

BUTTERFLIES AND MOTHS AS FOOD FOR MAN

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The eggs, larvae, pupae, and adults of certain species of butterflies and moths have been eaten by man since prehistoric times and continue to be an item of the human diet in modern times. Human butterfly and moth eating is common to cultures in most parts of the world. Today butterfly and moth consumption is rare in the developed world, but remains a popular food in many developing regions of Latin America, Africa, Asia, and Oceania.

Larvae of some species of butterflies and moths serve as food for many ethnic groups around the world. They are often prepared charcoaled in salty water or, in some cases, fried or mixed with other food. These insects contribute a great amount of energy and protein to indigenous diets.

Nutrition

Lepidoptera comprise a major order with species of about eighty genera in twenty families used as food around the world. Some 23 species of butterfly and moth caterpillars have been analyzed by nutritionists who found that their crude protein content averaged more than 63 percent, compared to the meager 18 percent for beef.

The calorie count was about the same—200 to 300 calories per hundred grams for beef, depending on the fat level, and 265 calories for moth larvae. But, where beef contained about 58 percent water, the caterpillars came in at a dry four percent.

Asian Cuisine

In Thailand, China, Vietnam, India, Korea, Japan, and other Asian countries where there was a silk industry, cocoons of the silkworm moth were collected and sold commercially and the pupae boiled, steamed, baked, fried, or roasted, depending on locality and individual preference.

In China they are pickled with salt, or softened with water and fried with chicken eggs in an omelet, or simply fried with diced onion and a thick sauce. In Thailand, in 1987, the Thai Ministry of Public Health included silkworm pupae on a list of local foods that could be used in supplementary food formula developed for malnourished infants and pre-school children. They are fried and ground into a coarse powder that is then added to curries and soups.

In Vietnam, they are boiled with cabbage, seasoned, and served as a soup. From South Korea, they are exported in tins and sold in Asian groceries as far away as the United States. They may also be dried in the sun, preserving them for later use.

Today countries with silkworm farms stretch from Asia to Italy. But a few hundred years ago, the silkworm center was in China, where, according to Marco Polo, the pupae were sold in the markets of Hangzhou, the capital of China during the Middle Ages. The silkworm chrysalis is known in China as an excellent stomach medicine, both fortifying and refreshing, and often a successful remedy for those in poor health.

African Delicacy

In some areas of Africa, the large, spiny mopane worms (caterpillars of the *Gonimbrasia belina* moth) are so popular that when they are in season, crawling all over village and jungle trees, the sale of beef and other protein meats is seriously affected.

The caterpillars are found mainly in the bushveld from Mozambique and Zimbabwe to Namibia and South Africa, where village women collect them in the early spring, often popping one into their mouth after deftly pinching out the pungent-smelling insides.

Later, the women stew them with tomato, onion, and a wild spinach-like green, or fry them, then sprinkle them with salt and lemon juice. Leftover mopane may be dried in the sun. Any way they are prepared, South African government researchers claim that just twenty of the protein-rich caterpillars will satisfy an adult male's entire daily requirement for calcium, phosphorus, riboflavin, and iron.



Silkworm Cocoon
Turkey, 1989, Sc#B227



Mopane Worms
Botswana, 1985, Sc#362

Some African species in the larval stage are preserved by pickling and are then exported to European cities. In Paris, France, for example, they are offered in the market of Rue Mouffetard in the Latin neighborhood. These are sold in huge fiber baskets, and can be seen in the street markets in several localities for sale on different days of the week. They are mostly bought by immigrants in those countries.

Australian Moth Meat

Australian aborigines feasted on Bogong moths (*Agrotis infusa*) harvesting them in large numbers during the winter months from the caves and crevices of the Bogong High Plains.

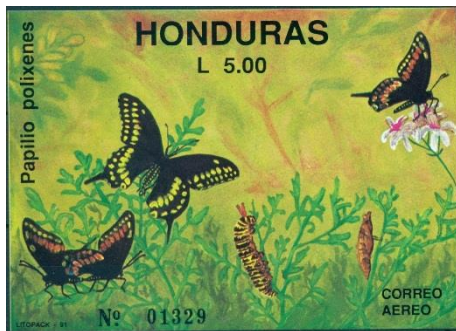
They roasted the moths in hot ashes where their legs and wings fully burn. Then they sieve them through a mesh to eliminate the moth heads. The resulting mass is kneaded and molded into pellets that are fried in an open flame, or the moths milled into a powder that is diluted with water until obtaining a kind of cookie dough.

American Entomophagy

In the Cascade and Sierra Mountains of North America, Indian tribesmen harvested the large caterpillars of the moth *Coloradia pandora*. The full grown caterpillars measure from two to two-and-one-half inches in length and are as fat as an index finger.

Normally, these caterpillars live on the pine trees, far out of reach, but in order to pass into the pupal stage they descend in great numbers to burrow into the soil. Just before this takes place the Indians build fires under the trees and stupefy the caterpillars by the smoke. This causes them to loosen their hold on the trees and fall to the ground where they are collected in baskets. They are then prepared as food by being dried over a bed of hot ashes, or by being boiled in water.

Mexican Indians eat 67 species of butterfly and moth caterpillars. Samples:



Papilio polyxenes
(Papilionidae)
Honduras, 1991, Sc#C812



Pontia protodice
(Pieridae)
Honduras, 1991, Sc#C833



Spodoptera frugiperda
(Noctuidae)
Venezuela, Sc#916



Actias luna
(Saturniidae)
US, 1987, Sc#2293

The trade of Lepidoptera larvae in Mexico still persists being sold in markets in several towns and even at the capital.

The red and white agave worms of the moth *Hypopta agavis* are in great demand, in large part due to their exquisite flavor, though the eating of these larvae is also an ancestral tradition and a signal of power in diverse sectors of the population.

Due to high demand for these species, some sellers have special refrigerators for freezing and storing them. In order to offer them at high prices after the collecting season.



Manduca sexta
(Sphingidae)
Venezuela, 1968, Sc#918



Nymphalis antiopa
(Nymphalidae)
Comoros, 2009, Sc#1053a

Some of the recorded edible Lepidoptera clearly constitute an important part of the nutrition and economy of the Mexican people, particularly for the indigenous collectors, middlemen, distributors, salesmen, and restaurant owners. In addition, canned white agave worms are exported to the United States and Canada.



Agrotis sp.
Mauritania, 1989, Sc#650