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Red-cockaded Woodpecker Cavity Tree Resin Avoidance by Southern Flying Squirrels

Richard R. Schaefer'." and Daniel Saenz[1]

ABSTRACT.—While examining Red-cockaded Woodpecker (*Picoides borealis*) cavity contents in eastern Texas, we observed cavity tree resin avoidance by southern flying squirrels (*Glaucomys volans*). The tree surface around an active Red-cockaded Woodpecker cavity is coated with sticky resin which flows from resin wells created by the woodpecker. The southern flying squirrel is a competitor for Red-cockaded Woodpecker cavities and is known to be quite capable of entering active cavities in trees with a well developed resin coating. However, our observation indicates that in some circumstances the resin coating can offer some deterrence. *Received 6 March 1997, accepted 18 Aug. 1997.*

The Red-cockaded Woodpecker (*Picoides borealis*) excavates roosting and nesting cavities in live southern pines (*Pinus* spp.) (Steirly 1957, Ligon 1970, Lay 1970). Each Red-cockaded Woodpecker social unit. or group, occupies a cluster of cavity trees, usually containing a number of both active and inactive cavities (Walters 1990). Red-cockaded Woodpeckers maintain a constant flow of sticky resin around active cavities by regularly excavating resin wells in the vicinity of the cavity entrance (Ligon 1970). Also, a smooth tree bole is created by scaling loose bark from the trunk (Ligon 1970. Rudolph et al. 199Oa). The resin flows down the smooth trunk of the tree and helps to create a barrier against predation by rat snakes of the genus *Elaphe* (Jackson 1974, Rudolph et al. 1990b).

A number of other species are known to use Red-cockaded Woodpecker cavities with the southern flying squirrel (*Glaucomys volans*) being one of the most frequent users (Baker 1971, Dennis 1971. Hopkins and Lynn 1971, Harlow and Lennartz 1983, Conner et al. 1996). Flying squirrels prefer entrance diameters similar to those preferred by Red-cockaded Woodpeckers, thereby creating the potential for cavity competition (Rudolph et al. 1990a, Loeb 1993). On 19 April 1991, while checking Red-cockaded Woodpecker cavity contents on the Angelina National Forest in eastern Texas, we observed the following southern flying squirrel behavior. Tree A had one inactive cavity containing eight flying squirrels. Tree B had a total of three cavities. The lowest cavity (4.6 m above ground level) was inactive and contained three flying squirrels, while the middle cavity (3 m above the lowest cavity) was inactive and empty. The uppermost cavity (2.4 m above the middle cavity and 0.2 m below the base of the crown) was active and served as the breeding male Red-cockaded Woodpecker's roost cavity, and the group's nest cavity in 1990 and 1991. There was a well developed coating of sticky resin extending from about 0.5 m above to 1.5 m below the cavity. After being flushed from its cavity by our activities, one of the eight flying squirrels from tree A glided to tree B and entered the lower cavity. It immediately exited the lower cavity. presumably expelled by the three flying squirrels already in it, ran up the trunk and entered the middle cavity. Shortly thereafter, a second flying squirrel from tree A repeated the same scenario as the first flying squirrel. Subsequently, during the process of checking the cavity contents of tree B, we flushed the two flying squirrels from the middle cavity. One flying squirrel exited first and ran up the trunk towards the active cavity entrance. It is unknown if the flying squirrel intended to enter the cavity or to bypass it and seek cover in the canopy. As the flying squirrel came into contact with the sticky resin coating beneath the active cavity, it hopped onto and began using primary branches to make its way up and past the level

[1] Wildlife Habitat and Silviculture Laboratory (maintained in cooperation with the College of Forestry, Stephen F. Austin State Univ.), Southern Research Station, U.S.D.A. Forest Service, Nacogdoches, Texas 75962.

[2] Corresponding author.

of the fresh resin. While it progressed upward, the flying squirrel occasionally landed on the sticky trunk of the pine but quickly moved off of it as it made its way from branch to branch. When the flying squirrel was above the level of fresh resin it returned to the trunk and continued running up the tree. The second flying squirrel flushed from the middle cavity behaved in the same manner as the first one. Both flying squirrels were clearly attempting to avoid contact with the sticky resin. This is our second observation of such flying squirrel behavior. Although we have no detailed notes describing the first observation, the behavior was very similar. To our knowledge, there are no reports in the literature of resin avoidance by southern flying squirrels.

Dennis (197 1) and Rudolph and coworkers (1990a) found little evidence that resin prevents intruders other than snakes from entering active Red-cockaded Woodpecker cavities. We have regularly found one or more flying squirrels in active Red-cockaded Woodpecker cavities. We have also observed instances of a flying squirrel gliding from one tree directly to the entrance of an active cavity in a neighboring tree, thus avoiding most resin contact. Without a doubt, flying squirrels are quite capable of entering active Red-cockaded Woodpecker cavities (Rudolph et al. 1990a, Loeb 1993). However, under some circumstances the resin coating can offer some deterrence.

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