

Description of
***Amphidromus (Syndromus) sylviae* spec. nov.**
(Mollusca: Gastropoda: Pulmonata: Camaenidae)
from Vietnam

Andreas Stark



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Caption of front cover and second cover page: Holotype of *Amphidromus (Syndromus) sylviae* spec. nov. from front (Front cover) and back (Second cover page). Natural size of the shell 29.6 mm.

*We should appreciate biological diversity
as a breeding ground for
human psyche, spirit and soul.*

*„Wir können der biologischen Vielfalt
einen Wert beimessen, weil
sie die menschliche Psyche nährt,
den menschlichen Geist,
die menschliche Seele.“*

Richard Leakey/Roger Lewin

From: „The Sixth Extinction; Patterns of Life and the
Future of Mankind“ 1995. New York: Doubleday.

Richard Leakey/Roger Lewin

Aus: „Die sechste Auslöschung; Lebensvielfalt
und die Zukunft der Menschheit“
1996. Frankfurt am Main: S. Fischer

Description of *Amphidromus (Syndromus) sylviae* spec. nov. (Mollusca: Gastropoda: Pulmonata: Camaenidae) from Vietnam

Andreas Stark

With 25 figures and one plate

Abstract: A new species of *Amphidromus (Syndromus)* is described. *Amphidromus (S.) sylviae* spec. nov., a tree-inhabiting species, was found in the province Lam Dong, Vietnam. Unique characters of this species are the black lip, the dark interior of the mouth, and the fine parallel radial streaks of green colour on the ostracum of the lower whorls. The shell is basically yellow to greyish-yellow and the protoconch is colourless. The animal is light-grey with a darker median stripe and pinkish tentacles. Photographs are provided of the holo- and paratype shells as well as of live individuals in-situ. The species is only known from the type locality, Don Duong. Some aspects of the geographical distribution of *Amphidromus* are discussed.

Zusammenfassung: Eine neue *Amphidromus (Syndromus)*-Art aus Vietnam wird beschrieben. *Amphidromus (S.) sylviae* spec. nov. ist eine baumbewohnende Spezies, die in der Provinz Lam Dong gefunden wurde. Sie hat eine dunkle Lippe und eine dunkle Mündung. In der Grundfarbe des Gehäuses dominieren gelbe, graugelbe oder blaugelbe Töne. In den letzten Windungen treten feine, regelmäßige und parallele, radial angeordnete Streifen hinzu, die ihren Ursprung ebenfalls im Ostracum haben und nicht durch das Periostracum bedingt sind. Der Protoconch ist farblos. Die Grundfarbe des Fußes ist hellgrau mit gelblichen Anteilen und rosafarbenen Fühlern. Holotypus und Paratypus werden abgebildet. Fotos von lebenden Tieren, die der Entdecker und Sammler der Tiere, Herr PENG WEI aufgenommen hat, werden ebenfalls publiziert. Die neue Art ist bislang nur vom Typenfundort Don Duong bekannt. Einige Aspekte zum Vorkommen und zur Verbreitung von *Amphidromus*-Arten werden diskutiert.

Introduction

Amphidromus ALBERS, 1850 is a large genus of land snails, whose shells impress by eye-catching colours and patterns (e. g. fig. 25, plate at third cover page) and are therefore sought after by shell collectors. Species of *Amphidromus* belong to the so-called “tree snails”: they are arboricol and live on shrubs and trees in evergreen vegetation, preferably pristine forests, as far as is known. Their distribution is mainly restricted to the Indomalayan realm (“Oriental realm”). On Timor Island, or more specifically western Timor, the genus reaches the north-western edge of the Australasian region, with only *A. cognatus* FULTON, 1907 surmounting the Timor Sea and penetrating into Australia. While the taxonomic study of *Amphidromus* has never been a steady process, descriptive work on this genus became exceptionally intense in the last two decades (Fig. 1). Earlier, the decade between 1889 and 1898 had been another heyday of *Amphidromus* description, mainly due to the “List of the Species of *Amphidromus* ...” published by FULTON (1896). The high number of supraspecific taxa in *Amphidromus* is distinctive. Alone of *A. adamsi* REEVE, the describing author recognised ten different „varieties“. In the synoptic catalogue of *Amphidromus* by LAIDLAW & SOLEM (1961) 75 species are determined. The recent increase in described species (and a few other taxa) is due to several scientists and collectors, most notably JOHN ABBAS, BENJAMIN DHARMA, JEFF PARSONS, ANH PHAM, MIKE SEVERNS, and NGUYEN NGOC THACH. In the period from 1993 to May 2017, a total of 46 species and 16 subspecies of *Amphidromus* were newly described and several species that had not been found for decades were rediscovered. Here I describe a new species of *Amphidromus (Syndromus)* that was collected by Mr. PENG WEI in the province Lam Dong, Vietnam.

Material and methods

Specimens of the new species were acquired on the bidding platform “Shellauction”, where they were offered as “an obviously hitherto undescribed species of *Amphidromus*”. The holotype was purchased on 23 December 2016, the paratype in February 2017. In addition, the collector was contacted in order to obtain further information on the species’ habitat and behavior in-situ. Mr. PENG WEI was even able to provide excellent photographs of live individuals, a rare circumstance enhancing the value of the discovery described here. For comparison of *A. (S.) sylviae* with similar species I studied specimens in my collection and, when those were not available, descriptions and photographs in the literature and on the internet.

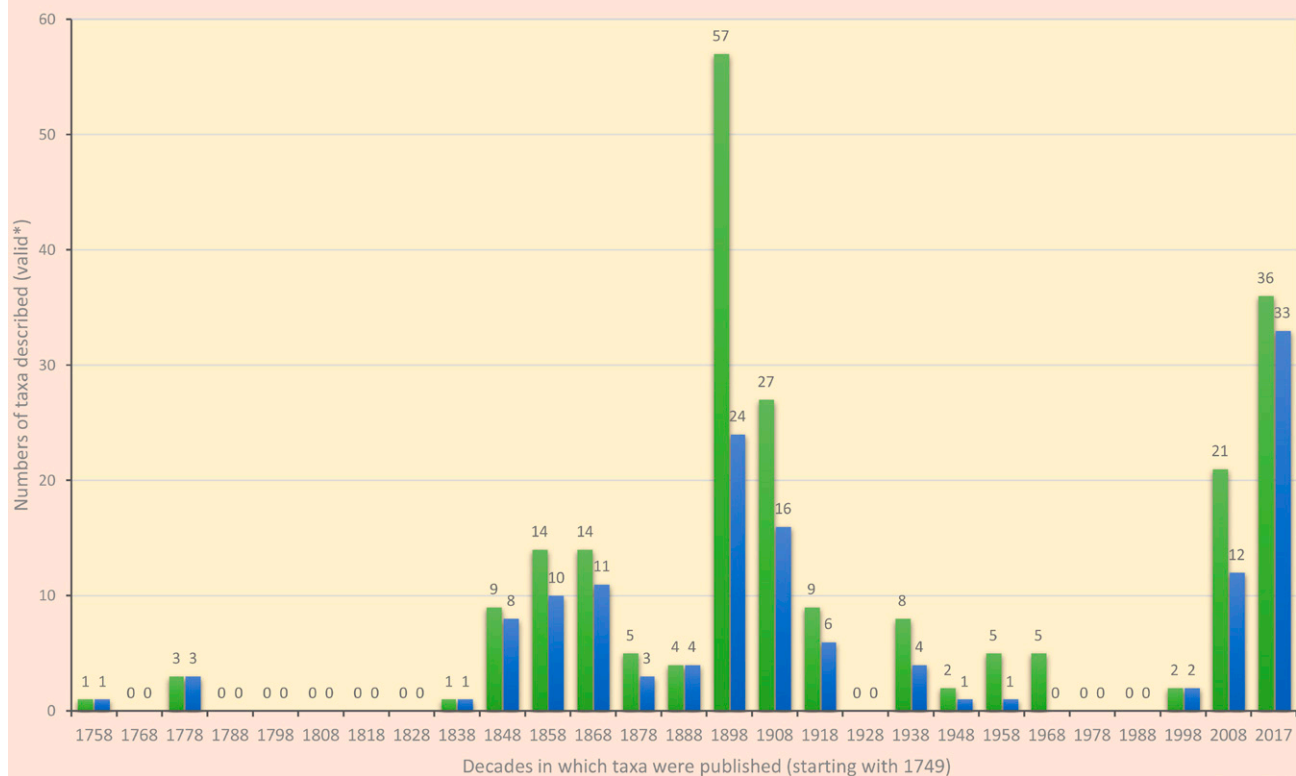


Fig. 1: Numbers of taxa (species, subspecies, “colour forms”) of *Amphidromus* ALBERS, 1850 described in 1758–2017 per decade starting with 1749. [Cutt of date 3 June 2017.]

Description

Amphidromus sylviae spec. nov. (Figs 3–19)

zoobank.org:act:9484A49B-3A05-4A93-A11D-B7F8000872C9

Holotype: Mature shell; Vietnam, Don Duong Province, Lam Dong, collected on a small hill covered by tall deciduous trees [e. g. Durian (*Durio zibethinus* L. ex MURRAY)] in 3–4 m height, 9 December 2016, leg. Mr. PENG WEI (Dalian City, Liaoning, Peoples Republic of China). The specimen will be deposited in the molluscan collection of the “Zentralmagazin Naturwissenschaftlicher Sammlungen” at the Martin-Luther-University of Halle (MLUH). See Figure 2 for the specimen label.

Paratype: Mature shell; with the same data as the holotype. The specimen will be kept in the private collection of the author (ANDREAS STARK, Halle) for the time being.

Derivatio nominis: This new species is named after my wife Sylvia who stands by my side since 1982, tolerating my foibles as well as encouraging my studies in natural history. Sylvia has always supported my enthusiasm for landsnails, which reawakened in 2005, and for entomology and palaeontology. Finally I found the unnamed species that I regard as worth bearing her name – my way to say thank you for many years of love and company. The name, Sylvia, is of Latin origin, meaning “belonging to the woods”, in the figurative sense also “queen of the forest”, an allusion to the species’ provenance.

Description of the holotype shell (Figs 3–10)

The shell is 29.6 mm high and 16.0 mm broad. The shape is sinistral and without parietal callus, typical of *Syndromus*, elongate-conical helicoid, with 6.5 whorls. The surface is smooth, almost completely lacking radial growth-lines or sculpture, with signs of a resting stage on the fifth whorl, but no varix. The aperture is 0.4 times the height of the shell (= 13 mm). The mature lip is expanded, dark-brown to violet, with the outer edge nearly black, followed by both a whitish-yellow and black stripe. The mouth of the shell is dark violet-black. This dark colouration of the shell’s inner is restricted to the last 1.5 whorls (fig. 10), the inner of the younger whorls is white. Seen from the outside the last whorl is bright yellow just before the lip. There is no parietal callus (Fig. 8). The palatum is dirty yellowish, not very thick, but visible. The mature whorls are basically intensely yellow. The apical whorls are pale; the protoconch is colourless and obviously without structure, smooth but not shining (Fig. 9). There is a thin, dark peripheral band that starts at the parietal corner of the lip and fades out near the back of the aperture (Fig. 5). Almost all of the shell has oblique radial streaks, which are green at the mature whorls, and grayish to brownish on the

Figs 2–10: *Amphidromus (Syndromus) sylviae* spec. nov., holotype. – **Fig. 2:** Facsimile of the original label. **Fig. 3:** Ventral view in natural size (29.6 mm). **Figs 4–6:** Enlarged view (4 x) in different orientations. **Fig. 7:** View from top. **Fig. 8:** Insertion of the lip at the palatum. **Fig. 9:** Protoconch. **Fig. 10:** Shell illuminated from behind to show the extension of dark colour on the inside. ➤



4



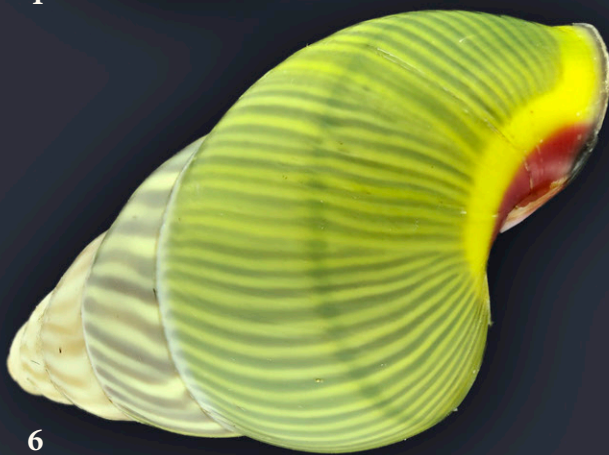
3



5

Amphidromus (Syndromus)
sylviae STARK, 2018
HOLOTYPE
 Vietnam, Don Duong Distr.,
 Lam Dong Prov. [Don Duong,
 Lam Dong] collected on
 high deciduous trees in 3-4 m
 height, 9th December 2016
 leg. Pang Wei (Chn.) [coll. A. St.]

2



6



7



8

9



10



12



13



11



14



15



Figs 16–19: *Amphidromus sylviae* spec. nov. crawling on deciduous leaves (mostly of Durian) in their natural habitat. (Photographs by PENG WEI).

younger whorls. They disappear towards the 3–4 top whorls. On the last whorl these streaks are strikingly regular and parallel to each other. The streaks are never split, but those on the top whorls are somewhat broader and paler, with a rather greyish-brown tinge and less regular compared with the last whorls. The base of the shell is bright yellow with green streaks, which originate from the ostracum, not the periostracum. The columellar fold, which is pinkish-purple, leaves the umbilicus narrowly open. At the base of the shell, parallel to the columellar fold, is a blood-red stripe, which is accompanied by a bright yellow band that continues on the hind margin of the lip (Fig. 6).

Remarks on the paratype shell (Figs 11–15)

With a height of 38.6 mm, the paratype shell is the largest of all the shells I have seen of this species (see Further material). Its colours are not as dark and contrasting as in the holotype (Figs 3–8) but otherwise similar. The peripheral band on the last whorl is pale, not dark. The last whorls are basically pale yellowish, with numerous greyish-green stripes. The basal whorls have a light bluish-gray tinge. The red band at the umbilicus is not as broad and intense as in the holotype shell.

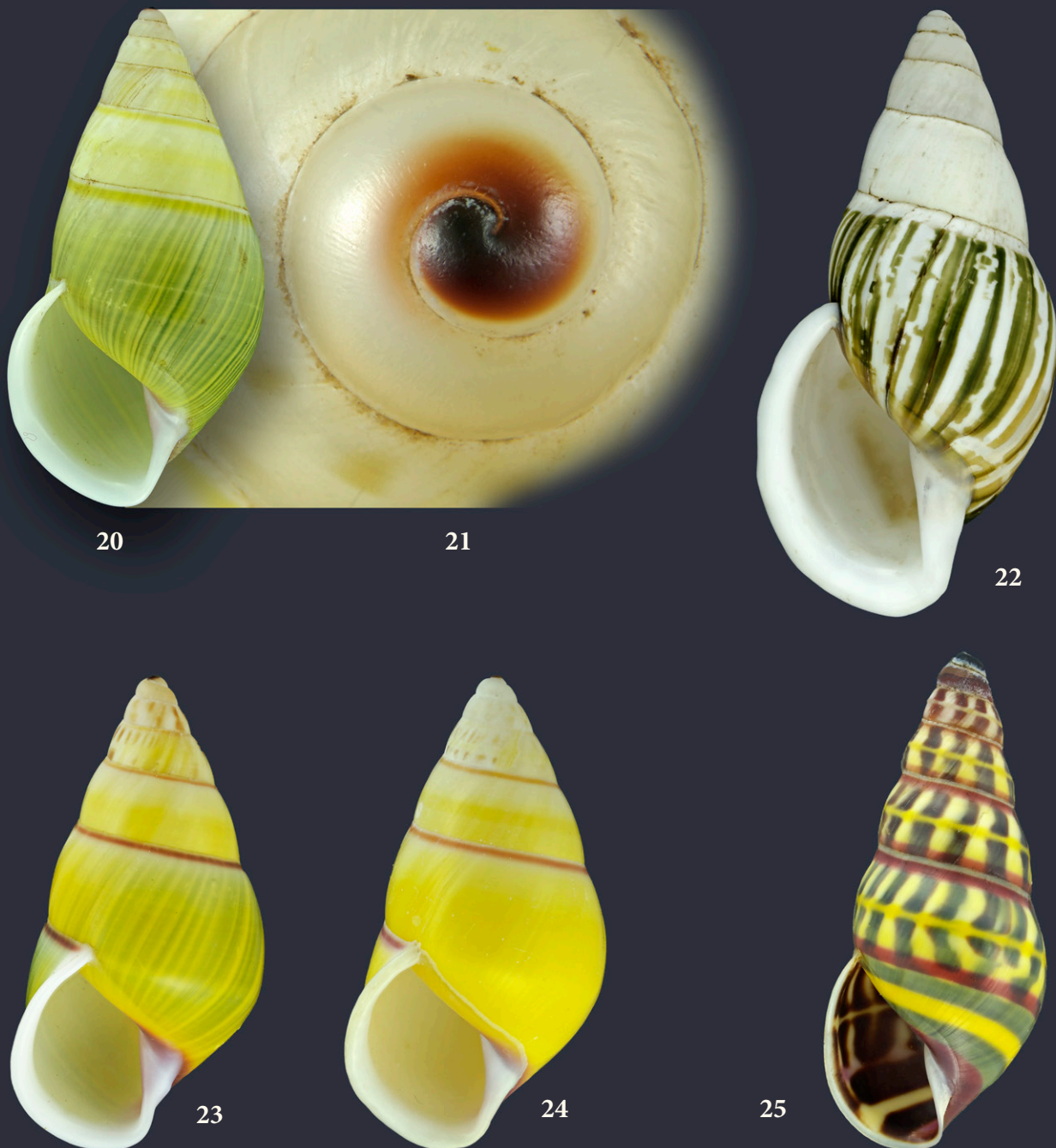
Description of the animal based on photographs (Figs 16–19)

The dominant colour is a whitish-grey. There is a broad, darker median stripe with dark purplish tinge, which leaves the granules pale. All of the head, ocular and sensory tentacles are pinkish-rose. The mantle, which is basically pale grey, becomes nearly white at the end of the foot (Figs 16, 18). No soft body was available for study.

Further material

To my knowledge, another five specimens of the newly described species were offered on internet auctions between December 2016 and March 2017. According to the collector, Mr. PENG WEI, they have the same data as the types. Of these specimens, which I was not able to study (and which are therefore not included in the type series), pictures were published on the internet (<http://www.shellauction.net>) providing some additional information. Most of these appear to have had two growth seasons before the mature lip was formed. The shell size ranges from 33.3 mm to 36.7 mm. No dextral shells are known. One of the shells, a bright yellow specimen without green lines, lacks the black colour on the inside of the mouth; this might be a special colour-form (see Fig. 17 for a different but similar specimen).

◀ **Figs 11–15:** *Amphidromus (Syndromus) sylviae* spec. nov., paratype. – **Fig. 11:** Ventral view in natural size (38.6 mm). **Figs 12–15:** Enlarged view (3 x) in different orientations.



Figs 20–25: Patterns and colour of periostracum and mouth in different *Amphidromus* species. **20, 21:** *A. (Syndromus) setzeri* THACH, 2015; – 19: Mature shell with green stripes of periostracal origin; – 20: Protoconch. **Fig. 22:** *A. cf. reflexilabris* f. *hanielanus* (RENSCH, 1931), shell of nearly white/ebony basic colour with green radial stripes of periostracal origin, natural size of the shell 45 mm. **Figs 23, 24:** *A. quadrasi* HIDALGO, 1887 from Bugsuk Island, Philippines, natural size of both shells 34 mm; – 22: With green radial stripes of periostracum; – 23: Shell with periostracum removed. **25:** *A. (Syndromus) columellaris sieraensis* from Tanimbar Island, Indonesia; natural size of the shell 27 mm. All shells in collection A. STARK (Halle).

Differential diagnosis

Amphidromus (Syndromus) sylviae is a very distinctive species. Its characters are compared here only with *A. (S.) smithi* FULTON, 1896; *A. (S.) setzeri* THACH, 2016; *A. (S.) daoae* THACH, 2016; *A. (S.) ledaoae* THACH, 2016, and *A. (S.) friedae* THACH, 2016, all found in Vietnam. Other, superficially similar species occur in considerable distance to the type locality of *A. (S.) sylviae* and are therefore distinguished alone by distribution (see Discussion).

Photographs of the types of one of the similar species, *Amphidromus (S.) smithi*, were published by SUTCHARIT et al. (2015) and THACH (2015: figs 9, 10; 2016: plate 29, fig. 373]. This species shares with *A. (S.) sylviae* spec. nov. the black lip but differs in the following characters: the shell is more slender; the suture is very smooth, provided with a thin black band on the last whorl, and lacks radial streaks or bars on the top whorls. As another characteristic of *A. (S.) smithi*, the quasiparallel green stripes on the last whorls in are somewhat irregular regarding the intensity

of colour and distance to each other. Also, the green stripes appear to originate from the periostracum, not the uppermost layer of the ostracum (see Figs 20, 22–24). Shells of *Amphidromus* (S.) *setzeri* are usually smaller and have a white lip; the protoconch is brown (Fig. 21), not colourless. To present knowledge, the distribution of this species is restricted to the Vinh An area in the province Dong Nai in south Vietnam. *Amphidromus* (S.) *daoae* and *A.* (S.) *ledaoae* are generally similar to each other. Both lack parallel stripes on the last whorl, a clear distinction to *A.* (S.) *sylviae*. Furthermore, the shell of *A.* (S.) *ledaoae* has a red or orange spiral band below the suture, which lacks in *A.* (S.) *sylviae*. *Amphidromus* (S.) *friedae* is peculiar in having a black lip, greenish periostracum, no radial streaks, and a black parietal wall.

Discussion

Nowadays the World Wide Web makes it easy for practically everybody to follow the exciting discovery process we are now witnessing in tropical land snails, with the internet offering great opportunities for both the communication of data and the trade of specimens. While the impressive increase in our knowledge of *Amphidromus* (and other land snail) biodiversity is certainly intriguing and welcome, information available from internet resources leaves no doubt that this is accompanied by enormous impairments of the living environment of these organisms. A glimpse on the physical map of Vietnam on Google Earth reveals a forest landscape that gets more and more fragmented, with forest roads literally paving the way into previously remote stretches of pristine forest – also to the benefit of shell collectors. This exploitation process is of ambivalent, almost paradoxical nature: to the same extent that our taxonomic knowledge is increasing, the biodiversity we pursue to study is likely to decrease. It is obvious that small-range species, such as *Amphidromus*, are particularly affected by this process.

In recent years many new species of *Amphidromus* were described from Indonesia, Malaysia and Vietnam, and, according to internet resources, a number of unnamed species from Laos and Vietnam are awaiting description. While SCHILEYKO (2011) knew of 22 *Amphidromus* species (plus one subspecies) in Vietnam, another 19 species (including *A. noriokowasoei* (THACH & HUBER 2017) and *A.* (S.) *sylviae*) have been added to the country's faunal list in just a few years. [Note that the Vietnamese record of *Amphidromus chloris* (REEVE, 1848), originally described from the Philippines, is probably a misidentification and presumably refers to one or more sibling species.] Vietnam, with the highest diversity of *Amphidromus* known on the planet, appears to be a recent centre of distribution for these land snails.

One of the most important recent publications on *Amphidromus* is that of SUTCHARIT et al. (2015). The authors published colour photographs of all 85 name-bearing types housed in the collections of the Natural History Museum in London. As the “type” [holotype] of a species is the only standard to re-evaluate other taxa (species, subspecies, “colour forms”), this paper gives the possibility to get a better imagination of species which only have been figured by black and white drawings or only by a written description in the original papers. Only with a few exceptions [e. g. recently *A.* (S.) *globonevilli* SUTCHARIT & PANHA, 2015 and *A.* (S.) *principalis* SUTCHARIT & PANHA, 2015] new *Amphidromus* species have been fixed by the shape and colouration of the shell. However SUTCHARIT et al. (2015: 51) mention that an evaluation of the “species as biological entities is largely outside of the scope of this study” and so they have “only” figured the taxa. This paper was evident to enlighten the status of *A. smithi*.

Considering their poor capability of dispersal, land snails are promising objects for evolutionary biological studies, an aspect emphasised by GOLDBERG & SEVERNS (1997). With a focus on *Amphidromus*, these authors point to a number of phenomena that they regard as worth investigating: frequency dependent selection, genetical drift, founder effect, character displacement. Obviously HANIEL (1921) was the first who had an idea of the existence of these phenomena in *Amphidromus*. He collected more than 1,500 shells of this genus in West-Timor. It is worth to note, that he not only registered the exact localities but was aware to note all places where the snails were absent as well (HANIEL 1921: 3): “An allen anderen Plätzen, wo ich oft Tage und Wochen blieb und in der Runde Exkursionen und Bergbesteigungen machte, fand ich keine *Amphidromus*. Die einzelnen Fundplätze sind über dem Westen Timors ... zerstreut und weit auseinander gelegen. ... In den Zwischenstrecken waren keine Schnecken. Eine ausgesprochene Trennungslinie bildet der Fluß Noimina. Wir wollen später untersuchen, ob er vielleicht als Isolationslinie eine Rolle gespielt hat.“ [„At all other localities, where I often stayed several days or weeks and made excursions in the vicinity and climbed mountains, I did not find *Amphidromus*. The single finding places are spread over West Timor and are wide apart from each other ... In the tracks between them snails were absent. A distinct boundary line is the river Noimina. We later on will investigate, if it has played a role as isolation line.” (translation by A. S.)]. It may be suggested, that many if not all isolated populations at Timor might represent true species. Some very recent publications support this presumption (e. g. THACH & ABBAS 2017).

An important aspect of future investigations will be to clarify the status of many taxa on the basis of precisely accurate locality data. Many snail populations had been lived or are living in isolated locations: on islands, on mountains or in river valleys. Isolation can normally not be surmounted by crawling or migration. What we see, when a population in a forest is spotted, is the status quo at this moment. One may try to find the animals around this area, but fail. The conclusion is, that this might be an isolated population. If this is indeed the case, one can be quite sure, that the members of this population will not be able to reach other isolated populations, which are several ten/hundred/thousand miles away from this “reproductive community”. According to the paleo-endemism concept the distribution area of an ancient species was splitted into smaller, isolated units a long time ago. These sub-populations were isolated e. g. by a declining or rising sea level, by drought in deeper valleys, by catastrophic

weather events etc. pp. These developments may have a history of several thousands of years – time enough, to cause even genetical adaptations. In the case of the isolated populations detected by HANIEL (1934) their members might – if put together in a terrarium – reproduce and will have fit progeny. The status quo is, that they will not come together and have clear distinctions in shell shape. So the observer is on the horns of a dilemma: the biospecies concept will work by unifying the populations only artificially (by human support), the morphospecies concept will work by comparing the shape of the shells between the populations. As regards neo-endemism, the snails may be spread from a population to another geographically isolated area, e. g. by storms, birds or human transport. In the latter case the time to get genetically isolated might have been too short. This matter is mentioned here because seen through our eyes larger areas may be suitable for the occurrence of several species. However, often the opposite is the case. One may wonder, why so many *Amphidromus* species seem to survive the destruction of the natural vegetation – their original habitat – and will be found years later alive and kicking on leaves of coffea, cocoa, durian or other fruit trees and on the other hand are not “able” to expand their distribution or spread over distances by migration. In one of the last auctions one of the dealers stated while offering *A. setzeri*: “Dong Nai Province in Vietnam. Caught on Rambutan trees in a plantation, without any primary forest nearby.” Most probably factors of the fundamental niche are responsible for this. If the natural vegetation cover was not destructed by fire, landsnails may have a chance to survive at their places. The phenomenon of homing (the ability of an animal to return to a distinct place) is known to be an important behavioural issue in landsnails (see e. g. JUNKER 2016). This should not be underestimated in the interpretation of the distribution of certain species and their ranges. This generally means that snails which were dislocated from their resting places, are able to return to. The significance of this phenomenon deserves in the discussion of endemism is as far as I know, not yet focused. As GOLDBERG & SEVERNS (1997) point out, translocation most probably is due to storms, passive transport by birds or fruit bats. How these forces may act at inland habitats is not clear.

Most probably *A. (S.) sylviae* inhabits a restricted area and therefore might be considered endemic to Lam Dong province in Vietnam. The fact to live in small areas might be true for many of the recently described species. Therefore it is important, to be aware of this fact and to protect the species from extinction. This is mainly due to avoid further deforestation and especially to inhibit the complete removal of woody plants to create arable land.

Acknowledgements

My great thanks are due to Mr. PENG WEI, Dalian, China, who found all the specimens known of this species and kindly contributed information on the type locality and photographs of live individuals. Dr. MATHIAS JASCHHOFF, insect taxonomist at Station Linné, Färjestaden, Sweden, read and commented on the manuscript.

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"... deciduous green periderm." (A)

A. schomburgki (PFEIFFER, 1860)
Chonburi City, Thailand, ↑ 40 mm



"... broad spiral color bands ..." (A)

A. metabletus ... *f. trizona*
V. MOELLENDORF, 1901
Nha Trang Province, Vietnam,
↑ 39 mm

".. narrow spiral bands ..." (A)



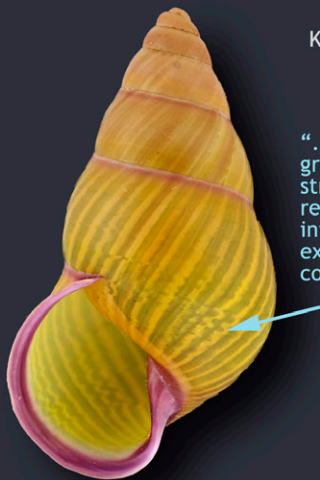
A. laevis (MÜLLER, 1774)
Kisar Island, Indonesia, ↑ 36 mm

"... broad radial flame-like markings ... and a roseate aperture." (A)



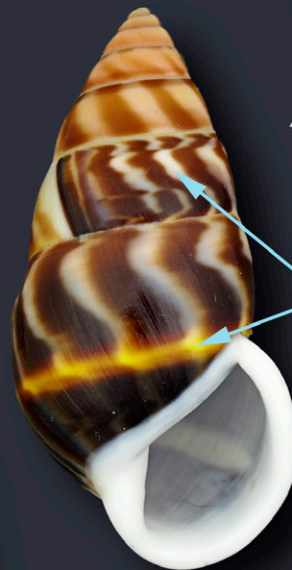
A. latestrigatus latestrigatus
SCHEPMAN, 1892
East Sumba, Indonesia, ↑ 40 mm

"... irregularly spaced apple-green collabral lines, ..."; "... stripes ... variable in width, sub-regular to ragged and randomly interconnected by short side extensions, partly interrupted or coalesce ..." (B)



A. alicetandiasae
PARSONS, 2016
Sarawak, Malaysia, ↑ 40 mm

"... interrupted zonation ... numerous wavy ... flammulations that are partially interrupted by a ... peripheral color band ..." (A)

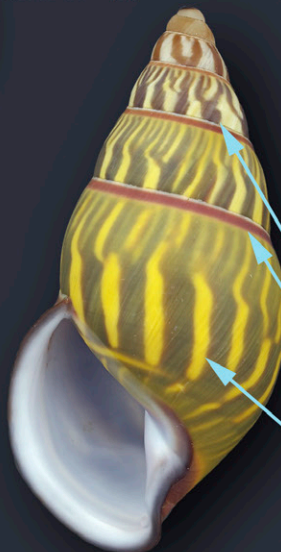


A. perversus melanomma
(PFEIFFER, 1852)
Pulau Sepanjang, Indonesia, ↑ 60 mm

"... forked brownish radial markings ..."

"... red subsutural band ..."

"... color flames ..." (A)



A. quadrasi everetti
Fulton, 1896
Rio Tuba, Palawan, Philippines ↑ 58 mm

Plate: Explanation of colour patterns in *Amphidromus*

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