Tropical Forests Prove Cornucopia to Humans There

By BAYARD WEBSTER

From time immemorial many people have regarded the tropical forest as more foe than friend. But the equatorial jungles that cover Africa, South America and Indonesia have been found by a scientist to be capable of providing hundreds of thousands of people with all their needs.

A detailed survey recently by a botanist at the New York Botanical Garden disclosed that a community in a remote section of Bolivia used 85 percent of the area's species of trees, shrubs, vines and herbs for food, clothing, housing, medicines, transportation and monetary gain.

The finding marks the first time that the many ways in which a human community uses different species of plants have been so precisely quantified and documented, scientists at the botanical garden say.

The survey, conducted by Brian M. Boom among a tribe of 400 aboriginal Indians in the northern Bolivia section of Amazonia, also indicates that many of the world's tribes and ethnic groups rely on the plants of the forest to a much greater degree than had been believed.

Brian Boom

Young Chácobo Indians with canoe carved from a tree in the myrrh family. Above, Brian M. Boom in northern Bolivian rain forest.

New Branch of Science

The investigation by Dr. Boom is one of a number of studies being made in the tropics at a time when rain forests are being increasingly cut and their fragile ecosystems destroyed. Scientists' awareness of this situation has given rise in recent years to growing interest in a relatively new branch of science, ethnobotany: the study of how different primitive groups use the plants in their environment.

Marking off a 10-acre plot in the forest surrounding the village of Alto Ivon, where the Chácobo Indians live, Dr. Boom collected 91 species of trees in the plot and determined that 75 of them were used by the Indians in a wide variety of ways.

By identifying all the plant species he had collected from the plot and then displaying them one by one to the Indian tribesmen and having them show him the benefits, the researcher learned the uses to which the plants were put.

Many Uses of Trees

Dr. Boom's study, conducted for the New York Botanical Garden's Institute of Economic Botany and financed by the E. J. Noble Foundation, disclosed that different parts of trees were collected and processed by tribesmen for hundreds of different uses.

Fibers from trees are spun into thread and used for sewing and weaving cloth; tree trunks are hollowed out to make canoes, and wood is used for bridge and house construction, for making hunting bows and for a variety of other implements.

Dr. Boom, in a recent interview at the botanical garden where he is preparing a report on his research, said the Indians also used the forest as a pharmaceutical cornucopia from which many of their medicinal needs were drawn. The fruits, leaves, roots, sap and bark of several dozen tree species provided a wide variety of cures or temporary relief for a wide variety of human ailments, he said.

Among these are arboreal decoctions for such ailments as stomach aches, fever, diarrhea, chest pains, and skin infections. Cloth soaked in the sap of one tree species is used for relieving muscle pains. Unprocessed sap from a different species is drunk to relieve fevers. In addition, the Indians have found dozens of other medicinal remedies among the hundreds of nontree plants, Dr. Boom said.

Although he has not completed the compilation of the nontree plant uses, Dr. Boom found that more than 40 different species of food crops are grown in the tribes' fields and garden plots. These range from rice and corn to papayas, watermelon and cashews. For meat and protein the Indians hunt anteaters, armadillos, peccaries, tapirs and birds.

In one of the ironies of nature, the forest, in addition to nurturing the animals that provide meat for the tribesmen, also provides the means by which the Indians can kill their prey. When a hunter waits for a bird to come to a tree whose fruit attracts birds, he kills the bird with an arrow made from another tree. And when a hunter goes to a pond to fish, he will pick one of four species of trees that exude a milky fluid, cut stems from it, and swish the stems through the water. The diluted fluid from the stems in the pond paralyzes the fish, which rise to the surface where they are easily caught.

When living with the Chácobos from October 1983 through April, Dr. Boom tried one of the medicinal remedies used by the tribe. It was an herb of the pepper plant family whose leaves, placed against the gums, are used to cure toothaches. "It worked," he said. "It creates a numbing sensation and dulls the pain."

Recent ethnobotanical research is credited with the development of the surgical anesthetic tubocurarine, vincristine for treating leukemia and reserpine for tranquilizers, all derived from plants that had been used for years by so-called "primitive" groups in the tropics.

But Dr. Boom and other ethnobotanists note that as their forest is being cut down for agriculture and other uses, primitive tribes also increasingly come into contact with more advanced cultures. As a result, they report, both the tribes' cultures and their plants are disappearing at an alarming rate. "As their dress changes and they no longer perform their old ceremonies their knowledge of plants is also being lost very fast," Dr. Boom said, adding that the old ceremonies involved the use of plants in traditional healing or celebratory rites that have been abandoned.

In addition to Dr. Boom's survey of plant uses in Bolivian Amazonia, other studies are being undertaken to determine the potential value of tropical plants for the world at large, and how they can be saved or transferred to areas where they would not be in danger of being wiped out.

One such study is a four-year project that will result in a catalogue of the ethnobotanical uses of plants in the Suriname-Guyana-Brazil area of South America. The catalogue, expected to be completed in 1985, is being compiled by Mark J. Plotkin, a forest scientist, the Armand Erpf Fellow of the World Wildlife Fund-U.S. at the Harvard Botanical Museum. It will list more than 2,000 species of plants used for a variety of purposes in the northern Amazonia areas.

Most scientists regard the tropical forests as untapped storehouses of valuable chemicals that can be of use to modern medicine and industry in many ways. They feel that the chemical compounds in these plants can be used either as direct therapeutic agents or as the foundation for the manufacture of more complex medicinal or industrial compounds.

Researchers expect that the plants and their chemicals, many of which have not yet been analyzed and tested, will eventually be found to be useful in all parts of the world — if they escape the destruction of the tropical forests.