

## Life on a Leaf

Cloudbridge Nature Reserve - Nature Notes No. 10

### The Five Tiny Kingdoms

Scientists tell us that many tropical species remain to be discovered. Did you know that some of these may be right in front of you, brushing your face as you thrust your way through the forest? The phyllosphere, the world on a leaf, can be home to many different forms of life, including species from the Plant Kingdom (the leaf itself), the Animal Kingdom (tiny insects), the Fungus Kingdom, the Algae Kingdom and the Bacteria Kingdom. (These are the five Kingdoms of Life.) There is even a special name for plants that live on other plants: epiphylls.



### Mosses and Liverworts

The family of mosses and liverworts, or bryophytes, seem to thrive on certain types of leaves in the cloud forest. These epiphylls need humidity and tend to colonize longer-living leaves with smooth surfaces, which promote the establishment of reproductive devices with adherent cells. An example of a leaf-loving liverwort is the one on the left. Some liverworts penetrate the leaf and may absorb water during the dry season, and many absorb minerals from their hosts.



### Lichens Like Leaves

Lichens consist of a fungus bound to an algae or to cyanobacteria; thus they bring together three of the Kingdoms. Costa Rica is the country with the highest number of leaf-inhabiting (foliicolous) species of lichens, with about 350 of the 550 species known worldwide. Indeed many species of lichen and other epiphylls can be found on a single leaf.

### Do Leaves Like Lichens?

While some epiphylls are semi-parasitic, their colonization may also benefit the host plant, because lichens and liverworts provide a suitable environment for nitrogen-fixing bacteria and cyanobacteria — the forest's fertilizers. They may also protect the leaves against herbivores.

### Animal Life on a Leaf

Snails, moth larvae, barklice, and worms are among the denizens of the miniature zoo that thrives on (or under) the forest leaves. Minute snails and psocids (barklice) are some examples of invertebrates which feed on foliicolous lichens and bryophytes. The damage caused by these animals can positively influence the diversity of life on individual leaves.

