A new electronic-nose device (AromaScan A32S), consisting of an organic matrix-coated polymer-type 32-detector array, was tested as a novel tool for the detection, identification, and discrimination of phytopathogenic microbes. The sensor array detects the unique mixture of volatile metabolites released by microbes growing on standardized growth media by measuring electrical resistance across detector paths. A unique aroma profile (signature pattern) is produced, defined by the normalized response intensities of each detector, that is specific to the types and amounts of compound(s) present in the sample gas. The device was sensitive to sample concentration and differences in relative humidity (RH) between sample and reference gases. Control of sample gas RH to within 2 to 3 percent above reference RH yielded the best results. The instrument provides rapid results (run time 90 to 220 s) and effectively discriminated prokaryotes and fungi to species and even strain depending on how extensively the neural net was taught pattern recognition from reference databases of known microbes.