

# WHO IS WHO?: BRYOPHYTES, FERNS & LICHENS

## An introduction

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Bryophytes, ferns and lycophytes, as well as lichenized fungi all share the common feature of being spore-bearing and traditionally their members have been lumped together and referred to as cryptogams. Although, cryptogams do not form a natural group and are not monophyletic, they share many ecological and physiological traits. Lichens and bryophytes, especially, share common ecological and physiological features: they are relatively small organisms that often produce species-diverse mats over rock, soil, and tree bark, and can survive periods of drought in non-metabolic stages.



	<i>Bryophytes</i>	<i>Ferns &amp; Allies</i>	<i>Lichens</i>
<b>Classification</b>	<p>Bryophytes represent three independent lineages, i.e.,</p> <ul style="list-style-type: none"> <li>• Marchantiophyta (liverworts) [ca. 7500 species]</li> <li>• Anthocerotophyta (hornworts) [ca. 100 species]</li> <li>• Bryophyta (mosses) [ca. 10,000 species]</li> </ul>	<p>Plants historically lumped together in groups such as “pteridophytes” and “ferns and fern allies” represent independent assemblages, including:</p> <ul style="list-style-type: none"> <li>• Psilotopsida (e.g., whisk ferns) [ca. 92 species]</li> <li>• Equisetopsida (horsetails) [ca. 15 species]</li> <li>• Marattiopsida [ca. 150 species]</li> <li>• Polypodiopsida (leptosporangiate ferns [ca. 10,000 species]</li> <li>• Lycopodiophyta (Lycopods) [ca. 1000 species]</li> </ul>	<p>A lichen is a symbiotic association of a fungus (mycobiont) and one or several photosynthetic partner/s (photobiont), which may be an alga and/or a cyanobacterium.</p> <p>Lichens are named based on the fungal component, typically <b>Ascomycota</b> - a Division/Phylum of the kingdom Fungi.</p> <p>There are an estimated 17,500 species.</p>
<b>Habitat</b>	 <p>Bryophytes, ferns and lichens are an important and conspicuous component of the vegetation in many regions of the world, constituting a major part of the biodiversity in moist forest, wetland, remote mountain elevation and tundra ecosystems. Unlike most</p>	<p>Bryophytes and ferns are frequently seen growing together, particularly in moist, cool places, e.g., streams</p>	<p>bryophytes and ferns, lichens can live in harsh environments like deserts and polar regions.</p>

**Ecological & biological significance:** Bryophytes, ferns and lycophytes as well as lichenized fungi are of ecological significance in a variety of ecosystems, and participate in key ecological functions such as erosion prevention, plant succession, decomposition, and as primary producers in the cycling of carbon and nitrogen. This group of organisms also have interesting biological properties such as anti-microbial, anti-fungal, cytotoxic, insect and muscle relaxing activity. Lichens have been used as environmental indicators of pollution. Ferns and lichens, in particular, have been a very important part in cultures throughout the world as a source of food, building resources, and dyes for textiles.

<b>Summary of similarities &amp; differences</b>	<i>Bryophytes</i>	<i>Ferns &amp; Allies</i>	<i>Lichens</i>
<b>Vascular tissue</b>	Absent	Present	Absent
<b>Photosynthetic</b>	Yes	Yes	Only algae partner
<b>Spores</b>	Yes	Yes	Yes
<b>General growth form &amp; size</b>	Small, erect, cushions, or tightly appressed	small to large tree-like, erect, climbers	Small, tightly appressed to substrate
<b>Life cycle</b>	Haploid gametophyte dominant	Diploid sporophyte dominant	Fungal partner dominant