



A tale of two lichens

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I have learned a few things as a naturalist. Whether I'm studying flora, fauna or fungi, I have discovered that appearances can be deceiving, that similarities are oftentimes superficial and that distinctions are frequently found only in the smallest of details. So when some photographs of the lichens *Dibaeis baeomyces* and *Icmadophila ericetorum* were posted to my Facebook page with inadvertently swapped identities, I saw a writing opportunity the teacher, writer and photographer in me could not pass up.

As you may already know, lichens are fungi with a unique lifestyle. Although they appear as singular entities, they are, in fact, dual organisms—a combination of a fungus (called the mycobiont) and a species of unicellular green or blue-green (or both) alga (called the photobiont). The fungus and alga coexist in a mutualistic relationship in which the fungus provides the alga with water and minerals and protects it from environmental stresses, while the alga relinquishes some of its photosynthesized sugars to the fungus for its growth and reproduction. Canadian lichenologists Trevor Goward may have described the relationship best: “Lichens are fungi that have discovered agriculture.”

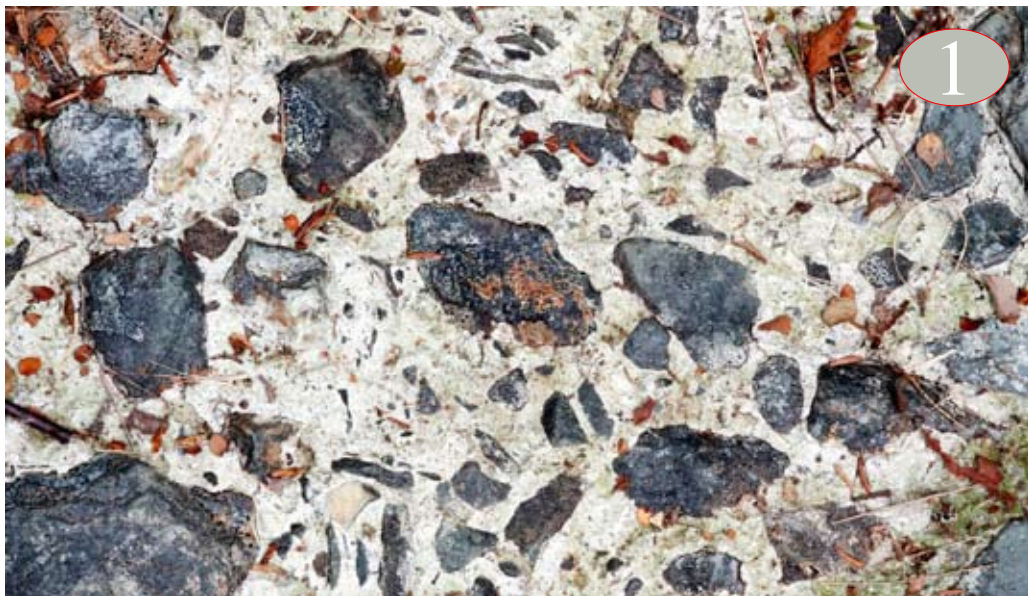
Fungi that are paired with a photobiont are called lichenized. As fungi, lichens are classified according to the mycobiont. But lichenized fungi are not a

monophyletic group, because the mycobiont can be either an ascomycete or basidiomycete, albeit few are the latter. About 64,000 ascomycete species are known, of which about 18,000 are lichenized. Both *Dibaeis baeomyces* and *Icmadophila ericetorum* are ascomycetes.

Lichens are often pioneer species, the first macroscopic organisms colonizing exposed surfaces. Individual lichen species are often very fussy about their substrates and habitats. *Dibaeis baeomyces* prefers siliceous, clayey soils that are exposed to direct sunlight. It is commonly found along road banks, ditches and old gravel roads and railways (Figure 1). If the soil is left undisturbed it will even grow on abandoned lots cleared of vegetation. *Icmadophila ericetorum*, on the other hand, prefers old, well decayed tree stumps and exposed roots

that have been stripped of their bark (Figure 2). The lichen also grows on tufts, and will aggressively overgrow moss as its thallus expands (Figure 3). *Icmadophila ericetorum* is less frequently found on soils, but some of the identification problems associated with these two lichens occur when they grow on similar substrates, if seen from a distance. On *Sphagnum* hummocks, *I. ericetorum* can be confused with the similar *Ochrolechia frigida*, and on decayed wood it is even possible to confuse it with squamulose lichens that frequently inhabit the same substrate.

Both *Dibaeis baeomyces* and *Icmadophila ericetorum* have continuous crustose thalli that look as if they were spray-painted on the substrate. The thalli are whitish in colour when dry (Figure 1) and pale grey-green when moist or wet (Figure 3). When occurring in large patches, both lichens tend to suppress the growth of other vegetation, such as mosses and other lichens. Since their light coloured thalli reflect sunlight, both lichens help to keep their respective substrates cool and moist, which aids soil development. The lower cortex of both species also extends slightly into the substrate, easily consolidating loose





material and creating a crust layer that prevents soil surface erosion. The differences in their thalli can be seen when examined close-up with a loupe (title banner). The thallus of *D. baeomyces* is coarsely granular, whereas that of *I. ericetorum* thicker, seemingly finer grained on wood than on tuft and soil.

Lichen reproductive structures differ depending on whether they are vegetative or sexual in nature. Vegetative structures include granules (soredia) that contain a little of both partners and coats the thallus like powder. Outgrowths on the upper cortex called isidia also contain some of both partners. Sexual reproductive structures arise from the fungus and are responsible for creating and releasing spores. The most common structure is the apothecium. Anatomically circular, disc, or cup-like in shape, apothecia often grow at the end of a short stalk or are attached directly to the thallus.

Both *Dibaeis baeomyces* and *Icmadophila ericetorum* have apothecia whose detailed characters are key to identification (title banner and Figure 4). The apothecia of *D. baeomyces* are largely bubble gum pink in colour, spherical, 1.5–4 mm in diameter and located on the tip of a 2–10 mm long light pink stalk. Some apothecia may appear collapsed or shrivelled, maybe because they are desiccated or remains of the previous year's growth. The apothecia of *I. ericetorum*, on the other hand, are pink to light orange in colour, flat discs or slightly convex cups about 1–4 mm in diameter with wavy whitish margins sometimes slightly enrolled. The apothecia may be attached to the thallus or grow on very short and barely visible stalks.

Lichens are probably the most ubiquitous, hardy and resilient forms of macroscopic terrestrial organisms on the planet. They are diverse and distributed from the tropics to the poles. Our two

lichens differ in their distribution. *D. baeomyces* is circumpolar, restricted to the temperate zones. In North America, it is confined to the eastern portion of the continent stretching from Labrador to Georgia and west to the western flanks of the Appalachian Mountains. It is one of thirteen species in the *Dibaeis* genus. *Icmadophila ericetorum* has a much wider distribution, found in tropical, subtropical and temperate zones. In North America, *I. ericetorum* is essentially a northern temperate species, confined to Canada and in the US to Alaska, New England and the hinterland of several Great Lakes states. Of the six species of *Icmadophila*, *I. ericetorum* is the only one found in North America.

Most organisms have vernacular names, local or regional in origin, usually based on looks or uses. Fungi have fewer common names than most other forms of vegetation, but they are always interesting, and for many people, easier to remember than the scientific tongue twisters commonly found in guidebook. *Dibaeis baeomyces* is commonly called pink earth lichen. When its apothecia are abundant, the lichen turns the ground noticeably pink, even when viewed from a short distance away. *Icmadophila ericetorum* has several common names including candy lichen, peppermint drop lichen and spray paint lichen. But the most imaginative and memorable name is fairy puke or fairy vomit, names reportedly given the lichen by loggers who may have recognized what they were looking at and knew it wasn't theirs.

The many abandoned lots, walking trails and gravel roads that cut through our forests are prime habitats for *Dibaeis baeomyces* and *Icmadophila ericetorum*. So, when out walking, watch for these lichens, get down on all fours, have a close look and use the characters of the substrate and apothecia to identify them.