

Arboreal lichens

of the Happy Valley-Goose Bay region of Labrador

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INTRODUCTION

Foray Newfoundland & Labrador organizes annual forays (gatherings of people interested in mushrooms and lichens) in different localities throughout Newfoundland and Labrador. In September of 2016, the annual foray was in the Happy Valley-Goose Bay (HVGB) region of Labrador. Here we present a description of the general habitat and a diagnostic key for the arboreal lichens likely to be encountered there, to aid people in identifying the lichens of the region.

THE LABRADOR ENVIRONMENT

If you are flying in to HVGB from St. John's and have a window seat, one of the first things that strike you as you approach is the sweep and bend of the Churchill River (known as the Grand River by the people of NunatuKavut and Nunatsiavut, and as the Mishtashipu by the Innu). This 856 km-long river has its headwaters at the Smallwood Reservoir and empties into Lake Melville and thence into the Atlantic Ocean. The river drains an area of 79,800 km², and carries silt, which has been deposited over the years on the floodplain on which Happy Valley-Goose Bay sits. As you take your first walk along any trail within the town, you will be struck by the sandy soil, carpeted with lichens, particularly those in genus *Cladonia*.

The area around Goose Bay lies in the High Boreal Forest (Lake Melville) Ecoregion, one of 12 ecoregions that make up the "Big Land" (the island part of the province has 9 ecoregions). The High Boreal Forest is dominated by black spruce (*Picea mariana*). The forests around HVGB are generally more extensive and productive than other parts of the boreal (including mainland boreal forests). Although this is a fire-driven system, there are a few more post-burn gaps and patches than in the neighbouring forest ecoregions. As well, the fire return interval is thought to be longer (perhaps even 300-500 years) than in other parts of the continental boreal forest, likely due to the slightly more maritime climate. In addition to *P. marina*, other trees include white birch (*Betula papyrifera*), which occurs mostly on moist valley slopes and river terraces, and balsam fir (*Abies balsamea*).

The landscape around HVGB is also heavily influenced by glaciation. Ribbed fens and upland terraces are the legacy of the massive ice sheets and create interesting pockets of habitat, including plateau bogs and extensive peatlands, which will likely harbour some unique lichens.

LABRADOR LICHENS

We selected the lichens in the dichotomous key below because they were either found during the 2016 foray or because they are expected to be encountered in the region. Our selection of species that were not encountered were based on: digitized collection records from 82 herbaria (Consortium of North American Lichen Herbaria 2016), published records from Newfoundland and Labrador (Ahti 1983, Thomson 1983, 1997, McCarthy *et al.* 2015, McMullin and Wiersma *in review*), studies in other parts of the boreal forest in eastern North America (Brodo *et al.* 2001, Brodo and Craig no date, Walker 2007, McMullin *et al.* 2013), and personal experience of the authors.

KEY TO SELECTED ARBOREAL LICHENS EXPECTED TO BE IN THE HAPPY VALLEY-GOOSE BAY REGION

- Selected species comprise a small amount of the arboreal lichen richness in HVGB.
- Descriptions are based on dry specimens, particularly the colour of the thallus, which often changes when wet.
- Uncommon terminology is defined in the glossary at the end.

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1b. Thallus crustose or fruticose.....	23
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3a. Thallus yellow, KOH-; soredia marginal; apothecia absent; typically on shrubs or the base of conifers..	<i>Vulpicida pinastri</i> (Fig. 1A)
3b. Thallus orange, KOH+ dark purple (anthroquinones); soredia absent, apothecia present; typically on deciduous trees.....	<i>Xanthoria hasseana</i> (Fig. 1B)
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7a. Thallus ascending from the substrate; lobe margins ruffled, with pycnidia (cylindrical spike-like projections), cilia present or absent; medulla C-.....	8
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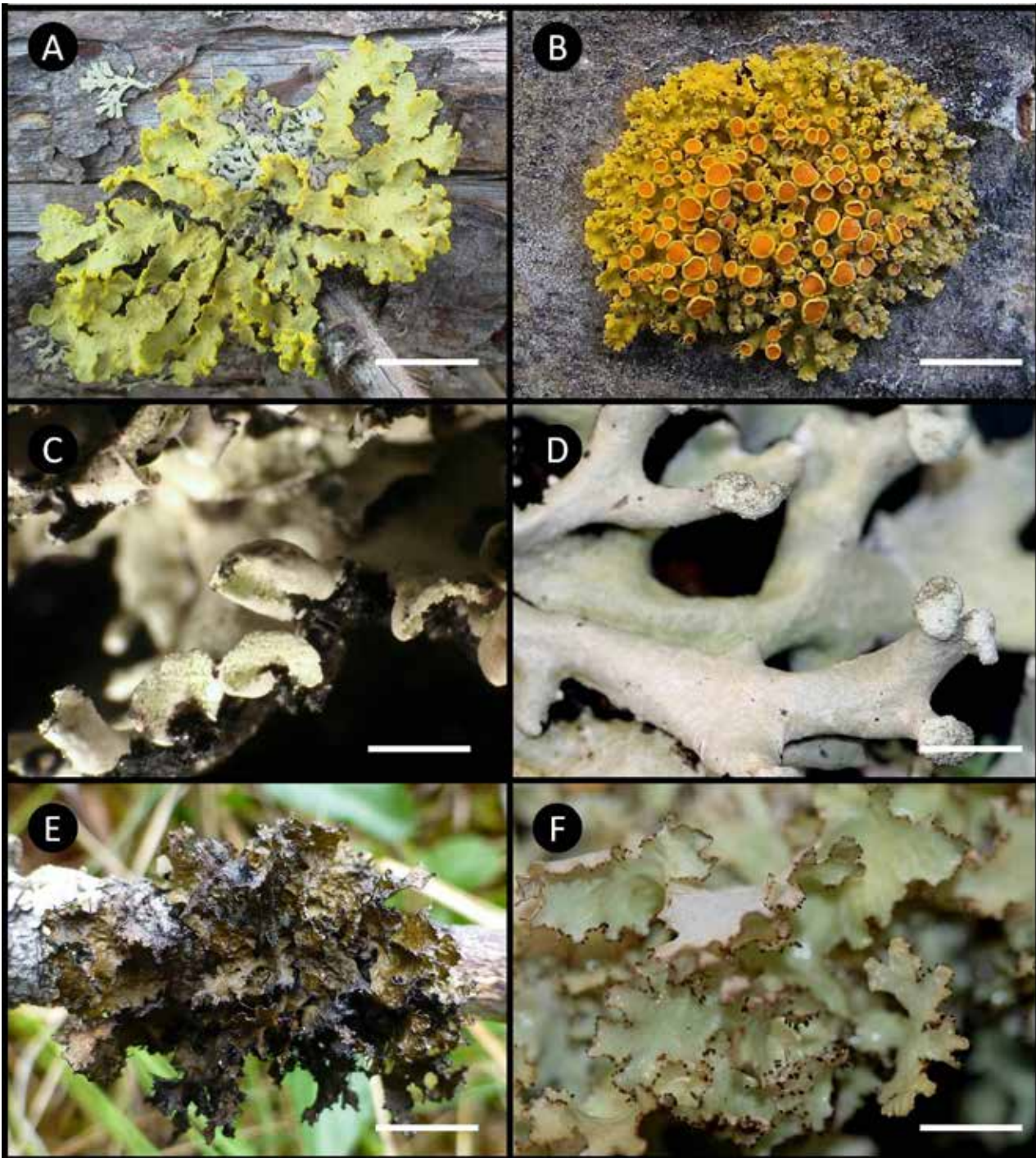


Figure 1. A) *Vulpicida pinastri*, scale = 7 mm. B) *Xanthoria hasseana*, scale = 4 mm. C) *Hypogymnia physodes*, scale = 2 mm. D) *Hypogymnia tubulosa*, scale = 2.5 mm. E) *Tuckermanopsis americana*, scale = 7 mm. F) *Tuckermanopsis orbata*, scale = 3.5 mm.

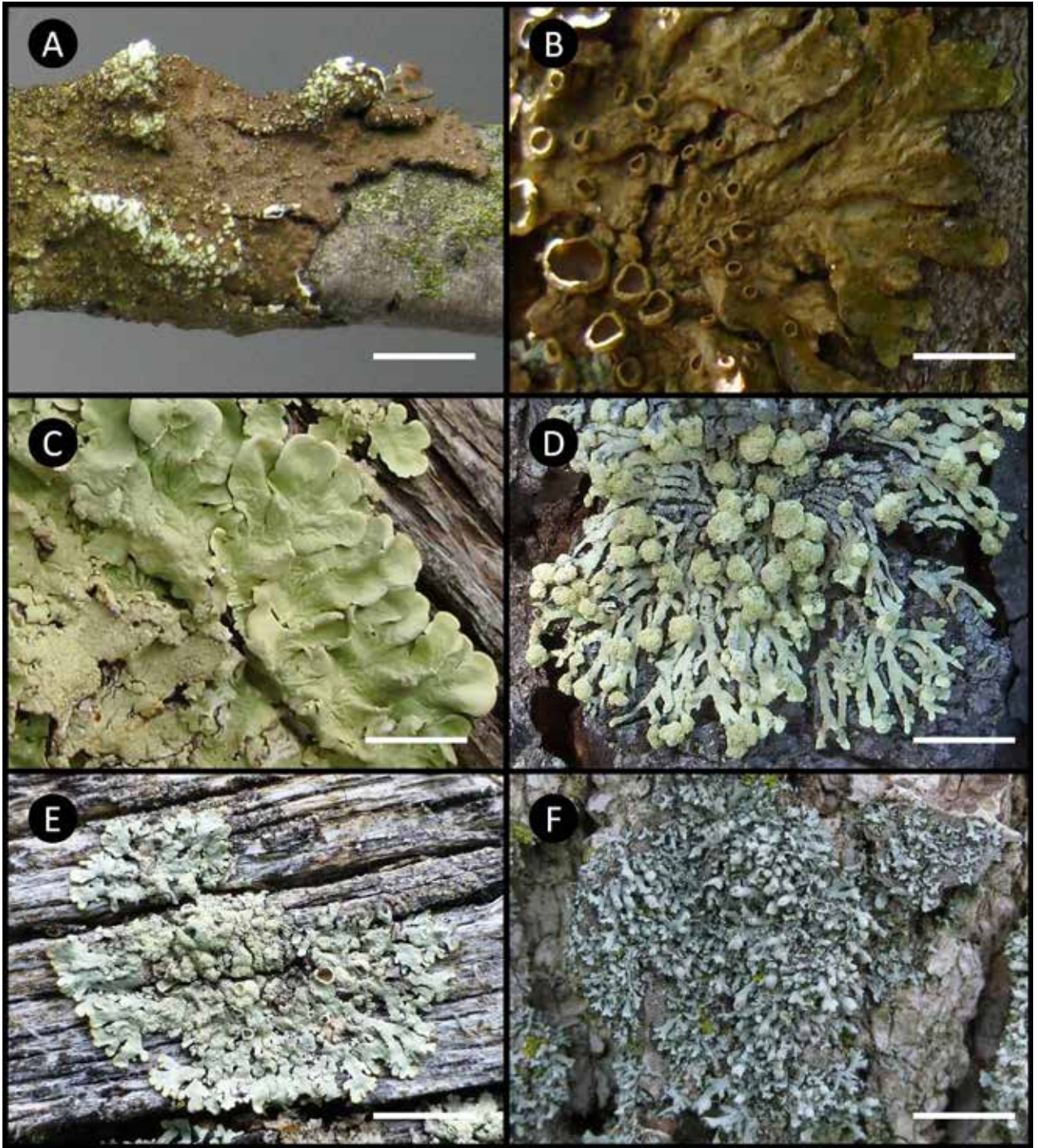


Figure 2. A) *Melanelixia subaurifera*, scale = 2 mm. B) *Melanohalea septentrionalis*, scale = 1.5 mm. C) *Flavoparmelia caperata*, scale = 7 mm. D) *Parmeliopsis capitata*, scale = 3.5 mm. E) *Parmeliopsis ambigua*, scale = 4 mm. F) *Physcia adscendens*, scale = 4.5 mm.

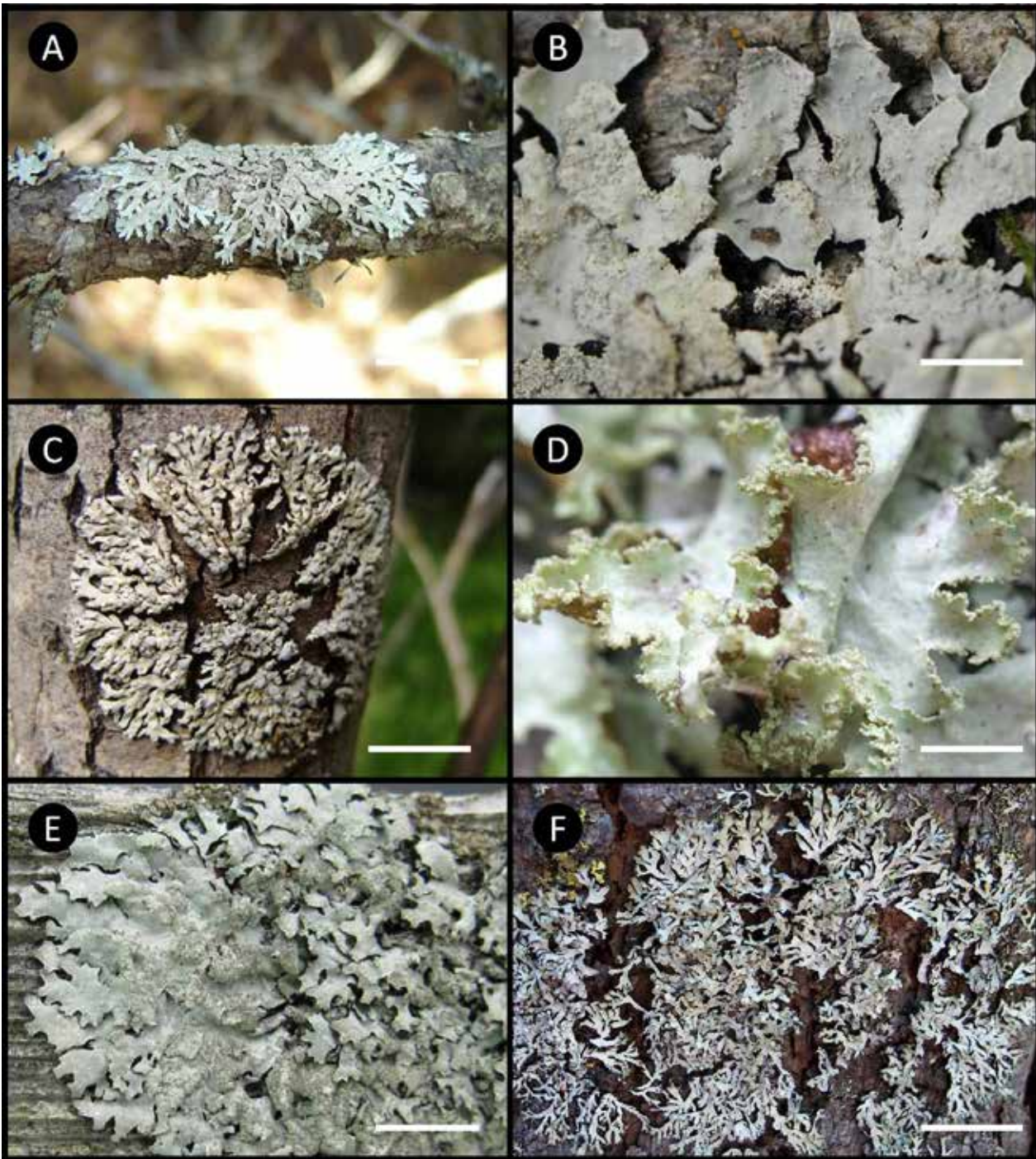


Figure 3. A) *Imshaugia aleurites*, scale = 5.5 mm. B) *Parmelia squarrosa*, scale = 7.5 mm. C) *Physcia aipolia*, scale = 6 mm. D) *Platismatia glauca*, scale = 9 mm. E) *Parmelia sulcata*, scale = 5.5 mm. F) *Parmeliopsis hyperopta*, scale = 9.5 mm.

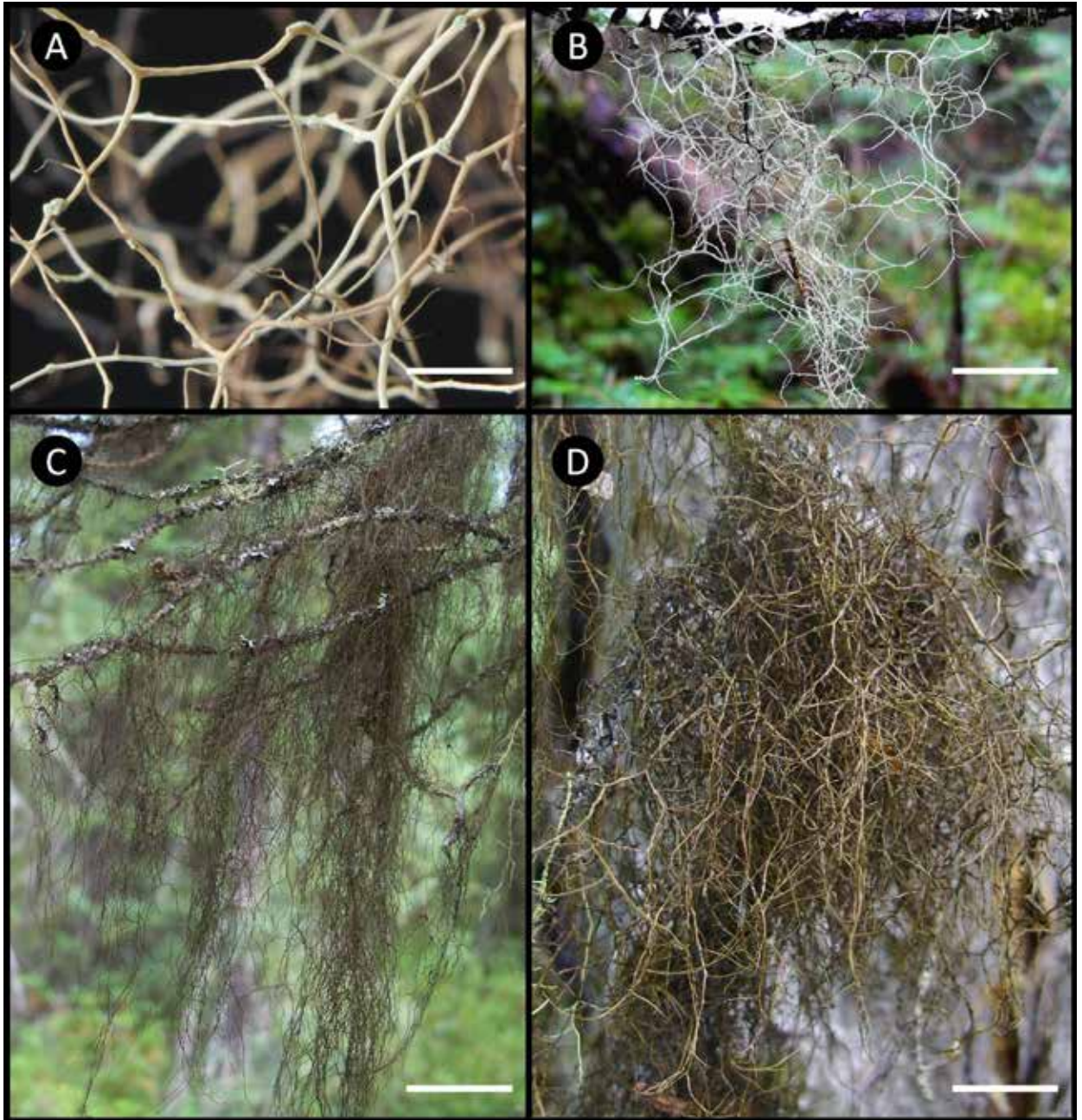


Figure 4. A) *Bryoria nadvornikiana*, scale = 2.5 mm. B) *Bryoria nadvornikiana*, scale = 7 mm. C) *Bryoria trichodes* ssp. *trichodes*, scale = 9 mm. D) *Bryoria furcellata*, scale = 6 mm.

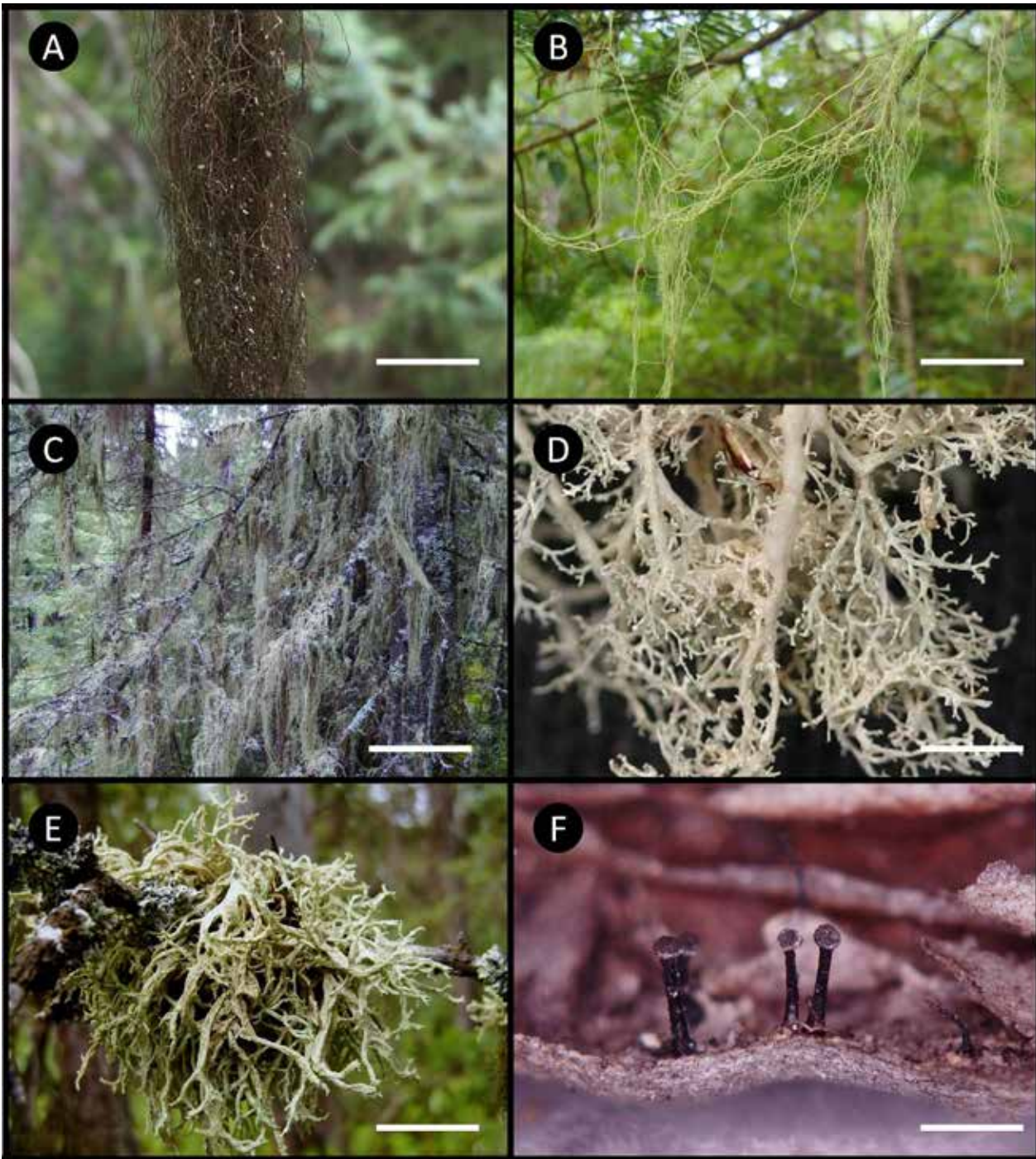


Figure 5. A) *Bryoria fuscescens*, scale = 6.5 mm. B) *Usnea cavernosa*, scale = 7.5 mm. C) *Usnea* spp., scale = ~30 cm. D) *Ramalina roesleri*, scale = 1.5 mm. E) *Evernia mesomorpha*, scale = 10 mm. F) *Calicium parvum*, scale = 0.9 mm.

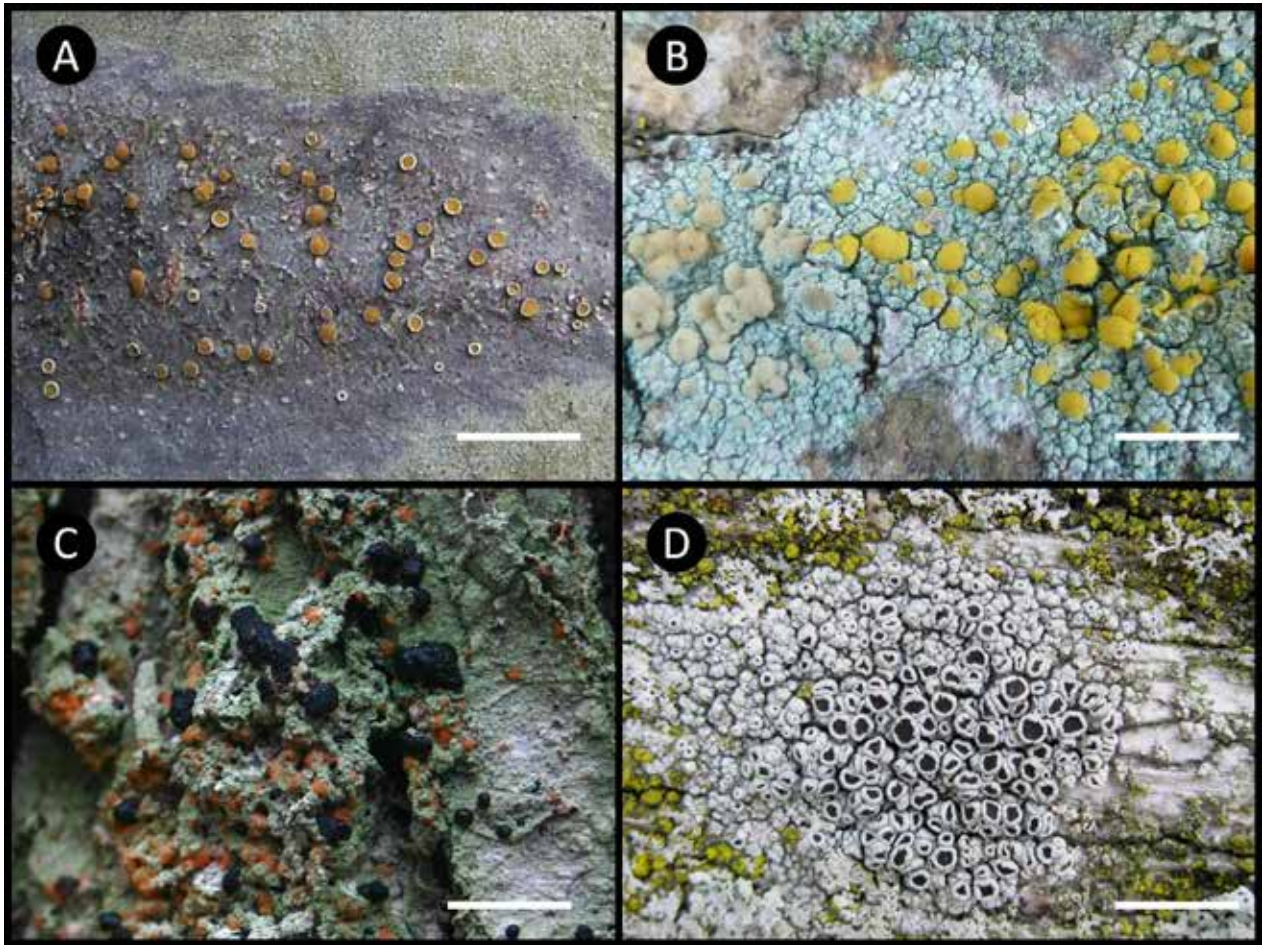


Figure 6. **A)** *Caloplaca cerina*, scale = 8 mm. **B)** *Lecanora symmicta*, scale = 5.5 mm. **C)** *Mycoblastus sanguinarioides* with orange *Trentepohlia* growing on the thallus, scale = 1.9 mm. **D)** *Lecanora hybocarpa*, scale = 7 cm.

GLOSSARY

Apothecium (pl. **apothecia**): Reproductive structures where fungal spores are produced.

Appressed: Pressed closely against.

C: A reagent of commercial bleach without additives, or sodium hypochlorite used in spot tests.

Central cord: The strong, cartilaginous thread forming the core of *Usnea* branches.

Cilium (pl. **cilia**): A slender hair-like outgrowth of the margin of the thallus or apothecium.

Cortex (pl. **cortices**): The protective outermost layer of the thallus; composed of densely packed fungal hyphae.

Crustose: A crust-like lichen growth form which tightly adheres to its substrate over its entire lower surface. Lacks a lower cortex and rhizines.

Fibril: A short branch growing perpendicular to the main branch.

Foliose: A leaf-like lichen growth form, which typically has a distinct upper and lower surface.

Fruticose: A branch-like or bushy lichen growth form, typically without a distinct upper and lower surface.

Hymenium: The spore producing region of the fruiting body which consists of the asci or basidia, spores and paraphyses, pseudoparaphyses, or paraphysoids.

Isidiate: Having isidia.

Isidium (pl. **isidia**): A cylindrical or globular vegetative propagule composed of both the photobiont and mycobiont packaged within a cortex. Attached to the thallus surface or the margins of apothecia.

KOH: A spot test reagent of 10% potassium hydroxide. Sodium hydroxide can serve as a substitute.

Laminal: On the upper surface of the thallus, does not include the area near the margins.

Lobulate: Resembling or bearing lobules.

Medulla: A loose layer of interwoven fungal hyphae in the interior of the thallus, beneath the cortex and photosynthetic layers. Most often white, rarely orange or yellow.

Papilla (pl. **papillae**): A small, wart-like bump found on the cortex of some lichens.

PD: A spot test reagent of *para*-phenylenediamine. Typically prepared with 70% ethyl alcohol.

Pseudocyphella (pl. **pseudocyphellae**): A break in the cortex through which medullary hyphae come to the surface and appear as pale spots or lines. Unlike cyphellae, not lined with special cells.

Rhizine: A root-like multicellular hypha growing from the bottom of the thallus to anchor the lichen to its substrate. Rhizines of different species can vary in their length, width, and degree of branching.

Ruffled: Wavy or undulating in form.

Soralium (pl. **soralia**): A crack or opening in the cortex where soredia are produced. Can take many forms.

Sorediate: Having soredia.

Squarrose: Of the thallus, having a scaly, rough surface. Of rhizines, having many short branches at right angles to the central axis.

Thallus (pl. **thalli**): The vegetative body of a lichen formed by a combination of algal and fungal cells.

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