

Chapter 19

CENTRAL AND EASTERN AFRICA: ANGOLA, CONGO, OTHERS

See **Regional Taxonomic Inventory** (Chapter 15)

ANGOLA

Oliveira et al (1976) conducted analyses of the nutritional value of four species as cooked according to traditional methods in central Angola (Angola Table 1; see Oliveira et al, Table VII). The termite, *Macrotermes subhyalinus*, has a wide distribution and is common in the north and east of Angola. The reproductive form or alate, known as *juinguna*, is consumed after the wings have been removed and the body fried in palm oil. The saturniid larva, *Imbrasia ertli*, feeds on the leaves of *Acacia* and two other host species in tropical rain and open forest of the Ethiopian faunal region. The mature larva is approximately 8 cm in length and known as *engu* (plural, *ovungu*). After removing the viscera, the larvae are either cooked in water, roasted or sundried. Salt is added for further flavoring. *Usta terpsichore*, another saturniid larva, is also widely distributed in the Ethiopian region and very common in Angola. It feeds on several species of plants and is locally known as *olumbalala* (plural, *olombalala*). The fully grown larva is about 8 cm long and is prepared for eating in a fashion similar to that for *I. ertli*. The weevil, *Rhynchophorus phoenicis*, is an important pest of palm, especially the oil palm, *Elaeis guineensis*, in Africa and its presence in the trunk of a tree is detectable because of the noise made by the larva when feeding. The apod larva measures about 3 cm in length and has a reddish-brown or black head and whitish-colored body. It is known locally as *maghogho*. After first incising the body, the larva is fried whole in oil.

The high fat content of *Macrotermes subhyalinus* and *Rhynchophorus phoenicis* is reflected in their high energy values, 613 and 561 kcal/100 g, respectively (Angola Table 1). *Usta terpsichore* is a rich source of iron, copper, zinc, thiamine and riboflavin, 100 g of cooked insect providing more than 100% of the daily requirement of each of these minerals and vitamins. It is also relatively high in calcium compared to many insects, and in phosphorus. *Macrotermes subhyalinus* is high in magnesium and copper, and *R. phoenicis* in zinc, thiamine and riboflavin, 100 g of insect in each case providing more than the daily requirement.

Barbara Rogers (pers. comm. 1987), the daughter of missionaries in Angola between 1948 and 1960, observed the use of several kinds of insects as food. While the observations were primarily on the Kimbundu speaking people in the Malanje area, they are valid also for the Ovimbundu area of southern Angola. Termites, or "flying ants," emerged with the first spring rains in September and were fried for use. Cricket nymphs were roasted. Bee larvae (and pupae?) were eaten with the honey comb in which they were found. Large beetle grubs, about 1 inch long, white and accordian-like with an orange head, were dug out of the ground, dried, and mixed with sauces. Large adult brownish and copperish grasshoppers, about 3 inches long, were roasted.

Coleoptera

Buprestidae (metallic woodborers)

Chrysobothris fatalis Harold, larva
Psiloptera wellmani Kerremans, larva
Steraspis amplipennis Fabr., larva
Sternocera feldspathica White, larva

Wellman (1908) states that the woodboring larvae are common items of food among the indigenous population, and he lists six species including the four buprestids listed above.

Cerambycidae (long-horned beetles)

Zographus ferox Har.

Wellman (1908) reports *Zographus ferox*, but does not make clear whether it is the larvae or adult beetles that are consumed, although probably the former.

Curculionidae (weevils, snout beetles)

Rhynchophorus phoenicis Fabr., larva

See Oliveira et al. in the Introduction.

Scarabaeidae (scarab beetles)

Camenta sp., larva

Wellman reports that the larvae of a species of *Camenta* are eaten.

Miscellaneous Coleoptera

Burr (1939: 210) mentions being offered a "huge black coleopterous larva, bigger than my finger."

Hymenoptera

Apidae (honey bees)

Bee brood (see Rogers 1987 in the Introduction).

Isoptera

Termitidae

Macrotermes subhyalinus Rambur, winged adult

Alate adults of *Macrotermes subhyalinus* are eaten (see Oliveira et al in the Introduction).

Miscellaneous Isoptera

Livingstone (1857: 464) reported that in the spring at Kolobeng, white ants swarm in the evenings by the thousands:

While swarming they appear like snow-flakes floating about in the air, and dogs, cats, hawks and almost every bird, may be seen busily devouring them. The natives, too, profit by the occasion, and actively collect them for food, they being about half an inch long, as thick as a crowquill, and very fat. When roasted they are said to be good, and somewhat resemble grains of boiled rice. An idea may be formed of this dish by what once occurred on the banks of the Zouga. The Bayeiye chief Palani visiting us while eating, I gave him a piece of bread and preserved apricots; and as he seemed to relish it much, I asked him if he had any food equal to that in his country. 'Ah,' said he, 'did you ever taste white ants?' As I never had, he replied 'Well, if you had, you never could have desired to eat anything better.'

Lepidoptera

Saturniidae (giant silkworm moths)

Imbrasia ertli Rebel, larva

Usta terpsichore M. & W., larva

See Oliveira et al. in the Introduction.

Miscellaneous Lepidoptera

Burr (1939: 210) mentions that his porters regularly prepared stews of two kinds of large caterpillars, "one pale green, fat and juicy, which certainly had a nutritious air," while the other was black, ringed with yellow.

Orthoptera

Acrididae (short-horned grasshoppers)

Schistocerca peregrinatoria Linn.

Regarding the locust, *Schistocerca peregrinatoria*, **Wellman (1908)** relates that:

I once witnessed the advance of the early wingless form through the Chisanje country to the east of Benguella. Hardly a green thing was left behind them. In the adult winged state they sometimes come in such numbers as to darken the sun. . . . At night these locusts (native name 'Olohuma')

settle on trees and shrubs, sometimes in such numbers as to almost cover them. . . . The insects are eaten by lizards, small mammals and birds, especially a sort of plover, *Glareola nordmanni*, which apparently follows and feeds entirely on locusts. The native Africans, too, are very fond of them when roasted. They also kill them by dropping them into boiling water and then dry and store them away for future use.

Gryllidae (crickets)

Brachytrupes (= *Brachytrupes*) *membranaceus*

Wellman (1908) reports that the giant cricket, *B. membranaceus*, is dug out of its burrows in mealie fields by the native women, often in great numbers.

One can sometimes see small basketfuls, wings and legs removed, ready for the pot - for they are esteemed a great delicacy. Native children often go about digging for these crickets, and not seldom get their fingers badly nipped in return, as the insect's mandibles are sharp and powerful and can draw blood. When a nest of driver ants (*Annoma arcens* Westwood) goes on a raid it is a sight to see the crickets (comparatively elephantine in size) driven from their holes, stridulating indignantly and struggling in vain to rid themselves from their foes.

Miscellaneous Insects

Livingstone (1858: 389) observed in the Quango River area [Bashinje tribe?] that the people "spend much energy in digging large white larvae [beetle grubs ?] out of the damp soil adjacent to their streams. and use them as a relish to their vegetable diet."

CAMEROON

Merle (1958), noting that earlier accounts of the use of insects as food in Cameroon "are generally rather old," set out to inquire about the caterpillar harvest of 1957. He states, "It is in Black Africa, from all evidence, that the consumption, and I would also say the trade, of caterpillars has maintained a rather important standing." He first discusses the importance of caterpillars of the genus *Anaphe*, which are eaten not only in Cameroon but throughout equatorial Africa. The large communal silken sac, containing a dozen individual cocoons, "is the focus of important commercial traffic and is sold in all the village and city markets." The pupae are not considered edible, at least in the Ebolowa region, thus the caterpillars are harvested immediately after formation of the cocoon before pupation takes place. They are first grilled to remove the bristles, which otherwise would cause an intense and disagreeable itching. The caterpillars are then washed, put into the pot with or without water, and tomatoes, salt, pepper, and oil are added. This dish is well-liked.

Merle states (translation):

It is important to note that the populations of Ebolowa are not deprived of meat and that several herds exist in the area. It is not, then, for 'need' of proteins that these people feed themselves caterpillars. I must point out that the *Anaphes* are not the only edible species in the region that interest us, and that certain caterpillars -- which derive their vernacular name from the tree on which they are captured -- are more sought after, more well-liked. It is interesting to know that the caterpillars, after having been grilled -- and sold in the market like that -- can be kept for several months. This is of interest from a nutritional point of view, because caterpillars are not found year-round, usually just from August to November.

According to Merle, in the Sanaga-Maritime (Bassa), there are mainly three species of caterpillars that are sought, and, aside from the *Anaphe*, "it is especially the Saturnidae which are the object of African appetites." Many of the species are found grouped together, sometimes in the hundreds, and their presence when not readily seen can be detected by the sound of their chewing or by the sound of the frass hitting the ground. Merle, apparently thinking that this assertion may sound unbelievable, says, "The reader who doubts the veracity of these words could experience it himself in Douala, for example, by standing in October under certain mango trees invaded by the enormous Saturnidae caterpillars."

Merle concludes by suggesting that, "the future development of Africa might do well not to brutally reject its whole past, even in the mundane domain of food.... Could not changing the simple 'gathering' of caterpillars

into a small local industry be envisaged?" As one possible example, he mentions a saturniid caterpillar that feeds on the "frake" tree (*Terminalia superba*), sometimes stripping it of all of its leaves in a single day. The frake tree grows from Guinea to Angola, and the caterpillar has perhaps five generations annually. Merle says: "We submit this idea to interested agencies. The raising of snails, of oysters, is practiced successfully under other skies. Why not the raising of caterpillars in the Tropics."

According to **Tessmann (1913/14, I: 108, II: 189-190)**, the Pangwe of southern Cameroon use 21 species of caterpillars as food. Tessmann enumerates a number of taboos, including *Oryctes* (= *Angosoma*) *centaurus* for the uninitiated. Forbidden for pregnant women are larvae of *Rhynchophorus phoenicis* "if found in a cocoon," and termites. Not forbidden are free-living larvae of *Rhynchophorus*. Dragonfly nymphs (*ese'i, -bak*) are eaten; "the child will, however, 'urinate' frequently as the dragonfly larvae do." *Apis mellifica* var. *adansoni* is not kept domestically (I, p. 108) but honey is collected from wild bees most commonly found in tree trunks, and is consumed raw. In the preface for Volume I, Tessmann states that the actual reasons why certain animals, insects, or plants cannot be eaten are partly based on religious beliefs, partly based on a fear of the animal's appearance or its way of life, or simply based on some past experience with consumption of them.

The Ba-Binga pygmies of the High-Nyong valley live mainly on meat, but when this is lacking they collect everything edible including caterpillars and other insects and their larvae (**Bertaut 1943: 89**; vide Bodenheimer 1951: 197). The Badjoues delight in the worms of the raphia palms (**Koch 1944**; vide Bodenheimer 1951: 139). **De Lisle (1944**; vide Bodenheimer 1951: 139) states that the natives in various regions of Cameroon eat many insects of all orders. De Lisle (pp. 57, 64) reported seeing baskets full of *Popillia* beetles, especially *P. femoralis*, for sale in the markets of the Dschang region. He also mentions that the eating of termites and locusts is well known.

Coleoptera

Curculionidae (weevils, snout beetles)

Rhynchophorus phoenicis Fabr., larva

See **Tessmann (1913/14)** and **Koch (1944)** in the Introduction. **Bodenheimer (1951: 139)** cites a personal observation by T. Monod that two kinds of palmworms are distinguished. One, found in living palms, is located when the trees are felled; the other is found in the decaying galleries of felled palms and these larvae are the more highly prized. [One of these two kinds may be *Oryctes*, a scarabaeid.]

Grimaldi and Bikia (1985) state (p. 136, translation): The larvae of certain coleoptera harvested from the oil palm and from the palm of genus *Raphia* are eaten in Cameroon. These larvae, called "Fos" in Ewondo, are white (oil palm) or yellow (raphia palm). They are sometimes reared. Before any preparation, the larvae are washed in a lot of water and pierced in the abdomen with a sharp piece of bamboo between each washing to let a white, fatty liquid escape. In all regions they are prepared either by stewing, frying in oil with salt and pepper, adding to squash seed paste, or putting on brochettes grilled over coals. The authors provide the following recipe for larves de palmier or coconut larvae. They add, 'This favorite dish is only offered to good friends and is served with manioc sticks.'

Ingredients: Larvae coming from oil palms or raphia palms, salt, pepper, onion, coconut.

Preparation: Larvae washed and cut in half are mixed with all the condiments cited. The coconuts are chosen at half-hard stage, so that the inside, completely globular, can be taken out of the husk without being broken. The most pointed end of the nut is cut in a way that forms a cap. The nuts are emptied of their milk, then refilled with the larvae and condiments and closed by attaching the caps firmly. The nuts are stood straight up by some banana leaves in a pot containing water. The amount of water should be such that, during the course of cooking, it cannot penetrate the nuts. The cooking is rather long. After cooking, the nuts are cut into slices.

Bamoun preparation: Among the Bamoun, the larvae are strung up and left to dry hanging under the trellis that is found above the foyer. After they are well-smoked, they can be incorporated, after being washed, into the squash seed paste.

Scarabaeidae (scarab beetles)

Oryctes (= *Angosoma*) *centaurus* Fabr., larva

Popillia femoralis Klug, adult

Larvae of *Oryctes centaurus* are eaten (see Tessmann in Introduction) as are the adults of *Popillia femoralis* (see De Lisle 1944 in Introduction).

Hymenoptera

Apidae (honey bees)

See Tessmann (1913/14) in Introduction.

Isoptera

Miscellaneous Isoptera

Bodenheimer (1951: 159) cites Jaques-Relix (in 1948) that the Bamilekes work termites into a sauce, *na*, which seasons the basic yam meal. Also see Tessmann 1913/14) and De Lisle (1944) in Introduction.

According to **Grimaldi and Bikia (1985: 137-138, 174, 184, 200)**, termites can be eaten raw; grilled by adding only salt; incorporated into pastes and sauces; crushed, then cooked in a bundle in the shape of manioc sticks (East). They are very tasty incorporated into squash seed paste. Their preparation in West Cameroon where they are known as "Ka ngo" in Nufi-fefe and as "Ngo'o" in Bangangte is as follows (p. 138): Wings are removed by passage to the hot frying pan and fanning. Then the termites are wrapped up in a softened banana leaf and put in a pot to cook. After cooking, they are drained and mixed in heated palm oil, salt and pepper. They are served accompanied by one of the tubers.

Lepidoptera

Notodontidae (prominents)

Anaphe spp., larvae

See Merle (1958) in Introduction.

Saturniidae (giant silkworm moths)

Caterpillars of many species are eaten (see Merle in Introduction).

Miscellaneous Lepidoptera

The Pangwe use 21 species of caterpillars (**Tessmann 1913/14**). See also Bertaut (1943).

Grimaldi and Bikia (1985: 138, 169, 175, 178-179, 184, 193, 200) note that caterpillars are harvested mainly during the rainy season, and, most often, their name is that of the tree from which they have been gathered. They are divided into three categories: smooth caterpillars, hairy caterpillars, and slightly rough caterpillars. Vernacular names of caterpillars eaten most often in central and southern Cameroon are Minlon, Ngombo, Minsie, Mimbin, Bisol, Bizom, Eyalkakam, Obegbe, Etondo, Andondo, Minyos, and Efok in Ewondo. The authors state (p. 138) that all of these caterpillars are eaten in the same way, but the preparation before cooking is different according to the varieties. The smooth caterpillars require no work before preparation. The hairy caterpillars are put into a basket with coals and fanned in order to burn off the hairs. Most often, the rough caterpillars are simply invaginated by driving a well-sharpened piece of bamboo through the anus or the head. The external part of the skin thus becomes the internal part. They are, in general, incorporated into sauces or into squash seed paste.

Odonata

Dragonfly nymphs are eaten (see **Tessmann 1913/14** in Introduction).

Orthoptera

Acrididae (short-horned grasshoppers)

Locusts are eaten (see De Lisle in Introduction).

Migratory grasshoppers and locusts known as "Ngongok" or "Ngam ntee" in Nufi-fefe and as "Ngam ntam" in Bangangte are cooked without water in a saucepan after having their wings and legs pulled off

(**Grimaldi and Bikia 1985**: 137). Upon contact with the heat, they secrete oil in which they will be fried. Some salt and pepper are added. They are eaten without accompaniment or served with a platter of tubers.

Gryllidae (crickets)

In the Coastal way of preparation, crickets are charcoal-grilled and eaten as is. They are known as "Besele badiboumba" in Douala (**Grimaldi and Bikia 1985**: 137). In the Western way of preparation, legs and wings are removed, the crickets are cooked over coals or in a dry frying pan by adding salt. Once cooked, they are eaten as is. They are known as "Sisi" in Nufi-fefe and as "Ntsetan" in Bangangte.

CENTRAL AFRICAN REPUBLIC

Much of the available information has been furnished by returned Peace Corps Volunteers. **Elizabeth W. McCoy**, Peace Corps volunteer from 1983 to 1985, reported consumption of termites and caterpillars (pers. comm. **1987**). Rain forest tribes in the southern CAR eat caterpillars, both dried and fresh, cooked in sauce with leaves. Their use was observed in Bangui, Ubaki, and other rain forest cities and towns. McCoy stated that she saw them only during the rainy season although they may have been a year-round delicacy. The "Mandja" tribe and many others consumed termites with the wings removed and lightly sauteed in a bit of water or in a sauce. Specific observations were made at Bangui, Bossembele, and other towns. McCoy states:

It's difficult to cite specific tribes in the CAR because the population is a motley group. There are areas where certain tribes have settled but other groups live in these areas as well, generally because of work transfers. I got the impression caterpillars were a real delicacy and that termites were a cheap treat, i.e., people liked eating termites because they were seasonal but also because they were cheap. It could be they weren't that cheap in the market -- I don't know. . . . Muslims, because of the food restrictions of Islam, wouldn't eat insects, but most other people did.

Katharine Jane Dyer, Peace Corps volunteer from 1984 to 1986, also reported {pers. comm. **1987**) that most of the Central African tribes eat both caterpillars and termites. Towns where one or both were for sale included Bangui, Nola, Sibut, Mobaye, Bambari, Mbaiki, Berberati, Carnot, Bossembele, and Kagabandore. Caterpillars, which were collected by searching for them in their natural habitat, were commonly seen from the beginning to the middle of the rainy season. Prepared with Koko leaves in a sauce, they were used as a main dish; fried black, they were used as a side dish or appetizer. Kerosene lamps were put out when the winged termites emerged; they were drowned in buckets of water when attracted to the lamps. After removal of the wings they were eaten raw or fried like popcorn as an appetizer, or mixed with squash seed paste as a main dish.

Coleoptera

Elateridae (click beetles)

Tetralobus flabellicornis Linn., larva

In Central Africa, the larva of the giant click beetle, *Tetralobus flabellicornis*, "is esteemed a delicacy." (**Berensberg 1907**).

Isoptera

Junker (1891: 340) described the termite harvest as follows:

I have already remarked that with the commencement of the rainy season, the natives also begin to gather certain species of termites. Weeks before the 'harvest', the people mark off those nests which seem most suitable for their purpose. Here they dig a round hole a foot wide and several feet deep, whereby the place is at the same time set apart for a certain person and left untouched by the others. Like everybody else, my servants had done this, and also prepared a quantity of long bundles of dry grass, which here take the place of the resinous torches elsewhere in use.

Rainy days and excessive moisture are unfavourable conditions for the appearance of the termites, which may be safely expected on fine evenings following sunny days. Then the people may everywhere be seen with their flaming brands squatting down each at the hole which he had dug at the foot of the hill reserved for him. The female termites creeping out go straight to the fire

without actually rising on the wing; others soar into the air, but also partly wheel round towards the light, while the rest fly away. Those approaching the hole are all swept in with tufts of foliage. Many lose their wings, and most of them are in a dazed state, so that they are afterwards easily transferred to baskets, sacks, or pots. The termites for the most part take wing during several successive days, or else at intervals in bad weather.

Daguin (1900: 18; vide Bodenheimer 1951: 160) credits Sir S.W. Baker with the statement from Central Africa that termites, fried in butter, are considered a very delicate meal. Baker himself found that they have "rather a good taste, with a light flavour of burned plums." [Earlier records should be checked to be certain they refer to territory within the CAR, not to "Central Africa" in general.]

Noyes (1937: 228 f.), as related by Bodenheimer (1951: 157-159):

. . . compares the welcome of the rainy season with its termite flights in Central Africa to the hailing of the advent of the oyster season by the British gourmets. The Baganda like the winged sexuals, alive. When these leave the nests, a contingency which has long been foreseen, they often rise only to collide with a sheet of bark-cloth spread over the summit of the termite hill by the natives. The impact breaks off the wings at the sutures and they fall to the ground within the curtain in white, struggling masses; their wings are swept aside by human hands, when they are sifted out from the cloth. Men and women scoop them up in handfuls, eating a few occasionally, savouring the flavour; naked children, shrieking with delight, vie with all the birds of the neighbourhood, wild or tame, in chasing and collecting stragglers, munching as they run, stuffing themselves to repletion, heedless of the acute diarrhoea which will presently disorganize their interiors.

See also Dyar (1987) and McCoy (1987).

Lepidoptera

See McCoy (1987) and Dyer (1987) in the Introduction.

Orthoptera

Acrididae (short-horned grasshoppers)

Junker (1891: 278) wrote:

Wando and Fero kept us on such short commons that my people were glad to join the natives of an evening, when they went with lighted torches locust gathering. This was done [near Ndoruma in Central Africa] not through any absolute want of food, but because of their preference both for locusts and termites, which, however, do not by any means form a common article of their diet. In Central Africa, I only once saw a large harvest [of locusts], though in Tunis it was of frequent occurrence. I soon overcame my repugnance to such fare, which, in fact, I found very palatable. The insects were very fat, and when roasted without wings and legs, looked like little fish or shrimps.

CONGO (Brazzaville)

Nkouka (1987) states that many varieties of insects, including representatives from the majority of orders, are appreciated as food in the Congo. Lepidopterous caterpillars are the most frequently and abundantly consumed, especially during the period November through January. The author notes that 20 years ago, the estimated consumption of caterpillars collected around Brazzaville was estimated at 30 g/person/day, which is considerable.

Nkouka presents data on nutritive value of various edible insects, beef and fish (*Diagramma mediterraneus*) gathered from FAO and ORANA (Congo Brazzaville Table 1; see Nkouka's Table 1) and states that the nutritive value of the insects is at least as good as that of the more usual animal foods. In general the insects are higher in protein, fat, niacin, riboflavin and energy. Nkouka concludes that it is "an error to uphold the taboos which can make insects in the eyes of some Africans appear as vestiges of a time long past. Many of the multiple nutritional deficiencies observed in the hospitals come from suburban areas and are found among people

who have lost contact with country foods. This disturbance in the food balance is aggravated by a deficient income which prevents the acquisition of suitable replacement products. In the rural environment the traditional food resources provide a supplement which fills the deficit left by meat or fish or other resources in countries where animal production is very insufficient. The promotion of edible insects merits, therefore, more detailed study.

Bissmeyer and Dury (1992), Peace Corp volunteers and fish extension agents, express an interest in using insects as a supplementary food source for the subtropical fish, *Tilapia*, inasmuch as termites and ants seem to be a favorite of these otherwise vegetarian fish, and both insects are plentiful. Bissmeyer and Dury also mention eating yellow palm grubs and many other insects which they "might otherwise have ignored." They ask, "Why are insects so taboo in America?; they make quite tasty snacks."

Bani (1993) mentions the difficulty in breaking preconceived ideas about insects as food, and states, "In my country for example, many people are fond of many food insects but a lot of them do not show it because they think that edible insects are 'uncivilized' food. I think it might be the same in many other African countries."

Bani (1995) states that "There are many traditional meals composed of products from hunting and gathering. Meals can be different among people in the Congo, according to the environment (forest or savannah) in which they are presently living and the culture from which they are derived historically." Forest covers 60% of the country, savannah about 24%, and there are more than 60 ethnic groups. Insects hold an honorable place among gathered products, because weight for weight, some species command a higher price on the market than imported meat. The author notes that knowledge is still limited concerning the number of edible insect species used in the Congo, but many kinds are eaten and they are eaten essentially throughout the country. He advocates promoting and popularizing to greater extent the use of edible insects, not only because they are an important proteinaceous food but because they can have economic effects locally. Species discussed by Bani are included below under the appropriate taxonomic categories.

Coleoptera

Larval and pupal Coleoptera are much sought after and are eaten raw or roasted (**Nkouka (1987)**).

Bostrichidae (branch and twig borers)

Bostrichid larvae are among those coleopterans less frequently eaten (**Bani 1995**).

Cerambycidae (long-horned beetles)

Cerambycid larvae are among the less frequently consumed coleopterous larvae (**Bani 1995**).

Curculionidae (weevils, snout beetles)

Rhynchophorus phoenicis Fabr., larva

One larva which is prized everywhere is the palm worm *Rhynchophorus phoenicis* which lives in oil and coconut palms. Its rarity in the markets and its taste make it a high-priced food; in the "Total" market in Brazzaville each worm costs 40-50 F (**Nkouka 1987**). **Bani (1995)** calls *R. phoenicis* larvae "the most appreciated edible insect throughout the Congo."

Passalidae (bess beetles)

Certain genera of Passalidae and Tenebrionidae, xylophagous insects [?], are not [delaisse] by the peasants. It seems that the only precondition for collection is abundance (**Nkouka 1987**).

Scarabaeidae (scarab beetles)

Augosoma (= *Angosoma*) *centaurus* Fabr., larva

Oryctes boas Fabr., larva

Oryctes owariensis Beauv., larva

Larvae of *Oryctes owariensis*, *O. boas* and *Angosoma centaurus* are preferred (**Nkouka 1987**). The three species listed above are eaten fried (**Bani 1995**).

Hemiptera

Belostomatidae (giant water bugs)

Belostomus (= *Belostoma*?) spp.

Those eaten are the *Belostoma* and related aquatic genera which are collected in relation to fishing (**Nkouka 1987**). According to **Bani**, many species of *Belostomus* are fried and eaten. They are caught by Congolese while fishing and, particularly, when emptying fishing ponds.

Homoptera**Cicadidae (cicadas)**

Afzeliada sp., adult

Platypleura adouma Distant, adult

Ugada giovannina Fabr., adult

Ugada limbata Fabr., adult

Ugada limbimaculata Fabr., adult

The Cigales (cicadas) are captured using glue on a long cane and are eaten either raw or cooked (**Nkouka 1987**). Species eaten include *Platypleura adouma*, *Ugada limbata*, *U. giovannina*, *U. limbimaculata* and *Afzeliada* sp. **Bani** also mentions that cicadas are caught with a stick and eaten fried or raw.

Hymenoptera**Formicidae (ants)**

Oecophylla sp.

Some hymenopterans have long been favored by gourmets and are eaten here and there (**Nkouka 1987**). The *Oecophylla*, red ants which make silky leaf-enclosed nests, are caught, pinched between finger and thumb to squeeze out a colorless, very acid, droplet which placed on the tongue stimulates the gastric juices. [Part of the section on Hymenoptera and all of the section on commercialization needs re-duplicating; not legible in our copy.] **Bani** also mentions this procedure occurring before the abdomen is ingested.

Isoptera

Termites are included in the diet, sometimes by necessity, sometimes as a [friandise] (**Nkouka 1987**). Depending on the region, queens, winged sexuals, soldiers, and workers and nymphs are all eaten. In the Pool region, it is the winged sexuals that are most appreciated. **Bani** mentions that many species are eaten, and they are important in the economy because they are sold in markets throughout the country.

Termitidae

Cubitermes spp., all stages

Macrotermes bellicosus Smeathman, all stages

Macrotermes bellicosus is the most sought-after species (**Nkouka 1987**), while species of *Cubitermes* are only occasionally used.

Lepidoptera

Many species of moth caterpillars (but not butterfly) are considered very edible (**Nkouka 1987**). In Baya country, in the Haute Sangha, more than 20 species are known and the harvest is in August and September. In the Brazzaville area, the harvest is principally in November-January. The most widely used and appreciated caterpillars are those of saturniids of the genus *Imbrasia*, sphingids, noctuids and the hesperiid, *Coeliades libeon* Druce, which lives on ironwood [?] (*Milletia*, "ntoka"), abundant in Brazzaville in November and December. Certain species have not yet been identified but are known in the local language as: Mitsina (craneurs), Mpouampouala, Mihouka, Bimbami, Nsongo, Ntoubougou, Mbouengue, Bilelea, Ngantsoua, Ntessi, Mimpemba, and Bihoubouri.

Bani notes that caterpillars from many families are commonly part of menus in the Congo. They are harvested in both savannah and forest and are marketed in the large towns. They may be marketed either fried or fresh. **Bani** states that many as yet unknown species are used as food.

Hesperiidae (skippers)*Coliades libeon* Druce, larva

Coliades libeon larvae (see **Nkouka** above). **Bani** states that many species of Hesperiidae are edible, but specifically mentions only *C. libeon*. He mentions that there was a severe attack by a species of hesperiid on soybean research plots at Loudima, about 300 km from Brazzaville in November 1992. The attack was stopped by local subsistence farmers who found that the caterpillars were edible, thus averting the costs of a management program to control the outbreak and providing a dietary supplement for the farmers.

Noctuidae (noctuids)

See Nkouka above.

Notodontidae (prominants)*Anaphe* (= *Anathepanda*) *infracta* Wesgh., larva*Anaphe* sp., larva

Le Clerc et al (date?) conducted proximate, mineral, vitamin, amino acid and fatty acid analyses on *Anathepanda infracta* Wesgh., which, according to the authors is frequently eaten in Cameroon and Congo. The method of preparation is variable, but most commonly consists of a long boiling, with the addition of salt, followed by a prolonged drying in the sun. Sometimes the caterpillars are fried. The authors note (translation): "The spectacle of young children hurrying noisily about as soon as school lets out to gather caterpillars proves that the caterpillars are widely appreciated in the area of taste. Moreover, their flavor after cooking is acceptable even to a non-accustomed palate."

The chemical analyses were conducted on both raw caterpillars containing 73.6% water and 15.2% crude protein, and cooked caterpillars containing 13.3% water and 51.6% protein. The caloric value in usable kilocalories per kg was 3,198 in the cooked caterpillars. Amino acids of cooked caterpillars are compared in a table with the balanced amino acid content of the whole egg. The limiting factor was found to be methionine and the authors calculate a chemical score of 52 for caterpillar protein. Fatty acids were 64% unsaturated, with a very high content (37.9%) of linolenic acid, making these caterpillars one of the richest sources known for this unsaturated acid. The authors conclude that "the sporadic alimentary contribution represented in certain populations by the consumption of caterpillars shows an appreciable and interesting nutritional worth." **Le Clerc et al** cite an earlier study (unpublished?) by P. Bascoulergue and J. Bergot which found that caterpillar consumption in Congo in season may reach 30 g/man/day.

Bani (1995) mentioned *Anaphe* sp. among the edible lepidopterans eaten.

Saturniidae (giant silkworm moths)*Imbrasia epimethea* Drury, larva*Imbrasia obscura* (author?), larva*Imbrasia oyemensis* (author?), larva*Imbrasia truncata* (author?), larva*Imbrasia* spp., larvae

Nkouka reported *Imbrasia* spp. (see Introduction). **Bani** reported the four others listed above, saying that Saturniidae (along with Hesperiidae) contains the greatest number of edible species.

Family uncertain

Merle (1958) states that, "I must say that in Brazzaville itself, it has happened very often that I found in the gardens of the city several children gathering caterpillars with cans filled to the brim" (translation).

Odonata

Dragonfly larvae are caught by people when fishing and are eaten after boiling (**Bani 1995**).

Orthoptera

Some Orthoptera are sold in the markets, allowing many people from the countryside to use these insects as a "cash crop," according to **Bani (1995)**.

Acrididae (short-horned grasshoppers)

Acanthacris ruficornis Fabr. (= *ruficornis*?), adult
Afroxyrrheps procera (Burmeister), adult
Ampe sp., adult
Cantatops spissus Walker (= *spissus*?), adult
Chirista compta Walker, adult
Gastrimargus africanus Saussure, adult
Heterocris guineensis Krauss, adult
Locusta m. migratoria Linn., adult
Ornithacris turbida (author?), adult
Oxycantatops congoensis Sjostedt, adult

"Crickets" [short-horned grasshoppers] comprise an incredible variety of edible species of different sizes that are collected, especially following bush fires (**Nkouka 1987**). Principal among the larger ones are *Locusta migratoria*, *Acanthacris ruficornis*, *Heterocris guineensis*; medium-sized species include *Chirista compta*, *Gastrimargus africanus*, *Cantatops spissus*, *Oxycantatops congoensis* and *Afroxyrrheps procera*. On the Plateau region, a small cricket, *Ampe (teke)* is popular. **Bani** mentions that many other locust and grasshopper species are eaten.

Gryllidae (crickets)

Brachytrupes (= *Brachytrypes*) *membranaceus* Drury, adult

The Grillons, *Brachytrypes membranaceus*, are widely consumed (**Nkouka 1987**). *B. membranaceus* is the most commonly consumed cricket, according to **Bani**.

Tettigoniidae (long-horned grasshoppers)

Tettigonia sp., adult

Alongside the crickets are the grasshoppers [long-horned] such as the genus *Tettigonia* (**Nkouka 1987**). The "Mignegne" are abundant in certain periods (May-June) in the streets of Brazzaville where they are attracted to the streetlights.

GABON**Coleoptera****Cerambycidae (long-horned beetles)**

Ancylonotus tribulus Fabr., larva

Larvae of *Ancylonotus tribulus* are eaten in Gabon according to **Bodenheimer 1951**: 186).

Hymenoptera**Formicidae (ants)**

The Pabouins collect an ant called the *ntchongou* into big calabashes filled with hot water. The ants are boiled, then pounded with a herb similar in taste to chicory, making a dish that is esteemed by this tribe (**Brygoo 1946**: 52; vide **Bodenheimer 1951**: 193).

Lepidoptera**Saturniidae (giant silkworm moths)**

Anthocera monippe (author), larva
Anthocera spp., larvae
Anthocera teffraria (author), larva
Saturnia marchii (author?), larva
Urota sinope Westwood, larva

Bergier (1941; vide Merle 1958) cites a long list of African races that eat caterpillars. He mentions specifically a number of Saturniidae whose larvae are gathered by pygmy populations:

It is *Saturnia marchii* which are found especially at the edge of the Ogoue [a river], *Urota sinope*, velvety and dark black *Anthocera teffraria*, a sparkling red *Anthocera monippe*, and some other *Anthocera*. In order to eat them, the pygmies lightly press the tail end to squeeze out the excrement, then put the caterpillars in pots and boil them with palm oil. At first the dish, which resembles a thick, black paste, is not very attractive. It is, on the contrary, very good.

A fat, yellow caterpillar that feeds on "a beautiful tree with shiny leaves" is also greatly valued by the pygmies who gather them by the basketful.

SAO TOME AND PRINCIPE

Coleoptera

Cerambycidae (long-horned beetles)

Macrotoma edulis Karsch, larva

Larvae of the beetle, *Macrotoma edulis*, are fried in palm oil and eaten on Sao Tome Island in the Gulf of Guinea (**Netolitzky 1920;** vide Bodenheimer 1951: 186) (Awaiting re-translation).

GEOGRAPHICALLY UNSPECIFIC REPORTS APPLICABLE AT LEAST IN PART TO CENTRAL AND EASTERN AFRICA

Ghesquière (1947) stated (translation):

In almost all of the native markets of tropical Africa, live or oil-fried plump nymphs and larvae of 'Charancons' [Curculionidae] (Rhynchophoridae or Rhinostomes) and scarabs (*Oryctes*, *Platygenia*, or Augosomes) are displayed for sale. They are placed next to termites, grasshoppers, crickets, ants, spiders, larvae of long-horned beetles or caterpillars and chrysalides from nests of *Anaphes* and different Saturniidae." Only the abdomens of the adult beetles are eaten.

Briault (1943: 86) notes that (translation):

Meat, fish and pastes of caterpillars or of large palm tree worms are set in a large, supple leaf, which is made more supple by passing it over a flame. Then it is folded into a purse and tied at the top. A little bit of salt, a dash of pepper, a little wild lemon, and everything is put into the hot ashes. It never takes long.

Bloomhill (1958) wrote as follows concerning "some favourite dishes of the African gourmet":

One of my earliest, most delectable (and afterwards most painful) memories was of a four--year-old slinking away from Sunday's dinner of roast lamb and apple tart, to join the piccanninies at our farm compound in their feast of locusts and kaffir melon, served with balls of mealie-meal rolled in our grubby palms and dipped into the common relish-pot.

Should you live in Africa, you don't need to wait for Japan to can them for you. Go out at daybreak with a wide-mouthed sack, after a swarm has settled. The insects will be bunched on twigs and stupified with the cold night air. If you shake the boughs they will drop by thousands into the sack. Douse them in boiling water, strip off the wings, spread on paper in the sun to dry, and store in jars. They can be eaten boiled or grilled; Africans sometimes make them into a paste.

Flying ants are best caught during their swarming season, when in their nuptial flight after a downpour. Low, smouldering fires are lit beside a shallow hole. The insects are attracted by the fire and drop near it, so that they can be swept in masses into the hole. They are then treated in

the same way as locusts.

Another African gourmet's dish is the large green caterpillar found on *mopane* trees. The insides are squeezed out, the hairs singed off in hot ashes, and the bodies sun-dried. They boil up into a decoction that looks and tastes something like turtle soup. Crickets and other small insects are often eaten alive.

Loosli (1974) is one of the few western nutritionists who have mentioned insects in considering new sources of protein. Basing his statement on Wu Leung's composition tables, Loosli mentions that several insects are among the foods of animal origin that are accepted by some groups in Africa, i.e., flying ants, beetles, caterpillars, crickets, lake flies, grasshoppers, locusts and termites.

Coleoptera

Cerambycidae (long-horned beetles)

Larvae of long-horned beetles (see Ghesquière 1947 in the Introduction).

Curculionidae (weevils, snout beetles)

The "big palmworms" mentioned by Briault (see Introduction) were probably *Rhynchophorus* larvae. Also see Ghesquière (Introduction).

Scarabaeidae

Oryctes larvae

Platygenia larvae

See Ghesquière (Introduction).

Hymenoptera

Apidae (honey bees)

Cameron mentions (1877: 317) that west of Lovale in the country of Kibokwe: "Bee culture is here the chief occupation of the natives. The large trees are utilized to support their beehives, the produce of which forms a considerable and profitable item of barter. They exchange the wax for all the foreign trade goods they require, and from the honey make a sort of mead which is strong and by no means unpalatable."

Seyffert (1930), **Bodenheimer (1951: 165-186)** and **Irvine (1957)** have written extensively on the importance of bees and honey in the life of Africa. The account of Bodenheimer is based largely on the work of Seyffert.

Formicidae (ants)

Ghesquière (1947) notes the sale of ants in the native markets (Introduction).

Isoptera

Bodenheimer (1951: 160) quotes E. Brygoo (1946):

Thus it is well demonstrated that at least in Africa the alimentary role of the termites surpasses by far that of a mere curiosity. Even if one cannot speak of a civilisation of termites, they play a very important role in the life of many tribes. They are the origin of many strictly codified customs and may even determine a rhythm of life of these tribes.

Bodenheimer (pp. 159-160) cites several other earlier workers: S. Pinto (in 1881) that the Bihenos have a true passion for termites; E. Daguin (in 1900) that most travelers in Africa mention the taste of the local populations for termites; H. Patenostre (in 1927) that the people of Djallon water the entrance holes of the termite hills to induce the insects to emerge before the onset of the rains, and; J. d'Aguilar (in 1941) that, "The natives of the Black continent cook them until they turn brown and eat the termites by the handful without any seasoning."

Fladung (1924: 7) states that, "The natives of the Central Lake Regions of Africa, when short of tobacco, chew as a substitute the clay of the ant [termite] hills, which they call 'sweet earth.'"

Curran (1951: 216-217) relates the following:

A friend who has travelled in Africa extensively has described to me his first experience with natives collecting and eating termites. He was working in his tent when he heard sounds of excitement outside and thinking that something might be wrong he went to investigate. His native boys were clustered around a light and were enjoying themselves immensely as they jostled each other in their efforts to catch the termites that were swarming about. Not realizing what they were doing, he questioned one of the boys, who reluctantly gave up the chase in order to reply. After watching them for awhile, and noting the relish with which they ate the insects, he decided to try his hand. Catching one of them, he placed it rather gingerly in his mouth and instantly emitted a howl of surprise. The insect had sunk its jaws into his tongue. While most termites are small and unable to inflict a bite on a man, some of the large ones are able to pierce delicate skin, and this specimen had lost no time in sinking its jaws into the delicate tissues of the mouth.

The gleeful shouts of the natives did not help the situation, since it placed him in an inferior position. He was determined to master the art of eating live termites if only to save his face. One of the boys showed him how to hold the insect by the wings, dash it just the right distance into the mouth and snap the teeth together before the termite had a chance to bite first. With a little practice he became adept, and from then on, whenever there was a flight of large termites, he was among those who sought them eagerly and ate them with relish. He informs me that they have a flavor not unlike pineapple and that they are a real delicacy.

Ghesquière (1947) and Bloomhill (1958) also mention termites (see above).

Lepidoptera

The use of unspecified caterpillars is mentioned by Briault (1943) and Bloomhill (1958) (see above).

Notodontidae (prominants)

Anaphe spp., larvae, pupae

The sale of *Anaphe* larvae and pupae are noted by Ghesquière (Introduction).

Saturniidae (giant silkworm moths)

Ghesquière (1947) notes the sale of saturniid larvae in the markets (Introduction).

Sphingidae (sphinx or hawk-moths)

Bodenheimer (1951: 190) cites Pinto (in 1881) that, while crossing Africa, he was offered a large basket of hawk-moth caterpillars which are collected in abundance from certain plants. The Ganguelas like them a great deal, but Pinto's men would not touch them.

Orthoptera

Acrididae (short-horned grasshoppers)

Cameron (1877: 243) mentions that, "Several swarms of locusts passed during the day, some so thick as to obscure the sun, and my men gladly seized the opportunity of securing some for food." Consumption of grasshoppers and locusts are mentioned by Ghesquière (1947) and Bloomhill (1958), respectively (Introduction).

Gryllidae (crickets)

Ghesquière (1947) and Bloomhill (1958) note the use of crickets (Introduction).

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Chapter 19 of, *The Human Use of Insects as a Food Resource: A Bibliographic Account in Progress*, by Gene R. DeFoliart, posted on website, July, 2002.

Items Needing Attention

Page 12. See note on Nkouka (1987) under Formicidae

Page 14. Le Clerc et al: date?

Page 16. Netolitzky under Sao Tome and Principe (awaiting re-translation)

Angola Table 1. Proximate, minerals and vitamins analyses of certain insects used as food in Angola (percentages of daily requirements/100 g of insect as consumed) (Oliveira et al 1976).

Reference man	Saturnid cater- (FAO 1973)	Saturnid cater- Termitel	Saturnid cater- Palm pillar2	Saturnid cater- Palm pillar3	Saturnid cater- Palm weevil4	
Energy	2850 kcal	21.5%	13.2%	13.0%	19.7%	
Protein	37 g	38.4	26.3	76.3	18.1	
Calcium	1 g		4.0	5.0	35.5	18.6
Phosphorus	1 g		43.8	54.6	69.5	31.4
Magnesium	400 mg	104.2	57.8	13.5	7.5	
Iron	18 mg	41.7	10.6	197.2	72.8	
Copper	2 mg	680.0	70.0	120.0	70.0	
Zinc	15 mg	-	-	153.3	158.0	
Thiamine	1.5 mg	8.7	-	244.7	201.3	
Riboflavin	1.7 mg	67.4	-	112.2	131.7	
Niacin	20 mg	47.7	-	26.0	38.9	

1 *Macrotermes subhyalinus*; 2 *Imbrasia ertli*; 3 *Usta terpsichore*;
4 *Rhynchophorus phoenicis*.

