ETHNOENTOMOLOGICAL SURVEY OF AMERIND GROUPS IN LOWLAND LATIN AMERICA

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The American Indian or Amerind had undergone thousands of years of adaptation to living conditions of the New World prior to the arrival of European explorers, conquerors and settlers. Although dominant Europeans depleted or destroyed many Amerind tribes, some peaceful cultural exchanges did take place as various tribes shared their particular folk knowledge with settlers (Crosby 1972). Relatively unacculturated Indian groups remain today in areas least desired by or accessible to Europeans, like the inhospitable rainforests of the Americas. To varying degrees, they continue to practice their traditional cultures and form an important reservoir of information for ethnoentomological research. This paper focuses upon selected Central and South American groups that live in the lowland tropics. Though some practice slash and burn agriculture, these Amerind groups remain primarily hunting and gathering peoples.

Insects and related arthropods continue to pose serious problems to peoples of simple technology. Arthropods threaten public health, crop productivity, and are effective competitors for living space and food. Insects thus play an important role in cultural knowledge, material culture and belief systems of Amerinds.

UTILIZATION OF INSECTS

The precolumbian agricultural system of Latin America was slash and burn, which is characterized by regular shifting of field plots. In lowland tropical areas, starchy root crops have become the primary food source (Carneiro 1960). Fishing and hunting accounts for an adequate protein supply for some tribes, but protein intake appears to remain remarkably low for many Amerind groups. This reflects no special biological adaptation to low protein diets, but rather, erroneous data collection by biased observers. For Europeans, food is consumed during certain times and in certain places; for Indians, foods are gathered constantly and eaten on the spot. Gathering practices are so routine and continuous that data is difficult to acquire (Lyon 1974). Unless researchers follow on such routine ventures, constantly recording and weighing the gathered foods, the importance of such foods may be grossly underestimated. Denevan (1971) realized the significance of gathered foods in the diets of the Campa, who rely upon small animals such as miscellaneous larvae, ants, beetles, and other insects for a source of protein. Insects offer a rich supply of protein and fats and are readily obtained and available throughout the year (Taylor 1975).

Ants (Formicidae) are one of the most popular insect foods gathered in Latin America. The tribes of the Uapés-Caquetá region of the Amazon eat large quantities of the fat abdomen of the "cuqui" ant (genus and

species unknown) (Goldman 1963). The Roamaina and Iquito prefer certain flying ants (Metraux 1963b), while the Tucuna fancy the abdomen of "red ants" (Nimuendaju 1952). The Mave and Arapium eat winged female "sauva" (*Atta sexdens* L.),which are roasted, pounded, and then added to manioc flour. Though roasting seems to be the favored way of eating ants, Steward (1963) describes the widespread practice of adding whole ants or ant abdomens to manioc cakes. Eggs of some species (for example, *Atta cephalotes* L.) are considered greater delicacies than adults.

According to Chagnon (1968) the Yanomamo also eat spiders and caterpillars (probably Phalaenidae and Morphidae), which are wrapped in leaves and thrown into the coals to roast. These are said to become crunchy and have a texture and form like cheese pone.

Beetle grubs (Scarabaeidae and Buprestidae) are perhaps the most important insect food source. The Cayapa prize various types of grubs which they eat raw, fry in their own fat, or mash and make into a gruel with boiled plantain. Steward and Metraux (1948) observed the Peban tribes preparing a favorite sauce of red peppers, maize flour, and large fat grubs. The Yanomamo prepare large grubs for cooking by biting the insects behind their heads; a quick pull removes the head and intestines. If the grub is damaged in the process, the parts are eaten raw instead of being saved for roasting in leaves. The soft, white bodies that remain are said to taste like bacon. Liquid fat left over from the cooking is also licked off the leaves (Chagnon 1968).

Chagnon (1968) suggests that the Yanomamo come very close to "animal domestication" in their techniques of exploiting grubs. They deliberately cut down palm trees (various genera of Palmae) to provide fodder for developing grubs. The decaying pith attracts adult beetles to lay their eggs in the decaying palm heap. The Indians have learned when to return to the fodder to extract the numerous large grubs. A fair sized palm tree will yield 3-4 pounds of these grubs, some of which are "as big as mice". Thus one tree hosts a rich protein source readily available and always near a Yanomamo settlement.

Other insects are also intentionally reared and their life cycles are well known by their Indian keepers. Both Chagnon (1968) and Metraux (1963a) suggest various unnamed wasp species that can be considered semi-domesticates, including various species of stingless bees (Apidae). When evaluating whether or not bees are or were domesticated, it is important to consider the intentional acts that tend to propogate the hive. Metraux (1963b) observed the Guarani's techniques of collecting honey and was amazed at their intentional act of leaving parts of the comb and a few larvae so that displaced bees would return to the disturbed hive.

Indians have a keen eye for bees and are aware of the various habits of different species. They are able to observe bees flying about, follow them to their nests, and locate the hives in the highest parts of trees. The tree is either felled or climbed and some of the honey is eaten on the spot. Often honey is diluted and consumed as a beverage; this liquid is sometimes fermented to produce a mildly alcoholic beverage used in feasts (Conzemius 1932).

Beeswax is generally as important as honey. The Cayapa use wax as a waterproof caulking for canoes (Metraux 1963b). Wax is also boiled with

pigments to produce a paint for canoes and pottery. The mixture is applied hot; as the wax soaks into the wood or pottery, a smooth, colored coat is left on the outside (Barrett 1925). Beeswax is also used as a cement for making arrows, spears, and other implements. It is also burned for light (Conzemius 1932).

Insects are often used for decorative purposes. The Cayaya, for example, utilize the elytra of large irridescent beetles (Buprestidae), which are strung in great shiny clusters from headdresses, necklaces, and ceremonial clothing. Butterfly wings are likewise prized for personal adornment (Conzemius 1932). In those cultures that do make pottery, insects are frequently iconized in motifs (Covarrubias 1971).

Adaptation To Insects

Coping with insects is an unrelenting task for Amerind groups. Whether it is the daily routine of delousing the family, the formulation of natural insect repellents, or the production of fly fans, Amerinds have refined techniques for adapting to insects.

A sophisticated knowledge of insects, their behavior, and other environmental factors is essential to minimize the effects of insect pests. Careful settlement site selection and house type variation are two ways of modifying cultural forms to diminish contact with pests. Steward (1963) observed that the Witotoan tribes of the upper Amazon were quite careful to select village sites that were dry and "some distance from the river for protection from enemies and mosquitoes." Denevan (1971) observed that in spite of poorer soils, the Campa preferred sloped sites because of their greater exposure to sunlight and wind and the corresponding decrease in insect pests. Mosquitoes, black flies, and sand flies will fly only a few feet above their breeding sites (Borror and DeLong 1976). Tabanids are sensitive to minute wind currents as are midges and black flies. Prevailing winds are also an important consideration for coastal groups who seek to locate upwind from mosquito filled swamps. The Yanomamo select a rise or hump for their villages to minimize the attacks of insects. Their houses are rounded with only a smoke hole at the top. Smoke from smouldering fires repels most insects and hinders species that live in thatch. Palm fronds and banana leaves are arranged at the entrances to the houses to keep in the smoke and to form an effective barrier to most flying insects (Chagnon 1968).

Smoke is a universal repellent to insects. Holmberg (1950) reported that the Siriono have a fire smouldering at all times between each hammock to repel mosquitoes. Wagley and Galvão (1948) observed the same practice among the Tenetehara.

Various house types have developed to adapt to local insect problems. The Jura take refuge from mosquitoes in small oven-like structures made of earth (Metraux 1963b). The small thatch hut is as ubiquitous as insects in the tropical lowlands. They are generally tightly thatched and closed except for small doorways. Metraux attributes this construction as a protection against mosquitoes, though the thach itself is subject to severe infestations of various other insects. Barrett (1925) reports that cockroaches in the thatch of buildings are one of the greatest problems of the lowland tropics. For many tribes, like the Jívaro, the infestation is so bad

that every 3-5 years sites are abandoned and built anew somewhere else (Harner 1972). The Yanomamo completely burn their entire villages every 2 years because of tremendous populations of cockroaches, spiders, and scorpions in the thatched roofs (Chagnon 1968).

Steward and Faron (1959) report that "mosquito shelters" made from woven cane mats were being used within the communal houses of the Otomecs. Amerinds were using and producing mosquito netting long before the arrival of Europeans; mats of tightly woven cane and reeds were widespread in Latin America (Steward and Metraux 1948).

Sleeping platforms are also common throughout the Americas. The Cayapa utilize sleeping platforms both inside and outside their huts. These are 5-7 feet above the ground and provide remarkable protection against pests like horse flies, black flies, and sand flies that rarely attack above this level (Borror and DeLong 1976). Occasionally, "flea beds" are also seen in Latin America. These are built at a distance off the ground "beyond which a flea cannot jump" (Dunn 1973).

From the above descriptions it should be evident that the Amerind has developed diverse and sophisticated means of adapting to and utilizing insects. Further ethnoentomological research with remaining Amerind groups should reveal more details of the complex interrelationships between man and insects in the tropical lowlands.

I wish to express special thanks to Drs. Haag and Richardson, Department of Geography and Anthropology, Louisiana State University, Baton Rouge, Louisiana, for encouragement to pursue ethnoentomological research. I am also grateful to Dr. Michael D. Olien, Department of Anthropology, University of Georgia, Athens, Georgia, and Dr. William Overal, Chefe, Seção Entomologia, Museu Goeldi, Belém-Pará, for suggestions and advice in preparing this manuscript.

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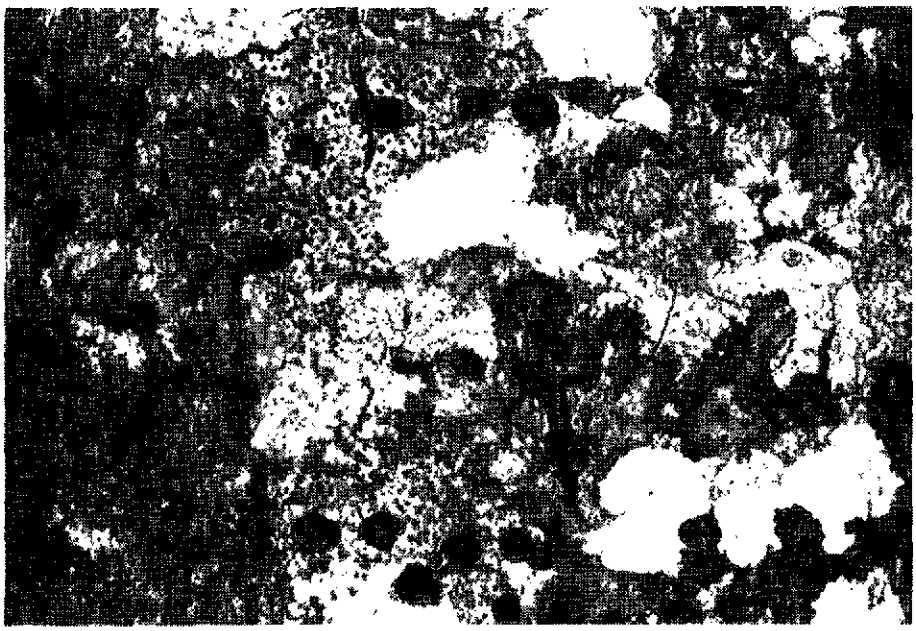

Photo Story—This stink bug (*Brochymena* sp.) is as cryptic in living color when resting on lichen-encrusted bark as it is in this B&W photo. Its antennae give it away this time. What search image could a predator form? JEL.