

Snails and Bivalves

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Freshwater shellfish is popularly consumed by people along Mekong River. Live, heated, and cooked ones are available in markets, and they are also cooked and served at home daily. Roasted or boiled shellfish are sold at the stall in the city, and one can even eat right there. Among the shellfish sold in market, snails are most widely available both commercially and domestically because they are easily caught in nearby *Mizube* (water front) such as paddy or marsh. Bivalves are not as commonly seen as snails, but there are some available in the market, often ones caught in rivers. Not only aquatic snails, but land snails are also consumed. The study team confirmed about 40 species (subspecies) including land snails such as Cyclophoridae, Ariophantidae, and aquatic snails such as Pilidae, Viviparidae, Thiaridae and aquatic bivalves such as Unionidae, Cyrenidae. Because it is difficult to identify shellfish at the site, we assume that there are more species than the ones we recognized during the study.

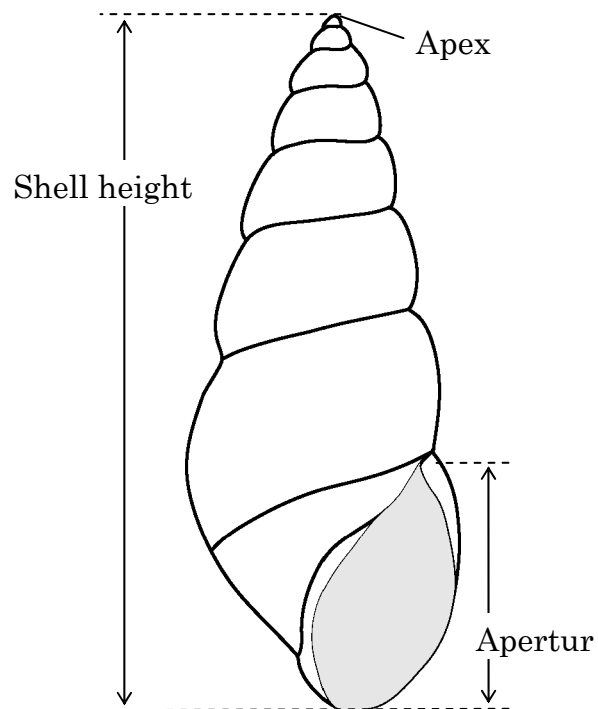
The most popular freshwater snail in Mekong river basin would be Applesnail (Ampullariidae) and Vivipalidae. Reason for the high popularity is they are abundant and easily caught in the surrounding areas such as paddy, marsh, and lakes. People are often sighted in water front near house to catch just enough to make dinner. Applesnail is an alien species from Central and South America, but they are widely habituated throughout Indochina peninsula and have become one of the most popularly used snails. However, Applesnail is also known for damaging rice crops and it is becoming a serious issue as the damage become widespread. Other popular snails other than Applesnail and Vivipalidae are pleuroceridae, bivalve, and land snails. *Tegillarca granosa* (related to Bloody clam) are small bivalves which have distinctively thick shells and bright red blood. They are often sold at market and stalls, but we do not include them as local *Mizube no Sachi* they are collected in tidal flat and brought inland.

Shellfish introduced in this section are available throughout year, although the ones live in rivers increase amount of catch during dry season when the water level is low. Paddies dry up during dry season, and people take the opportunity to dig and collect Vivipalidae and Applesnail. They are often stir-fried, steamed, or boiled with spices and herbs to rid the strong smell.

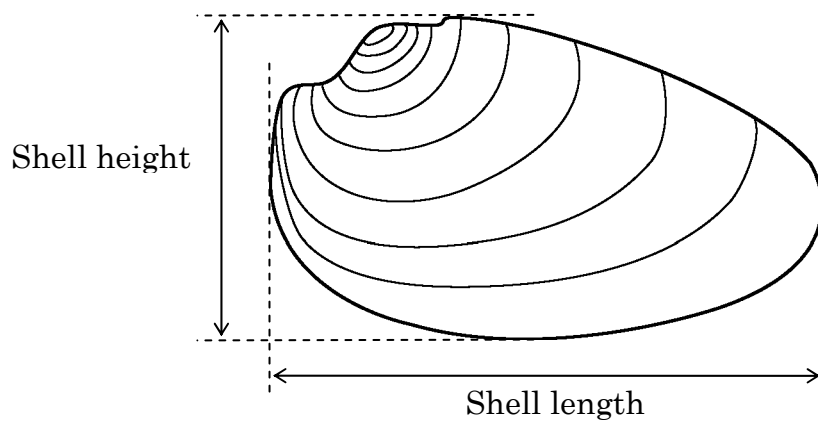


Morphology of Snails and Bivalves

Snail



Bivalve



Cyclophoridae spp.

Order: Architaenioglossa
Family: Cyclophoridae

| | | |
|-----------|----------------------|-------------------|
| LA | <u>Hov hom</u> | |
| KH | <u>Kchong hein</u> | |
| TH | <u>Hov ma la you</u> | |
| VN | <u>Oc</u> | <u>Ốc</u> |
| JP | <u>Yama-tanishi</u> | <u>ヤマタニシ科の複数種</u> |

Remarks

Basic Information

It is distributed in Indo-China, mainland China, Hainan Island (China), Taiwan, Batan Island (the Philippines), and Japan. It is a type of gastropod. Although terrestrial, it is different from the common snail as it has a lid on the shell opening and eyes on the bottom of its antennae. The opening of the shell is rather large and the edge is thick. It has no gills. It is found in between fallen leaves in the shades of lowland to the mountains.

Use

They are prepared in the following ways: cooking them with shells-on in salted and spiced hot water, roasting them with the shells-on and dip them in chili sauce, or put in a soup. In Laos, they are boiled with Chinese star anise and dipped in chili sauce and served. The savory aroma of star anise is tantalizing.

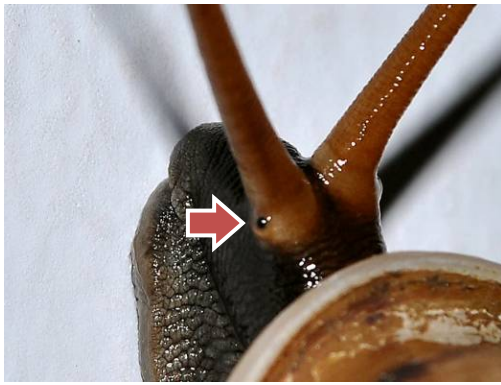
The team confirmed its use as food in Cambodia and Laos. Large amounts are consumed especially in Southern Laos. During a market research, 4 species of *Cyclophorus* were confirmed as being sold. It is found in open markets alongside the suburban roads, and more so than in big markets in the central city. Its collection is done by hand, picking individuals on tree trunks in the forests.



Cyclophorus sp. (cf. sogmaensis)
23 Jul. 2010 Near Wat Phou,
Champasak, Laos



Cyclophorus sp. (cf. sogmaensis)
23 Jul. 2010 Near Wat Phou, Champasak,
Laos



14 Sep. 2011 Kok Market, Khammouane, Laos



23 Jul. 2010 Near Wat Phou, Champasak, Laos



Cyclophorus spp.
23 Jul. 2010 Near Wat Phou, Champasak, Laos



14 Sep. 2011 Kok Market, Khammouane, Laos



Cyclophorus sp. 3
14 Sep. 2011 Kok Market, Khammouane, Laos



Cyclophorus sp. 2
14 Sep. 2011 Khammouane, Laos



Cyclophorus sp. 2
14 Sep. 2011 Kok Market, Khammouane, Laos



Cyclophorus sp. 2
14 Sep. 2011 Kok Market, Khammouane, Laos



Cyclophorus sp. 1
23 Jul. 2010 Near Wat Phou, Champasak, Laos



Cyclophorus sp. 1
23 Jul. 2010 Near Wat Phou, Champasak, Laos



Cyclophorus sp. 2
14 Sep. 2011 Kok Market, Khammouane, Laos



Cyclophorus sp. 2
14 Sep. 2011 Kok Market, Khammouane, Laos



Cyclophorus sp. 3
14 Sep. 2011 Kok Market, Khammouane, Laos



Cyclophorus sp. 3
14 Sep. 2011 Kok Market, Khammouane, Laos

Pomacea canaliculata

Order: Architaenioglossa
Family: Ampullariidae

| | | |
|-----------|------------------------|---------------------|
| LA | <u>Hov pakkouang</u> | |
| KH | <u>Kchong srae</u> | |
| TH | <u>Hov cherry</u> | |
| VN | <u>Oc buou vang</u> | <u>Ốc bươu vàng</u> |
| JP | <u>Sukumi-ringogai</u> | <u>スクミリンゴガイ</u> |

Remarks

Basic Information

It originated in Central and South America, and has been transplanted in parts of Asia since the 1980s. It is a type of snail with the shell length of 80mm. The shell is close to spherical and its color varies from yellow-brown to blackish brown. Some shells have stripes. It is found in rice paddies, marshes, waterways, rivers, ponds, and lakes. It can tolerate drought, and survives the dry season by burying itself in the mud. It is omnivorous and prefers soft rice leaves which cause crop damage in various areas. It is labeled as one of the 100 World's Worst Invasive Alien Species.

Its eggs are bright pink. Females go above water to lay eggs on plants, stakes, or walls of waterways. Eggs hatch in about 2 weeks.

Use

Among the edible shells, this snail is as popular as river snails. It is commonly found in markets as well. It is very easily collected which makes it a popular dish in many homes. It is roasted or boiled and served with chili sauce and fish sauce, or cooked together with herbs such as tamarind and lemongrass. Kebabs of roasted snails seasoned with MSG or fish sauce are sold at markets. Sometimes it is boiled and fed to cattle and hogs. It is collected in nearby rice paddies and marshes. It can be picked by hand or scooped with nets or colanders. When using a net or colander, one has to sort snails from other aquatic species. Farmers frequently go out to collect it in a rice paddy as a means to collect food as well as to prevent it from feeding on newly sprouted rice plants. Other species of the genus *Pila* that resembles the shape of this snail are confirmed in Cambodia.



17 Feb .2010 Song, Champasak, Laos



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



Albino
14 Nov. 2008 Napuheuy, Vientiane Province,
Laos



25 Jul. 2010 Phonekeo, Vientiane Province,
Laos



11 Oct. 2010 Vientiane Province, Laos



Egg mass
26 Nov. 2009 Dong Borng, Vientiane Capital,
Laos



19 Nov. 2009 Thong Khan Kham Market,
Vientiane Capital, Laos



28 Jul. 2008 Thong Khan Kham Market,
Vientiane Capital, Laos



01 Sep. 2010 Vientiane Capital, Laos



12 Dec. 2010 Vientiane, Laos



20 Dec. 2010 Phonekeo, Vientiane Province,
Laos



09 Nov. 2008 Xiangmouak, Louang Phrabang,
Laos



24 Jul. 2008 Khun Neua, Vientiane Province,
Laos



Pila polita
10 Apr. 2009 Ra ka thnorl, Takeo, Cambodia



Pila sp. 1
27 Feb. 2009 Kampong Thom, Cambodia



Pila sp. 2
05 Jan. 2009 Kampong Cham, Cambodia



Pila sp. 3
06 Jan. 2009 Vi hear Kphours, Kampong
Cham, Cambodia



Pila sp. 4
30 Jan. 2009 Traw Paing ROUNG, Takeo,
Cambodia

Viviparidae spp.

Order: Architaenioglossa
Family: Viviparidae

| | | |
|-----------|----------------------------------|-----------------|
| LA | <u>Hov choup</u> | |
| KH | <u>Kchau k' hai, Kchau dong,</u> | |
| | <u>Kchau tnaot</u> | |
| TH | <u>Hoy khom</u> | |
| VN | <u>Oc dang</u> | <u>Ốc dăng</u> |
| JP | <u>Tanishi</u> | <u>タニシ科の複数種</u> |

Remarks

Basic Information

It is a water spiral snail with shell length of 20 to 80mm. The opening is covered with a thick lid. As it matures, the shell around the opening becomes black and thicker. Its habitats are lakes, ponds, rice paddies, and rivers. The fertilization occurs in vivo and females raise eggs until they grow into young snails and then give birth.

Use

It is one of the most familiar and important water spiral snails as food. Most of the time, it is boiled to be served. After it is boiled with its shell on, people pull out the meat with a toothpick, or suck the meat out from the shell. It is commonly seen in the market, but also very popularly caught and consumed at home. Collection is done by hand, picking them while walking along the shore. During the dry season, it buries itself in the mud of a rice paddy. People scrape and scoop the mud at the bottom of a rice plant to find the snail. Also, in the dry season when the pond is dry, large amounts of water spiral snails can be collected. Water spiral snails that are collected in the study areas are multiple species. People eat any snails that are large enough.



Filopaludina (Filopaludina) sp. 1
05 Jan. 2009 Kampong Cham, Cambodia



24 Nov. 2009 Phonekeo, Vientiane
Province, Laos



15 Sep. 2007 Tonle Sap, Siem Reap, Cambodia



Trochotaia trochoides
25 Jun. 2010 Dong Makkai, Vientiane Province,
Laos



08 Nov. 2008 Tha Heua Market,
Louang Phrabang, Laos



16 Jan. 2013 Bang Lam Phoo Market,
Khon Kaen, Thailand



24 Nov. 2009 Mueng Song,
Vientiane Province, Laos



24 Nov. 2009 Mueng Song,
Vientiane Province, Laos



24 Nov. 2009 Mueng Song,
Vientiane Province, Laos



24 Nov. 2009 Mueng Song,
Vientiane Province, Laos



06 Dec. 2009 Vientiane Capital, Laos



Filopaludina (Filopaludina) sumatrensis
27 Feb. 2009 Kampong Thom, Cambodia



Filopaludina (Filopaludina) sumatrensis subsp. 1
17 Feb. 2010 Song, Champasak, Laos



Filopaludina (Filopaludina) sumatrensis subsp. 2
24 Jun. 2009 Phonekeo, Vientiane Province, Laos



Filopaludina (Siamopaludina) maekoki
24 Jun. 2009 Phonekeo, Vientiane Province, Laos



Filopaludina (Siamopaludina) sp. (cf. martensi)
17 Feb. 2010 Dao Heuang Market, Champasak, Laos



Filopaludina (Siamopaludina) martensi cambodjensis



Idiopoma dissimilis
23 Jun. 2009 Mueng Song, Vientiane Province, Laos



Idiopoma ingallsiana
26 Feb.2009 Kampong Thom, Cambodia



Mekongia sp. 1
18 Jul. 2010 Near Central Market, Kampong Cham, Cambodia



Mekongia sp. 2
26 Feb.2009 Kampong Thom, Cambodia



Trochotaia trochoides
25 Jun. 2010 Dong Makkai, Vientiane Capital, Laos

Thiaridae spp.

Order: Mesogastropoda
Family: Thiaridae

| | | |
|-----------|-------------------------|----------------------|
| LA | <u>Hov lekchan</u> | |
| KH | <u>Cha chraing</u> | |
| TH | <u>Hov chedi</u> | |
| VN | <u>Oc len</u> | <u>Ôc len</u> |
| JP | <u>Tougata-kawanina</u> | <u>トウガタカワニナ科の複数種</u> |

Remarks

Basic Information

It is a type of snail. The shape of the shell varies from spindle to a long narrow cylinder, which is narrower and longer than the shell of a *Viviparidae* spp. The lid has a leather-like texture. There are two types; one lay eggs and the other keeps the eggs inside and when they grow into young snails they gives birth.

Use

Compared to *Viviparidae* spp. or *Pomacea canaliculata*, it is less often used, but still it is commonly found as food. It is sold live at markets, and cooked ones are available at

stalls. It is boiled to be served most of the time. The ones sold in the stalls are often seasoned with chili and are spicy. It is collected by grouping hands in small rivers or waterways. In the rice paddies in flatland, *Viviparidae* spp. or *Pomacea canaliculata* are more often found because they are easier to collect. Iin the mountain areas where there are less rice paddies, *Thiaridae* spp. can be used more often. Although Luan Pulabang in Laos is in a mountain area where there are not many rice paddies, large amounts of *Brotia manningi* were collected in nearby small rivers and sold at markets.

Larger type of genus *Brotia*, is used more often, but use of *Tarebia granifera* and *Thiara scabra* are confirmed as well. However, those smaller types of snails are not selectively used, rather, mixed in with the larger type of snails.



Brotia manningi
10 Jun. 2009 Xiengngeun, Louang
Phabang, Laos



25 May 2009 Louang Phabang, Laos



Brotia manningi
25 May 2009 Phoshy Market, Louang Phrabang, Laos



26 May 2009 Nam Ming, Louang Phrabang, Laos



26 May 2009 Nam Ming, Louang Phrabang, Laos



Brotia manningi
26 May 2009 Nam Ming, Louang Phrabang, Laos



Brotia sp. (cf. *binodosa*)
27 Feb. 2009 Kampong Thom, Cambodia



Brotia sp. (cf. *microsculpta*)
18 Feb. 2010 Dao Heuang Market, Champasak, Laos



Tarebia granifera
23 Jun. 2009 Song, Vientiane Province, Laos



Thiara scabra
May 2009 Vangvieng, Vientiane Province, Laos

Hemiplecta sp. (cf. *distincta*)

Order: Stylommatophora
Family: Ariophantidae

| | | |
|-----------|------------------------------------|------------------------------|
| LA | <u>Hov khao leuane, Hov satang</u> | |
| KH | <u>Kchong hien, Kchong dua</u> | |
| TH | <u>Hov duea</u> | |
| VN | <u>Oc mo</u> | <u>Ốc mỡ</u> |
| JP | <u>Neptune-oomaimai</u> | <u>ネプチューンオオマイマイ属 の一種</u> |

Remarks

Basic Information

It is a type of snail without a lid. Its eyes are located at the tip of its antennae. It is mainly herbivore, but sometimes will eat particles of dirt and shells of other snails. Mating occurs annually during the late dry period to the beginning of the rain period.

Use

It was spotted at a market in southern Laos. It is roasted, steamed, or boiled with its shell and served with chili sauce. The boiled ones felt slimy in one's mouth and could not taste the snail itself.

Other land snail that is confirmed as a food source is *Camaena* sp. Its preparation is same as this species.



Hemiplecta sp. (cf. *distincta*)
23 Jul. 2010 Near Wat Phou,
Champasak, Laos



Hemiplecta sp. (cf. *distincta*)
19 Feb. 2010 Thakhek, Khammouane,
Laos



Hemiplecta sp. (cf. *distincta*)
23 Jul. 2010 Near Wat Phou, Champasak, Laos



Hemiplecta sp. (cf. *distincta*)
23 Jul. 2010 Near Wat Phou, Champasak, Laos



23 Jul. 2010 Near Wat Phou, Champasak, Laos



Hemiplecta sp. (cf. *distincta*)
19 Feb. 2010 Thakhek, Khammouane, Laos



Hemiplecta sp.
20 Jan. 2013 Noun Market, Champasak, Laos



Hemiplecta sp.
20 Jan. 2013 Noun Market, Champasak, Laos



Camaena sp.
11 Oct. 2011 Laos



Camaena sp.
11 Oct. 2011 Laos

Unionidae spp.

Order: Unionoida
Family: Unionidae

| | | |
|-----------|-------------------------|------------------|
| LA | <u>Hov kii, Hov xai</u> | |
| KH | <u>Krom</u> | |
| TH | | |
| VN | <u>Ngao</u> | <u>Ngao</u> |
| JP | <u>Ishi-gai</u> | <u>イシガイ科の複数種</u> |

Remarks

Basic Information

It is a type of bivalve with a medium to large shell size. The shapes vary from egg-shaped to triangular. Pearlescence inside the shell is extremely bright. *Unionidae* spp. can be divided into two broad groups: one with teeth and one without teeth. All the species live in fresh water, between rocks or under mud.

Use

It is boiled with Tamarind leaves to be served. People like this dish with beer. It is collected mostly in rivers, using hand or hand-held nets. It is not seen in markets as often, however, if there is a pile of *Unionidae* spp in the market, it will contain several species and many types of shells are mixed.



Cristaria sp.(cf. *plicata*)

18 Feb. 2010 PakPeo , Champasak, Lao



19 Nov. 2009 Hou Kua Market, Vientiane Capital, Laos



24 Nov. 2009 Phonekeo, Vientiane Province, Laos



18 Feb. 2010 Lak14 Market, Champasak, Laos



Ensidens ingallsiana
26 Feb. 2009 Kampong Thom, Cambodia



Hyriopsis delaporteii
18 Feb. 2010 Lak14 Market, Champasak, Laos



Physunio cambodiensis
May 2009 Nalao, Vientiane Province, Laos



Pilsbryconcha exilis
13 Feb. 2010 Dong Makkai Market, Vientiane Capital, Laos



Pseudodon vondembuschianus chaperi
29 Jun. 2009 Dong Makkai Market, Vientiane Capital, Laos



Pseudodon vondembuschianus ellipticus
29 Jun. 2009 Dong Makkai Market, Vientiane Capital, Laos



Scabies crispate
26 Feb. 2009 Kampong Thom , Cambodia



Uniandra sp. 1
24 Jun. 2009 Phonekeo, Vientiane Province,
Laos



Uniandra sp. 2
12 Feb. 2010 Kok Sa Moi, Louang Phrabang,
Laos

Corbicula spp.

Order: Veneroida
Family: Corbiculidae

| | | |
|-----------|----------------------------------|----------|
| LA | Hoy kii, Hoy xai, Hoy lep maa | |
| KH | Liah bang | |
| TH | Hoy sai | |
| VN | Hen | Hén |
| JP | Shizimi-gai | シジミ属の複数種 |

Remarks

Basic Information

It is a small bivalve which is smaller than Unionidae spp..

It is often found buried in the sand under the water.

Use

It is eaten boiled with the shell-on, in the same way as the *Unionidae* spp.. Often times it is boiled with spices and herbs such as Tamarind leaves. It is collected by hand and hand-held nets.



Corbicula fluminea
29 Jun. 2009 Dong Makkai Market,
Vientiane Capital, Laos



03 Nov. 2008 Central Market, Phnom Penh,
Cambodia



14 Sep. 2007 Siem Reap, Cambodia



06 Nov. 2008 Neak Loeung, Kandal, Cambodia



Corbicula fluminea f. insularis
29 Jun. 2009 Dong Makkai Market, Vientiane
Capital, Laos



Corbicula moreletiana
18 Jul. 2010 Near Central Market, Kampong
Cham, Cambodia



Corbicula sp. 1
18 Jul. 2010 Near Central Market, Kampong
Cham, Cambodia



Corbicula sp. 2
18 Jul. 2010 Near Central Market, Kampong
Cham, Cambodia

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「Global invasive species database」 <http://www.issg.org/database/welcome/>