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Mountain Ethnobiology and Development in Highland Chiapas, Mexico

Lessons in Biodiversity and Health

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Ethnobiology has a rich tradition of understanding and documenting ecological knowledge of traditional peoples living in montane environments. These peoples and their environments currently face great threats to their continued existence. The Highland region of Chiapas, Mexico (Figure 1), in particular, is an area of interest to both ethnobiologists and development practitioners. The montane forests of this region are considered one of Conservation International's priority megadiversity hot spots. Over the

last few decades, poverty, population pressure, environmental degradation, and political conflict have intensified in Chiapas. Widespread political unrest and violence continue despite a "cease-fire" between the Mexican government and supporters of the Zapatista movement that first appeared in 1994. Despite these odds, projects aiming to support traditional indigenous health care while exploring ways of conserving local biodiversity are being continued in Highland Chiapas.



FIGURE 1 Map of the highland region in Chiapas, Mexico—an area characterized by a polarized political climate.

Highland Maya and their influence on biodiversity

Chiapas owes much of its biodiversity to its somewhat unique geographical position, but it is also a region that has experienced continuous human settlement and exploitation of its environments for thousands of years. There is increasing evidence that some (but certainly not all) human populations actually increase biodiversity through a sophisticated local environmental knowledge that leads to maintenance of certain types of habitats. In the Highlands, the Tzeltal and Tzotzil Maya, numbering approximately 800,000, have developed an elaborate knowledge system and modes of interacting with the biophysical environment. Their landscape today is very much a human landscape, with a patchy mosaic of different ecological zones that, in most cases, are human determined (Figure 2). In fact, the Maya utilize the entire landscape in one form or another.

These environmental relationships are readily exemplified by the Mayan use of medicinal plants. The Highland Maya have an intimate understanding of the distribution of medicinal plants throughout different microenvironments and utilize several hundred species in primary health care. This is an area of research that presents a variety of opportunities for conservation, sustainable development, and healthcare. Given the current situation in Highland Chiapas, it is crucial to explore these linkages. Some previous development projects in the region have tended to promote Western medicine to the exclusion of indigenous medicine as part of a larger pattern of paternalism and devaluation of indigenous

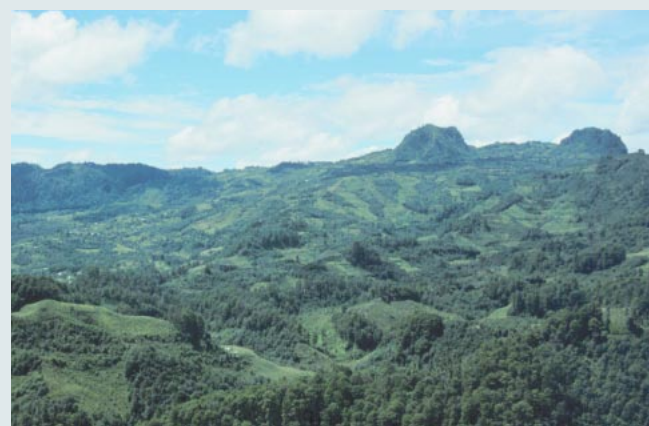
knowledge systems. Little attempt has been made to recognize the Maya medical system as a valid empirically based system until the work of Brent and Elois Ann Berlin in the 1980s. Medicinal plants play an overwhelming primary role in the daily health care of the Highland Maya. Despite access to clinics in most of their communities, people continue to self-administer treatments, relying on clinics only on rare occasions for very serious conditions.

The Maya International Cooperative Biodiversity Group (Maya ICBG) is a research and development initiative with over 30 researchers from 3 countries, for which Brent Berlin serves as the program leader. The project is sponsored by the United States National Institutes of Health, the National Science Foundation, and the Foreign Agricultural Service and works to conserve biodiversity. It also aims to create alternative economic opportunities for the indigenous inhabitants of the Highlands.

Indigenous health care and biodiversity conservation

There is virtually no medicinal plant cultivation among the Highland Maya despite their vast wealth of medicinal plant knowledge, making them perhaps unique in

FIGURE 2 Highland Chiapas: a patchy landscape mosaic of different successional stages. The majority of the land is under some form of cultivation or management. Montane cloud forest exists at higher elevations but faces grave threats as a result of population pressure. (Photo by John R. Stepp, 1995)



Mesoamerica. The Maya ICBG project is encouraging cultivation of medicinal plants to alleviate potential stress on wild populations while also exploring potential markets. Medicinal plant conservation is a relatively new endeavor, stemming in part from growing trends of plant habitat reduction that have now endangered over 20,000 plant species worldwide. This number does not include plants in danger of local extinction. This problem has widespread implications for traditional peoples like the Highland Maya who are almost completely reliant on traditional plant medicine for their primary health care. According to the World Health Organization, this situation is found among approximately 80% of the population in developing countries.

A core group of medicinal plants known as the *cuadro básico* (basic medical kit) has been identified based on previous research (Berlin and Berlin). The *cuadro básico* project has three main objectives:

1. Cultivation of medicinal plant species that meet local health needs.
2. Cultivation of medicinal plant species that are potentially endangered.
3. Cultivation of medicinal plants for local economic development.

The initial phase of the project involved identification of appropriate species for inclusion in gardens and identification of communities and individuals with whom to collaborate (Figure 3). The highest priorities for inclusion of species were based on the following criteria: species for which there is great local demand and low local availability, species that have shown bioactivity in laboratory analyses, species for which there is strong consensus regarding efficacy, and species for which a potential market exists for dried material. Species were then prioritized based on their distribution within different ecological zones and the relative demand for plants based on actual household usage. Medicinal plant gardens have

been established in 5 communities so far, and this number is expected to grow rapidly during the next few years.

Management by the Maya, both intentional and unintentional, has also been investigated along with cultural factors mediating such management (Figure 4). Based on an understanding of the specific ecological relationships of these plants, recommendations are now being made for improved management in light of increased population density and environmental degradation throughout the Highlands. It should be pointed out that none of the most important medicinal plant species face imminent threats of local extirpation. However, taking a proactive stance toward medicinal plant conservation ensures that these plants are not only maintained in their natural habitats but are also readily available in home gardens. This project also sets the stage for more intensive cultivation if a sufficient market can be developed. The market for herbal medicines and other natural botanical products is growing rapidly worldwide. The sustainable production of these plants for local, national, and international markets could be an additional source of income for indigenous families.

The Highlands of Chiapas provide an excellent opportunity to test the utility of a general model for managing, harvesting, and producing medicinal species recognized in traditional herbal medicine. Such a model would have the potential for broad applicability worldwide, particularly in developing countries where indigenous populations are heavily dependent on wild collected herbs for their primary health care. An ethnobiological perspective can create a crucial link between conserving both biological and cultural diversity, demonstrating that cultural and environmental preservation can be mutually supportive goals. Most importantly, it can contribute solutions to the pressing social and environmental problems of this region.

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FIGURE 3 Community members discuss which medicinal plant species to include in gardens. (Photo by John R. Stepp, 1999)



FIGURE 4 The author conducting an interview on medicinal plants in Tzeltal Maya, one of two Maya languages spoken in Highland Chiapas. (Photo by Samuel Crane, 1999)

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