What is an epiphytic lichen and why study it?

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An epiphyte is an organism that lives upon its host organism without securing any nutrients from the hosts' living tissues. Epiphytes are common on the outer dead cambium layers of older trees, where moisture and suitable substrate is available. There is a vast array of lichens, particularly epiphytic lichens (bark inhabiting) throughout the northern hardwood forests of the Northeast. These lichens, along with bryophytes and liverworts - create a unique epiphytic/epixylic community upon trees. These communities can contribute to the forest ecosystem in many ways. Lichens are central to forest mineral cycling (Pike 1978), are habitat and food for invertebrate communities (Pettersson et al. 1994), serve as nesting material for many species of small mammals, and are winter starvation food for many larger mammals such as white-tailed deer and moose. Some lichen species are present only under certain site conditions (age of tree, moisture present in bark, disturbance history, and proximity to industrial development) and thus can be used as indicators of old growth.

Collection and Identification

My project ran from June through August of 2000. Twelve sites were selected throughout the Adirondack State Park based on previous research with forest structural characteristics. (McGee, 1998) The site fell into four categories; old growth forest (< 300 years old), post-burn, managed (selective cut), and even -aged clear cut (>15-20 years old). Each site had two plots, fifty meters by twenty meters, which represented exactly 1/10 hectare of forest. In all, one and a fifth of a hectare of Adirondack forest was used for lichen collection.

In this study I collected lichens only from living tree trunks and recently fallen limbs. This was done to ensure that I only sampled true epiphytes, and not colonizer species of decaying wood. I took into account that some lichens can only be found in the upper branches. For this reason, downed tree limbs were included to get an idea of the lichen diversity in the forest canopy. All lichen samples were sorted and put into collection boxes based upon the site they came from.

After finishing the collections for the twelve sites, the lichens were dried and stored. With the help of regional keys and a dissecting microscope I am in the process of identifying the lichens and putting together a summarized species list for each site. This part of the study is still under construction, and hopefully a more complete list for all of the hardwood forest sites will be put together and posted here soon.

The Lichens

This is the abbreviated species list for the site at Ampersand Mt.

Crustose Lichens

Candelariella efflorescens
Conotrema urceolatum (insert link to Cono 1 and 2)
Graphis scripta (script lichen) - on American Beech
Lecanora thysanophora (with Graphis scripta)
Lecidea sp.
Pertusaria sp.

Foliose Lichens

Cetralia chicitae
Cetralia oakesiana
Hypogymnia physodes
Parmelia rudecta
Parmelia saxatilis
Parmelia subrudecta
Parmelia sulcata
Parmelia squarrosa
Parmeliopsis ambigua
Phaeophysicia rubropulchra
Psuedoparmelia caperata
Xanthoria parietina

Fruiticose Lichens

Cladonia polycarpoides
Cladonia pyxidata (pixie cup lichen)

Unidentified Cladonia sp.
Evernia mesomorpha (oak moss lichen)
Lobaria pulmonaria (lung lichen)
Usnea subfloridana (beard lichen)
Usnea sp.

The preservation and identification of lichen biodiversity in our northern forest remains a small, yet important challenge for the fields of forestry and conservation. Quantifying lichen species diversity in the northern hardwoods will further our understanding of the Adirondack forest ecosystem as a whole.

Contact information

Please feel free to contract me if you have any questions or comments. Any feedback is greatly appreciated.

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Links:

- Some excellent websites about lichen biology, morphology, and ecology.

The North American Lichen Project - http://www.lichen.com

LichenLand, Fun with Lichens - http://mgd.nacse.org/hyperSQL/lichenland/htm

Desert Varnish and Lichen Crust - http://daphne.palomar.edu/wayne/pljan98.htm

References:

Pike, L.H. 1978 The importance of epiphytic lichens in mineral cycling. The Bryologist. 81: 247-257

Pattersson, R.B., J.P. Ball, K. Renhorn, P. Esseen, and K. Sjornberg. 1995. Invertebrate communities in boreal forest canopies as influenced by forestry and lichens with implications for passerine birds. Biological Conservation. 74: 57-63.

McGee, G. 1998. Structural characteristics of Adirondack northern hardwood forests; implications for ecosystem management. Ph.D. Dissertation. State University of New York - College of Environmental Science and Forestry. Syracuse, NY, 206p.