Notes on Entomophagy in the Philippines

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During a 6-year stay in the Philippines I made occasional observations on insect-eating practices. Some of these were part of developing an undergraduate course in Industrial bananas and maize. Sarah and her family resisted eating the locusts but were finally persuaded by her grandmother. The grandmother was a Seventh Day Adventist, abstaining from pork, and her argument resembled that of Vincent Holt in the classic Why Not Eat Insects?: It is preposterous that you people eat pigs which feed on all manner of filthy trash, and yet turn up your noses at these locusts which eat only clean vegetation. They boiled the locusts, dried them, and then cooked them with lemon and other flavoring.

Andres Duatin lived in the Cotabato region of southern Mindanao at the time of an outbreak in 1958. He told me that he and others among our readers who have had first-hand experience with wild insects to send their most tried-and-true recipes for publication in the Newsletter.

Our mail, especially during the past year, suggests that there is a sizeable number of people out there, non-entomologists, who want to know which insects are edible, where you go to find them, and how you collect them. And, finally, where can recipes be found? Answering the last question first, if the book itself can be found (its out of print), Entertaining with Insects: The Original Guide to Insect Cookery, by Ronald Taylor and Barbara Carter is an excellent source of recipes (see review in the March 1989 Newsletter).

Although the recipes are based primarily on mealworms, crickets, and honey bee brood, some of them can undoubtedly be successfully applied to a variety of wild insects. Recipes based on a wider variety of insects would be welcomed, however, and this is an invitation to wilderness survivalists and others among our readers who have had first-hand experience with wild insects to send their most tried-and-true recipes for publication in the Newsletter.

A more difficult problem is the lack of information available to the non-entomologist on how to find, recognize and collect edible insects in the wild. This presents an opportunity and a challenge to U.S. and Canadian entomologists. The first question of course is which insects are considered edible. To help get the ball rolling, Table 1 (pp. 3-4) lists more than 60 species that were used as foods by North American Indian tribes, based on ethnographic or archaeological evidence, or probably used based on ecological evidence. Many of these have been mentioned before in The Newsletter (see "The Identity of Grasshoppers Used as Food by Native American Tribes," November 1989, and the review of Mark Sutton's monograph, "Insects as food: aboriginal entomophagy in the Great Basin," March 1990), but we list them here in one concise table to make their identity more easily accessible. It is hoped that this list will spawn a bevy of circulars and booklets with titles such as "Edible Insects in California: Where, When and How to Collect Them," "Edible Insects in Montana...", etc.

As part of an effort to provide background information for use in preparing such booklets, we plan to include in the next issue of two of the Newsletter an article on potential hazards posed by insects collected for human consumption, and how to avoid them. Potential problems can be lumped under three headings:

1. Insects as hosts and/or disseminators of vertebrate-pathogenic entities such as bacteria, protozoans, viruses and helminths;
2. Insects as a source of toxins, either secreted or sequestered from their food plants; and
3. Insects as a source of allergens, including ingestant, contactant and inhalant.

In passing, and fortunatly, it can be said that these hazards are of little concern relative to insects that would be intentionally collected as food in North America. Nevertheless, it is well to stick to the insects, at least congeneric, that have a history of consumption by humans.

The Newsletter faces uncertain future; one or more issues may be missed during 1992. See Editor's Corner, p. 2.

In the meantime, the Newsletter editor would welcome short "how to collect" notes or articles from individuals who have first-hand experience in harvesting from the wild any of the edible insect groups. For an example, see the article "Collecting Ant Pupae for Food," by Dr. Gregg Henderson, which appeared in the November 1990 Newsletter. A good subject for one such article might be on how to go out for a Sunday afternoon and collect a few grasshoppers, while exercising more dignity and less maximum exertion. Use a light, medium-sized sweep-net, maybe? Or, in a given geographical area which species of trees and/or logs should be searched for cerambycid beetle larvae, and what is the most efficient procedure for extracting them? How does one distinguish with certainty cerambycid larvae from other creatures that might be found in taking apart a recently felled tree? What is the safest and most efficient way to dig out yellowjacket larvae/pupae? When is the peak season for harvesting specific edible groups in a given geographical locality? Etc., etc. In the one wilderness survival book that we have seen, the information of this type was much too general to be of much value. What is needed next is for entomologists acquainted with the biology of one or more of the various edible groups to make their knowledge available for use within this new context. We hope to hear from some of you. A few thousand actual and potential entomophages will be grateful.

Gene DeFoliart, Editor

SEE REFERENCES, p. 9.
EDITOR’S CORNER

The Food Insects Newsletter is in danger of becoming a victim of its own success. About a year ago, with impending retirement to emeritus status and impending cessation of the research program, I renamed whatever it is we are trying to do around here as the “Educational Outreach Program on Insects as a Food Resource,” and staked out four primary objectives: 1) Continue publication of the Newsletter; 2) Continue work toward completion of a global bibliography (with abstracts) entitled “The Human Use of Insects as a Food Resource,” plus a related “working file” on the biology of edible insect groups; 3) Continue teaching a 1-credit course here at the University on insects as food, and 4) Develop a traveling school exhibit aimed at upper elementary and lower middle school ages and called “Insects as Food in Different Cultures.” I consider Number 2 the objective of basic importance because it would be a valuable resource for researchers, educators and others when published, and because it provides the information base that undergirds the Newsletter, the school exhibit, and the 1-credit university course.

Rather strenuous efforts earlier this year to obtain outside funding for this program at a level of about $25,000 per year for two years were not successful. The proposed budget was for such things as a part-time staff person to conduct the literature searches and arrange the interlibrary loans which are essential under Objective 2 and to maintain the cricket colonies which are a part of the school exhibit (Objective 4), payment for foreign-language translations, purchase of exhibit materials, and partial reimbursement to the Department of Entomology for clerical assistance and postage in handling well over 100 pieces of correspondence per month. The actual count (letters received) during the four weeks immediately preceding was 153; postage is significant because of numerous bulky packets, some of which are sent to overseas destinations. Newsletter costs per se have not been included in budget proposals. Income from reader contributions and sale of back issues totalled approximately $2,000 the past year, enough to cover the cost of printing and postage for the three issues. Also, Catherine Howley continues to put the Newsletter together for the printer on a donated-time basis (even though she commutes from Milwaukee), thus holding down production costs.

The current problem with the Newsletter is simply its prodigious growth in circulation—for a desktop operation—from fewer than 80°C in March 1991 to more than 1,500 as this November issue was going to the printer. Theoretically, and actually, this is cause for great happiness, but this growth spurt has come at a time when the availability of paid personnel and residual funding from formerly funded projects has dwindled to zero. The result is that your editor strongly suspects that he has become the most-do-it-yourself, xeroxing, envelope-licking professor, active or emeritus, in North America today. Progress on other objectives has come to a virtual standstill. Thus I wanted to let you know in advance that it could become necessary to skip an issue of the Newsletter during the coming year in order to resume satisfactory progress on some of those other objectives.

GRD

1. Sarah Ancheta is a native of the island of Leyte. In 1941 a locust outbreak in the hill country devastated such important crops as rice, in Cotabato there was no generalized prejudice against eating locusts, and he collected two big sacks of them, which he boiled and dried. They lasted him for about two weeks.

As far as I know, mole crickets (Gryllidae: Gryllotalpinae) are most commonly eaten in northern Luzon, where they are sometimes gathered in rice fields in an organized hunt. There has been some attention to the possibility of developing the culture of mole crickets in that region as a regular food.

June beetles (Scarabaeidae: Melolonthinae) seem to be the second most commonly eaten group of insects. My host in the city of Laoag, at the northern end of Luzon, had them cooked for me in vinegar and soy sauce after the appendages, head and prothorax were removed.

SEE PHILIPPINES, p. 12.
<table>
<thead>
<tr>
<th>Taxa and life stages consumed</th>
<th>Reference</th>
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<tbody>
<tr>
<td><strong>COLEOPTERA</strong> (beetles, weevils)</td>
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<tr>
<td>Bruchidae (seed beetles)</td>
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<td>Subfamily Bruchinae</td>
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<tr>
<td>Allophyes spp., larvae, pupae</td>
<td>Bell &amp; Conner 1977</td>
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<td>Merodes spp., larvae, pupae</td>
<td>Bell &amp; Conner 1977</td>
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<td>Crambidae (long-horned beetles)</td>
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<td>Cerambycidae (long-horned beetles)</td>
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<td>Oryctes spp. (long-horned beetle)</td>
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<td>Scythrosciinae (long-horned beetles)</td>
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<td>Pomacentrus (long-horned beetle)</td>
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<td><strong>HOMOPTERA</strong> (scale, aphids, etc.)</td>
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<tr>
<td>Aphidoidea (aphids)</td>
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<tr>
<td>Subfamily Pemphiginae</td>
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<tr>
<td><em>Pemphigus</em> sp., nymph &amp; adults</td>
<td>Summa 1988</td>
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<tr>
<td><strong>HYMENOPTERA</strong> (bees, ants, wasps)</td>
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<td>Apidae (honey bees, bumble bees)</td>
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<td>Summa 1988</td>
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<tr>
<td>Crambidae (long-horned beetles)</td>
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<td>Scythrosciinae (long-horned beetles)</td>
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<td>Pomacentrus (long-horned beetle)</td>
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<tr>
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<tr>
<td><em>Triatoma</em> sp., larva</td>
<td>Summa 1988</td>
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Table 1 continued on page 4
Insects in Chinese Medicine

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In Volume 4(1) of The Food Insects Newsletter, I wrote a query regarding the alleged practice of eating walking stick excreta. A fellow reader, D. Keith McE. Kevan, kindly answered my query with a reference stating that this indeed was/is a practice among the Chinese of Malaysia:

> Their [the walking stick] presence in a Chinese house is a good omen, but more than this they believe in the healing powers of droppings of the stick-insect. For this, more than any other reason, Chinese are known to rear them. They claim that dried excreta mixed with herbs will cure a number of ailments, such as asthma, stomach upsets, muscular pains. A brew is also made from the droppings and drunk like tea. This they claim will cleanse the body (Nadchatram 1963:35-36).

I was intrigued by this practice, as I had not considered that insect excreta would be used for medicinal purposes. Searching the library turned up an excellent monograph on insects in Chinese materia medica by Read (1984) which has not been previously mentioned in The Food Insects Newsletter. Read translated the Pen Tsao Kang Mu, an encyclopedia of traditional Chinese medicines, and supplemented it with translations of ancient Chinese records. Besides descriptions of uses for bee and silkworm products, the monograph includes uses for hornets, wasps, mantids, flies, stink bugs, caterpillars, beetles, butterflies, cicadas, mole-crickets, silverfish, cockroaches, crickets, dragonflies, locusts, lice, parasitic worms, spiders, scorpions, leeches, and other invertebrates. The monograph also includes uses for unusual invertebrate products such as insect galls, mantid egg cases, cicada fungus, cockoms, spider's webs, earthworm castings, and excreta. Notably, however, there is no mention of retained bloodclots, and as a "galactogogue" (milk inducer).

Silkworm caterpillar (Bombyx mori) was either rare or not commonly understood to be an insect, since it is sold bleached and nondescript at $.50/ounce. Read (1984: 56-57) describes many uses for them.

Notably, the most commonly found insect product at the shops (aside from honey bees), the cicada exoskeleton, consists principally of chitin which is known to have several valuable medical properties (Goodman 1989).

It is unfortunate that so few insects used in traditional Chinese medicine are available in the United States. One herbalist indicated to me that insects are difficult to import because the customs officials do not like to deal with them (but see Brickey and Gorham [1989]). Some of the people I encountered at the herb shops, both customers and herbalists, expressed disbelief, shock, or disdain when they realized what I was asking for; two herbalists actually said that the insects I was showing them in Read (1984) were not used in medicine! The Chinatowns of Oakland and San Francisco are not static, and they constantly receive new immigrants from China, Korea, and Southeast Asia. So it would seem that the sparsity of insects is not due solely to the alleged difficulty of importing them since the newer immigrants would presumably create sufficient demand for them; consequently it seems that insects, though diversely represented, are generally of marginal importance to Chinese materia medica. It would be interesting to know to what extent
walkingsticks, so the use of walkingstick excreta may be peculiar to the Chinese of Malaysia. The insect excreta described are from silkworm caterpillar and various grubs.

Spurred on by DeFoliart's query (1988), and my own desire to find insect items in a set of Chinese herbal shops in Oakland and San Francisco. Unfortunately, I found very little diversity in these shops. Of course, honey bee products were very common (honey, royal jelly and wax). I found only two non-insect invertebrates: scorpions and leeches; the scorpions, I was told were expensive, but I was not told how much. Here is a summary of the insects that I found (they were all dried):

- Mason bees (Xylocopa violacea) were found at only one shop at $2.00 each (perhaps overpriced). It was stored in salt perhaps indicating its age and disease. Read (1984: 29-30) describes the bee but only gives a use for its honey.
- Cockroaches (various species have been used) were fairly common, and cost $2.00/ounce. According to Read (1984: 134-136) they are used “for internal feverish-chills”, “to breaking up

degree insects constitute current materia medica in Asian Chinese communities where import restrictions would not be an issue.

Bibliography


Nakagaki, B.J.; DeFoliart, G.R. 1991. Comparison of diets for mass-rearing Acheta domestica (Orthoptera: Gryllidae) as a novelty, (innovative) food, a novelty commodity, (innovative) food, four cricket diets, two prepared in the laboratory and two

Recent Technical Papers


Department of Physiology and Biochemistry, Medical College of Pennsylvania, Philadelphia, PA 19129.

Author's Abstract. Since the establishment of a new social order in 1949, China's attempts to feed and nurture its large population has been a topic of serious study in many disciplines. This review focuses on dietary sources of Chinese population and incidence, increase and decline of important diet-related health disorders in China during the last four decades. Literature published since 1949 on goiter, rickets, riboflavin deficiency, beri-beri, vision impairment, fawism, cancer, atherosclerosis and coronary heart disease, hypertension, dental and smoking-related diseases, diabetes mellitus, pancreatitis, lactose intolerance, mineral deficiencies, Kashin-Beck disease, parasitic diseases and genetic disorders are reviewed. Also presented selectively are reports related to ethnodiaticets, health care, maternal health and pediatric care as well as longevity.

In the 1980s, total calorie intake of Chinese population showed a 19% increase on a daily basis from that of late 1940s. In overall terms, plant-derived foods supplied 93% of energy, 87% of protein and 55% of fat to the Chinese. Among the animal foods, pork remains the most common and least expensive form of meat, contributing more than 90% of China's animal foods, pork remains the most common and least expensive form of meat, contributing more than 90% of China's total meat production, excluding poultry and fish. In 1949, the life expectancy in China was only 36 years. In early 1980s, it has increased to 68 years. This increase in life expectancy is attributed mostly to improved nutrition and lowering of mortality due to decrease in infectious diseases. Though population, disease and mortality statistics of modern China are spotty and sometimes questionable, common consensus among the researchers is that since 1949 the public health situation in China has improved tremendously.

Tabular information is provided by the author on animal products used in Chinese traditional medicine and their implicated remedial action (the information is drawn from a NIH translation of "A Barefoot Doctor's Manual").

Bee hive: Relieves flatulence, counteracts toxicity and kills worms.

Cricket (Acheta domestica L.) - as a novelty (innovative) food, a novelty (innovative) food, four cricket diets, two prepared in the laboratory and two...
Spanish fly (Cantharis): Cauterizes tissues to control toxin
spread (esp. used in rabid dog bites).

As medicine, insects such as crickets, flying locusts and mantis
are roasted, pulverized and mixed with boiled water before
being taken.

commercial, were compared on the basis of cost per kilogram
(wet weight) of eighth instars produced. Costs were
influenced by dietary ingredients.

The Food Insects Newsletter

They Ate What?
(Catching up on the magazines)

The above is the title of an article published in the Cuisine
Section of American Way, the official mag of American
Airlines. I found it on my desk one day last spring. Dr. Jane
Homan, who has flown to just about everywhere in her travels
for the UW Office of International Agricultural Programs, had
attached a note: "When this starts showing up in airline
magazines it must be getting 'chic'!!

Author Dick Reavis, a contributing editor of American way,
certainly makes it sound so, with "creepy creatures" now
considered by some as the height of haute cuisine. According
to Reavis; "It's in style: Now that Mexican restaurants are
popular from Bangor to San Diego, the cognoscenti of real
Mexican food are seeking out restaurants that serve
unadulterated, un-Europeanized food from Central America
and Mexico. Pre-Hispanic or pre-Columbian food it's called,
the kinds of dishes Mexicans ate before the region was
subdued by the Spanish. Worms [read insect larvae], cooked
or live, are a big part of pre-Hispanic cuisine, and eating them
has become a rite of passage for those who would be intimate
with the Mexican past."

One restaurant providing this kind of fare is Don Chon's, near
the historic La Merced market in Mexico City, "a back-street
landmark for novices and adventurous connoisseurs.' It's
impretentious, "but diplomats, ambassadors, and the theater
crowd flock there at lunchtimes." The owner of Don Chon's,
Leopoldo Ortega, notes that back in the 'fifties, the restaurant
was mainly patronized by the vendors who came to La Merced
from the countryside. Because pre-Hispanic food has become
relatively expensive, tourists and people with bohemian tastes
now outnumber the country folk, who, Ortega says, have
"become our sellers more than our customers." A hint of how
expensive is given by Reavis who ordered a plate of red agave
worms [Larvae of the moth, Xyleutes redtenbachi]; price,
30,000 pesos or about $11, nearly two times the daily wage of
most Mexicans. (Reavis also tried a side dish of live worms
and describes the indeletable maneuvers required to remove one
when it bit him.)

Reavis concludes his article with the following paragraph: "In
my opinion, the finest pre-Hispanic delicacy at Don Chon's
(and also sometimes served at the hightower Prendez restaurant
downtown on 16 de Septembre Street, a place not known for
pre-Hispanic food; that it even offers such a dish proves the
evolution of a national cuisine. The evidence comes from
many sources; the Aztecs, who wrote about their own
civilization; from pre-Columbian and colonial Mexican art;
from ethnographic documents produced at the direction of the
Spaniards soon after the conquest; and from survival of ancient
foodways that are still abundantly practiced in Mexico today.

The single most important work was the monument General
History of the Things of New Spain (Historia general de las
cosas de Nueva Espana), by the Franciscan friar Bernardo
de Sahagun. From Sahagun it is known that the Aztec diet was
based on corn and tortillas, tamales and plenty of chilies in
many varieties. Sokolov describes how this diet was
influenced by the importation of European-style foods that
began with Cortes, and states that it is a wonder "that so much
of what Mexican ate before Cortes is still available today and
popularly consumed, from cactus paddles to chilies, from
tadpoles to various worms and bugs."

The article concludes with a recipe for Salsa de Junjiliees
(Mountain chinch sauce) taken from Adela Fernandez's book,
La Tradicional Cocina Mexicana y sus Mejores Recetas,
Panorama Editorial, Mexico, 1989. We have not reprinted this
recipe because we doubt that very many Americans are yet
ready for it. Junjiliees belong to the "stink bug" family,
Pentatomidae, Order Hemiptera.

- In the September 1989 issue of Natural History, Sokolov
follows up on the previous month with an article titled

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The Food Insects Newsletter

They Ate What? (cont)

Other Tidbits and subtitled "The Mexican diet, before Cortes,
obtained high-quality protein from lowly sources." He
popular as snacks among Mixtec peasants; ant larvae and
pupa (called ant eggs); and in Jungapeo, Michoacan, wasps.
Two excellent photographs (one of maguey worms)
accompany the article. (Ed.: It can be noted that Dr. Julieta

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If we are looking for glamour, however, we needn't settle for
the airline magazines. How about the 1989 25th Anniversary
Swimsuit Issue of Sports Illustrated? Now we're talking sun
and surf and the Pacific Coast of Mexico. But, according to
the author, it is the worst place in the world to be a
grasshopper. A recipe is offered (page 260) for a small
species sometimes served for lunch in Oaxaca:

Ingredients

About 1000 grasshoppers 1/2 cup chili sauce
(the younger the better) garlic 1 lemon
1 cup guacamole onion
tortillas

Directions: Soak the grasshoppers in clean water for 24 hours.
Boil them, then let dry. Fry in a pan with garlic, onion, salt
and lemon. Roll up in tortillas with chili sauce and
guacamole. According to the author, "Serves six if you can
find six."

- If one prefers not glamour but a more sedate and intellectual
approach, one can consult Natural History magazine,
specifically food historian Raymond Sokolov's column, "A
Matter of Taste." Three times in the past two years, Sokolov
has dipped into things entomophagous. The first was in the
August 1989 issue in an article titled, "Before the Conquest"
and subtitled 'Thousands of Mexican dishes could not have
existed before Cortes.' Sokolov notes that Mexico has a
better opportunity than most cultures do for precisely tracing
the evolution of a national cuisine. The evidence comes from
many sources; the Aztecs, who wrote about their own

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SEE THEY ATE WHAT? P. 8

- In the September 1989 issue of Natural History, Sokolov
follows up on the previous month with an article titled

Insects, Worms, and
emphasizes that "authentic" cuisine "virtually everywhere" is not the invariable tradition that traditionalists wish it to be, and furnishes an impressive list of foods contributed by the New World to the Old, including potato, tomato, corn, chocolate, squashes, beans and many others. Some of these New World foods have had great nutritional impact, for example, the sweet potato, peanut and the chili pepper in China, and macoc, corn, peanuts and pumpkins in Africa.

Relative to Mexico when Cortes appeared Sokolov notes that the country "was a major world civilization with a vigorous culture that continues to challenge imported European culture today. [Mexican] native Mexicans have survived to carry on local food traditions in tandem with the new ideas and foods from Spain and the Spanish Empire." Insects of many species are a prominent part of these local food traditions, but Sokolov devotes the most space to the maguay worm, larva of the giant skipper butterfly, Aegiale hesperia, which are also called palomillas del maguay (maguey squabs), champolocas, meocutinas and pecahs. Sokolov paraphrases the account of these larvae in Teresa Castello Yterbide's Presencia de la Comida Prehispanica (Banares, 1896), as follows: "Larvae harvesters poke about among the maguay's lower leaves, looking for the telltale tunnels at the base of the leaves near the outer edges. Working very carefully with a machete, so as not to disembody the larvae unwittingly, they cut open the leaf. To extract the larvae whole, they use hooks formed by cutting thin strips from the edge of a maguay leaf. Then they remove all its spines except for one at the end of the strip. This they form into the hook they use to catch the larvae by the head. To store the larvae, they make pouches with the skin of a tender, new maguay leaf, which is called mixiote (it gives its name synecdochically, to a dish made of chunks of marinated meat wrapped in mixiote pouches and steamed).

To cook the larvae, people sometimes just put a whole gusano (larvae)-filled mixiote over coals or hot ashes, or they might just put the larvae directly on a bakestone until they swell and stiffen, turning golden brown and crunchy. And this is not some quaint account of a long-forgotten practice. Castello Yterbide nonchalantly mentions that maguay larvae can be obtained in April in the market of San Juan in Mexico City or in Actopan and Ixmiquilpan (two villages of the state of Hidalgo) or in farm hamlets around Mexico City.

Relative to other insects, Sokolov notes that the eggs of water bugs (moscas de paja) (Hemiptera) are still harvested in the same manner described by Sahagun. Today, they are toasted, ground up and made into little cakes held together with turkey egg. In the late 18th Century, they were apparently a garnish for the festive dish called revoltillo, served on Christmas Eve and at the vigil of Thursday night of Holy Week. Other insects still eaten include locusts, available year-round at markets in Oaxaco and Atlixco, toasted and eaten with tortillas and a sauce of chili pasilla; mountain cricket bugs, eaten toasted; living; oak-boring beetles which are still eaten include locusts, available year-round at markets in Oaxaco and Atlixco, toasted and eaten with tortillas and a sauce of chili pasilla; mountain cricket bugs, eaten toasted; living; oak-boring beetles which are.

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To cook the larvae, people sometimes just put a whole gusano (larvae)-filled mixiote over coals or hot ashes, or they might just put the larvae directly on a bakestone until they swell and stiffen, turning golden brown and crunchy. And this is not some quaint account of a long-forgotten practice. Castello Yterbide nonchalantly mentions that maguay larvae can be obtained in April in the market of San Juan in Mexico City or in Actopan and Ixmiquilpan (two villages of the state of Hidalgo) or in farm hamlets around Mexico City.

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are the most valuable food source which has been left unutilized on the earth. Based on this idea, we discussed selection of species suitable as foods, methods of large scale production of insects at low cost, ways of reforming people's hatred for insects, and

Dr. J. Mitsuhashi
Dr. K. Umeya

Toward a Recipe File (cont.)

References.


**Philippines (cont.)**

Remarks by people in other areas indicate that this very common form of cooking (known as adobo) is the usual one for June beetles. They are often available in the market in Laoag, and probably in some other areas as well. I am told that adults and larvae of other large scarabaeids and longhorn beetles (cerambycids) are also eaten.

I have not seen indications that any termite is commonly eaten in the Philippines. The most likely candidate would be the sexuals of *Macrotermes gilvus* (Termitidae: Macrotermitinae). This is the largest Philippine termite, and colonies are often so massive that they undoubtedly give off large, harvestable masses of sexuals during the pairing season.

The only ant which I have found as human food is the weaver ant *Oecophylla smaragdina* (Formicidae). Ronald Taylor mentions in *Butterflies in my Stomach* that the Dyaks of Borneo sometimes mix worker ants in their rice for flavoring (due to the formic acid). I have not seen this done, but during the season when new queens are produced, farmers in the Philippines sometimes slash the silk nests and catch the falling brood. The ideal time is undoubtedly when prepupae and early pupae of queens predominate. Still, one should never expect to get a pure harvest, and when I was served stir-fried weaver ants in a village on the northern coast of Luzon I found quite a heterogeneous mixture. At that time of year we had ants at every meal in that village, to my delight. I never learned how they harvest weaver ants without getting bitten (and formic acid sprayed directly into the bite) by the masses of aggressive workers, and it may be that harvesting is not worthwhile except during the queen-rearing season.

**Letter**

**But, the Indians were ahead of the Ohioans**

From Janet Stein Carter, formerly of the Cincinnati Zoo:

By the way, the folks in Chicago who were eating cicadas last year (Brood 13) are "copycats." In the spirit of friendly competition, we here in Cincinnati were eating them way back in Brood 10 [Ed. 1987?]. We served batter-dipped and fried cicadas to quite a crowd. Did you see the segment on "Entertainment This Week" of the cicada stir-fry? Although George Ciccarone was "chicken," the Zoo staff made short work of the leftover stir-fry. Actually Gene Kritsky knows of a newspaper article from the Cincinnati paper, 1902 emergence of Brood 10, about some high-society folks who were eating cicada pie.