It has been expressed by some field users that it is useful for their records as well. We have adapted it for your use. If you are overwhelmed by the paperwork, this is far less important than a complete site form and some basic descriptive notes about the fresh specimen.

Fill out one lot form per group of collections delivered or send to the Corvallis Survey and Manage Team. Fill in only the shaded areas. We will complete the form and return a copy to you.

If there is urgency to the verification of your specimen(s), please indicate so on this form or by phone.

Please fill out only the areas that are shaded gray:

Contact person: Usually the person who sends the collection to us. This is the person we will contact if questions arise and when we have completed the species verification.

Agency, subunit, address, and phone number: The address to which we will send a copy of the completed lot form. The phone number of the contact person.

Collection number: Your reference-tracking number for the specimen. Often formatted as a number and letter system using the collector's name, initials, collection number or date (Stockman-232 or J.S. 98-May-04#1, etc.).

Tentative determination: Your determination of what the fungus species is or at least a general description of the specimen: black-cup with orange granules; chunky, orange-brown polypore with no stem; glutinous, olive-colored Agaric with 12-inch stem; etc.

Place name: A geographic place name identifiable on a map. For example: Black Butte; Ingals Creek trailhead, 100 meters east of parking lot; junction of Forest Road 1038 & spur 302, south side of road.

Completing the optional fungi description forms: Boletoid and polyporus fungi, gilled fungi, nongilled fungi, Pored Fungi, Sequestrate Fungi, Coralloid Fungi.

These forms are optional but can be used as a place to take notes about freshly collected specimens, particularly on rare species, or if you really have no idea where to begin. It is extremely difficult to determine dried specimens without notes on fresh characters.

Descriptive notes of fresh specimens are very important for identifying fungi when they are dry. Notes on fresh color, texture, size, taste, and odor are crucial. Detail is critical when describing the color variations of fungi.

In general, those characters used in the keys for the group of fungi you are working with are the characters that you should give the most attention to describing or measuring.

If you have the capability, measure spore size and note spore shape, ornamentation under oil immersion at 1000x magnification. This is a microscopic character commonly used in specific descriptions.

If you have additional questions concerning these forms, please contact:

Thom O'Dell: Survey and Manage Mycology Team, USDA Forest Service, PNW Forestry Sciences Lab, 3200 S.W. Jefferson Way, Corvallis, OR 97331. Telephone (541) 750-7404; FAX (541) 758-7760

Electronic communication: IBM(FS): todell/r6pnw_corvallis@fs.fed.us

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Merrily Ellestad: mellesta/r6pnw_corvallis@fs.fed.us

Directions for Survey and Manage Fungi Site Form

Fill out one site form per site (at least 1.5 km apart or different habitat)

Lot number: For PNW Survey and Manage team to complete.

Date: Date collection(s) were made.

Land ownership: Select: Bureau of Land Management (BLM), USDA Forest Service (USFS), state or private.

Land allocation: Specify if this location is in a late-successional reserve, managed late-successional area, matrix, adaptive management area, area of critical environmental concern, Research Natural Area, botanical special interest area, riparian reserve, wilderness, or describe others.

Forest/District/Resource Area: Specify which National Forest and District or BLM District and Resource Area.

State and county: Specify, please do not abbreviate county.

Quad name: Write quad name and circle appropriate map scale. Please do not abbreviate.

TRS: Township, Range, Section, Quarter, Sixteenth of the Quarter Section

Meridian: Found on USGS and Forest map. Willamette is western Washington and Oregon, Humboldt is northwest California, Mt. Diablo is northeast California.

Latitude and longitude: Please record in decimal form. Please record to 4 decimal places. Do not write UTM's.

Location/directions to site: Provide a geographical place name such as Icicle River campground, Salmon Berry wayside, Hart Mountain, Johnny Creek trail. Also provide clear, detailed directions sufficient to relocate site. Include road numbers, mileage from road junctions and distance and azimuth from road. Map the location on the appropriate topographic map and label with quad name, township, range, section, quarter and sixteenth. Give approximate distance in miles from nearest municipality.

Elevation, slope, and aspect: Please be as accurate as possible, specify units where appropriate.

Topography: Circle the appropriate categories or briefly describe area.

Habitat: List dominant overstory trees, indicator shrub and herb species. Use full species name (*Pinus ponderosa*), not acronym (PIPO). Note and describe plant association and successional stage if possible. Note general amount, size and decay class of coarse woody debris. Describe any interesting or unusual observations of habitat. Note substrate if appropriate.

Collector(s): List collector(s).

Phone number and e-mail: Who should be contacted if questions arise?

New occurrence, specimens photographed and photo of habitat: Circle appropriate category.

List species collected: List names of species collected at site, tentative determinations are OK.

Other notes: Mark if maps, description sheets, or other data are included with collection.

SURVEY AND MANAGE FUNGI FIELD SITE FORM **Lot number** _____

COMPLETE ONE SITE FORM PER SITE

Multiple specimens at the same site need only one site form.

Collector(s): _____ **Date** _____

Land ownership: BLM USFS State Private **Land allocation**: _____

Forest/District/Resource Area: _____

State: _____ **County:** _____ **Quad name:** _____ 7.5 min/ 15 min

T: _____ **R:** _____ **Sec.** _____ **1/4** _____ **1/16** _____ **Meridian:** Willamette Mt. Diablo Humboldt

Latitude (4 decimal places)**:** _____ **Longitude** (4 decimal places)**:** _____

Location/Directions to site: _____

_____

_____

_____

_____

Elevation: _____ **feet meters** **Slope:** _____ **Aspect:** _____

Topography: ridge upper slope mid slope lower slope valley swale bench trail roadside

Describe: _____

Habitat: dominant trees: _____

_____

shrubs: _____

_____

herbs: _____

_____

_____

stand structure: _____

coarse woody debris: _____

_____

Survey and Manage Boletoid and Polyporous Fungi Description Form

Provide notes and circle as many of the characters from grouped character sets as appropriate.

Genus/species: _____ Mycology team collection number: _____
Other collector's number: _____ Date: _____
Collected by: _____

Ecology:

Dominant trees and shrubs: _____
Growth habit: single scattered caespitose grouped
Age of specimens: immature mature old mixed
Substrate (circle one): On duff: pine cone leaves needles twig litter
On soil: mineral humus
On wood: conifer hardwood Species**: _____**

General characters (write range of dimensions in mm for multiple specimens*)*

Sporocarp type: Bolete Polypore
Height of entire specimen: _____ Length of stem: _____
Width of cap: _____ Width of stem at apex: _____ Widest width of stem: _____
Taste (don't swallow)**:** mild strong pleasant unpleasant peppery
*Other***: _____**

Color (note color gradations, spots, streaks, bruising reactions, changes with age or drying*)*

Cap surface: _____ Bruising color: _____
Cap flesh: _____ Bruising color: _____
Pore layer: _____ Bruising color: _____
Stem surface: _____ Bruising color: _____
Stem flesh: _____ Bruising color: _____

Cap characters:

Surface texture: dry greasy sticky slimy
Surface ornamentation: smooth pubescent fibrillose cracked wrinkled scaly granular velvety
Cap shape: convex plane uplifted irregular centrally depressed *Other***: _____**
Flesh consistency: fleshy brittle spongy *Other***: _____**

Stem characters:

Stem shape: equal ventricose tapered at apex tapered at base clavate bulbous
Surface texture: viscid sticky dry polished glabrous fibrillose punctate
Surface ornamentation: glandular dotted pruinose (lightly powdered) scabrous scaly fibrillose finely reticulated (netted) coarsely reticulate
Location of reticulum: apex only top 1/2 of stem entire stem *Other*: _____
Color of ornamentation: _____
Annulus present: N Y **Annulus color: _____**
Annulus structure: membranous fibrillose cottony-cortina slimy

Survey and Manage Gilled Fungi Description Form

Provide notes and circle as many of the characters from grouped character sets as appropriate.

Genus/species: _____ **Mycology team collection number:** _____
Other collector's number: _____ **Date:** _____
Collected by: _____

Ecology:

Dominant trees and shrubs: _____
Growth habit: single scattered caespitose grouped
Age of specimens: immature mature old mixed
Substrate (circle one): **On duff:** pine cone leaves needles twig litter
On soil: mineral humus
On wood: conifer hardwood Species**:** _____
Other: fungus insect

General characters (write range of dimensions in mm for multiple specimens*)*

Color of spore print: _____
Height of entire specimen: _____ **Length of stem:** _____
Width of cap: _____ **Height of cap at center:** _____
Width of stem at apex: _____ **Widest width of stem:** _____
Odor: mild strong pleasant unpleasant *Other*: _____
Taste (don't swallow)**:** mild strong pleasant unpleasant peppery *Other*: _____

Color (note color gradations, spots, streaks, bruising reactions, changes with age or drying*)*

Cap surface: _____
Hygrophanous (watery appearance when wet; changes color when losing moisture): N Y
Cap flesh: _____
Gills: _____ **Gill edge:** concolorous darker lighter
Stem surface: _____
Stem flesh: _____

Cap characters:

Latex: N Y **Latex color:** _____
Surface texture: dry greasy sticky slimy
Surface ornamentation: smooth pubescent fibrillose cracked wrinkled scaly granular warty
Shape: convex conic bell-shaped plane depressed umbilicate funnel mammilate umbonate
*Other***:** _____
Margin shape: straight uplifted recurved inrolled incurved
Contours of margin: striate even wavy irregular appendiculate *Other*: _____
Flesh consistency: fleshy brittle spongy tough chalky *Other***:** _____

(page 2 on reverse)

Stem characters:

Stem shape: equal ventricose tapered at apex tapered at base radicate (rooted) clavate bulbous twisted

Other: _____

Surface texture: viscid sticky dry polished smooth fibrillose punctate

Surface ornamentation: smooth pruinose (powdered at apex) scaly fibrillose tomentose

Other: _____

Stem consistency: cartilaginous fibrous chalky *Other*: _____

Flesh texture: solid stuffed hollow *Other*: _____

Gill characters:

Attachment to stem: free adnexed adnate sinuate decurrent *Other:* _____

Edge shape: entire scalloped wavy serrate eroded *Other:* _____

Veil:

Any veil or veil remnants present: N Y if yes, complete the following**:**

Partial veil: N Y **Veil color:** _____

Veil structure: membranous fibrillose cortina slimy

Annulus: N Y **General position of annulus:** apical central basal

Annulus type: single double **Annulus color:** _____

Universal veil: N Y **Volva shape:** saccate collared sheathing concentric zones

Volva color: _____

Remnants present on cap: N Y **Color of remnant:** _____

Notes/Sketch:

Survey and Manage Nongilled Fungi Description Form

Elfin saddles, Cups, Club-like fungi, Cantharellaceae, Tooth fungi Jelly fungi

Provide notes and circle as many of the characters from grouped character sets as appropriate.

Genus/species: _____ Mycology team collection number: _____
Other collector's number: _____ Date: _____
Collected by: _____

Ecology:

Dominant trees and shrubs: _____
Growth habit: single scattered caespitose grouped
Age of specimens: immature mature old mixed
Substrate (circle one): On duff: pine cone leaves needles twig litter
On soil: mineral humus
On wood: conifer hardwood Species**: _____**

General characters (write range of dimensions in mm for multiple specimens*)*

Sporocarp type: Morel-types Elfin saddles Cups Club-like fungi Cantharellaceae Tooth fungi Jelly fungi
Height of entire specimen: _____ Length of stem: _____
Width of cap: _____ Cap flesh thickness: _____
Odor: mild strong fragrant farinaceous *Other*: _____
Taste (don't swallow)**:** mild strong sweet bitter hot *Other*: _____
Sporocarp shape: cup disk cushion rabbit-ear truncate club spatulate "mushroom"-like saddle-stipitate brain-stipitate pitted-stipitate funnel cantherelloid *Other:* _____
Flesh consistency (in cross-section)**:** gelatinous fleshy brittle tough rubbery spongy
Flesh color and bruising: _____
Cap color (top of chantrelle or tooth fungus)**: _____**
Hymenium color (spore-bearing surface)**: _____**
Abhymenium color (opposite spore-bearing surface)**: _____**
Abhymenium/cap texture: smooth pubescent scaly granular warty fibrillose greasy sticky dry silky hygrophanous (changing color when losing moisture)

Stem characters (if present, use cross-section for measurement*)**:*

Stem present: N Y (if yes, then continue)
Length (mm)**: _____ Width at widest point** (mm)**: _____ Width at base** (mm): _____
Shape: equal ventricose tapered at apex tapered at base compressed
Other: _____
Stem flesh texture: gelatinous firm solid stuffed hollow
Flesh color: _____ Surface color: _____
Surface character: dry moist viscid smooth tomentose ribbed scaly folded grooved wrinkled fibrillose *Other*: _____

Survey and Manage Coral Fungi Description Form

Provide notes and circle as many of the characters from grouped character sets as appropriate.

Genus/species: _____ Mycology team collection number: _____
Other collector's number: _____ Date: _____
Collected by: _____

Ecology:

Dominant trees and shrubs: _____
Age of specimens: immature mature old mixed
Substrate (circle one): On duff: pine cone leaves needles twig litter
On soil: mineral humus
On wood: conifer hardwood Species**: _____**

General characters (write range of dimensions in mm for multiple specimens)

Height of entire specimen (mm)**:** **Crown diameter** (mm)**:**
Width of stem: _____ Width of stem at base: _____
Odor: not distinct weak strong sweet anise beany pungent unpleasant musty earthy citrus
Taste (don't swallow)**:** not distinct mild strong bitter acrid *Other***: _____**

Surface color (Write range for multiple specimens; note color gradations, spots, streaks, and bruising)*:*

Tips: _____
Branches: _____
_____
Stem: _____
_____
Bruising (note color and location)**: _____**
Yellow band at junction of stem and branches (fades after picking and in older specimens)**:** N Y

Color of flesh in cross section:

Tips: _____
Branches: _____
Stem: _____
Rusty root present (pale brown band in lower stipe when cut longitudinally; can look like a water mark)**:** N Y

Branch and stem characters:

Stem form: massive chunky slender single fused fascicled
Stem flesh consistency (one or more)**:** solid hollow fleshy-fibrous brittle rubbery-cartilaginous
firm-cartilaginous slimy-cartilaginous marbled-gelatinous *Other*: _____
Branch consistency: fragile firm fleshy-firbous cartilaginous brittle rubbery firmly-gelatinous
slimy-gelatinous) *Notes:* _____
Rhizomorphs present (white threads at base)**:** N Y
Reaction of Melzer's reagent on interior stem flesh (optional)**:** amyloid dextrinoid none

Survey and Manage Sequestrate Fungi Description Form

Provide notes and circle as many of the characters from grouped character sets as needed

Genus/species: _____ **Mycology team collection number:** _____
Other collector's number: _____ **Date:** _____
Collected by: _____

Ecology:

Dominant trees and shrubs: _____
Growth habit: single scattered grouped
Age of specimens: immature mature old mixed
Substrate (circle one): **In duff:** pine cone leaves needles twig litter
In soil: mineral humus
On wood: conifer hardwood Species**:** _____

General characters (write range of dimensions in mm for multiple specimens*)*

Height (mm) _____ **Width** (mm): _____
Shape: globose subglobose irregular top-shaped
Overall consistency: tough crisp rubbery friable hard powdery inside
Odor: mild strong pleasant unpleasant *Describe***:** _____

Peridium (outer surface*):***

Color immediately upon collection: _____
Color changes or bruising: _____
Texture: warty smooth tomentose wrinkled folded crusty
Color change with KOH 5% (when available)**:** _____
Separable from gleba (inner portion)**:** N Y **Thickness** (mm)**:** _____
Rhizomorphs present: N Y If yes, attachment**:** at base along sides overall
Rhizomorph color and changes: _____

Gleba (inner portion: describe when cut in half*):***

Arrangement: solid veined gilled convoluted chambered
Texture: powdery cottony marbled gelatinous waxy
Color: _____
Color changes and bruising after 5 minutes: _____
Latex present: N Y **Latex color:** _____
Columella present (sterile differentiated tissue)**:** N Y If yes: single robust joins apex of peridium dendroid
Columella color: translucent opaque *Other*: _____
Stem present: N Y If yes, as**:** basal pad distinct stem

Field Tags (to be cut up)

Date: ______________________ Taxon: __________
Collector(s): ______________________ Coll. # __________
WA - OR - CA - County: __________ Land owner: __________
Location: ____
____
Wood - Moss - Litter - Soil - Fungus Habitat: ______________
____
Notes (color, odor, taste, texture, etc.): ______________________
____
____

Date: ______________________ Taxon: __________
Collector(s): ______________________ Coll. # __________
WA - OR - CA - County: __________ Land owner: __________
Location: ____
____
Wood - Moss - Litter - Soil - Fungus Habitat: ______________
____
Notes (color, odor, taste, texture, etc.): ______________________
____
____

Date: ______________________ Taxon: __________
Collector(s): ______________________ Coll. # __________
WA - OR - CA - County: __________ Land owner: __________
Location: ____
____
Wood - Moss - Litter - Soil - Fungus Habitat: ______________
____
Notes (color, odor, taste, texture, etc.): ______________________
____
____

Date: ______________________ Taxon: __________
Collector(s): ______________________ Coll. # __________
WA - OR - CA - County: __________ Land owner: __________
Location: ____
____
Wood - Moss - Litter - Soil - Fungus Habitat: ______________
____
Notes (color, odor, taste, texture, etc.): ______________________
____
____

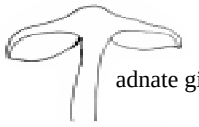
Date: ______________________ Taxon: __________
Collector(s): ______________________ Coll. # __________
WA - OR - CA - County: __________ Land owner: __________
Location: ____
____
Wood - Moss - Litter - Soil - Fungus Habitat: ______________
____
Notes (color, odor, taste, texture, etc.): ______________________
____
____

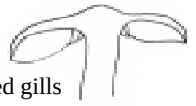
Date: ______________________ Taxon: __________
Collector(s): ______________________ Coll. # __________
WA - OR - CA - County: __________ Land owner: __________
Location: ____
____
Wood - Moss - Litter - Soil - Fungus Habitat: ______________
____
Notes (color, odor, taste, texture, etc.): ______________________
____
____

Glossary


acanthophyses

abhymenial surface–opposite the spore-bearing surface
acanthophyses–clavate or cylindrical hyphae with pinlike outgrowths near the apex
acrid–peppery
acrogenous–borne at the apex
aculeate–having narrow spines
acute–less than a right angle
acyanophilic–not staining blue when mounted in cotton blue
adnate–gills attached to the stem
adnexed–gills attached narrowly to the stipe
agaricoid–having the overall features of a gilled mushroom
agglutinated–stuck together as if with glue
allantoid–slightly curved with rounded ends
alveolae–honeycomblike hollows
alveolate–marked with honeycomblike hollows
amorphous–having no definite form
ampulliform–flasklike in form
amygdaliform–almond-shaped
amyloid–staining blue or black with application of Melzer's reagent
anastomose–fusion between hyphae
anise–smell of licorice
annulus–a ring-like partial veil, around the stipe after expansion of the cap
ANO–aniline oil (1:1 aqueous mixture)
ANW–alpha naphthol (5 percent aqueous solution)
apiculate–having an apiculus
apiculus–a short projection at one end, also called a hilar appendage
apobasidium–a basidium with nonapiculate spores, borne symmetrically on the sterigmata and not forcibly discharged
apothecium–a cup or saucerlike sporocarp in which the hymenium is exposed at maturity
appendiculate–the edge of the expanded pileus fringed with toothlike remains of the veil
applanate–flattened
arcuate–arclike
areoles–cracks or divisions
asci (us)–saclike structure that contains ascospores
Ascomycete (s)–phylum level of classification for ascus-containing fungi
aseptate–lacking septa
astringent–bitter
asymmetrical–not symmetrical
attenuation–narrowing
autolysed–self-digestion of a cell
avellaneous–pale yellow brown
bacilliform–rodlike in form
basal collar–collar located at the base of the spore
basal pad–sterile tissue located at point of attachment
basal scar–scar located at point of attachment of spore to basidium
basidia–cell that produces spores externally on sterigmata
basidiole–a sterile basidiumlike hymenial cell
Basidiomycete(s)–phylum level of classification for basidia containing fungi
bifid–forked
biguttulate–having two oillike drops within the spore
boletoid–resembling bolete in structure
brachybasidole(s)–short basidioles
brunnescent–becoming brown
bryophillous–fungi growing on mosses or liverworts
bulbous–bulblike; a stem with a swelling at the base


adnate gills


adnexed gills


annulus

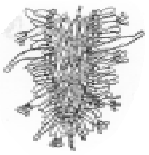

two shapes of asci


basidia basidiole

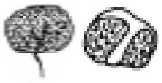

bulbous stem base


campanulate cap

campanulate–bell shaped
cap cuticle–the outer layer of the pileus
capillitium–sterile, threadlike elements in among the spores
capitate–having a well-formed head
cartilaginous–firm and tough but readily bent
caulocystidia–cystidia found on the stipe
centipetally–toward the center
cheilocystidia–cystidia found on the edge of the lamella
chrysocystidia–smooth, thin-walled cystidia with highly staining contents
circumferentially aligned–aligned along the perimeter of a circle
clamp connections–a hyphal outgrowth that at cell division makes a connection between the resulting two cells by fusion
clavate–clublike; narrowing in the direction of the base
claviform–clublike; see clavate
cleft–partially split or divided
coagulated–congealed or clotted
coalesced–grown together
columella–a sterile central axis within a mature sequestrate sporocarp
concave–hollowed inward; similar to a bowl
concolorous–of one color
confluent–coming together
conic–shaped like a cone
connate–born together
context–tramal tissue
convex–broadly obtuse
copious–abundant
coral–corallike fleshy fungi in the family Clavariaceae
coriaceous–leatherlike in texture
cortex–a more or less thick outer covering
cortical tissue–tissue from the cortex
cortina–a weblike partial veil covering the gills
crenulate–edged with delicate rounded teeth
cristate–crested
croziers–a hook of an ascogenous hypha before ascus development
crustose–a hard surface layer
crystalloid–resembling crystals
cup–a Discomycete, particularly in the Pezizales or Leotiales
cyanophilic–readily absorbing cotton blue
cystidia–a sterile, distinctively shaped cell
cystidoid–cystidialike
cytoplasm–the protoplasm of a cell
decurrent–running down the stipe
dendroid–treelike in form
denticulate–toothed
dermatopseudocystidia–cystidia-like structures on the edge of the pileus
dextrinoid–staining red or red-brown in Melzer's reagent
dichophyses–a modified terminal hypha in the hymenium
dichotomous–dividing into two parts
dimitic–having hyphae of two kinds
disc–the round, platelike or curved spore-producing part of an Ascomycete sporocarp
discoid–resembling a disk
distally–situated away from the center of the sporocarp
divaricate–divergent at right angles
diverticula–a pocketlike side branch
earth tongue–sporocarps of the genus Geoglossum
eccentric–not circular


cheilocystidia


clavate cells


two types of columella


conic-shaped cap


corallike sporocarps


cortina


crenulate gills


cup-shaped sporocarps


decurrent gills

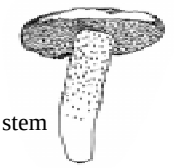
echinate–having sharply pointed spines
ectal excipulum–the outer layer such as in the peridium
eguttulate–without guttules
ellipsoid–shaped like an ellipse
emergent–rising out of
encrusted–overlain with a crust
endophytic–living within another
enrolled margin–rolled within


enrolled margin

ental excipulum–the inner layer such as in the peridium
ephemeral–lasting a short time
epicuticular–outer layer of tissue
epicutis–outer layer of tissue
epigeous–growing aboveground
epiphytic–living on the surface of another
epithelium–the outer layer of tissue
ETOH–ethanol
euhymenium–containing a palisade of basidia
evanescent–having a short existence
excrescence–an abnormal outgrowth
extracellular–outside the cell
fabaceous–resembling a bean
farinaceous–smells like corn meal
fascicle–a little group or bundle
fasciculate–growing in fascicles
fawn–pale gray-brown
FCL–ferric chloride (10 percent aqueous solution)
ferruginous–resembling iron rust in color
fibrillose–with fine hairs or fibres
fibrils–small fibers
filamentose–threadlike
filiform–threadlike
flabellate–shaped like a fan
flabelliform–shaped like a fan


flabellate sporocarps

flexuous–elastic
flocculose–delicately cottony
friable–easily crumbled
FSW–ferric sulphate 10 percent aqueous
fulvous–pale brown-yellow
fungiphobia–afraid of fungi
furcate–forked
furfuraceous–covered with flaky particles
fuscous–brown-gray
fusoid–tapering towards each end
gametangia–cell containing gametes or gametic nuclei
gelatinized–jellylike
gelatinous–jellylike
generative hyphae–hyphae that are branched, septate, with or without clamp connections, thin- or thick-walled and of unlimited growth
germ pore–a differentiated, frequently apical area in a spore wall
glabrescent–smooth
glabrous–smooth
glandular dot–a dot due to the presence of a gland


glandular dots on stem

gleba–spore-bearing tissue in sequestrate fungi
gleoplerous hyphae–hyphae with very long cells, with numerous oil drops
gloeocystidia–thin-walled, usually irregular cystidia with yellow or highly refractive contents
gluten–a substance that is sticky when wet

glutinous–covered with gluten
granulated–covered with very small particles
granules–a small particle
granulose–roughened with granules
gregarious–in groups but not joined together
GUA–tincture of guaiac (saturated solution of gum guaiac in 95 percent ethyl alcohol)
guttules–oillike drops
hemispheric–one of two half-spheres
heteromerous–having sphaerocyst nests among filamentous hyphae
hirsute–having long hairs
hyaline–colorless
hygrophanous–having a water-soaked appearance when wet
hymenium–the spore-bearing layer of tissue
hyphoid–like hyphae in form
hypogeous–growing belowground
IKI–Melzer's reagent
imbricate–scales partly covering one another like roof tiles
inamyloid–not reacting to Melzer's reagent
incurved– curved inward


incurved margin

inoperculate–opening by an irregular apical split to discharge spores
internodes–the interval between nodes
intervenose–condition where veins are found in the spaces between gills
isodiametric–having equal diameters
ixocutis–a slimy cuticle


intervenose connections

ixotrichoderm(ium)–a trichodermium composed of gelatinized hyphae
KOH–(as mounting medium): potassium hydroxide (2 percent aqueous solution)
KOH–(as macrochemical reagent): potassium hydroxide (10 percent aqueous solution)
labyrinthine–structure of complex paths
lacerate–to tear roughly
lacticiferous hyphae–hyphae which secret a milky juice
lacunose–having a hole or hollow
lamellae–hymenium-covered vertical plates on the underside of the pileus
lamellar–of lamellae
lamellulae–a small lamella
laminate–composed of layers
latex–a milklike juice
lattice–cross-barred; like a network


leptocysidia

leptocystidia–a thin-walled smooth cystidia
ligniculous–occurring on wood
limoniform–lemonlike in form
loculate–divided into locules
locules–a cavity
lunate–like a new moon
macrocystidia–cystidia which arise from deep within the hymenium
macrofungi–fungi with sporocarps large enough to be seen without a hand lens
matrix–the substrate in or on which an organism is living
mediostratum–the middle layer
medullary excipulum–tissue below the generative layer in an apothecium
Melzer's reagent–an iodine reagent
membranaceous–like a thin skin
microfungi–fungi with small sporocarps that are seen only with a hand lens
moniliform–having swellings at regular intervals
monochromatic–consisting of one color or hue
monomitic–consisting a single kind of hyphae
monosporus–one-spored
mottled–having patches of different colors or shades

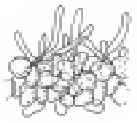
mottling–to be mottled
mucilage–a gelatinous substance
mucilaginous–sticky or viscid
mucronate–an abrupt sharp terminal point
multifid–divided into a number of parts or lobes
multiguttulate–having more than two guttules
mushroom–an enlarged, epigeous, fleshy sporocarp of a fungus
mycophilic–lover of fungi
mycorrhiza(e)–a mutually beneficial symbiotic association of plant roots and fungi
napiform–turnip-like in form
nodulose–having broad-based, blunt, wartlike structures


nodulose spore shape

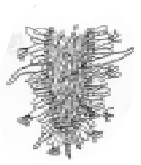
NOH–ammonium hydroxide (10 percent aqueous solution)
obclavate–inversely clavate
obconic–inversely conic
oblique–not at 45-degree angle
obovoid–ovoid with the broad end towards the apex
obpyramidal–the reverse of pyramid-shaped
obpyriform–the reverse of pear-shaped
obtuse–rounded or blunt
ocher–a red-yellow color
ochraceous–somewhat ocherlike in color
ochre–a red-yellow color
oleiferous–containing a refractive substance
olivaceous–somewhat olive colored
opaque–unable to be seen through
operculate–opening by an apical lid to discharge spores
orbicular–circular
palisade–a layer of columnar cells
pallid–pale
papilla–a small rounded process
papillate–having papilla


paraphyses

paraphyses–a sterile upward growing, basely attached hyphal element in a Ascomycete hymenium
partial veil–a layer of tissue, developed from the stipe, which joins the stipe to the pileus edge during hymenium development
pedicellate–having a small stalk
pellucid-striate–having a somewhat transparent top so that the gills can be seen from above
percurrent–extending throughout the entire length
periclinal–curved in the direction of the surface
peridium–the outer membrane of a sequestrate sporocarp
perisporal sac–a wall that forms a loose envelope around a spore
PHN–phenol (2 percent aqueous solution)
pileate–having a pileus
pileus–the umbrella-shaped (cap) structure of a mushroom


pileocystidia on cap

pileipellis–the cellular cortical layers
pileocystidia–cystidia found on cap
cap cuticle–the outer layer of cells on a cap
pip-shaped–shaped like an apple seed
plage–a smooth, colorless spot on a surface
plano-convex–flat on one side and convex on the other
pleurocystidia–cystidia found on the side of the structure


pleurocystidia

pluridigitate–multidigitate; many fingerlike structures
plurinodulose–with multiple nodulose elements
polychotomous–having an apex dividing into more than two branches
polypore–a macrofungus with a pored hymenium
pore–a small opening
pruinose–having a frostlike or flourlike surface

pseudocystidia–cells that appear like cystidia but are not cystidia
pseudoparenchymatous–inflated cells in the peridium or trama of certain fungal groups
pseudorhiza–rootlike structure of the lower stipe
pubescent–having soft hairs
puffball(s)–species in the order Lycoperdales
pulvinate–cushionlike in form
punctate–marked with very small spots
pungent–having a strong smell
PYR–pyrogallol (10 percent aqueous solution of pyrogallic acid)
pyriform–pearlike in form
raphanoid–radishlike
recalcitrant–not easily changed
recurved–curved backward or inward
refractive–not translucent
refractive hyphae–hyphae with contents that are colored
refringent–not translucent
repent–prostrate
resupinate–found with the hymenium upward and very little sterile tissue
reticulum–like a net
rhizomorph(s)–a rootlike aggregation of hyphae having a well-defined apical meristem
rhizomorphic–rhizomorphlike
rimose–having small cracks
rimose-rugulose–having small cracks or delicately wrinkled
rostrate–beaked
rugose–wrinkled
saccate–like a sack
salmon–yellow-pink
salmonaceous–somewhat yellow-pink
saprophyte–living upon dead material
scabrous–rough
scurfy–flakes or scales that adhere to the surface
seceded–withdrawn
sepia–brown-gray to dark olive-brown
septa–a dividing wall in fungal cells
sequestrate–sporocarps that normally retain their spores within until it decays in place or is eaten
sessile–without a stem
sheen–shiny or glossy appearance
silica gel–colloidal silica
sinuate–notched
skeletel hyphae–hyphae that are thick-walled, aseptate, of limited length, with thin-walled apices, usually unbranched
sordid–a dull or muddy color
sphaerocysts–globose cells
spherical–having the form of a sphere
spinulae–a small spine
sporiferous–bearing spores
sporocarp–a general term for a spore-bearing organ
squamule–a small scale
squamulose–having small scales
stalactitiform–having the general form of a stalactite
sterigmal attachment–the attachment point for the spore on the basidium
sterigmata–the structure that attaches the spore to the basidium
stipitate–having a stem
stipitipellis–layer of tissue making up the stem
stipitipith–the tissue within the context of the stem
stratum–a layer of tissue


resupinate sporocarp


reticulate ornamentation


rhizomorph attached at base


saccate ascus


squamulose cap


sterigmata on basidium

striate–marked by lines, grooves or ridges
striatulate–marked by small lines, grooves or ridges
sub-–prefix for approximating
sulcate - grooved
suprahilar–the area above the sterigmal attachment
suprapellis - the topmost cortical layer
SYR–Syringaldazine in ethanol
tawny–brown-orange to pale brown
terete–cylindrical but narrowing at one end
terrestrial–growing on soil
tibiiform–shaped like a tibia bone
tomentose–a covering of soft, matted hairs
tomentum–downy
tortuous–with repeated twists, bends, or turns
torulose–cylindrical but with swellings at intervals
trama–the layer directly beneath the subhymenium
trichodermium - the outer layer composed of hair-like elements projecting from the surface
truffle(s)–sequestrate basidiomycota, ascomycota, and zygomycota
truncate–ending abruptly
tuberculate–wartlike processes
tubulose–having the form of a tube
turbinate–in the shape of a top
turf–a distinct layer
TYR–l-tyrisine
umbo–a rounded elevation
umbonate–having a rounded elevation
undulate–rising and falling as in waves
ungulate–a hoofed animal
uniseptate–with a single septa
uniseriate–in a single series
urnulate–shaped like an urn
veil–a ringlike tissue on the stipe after sporocarp expansion
velutinous–covered with a silky pubescence
venae externae–veins of pale colored tissue that reach the outer surface within sequestrate ascomycota
venae internae–dark-colored, spore-bearing tissue that do not reach the outer surface within sequestrate ascomycota
ventricose–swelling in the middle or on one side
verrucose–small rounded warts
versiform–changing form with age
vesicles–a bladderlike sac
vesicular–vesiclelike
vesiculose–full of vesicles
villose–covered with long soft hairs
vinaceous–the color of wine
violaceous–the color violet
viscid–slimy, sticky, or viscous
Zygomycete(s)–the class of fungi having zygospores
zygospores–the formation of spores by the fusion of gametangia


umbonate cap


veil


verrucose ornamentation

Castellano, Michael A.; Smith, Jane E.; O'Dell, Thom; Cázares, Efrén; Nugent, Susan. 1999.
Handbook to strategy 1 fungal taxa from the Northwest Forest Plan. Gen. Tech. Rep. PNW-GTR-476. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 195 p.

There are 147 fungal species listed under strategy 1 (S1) in the record of decision (ROD) for amendments to Forest Service and Bureau of Land Management planning documents within the range of the northern spotted owl. Upon further taxonomic examination of the S1 fungal species, it was determined that only 135 separate species existed, with the others reduced to synomomy. Most of these S1 fungal species are poorly known and uncommon to rare. A few S1 fungal species were revealed to be much more common than previously thought. This handbook was designed to facilitate understanding of the life history of all S1 and protection buffer species and to aid in their discovery and identification. Each species is represented by a condensed description, a set of distinguishing features, and information on substrate, habitat, and seasonality. We also present a list of known sites within the range of the northern spotted owl, a distribution map and additional references to introduce the available literature on a particular species. A set of artificial taxonomic keys is presented to aid the worker in identification. A partially illustrated glossary helps introduce the novice to mycological terms.

Keywords: Mycology, mushrooms, sequestrate fungi, truffles, biodiversity, monitoring, rare fungi, forest ecology.

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