Insects
Insects

Mekong river basin has tradition of eating insects and one sees variety of insects in the market today. Insects and freshwater fish have been used as good source of protein especially among inland areas. Although modern advancement of transportation enabled to have food from distance and made insects as less important as a sole source of protein, they are still popular as food to enjoy. They can be a main dish, a snack or an appetizer so they are enjoyed by everybody from elderly to young. In the cities, insect dishes are available in markets, stalls, and eateries.
In the market, there are insects that are sold throughout year, only in certain season, and only by chance. Geographic difference plays a role and marketed insects change from area to area. Commonly seen insects are from Orthoptera, Hemiptera, Hymenoptera, Coleoptera, Lepidoptera. There are even insects that are very popularly consumed in Mekong river basin yet they are protected species in Japan. In this study, we recorded more than 120 species of insects, but in reality, there are more species consumed than one can see in market.
Most popular method to cook insects is frying and seasoning it with salt, fish sauce and MSG, or mix it with chili. Other than frying, they can be roasted, boiled, stir fried, steamed, eaten raw or mixed with chili paste. Also noted is an insect is cooked differently according to its development phase of egg, larva, cocoon, and adult form.
Many of insects are common species and caught in wetlands near villages. They are consumed at home as well as sold at markets in exchange of money. Some species such as silkworm (Bombyx mori) and house cricket (Acheta domestica) are cultured to enable stable supply to markets. There are suppliers that export them overseas. In this study, approximately 120 species of edible insects have been confirmed. Those species that lack detailed information are introduced with only picture and name. Our purpose here is to introduce as many species as possible.
The Collection Method
As mentioned before, many insect species are utilized as food source in Mekong river basin. Various collection methods exist according to species, seasons, and habitat. In this section, we introduce most popular collection methods.

<Light trap>
This method incorporates fluorescent light and black light which emits strong ultraviolet to be lit during night. It attracts insects with phototactic behavior. Insects fly into light and hit a piece of galvanized metal sheet or cloth set behind the light and drop into a bucket or box underneath. The bucket or box is filled with water so that fallen insects would not escape. This type of trap is often set up in one’s yard where it has easy access to electric outlet. The light is shone towards waterfronts such as paddy fields. The trap is filled with water and lit in the evening, then they collect the trapped insects in the morning. It is simple and effective. Typical catches are giant water bug, predaceous diving beetle, water scavenger beetle, termite, mole cricket and others. Large insects and popular species are sorted out and others are frozen altogether to be sold at market or cooked at home. Kinds and amount of insects vary depending on the season, so some people set trap throughout year while others only collect during certain seasons.

<Night collection>
In this method, people go out at night with a light. It is a casual walk to paths, forest fridge, or paddy field near the village. Diurnal insects such as grasshopper which does not move at night are often caught in this method.
A round bamboo colander is used, or a handle-less net which is spread and fitted in round or triangular woven bamboo is used to scoop water in. This method is used in shallow water such as paddy or marsh. Aquatic insect such as dragonfly larva, Ferocious water bug, Water stick insect and aquatic coreoptera such as predaceous diving beetle and water scavenger beetle are popular catch. Shrimp, small fish and tadpoles are caught at the same time. It is often used by women and youth.
Morphology of insects

**Odonata**

- Antenna
- Head
- Thorax
- Abdomen
- Forewing
- Eye (Compound eye)
- Hindwing

**Orthoptera**

- Pronotum
- Antenna
- Temur
- Tibia
- Eye (Compound eye)
- Mouth parts
- (Grasshopper)

**Hemiptera**

- Compound eye
- Shingle eye
- Wing apex
- Ovipositor
- (Cicada)
Coreoptera

(Beetle)

- Pronotum
- Elytra
- Femur
- Tibia
- Trasus
- Spined process

(Water scavenger beetle)

Lepidoptera

(Billbug)

- Rostrum
- Puncture series

(Emperor moth)

Wingspan
Basic Information

Dragonfly larvae have completely different appearance from the adults. The body of a larva is short and thick, usually cylindrical. Larvae of *Aeshnidae* have a proportion of their body width and length as 1:5. Larvae of *Gomphidae* and *Macromiidae* have flat abdomen, and the proportion is 1 to 2:3.5. Larvae of *Libellulidae* have proportion of 1:4. Most of the species are one generation per year, and larvae are aquatic. Both adults and larvae are carnivorous. They eat other smaller insects. Depending of the species, eggs are dropped on a water body or laid on a plant body in water. When larvae are ready for their final molt, they leave the water and crawl onto a bank where they will molt into adults. Newly emerged adults leave the aquatic environment for a while then come back when they are fully matured.

Use

The dragonfly larvae are primarily used as food. Adults are said to be eaten in some areas, but it is not a common habit. Especially in Laos, dragonfly larvae are used frequently, whereas in Cambodia, they are not a popular insect as food. Larvae are fried, stir-fried, or steamed to be served. In Lao market, steamed larvae wrapped in banana leaves are sold. Adults are roasted or fried to be eaten.

Collection of larvae is usually done by skimming them by using a colander or a hand-held net. During rain season, collection takes place at shallow water with ample aquatic vegetation, such as marshes, and during the dry season, it is done at rivers which have decreased water volume. Several species of larvae are more frequently used, such as *Aeshnidae*, *Gomphidae*, *Corduliidae*, and *Libellulidae*. They are often sold mixed with other small aquatic animals. In this section, we introduce species that are often sighted in markets and around water. It is assumed that there are many more species used as food other than those written in this report.
04 Sep. 2010  Vang Vieng Market, Vientiane Province, Laos
10 Jun. 2007  Dong Makkai Market, Vientiane Capital, Laos
14 Oct. 2009  Dong Makkai Market, Vientiane Capital, Laos
09 Sep. 2010  Phon Sim, Savannakhet, Laos
02 Sep. 2010  Epophthalmia sp.
25 Nov. 2009  Hou Kua Market, Vientiane Capital, Laos
06 Sep. 2009  Dong Makkai Market, Vientiane Capital, Laos
19 Jan. 2013  Lak14 Market, Champasak, Laos
Gomphidia perakensis
27 Jul. 2008  Nathone, Vientiane Capital, Laos

Hydrobasileus croceus
18 May. 2010  Cambodia

Orthetrum
23 Jul. 2008  Dong Makkai, Vientiane Capital, Laos

Orthetrum triangulare
6 May. 2010 Laos

Gomphidia perakensis
Jul. 2008  Vientiane, Laos

Hydrobasileus croceus
12 Oct. 2010  Laos

Orthetrum glaucum
9 Sep. 2009 Laos

Orthetrum pruinosum neglectum
27 Jun. 2010  Phonekeo, Vientiane Province, Laos
Orthetrum sabina sabina
16 Aug. 2010  Dong Makkai, Vientiane Capital, Laos

Brachydiplax
27 Jul. 2008  Nathone, Vientiane Capital, Laos

Brachydiplax chalybea chalybea
9 Nov. 2007  Vientiane Capital, Laos

Brachydiplax farinosa
26 Jul. 2010  Phone Ngeun, Vientiane Province, Laos

Diplacodes trivialis
12 Sep. 2007  Phoxay, Vientiane Capital, Laos

Diplacodes trivialis
7 May 2010 Laos

Neurothemis tullia tullia
02 Sep. 2010  Vang Hou, Vientiane Capital, Laos

Neurothemis tullia tullia
8 Nov. 2007  Siem Reap, Cambodia
**Tholymis tillarga**
02 Sep. 2010  Norng Bon, Vientiane Capital, Laos

**Tholymis tillarga**
13 Oct. 2010 Laos

**Pantala flavescens**
04 Sep. 2010  Vientiane Province, Laos

**Pantala flavescens**
12 Oct. 2010 Laos

**Potamarcha congener**
25 Jul. 2010  Na Seng, Vientiane Province, Laos

**Trithemis pallidinervis**
01 Aug. 2010  Napuheuy, Vientiane Province, Laos

**Trithemis aurora**
26 Jul. 2010  Phone Ngeun, Vientiane Province, Laos

**Diplacodes nebulosa**
26 Nov. 2009  Dong Borng, Vientiane Capital, Laos
Brachythemis contaminata
28 Jun. 2010  Mueng Song, Vientiane Province, Laos

Crocothemis servilia servilia
01 Aug. 2010  Napuheuy, Vientiane Province, Laos

Rhyothemis triangularis
09 Sep. 2010  Thating Hang, Savannakhet, Laos

Rhyothemis plutonia
22 May 2009  Houasang, Vientiane Capital, Laos

Neurothemis fluviata
27 Jun. 2010  Phonekoo, Vientiane Province, Laos
**Gryllotalpa orientalis**

**Order:** Orthoptera  
**Family:** Gryllotalpidae

### Basic Information

It is widely distributed in Southeast Asia, Australia, and Africa. Its length is 30 to 35mm. Its front legs are formed so that they are suitable to dig holes and bury itself. There is no significant difference in appearance between a male and female. It lives in burrows in the ground of paddy or farm field. Both male and female make a sound, and they communicate while being underground. It is omnivorous and eats any organic matter. Adults have tendency to fly during night and gather around the light sources. It can swim as well.

### Use

It is used as food in many areas. It is often fried, roasted, or stir-fried to be served. In Laos, it is used as an ingredient of chili paste. It has neutral taste, and people like it very much. Collection is mostly done by light trap method.

### Remarks

- **LA** Maeng sone
- **KH** Tok tol
- **TH** Maeng gi son, Ma lang kra sone, Krachorn
- **VN** De nhui
- **JP** Kera

**30 Jun. 2009** Laos

**02 Jul. 2010** Phonekeo, Vientiane Province, Laos
Basic Information

Its body is horizontally flat with black to dark brown color, and its antennae are thin and long. Most of the species live closer to the ground surface, and many are nocturnal. Adults live hiding behind an object on the ground, or by digging a shallow hole close to the surface. It is omnivorous and feed on carcass of small animals or dead plants.

Use

Both adult and larva are used as food. It is fried, roasted, or stir-fried to be eaten. In Laos, it is used as an ingredient of chili paste.

In Thailand, it is blanched first then cooked slowly in a fish paste. Canned, fried Gryllidae spp. is also popularly distributed. Popular species that are sold in markets are large _Brachytrupes portentosus_, mid-sized _Gryllus bimaculatus_, and cultured _Acheta domesticus_. In Cambodia, _B. portentosus_ is very popular, therefore it is sold at higher price than other _Gryllidae_ spp. Other species confirmed in this study are: _Teleogryllus occipitalis_, _Gymnogryllus vietnamensis_, and _Teleogryllus_ sp.. The farming technology of _A. domesticus_ has been studied in advance, and its farms are widely seen in many areas. The cultured crickets are fed with artificial diet, and it takes a little over one month for an egg to become ready for shipping. Other than being shipped to the markets, it is also traded as food for pet reptiles to pet stores and zoos.

Collection of Gryllidae spp. takes place at dry paddy field or grass areas by digging soil to find it in the nest.
Acheta domestica

Gryllus bimaculatus
19 May 2009  Cambodia

Gryllus vietnamensis
19 May 2009  Cambodia

Teleogryllus occipitalis
19 May 2009  Cambodia

Teleogryllus sp.
29 Jun 2009  Laos
**Basic Information**

It is distributed in Indo-China, tropical Asia, Taiwan, and Japan (Nansei Islands). Its length is 50 to 75mm. It lives in a grass area or on a leaf of bushes in forest fringes. It is more active during the night, and adult males make a loud sound during the night.

**Use**

The general use of *Gampsocleis* spp. will be described in this section. People eat only adult *Gampsocleis* spp. It is usually fried or stir-fried to be served, and its legs are typically removed when cooking because they tend to prick a person’s mouth. *Gampsocleis* spp. is sold in markets, but it is less often seen when compared to other grasshoppers. It is popular as homemade dish, and some people really favor it in Cambodia. Large species are collected by bare hands during the night by flashing a light. It is often found in grass, in a bush, or in forest fringe along the paddy field. *Mecopoda elongata* is especially attracted to a light, so it is collected by light trap method. Small species are collected by swinging a net in the grassland. With this method, other grasshoppers will be caught as well, so they are all eaten together. Other than *Mecopoda elongate* in the *Gampsocleis* spp., *Conocephalus maculatus* is also popularly used. Other species are also used commonly.
Conocephalus maculatus  
20 Oct. 2010  Laos

Ducetia curciata  
9 Sep. 2008 Laos

Euconocephalus gracilis  
18 May 2009  Cambodia

Holochlora venosa  
26 Jun. 2009  Laos

Pyrgocorypha sp.  
26 Jun. 2009  Laos
Cryptocanthacris tatarica

**Order:** Orthoptera  
**Family:** Acrididae

### Basic Information
Female length is about 52mm to the end of wings. Male length is about 4.2cm to the end of wings. Its body is grayish brown and has distinct dark brown mottle.

### Use
The general use of Acrididae, and Pyrgomorphidae in Orthoptera spp. will be described in this section. Only adults are used as food, and it is fried to be served most of the time. Variety of seasonings are used such as dipping sauce of MSG and fish sauce, salting to fry, frying with leaves of Citrus hystrix as a flavor, or frying chili together to make it spicy.

When eating larger grasshoppers, their legs are removed because they tend to prick a person’s mouth. Smaller ones are sometimes stir-fried with other grasshoppers. Larger ones are collected by bare hands at night by flashing a light. **Cryptocanthacris tatarica** is a species particularly collected well by this method. Smaller ones are caught by swinging a net in grass areas. In this method, other grasshoppers are caught in the net as well, so they are all eaten together. Other species that are seen in the markets are *Chondracris rosea*, *Patanga succincta*, and *Oxya japonica japonica*. Other species which we could not confirm in the markets are eaten in the same way. Confirmed species are described with basic information below. Some of other unconfirmed species are introduced by pictures.
**Chondracris rosea**

*Order: Orthoptera*

*Family: Acrididae*

**Basic Information**

Female length is about 60mm to the end of wings. Male length is about 45mm.

Its body is bright green, with yellowish brown compound eyes. It is usually found in tall grass areas and on the leaves of bushes along the forest edge. It flies away when approached by a human. It is mostly active in a daylight.

**4 Sep.2008 Laos**

**Patanga succincta**

*Order: Orthoptera*

*Family: Acrididae*

**Basic Information**

Female has about 53mm body length to the end of abdomen, about 70mm to the end of wings.

Its body is light brown. Its forewings are generally thin and long. Part where wings extend past abdomen is distinctively longer than that of other species. From its dorsal side of prothorax toward an area where forewings overlap is colored grayish brown. Its prothorax has distinctive vertical and broad dark brown bands when seen from the side.

**24 Sep.2008 Cambodia**
Basic Information

It is distributed in Southeast Asia, China, Taiwan, India and Sri Lanka.

Male has a body length of about 17 to 34mm (to the end of wings), and female 21 to 40mm. Individuals differ in coloration of their body and dorsal side; either yellow green or yellow brown. In general its body is glossy. There is a dark brown band from behind the compound eyes to the side of the wings when folded. Both adults and larvae live in a paddy field and surrounding wet grasslands. They favor eating leaves of gramineous plants.
25 Jun. 2010  Don Makkai, Vientiane Capital, Laos

*Crytocanthacris tatarica*

25 Jun. 2010  Don Makkai, Vientiane Capital, Laos

*Crytocanthacris tatarica*

25 Jun. 2010  Don Makkai, Vientiane Capital, Laos

24 Jun. 2010  Hong Kae, Vientiane Capital, Laos

*Atractomorpha* sp.
Cambodia

*Tagasta* sp.
Laos

*Acrida* sp.
Laos

*Aiolophus thalassinus tamulus*
Cambodia
Calephorus vitalisi  
Cambodia

Catantops pinguis  
Laos

Choroedocus sp.  
Laos

Ey prepocnemis sp.  
Laos

Gastrimargus marmoratus  
08 Sep. 2008 Laos

Hieroglyphus banian  
Cambodia

Locusta migratoria  
04 Sep. 2008 Laos

Patanga luteicornis  
24 Sep. 2008 Cambodia
Phlaeoba antennata  
Sep.2007  Vientiane, Laos

Pternoscirta sp.  
Sep.2007  Vientiane, Laos

Trilophidia annulata  
Sep.2007  Vientiane, Laos

Valanga nigricornis  
Sep.2007  Vientiane, Laos

Xenocatantops humilis  
Sep.2007  Vientiane, Laos
Cicadidae spp.

Basic Information

Many of the adults of this species have wings that are membranous and transparent. The abdomen of males serve as a sounding organ and their abdominal cavity is hollow to serve as a resonance chamber. Females use the tip of their abdomen to scratch a tree branch to lay eggs. After the larvae emerge, they descend to the ground by themselves, and go underneath the soil through cracks on the surface. They stay there and grow slowly over a few years. When it is closer to the final molt, they emerge to the surface during the evening to the night, then climb on a tree or a grass to molt as adults. When matured, males sing to attract females in order to mate.

Use

In Laos and Thailand, several species of adults and larvae are used. Its culinary use in Cambodia was not confirmed in this study. Adults are often fried to eat, and sometimes roasted ones are served with salt. Larvae are also fried and served. In this study, 4 genus and 6 species are confirmed, however, it is assumed that more species are being used. Adults are collected by using a hand-held net with a long handle, a slingshot, a birdlime, or hand-collected by shaking trees during the night. In the Lao mountainous region, there is the method to lure in imitation sound of the cicada voice by bamboo. In Laos, they use Ton Yang as a birdlime, which is made by adhesive resin extracted from woody vines. Using Ton Yang, a collector catches newly emerged adults when they come to acquire water from the moist ground along the Mekong River. He can collect more than 10 *Meimuna subviridissima* in a matter of 5 minutes. Larvae are collected by digging the base of a tree with a hoe. In Vientiane Prefecture, Laos, they were collected in forests around paddy fields during the dry period. People can collect 20 to 30 larvae in an hour.
Macrosemia tonkiniana
21 Oct. 2010 Laos

Meimuna subviridissima
14 Apr. 2010 Laos

Muda sp.
21 Oct. 2010 Laos

Platylomia bocki
2 Dec. 2010 Laos

Pomponia sp. (aff. linearis)
28 Nov. 2007 Vientiane Capital, Laos

Apr. 2010 Vientiane Capital, Laos

17 Nov. 2008 Laos

19 Nov. 2009 Dong Makkai Market, Vientiane Capital, Laos
**Tessaratoma quadrata**

**Order:** Hemiptera  
**Family:** Scutelleridae

### Basic Information

The stink bugs have a length of 24.5mm to 34mm. Its body is relatively flat and a light yellowish brown color. It is a pest for longan and lychee trees; therefore, it can be easily found in and around a longan orchard. It feeds on plant sap by inserting a needle-like sucking mouthparts on a leaf vein or the stem of a plant. Eggs are laid in a cluster on the back of a leaf. Larvae live together right after hatching, they are then dispersed to have a solitary life.

### Use

Both adults and larvae are used as food. Live and cooked ones are sold at markets. We could not confirm its use in Cambodia in this study. It is fried or stir-fried to be served. In Laos, it is a popular ingredient for chili paste, called Cheo, and served with sweet rice. Other edible stink bugs tend to have a distinct aroma, but this species is found to be less aromatic. Adults and larvae that are on longan and lychee trees are collected by insect nets. In Laos, a larger amount is collected just before the rain season. From April to June, 3 to 4kg can be collected per day.

### Remarks

- **LA** Maeng kheng
- **KH** Maeng krang, Mung lum yai, Mang kheng
- **TH** Bo xit nhan
- **VN** Bo xit nhân
- **JP**

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26 May 2009  Khouathi, Louang Phrabang, Laos  
5,000kip

13 Feb. 2010  Tha Heua Market, Louang Phrabang, Laos
26 May 2009  Khouathi, Louang Phrabang, Laos

17 Sep. 2011  Sampana, Vientiane Capital, Laos

13 Feb. 2010  Tha Heua Market, Louang Phrabang, Laos

15 Feb. 2010  Savan Say Market, Savannakhet, Laos

29 Jun. 2010  Dong Borng, Vientiane Capital, Laos

17 Sep. 2011  Sampana, Vientiane Capital, Laos
**Basic Information**

Leptocorisa spp.

- **Order:** Hemiptera
- **Family:** Coreidae

Its length is 14 to 17mm. The body is slender overall. It has a pale green body with brown wings when alive, but the green part changes to yellow when it dies. It lives in gramineous grassland or near the paddy field, and sucks on plant sap from the plant spikes. Its Lao name, “khao”, means rice, since it is often found around rice paddies.

**Use**

Adults are used as food in Laos. It is fried or roasted and also used as an ingredient for chili paste. It has the distinctive fruity aroma of stink bugs.

The collection takes place at night. Adults are inactive at night, so a collector walks by shining a light to catch them.

**Remarks**

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<td>VN</td>
<td>Kumo heri kamemushi</td>
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<td>JP</td>
<td>クモヘリカメムシ属の一種</td>
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</tbody>
</table>

Leptocorisa sp.

- **21 Nov. 2007** Vientiane Capital, Laos

Leptocorisa sp.

- **10 Jun. 2007** Dong Makkai Market, Vientiane Capital, Laos
Coreidae sp.  

**Order:** Hemiptera  
**Family:** Coreidae

| LA | MAENG KHENG KA PO |
| KH | MUNG NUG KREN |
| TH | BO XIT NAU |
| VN | BO XIT NÄU |
| JP | HERIKAMEMUSHI |

### Basic Information

Its length is 15 to 18mm. Its body is a long oval shape with a dark brown color. There are three distinctive brown bands on its hind femur.

### Use

Adults are eaten in Laos and Thailand. It is fried or stir-fried to be served. In Laos, it is a popular ingredient of chili paste. It is favored for its fruity aroma. Collection is done by using a tool which is a long stick with a bag attached at the end.

A collector would tap on the insect in the tree, and when it drops, he catches it in the bag. A few species within Coreidae sp. are confirmed, but the above pictured species is most commonly seen in the market.
**Drosicha sp.**

**Order:** Hemiptera  
**Family:** Margarodidae

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<td>Warai-kaigaramushi</td>
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**Basic Information**

Its body is oval and flat. Larvae and adults have evolved into a shape that is well adapted to a parasitic life in which it attaches to the host plant. There is almost no border or joint between its head, thorax and abdomen. Its suctorial mouth is a long thread-like tube which can extend a few times more than its body length. Adults cover their body with wax coating. Only during the larva stage, can they crawl and move. While maturing, they lose their vestigial legs, antennae, eyes and become immobile. They feed on plant sap.

**Use**

It is used as food in Laos, but rarely seen in the market. It only circulates in the market in May of each year. It is fried or steamed in banana leaves. It is often mistaken for a cicada’s eggs.
Lethocerus indicus

Order: Hemiptera
Family: Belostomatidae

Basic Information
It is distributed in tropical to subtropical areas in Eastern Asia and India. Its body is 60 to 90mm. Its body is oval and flat. It lives in a deep pond or a water hole with abundant aquatic plants. Eggs are laid in a pattern that surrounds a branch. The beginning of the rain season marks the peak of the egg laying season. Males protect the eggs until they hatch. The larvae and adults hide between aquatic plants, and catch aquatic insects, tadpoles and small fish by their front legs to feed.

Use
It is one of a famous edible insect in Indo-China, and is very popular. Adults have distinct aroma which resembles coriander, which is the reason it is favored. Males are supposed to be more aromatic than females, so they are traded at a higher price. Mature females with eggs are said to be as tasty as males. It is roasted, fried, or steamed to eat. It is also used as a spice to add flavor to other dishes. In Laos and Thailand, it is used as an ingredient for chili paste. In Cambodia, it is popular as a snack to go with alcohol beverages. There is even an artificial seasoning that tastes like Lethocerus indicus. Many methods are used to collect it: skimming it by a colander or hand net, cast net, draw net, gill net, or a light trap. In Laos, during the high season, 45 to 50 counts, sometimes 100 of these can be caught by a colander in half a day. Using a cast net, 20 to 30 counts can be collected in 1 hour.
03 Aug. 2010  Suvarnabhumi International Airport, Thai
21 Sep 2011  Talat Sao, Vientiane Capital, Laos
29 Jan. 2013  Thalat Sao, Chanthabuly, Vientiane Capital, Laos
25 Jun. 2010  Dong Makai, Vientiane Capital, Laos
02 Jul. 2010  Napuheuy, Vientiane Province, Laos
29 Jun. 2010  Dong Borng, Vientiane Capital, Laos
Appasus sp.

Order: Hemiptera
Family: Belostomatidae

Basic Information
Its length is about 13mm. The body is flat and has an elongated oval shape with the widest part occurring at 1/3 from the caudal end. There are dark and light mottles along the edge of latter part of forewings. Adults hide under dead plants at the bottom of the water, and catch nearby aquatic insects and tadpoles or small fish by their fore legs. The life cycle of larvae is not fully known.

Use
In Laos, adults and larvae are eaten. They are fried or steamed to be served.

This species is often not eaten by itself, but rather mixed with other aquatic organisms. Collection takes place in a shallow marsh or paddy field. Hand-held nets are used, and other aquatic small animals are collected together. It is not well recognized among local people. It is often confused with Lethocerus indicus or Dytiscidae sp.. Sometimes, a Naucoridae sp. is caught because of its similar appearance and used in the same way.
Appasus sp.  
28 Jun. 2010  Mueng Song, Vientiane Province, Laos

Naucoris scutellaris  
9 Jul. 2009 Laos

Appasus sp.  
28 Jun. 2010  Mueng Song, Vientiane Province, Laos

Naucoris sp.  
9 Jul. 2009 Laos
**Laccotrephes grossus**  
**Order:** Hemiptera  
**Family:** Nepidae

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<td>JP</td>
<td>Taiwan: taikouchi</td>
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### Basic Information

It is distributed in Southeast Asia and China. Body length is 24 to 29mm. Its body is long, thin and flat, with a dark brown color. *L. maculatus* is the smaller species in the same family. *L. maculatus* has 16 to 18mm body length, and has a blunt beak at the base of the femur of its front legs. Adults hide in dead plants at the bottom of the water and with its front leg catch aquatic insects, tadpoles, and small fish. Its larva stage of lifecycle is not well known. Mature females lay a cluster of eggs, about 10, in the wet soil near the waterline.

It is assumed that hatched larvae molt 5 times in about 2 months, before becoming adults.

### Use

Adults and larvae are used as food. It is not sold by itself, but mixed with other aquatic organisms such as shrimp, small fish, or larvae of a dragonfly. The mixture is steamed, stir-fried, or fried to be served. Due to its slenderness, this insect is not specially favored as food. It is not used in Cambodia. Other than culinary use, it is sometimes used as food for farmed fish. It is collected by using a hand net or colander in the shallow water with abundant aquatic plants such as marshes. Usually, other aquatic insects and animals are caught together. *L. maculatus* is used in the same manner.
Laccotrephes sp.
24 May 2009 Phonekeo, Vientiane Province, Laos

Laccotrephes sp.
24 Nov 2009 Phonekeo, Vientiane Province, Laos

Laccotrephe...
### Basic Information

It is widely distributed throughout Southeast Asia. It is also found in Taiwan and Japan (Ryukyu Islands).

Its body is 24 to 29mm, with a stick-like long and narrow appearance. The color varies from light brown to brown. There are 2 small blunt beaks in the middle of front leg femurs.

### Use

General use is similar to that of *Laccotrephes grossus*. Both adults and larvae are used. It is stir-fried with other aquatic animals or steamed in banana leaves. Genus *Cercotmentus* in the same family is used in the same way. It is collected by a hand net or a colander in shallow waters with abundant aquatic plants such as marshes. Other aquatic animals are caught together.

### Remarks

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#### 10 Dec. 2008 Cambodia

#### 17 Sep. 2007 Wat Preah Yesu, Siem Reap Cambodia

#### 24 Jun. 2009 Laos

#### 17 Sep. 2008 Laos
**Termitidae spp.**

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**Remarks**

**Basic Information**

Adult length is 6 to 20mm, with a queen of largest species reaches up to 120mm. The winged caste has brown to dark brown coloration on the dorsal side, and light colored lateral and ventral sides. Soldier caste has a larger head than worker caste and its jaw is well developed and black in color. Larvae are white. Its colony is consisted of kings and a queen and other family members, and their social life is based on division of labor. Adults possess wings only for a short period, of which they are involved in reproduction. During the mating season, some of them are attracted to lights.

Some colonies become as large as containing 300 million individuals over the period of a few years.

**Use**

Winged adults are used as food. They are fried or stir-fried to be eaten. In Thailand, grilled ones are sun-dried and used as preserved food. Its collection takes place in the beginning of a rain season, which is when they start to fly in clusters. At this time, when a collector sets up a light in his yard, a large number of them swarm to it.
Corydalidae sp.

Order: Neuroptera
Family: Corydalidae

Basic Information
Forewings and hindwings of an adult are about the same shape. They are broader than that of a dragonfly, and the wingspan is 40 to 150mm. Larvae become 50 to 60mm at final molt. They have hard head and prothorax, and a well-developed mandible and legs. Middle and hind thorax are soft, and each segment of the abdomen has distinctive flexible protuberance. Its egg, pupa, and adult are terrestrial whereas the larva is aquatic. Larva period is usually 1 to 3 years during which it molts about 10 times and grows. During the daytime, it hides under dead leaves or small gravels in the water, and becomes active at night. It is carnivorous and catches aquatic insects with its well-developed mandible. At the final molt, larvae leave the water and make a round room in the ground to become a pupa. A pupa emerges as an adult in about 10 days.

Use
In Laos, larvae are used as food. It is sold in the market together with other aquatic organisms, but it is not found very often. It is fried, put in soups, or skewed to be served. Sometimes it is steamed with other fish or aquatic insects. Its collection takes place at rivers and streams, but it is not intended to catch solely this species. Other aquatic animals are collected together with colanders and nets.
Oecophylla smaragdina

Order: Hymenoptera
Family: Formicidae

LA
Mod som, Mod deng

KH
Ang krong

TH
Mod daeng

VN
Kien vang

JP
Asia'tsumugi:ari アジアツムギアリ

Basic Information
It is distributed in Indo-China peninsula, Malaysia, India, South China, and the Philippines. Total length is 5 to 10mm. Its body is pale, semi-transparent brown in color. Their habitat is forest, and they make a ball-shaped nest in the tree by gathering nearby leaves. Their colony is made up of a large number of ants, sometimes 500 thousand individuals. Adults are extremely aggressive, and if a human comes close to the nest, they would bite with their strong jaw. It is called “weaver ant” because it makes its nest by weaving leaves together using a thread which is secreted from its body.

Use
Adult, pupa, larva, and egg are used as food. It is stir-fried, made into a salad, put in soup or omelet to be served. In Cambodia, it is stir-fried together with a float plant Neptunia oleracea. It is often used to add sour flavor to a dish. In Cambodia, it is used as a medicine to condition the uterus. In Laos, it is collected in a forest near a village or a paddy field. A bag is attached at the end of a rod of about a few meters, and using the bagged end, a collector will tap the nest and catches the adult, pupa, larva and egg that are dropped into the bag. Cambodia exports a large amount of collected Oecophylla smaragdina to Thailand. Other than this species, use of Clematogaster sp. was confirmed, but it is not often found in the markets. Clematogaster sp. is used in the same way.
224

28 Aug. 2008  Otdom, Prey Veng, Cambodia

23 May 2009  Vang Vieng, Vientiang Province, Laos

19 Jan. 2013  Ban Watlouang, Champasak, Laos

27 Jan. 2013  Vientiane Capital, Laos

14 Mar. 2009  Dong Borng, Vientiane Capital, Laos

Clematogaster sp.
14 Feb. 2010  Lak2 Market, Khammouane, Laos
Basic Information

It is distributed in tropical areas of East Asia, Himalayan region, India, Southeast Asia, and New Guinea. Workers have 18 to 28mm body length with a dark brown color. Its abdomen has distinctive coloration with yellow anterior half and black posterior half. They live in secondary environment, and make their nests on a tree branch, on grass near the ground surface, on a vine up to 1m above ground, or space under the eaves of a house.

Use

Larva, pupa, and adult are used as food. In Cambodia, only the larva is used. Larvae and pupae are steamed or fried to be served. Usually, a nest itself is steamed and pupae and larvae inside are picked up to be eaten. In Thailand, it is marinated in fish sauce and being sold. This is eaten by grilling with butter and served as a snack hood of alcohol. Adults are often fried to be served. In Laos and Thailand, an alcohol beverage in which adults are pickled, is sold. Other species of *Vespa* are used in the same manner.
13 Jul. 2010  Vientiane Capital, Laos

29 Jul. 2010  Nong Yao, Vientiane Capital, Laos

29 Nov. 2009  Dong Makkai Market, Vientiane Capital, Laos

26 May 2009  Tha Heua Market, Louang Phrabang, Laos

06 Sep. 2009  Dong Makkai Market, Vientiane Capital, Laos

27 Jul. 2010  Dong Makkai Market, Vientiane Capital, Laos

24 Jun. 2010  Dong Makkai Market, Vientiane Capital, Laos

Vespa sp.
01 Dec. 2010 Laos
Basic Information
Worker bees are about 15mm. They have a dark brown body with relatively large head which has no significant development on its hind angle. The compound eyes are large, and they reach from front angle of the head to hind angle. Antennae are relatively short. Abdomen is yellow, but it looks striped due to dark lining of a posterior edge of each segment. Bees that are kept by humans from ancient times, such as Apis mellifera, make a nest in closed space such as a hollow of a tree, and develop a few honeycombs that are suspended in parallel.

Bees such as Apis dorsata and Apis florea make a nest in open space with one honeycomb. One nest of Apis mellifera is consisted of 40 to 60 thousand workers, 200 males and one queen. The queen lays 1,500 eggs per day, and usually lives 1 to 5 years. Workers secrete wax to make perpendicular honeycombs filled with hexagonal rooms. Workers also maintain the nest, nurse the eggs and larvae, and collect flower nectar. Their life span is about 6 weeks. When a queen weakens or number of workers exceeds a certain level, colony fission (swarming) occurs.

Use
Larva and nest (honey) are used as food. Honey is especially favored in every day diet. A nest that contains larvae are cut into square bars and roasted or steamed in banana leaves to be served. It is very sweet. In Thailand, larvae marinated in fish sauce are sold. It is grilled with butter and served with alcohol.
**Heliocopris bucephalus**

**Basic Information**

Body length is 30 to 50mm, with some large ones reaching maximum of 70mm. It is entirely black color and has a round figure. Its thickness of lateral side and width of dorsal side are about the same. Its front edge of the head broadens like a fan. Front legs are serrated which are adapted to digging. It gathers around a dung of an elephant or a water buffalo, and larvae feed on it. A pair will mate at a dung site and they dig a tunnel under the dung to make a broad chamber. Parents roll the dung to make a ball and bring it into the chamber. Each dung ball has one egg inside. Hatched larva feeds on the dung ball and becomes pupa inside the ball. Parents stay with the ball inside the chamber during this period to keep the ball free from mold and flies.

**Use**

Larva, pupa and adult are used as food in southern Laos and surrounding area. Larva and pupa are mainly used, and dung balls that contain those are sold in the markets. They are fried or put in soup, stew, omelet and salad. They are gutted when cooking. Adults are fried, or roasted then ground to be put into a curry dish. Since its nature of feeding on dungs, many local people avoid eating it. Dung balls are collected mainly in dry season from November to May. It takes place in and around a paddy field. A collector tells that the high season is March through April, during which individuals are plump and taste better. The grooming chamber is sought by digging under old and dried dung of a water buffalo. A few dung balls and a female adult are found per chamber.
**Proagoderus mouhoti**

**Order:** Coleoptera  
**Family:** Scarabaeidae

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<td>Kabuto'emma'kogane カブトエンマコガネ</td>
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**Basic Information**

Its body length is 15 to 19mm. The entire body is dark green and shiny. Adult flies and finds dungs which become food for its larva. It digs a shallow tunnel underneath the dung, and brings in the dung ball to lay one egg in it. Larva feeds on the dung ball from inside, and eventually becomes a pupa and emerges. Adult is active during daytime, but more so after evening through night, and is attracted to a light.

**Use**

No culinary use was confirmed in Thailand, but adult use was observed in Laos. It is fried or roasted to be eaten. People take time to clean the dung from a beetle, then soak it in the water or wash thoroughly before cooking. If this process is not thoroughly done, the odor lingers. Since it feeds on dungs, some local people avoid eating it. It is collected by picking adults that gather around dungs of a water buffalo in the early morning, or by digging underneath the dung. Collection mainly takes place around a dried paddy field during the dry season. Other than this species, adults of smaller to medium sized dung beetle are also used. Smaller species which body size is 10 to 20mm, are preferred in the markets. Other than this species, many individuals from genus Onthophagus are sold. Many other species are mixed and sold.
24 Jun. 2010  Hou Kua Market, Vientiane Capital, Laos

26 Jul. 2009  Vientiane Capital, Laos

28 Jul. 2010  Dong Makkai, Vientiane Capital, Laos

24 Jun. 2010  Hou Kua Market, Vientiane Capital, Laos

Onthophagus spp.
17 Feb. 2010  Pakse New Market, Champasak Laos

Onthophagus spp.
30 May 2009  Dong Makai Market, Vientiane Capital, Laos
24 Nov. 2009  Phonekeo, Vientiane Province, Laos

Onthophagus, sp.
24 Nov. 2009  Phonekeo, Vientiane Province, Laos

Catharsius birmanensis
22 Apr. 2010 Laos

Copris siamensis
30 Jun. 2009 Laos

Copris sinicu
01 Jun. 2010 Laos

Digitonthophagus bonasus
22 Apr. 2010 Cambodia

Liatongus rhadamistus ♂
01 Jun. 2010 Laos
Microcopris reflexus
01 Jul.2009 Laos

Onitis sp.
30 Jun.2009 Laos

Onthophagus armatus
21 Jan.2009 Laos

Onthophagus recticornutus ♀
09 Sep.2009 Laos

Onthophagus sagittarius ♂
01 Jul.2009 Laos

Onthophagus seniculus ♂
01 Jul.2009 Laos

Onthophagus sp.
09 Sep.2009 Laos

Paracopris punctulatus
01 Jun.2010 Laos
Basic Information

Body length is 15 to 35mm. It is uniformly brown to a black color with oval shape. Larva lives underground near the surface, and feeds on plant roots. Adult is active during the daytime, and feeds on various plant leaves. Adult becomes more active after the evening, and is attracted to a light after dark.

Use

Adult is used as food. It is fried or stir-fried to be served. It is collected by placing a light in the yard.

Other than genus Holotrichia, culinary use of herbivorous beetles such as Anomala, Apogonia, and Lepidiota is confirmed. Genus Holotrichia is preferred in Laos, and Anomala antique is preferably used in northeastern Thailand. In Cambodia, it is used in only a few areas.
28 Jul. 2010  Dong Makai, Vientiane Capital, Laos

10 Jun. 2007  New Nong Neow Market, Vientiane Capital, Laos

13 Feb. 2010  Dong Makai Market, Vientiane Capital, Laos

A nomala antiquae 02 Dec. 2010 Cambodia

Anomala sp. 1 02 Dec. 2010 Cambodia

Anomala sp. 2 02 Dec. 2010 Laos

Apogonia cribricollis 02 Dec. 2010 SCambodia

Lepidiota bimaculata 02 Dec. 2010 Vientiane, Laos
**Xylotrupes gideon tonkinensis**

**Order:** Coleoptera  
**Family:** Scarabaeidae

### Basic Information

Male has a length of 35 to 80mm. Female length is 28 to 55mm. Entire body is glossy reddish brown to a black color. Females lack cephalic horn, but males have distinctive forked horns one on the head and the other pointing forward from the center of the thorax. Larvae feed on decomposed plant material and become pupae over the period of 2 years. Adults feed on plant sap and live 2 to 4 months.

### Use

Larva, pupa, and adult are used as food. In Laos, adults are used more often. Adults are cooked by removing forewings and fried or roasted. Usually the abdomen is the only part that is eaten, but since there is not much volume, it is not very popular as edible insect. Larva and pupa are marinated in coconut milk and roasted. Other than culinary use, its male is very popularly used in an insect fight in northern Thailand. Adults raised for fighting is also sold.
**Cybister limbatus**

**Order:** Coleoptera  
**Family:** Dytiscidea

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**Basic Information**

It is distributed in Southeast Asia, China, Taiwan, Japan (Nansei Islands), the Philippines, India and Nepal. Adult length is 32 to 35mm and has a long oval shape. Its dorsal side is shiny and black with brownish tint. There is a yellowish brown lining from lateral dorsal prothorax to the lateral forewing. Ventral side is uniformly black. Adults are carnivorous. Eggs are laid singularly in the aquatic plant tissue. In a captive life, a larva malts twice in one month before leaving the water, then it buries itself about a few to 10cm in the ground to become a pupa and emerges. Newly emerged adult comes out from the ground then starts an aquatic life.

**Use**

Not only this species but most of the genus *Cybister* is used as food. Adult is used in many countries, but the use of larva is only confirmed in Laos. Adult is mainly fried or stir-fried to be eaten. Hard forewings are removed when cooking. In the market, it is often found mixed with other types of *Hydrophilidae*. Larva is stir-fried, cooked, or steamed to be served. It is rarely used solely, but rather, it is cooked as a mixture with larvae of dragonfly, tadpoles, or shrimps and other aquatic organisms. Adults are collected by skimming with a hand net or a colander, or gathered by light trap method. Larvae are skimmed by a hand net or a colander. Many adults are found in the remaining puddles of dried paddy field during the dry season.
06 Sep. 2009  Dong, Vientiane Province, Laos

24 Jul. 2010  Phonekeo, Vientiane Province, Laos

27 Jun. 2010  Phonekeo, Vientiane Province, Laos

06 Sep. 2009  Dong, Vientiane Province, Laos

Cybister sp.

12 Sep. 2010  Sivilay, Vientiane, Vientiane Capital, Laos

30 May 2010  Phonekeo, Vientiane Province, Laos

28 Jan. 2013  Thoag Mang, Vientiane Province, Laos

Jan. 2013  Lak14 Market, Champasak, Laos
19 Jan. 2013  Lak14 Market, Champasak, Laos

24 Jul. 2008  Mai Haiyone, Vientiane Province, Laos

26 Nov. 2009  Dong Bong, Vientiane Capital, Laos

Cybister rugosus
01 Sep. 2008 Laos

Cybister sp. 1
01 Sep. 2008 Laos

Cybister sp. 2
2007 Vientiane Capital, Laos

Cybister sugillatus
2 Jul. 2009 Laos

Cybister tripunctatus ssp.
2 Sep. 2009 Laos
**Hydrophilus bilineatus cashimirensis**

**Order:** Coleoptera  
**Family:** Hydrophilidae

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**Remarks**

**Basic Information**

Its body length is about 35mm. It has a shiny black body with slender oval shape. *Hydrophilus cavisternum* has a similar appearance to this species. Adults are often found clinging to an aquatic plant and staying still. Adults are herbivorous except for the mating season, during which they feed on animals. Females use plant fragments in the water to make an egg sac filled with eggs, called “cradle”, near the water surface. There are several tens of eggs in one egg sac. Eggs are expected to hatch in about 2 weeks. Larvae are carnivorous, catching small animals alive by their strong mandibles. After larvae molt twice, they leave the water to bury themselves in the ground and become pupae, then adults. Newly emerged adults come out from the ground and start an aquatic life.

**Use**

Adults are eaten including *H. cavisternum* in the same genus. It is mainly fried or stir-fried to be served. The hard forewings and prickles on the underside are removed when cooking. Larvae are almost never used, but in Lao market, it is found occasionally mixed with larvae of dragonfly, frogs, or shrimps and other aquatic animals. Adults are skimmed and collected with a hand net or a colander. Light trap is also used for collection. Adults of *Hydrophilidae* are called by the same local name with *Dytiscidae*, and the two are not distinguished as separate species. In Laos, *Hydrophilus* and *Cybister* are considered as female and male of the same species. *Hydrophilus* is considered as males because people mistakenly recognize the spiny protuberance on the underside of its abdomen as a reproductive organ.
Hydrophilus sp.
06 Sep. 2010  Dong, Vientiane Province, Laos

Hydrophilus sp.
25 Jun. 2010  Dong Makai, Vientiane Capital, Laos

Hydrophilus sp.
29 Nov. 2009  Dong Makai Market, Vientiane Capital, Laos

Hydrophilus sp.
06 Nov. 2008  Neak Loeung, Kandal, Cambodia

Hydrophilus bilineatus cashimirensis
27 Sep. 2010 Cambodia

Hydrophilus cavisternum
04 Oct. 2010 Laos
**Sternocera sp.**

**Order:** Coleoptera  
**Family:** Buprestidae

### Basic Information

It is a large beetle with body length of 30 to 40mm. Overall, its color is light golden green with metallic luster. Some species have reddish brown antennae and legs. A few species are distributed in Indo-China region. They are very similar in appearance, such as *Sternocera aeguisignata* and *S. ruficornis*. Their detailed ecology is not understood yet; however, larvae of *Sternocera sp.*, including this species, are known to feed on plant roots in the ground. Adults are diurnal and feed on plant pollen and leaves.

### Use

Adults are used as food. It is occasionally found in the markets. When cooking, its forewings are removed and the remaining is fried, roasted, or stir-fried to be served. To collect, it is picked up by hands if it is on a tree, or by shaking it off the tree. In Cambodia, it is said to be cultivated, but it is assumed to be merely protecting the host trees that the beetles feed on.
Cerambycidae spp.  
Family: Cerambycidae  
Order: Coleoptera

Basic Information
Adult body is 40 to 70mm for larger species and about 3mm for smaller species. Medium to large sized species of more than 30mm are popularly used. In general, the body is slender and cylindrical. It is known for its long antennae, which are the longest among other beetles. When touched, it produces sound by rubbing the edge of the pronotum scraping against a file on the mesonotum. Smaller species usually matures in one year, while larger species takes 3 to 5 years to mature. Most of the species bore holes on plant materials, usually a tree, and feed on them.

Use
Larvae, pupae and adults of larger species are used as food. Adults are occasionally spotted in the markets, but it is not sold solely, but mixed with other insects. Adults are fried, stir-fried or roasted to be eaten. Hard parts such as the forewings are removed when cooking. In Thailand, larvae and pupae of Apriona japonica are fried or steamed in banana leaves to be served. Species that are attracted to lights are collected by light trap method. In Laos, adult use of Dorysthenes walker, Hoplocerambyx spicicornis, Xystrocera globose, and Batocera davdis are confirmed.

Remarks
**Hypomeces squamosus**

**Order:** Coleoptera  
**Family:** Curculionidae

### Basic Information

Adult length is about 10mm. Its mouthparts are stout and short. Fresh adult is covered with shiny green scales, but eventually they all scrape off. The color of scales varies depending on the region it resides, from green, reddish copper, purple, to gray, but green individuals are most abundant. It lives in a flatland to low hill areas, and commonly found on leaves of trees along the roadside.

### Use

Adults are eaten in Laos and Cambodia. It is mainly fried to be served. Insect nets with a long-pole are used to collect ones on a tree.

### Remarks

- **LA**: Maeng sang  
- **KH**: Me ambok  
- **TH**: Malang kom tong  
- **VN**: Cau cau xah  
- **JP**: Zoumushi  

**Remarks**

28 Nov. 2007 Cambodia

18 Feb. 2010 Pakse New Market, Champasak, Laos
**Cryotrachelus spp.**

**Order:** Coleoptera  
**Family:** Rhynochophoridae

### Basic Information

Adult body is 15 to 30mm. Its coloration is shiny vermilion. Larvae have a dark brown head with yellowish brown body, and they do not have legs. They feed on bamboos from inside, sometimes reaching to the outer layer and making a hole. Fully grown larvae make a simple chamber in a bamboo joint, using tree debris and become pupae then emerge.

### Use

Larvae are used in Laos and Thailand. It is usually fried to be served. In Laos, people said larvae of bamboo-eating weevils have soft skin and are tastier than larvae of *Rhynchophorus ferrugineus*.

Its collection takes place in a bamboo forest, and larvae are sought inside bamboos.
Cryotrachelus sp.
03 Oct. 2010  Phonekeo, Vientiane Province, Laos

24 Sep. 2010  Phonekeo, Vientiane Province, Laos

14 Oct. 2010  Phonekeo, Vientiane Province, Laos

24 Sep. 2010  Phonekeo, Vientiane Province, Laos
**Rhynchophorus ferrugineus**

**Order:** Coleoptera  
**Family:** Rhynochophoridae

**Basic Information**

It is distributed in Southeast Asia, India, China, Taiwan, Japan (Okinawa), and Papua New Guinea. Adult length is 22 to 35mm. Its body is shaped like a grain of rice. Larvae have a dark brown head with yellowish brown body, and they do not have legs. Larvae feed on palm trees, and the woody part of palm trees become powdery after larvae feed on it. When larvae have reached their full growth, they make pupal chamber by using palm fibers and pupate then emerge.

**Use**

Larvae and pupae are used as food in Laos and Thailand. They are mainly fried to be served. Texture and taste are close to that of French fries. It is a pest for Palmyra Palm (*Borassus flabellifer*). It is collected from an infested, dying Palmyra Palm. It is occasionally found in the markets. Its harvesting method is being studied in universities in Thailand and Laos.
**Omphisa sp.**

**Order:** Lepidoptera  
**Family:** Pyralidae

| LA       | Duang mai phai. Duang mae |  
| KH       | Dong kau neang            |  
| TH       | Rot duan, Duang mai pai.  |  
| VN       | None mai pai              |  
| JP       | Taketsutoga               |  

**Remarks**

**Basic Information**

Adult wingspan is 20 to 30mm for males, and slightly larger for females. Adults fly out from bamboo stem during the night to mate and lay eggs on the surface of a young bamboo shoot. Hatched larvae gather around and move to a fresh part of the shoot in a single line and make a hole in the joint to go inside. Larvae feed on the inside tissue of a bamboo. Larvae become pupae in about 10 months. Pupae collectively hang from the joint of a bamboo, and emerge as adults after 40 to 60 days.

**Use**

Larvae are one of the frequently used edible insects, and often found in the markets. It is widely used in Laos and Thailand. In Cambodia, it is not a common edible insect, but it is popular near the border of Thailand. It is usually fried to be eaten. It is popular as a snack to go with a beer. Its collection takes place in a bamboo forest. First a collector looks for a dying bamboo stem due to the infection by this species. If there is a hole of about 2mm in diameter near the bamboo root, he would cut open the joint to check for the presence of larvae. If there are larvae, the joint one below where the larvae are is cut to fell the bamboo and extract the larvae. From one bamboo, about a cup full of larvae can be collected.
19 Nov. 2009  Dong Makkai Market, Vientiane Capital, Laos

11 Nov. 2008  Dong Makkai Market, Vientiane Capital, Laos

20 Sep. 2009  Bokeo, Laos

21 Sep. 2009  Huay Khom Nok, Chiang Rai, Thailand

21 Sep. 2009  Huay Khom Nok, Chiang Rai, Thailand

19 Sep. 2009  Thung Yao, Lamphun, Thailand

21 Sep. 2009  Huay Khom Nok, Chiang Rai, Thailand

21 Sep. 2009  Huay Khom Nok, Chiang Rai, Thailand
### Basic Information

Adult wingspan is 180 to 230mm. Its body and wings are covered with white scales. Larvae of popular breeds have a white body, and at full growth, they are 6 to 7cm long and weigh 5 to 6g. Larvae exclusively feed on mulberry leaves, and they molt 4 times before making a cocoon and become a pupa. Pupae emerge in about 2 weeks.

### Use

It is one of the most popular edible insects, and its pupa is found in the markets throughout a year. It is fried, roasted, or boiled to be served. It has distinct aroma.

In Laos, a tea made out of dried larvae dungs are sold, but it is not very popular. The pupa after having taken the silk is supplied steadily.

<table>
<thead>
<tr>
<th>LA</th>
<th>Duck dae morn</th>
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<tbody>
<tr>
<td>KH</td>
<td>Dok dua</td>
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<td>TH</td>
<td>Duk dae mai</td>
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<td>VN</td>
<td>Nhông tam</td>
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<tr>
<td>JP</td>
<td>Kaikoga</td>
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Remarks

12 Sep 2007 Hou Kua Market, Vientiane Capital, Laos

21 Jun. 2009 Hou Kua Market, Vientiane Capital, Laos
Saturniidae sp.

**Order:** Lepidoptera  
**Family:** Saturniidae

### Basic Information

Adult wingspan is about 130mm. Its body and wings are covered with yellowish brown scales. Full grown larvae are measured 70 to 80mm, and weigh 17 to 20g. Its cocoon is milk white in color and 18mm in length. Pupae are yellowish brown to dark brown in color and 14 to 15mm in length. From one cocoon, 600 to 700m of silk thread can be produced.

### Use

In Laos, pupae are used as food. Although it is not a popular insect as food, pupae in the cocoon and pupae without cocoon are sold in the market. It is mainly fried to eat.
### Basic Information

It is a medium to large sized moth, with adult wingspan measuring about 30 to 150mm. Wings are slender and long, with the forewings considerably longer than the hindwings. Its thorax is stout and streamline shaped. Its pectoral muscle is well developed, and provides strength for its ability to fly. Its body is covered with hair-like scales, and they are easily scraped off when touched. It has a long and thin mouthpart like that of butterflies, which are adapted to suck flower nectar. There are varieties of patterns on its prothorax and wings, depending on the species. In general, its forewings have dull color and patterns, while hindwings have brighter colors.

Larvae have classic shape of worms and lack major hair. They are characterized by a distinctive spiny protuberance on the posterior abdomen. Adults of many species are nocturnal, but there are species which are active during daytime or in the evening. It can fly very fast, with some species reach a speed of 50km per hour. Many are attracted to lights at night, and many are found staying there even after sunrise due to drop of temperature. Larvae live a solitary life since their early stages. They feed on various plant leaves. When touched, larvae take threatening position by raising their head and thorax high and swinging them right to left. At full growth, larvae bury themselves in the ground and become pupae without making a cocoon.

### Use

In Laos, adult use was confirmed, but it is rarely seen in the markets. It is fried or stir-fried to be served. People capture the moth with other insects by using a light trap. *Sphingidae* spp. is not intended to be eaten solely but rather, cooked as mixture with other insects.

<table>
<thead>
<tr>
<th>LA</th>
<th>Ka bee, Cha ruad</th>
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<td>KH</td>
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<td>TH</td>
<td>Pee seu cha ruad</td>
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<td>VN</td>
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<td>JP</td>
<td>Suzumega</td>
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### Remarks

31 Jun. 2010  Dong Borng, Vientiane Capital, Laos

01 Mar. 2009  Dong Makkai Market, Vientiane Capital, Laos
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