



# Vietnamese giant magnolia snail

*(Bertia cambojiensis)*





## General Introduction

Vietnam is one of the global hotspots of biodiversity and is a megadiverse country. Discoveries of new species are regularly reported from it. Biodiversity knowledge of invertebrates is certainly poor.

## Biology

One of the largest and both most beautiful and prominent invertebrates of Vietnam is the Vietnamese magnolia snail, also named Vietnamese giant snail or Vietnamese giant magnolia snail, *Bertia cambojiensis*. It is the largest terrestrial mollusk in Southeast Asia. Representatives of *Bertia* are air-breathing Asian land snails (pulmonate gastropod molluscs in the family Dyakiidae).

The Dyakiidae are a land-snail family restricted to Southeast Asia, with at least 60 described species in 10 genera. Like many pulmonates, the Dyakiid snails are simultaneous hermaphrodites. During their bizarre reproductive behavior they release so-called love darts. These darts are calcareous, elongated and pointed in form and are shot with great force through the partner's skin during copulatory behavior.

The species is a ground-living species. It lives under leaf litter of tropical moist lowland forest. During the dry season it undertakes a dormant state. Observations within the conservation breeding program at the Zoological society of London have revealed that adult snails stay with their egg batch and produce additional eggs on top of the initial egg batch. The early hatchling snails from the first egg batch eat the unhatched eggs and thus develop rapidly.

These snails are omnivorous scavengers, feeding on a range of decaying and live vegetation, fruit, fungi, and carrion. In captivity, the species has been observed



consuming large quantities of leaf litter, suggesting it has an important ecological role as a detritivore and speeding up the nutrient cycling of these tropical forests.

This species has an extremely rapid growth rate, tripling in size within two weeks of hatching and reaching in excess of 160g within two years. This rapid growth makes it important, in captivity, to track weight at least every 3 weeks to monitor body condition and growth rates.

Although already scientifically described more than 160 years ago, knowledge of the snail with the large, brightly coloured, and shiny shell is still poor. The snail is known only to inhabit a very restricted area in southern Vietnam and Cambodia. Records are rare, and it was already believed to be extinct for over a century after many years without records. It was rediscovered alive in 2013 and has been reported in several provinces and also from within protected areas. However, only a few living individuals were found after significant survey work, and the exact range and population status is still not known. As it has only been located in a small area, the size of the population is clearly limited. Regular surveys of the wild populations are not currently being carried out, and there is a near-total lack of knowledge of their status and trends, other than the species' extreme scarcity.



## Status

The species is threatened due to local harvesting of it as food and medicine. Also Forest destruction certainly has a negative impact along with the disturbance of the understory underneath the trees or disturbance along paths when people enter the forests. Further alarmingly, their shells have a high market value in the trade among shell collectors due to its beauty and rarity. Thus over-exploitation is a huge risk, with the greatest immediate threat being collection for the shell trade, causing continuing decline in mature individuals based on the shell trade take off. Consequently, the microendemic species is listed as critically endangered on the IUCN Red List of Threatened species with the current population trend being unknown.

## Conservation action

Based on a formal MOU between the Vietnam National Museum of Nature (VNHM), The Natural History Museum, UK (NHM) and the Zoological Society of London (ZSL), a conservation breeding program was established in 2013 under the leadership of Paul Pearce-Kelly. The building up of husbandry knowledge to support the establishment of an ex situ population in Vietnam was planned as a direct conservation role of the *Bertia cambojiensis* EEP. In addition, viable cell preparations have been taken and stored at very low temperatures to allow for possible restoration of the species should they become extinct. Whilst the captive population built up in Vietnam, at VNMN, has declined, the conservation breeding program which was started at ZSL has been successful, and since 2017 has begun to be distributed to other collections. Important knowledge on breeding behaviour was obtained that way, and the conservation breeding network has been extended to Chester Zoo and more recently also Cologne Zoo. Successful breeding has happened repeatedly at Chester Zoo and as a consequence, a good population with a promising number of offspring is now available in European



zoos, alongside a wealth of gathered information on effective husbandry which has enabled this larger-scale breeding.

## Campaign objectives

To expand conservation measures for the Critically Endangered Vietnamese giant magnolia snail, the EAZA Vietnam campaign will foster:

- the extension of the European captive breeding program, viz. advertise for more participating zoos and thus more breeding successes;
- the sharing of husbandry knowledge in the form of Best Practice Guidelines to allow other collections to succeed in breeding this specialist, husbandry-demanding snail species;
- cooperation together with its Vietnamese partners to establish a new captive population in Vietnam;
- to fund continued monitoring and increased One Plan Approach Conservation.



Vietnamese giant magnolia snail (*Bertia cambojiensis*). Phot. G. Garcia



Snail shells for sale on a market. Phot. Janpietruszka | Dreamstime