



Land Snails and Slugs

Boasting a rich tapestry of biodiversity

Penang Hill has long been a focal point of natural history research. Land snails, with their intricate shells, have been silent witnesses to the hill's evolving story since the first comprehensive – two weeks land snail survey, was conducted by Ferdinand Stoliczka, a researcher from Geological Survey of India under the British Government in India in the late 19th century, who visited Penang hills in August 1869. There were 32 land snail species, including 18 new species, were documented by Stoliczka (1872, 1873). A recent survey of land snails following the footstep of Stoliczka after 150 years, were conducted by Universiti Malaysia Sabah with the supports from The Habitat Foundation, added the land snail's diversity of Penang Hill to 66 species.

Many of the land snails have unique and interesting appearance though they have been overlooked by the many visitors to Penang Hill. As demonstrate in the two intensive surveys, even for professional researchers that conducting intensive sampling, they still can miss many species. However, this is not all that lost, or mean that the diversity is very low. It is just because the land snail's species tend to be

patchily distributed and it is not possible to find all of the 66 species in one spot, from the recent study an area of pristine forest of the size of volleyball court can harbour up to 15 species of land snails.

As they are mostly nocturnal animal, much smaller than other animal, and move slowly as compared to insect for example, it can be easily missed by the naturalist who are interested in biodiversity. The world of micro-snails, those under 5mm, is vast and varied.

Nonetheless, not all the land snails of Penang Hill are native. Since 1870s, there were already records of alien species that were introduced by chance. The recent survey reveals an additional of seven alien species. Ironically, these alien species are those what most of us familiar and can be found in our home yard or urban garden and man-made habitat. So far little is known about the impact of these alien species, and they were not found in the intact forest of Penang Hill. On the other hand, a few native species seem adapting well into the slight degraded human modified landscape. Nevertheless, the presence of alien species could pose potential threats to the native ecosystem.



Where to Find Them

From the lowland tropical rainforest habitat at the foothills of Penang Hills, with humid and hot climates, to the lower montane forest at the top of Penang Hills with cooler and wet climate, visitor can experience and feel that differences.

However, the elevation gradient along the Penang Hill is not too extensive that cause the differentiation of land snail composition. Below 1,500m, most of the land snails and slugs are lowland species.

Large part of Penang Hill is still with natural forest habitats that were protected by Forest Reserve. Some parts of the foothill of the Penang Hill with more human activities and semi-natural habitats with some remnants of natural vegetation together with ornamental plants and manmade structures such as building, road, and walk paths. Most of the mid elevation and top of the Penang hills are still in intact condition and the areas that were opened for human activities are usually with intact forest right next to it.

Many land snails that were hard to see in the forest because of the complex vegetation structures and thicker leaf litters on the forest floor, were seen on

the vegetation along the walking paths, particularly at the top stations where some time there are more organic humous from the mixture of ornamental and original vegetations in such more open areas. However, in very degraded habitats such as vegetables farm or orchards, only introduced land snails and slugs were found and they are usually occurred in abundant.

To help you explore this diversity, images of 37 species are featured on the next page. While most of the snails with large and thick shells will leave the shell even after they died for visitor to appreciate the diverse shell shape and colours, living snails can be spotted usually after the rains during the daytime, or in the normal day when the night is dark until the dawn. Just pay more attention on the forest floor, the surface of rock boulder or brick wall, and on the upper and underneath of leaf of vegetation, visitor would be able to spot at least a few species from a natural walk. So far, none of the land snails that we know in Malaysia are poisonous except the snails will quickly retract into the shells for the land snails and slug react viciously when they were disturbed. They also secrete thick mucous when they were threatened.



Field Identification of Land Snails



Almost of all of the land snails and slugs in Penang hills can be identified by their external morphological characters, the colour, shape and size of the shell, the details of different type of sculpture on the shell surface which may be hard to see by naked eye without the use of instruments, and the colour, patterns of the soft part of the animal (see Liew & Foon, 2022 for more information).

Explore and Conserve Penang Hill's Land Snails

With the information presented in this pamphlet, it is hoped that visitors can learn more about these often-overlooked creatures and appreciate their staggering variety, emphasising their importance in understanding our natural world. Penang Hill's land snail diversity is a testament to nature's wonders and the importance of continued research. A total of 66 species have been documented on Penang Hill, showcasing the rich biodiversity of this unique habitat.



This guide has been funded by Ministry of Natural Resources and Environmental Sustainability (NRES). Institute for Tropical Biology and Conservation, Universiti Malaysia Sabah (ITBC, UMS) conducted the recent survey that supported by The Habitat Foundation (THF), Malaysia. Malaysia Biodiversity Information System (MyBIS) is a one-stop repository for biodiversity information in Malaysia and provides the information exchange platform of the Convention on Biological Diversity. THF is a charitable trust based in Penang and committed to working with a wide range of partners towards finding effective pathways to safeguard the diversity of life and the living environment upon which the future depends. ITBC is a research institute in Universiti Malaysia Sabah that promote and carry out research on the biodiversity of tropical flora and fauna, especially of the Malaysian state of Sabah.

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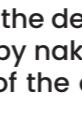
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Further Reading



Stoliczka F. (1872). On the land shells of Penang Island, with descriptions of the animals and anatomical notes; part first, Cyclostomacea. *Journal of the Asiatic Society of Bengal*, 41(2): 261–271.



Stoliczka F. (1873). On the land-shells of Penang Island, with descriptions of the animals and anatomical notes; part second, Helicacea. *Journal of the Asiatic Society of Bengal*, 43: 11–38.



Liew T.-S. & Foon J.-K. (2022). *An Introduction to the Land Snails and Slugs of Malaysia*. Forest Research Institute Malaysia. Pp. 90. e-ISBN: 978-967-2810-23-0. <https://mybis.gov.my/pb/4679>

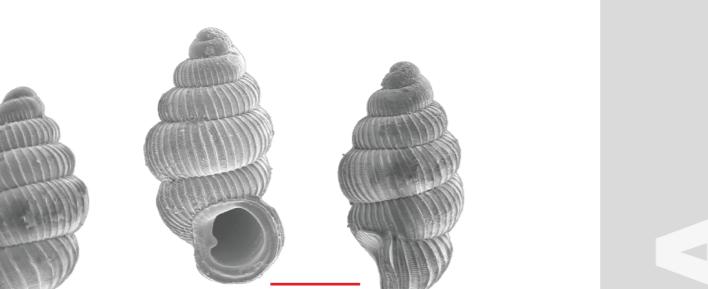
About This Guide

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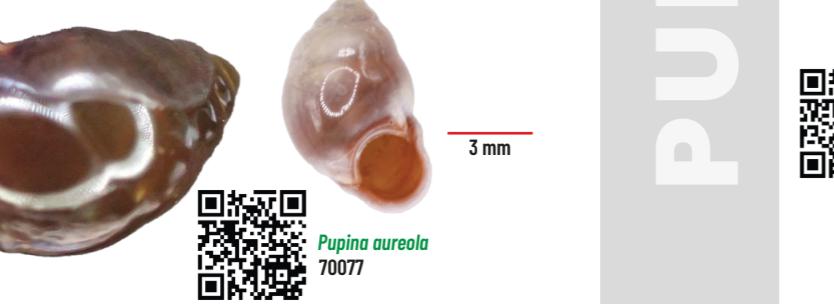
Cyclophoridae



Diplommatinidae



Puinidae



PULMONATA

Achatinidae



Ariophantidae



Charopidae



Chronidae



Dyakiidae



Camaenidae



Trochomorphidae



Veronicellidae



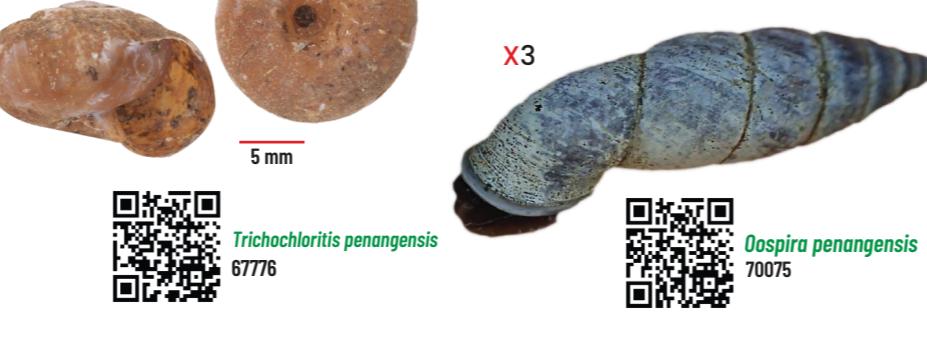
Punctidae



Rathouisiidae



Clausiliidae



Philomycidae

