

Mollusca – Molluscs

TAN SIONG KIAT, TAN KOH SIANG

Scientific Name:

Limopsis excancellata Sacco,
1898

Common Name:

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Order/Family:

Bivalvia (Arcida): Limopsidae

National Status: Presumed Nationally Extinct (NEx)

Habitat and Ecology: Presumably infaunal in muddy substrates subtidally. Shell small, usually less than 6 mm, but sizes of more than 1 cm have been reported for shells from elsewhere.

Distribution: Southeast Asia. In Singapore, this species has been collected from the Seletar area in 1933.

Threats: Habitat loss, habitat modification, declining water quality, sedimentation, oil spills.

Photo: Tan Siong Kiat



Limopsis excancellata from Seletar.

Scientific Interest and Potential Value: This species was first described from Singapore by Reeve (1843 as *Pectunculus cancellata* [non Michelotti, 1839]). *Limopsis excancellata* is a replacement name.

Conservation Measures: This species has not been documented in surveys carried out in the past few decades, thus it is presumed to be nationally extinct. Surveys are needed to determine if it still occurs at any sites, which would then need to be protected from urbanisation and disturbance.

Scientific Name:

Amusium pleuronectes (Linnaeus,
1758)

Common Name:

Asian moon scallop, Sun and
moon scallop

Order/Family:

Bivalvia (Pectinida): Pectinidae

National Status: Presumed Nationally Extinct (NEx)

Habitat and Ecology: Subtidal on sand and mud sediments. Shell length up to around 8 cm.

Distribution: Indo-West Pacific. In Singapore, it has

Photo: Tan Siong Kiat



Amusium pleuronectes from Siglap.

only been found in the area around the present-day East Coast Park prior to the large-scale reclamation works in the 1970s.

Threats: Habitat loss, habitat modification, declining water quality, sedimentation, oil spills.

Scientific Interest and Potential Value: Very common and commercially exploited in some countries. Often available in the markets of Southeast Asia.

Conservation Measures: This species has not been documented in surveys carried out in the past few

decades thus it is presumed nationally extinct. It is likely that this species was never common, and it was noted to be rare by Chuang (1973). Surveys are needed to determine any sites of occurrence, which would need to be protected from urbanisation and disturbance.

Scientific Name:
Hippopus hippopus (Linnaeus, 1758)

Common Name:
Horse's hoof clam, Bear paw clam,
Siput lupat

Order/Family:
Bivalvia (Cardiida): Cardiidae

National Status: Presumed Nationally Extinct (NEx)

Habitat and Ecology: Shell length often reaching around 20 cm, but large ones may attain lengths of more than 40 cm.

Distribution: Indo-Pacific. In Singapore, this species was recorded from several of the southern and western islands including, but not limited to, Pulau Pawai, Pulau Senang, and Pulau Satumu.

Threats: Habitat loss, habitat modification, declining water quality, sedimentation, oil spills, overcollection.

Scientific Interest and Potential Value: Collected for food, and/or the aquarium and shell trade in some countries.

Conservation Measures: This species has not been documented in surveys carried out in the past few decades thus it is presumed nationally extinct. It is likely that this species was never common. Surveys are needed to determine any sites of occurrence, which would need to be protected from urbanisation and disturbance.

Photo: Tan Siong Kiat



Hippopus hippopus from Pulau Senang.

Scientific Name:

Tridacna crocea Lamarck, 1819

Common Name:

Crocus giant clam, Boring giant clam

Order/Family:

Bivalvia (Cardiida): Cardiidae

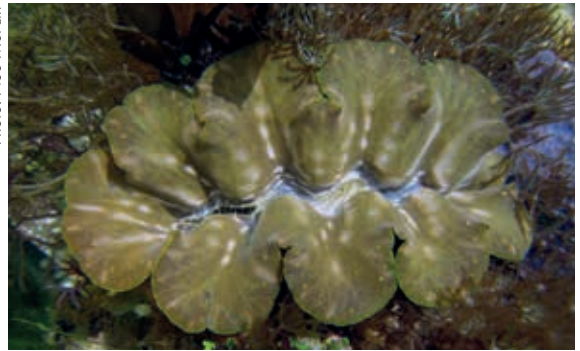
National Status: Endangered (EN)

Habitat and Ecology: Boring in coral heads, coral rocks and boulders, on reef flats and coral reefs. Shell length reaching a maximum of around 15 cm.

Distribution: Indo-Pacific. In Singapore, this species has been recorded from many of the southern and western islands.

Threats: Habitat loss, habitat modification, declining water quality, sedimentation, oil spills, overcollection.

Photo: Neo Mei Lin



Tridacna crocea at Pulau Semakau.

Scientific Interest and Potential Value: Collected for food, and/or the aquarium and shell trade in some countries.

Conservation Measures: This species has been observed sporadically in surveys over the last few decades although always in small numbers fewer than five individuals per occasion. Conservation of sufficiently healthy coastal habitats will be beneficial.

Scientific Name:

Tridacna gigas (Linnaeus, 1758)

Common Name:

True giant clam

Order/Family:

Bivalvia (Cardiida): Cardiidae

National Status: Presumed Nationally Extinct (NEx)

Habitat and Ecology: Usually free-living on either sand or hard reef substrata on coral reefs. May reach more than a metre in shell length, and massive ones are very thick and heavy.

Distribution: Indo-Pacific. Anecdotal reports are available but there are no verifiable records from Singapore.

Threats: Habitat loss, habitat modification, declining water quality, sedimentation, oil spills.

Photo: Neo Mei Lin



Tridacna gigas in the waters of Sipadan, Sabah, Malaysia.

Scientific Interest and Potential Value: Collected for food, and/or the aquarium and shell trade in some countries.

Conservation Measures: This species has not been documented in surveys carried out in the past few decades thus it is presumed nationally extinct. It is likely that this species was never common. Surveys are needed to determine any sites of occurrence, which would need to be protected from urbanisation and disturbance.

Scientific Name:

Tridacna maxima (Röding, 1798)

Common Name:

Elongate giant clam, Small giant clam

Order/Family:

Bivalvia (Cardiida): Cardiidae

National Status: Critically Endangered (CR)

Habitat and Ecology: Usually nestled or partially embedded in and amongst coral heads, coral rocks and boulders on coral reefs. Shell length may reach more than 15 cm, but are usually smaller.

Distribution: Indo-Pacific. In Singapore, this species has only been recorded from Pulau Satumu and Terumbu Bemban.

Threats: Habitat loss, habitat modification, declining water quality, sedimentation, oil spills.

Scientific Interest and Potential Value: Collected for food, and/or the aquarium and shell trade in some countries.

Conservation Measures: This species only has two confirmed sightings from surveys over the last few decades, suggesting that this species likely was never common. The species is assessed as critically endangered because of its rarity. Surveys are needed to determine the sites of occurrence, which need to be protected from urbanisation and disturbances.

Photo: Tan Siong Kiat



Tridacna maxima from the Philippines.

Scientific Name:

Tridacna squamosa Lamarck, 1819

Common Name:

Fluted giant clam, Scaly giant clam, Siput kima

Order/Family:

Bivalvia (Cardiida): Cardiidae

Photo: Tan Siong Kiat



Tridacna squamosa at Pulau Satumu.

National Status: Critically Endangered (CR)

Habitat and Ecology: Usually nestled amongst coral and rocks on coral reefs. Shell length may reach more than 40 cm.

Distribution: Indo-Pacific. In Singapore, this species has been recorded from many of the southern and western islands.

Threats: Habitat loss, habitat modification, declining water quality, sedimentation, oil spills.

Scientific Interest and Potential Value: Collected for food, and/or the aquarium and shell trade in some countries.

Conservation Measures: This species has been observed sporadically in surveys over the last few decades although always in small numbers fewer than five individuals per occasion. Conservation of sufficiently healthy coastal habitats will be beneficial.

Scientific Name:
Dallitellina rostrata (Linnaeus, 1758)

Common Name:
Rostrate tellin

Order/Family:
Bivalvia (Cardiida): Tellinidae

National Status: Vulnerable (VU)

Habitat and Ecology: Burrowing in soft sandy or muddy substrates, in which they frequently lie somewhat horizontally with the left valve on top. Shell length may reach more than 7 cm.

Distribution: Indo-West Pacific. In Singapore, it has thus far been recorded from Bedok, Changi, and Pulau Hantu, but is likely to be more widespread.

Threats: Habitat loss, habitat modification, declining water quality, sedimentation, oil spills.

Scientific Interest and Potential Value: Collected for food and for its attractive shell in some countries.

Photo: Tan Siong Kiat



Dallitellina rostrata from Changi.

Conservation Measures: Although this species was reported from Singapore since the 1800s, there are very few records in the literature and in the LKCNHM. This species is assessed as vulnerable because of its apparent rarity. Conservation of sufficiently healthy coastal habitats will be beneficial.

Scientific Name:
Potamocorbula nimbosa
(Hanley, 1843)

Common Name:
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Order/Family:
Bivalvia (Myida): Corbulidae

National Status: Presumed Nationally Extinct (NEx)

Habitat and Ecology: Presumably in sand, mud and clay sediments of estuaries and mudflats from the intertidal to shallow subtidal zones. Shell length up to around 3 cm.

Distribution: South China Sea, Japan, and to the Cocos (Keeling) Islands in the eastern Indian Ocean.

Threats: Habitat loss, habitat modification, declining water quality, sedimentation, oil spills.

Scientific Interest and Potential Value:
This species was described from Singapore as *Corbula nimbosa* by Hanley (1843). Incidentally, the synonyms *Corbula ustulata* and *C. labiata* described by Reeve (1844 [in 1843–1844]) were also based on specimens from Singapore.

Photo: Tan Siong Kiat



Potamocorbula nimbosa from Singapore.

Conservation Measures: There have been no original records of this species from Singapore in the past century. It is thus presumed to be nationally extinct. Surveys are needed to determine any sites of occurrence, which would need to be protected from urbanisation and disturbances.

Scientific Name:
Barnea manilensis (Philippi, 1847)

Common Name:
Manila piddock

Order/Family:
Bivalvia (Myida): Pholadidae

National Status: Presumed Nationally Extinct (NEx)

Habitat and Ecology: Boring in clay and soft rocks, from the intertidal zone to depths of about 20 m. Shell length may reach more than 7 cm.

Photo: Tan Siong Kiat



Barnea manilensis from Tanjong Gul.

Distribution: Indo-Pacific. In Singapore, this species was recorded from Telok Ayer and Tanjong Gul, both since reclaimed.

Threats: Habitat loss, habitat modification, declining water quality, sedimentation, oil spills.

Scientific Interest and Potential Value: Collected for food and sometimes offered in the markets of Southeast Asia.

Conservation Measures: Two lots of this species in the LKCNHM, collected from Telok Ayer in 1900 and Tanjong Gul in 1968, are the only examples we know of this species. It has not been subsequently collected nor reported from Singapore thus presumed to be nationally extinct. Surveys are needed to determine any sites of occurrence, which would need to be protected from urbanisation and disturbance.

Scientific Name:
Verpa penis (Linnaeus, 1758)

Common Name:
Common watering pot shell

Order/Family:
Bivalvia (Anomalodesmata):
Penicillidae

National Status: Vulnerable (VU)

Habitat and Ecology: In muddy sand sediment, from areas exposed during the lowest spring tides to the shallow subtidal depths. Buried vertically with only the posterior part of its tube showing above the substrate. Jets of water forced periodically through the perforations of its anterior disc is thought to aid burrowing and the fringes of the disc could possibly serve to stabilise the shell to prevent dislodging. Shell length may reach more than 12 cm.

Distribution: Indo-West Pacific. In Singapore, most records are from the eastern coasts from Pasir Ris to East Coast Park.

Threats: Habitat loss, habitat modification, declining water quality, sedimentation, oil spills.



Photo: Tan Siong Kiat

Verpa penis from Changi.

Scientific Interest and Potential Value: This species is generally regarded to be rare because of their cryptic habits. This species appears to be relatively common in Singapore where specimens were first collected by Hugh Cuming who was in Singapore in 1836 and from 1839–1840. Studies on its biology were also carried out by Purchon (1956; 1960) based on specimens collected here.

Conservation Measures: Previously presumed to be nationally extinct, live specimens have since been found around the eastern side of Singapore. It is assessed to be vulnerable because of its perceived rarity. Conservation of sufficiently healthy coastal habitats will be beneficial.

Scientific Name:
Tectus pyramis (Born, 1778)

Common Name:
Pyramid top, Pyram top

Order/Family:
Gastropoda (Trochida): Tegulidae

National Status: Critically Endangered (CR)

Habitat and Ecology: Amongst rocks on coral reefs and rocky shores. Shell length usually up to around 8 cm.

Distribution: Indo-Pacific. In Singapore, it has been recorded from Pulau Hantu, Pulau Subar Laut, and Pulau Satumu.

Threats: Habitat loss, habitat modification, declining water quality, sedimentation, oil spills, overcollection.

Photo: Tan Siong Kiat



Tectus pyramis from Pulau Sakijang.

Scientific Interest and Potential Value: Collected for food and for its attractive shell in some countries. Shells often polished and used in shell craft.

Conservation Measures: Although there is no evidence to suggest that this species was abundant or even common in the past, there were records of this species on the reefs of the southern and western islands up to the mid-1960s. There have been no documented sightings in the past decades. Surveys are needed to determine the sites of occurrence, which need to be protected from urbanisation and disturbances.

Scientific Name:
Turbo petholatus Linnaeus, 1758

Common Name:
Tapestry turban

Order/Family:
Gastropoda (Trochida): Turbinidae

National Status: Vulnerable (VU)

Habitat and Ecology: Coral reefs and rocky shores, subtidal. Shell length may reach more than 6cm.

Distribution: Indo-Pacific. In Singapore, this species has been recorded from Pulau Jong, Kusu, Pulau Hantu, Terumbu Pempang Tengah, and Pulau Satumu.

Threats: Habitat loss, habitat modification, declining water quality, sedimentation, oil spills.

Scientific Interest and Potential Value: Collected for food and for its colourful shell in some countries.

Photo: Neo Mei Lin



Turbo petholatus at Pulau Satumu.

Its operculum is often used in shell craft and costume jewellery.

Conservation Measures: This species is assessed as vulnerable because of its rarity and apparent restriction to coral reef habitats. This species is only very rarely encountered during intertidal surveys, but it has been observed to be moderately common on the subtidal reefs at Pulau Satumu. Conservation of sufficiently healthy coastal habitats will be beneficial.

Scientific Name:

Cerithium nodulosum Bruguière, 1792

Common Name:

Giant knobbed cerith

Order/Family:

Gastropoda (Caenogastropoda):
Cerithiidae

National Status: Vulnerable (VU)

Habitat and Ecology: Sandy and rubbly areas of intertidal reef flats, and coral reefs. Shell length may reach more than 10 cm.

Distribution: Indo-Pacific. In Singapore, this species has thus far been recorded from Pulau Satumu, Pulau Pawai, and Pulau Hantu.

Threats: Habitat loss, habitat modification, declining water quality, sedimentation, oil spills.

Scientific Interest and Potential Value: Commonly collected for food and shell trade in some countries.

Photo: Rene S.L. Ong



Cerithium nodulosum from Pulau Satumu.

Conservation Measures: This species is assessed as vulnerable because of its present rarity in Singapore and apparent restriction to coral reef habitats. Conservation of sufficiently healthy coastal habitats will be beneficial.

Scientific Name:

Rhinoclavis aspera (Linnaeus, 1758)

Common Name:

Rough vertagus

Order/Family:

Gastropoda (Caenogastropoda):
Cerithiidae

National Status: Endangered (EN)

Habitat and Ecology: In sand of sand flats and sand pockets of coral reef areas, from the low intertidal to shallow subtidal depths. Shell length may reach more than 5 cm.

Distribution: Indo-West Pacific. In Singapore, this species has been recorded from Pulau Salu, Sentosa, Pulau Semakau, Cyrene Reef, and Terumbu Raya.

Photo: Rene S.L. Ong



Rhinoclavis aspera from Pulau Semakau.

Threats: Habitat loss, habitat modification, declining water quality, sedimentation, oil spills.

Scientific Interest and Potential Value: Very common and often collected for shell craft in some countries.

Conservation Measures: This species can be locally abundant where found, but living specimens have not

been reported nor encountered in recent surveys in the past couple of decades. It is thus provisionally assessed to be endangered. Surveys are needed to determine the sites of occurrence, which need to be protected from urbanisation and disturbances. Conservation of sufficiently healthy coastal habitats will be beneficial.

Scientific Name:

Rhinoclavis vertagus (Linnaeus, 1767)

Common Name:

Common vertagus

Order/Family:

Gastropoda (Caenogastropoda):
Cerithiidae

National Status: Endangered (EN)

Habitat and Ecology: In sand and muddy sand substrates on reef flats, seagrass meadows, and coral reefs.

Distribution: Indo-West Pacific. In Singapore, this species has been recorded from Pulau Senang, Pulau Hantu, and Pulau Semakau. Shell length may reach more than 5 cm.

Threats: Habitat loss, habitat modification, declining water quality, sedimentation, oil spills.

Scientific Interest and Potential Value: Very common, and often collected for the shell trade and occasionally as food in some countries.

Conservation Measures: This species is provisionally assessed to be endangered although there is no evidence to suggest that this species was ever common in Singapore. It can be locally abundant where found, but no living specimens have been reported or encountered in surveys carried out in the past few decades. Further surveys are needed to identify the sites of occurrence in Singapore for a reassessment in the future. Conservation of sufficiently healthy coastal habitats will be beneficial.

Photo: Rene S.L. Ong



Rhinoclavis vertagus from Pulau Semakau.

Scientific Name:
Terebralia palustris (Linnaeus, 1767)

Common Name:
Mud creeper, Mangrove whelk

Order/Family:
Gastropoda (Caenogastropoda):
Potamididae

National Status: Endangered (EN)

Habitat and Ecology: On sandy mud and mud in and near mangroves and estuaries. Appears to prefer more open high energy mangroves and has thus far not been reported from the estuarine mangroves of the Johor Strait. Shell length may reach more than 15 cm.

Distribution: Indo-West Pacific. In Singapore, this species has been recorded from Pandan, Pulau Semakau, and Marina East.

Threats: Habitat loss, habitat modification, oil spills, overcollection.

Scientific Interest and Potential Value: Collected for food in many Southeast Asian countries and commonly available in markets.

Photo: Tan Siang Kiat



Terebralia palustris from Pulau Semakau.

Conservation Measures: This species was documented quite early in the history of Singapore although there is no evidence to suggest that it was ever common. It is assessed to be endangered because of its restricted distribution in Singapore. Currently, the only known site where a sizable population occurs is at Pulau Semakau. Surveys are needed to determine whether the species occurs in other areas, especially in the mangrove forests of the southern and western islands. Conservation of sufficiently healthy coastal habitats will be beneficial.

Scientific Name:
Cypraea tigris Linnaeus, 1758

Common Name:
Tiger cowrie

Order/Family:
Gastropoda (Littorinimorpha):
Cypraeidae

National Status: Vulnerable (VU)

Habitat and Ecology: On sand, and on and amongst rocky rubble or corals in coral reef areas, intertidal to shallow subtidal depths. Shell length may reach more than 10 cm, but usually smaller.

Photo: Rene S.L. Ong



Cypraea tigris from Singapore.

Distribution: Indo-Pacific. In Singapore, it has been documented from several of the southern and western islands.

Threats: Habitat loss, habitat modification, declining water quality, sedimentation, oil spills, overcollection.

Scientific Interest and Potential Value: Collected for food and for its attractive shell in many countries. Largest member of its family in Singapore.

Conservation Measures: This species has been observed sporadically in surveys over the last few decades although always in small numbers fewer than five individuals per occasion. It is assessed to be vulnerable due to its apparent rarity in Singapore and restriction to coral reef habitats. Conservation of sufficiently healthy coastal habitats will be beneficial.

Scientific Name:

Monetaria annulus (Linnaeus, 1758)

Common Name:

Gold-ring cowrie

Order/Family:

Gastropoda (Littorinimorpha):
Cypraeidae

National Status: Critically Endangered (CR)

Habitat and Ecology: Amongst rocks and rubble on reef flats and reef slope, intertidal to shallow subtidal depths. Shell length usually between 2 to 3 cm.

Distribution: Indo-Pacific. In Singapore, this species has been recorded from Lazarus Island.

Threats: Habitat loss, habitat modification, declining water quality, sedimentation, oil spills, overcollection.

Scientific Interest and Potential Value: Once used as currency, this species is very common in some countries and large numbers are collected for the shell trade, mainly for shell craft.

Conservation Measures: This species was documented quite early in the history of Singapore, but there is no evidence to suggest that it was ever common. It appears to be very rare in Singapore today and there has been no documented sightings in the past few decades. Surveys are needed to determine the sites of occurrence, which need to be protected from urbanisation and disturbances.

Photo: Rene S.L. Ong



Monetaria annulus from Lazarus Island.

Scientific Name:
Monetaria moneta (Linnaeus, 1758)

Common Name:
Money cowrie

Order/Family:
Gastropoda (Littorinimorpha):
Cypraeidae

National Status: Critically Endangered (CR)

Habitat and Ecology: Amongst rocks and rubble on reef flats and reef slope, intertidal to shallow subtidal depths. Shell length usually between 2 to 3 cm.

Distribution: Indo-Pacific. In Singapore, this species has been recently sighted at Lazarus Island and Cyrene Reef.

Threats: Habitat loss, habitat modification, declining water quality, sedimentation, oil spills, overcollection.

Scientific Interest and Potential Value: Once used as currency, this species is very common in some countries and large numbers are collected for the shell trade, mainly for shell craft.

Photo: Tan Siang Kiat



Monetaria moneta from Cyrene Reef.

Conservation Measures: This species was documented quite early in the history of Singapore although there is no evidence to suggest that it was ever common. There has been no documented sightings in the past few decades until quite recently, and it appears to be very rare in Singapore today. Surveys are needed to determine the sites of occurrence, which need to be protected from urbanisation and disturbances.

Scientific Name:
Truncatella guerinii
A. Villa & J.B. Villa, 1841

Common Name:
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Order/Family:
Gastropoda (Littorinimorpha):
Truncatellidae

National Status: Endangered (EN)

Habitat and Ecology: In vegetation, leaf litter, under rocks and debris at the supralittoral zone near beaches, coastal cliffs, coastal woodlands. Shell length typically around 7 to 8 mm.

Photo: Tan Siang Kiat



Truncatella guerinii from Changi.

Distribution: Indo-West Pacific. In Singapore, the only known living population was at Changi. Empty shells found amongst the debris along the strandline at beaches elsewhere.

Threats: Habitat loss, habitat modification.

Scientific Interest and Potential Value: Not known.

Conservation Measures: Provisionally assessed to be endangered, but further surveys are needed to determine the sites of occurrence and their abundance in Singapore for a future reassessment. This species is largely dependent on the availability of suitable coastal forest habitats. It has not been found alive since the only population known to us was extirpated in a location that was developed in 2007. Surveys are needed to determine the sites of occurrence, which need to be protected from urbanisation and disturbances.

Scientific Name:

Volema myristica Röding, 1798

Common Name:

Nutmeg melongena

Order/Family:

Gastropoda (Neogastropoda):
Melongenidae

National Status: Vulnerable (VU)

Habitat and Ecology: Sand or muddy sand areas near mangroves, and in seagrass meadows and reef flats. Shell length usually around 5 to 6 cm and seldom exceeding 8 cm.

Distribution: Southeast Asia, Western Pacific. In Singapore, this species has been recorded from Tanah Merah, Pulau Hantu, Pulau Semakau, Pulau Pawai, and Pulau Senang.

Threats: Habitat loss, habitat modification, declining water quality, sedimentation, oil spills.

Scientific Interest and Potential Value: Collected for food in many parts of Southeast Asia.

Photo: Rene S.L. Ong



Volema myristica from Pulau Semakau.

Conservation Measures: An uncommon species assessed to be vulnerable because of its current low numbers. The number of historical records suggest that it was more common on the shores of Singapore in the past. Conservation of sufficiently healthy coastal habitats will be beneficial.

Scientific Name:
Murex ternispina Lamarck, 1822

Common Name:
Black-spined murex

Order/Family:
Gastropoda (Littorinimorpha):
Cypraeidae

National Status: Vulnerable (VU)

Habitat and Ecology: Subtidal on soft, muddy to sandy sediments. Shell length usually to around 9 cm.

Distribution: Indo-West Pacific. In Singapore, this species has been recorded from Kusu, Pulau Pawai, Pulau Sudong, and the eastern and south-eastern coasts that have since been reclaimed.

Threats: Habitat loss, habitat modification, declining water quality, sedimentation, oil spills.

Photo: Tan Heok Hui



Murex ternispina from Pulau Sudong.

Scientific Interest and Potential Value: Collected for food and shell trade in some countries.

Conservation Measures: An uncommon species, it is assessed to be vulnerable because of its current low numbers. Surveys are needed to determine the sites of occurrence, which need to be protected from urbanisation and disturbances.

Scientific Name:
Melo melo [Lightfoot], 1786

Common Name:
Indian volute, Bailer shell

Order/Family:
Gastropoda (Neogastropoda):
Volutidae

National Status: Vulnerable (VU)

Habitat and Ecology: On muddy sand sediments from the littoral to shallow sublittoral zones. Shell length commonly exceeding 20 cm.

Distribution: On muddy sand sediments from the littoral to shallow sublittoral zones.

Threats: Habitat loss, habitat modification, declining water quality, sedimentation, oil spills.

Photo: Tan Siong Kiat



Melo melo from Changi.

Scientific Interest and Potential Value: Collected for food in many Southeast Asian countries and commonly available in markets. Shells used as decorative items, or as scoops.

Conservation Measures: Although not particularly uncommon, this species is assessed to be vulnerable because of its perceived low numbers, and likelihood of exploitation for food. Conservation of sufficiently healthy coastal habitats will be beneficial.

Scientific Name:
Oliva miniacea (Röding, 1798)

Common Name:
Red-mouthed olive,
Orange-mouthed olive

Order/Family:
Gastropoda (Neogastropoda):
Olividae

National Status: Vulnerable (VU)

Habitat and Ecology: Burrowing in sand of sandy flats, and sandy areas in and near coral reefs from the intertidal to shallow subtidal zones. Shell length usually up to around 8 cm.

Distribution: Indo-West Pacific. In Singapore, this species has been recorded from Cyrene Reef, East Coast Park, Changi, Pulau Hantu, and Sisters' Islands.

Threats: Habitat loss, habitat modification, declining water quality, sedimentation, oil spills, overcollection.

Scientific Interest and Potential Value: Collected both for its large, colourful shell, and for food in many countries.

Photo: Tan Siang Kiat



Oliva miniacea from Changi.

Conservation Measures: An uncommon species that is assessed to be vulnerable because of its current low numbers. The populations on our shores appear to be episodic and relatively ephemeral. They may disappear for some time before reappearing again in some numbers. Conservation of sufficiently healthy coastal habitats will be beneficial.

Scientific Name:
Conus consors G.B. Sowerby I, 1833

Common Name:
Consort cone

Order/Family:
Gastropoda (Neogastropoda):
Conidae

Photo: Tan Siang Kiat



Conus consors from Cyrene Reef.

National Status: Vulnerable (VU)

Habitat and Ecology: In sand, and under and amongst stones and rocks in coral reef areas, intertidal to shallow sublittoral zones. Shell length usually up to around 7 or 8 cm and rarely exceeding 10.

Distribution: Indo-West Pacific. In Singapore, it has been documented from the southern and western islands, and recent sightings include, but are not limited to, Terumbu Pempang Laut, Terumbu Bemban, Pulau Jong, and St. John's Island.

Threats: Habitat loss, habitat modification, declining water quality, sedimentation, oil spills, overcollection.

Scientific Interest and Potential Value: Collected for the shell trade. Many larger species of the family, including this species, are occasionally collected for food in some countries.

Conservation Measures: An uncommon species assessed to be vulnerable because of its current low numbers. This species was reportedly very common prior to the 1970s, but encounters have become exceedingly rare until the past decade where there has been a marked increase in sightings and reports, which suggest that the species is re-establishing itself. Conservation of sufficiently healthy coastal habitats will be beneficial.

Scientific Name:

Ellobium scheepmakeri (Petit de la Saussaye, 1850)

Common Name:

Malchus' ear shell

Order/Family:

Gastropoda (Ellobiida): Ellobiidae

National Status: Critically Endangered (CR)

Habitat and Ecology: Mangrove forests, amongst wood debris and on plants in the back mangroves. Shell length up to around 7 cm.

Distribution: Southeast Asia. In Singapore, Mandai is the only site where a healthy population has been documented.

Threats: Habitat loss, habitat modification, declining water quality, oil spills, overcollection.

Scientific Interest and Potential Value: This species often occurs sympatrically with the larger *Ellobium aurismidae* (Linnaeus, 1758), but may be naturally less common throughout most of its distributional range. Both species are sometimes collected for food in some countries. Broken shells around fire pits are sometimes encountered in the mangroves of Singapore.

Photo: Tan Siang Kiat



Ellobium scheepmakeri from Mandai.

Conservation Measures: This species was documented quite early in the history of Singapore although there is no evidence to suggest that it was common or widespread. It is assessed to be critically endangered because of its highly restricted distribution in Singapore. Suitable sites need to be designated as nature areas to be protected from urbanisation and disturbances.

Scientific Name:

Pythia scarabaeus (Linnaeus, 1758)

Common Name:

Common pythia, Scarab pythia

Order/Family:

Gastropoda (Ellobiida): Ellobiidae

National Status: Vulnerable (VU)

Habitat and Ecology: In debris and leaf litter at the supralittoral zone of coastal forests and mangroves. Shell length usually around 2 cm or more.

Distribution: Indo-West Pacific. In Singapore, this species has been recorded from only Changi and Punggol.

Threats: Habitat loss, habitat modification.

Scientific Interest and Potential Value: Not known.

Conservation Measures: Provisionally assessed to be vulnerable, but further surveys are needed to determine the sites of occurrence and their abundance

Photo: Tan Siong Kiat



Pythia scarabaeus at Changi.

in Singapore for a future reassessment. This species is largely dependent on the availability of suitable coastal forest habitats of which very few are left in Singapore, and populations have not been found in recent surveys. Surveys are needed to determine the sites of occurrence, which need to be protected from urbanisation and disturbances.

Scientific Name:

Amphidromus inversus (Müller, 1774)

Common Name:

Inverse amphidromus,
Brown tree snail

Order/Family:

Gastropoda (Stylommatophora):
Camaenidae

National Status: Critically Endangered (CR)

Habitat and Ecology: Largely arboreal, and rarely found on the ground. They have been observed to lay eggs in clusters under loose bark and in small cavities. Shell length up to around 5 cm.

Photo: Tan Siong Kiat



Amphidromus inversus at the Singapore Botanic Gardens.

Distribution: Southeast Asia. In Singapore, this species appears to be restricted to the Singapore Botanic Gardens (SBG) and its immediate vicinity.

Threats: Habitat loss, habitat modification, indiscriminate use of pesticides, introduction of alien predators.

Scientific Interest and Potential Value: Occasionally collected for the shell trade in some countries. Several recognisable subspecies and forms are known. Whether the SBG population is an

introduced or a remnant population remains unclear and will be an interesting topic for future research.

Conservation Measures: Although not exceedingly rare at the SBG, the small and restricted population may be easily affected by pesticides or inadvertent introduction of predators. However, the introduction of this species to existing forested areas where other native snails thrive should not be attempted without careful consideration. Continued conservation of the forested area in the SBG will be beneficial.

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Blattodea – Termites and Cockroaches

FOO MAOSHENG

Termites and cockroaches tend to be viewed as pests due to the notoriety of the handful of globally invasive species such as the American cockroach (*Periplaneta americana*) and the Asian subterranean termite (*Coptotermes gestroi*). However, the pest species do not represent the majority of the species under Blattodea. In fact, both termites and cockroaches have major roles in the leaf litter ecosystem, with some cockroach species also known to assist in flower pollination.

There are at least 67 species of termites, and at least 50 species of cockroaches found in Singapore but most species are still poorly known, and some are still undescribed scientifically. Hence, the conservation status for most species cannot be determined without additional data. Most species inhabit old secondary or primary forests, with some species in back mangrove forests. The loss and fragmentation of habitats, altering or removal of the ground soil and usage of heavy machinery, can threaten their survival in general.

In this section, the focus will be on termites as they have a major role in decomposition, the carbon mineralisation process as well as in the nitrogen and phosphorous cycle. The activity of the termites does have an influence on both soil properties and structure, from which the trees and vegetation grow on. The following detailed writeup will look into the different feeding groups of termites namely: the fungus growers, epiphyte feeders and soil feeders.

Scientific Name:
Macrotermes carbonarius
 (Hagen, 1858)

Common Name:
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Order/Family:
 Blattodea / Termitidae

National Status: Least Concern (LC)

Habitat and Ecology: They are found in old secondary forests and primary forests, and sometimes in maturing secondary forests or the back mangroves. The termite mounds are sometimes visible above ground level, going as high as 1.3m on Pulau Ubin. They are also a food source for the local Sunda Pangolin.

Distribution: Found throughout Southeast Asia

Threats: Development and degradation of forest habitats

Scientific Interest and Potential Value: It is one of the fungus-growing termites that have a symbiotic relationship with the fungus, *Termitomyces* spp., cultivated within the mounds. Moreover, termite mounds form a nutrient rich area due to the feeding and construction habits of the termite workers. These mounds are created by the deposition of organically rich faecal matter mixed with soil and their saliva, having higher levels of nitrogen and phosphorus (plant macronutrients). The subsequent erosion of such mounds leads to enrichment of the topsoil in surrounding areas. In addition, the constant foraging and construction activity of the termite workers significantly improves the soil physical properties such as better infiltration of water into the ground.

Conservation Measures: Conservation of our remaining forests will ensure their survival.

Photo: Foo Maosheng



Macrotermes carbonarius.

Photo: Foo Maosheng



Macrotermes carbonarius alate.

Scientific Name:

Dicuspitermes nemorou
(Haviland, 1898)

Common Name:

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Order/Family:

Blattodea / Termitidae

National Status: Data Deficient (DD)

Habitat and Ecology: Old-growth secondary forests and primary forests. Their nests tend to be found near or at the base of large trees. The termite mounds can be between 30 to 40cm in height.

Distribution: Found across Malaysia, Singapore, and Indonesia.

Threats: Development and degradation of forest habitats, compaction of ground soil.

Scientific Interest and Potential Value: Presence of this soil-humus feeding termites indicates the soil in the area has a high proportion of organic matter. The nutrient-rich topsoil provides better conditions for plants to grow on. Moreover, the feeding activity of these termites can further improve soil quality such as buffering



Dicuspitermes nemorou – queen



Left Image: Nest. Right image: soldier.

the pH level to optimise the nutrients availability for plants.

Conservation Measures: Due to the specificity of their habitat preference to larger trees in nutrient-rich topsoil area, their current distribution within Singapore is unknown and likely to be restricted to certain forest fragments within Bukit Timah and Central Catchment nature reserves.

Scientific Name:

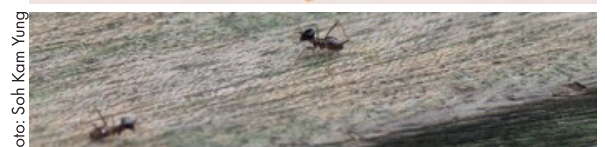
Hospitalitermes umbrinus
(Haviland, 1898)

Common Name:

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Order/Family:

Blattodea / Termitidae



Hospitalitermes umbrinus soldier.

National Status: Least Concern (LC)

Habitat and Ecology: Found in regenerating secondary forests to primary forests. These termites are often seen on the forest floor, foraging in the open instead of under mud galleries or through dead wood, forming long foraging lines between the nest and foraging site. They are often mistaken as ants due to their black coloration. Their nests are usually black or dark in colour, at the base of large trees, and serve as an alternative food source for the Sunda Pangolin and other ground insectivores. At other times, the nest may be above ground, occupying a crevice in the tree.

Distribution: Found across Malaysia, Singapore, and Indonesia.

Threats: Development and degradation of forest habitats.

Scientific Interest and Potential Value: They are one of the few termite species that feed mainly on bryophytes and micro-epiphytes such as lichen, instead of dead wood, found on tree trunks and in the tree canopies. Their nest may be shared with other termites such as *Termes* spp. or termite inquilines such as staphylinid beetles (*Neotermitosocius* sp. and *Coptotermocola* sp.)

Conservation Measures: Increasing the awareness of the public to such a species, along with conserving our remaining forests will ensure the survival of this genus/species.

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