CLOUD FORESTS

A cloud forest is a rain forest without the deluges. It is a highland forest characterized by nearly 100% humidity throughout the year. Clouds are constantly drifting through the valleys and treetops. The forest gathers water through evapotranspiration — the accumulation of water vapors on the floor of the cloud forest and in the aerial plants known as epiphytes. The foliage harbors a wide diversity of epiphytes. Some, like “old man’s beard” (the lichen usnea) draped on branches and vines, act as a huge net to capture moisture. Tree trunks are almost always covered with mosses, bromeliads, ferns, and other plants. Intact cloud forests play an extremely important role in the hydrology of certain regions of the planet; they capture, store, and filter water that feeds into local communities and large rivers hundreds of miles away.

Trade Winds

The cloud forest exists because of the wet tropical trade winds blowing east to west from the Caribbean Sea. These moisture-laden winds are forced up the mountains, like the steep slopes shown in the picture at the top. The air cools as it rises in altitude, and the moisture is squeezed out to form water droplets which make up the almost ever-present clouds. One of the defining features of a cloud forest (as opposed to a rain forest) is that in a cloud forest most of the moisture is obtained from the clouds (horizontal mists), and a lesser amount is received as rain (vertical drops). Many hundreds of plants have evolved to depend upon this continual mist; hundreds of animals have evolved to depend on these plants. The Chirripo and Talamanca National Parks protect a large section of this precious and fragile cloud forest. In recent years, however, research has shown that this environment is even more fragile than previously known — protecting the land within the reserve might not be enough. Studies over the last several years, notably at the Monteverde Reserve, have shown that cloud production is directly affected by downslope deforestation. Winds that blow across pastures and farmland are warmer and drier than winds that blow across forests. When warmer and drier winds rise along the slopes of the mountains on their way to the alpine forests, they must rise higher before clouds are formed. The Chirripo preserve is along the top of the continental divide: if clouds are formed higher they will be formed above, not within the forest. This will rob plants of the mists so critical to their survival. This issue has been studied extensively at Monteverde, and it is likely that cloud forests in other areas are similarly threatened.

Epiphytes

Because cloud forests are found in the mountains, they are much cooler than the hot tropical rainforests most people are familiar with. Mountain winds and the added weight of water-laden epiphytes often cause branches to fall to the ground. Falling branches also create light gaps, allowing the growth of light tolerant plants and producing a constant mosaic of succession.

Soils

The cloud forest topsoil or humus layer will have less natural fertilizers, meaning that the leaves that fall to the topsoil will not decompose fast enough to give nutrients back to the trees. In the rain forest for the most part the rain pours down in greater amounts and the decaying compost made out of leaves, rotten trees and other forest vegetation will have time to decompose. In the cloud forest, rain permeates the topsoil more easily; hence as a general rule trees will grow smaller than in a rain forest. This reduces the height of the cloud forest canopy and adds to the forest's gnarled appearance. Animals are abundant but the cloud forest has thicker understory foliage so that we, as visitors, are less likely to see them. Indeed, birds are more abundant as well as evident in secondary underbrush and forest.