# USING CALICIOID LICHENS AND FUNGI TO ASSESS ECOLOGICAL CONTINUITY IN THE ACADIAN FOREST

**Steven B. Selva**

Division of Natural and Behavioral Sciences, University of Maine at Fort Kent, Fort Kent, ME 04743
sselva@maine.edu

Using lichens to assess ecological continuity in forest ecosystems was pioneered by Francis Rose in the British Isles. Rose established that oak woodlands in Britain, which have retained some degree of long-term ecological continuity, support significant lichen assemblages, which are absent or poorly represented in woods where disruption to ecological continuity has occurred to a greater or lesser degree. He concluded that these species represent a "relict flora" and developed the concept of their use as "indicator species" for grading woodlands on a scale of increasing or decreasing levels of past disturbance. Reasoning that the methods of Rose could also be used to assess the continuity of forest ecosystems in northeastern North America, old-growth indicator lichens were identified and indices were developed to assess the ecological continuity of northern hardwoods and spruce-fir stands in the Acadian Forest Ecoregion.

Given the wide variety of potential microhabitats that characterize aging forests, and the fact that an analysis of ecological continuity using the methods of Rose is only as valid as species inventories are complete, such investigations are often as daunting as they are time consuming. A more efficient method is suggested in the conclusions of Selva (1994), who showed that, not only do epiphytic lichen floras become richer over time—with older stands harboring more rare species—but the total number of calicioid lichens and fungi collected at a site is, itself, an indicator of continuity. With calicioid taxa found growing in more forest microhabitats than any other group of species, it is argued that an assessment index based on the total number of calicioid species collected at a site provides a more accurate assessment of continuity than an assessment following the methods of Rose. The higher the number of calicioid species collected at a site, the more ancient the site, and vice versa.

Commonly called the "stubble lichens" because of their small size, the calicioid lichens and fungi are an assemblage of saprophytic, parasitic and lichenized fungi that can be distinguished, in part, by their tiny (1-2 mm tall) stipitate apothecia. They colonize a variety of substrates including the bark and lignum of numerous angiosperm and gymnosperm species. Most species show clear substrate preferences, with many of the rarer calicioid species restricted to old-growth and ancient forest sites. Once established—and because dispersal is limited—these ancient forest indicators require ecological continuity of mature trees and a constant supply of substrate in various stages of decomposition to persist.

To date, the ecological continuity of 78 northern hardwoods and spruce-fir stands in the Acadian Forest Ecoregion have been assessed using this calicioid species index, 17 of which are considered ancient forest sites.