

Edible Beetles (Coleoptera) from Northern Thailand

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Abstract Edible beetles from northern Thailand are dealt with. Of more than 150 species of edible insects collected, about 100 belong to the order Coleoptera, of which five families and 70 species have been specifically determined. Current insect-eating behaviour of villagers was investigated by using a questionnaire survey in Ban Angkhai, Chiang Mai Province in November 1998. Approximately 15 different groups of insects were eaten by the villagers, and 6 groups of them were beetles. Reasons for eating insects were “tasty”, “good for a side dish”, “as a seasoning”, etc. They prepare and cook beetles before eating, though they eat weevils raw. Insect-eating has obviously declined due to changes in recent dietary habits in that village.

Introduction

The habit of insect-eating has been known since prehistoric times, and is still popular in such areas as Southeast Asia, Central and South America, and Oceania. Local people utilize insects as a nutritious food, and sometimes as seasoning, not only in the imaginal stage but also in pupae and larvae. It is also a fact that this habit has recently declined due to changes in dietary habits, mainly caused by economic development. From a long term viewpoint, understanding the insect-eating habit is very significant in maintaining a traditional culture. Furthermore, studies of edible insects could be a key solution to food resource problems in the future.

We have been conducting researches on the beetle fauna of northern Thailand for the last ten years and became interested in seeing that the local people use a variety of insects, including many Coleoptera, as food materials. This encouraged us to start an on-going study of insect-eating in the area.

I. Materials and Method

In 1997 we started a continuing survey of the insect-eating habit and collected specimens actually served as food in northern Thailand (Fig. 1).

We collected specimens of the insect groups we had observed being eaten from fields in Chiang Mai and Mae Hong Son Provinces, and confirmed with villagers if these were what they actually ate. We also purchased insects from markets in Chiang Mai City, Fang District, Lamphun–Lampang Pass, etc. The specimens collected were carefully determined by ourselves (*Scarabaeidae*, *Laparosticti*) and specialists of each taxonomic group.



Fig. 1. Map of northern Thailand.

We observed the insect-eating behaviour of villagers in Ban Angkhai, Samoeng District, Chiang Mai Province and of the people in local restaurants in Chiang Mai City. In addition we investigated current insect-eating behaviour by using a questionnaire survey of the villagers (63 persons: approximately 1/3 of inhabitants) of Ban Angkhai in November 1998. The answers received were analyzed by utilizing standard social science methodologies.

II. Results

A. *Determination of edible beetles*

We have collected more than 150 species of edible insects during the last three years. Of these about 100 species belong to the order Coleoptera, and five families and 70 species of beetles have been specifically determined (Table 1) in the course of this study. Thanks to cooperation of several specialists, this result is the most detailed ever. In previous studies concerning edible insects, not so many species have been specifically identified. Determination of Southeast Asian insects at the species level is very difficult due to the great diversity of species, including unknown ones, distributed in the area.

Of the forty species remaining undetermined, the majority belong to the Scarabaeidae (Pleurosticti). A number of new species are included. These will be made known in papers in the future by each specialist. Specimens of orders other than the Coleoptera were also sent to specialists for determination, and the results will be reported elsewhere.

B. *Results from the questionnaire*

1) Insects currently eaten by villagers

What kinds of insects do the villagers currently (during these years) eat?

“Dynastid beetles (imago)”, “ants”, and “bees” are the top three categories, eaten by 92.1%, 90.5% and 88.9% of villagers, respectively (Table 2). Approximately 15 different groups of insects were eaten by villagers, and six of these were various groups of beetles.

2) Insects formerly eaten by villagers

What kinds of insects did the villagers eat in the past?

“Dung beetles” rank in the first place including 34.9% of respondents. “Insects in water (diving beetles, etc.)” rank second at 31.7% and followed by “cicadas (28.6%)” (Table 3). “Dynastid beetles”, “weevils” and “silkworms” shared the 4th place.

3) Reasons of eating insects

Why do the people of Ban Angkhai eat insects?

“Tasty” was the commonest reason given with close to 90% (Table 4). “Good for a side dish” ranks the second, followed by “as a seasoning”. “No other nutritious food from nature” ranks the 7th and included only 11.7% of replies.

Table 1. Edible beetles from northern Thailand.

Family Dytiscidae	
<i>Cybister limbatus</i> (FABRICIUS)	<i>C. tripunctatus asiaticus</i> SHARP
Family Scarabaeidae	
Laparosticti	
<i>Heliocopris bucephalus</i> (FABRICIUS)	<i>Melolontha malaccensis</i> MOSER
<i>Catharsius birmanensis</i> LANSBERGE	<i>Megistophylla andrewesi</i> MOSER
<i>C. molossus</i> LINNÉ	<i>Sophrops foveatus</i> (MOSER)
<i>Copris punctulatus</i> WIEDEMANN	<i>S. paucisetosa</i> FREY
<i>C. furciceps</i> FELSCHÉ	<i>S. rotundicollis</i> T. ITOH
<i>C. reflex</i> (FABRICIUS)	<i>S. opacidorsalis</i> T. ITOH
<i>C. carinicus</i> GILLET	<i>S. simplex</i> FREY
<i>C. sinicus</i> HOPE	<i>S. excisus</i> T. ITOH
<i>C. corpulentus</i> GILLET	<i>Brahmina parvula</i> MOSER
<i>Onitis kiuchii</i> MASUMOTO	<i>B. mikado</i> T. ITOH
<i>O. subopacus</i> ARROW	<i>Adoretus pachysomatus</i> H. KOBAYASHI
<i>Oniticellus cinctus</i> (FABRICIUS)	<i>Anomala laotica</i> FREY
<i>Liatongus rhadamistus</i> (FABRICIUS)	<i>A. lignea</i> ARROW
<i>L. tridentatus</i> (BOUCOMONT)	<i>A. shanica</i> ARROW
<i>L. venator</i> (FABRICIUS)	<i>A. scherei</i> FREY
<i>L. affinis</i> (ARROW)	<i>A. anguliceps</i> ARROW
<i>Onthophagus bonasus</i> (FABRICIUS)	<i>A. bilunulata</i> FAIRMAIRE
<i>O. rectecornutus</i> LANSBERGE	<i>A. vuilletae</i> PAULIAN
<i>O. sagittarius</i> (FABRICIUS)	<i>A. cupripes</i> HOPE
<i>O. seniculus</i> (FABRICIUS)	<i>A. antiqua</i> GYLLENHAL
<i>O. orientalis</i> HAROLD	<i>Mimela ferreroi</i> SABATINELLI
<i>O. trituber</i> WIEDEMANN	<i>M. schulzei</i> SABATINELLI
<i>O. taurinus</i> WHITE	<i>M. linping</i> SABATINELLI
<i>O. proletarius</i> HAROLD	<i>Miridiba tuberculipennis obscura</i> T. ITOH
<i>O. luridipennis</i> BOHEMAN	<i>Holotrichia hainanensis</i> CHANG
Pleurosticti	<i>H. nigricollis rubricollis</i> MOSER
<i>Eupatorus gracilicornis</i> ARROW	<i>H. cephalotes</i> (BURMEISTER)
<i>Xylotrupes gideon siamensis</i> MINIK	<i>Exolontha castanea</i> ZHANG
<i>Lepidiota hauseri</i> NONFRIED	<i>Polyphylla tonkinensis</i> DEWAILLY
<i>L. bimaculata</i> (SAUNDERS)	
Family Hydrophilidae	
<i>Hydrophilus cavisternus</i> BEDEL	<i>H. olivaceus</i> FABRICIUS
Family Cerambycidae	
<i>Dorysthenes buqueti</i> GILLET	<i>D. walkeri</i> (WATERHOUSE)
<i>D. granulosis</i> (THOMSON)	<i>Macrotoma fisheri</i> (WATERHOUSE)
Family Curculionidae	
<i>Cryptotrachelus buqueti</i> (GUERAN)	<i>C. longimanus</i> (FABRICIUS)
<i>C. rufopectinipes birmanicus</i> FAUST	<i>Rhynchophorus ferrugineus</i> (OLIVIER)

Table 2. Insects currently eaten by villagers (M. A.).

Insects	Answers	%
Dynastid beetles (imago)	58	92.1
Ants	57	90.5
Bees	56	88.9
Grasshoppers	52	82.5
Worms inside bamboo (larvae of moths)	52	82.5
Dung beetles	49	77.8
Crickets	47	74.6
Giant water bug	47	74.6
Cicadas	41	65.1
Insects in water (<i>e.g.</i> , diving beetle)	29	46.0
Scarabaeid beetles (Pleurosticti)	25	39.7
Larvae under ground (<i>e.g.</i> , dynastid beetles)	24	38.1
Weevils	22	34.9
Silkworm (pupa)	9	14.3
Others	7	11.1
Total	575	

Table 3. Insects formerly eaten by villagers (M. A.).

Insects	Answers	%
Dung beetles	22	34.9
Insects in water (<i>e.g.</i> , diving beetle)	20	31.7
Cicadas	18	28.6
Dynastid beetles (imago)	12	19.0
Weevils	12	19.0
Silkworm (pupa)	12	19.0
Scarabaeid beetles (Pleurosticti)	10	15.9
Larvae under ground (<i>e.g.</i> , dynastid beetles)	10	15.9
Ants	9	14.3
Giant water bug	9	14.3
Bees	8	12.7
Grasshoppers	7	11.1
Worms from inside bamboo (larvae of moths)	5	7.9
Crickets	4	6.3
Mole crickets	1	1.6
Imagoes of dragonflies	1	1.6
Total	160	

C. Preparation and cooking of edible beetles

We observed cooking of edible insects in Ban Angkhai and also in restaurants in Chiang Mai City.

Villagers mostly cook beetles before eating, though they eat weevils raw.

Table 4. Reasons for eating insects (M. A.).

Reasons	Answers	%
Tasty	56	88.9
Good for a side dish	38	60.3
As a seasoning	20	31.7
As a relish	17	27.0
Good for snack	14	22.2
Good for health (substitute for medicine)	14	22.2
No other nutritious food from nature	7	11.1
Total	166	

In the case of scarabaeid beetles (*Laparosticti*), they are kept in rice hulls for a day to eliminate dirt and feces, and then killed in boiling water. After draining the water, they pluck off the wings and legs, and mix the insects into curry instead of meat.

In the case of dynastid beetles and some other *Pleurosticti*, they first kill them in boiling water. After draining the water, plucking off wings and legs, they parch them with oil. Other beetles such as cerambycids, hydrophilids and dytiscids are treated in the same way.

Other insects, such as cicadas, grasshoppers, crickets, etc., are first killed in boiling water, then fried.

III. Conclusion

We collected more than 150 species of edible insects. Of these about 2/3 are Coleoptera. Five families and 70 species were specifically determined.

In the case study at the village of Ban Angkhai, the villagers mostly ate "dynastid beetles (imago)", "ants", and "bees". Approximately 15 different groups of insects were eaten by the villagers, 6 groups of them being beetles. In the past, the villagers ate various other groups of insects. There are obvious recent changes in their food selection behaviour. They can obtain nutritious food (*e.g.*, chicken, fishes, snack foods, etc.) through markets much easier than in the past. Necessity for eating insects may have been reduced by their economic development. Furthermore, obtaining natural food sources is becoming more difficult because of deterioration of natural environment. From the responses of younger generation, we have found that they eat fewer insects than older villagers.

The villagers mostly cook insects before eating, though they eat weevils raw. They first kill the beetles (except dung beetles) in boiling water. After plucking off the wings and legs and draining the water, they parch them with oil or fry them. In the case of scarabaeid beetles (*Laparosticti*), they prepare in a more complicated way. A step is necessary for eliminating dirt and feces before killing them by boiling water.

We believe that the complicated procedures for preparation of dung beetles for food may explain their declining popularity.

We intend to continue research on edible insects, particularly the Coleoptera, in greater detail, and compare the results with other studies in northeastern Thailand in the near future.

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要 約

宇都宮由佳・益本仁雄：北タイの食用甲虫について。—— 1997年以来、北タイで住民の食虫習俗に関する調査と実際に食用に供せられる昆虫について採集をおこなってきた。150種以上の食用昆虫が採集されたが、そのうちの5科70種の甲虫を種段階まで同定した。一方、食虫習俗の現状について、1998年11月にチェンマイ県アンカイ村でアンケート調査をおこなった。村人は、およそ15群の昆虫を食料にしていたが、そのうちの6群は甲虫であった。昆虫を食べる理由として、「おいしいから」、「おかずとして」、「調味料として」などがあげられた。ゾウムシを除いて、昆虫は食べる前に調理されていた。食虫習俗は、最近の食生活の変化のため、明らかに減少しつつあることがわかった。

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Revival of *Strongylium interruptum* (Coleoptera, Tenebrionidae, Strongyliini)

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Strongylium interruptum was described by BLAIR (1930) from Darjeeling. In his catalogue of the Tenebrionidae (p. 911), GEBIEN (1943) regarded it as a form of *S. simulator* DOHRN, 1880, from "Birma".* Through the courtesy of Mr. Martin J. D. BRENDLELL, the Natural History Museum, London, and Dr. Dariusz IWAN, Museum and Institute of Zoology, Polish Academy of Sciences, I was able to examine the types of the two species, and concluded that *S. interruptum* is a good species.

Strongylium interruptum BLAIR, 1930

Strongylium interruptum BLAIR, 1930, Entomol. mon. Mag., London, **66**: 179.

Notes. As compared with *S. simulator* DOHRN, *Strongylium interruptum* BLAIR is obviously slenderer, with larger eyes (diatone about 1.5 times the width of an eye diameter in dorsal view), pronotum somewhat barrel-shaped and lacking the medial groove, and the elytra sub-cylindrical and more finely striate.

* *Strongylium simulator* DOHRN, 1880, Stett. ent. Ztg., **1880**: 373.