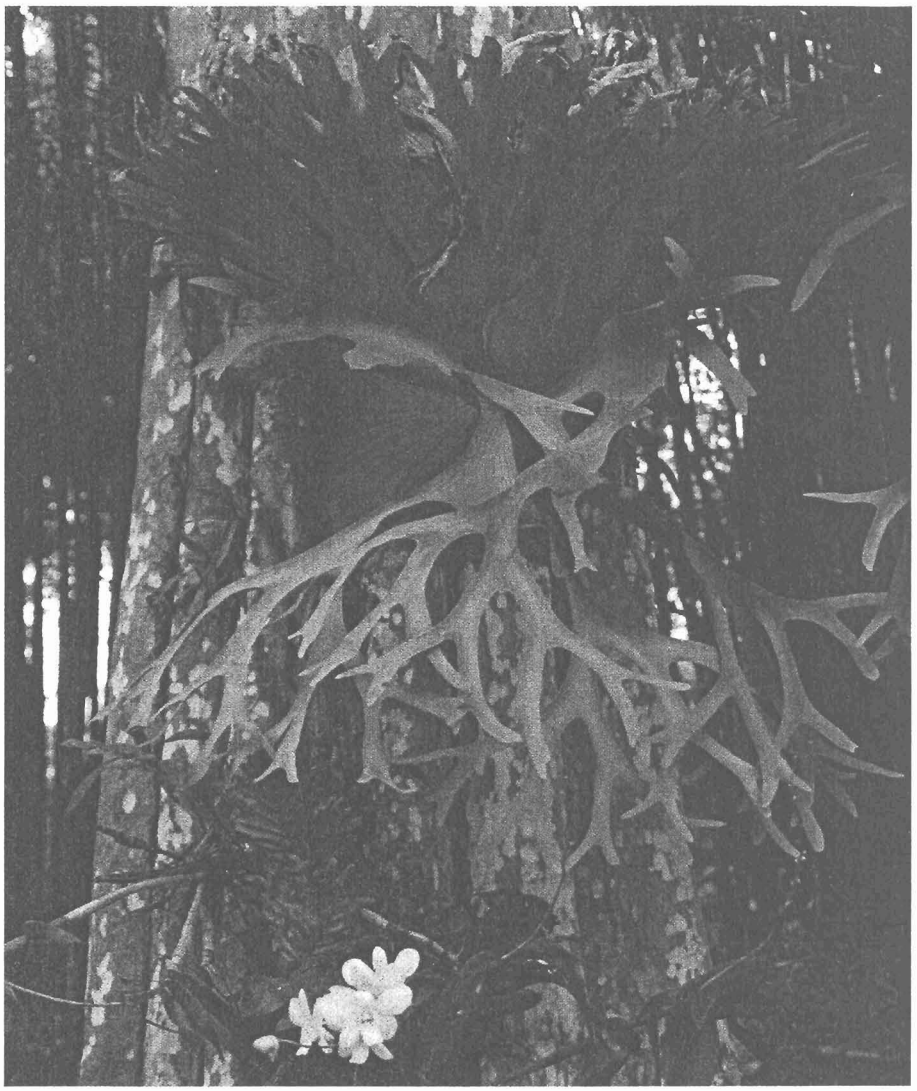
Epiphytes

Epiphytes (*epi*, meaning "surface," and *phytes*, meaning "plants") are plants that live on host plants, usually in the treetops. They include a wide variety of growth forms, ranging from woody structures to herbs. Epiphytes are not parasites but simply rely on their host trees for support. In return, they collect enough light to manufacture energy and also provide food and shelter for many organisms living in the treetops, such as insects, birds, and other small animals. More than twenty-five species of epiphytes have been classified by botanists, and more are found each year as botanists continue to find new ways to climb into the treetops of the tallest, unexplored regions of tropical rain forests.

Epiphytes have unique ecological characteristics that enable them to survive in the forest canopy. Some of these special adaptations include:

- holdfasts or other ways of adhering to the bark or branches of trees, so that wind or other forces do not knock them down and so they can compete for sunlight in the canopy; epiphytes do not have conventional roots that extend into the soil

An epiphytic orchid on a tree trunk in Thailand.



herbivore an organism that feeds on plant parts

- evergreen foliage that is resistant to drying out in the hot, dry canopy and that is too tough to be chewed by insect **herbivores**
- plant shapes (e.g., cups or rosettes) that allow the collection of water, fallen leaves, and decomposing bodies of insects that together form a nutrient pool for the plant as well as for their aquatic animal inhabitants
- tiny seeds that are wind-dispersed and can lodge in tiny crevices in tree bark
- pollinators such as bees and flies that inhabit the canopy
- relationships with fungi (mycorrhizae) that aid the epiphyte in gathering additional nutrition for photosynthesis.

More than eighty families of plants contain species that are epiphytes, but only several have a significant number of species that are epiphytic in their habit. These include orchids (family Orchidaceae), bromeliads (family Bromeliaceae), cacti (family Cactaceae), ferns (family Pteridophyta), aroids (family Araceae), and several groups of ferns, mosses, and liverworts. Over

twenty-five thousand species of epiphytes exist, including approximately twenty-one thousand orchids and over one thousand species of bromeliads.

Many animals depend on epiphytes for their existence in the canopy. Tarantulas often live within the rosettes of bromeliads, while bats, birds, and insects serve as important pollinator groups for bromeliads; lizards and birds visit epiphytes for feeding and drinking; insects dominate as pollinators of orchids; and ant-nest garden epiphytes provide nesting cavities and shelter for their ant residents. Tank epiphytes, those plants that contain a pool of water formed by tightly pressed leaves in a rosette, provide a mini-aquatic ecosystem in the canopy that has been shown to support over fifty species of animals, including mosquito larvae, tadpoles, beetles, spiders, flies, and even lizards. Because epiphytes are plants and produce their own energy, they actually provide nutrients to other organisms and thereby enhance the diversity of life in the forest canopy.

Relatively little is known about epiphytes in contrast to the plants' terrestrial counterparts because of their location high above the forest floor. During the past decade, new methods for reaching the treetops have been developed that provide better access for the study of epiphytes. These techniques include the construction of canopy walkways, the use of ropes and technical climbing hardware, hot air balloons and inflatable canopy rafts, and even construction cranes. The challenge of reaching epiphytes and their inhabitants has been overcome, and in the future more information will be discovered about these unique plants that inhabit the treetops. SEE ALSO INTERACTIONS, PLANT-PLANT; MYCORRHIZAE; ORCHIDACEAE; RAIN FOREST CANOPY; RAIN FORESTS; SYMBIOSIS; TREES.

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