



TERRESTRIAL GASTROPODS (MOLLUSCA)
OF PROVINCE MADANG IN PAPUA-NEW GUINEA.
PART III. PULMONATA: RATHOUSIIDAE, ELLOBIIDAE,
SUCCINEIDAE, AGRIOLIMACIDAE, ENDODONTIDAE
(PARTIM), ARIOPHANTIDAE, EUCONULIDAE,
SUBULINIDAE, STREPTAXIDAE

ANDRZEJ WIKTOR

Museum of Natural History, Wrocław University, Sienkiewicza 21, 50-355 Wrocław, Poland
(e-mail: awiktor@biol.uni.wroc.pl.)

ABSTRACT: This paper is the third publication devoted to the gastropods of the province of Madang in Papua-New Guinea. The morphology, distribution and ecology of species found by the author during his field research in Papua in 1990 are discussed, providing also information on the species recorded from this region by former researchers yet not confirmed to occur by himself.

KEY WORDS: Gastropoda, terrestrial Pulmonata, taxonomy, Papua-New Guinea, Province Madang

INTRODUCTION

The material for this study was collected by the author during his three month visit to Papua-New Guinea in 1990 (September–December). The specimens are kept at the Museum of Natural History, Wrocław University (Poland). The first part dealing with terrestrial malacofauna of Province Madang covered Prosobranchia (WIKTOR 1998), the second (WIKTOR 2002) was devoted to two new species of *Cryptaustenia*. The present paper is concerned with some families of terrestrial Pulmonata, the remaining taxa will be discussed in subsequent publications.

The province concerned is a mountainous territory, the highest peaks in its immediate neighbourhood reaching 4,500 m a.s.l. Although most of the terrain is situated at lower altitudes, the whole area is hilly and cut by deep valleys. Originally, it was probably covered by jungle, which is primaevial rain forest. As a German colony was once established there, in literature the area is often referred to as “Deutsch Neuguinea” (= German New Guinea). Since the colonial times, and especially during World War II and after it, several roads have been built, with many planta-

tions of coconut palms, cocoa trees, coffee etc. situated along them. Near those roads, colonisation by the local people and the accompanying devastation of the pristine habitats are observed. Apart from that, trees are felled for timber, and the locals burn the jungle to acquire land for their own gardens. The forest regeneration after the cultivation has ceased is very slow, and most commonly the ruined jungle is replaced by a secondary grassy vegetation covering the denuded slopes, or by poor bush. In human-transformed places introduced snail species, most frequently representing the so-called circum-tropical group, appear. Natural open, un-forested, habitats within the study area occur almost exclusively in the alpine zone, i.e. above the timberline (over 3,000 m a.s.l.).

Province Madang is among the earliest explored by malacologists. Most material was collected and the results of its examination published at the close of the 19th and the beginning of the 20th century. Then the research stopped, with only the northern part of New Guinea being studied. The earlier studies on terres-

trial snails of Papua were based on material provided by various, usually accidental, collectors, and analysed by specialists who had not been to the area themselves. Collecting snails in Papua is rendered difficult by the fact that in the primaevial tropical forest the density of snails is very low, and many species live in tree crowns. The apparently homogeneous jungle is immensely mosaic in character, actually highly diverse botanically, and certainly ecologically. Moreover, it is very difficult for a collector to move in the very thick jungle with many obstacles (marshy ground, oxbows, steep slopes, etc). At times all-day searches yielded merely a few empty shells. It also seems that in this humid environment empty shells last only for a very short time, then corrode and decompose, apart from being difficult to find. This may account for the fact that collections on which early publications were based include mainly thick shells of large snails which were easier to find. In the first part of my study on the snails of Province Madang, devoted to *Prosobranchia* (WIKTOR 1998), a relatively large percentage of the snails described were species new to science. Most of them are very small snails escaping notice of many collectors. In the second part (WIKTOR 2002) I described two pulmonate species new to science. The present, third, publication also deals with pulmonates. Most of them were already known, from other parts of New Guinea if not from the province concerned.

For the sake of facilitation, the numbering, description and map of the localities are repeated after part one (Map 1).

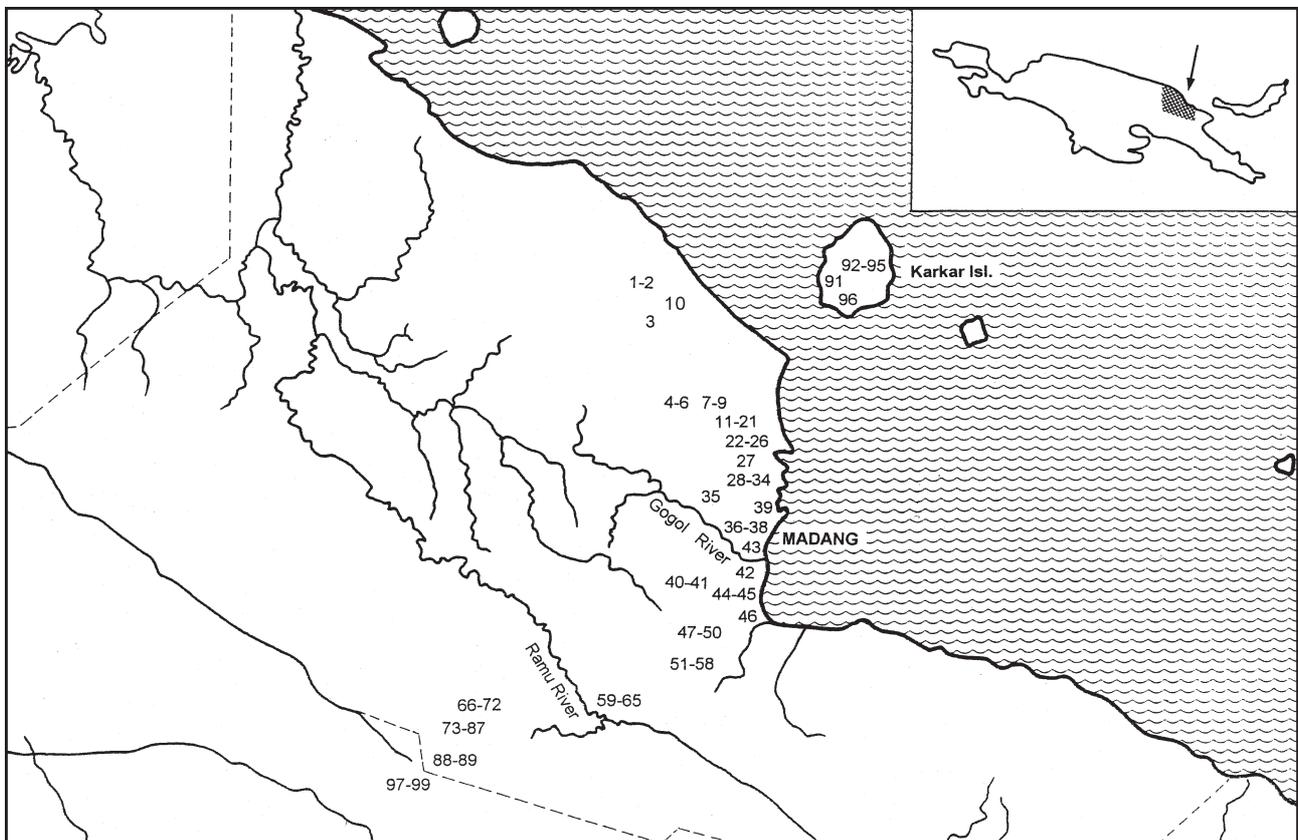
ABBREVIATIONS

Abbreviations used in the figures:

- App – appendix
- Dh – ductus hermaphroditicus
- E – eversible part of the Simroth gland
- Eg – egg
- Ep – epiphallus
- Ga – glandula albuminalis
- Gh – glandula hermaphroditica
- Ov – oviductus
- P – penis
- Rp – musculus retractor penis
- Sg – Simroth gland
- Sp – secretory part of the Simroth gland
- Spt – spermatheca
- Spov – spermoviductus

Abbreviations of collection names

- HNHM – Hungarian Natural History Museum, Budapest (Hungary)
- MNB – Museum of Natural History, Berlin (Germany)
- MNHW – Museum of Natural History, Wrocław University (Poland)
- NMNL – National Museum of Natural History, Leiden (The Netherlands)



Map 1. Map of the localities studied by the author



RBI – Royal Belgian Museum of Natural Sciences, Brussels (Belgium)
SMF – Natural History Museum, Senckenberg, Frankfurt a/Main (Germany)
ZMA – Zoological Museum, University of Amsterdam (The Netherlands)

LIST OF LOCALITIES

Province Madang

- 1 – near Kabanass vill. (ca. 65 km N of Madang, W of the road to Bogia), between vill. Magiar and Wasabamal, coconut plantation, limestone, ca. 60 m a.s.l., 16.10.90
- 2 – near Kabanass vill. (ca. 65 km N of Madang, W of the road to Bogia), between vill. Magiar and Wasabamal, fragment of destroyed rain forest, ca. 60 m a.s.l., 16.10.90
- 3 – Kurum (Ald Post) (ca. 65 km N of Madang and ca. 9 km W of the road to Bogia), rain forest adjoining a coconut plantation, 16.10.90
- 4 – near Yap vill. (N of Yoidik vill., ca. 50 km N of Madang, W of the road to Bogia), near Matukar Plantation, primaevial rain forest, ca. 60 m a.s.l., 13.10.90
- 5 – near Yap vill. (N of Yoidik, ca. 50 km N of Madang and W of the road to Bogia), stream, ca. 60 m a.s.l., 13.10.90
- 6 – near Yap vill. (N of Yoidik vill., ca. 50 km N of Madang and W of the road to Bogia), artificial pool, 13.10.90
- 7 – near Yoidik vill. (ca. 45 km N of Madang, W of the road to Bogia), primaevial rain forest, ca. 80 m a.s.l., 12.10.90
- 8 – near Wsawar vill. (N of Yoidik vill., ca. 50 km N of Madang, W of the road Bogia-Madang), primaevial rain forest, 12.10.90
- 9 – near Wsawar vill. (N of Yoidik vill., ca. 40 km N of Madang, W of the road to Bogia), river, 12.10.90
- 10 – ca. 10 km SW of vill. Yodicum (on the road Madang–Bogia, N of Madang), primaevial rain forest, 20.11.90
- 11 – near Ulolan vill. (ca. 32 km N of Madang, 15 km N of Alexishafen), trees on the coast, 11.10.90
- 12 – near Ulolan vill. (N of Madang, ca. 15 km N of Alexishafen), *Catophyla* trunks on the coast, 21.10.90
- 13 – near Rempi Mission (N of Alexishafen, ca. 35 km N of Madang), 24.09.90
- 14 – ca. 15 km N of Alexishafen, near the road to Baiteta vill. (N of Madang), primaevial rain forest, in litter, ca. 60–80 m a.s.l., 20.09.90
- 15 – ca. 15 km of Alexishafen, near the road to Baiteta vill. (N of Madang), ca. 50 m a.s.l., stream, 20.09.90
- 16 – ca. 20 km NW of Alexishafen (N of Madang), primaevial rain forest, 21.09.90
- 17 – ca. 20 km NW of Alexishafen (N of Madang), stream, 21.09.90
- 18 – near Baiteta vill. (ca. 25 km NW of Alexishafen and N of Madang), ca. 80 m a.s.l., 21.09.90
- 19 – near Baiteta vill. (N of Madang and Alexishafen), primaevial rain forest, ca. 100 m a.s.l., 3.12.90
- 20 – W of Baiteta vill. (ca. 25 km NW of Alexishafen and N of Madang), river bank, primaevial rain forest, ca. 80 m a.s.l., 22.09.90
- 21 – in the region of Baiteta vill. (N of Madang and Alexishafen), primaevial forest, limestone, 25.11.90
- 22 – Cape Barschtsch (N of Madang, ca. 5 km N of Alexishafen), coast, 20.10.90
- 23 – ca. 8 km of Alexishafen (N of Madang), plantations and gardens with banana trees, 25.09.90
- 24 – ca. 6 km W of Alexishafen (N of Madang), plantations on an old Japanese aerodrome, sago-palms, 24.09.90
- 25 – sea shore near Sempil vill. (N of Madang and Alexishafen), plant debris on the beach, 11.11.90
- 26 – Mobono (Midibur) plantation (W of Alexishafen, NW of Madang), 20.10.90
- 27 – Nabanab Mission (ca. 15 km NW of Madang), near the village, destroyed forest, ca. 380 m a.s.l., 10.10.90
- 28 – near Riwo vill. (ca. 15 km N of Madang), coconut plantation with banana trees and bamboo, limestone, 19.12.90
- 29 – near Riwo vill. (ca. 15 N of Madang), coconut plantation, small ephemeral pool, 19.12.90
- 30 – near Riwo vill. (ca. 15 km N of Madang), border between a coconut plantation and mangrove forest, under a palm leaf, 23.09.90
- 31 – near Riwo vill. (ca. 15 km N of Madang), plantations on the sea shore, 3.10.90
- 32 – near Riwo vill. (ca. 15 km N of Madang), old gardens, 6.12.90
- 33 – near Riwo vill. (ca. 15 km N of Madang), among gardens, rapid stream, 6.12.90
- 34 – mangrove near Riwo vill. (ca. 15 km N of Madang), 14–15.10.90
- 35a – near Korog vill. (ca. 20 km W of Madang), ca. 200 m a.s.l., 26.11.90
- 35b – near Barahaim School, ca. 12 km W of Madang, secondary forest and gardens, ca. 200 m a.s.l., 26.11.90
- 36 – Balek (ca. 15 km SW of Madang by the road to Lae), primaevial rain forest on a cliff and hills, near a cave and sulphur spring, limestone, ca. 100 m a.s.l., 25–26.09.90, 2.10.90, 12.11.90
- 37 – Balek (ca. 15 km SW of Madang by the road to Lae), sulphuric spring near a cave, ca. 100 m a.s.l., 6.10.90
- 38 – valley of a small tributary to the Gogol River in the region of the bridge on the road Madang–Lae (near Balek), primaevial rain forest, limestone, ca. 190 m a.s.l., 6.10.90, 21.11.90
- 39 – near Bomana vill. (ca. 7 km on the road Madang–Lae), between the Gogol River and Tapo Creek (S of the road), 22.11.90

- 40 – near a ford on Tapo Creek, hills (ca. 30 km SW of Madang by the road to Lae), primaeval rain forest, limestone, ca. 80–150 m a.s.l., 28.09.90
- 41 – near a ford on Tapo Creek on the road Madang–Lae, primaeval rain forest, limestone, ca. 200 m a.s.l., 17.10.90
- 42 – near Duduela vill. (ca. 20 km SW of Madang), near Tapo Creek, fragment of primaeval rain forest, 10.10.90
- 43 – near Gumalou vill. upon the Gogol River (ca. 30 km W of Madang), stream, 1.10.90
- 44 – near Dogia vill. (S of Madang and in the mouth of the Gogol River), fragment of the forest among plantations, ca. 30 m a.s.l., 3.10.90
- 45 – near Dogia vill. (S of Madang and S of the Gogol River mouth), stream, ca. 30 m a.s.l., 3.10.90
- 46 – near the mouth of the Ivoro River (S of Madang), 3.10.90
- 47 – ca. 35 km SW of Madang by the road to Lae, primaeval rain forest, volcanic rocks, ca. 150–200 m a.s.l., 28–29.09.90
- 48 – left bank of the Nuru River (ca. 40 km SW of Madang), near the road Madang–Lae, conglomerate rocks, primaeval rain forest, in litter, ca. 100 m a.s.l., 30.09.90
- 49 – right bank of the Nuru River (ca. 40 km SW of Madang), near the road Madang–Lae, primaeval rain forest, ca. 300 m a.s.l., 2.10.90
- 50 – N of the Nuru River (ca. 40 km SW of Madang), primaeval rain forest, ca. 100 m a.s.l., 18.10.90
- 51 – near Berin vill. on the Kokum River (ca. 40 km SW of Madang), fragment of natural forest, 1.10.90
- 52 – ca. 40 km SW of Madang by the road to Lae, left bank of the Nuru River, primaeval rain forest, ca. 560 m a.s.l., 5.10.90
- 53 – near the bridge on a tributary to the upper section of the Nuru River, on the road Madang–Lae, ca. 45 km of Madang, 9.10.90
- 54 – ca. 10 km W of Ono Camp by the road Madang–Lae, primaeval rain forest, schist, ca. 200 m a.s.l., 14.11.90
- 55 – ca. 70 km from Madang by the road to Lae (near Ono Camp), primaeval rain forest, basalt, ca. 560 m a.s.l., 19.10.90
- 56 – ca. 10 km W of Ono Camp by the road Madang–Lae, primaeval rain forest between *Pandanus* leaves, 14.11.90
- 57 – ca. 10 km W of Ono Camp on the road Madang–Lae, above westward-flowing stream, schist, on rocks, ca. 200 m a.s.l., 14.11.90
- 58 – near the crossing of the Ramu Highway and road to Madang (ca. 60 km SW of Madang), (?) natural forest, ca. 400 m a.s.l., 4.10.90
- 59 – NW of Brahmin (=Braham) Mission, primaeval rain forest, ca. 200 m a.s.l., volcanic rocks, 15.11.90
- 60 – S of Brahmin (=Braham) Mission, natural forest and old gardens, volcanic rocks, ca. 400 m a.s.l., 18.11.90
- 61 – pool near the Ramu River, by the road Brahmin (=Braham) Mission–Madang, *Carex*, *Calamus*, ca. 130 m a.s.l., 15.11.90
- 62 – W of Brahmin (=Braham) Mission, near the road to Bundi, the Imbram River valley, primaeval rain forest, volcanic rocks, ca. 250 m a.s.l., 16.11.90
- 63 – SE of Brahmin (=Braham) Mission, N of Touya, left bank of the Touya River, primaeval rain forest, ca. 500 m a.s.l., 16.11.90
- 64 – SE of Touya vill. and SE of Brahmin (=Braham) Mission, primaeval forest, volcanic rocks, ca. 200–600 m a.s.l., 17.11.90
- 65 – the Ramu River valley, right of the river and N of the road Brahmin (=Braham) Mission–Madang, primaeval rain forest, 17.11.90
- 66 – Bundi, mission's garden, ca. 1,300 m a.s.l., 8.11.90
- 67 – Bundi, forest fragment near the mission's power station, schist, 1,300 m a.s.l., 9.11.90
- 68 – Bundi, near the mission (SW of Madang), ca. 1,400 m a.s.l., 23.10.90
- 69 – Bundi, forest fragment near the mission's power station, slate, destroyed habitats with bushes, ca. 1,200 m a.s.l., 9.11.90
- 70 – Bundi (NW of Madang), valley above the mission, primaeval rain forest, granite, ca. 1,350 m a.s.l., 26.10.90
- 71 – Bundi (NW of Madang), near the waterfall by the road to the Ramu valley, ca. 1,200 m a.s.l., 26.10.90
- 72 – Bundi (SW of Madang), SW of the mission, small stream valley (by the road to Budikara), fragments of primaeval rain forest, granite, ca. 1,600 m a.s.l., 24.10.90
- 73 – Pandambay vill. (near Karisokera), on the road Bundi–Yandera, Bismarck Range, primaeval rain forest, granite, ca. 2,300 m a.s.l., 28.10.90
- 74 – Pandambai vill., by the road to Karisokera, Bismarck Range (on the road Bundi–Yandera), primaeval rain forest and gardens, near a stream, ca. 2,300 m a.s.l., 28.10.90
- 75 – between Panadambai and Karisokera, Bismarck Range (on the road Bundi–Yandera), in a small stream, ca. 2,300 m a.s.l., 23.10.90
- 76 – near Pandambai vill., Bismarck Range (on the road Bundi–Yandera), primaeval forest, ca. 2,000 m a.s.l., 1.11.1990
- 77 – Pandambai, Bismarck Range (on the road Bundi–Yandera), primaeval rain forest, ca. 2,000 m a.s.l., 6.11.90
- 78 – Pandambai vill., Bismarck Range, habitat unknown (collected by locals, in A. WIKTOR's coll.), 7.11.90
- 79 – bush near Pandambai vill., Bismarck Range (on the road Bundi–Yandera), habitat unknown (collected by locals, in A. WIKTOR's coll.), 7.11.90
- 80 – near Pandambai vill., Bismarck Range (on the road Bundi–Yandera), primaeval rain forest, granite, ca. 2,000 m a.s.l., 7. 11. 90



- 81 – near Karisokera vill., Bismarck Range (on the road Bundi–Yandera), probably in a garden (collected by local children, in A. WIKTOR’s coll.), 3.11.90
- 82 – Korisakera vill., Bismarck Range (on the Bundi–Yandera road), habitat unknown (collected by locals, in A. WIKTOR’s coll.), 6.11.90
- 83 – Yandera vill., Bismarck Range, stream on cultivated land and in gardens, 1,500–1,600 m a.s.l., 3.11.90
- 84 – under “White Stone” near Yandera, forest, rock forms with some precipitate (probably calcium carbonate), ca. 1,600 m a.s.l., 3.11.90
- 85 – Yandera, Bismarck Range, grassland (?) (collected by local children, in A. WIKTOR’s coll.), 4.11.90
- 86 – Yandera, Bismarck Range, the Miriam River valley, destroyed vegetation and gardens, granite, 1,600–1,800 m a.s.l., 4.11.90
- 87 – Yandera, Bismarck Range, W part of the Miriam River valley, fragment of primaeval forest, granite, ca. 1,700 m a.s.l., 5.11.90
- 88 – region of the Iwam Pass, Bismarck Range, primaeval forest, granite, 2,600–3,000 m a.s.l., 7.11.90
- 89 – region of the Iwam Pass, Bismarck Range, primaeval rain forest, among *Pandanus* leaves, 2,600–3,000 m a.s.l., 7.11.90
- 90 – Pig Island, E of Rivo vill. and N of Madang, 12.10.90 (Small island not shown on the Map 1)
- 91 – Karkar Island, between Kevasop vill. and the volcano, gardens, ca. 500 m a.s.l., 28.11.90
- 92 – Karkar Island, between Kevasop vill. and the volcano, primaeval rain forest, 600–1,000 m a.s.l., 28.11.90
- 93 – Karkar Island, near the volcano and Mt Ulman, succession of natural forest (after an eruption in 1978), 1,000–1,200 m a.s.l., 29.11.90
- 94 – Karkar Island, in S region of Mt Ulman crater, natural succession of forest with *Pandanus* and tree-ferns (probably destroyed by eruptions in 1974 and 1978), in litter, 1,000–1,200 m a.s.l., 2.12.90
- 95 – Karkar Island, above Kevasop vill., primaeval rain forest, 400–1,000 m a.s.l., 30.11.90
- 96 – Karkar Island, sea shore near Namu School (N of Gaubin Mission), 1.12.90

Province Chimbu

- 97 – near Lake Piune under Mt Wilhelm in the Bismarck Range, mountain meadows and *Rhododendron* shrubs, granite, ca. 3,600 m.a.s.l., 31.10.90
- 98 – timberline between Kegesul vill. and Mt Wilhelm in the Bismarck Range, primaeval mountain rain forest with many epiphytes and moss, granite, 3,200–3,300 m a.s.l., 31.10.90
- 99 – between Kegsugl vill. and Mt Wilhelm in the Bismarck Range, grassy slopes, granite, ca. 3,400 m a.s.l., 31.10.90

SYSTEMATIC DESCRIPTIONS

Attention! With all figures the scale bar equals 1 mm.

Family: Rathoussiidae

Atopos (Prisma) smithi (Collinge, 1902)

Prisma smithi COLLINGE 1902: 130. Terra typica: New Guinea. Type: ?

Material: 8 alcohol-preserved specimens: 2 adult and 6 juvenile.

Localities: 2, 28, 35b, 36, 41, 86, 92.

The largest preserved individual is 85 mm long and 14 mm wide. The coloration of big individuals is dirty beige with blackish spots (Fig. 1). Juveniles are similarly coloured. The skin in live specimens is almost dry, only on irritation producing a little mucus. The whole of the back is covered by fine nodules, the integuments resembling the lizard skin.

Genitalia (Figs 2–4). The slug is difficult to find. I collected the majority of specimens from the ground, but they were mostly juveniles. The species climbs up trees, where it certainly lives. I always found single individuals. Once I noticed two individuals, the largest I had caught, close to each other on a branch several

metres above the ground, and a big mucus-covered spot just near them. This must have certainly been the mucus “platform”, on which the two had performed a mating dance and copulation. I succeeded to get one of the slugs, whereas the other fell down the tree, and I failed to find it in leaf litter. The species is not very mobile. During several days of being kept in a jar, the individual I had collected changed its position by a mere few centimetres. It was impossible to force it to crawl or to attempt escaping.

Comments. *Atopos smithi* seems to be the species whose anatomy was examined by DE WILDE (1984). The specimens studied by this author were from Kiriwina Island (Trobriand Islands), situated several

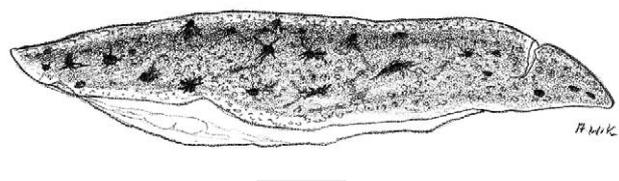


Fig. 1. *Atopos (Prisma) smithi* (Collinge, 1902) – external appearance of a specimen from locality no. 41

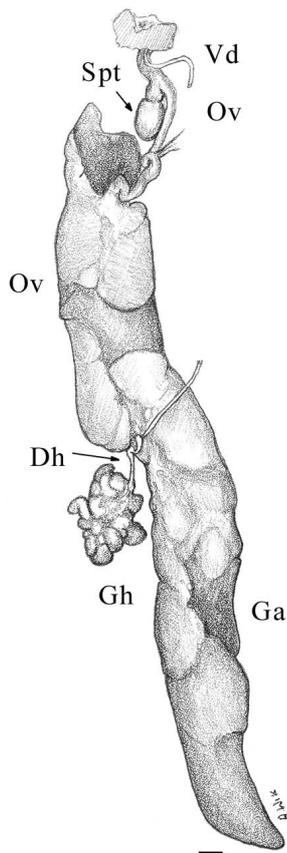


Fig. 2. *Atopos (Prisma) smithi* (Collinge, 1902) – reproductive system of a specimen from locality no. 34

hundred kilometres southward, and one specimen from Manam Isl., a few kilometres northward of my localities. A conclusion can be drawn that the slug occurs also in the vast territory of Papua-New Guinea, and the sites I visited (New Guinea Island), are situated between the localities mentioned by DE WILDE (1984).

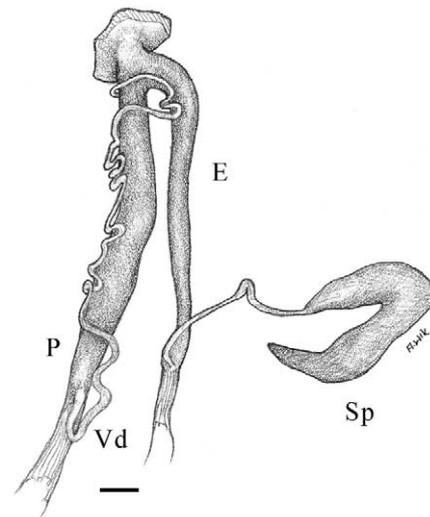
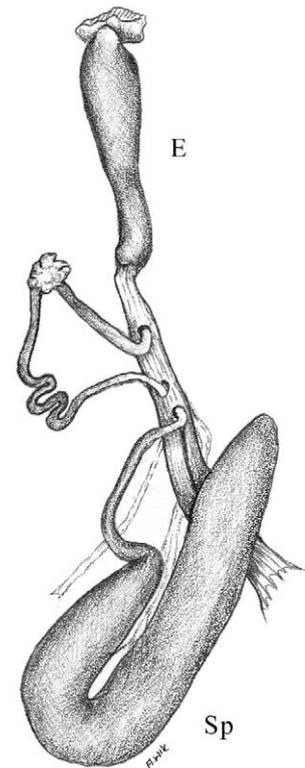
The genus *Atopos* needs a taxonomic revision. Many species have been described (HOFFMANN 1926), but their status is mostly unclear. It is not certain, either, which characters of those slugs are of the greatest taxonomic value.

HOFFMANN (1926: 28) and VAN BENTHEM JUTTING (1933: 89) mention another species of this genus, *Atopos australis* (Heynemann, 1876). The former author notes the species occurrence on Sorong Island in the Huon Gulf (south of Province Madang), whereas the latter records it from the Indonesian part of New Guinea. It cannot be excluded that the same species is concerned – the one I have also dealt with, although the drawing by VAN BENTHEM JUTTING (1933 Fig. 18) shows a different coloration of the slug.

Family: Ellobiidae

Pythia scarabaeus (Linnaeus, 1758)

Helix scarabaeus LINNAEUS 1758: 768. Terra typica: "Habitat in Asiae montibus".



Figs. 3–4. *Atopos (Prisma) smithi* (Collinge, 1902) – Simroth gland of two specimens from locality no. 34

Material: 87 alcohol-preserved specimens + 27 shells.

Localities: 11, 28, 30, 33, 90.

The shell of the specimen collected at locality no. 28 is shown in Fig. 5.

All the sites where I collected this snail are under strong anthropopressure (gardens, plantations, shore above a lagoon), which indicates that it is an introduced species. As far as I know, it has not been recorded from New Guinea so far.



Fig. 5. *Pythia scarabaeus* (Linnaeus, 1752) – shell of a specimen from locality no. 28 (photo: J. MACIAZEK)

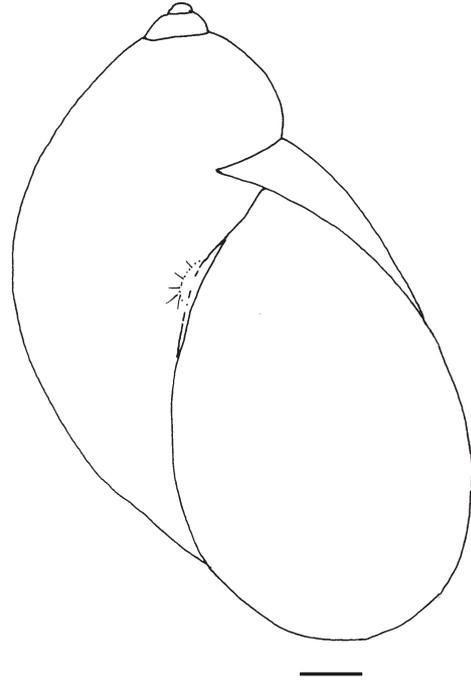


Fig. 6. *Succinea quicki* Van Benthem Jutting, 1964 – shell of a specimen from locality no. 57

Family: Succineidae

(?) *Succinea simplex* Pfeiffer, 1854

Succinea simplex PFEIFFER 1854: 123. Terra tryptica: ?

Type: ?

Succinea simplex: SOÓS 1911: 356; LESCHKE 1912: 145; VAN BENTHEM JUTTING 1964: 6.

VAN BENTHEM JUTTING (1964: 8) doubts if the identification and information by SOÓS (1911) about the occurrence of the species in the so-called “German New Guinea” (at present Papua) is correct. SOÓS’s specimens, deposited in Budapest (HNHM), have been destroyed, and there are no figures in his paper.

Succinea quicki Van Benthem Jutting, 1964

Succinea quicki VAN BENTHEM JUTTING 1964: 8, Figs 1–3. Locus typicus: Serui Id. of Japen (New Guinea). Holotype: ZMA.

Material: 135 alcohol-preserved specimens.

Locality: 57.

The appearance of the shell is shown in Fig. 6, that of the reproductive system in Fig. 7.

I collected a long series of this species in a small area of flood waters of a brook. The snail was very abundant there, but this site was the only one where I could find it.

According to VAN BENTHEM JUTTING (1964) the taxonomy of *Succinea* from New Guinea was difficult. In my opinion, the shell appearance and anatomical characters agree with the description of *S. quicki* (VAN

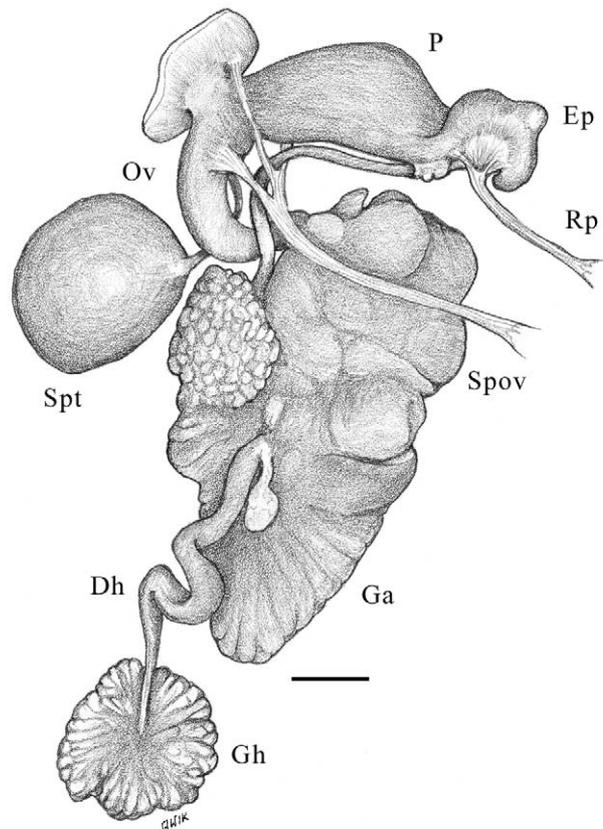


Fig. 7. *Succinea quicki* Van Benthem Jutting, 1964 – reproductive system of a specimen from locality no. 57

BENTHEM JUTTING 1964), although this snail was described from another part of the island concerned.

Family: Agriolimacidae***Deroceras laeve* (O. F. Müller, 1774)**

Limax laevis O. F. MÜLLER 1774: 1. Locus typicus: Frideriksdal (near Copenhagen, Denmark). Type: probably non-existent.

Deroceras laeve: WIKTOR 2000: 462, Figs 332–349.

Material: 16 alcohol-preserved specimens.

Localities: 83, 86.

The species has been introduced in Papua. It is a Palaearctic slug, which, as introduced, has spread nearly world-wide, from the tropics through the temperate zone to the subpolar areas (WIKTOR 2000). The two Papuan localities mentioned above are situated in the region where a gold mine had existed until recently, with the habitats much altered. I collected the slug in very humid places on shores of streams, a habitat typical of this species.

Family: Endodontidae***Paryphantopsis filosa* Van Benthem Jutting, 1964**

Paryphantopsis filosa VAN BENTHEM JUTTING 1964: 14, Figs 16–19. Locus typicus: Araucariakamp, Western New Guinea. Holotype: ZMA.

Material: 6 alcohol-preserved specimens + 1 shell.

Locality: 95.

The shell breadth is ca. 4.3 mm, height ca. 2.3 mm. In apertural view, the penultimate whorl is well visible. Aperture nearly circular. The embryonic shell is covered by spirally arranged rows of pits resembling pin punctures. The remaining part of the shell with irregular well-pronounced periostracal growth lines. In one specimen incipient protruding spines are visible on the peripheral part of the body whorl. Apart from that, on the entire shell (except protoconch) regular spiral striae occur (Fig. 8). Coloration uniformly brown, only the growth lines being slightly darker. The appearance of the shells of the snails I collected corresponds with Figures 16–19 by VAN BENTHEM JUTTING (1964), although my shells are somewhat bigger.

These snails live on rotting logs, and hide under bark. They were collected in primaeval forest with high precipitation.

Genitalia (Fig. 9). Vas deferens proportionally thick, opening to epiphallus, the latter claviformly distended at the posterior end, and more anteriorly cylindrical. Having insignificantly narrowed, this organ opens apically to penis. The latter is club-shaped. Inside it there are longitudinal rows of wrinkles or folds, and in the posterior section a kind of V-shaped ligula and a small papilla (see *P. lamelligera* below). Spermatheca has a small oval container and a long ductus spermathecae which broadens anterad. In this broadened part of the duct longitudinal folds occur. Both oviductus and atrium genitale are short and devoid of appendages.

Spermatophore (Fig. 10) – in the dissected specimen the spermatophore is simple in structure, in shape resembling a fly larva. It is provided with a smooth shiny copper-coloured envelope.

With respect to the structure of the reproductive system, this snail does not differ perceptibly from *P. lamelligera* (see the descriptions and figures below).

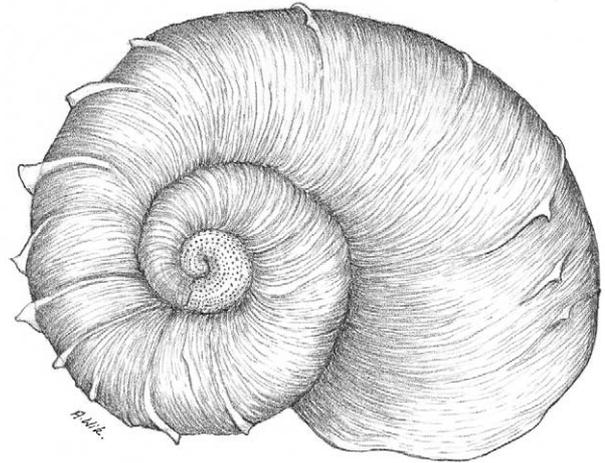


Fig. 8. *Paryphantopsis filosa* Van Benthem Jutting, 1964 – shell of a specimen from locality no. 95

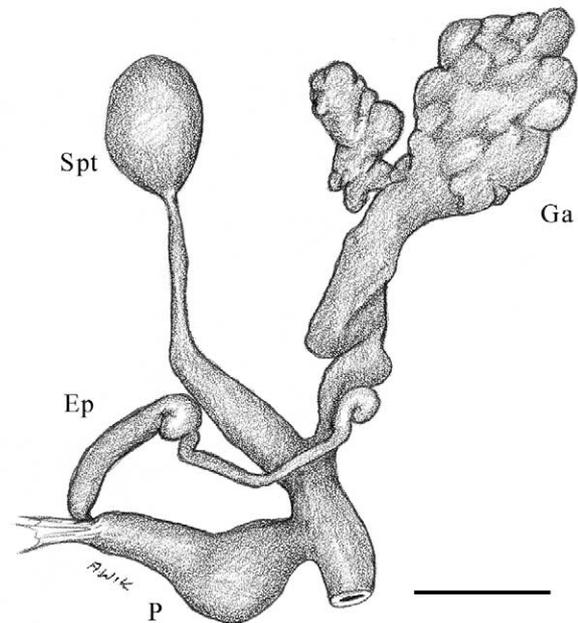


Fig. 9. *Paryphantopsis filosa* Van Benthem Jutting, 1964 – reproductive system of a specimen from locality no. 95

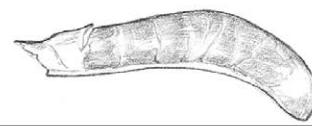


Fig. 10. *Paryphantopsis filosa* Van Benthem Jutting, 1964 – spermatophore (probably incomplete) of a specimen from locality no. 95

***Paryphantopsis lamelligera* (Thiele, 1928)**

Flammulina (*Paryphantopsis*) *lamelligera* THIELE 1928: 126, Figs 10, 10a, 11. Syntype: ? Terra typica: "In Deutsch Neu Guinea." See Comments.

Paryphantopsis lamelligera: ZILCH 1959–1960: 223, Fig. 790.

Material: 7 alcohol-preserved specimens.

Localities: 76, 77.

Shell breadth up to ca. 7.5 mm, height ca. 3.5 mm. The shell is fairly flattened, only the penultimate whorl partially visible. Suture shallow. The embryonic

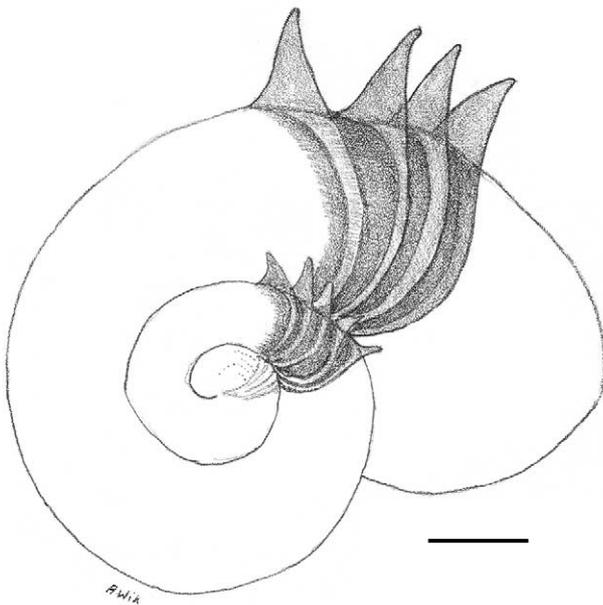


Fig. 11. *Paryphantopsis lamelligera* (Thiele, 1928) – shell of a specimen from locality no. 77, kept in alcohol spine-shaped processes not deformed

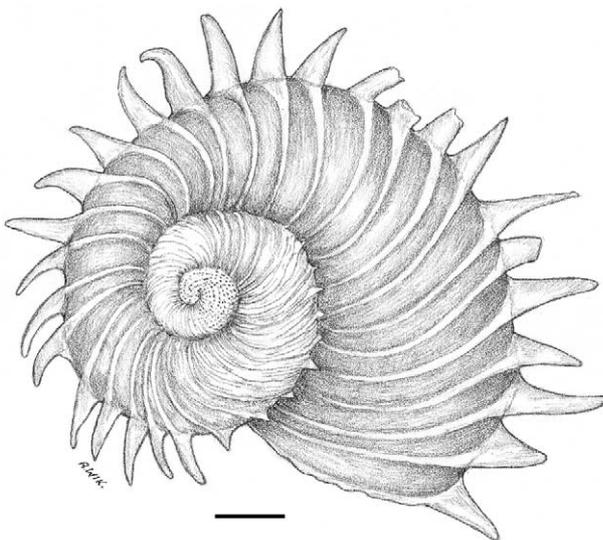


Fig. 12. *Paryphantopsis lamelligera* (Thiele, 1928) – dry shell of a specimen from locality no. 76

shell covered by rows of pits resembling pin punctures. On the remaining parts of the shell radial periostracal ribs terminating with spine-shaped processes (Figs 11–12). In fresh specimens or ones kept in alcohol, these processes have a wide membraneous part (Fig. 11), which heavily contracts after the shell has got dry (Fig. 12). Shell dark brown, radial ledges paler than the rest.

Genitalia (Figs 13–15). Vas deferens is comparatively short. Epiphallus more or less equalling the length of penis. On the border between these two organs retractor is attached. Penis is claviform since its posterior part is broadened (cf. *P. filosa*). Inside penis (Fig. 15) there is a small papilla surrounded by a fold, and also fine papillae and folds in the anterior half of this organ. Spermatheca has a small oval container, a long truncus which is half-thin and half-broadened, the broader section with a system of folds (Fig. 14). In the structure of reproductive system this snail does not clearly differ from *P. filosa* (see the description and figures below).

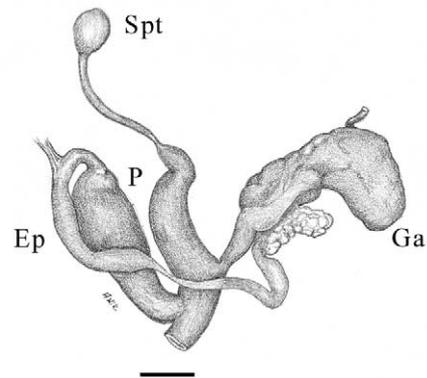
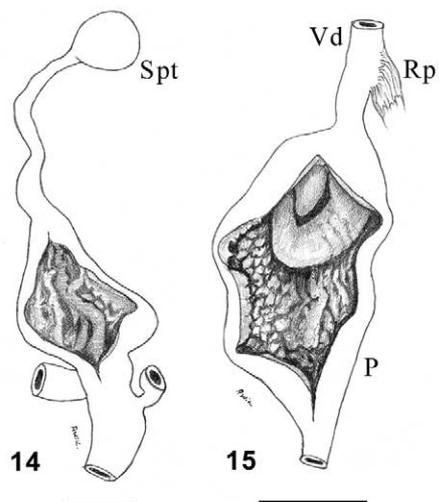


Fig. 13. *Paryphantopsis lamelligera* (Thiele, 1928) – reproductive system of a specimen from locality no. 77



Figs 14–15. *Paryphantopsis lamelligera* (Thiele, 1928) specimen from locality no. 77; 14 – internal structure of spermatheca duct; 15 – internal structure of penis

Like its New-Guinean relatives, this snail shelters under the bark of rotting tree trunks.

Comments. THIELE (1928) states that the types are “Zwei von 7 Dr. Bürgers in Deutsch Neu-Guinea gesammelte Tiere zum Teil von Meanderberg in 670 m Höhe, zum Teil ohne nähere Angaben des fundortes...”

***Philalanka quadricarinata sejuncta* Rensch, 1932**

Philalanka quadricarinata sejuncta RENSCH 1932: 33.

Type: MNB no. 104. 110. Terra typica: “Neu-Pommern” (= New Britain) “Weite Bucht, Karlei”.

Philalanka quadricarinata sejuncta: RENSCH 1937: 585.

Material: 11 alcohol-preserved specimens.

Localities: 60, 66, 68, 91.

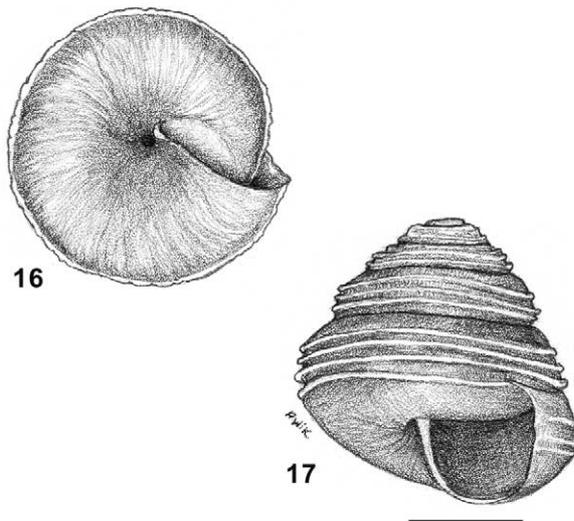
Shell breadth in the largest specimen 3 mm, height 3.2 mm. Shell conical and dextral, of ca. 5.7 regularly increasing whorls. On the surface of these whorls 4 or 3 spiral carinae (Figs 16–17). Aperture margin sharp, with no lip. Umbilicus narrow but open. The shell colour somewhat yellowish, white when the shell is dried.

Up to now not recorded from New Guinea. Occurring in transformed habitats, i.e. gardens, but also in primaeval forest.

Comments. The holotype of *Philalanka quadricarinata sejuncta* has a slightly larger shell, as its height equals 4 mm, with roughly the same number of whorls. The carinae are lower than in the specimens I collected.

The snail may have been introduced from the neighbouring island of New Britain.

ZILCH (1959–1960) does not mention this genus to occur in New Guinea.



Figs. 16–17. *Philalanka quadricarinata sejuncta* Rensch, 1932 – shell of a specimen from locality no. 91; 16 – ventral view; 17 – lateral view

Family: Achatinidae

***Achatina (Lissachatina) fulica* Bowdich, 1822**

Achatina fulica BOWDICH 1822: 1, pl. 13, Fig. 3 (Elements of Conch – after VAN BENTHEM JUTTING 1952: 391). Type: ?

Achatina fulica: VAN BENTHEM JUTTING 1951: 111, Figs 1–3; 1952: 391, Fig. 60.

Material: 3 alcohol-preserved specimens + 44 shells.

Localities: 23, 24, 28, 36, 40, 41, 44.

This species seems to be highly variable. The largest specimens have their shells 110 mm high and 51 mm broad (localities 40 and 41) (Fig. 18), thin and slender. In this whole population the measurements of adult individuals were more or less the same. At site 36 (Fig. 19), besides specimens approximating to the largest ones, I collected numerous shells (!) merely 60 mm in height and 36 mm in breadth. These shells are considerably thicker. They have a well pronounced callus and the external margin of the body whorl thickened. In both cases the number of whorls equals 7–8. At the latter locality mentioned specimens of medium size and shell thickness could also be found. It seems to me that the shells of small specimens are from unfavourable environment, characterised for instance by some microclimatic fluctuations or deviations, or scarcity of food.

At all the sites I studied the snail was abundant but only in a small area. It occurred in the margins of



Fig. 18. *Achatina (Lissachatina) fulica* Bowdich, 1822 – shell of a specimen belonging to a population of large individuals from locality 41 (photo: J. MACIAŻEK)



Fig. 19. *Achatina (Lissachatina) fulica* Bowdich, 1822 – two different shells representing a population composed mainly of dwarf individuals from locality no. 36 (photo: J. MACIAŹEK)

primaeval forest, most frequently close to man-devastated habitats. This species does not penetrate deep into the jungle (pointed out by VAN BENTHEM JUTTING 1952 as well). At some of the sites I found very numerous weathered shells and not a live snail. This indicates extinct populations, but the reasons for the extinction are unknown.

These snails climb tree trunks, where they stay also when resting.

Achatina fulica originates from Madagascar, and has been introduced among others into various regions of Africa, and other areas of warm climate where it is still in expansion. It has been introduced in India, Ceylon and Malaya, where it is farmed for consumption reasons. The snail has further spread to South Asia onto numerous archipelagos on the Pacific, into China, Japan and California. In Papua it is also an introduced species. The locals inform that the snail often does much harm in gardens. It had earlier been recorded from New Guinea (see VAN BENTHEM JUTTING 1952).

Family: Ariophantidae

Nanina citrina (Linnaeus, 1758)

Helix Citrina LINNAEUS 1758: 771. Terra typica: "Habitat in Jamaic australi terrestris". Type: ?

Xistia citrina: MÖLLENDORFF 1895: 234, Constantin-hafen (var. *apicata*); LESCHKE 1912: 142 (var. *apicata*).

Nanina citrina: BRANCSIK 1894–1895: 222, Finisterre; VAN BENTHEM JUTTING 1964: 47, Stephansort (var. *interjecta*).

Material: 3 alcohol-preserved specimens (1 adult, 2 juvenile) + 34 shells.

Localities: 3, 7, 38 (Fig. 20), 50, 52, 53, 54, 55, 57, 60, ?64, 69.

A species characterised by a high variability of the shell, especially its coloration, a spiral band on it present or absent.



Fig. 20. *Nanina citrina* (Linnaeus, 1758) – shell of a white specimen, shown from three different sides, from locality no. 38 (photo: J. MACIAŹEK)

The specimens I collected were partly weathered, the fresh shells being uniformly white (Fig. 20), slightly gleaming and lacking a keel. Measurements:

height up to 25 mm, breadth up to 37 mm; all were probably not fully developed and usually empty. The specimens from localities 38 and 54 correspond with the description of *N. citrina* var. *micholitzii* by VAN BENTHEM JUTTING (1933). A considerable part of specimens from other sites had their shells brown-yellowish with a darker horizontal stripe. Its bottom edge is blurred, the pigment as if trickling down. The upper edge clearly contrasts with the nearly transparent stripe. These brownish shells are distinctly thinner, and also more flattened. They attain up to 22 mm in height and 32 mm in breadth (localities 53, 64, 69).

The appearance of genitalia illustrated in Fig. 21.

The snail seems to inhabit the primaeval rain forest exclusively.

Comments. See *Nanina semilucida* below.

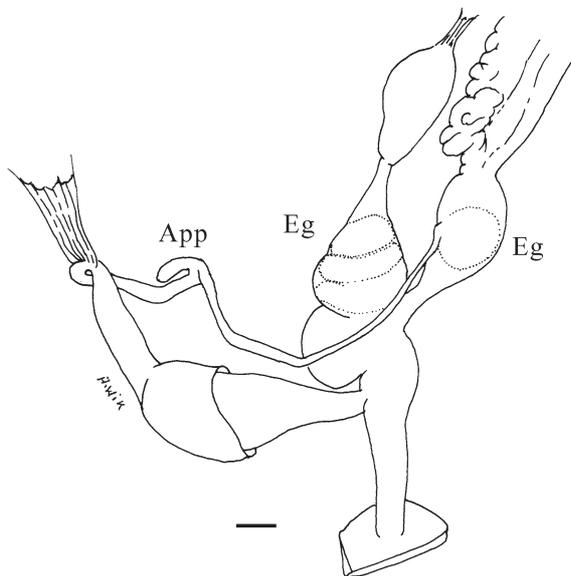


Fig. 21. *Nanina citrina* (Linnaeus, 1758) – copulatory organs of a specimen from locality no 69; eggs visible inside oviductus and truncus spermatecae

(?) *Nanina (Hemiglypta) semilucida* (Brancsik, 1895)

Hemiplecta semilucida BRANCSIK 1894–1895: 222, pl. V, Figs. 5a–c. Locus typicus: Astrolabe Bay (Papua-New Guinea). Type: probably not preserved.

Hemiplecta semilucida: LESCHKE 1912: 142.

I cannot say anything about this snail. Judging by the figures, a form of the highly variable *Nanina citrina* L. (see above) may be concerned.

Euplecta juvenis (Smith, 1895)

Nanina juvenis SMITH 1895: 363, pl. 20, Figs. 7–8.

Terra typica: neighbourhood of Constantin Hafen. Type: The Natural History Museum, London.

Hemiplecta juvenis: LESCHKE 1912: 142, Konstantinhafen.

Hemiplecta juvenis (sic!): VAN BENTHEM JUTTING 1964: 40, Konstantinhafen.

Material: 2 alcohol-preserved specimens + 45 shells.

Localities: 3, 4, 10, 27, 35a 35b, 36, 38, 40, 41, 47, 48, 50, 52, 53, 54, 55, 64.

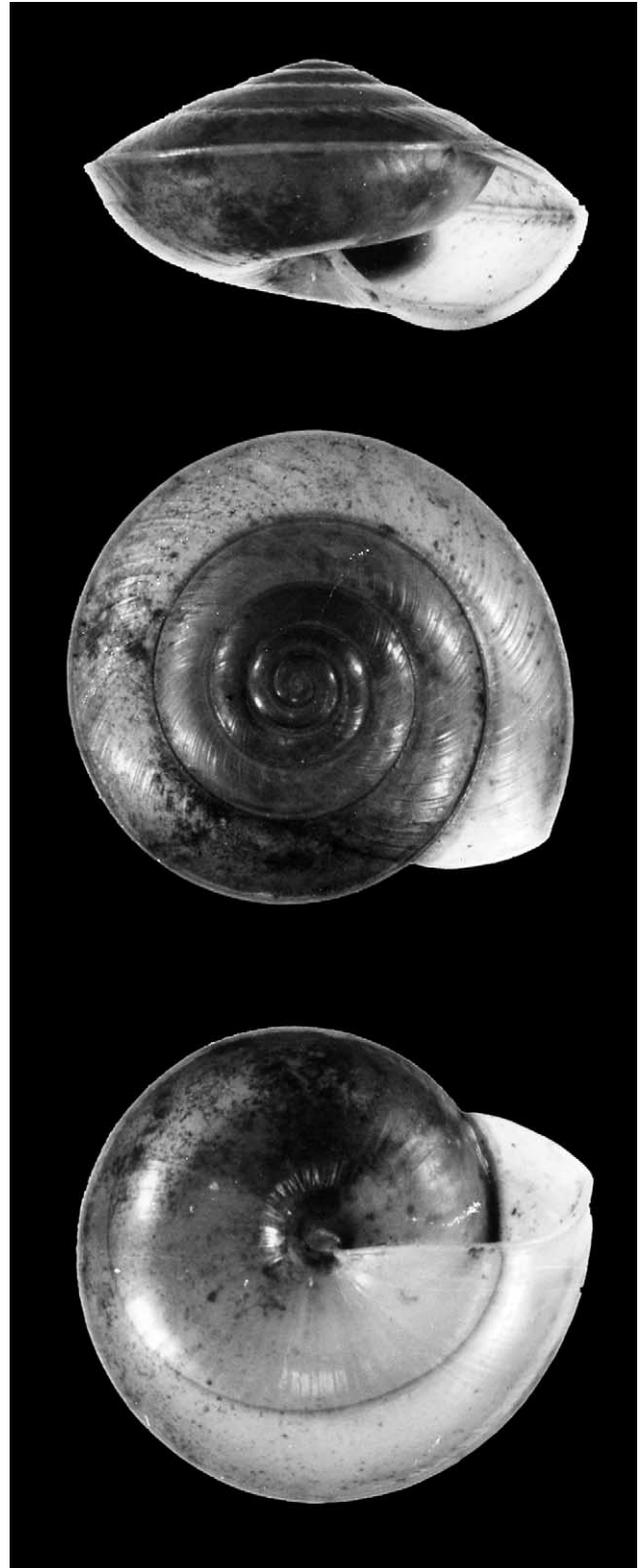


Fig. 22. *Euplecta juvenis* (Smith, 1895) – shell of a white specimen from locality no. 38 viewed from three different sides (photo: J. MACIAZEK)

Strongly flattened shells, with a distinct sharp keel above which, due to its being slightly turned up, a trough is clearly visible (Fig. 22). The upper surface gently radially striated, the lower one smooth, with a greasy sheen. Umbilicus closed. On the penultimate whorl, in the aperture interior, an imprint of mantle left. Coloration straw-brown.

The structure of genitalia illustrated in Fig 23.

I collected almost exclusively shells, the majority of which were slightly weathered. I found them both in primaeval and destroyed rain forest, in the lowlands.

Comments. SMITH (1895) described this species under the name of *juvenis*, whereas VAN BENTHEM JUTTING (1964) uses the name *juvensis*. I suppose it is a typographic error since LESCHKE (1912) quotes this name as *juvensis*, although in his original paper it spells *juvenis*.

A few very similar species have been described from New Guinea. One of them is *E. albilabiata* (Smith, 1897) (described as *Trochonanina albilabiata* SMITH 1897: 410 pl. 9, Figs 5–7), which differs (as follows from the figure) in a narrow but open umbilicus and in the keel which is not turned up. Another New-Guinean species, *E. imperata* Shepman, 1918, is slightly larger, the sculpture on the shell surface more pronounced. The third species which bears the closest resemblance to *E. juvenis* is *E. adulta* (Bavay, 1908). This snail (BAVAY 1908) also has a somewhat larger shell (I compared my specimens with ones from the Indonesian part of New Guinea kept in the Leiden

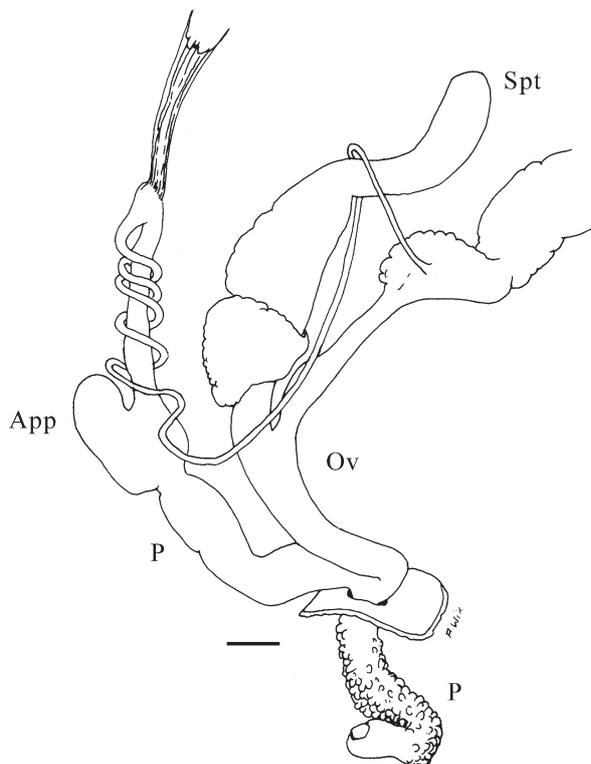


Fig. 23. *Euplecta juvenis* (Smith, 1895) – copulatory organs with partly everted penis, of a specimen from locality no. 47

collection). The only clear difference between the two species I can note is the presence of a distinct trough over the keel in *E. juvenis*, which is a result of the sharp edge of the keel being turned up. The character (a trough over the keel) occurs in all the specimens I collected and distinguishes them from *E. albilabiata*, which lacks such a trough.

See also (?) *Trochonanina sturanyi* below.

(?) *Trochonanina sturanyi* Brancsik, 1895

Trochonanina Sturanyi BRANCSIK 1894–1895: 223, pl. V,

Figs. 6a–c. Locus typicus: Astrolabe Bay. Type: ?

Trochonanina sturanyi LESCHKE 1912: 142.

The figures accompanying BRANCSIK's (1895) description indicate that the author might deal with *Euplecta juvenis* (see above), a species which was described in the same year by SMITH. At present I am unable to ascertain the synonymy and establish which name should be given priority.

According to ZILCH (1959–1960: 329), *Trochonanina* is a genus which represents the family Urocyclidae. There is, however, a snail of a similar name and appearance, i.e. *Trochonanita* (a subgenus in the genus *Distale* within Euconulidae, Microcystinae (ZILCH 1959–1960: 286), but it inhabits other regions.

Hemiplecta foersteri Kobelt, 1914

Hemiplecta foersteri KOBELT 1914: 3. Locus typicus: “bei Ogeramua im Hinterlande Hüongolfes” (=Huon Golf), New Guinea. Type: SMF no. 225950.

Material: 8 alcohol-preserved specimens (5 adult and 3 juvenile) + 58 shells (31 adult and 27 juvenile).

Localities: ?10 (juv.), 55, 60, ?64 (juv.), ?70 (juv.), 72, ?74 (juv.), ?76 (juv.), ?77 (juv.), ?83 (juv.), 84, 85, ?97 (juv.).

Shell low, with a blunt ridge (vestigial keel), thick-walled and non-transparent around the body whorl. Measurements: up to 28 mm in height, 45 mm in breadth (Fig. 24). Umbilicus ca. 4 mm in diameter. The aperture measurements: height 20 mm, width 26 mm at the maximum. The shell surface densely irregularly striated. Under a higher magnification the striae prove to be irregular knobs which produce an effect of a delicate chequered pattern. On the upper side the sculpture is slightly more pronounced than on the bottom. The largest shells have 5.65 whorls. Suture, partly reinforced with a spiral ledge, particularly between the younger whorls. Umbilicus almost completely open, only the lower margin of the aperture inconspicuously bent in its direction. Aperture edge sharp, with no lip. The aperture wider than high. Coloration of the shell brownish, lustreless. A darker band runs horizontally. Its upper limit is clear-cut and overlaps the ridge on the body whorl, the lower being blurred.

The appearance of reproductive system presented in Figs 25–27.



Fig. 24. *Hemiplecta foersteri* Kobelt, 1914 – shell, shown from three different sides, of a specimen from locality no. 55 (photo: J. MACIAŻEK)

Comments. KOBELT (1914) described the species based on a single shell, without, however, providing a drawing. The specimen was collected in an area immediately adjoining Province Madang. The author mentions that the specimen shows characters intermediate between *Hemiplecta semilucida* (Brancsik,

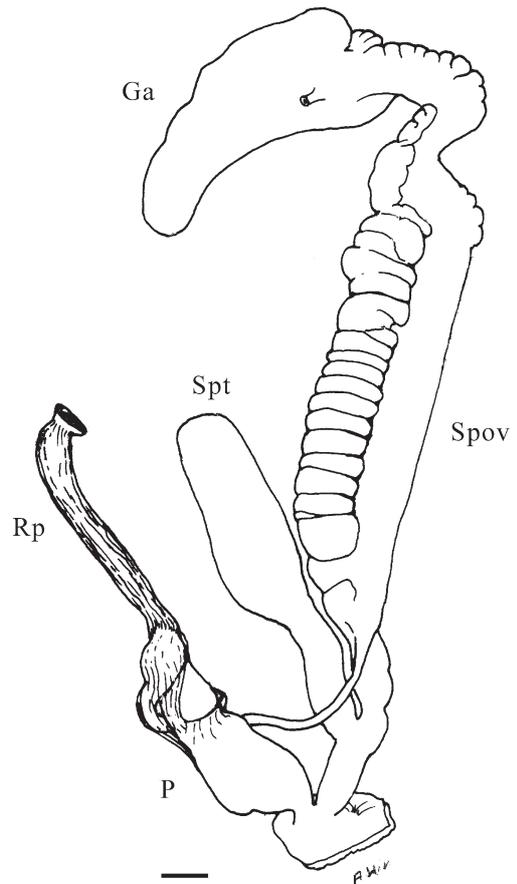


Fig. 25. *Hemiplecta foersteri* Kobelt, 1914 – copulatory organs of a specimen from locality no. 85

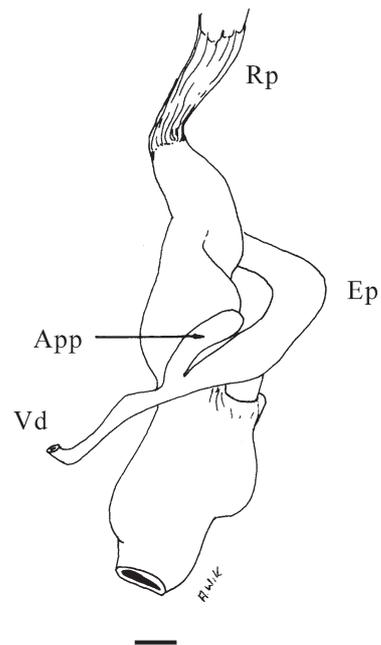


Fig. 26. *Hemiplecta foersteri* Kobelt, 1914 – penis viewed from the other side relative to that in Fig. 25; appendix visible on the border between epiphallus and vas deferens) – specimen from locality no. 85

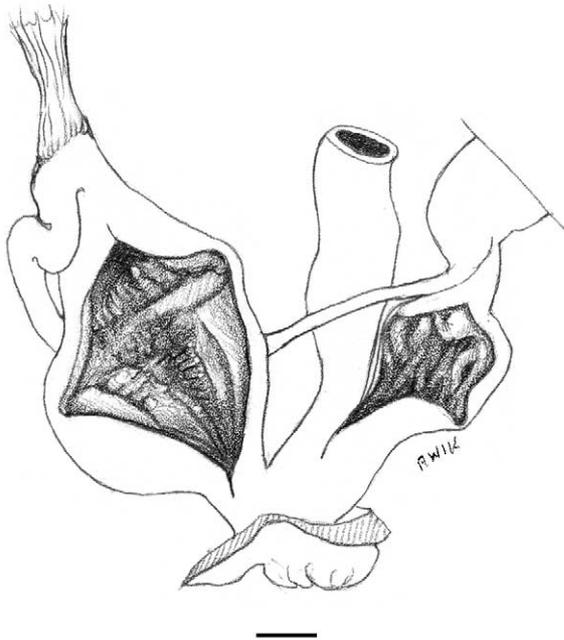


Fig. 27. *Hemiplecta foersteri* Kobelt, 1914 – copulatory organs of a specimen from locality no. 85; internal structure of penis and oviductus noticeable

1895) (the species described as *Nanina semilucida* (*Hemiglypta*)) from Papua (BRANCSIK 1894–1895: 222, pl. V, Fig. 5a–c; the type has probably not been preserved), and *H. granigera* Ancey, 1895 from (German?) Papua (ANCEY 1895: 378, pl. XXVI, Fig. 1).

The shells I collected differ from BRANCSIK's original figures of *semilucida* in being more flattened and having a broader umbilicus. Moreover, my specimens much better correspond with another drawing by this author, presented in the same plate (BRANCSIK 1894–1895: pl. V, Figs 4a–c), but representing *Nanina divergens* (Brancsik, 1895) (*Hemiplecta*). The type of this snail probably does not exist either. As far as *H. granigera* is concerned, the drawing, which seems to be freehand and hence inaccurate, reveals a closer similarity to the shells I collected and identified as *H. foersteri*. See also the remarks concerning *H. sericea* and *H. divergens*.

Hemiplecta sericea Boettger, 1914

Hemiplecta sericea BOETTGER 1914: 119, pl. 3, Figs 6–8.

Terra typica: Sattelberg near Finschhafen, German New Guinea. Types: they were kept among BOETTGER's private collection; I do not know where they are currently deposited.

I failed to find this snail during my field research in New Guinea.

Comments. In the Leiden collection there are three shells of this species, collected in Ogeramnanag, the Finisterre Mts., at an altitude of 1,800–2,000 m a.s.l., leg. ? F. FÖRSTER. It is unknown who identified them. These specimens are 19 mm high and 34 mm broad, the number of whorls being 4.65. These

shells are fresh, relatively thin. They have a distinct keel around the body whorl.

Terra typica of this species immediately adjoins Province Madang. Also, it is situated close to the type locality of *H. foersteri*, a snail described by KOBELT in the same year (see above). VAN BENTHEM JUTTING (1964) records *H. sericea* ??? from the neighbouring Province Chimbu. According to the latter author, the shell measurements in this snail are almost twice smaller (13 x 25 mm) than those of *H. foersteri*.

A comparison of specimens of *H. foersteri* I collected with the snails found in Ogeramnanag (Finisterre Mts) determined as *H. sericea* shows that the latter closely resembles the shells of immature *H. foersteri*, having the same number of whorls. They are, however, slightly more flattened, have a stronger keel, and the shell itself is somewhat thinner. I have an impression that the same species is concerned here. If more abundant material is compared and the specimens prove to fall within the same variability range, it will remain to decide about the priority of the names (*foersteri* or *sericea*) introduced in the same year. (See Comments to *H. foersteri* above).

Several species of *Hemiplecta* have been described from New Guinea (see VAN BENTHEM JUTTING 1964), *H. cerini* (Smith, 1887) among others. Terra typica of this snail is "Foot of the Astrolabe and Owen Stanley Mountains". The Astrolabe Mts. stretch at a considerable distance from Province Madang, close to the western coast of New Guinea, whereas the Owen Stanley Mts. are situated in the south of this island, far from Prov. Madang, too.

The shell of this snail measures 20 x 31 mm, and it follows from the drawing (SMITH 1887 pl. XV, Fig. 5) that it has a well-developed keel.

In the Amsterdam collection there is a specimen of *H. doriae* (Tapparone-Canefri, 1880). It is unknown who identified this specimen, but the label says it comes from "Entrance Arguni bay, near kampong Tangerangu" (New Guinea), leg. H. P. SCHAUB. The shell of this snail clearly differs from the ones I collected. It is thinner, the sculpture of its upper side more pronounced, the surface of its bottom part shining and almost smooth, keel stronger. And thus, without considering the correctness of identification of the specimen, one can state that in New Guinea there are undoubtedly at least few species similar to one another.

(?) *Hemiplecta achilles* Brazier, 1886

In his paper, MÖLLENDORFF (1895: 234) mentions a snail named "*Rhysota* (*Hemiplecta*) *Achilles* Braz." from Tombul near Constantihafen. This information is repeated by LESCHKE (1912: 132) but the species is referred to as "*Hemiplecta achilles* Braz." According to ZILCH (1959–1960: 301), the genus *Rhysota* vel *Ryssota* Albers, 1860 belongs to the family Helicarionidae. I have failed to determine what snail MÖLLENDORFF (1895) actually dealt with.

(?) *Hemiplecta divergens* Brancsik, 1895

Nanina (Hemiplecta) divergens BRANCSIK 1894–1895: 222, pl. V, Figs. 4a–c. Locus typicus: Astrolabe Bay (Papua-New Guinea). Type: ?

Hemiplecta divergens: LESCHKE 1912: 142.

The status of this species is unclear to me. Judging by the figures, one can suppose this is the same species which was later described by KOBELT under the name *H. foersteri* (see above).

Family: Euconulidae

Durgellina anthropophagorum (Hedley, 1894)

Sitala anthropophagorum HEDLEY 1894: 385, pl. 24, Figs. 1, 3, pl. 25, Fig. 21, pl. 26, Fig. 24. Terra typica: British Guinea. Types: I do not know if they exist.

Sitala anthropophagorum: SOÓS 1911: 352; LESCHKE 1912: 142.

Durgellina anthropophagorum: VAN BENTHEM JUTTING 1964: 22.

Material: 26 alcohol-preserved specimens + 3 shells.

Localities: 32, 35a, 53, 67, 83, 64, 92, 93, 95.

Shell breadth up to 5.5 mm, height up to 6 mm. Shell milky white, hardly transparent, of an almost smooth surface. A barely distinguishable ridge on the body whorl (Fig. 28). Umbilicus closed.

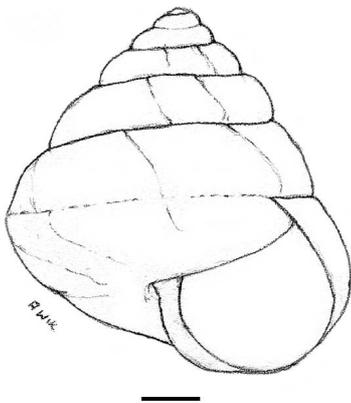


Fig. 28. *Durgellina anthropophagorum* (Hedley, 1894) – shell of a specimen from locality no. 93

The snail often occurs in areas degraded due to human activity (neighbourhood of gardens) but also in primaeval forest; living in leaf litter and on plants. It reaches at least 1,300 m a.s.l.

SOÓS (1911) records this species from Jamba (?).

Durgellina capillacea (Soós, 1911)

Sitala capillacea SOÓS 1911: 353, Fig. 9. Locus typicus: Sattelberg (New Guinea). Syntypes: probably burnt in the Budapest collection; one paratype housed in the collection of Amsterdam (VAN BENTHEM JUTTING 1964).

Sitala capillacea: LESCHKE 1912: 142.

Durgellina capillacea: VAN BENTHEM JUTTING 1964: 22.

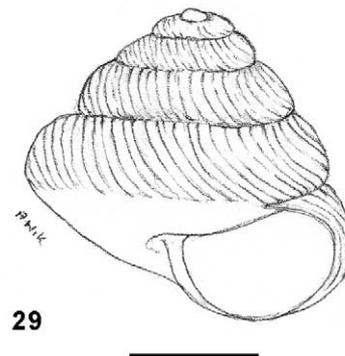
Material: 10 alcohol-preserved specimens + 5 shells.

Localities: 36*, 48*, 53*, 67*, 68*, 49, 60, 76*, 88* (* – sites where hairy shells were found, see below).

Breadth 3.5 mm, height 4 mm. Shell dirty creamy or pale horn-coloured, barely transparent. The shell surface distinctly conspicuously ribbed, the ribs extending only to the blunt edge of the body whorl (Fig. 29). On the shell surface juvenile specimens have two rows of hairs which easily break off (Fig. 30). The underside of the shell smooth. Umbilicus closed.

The species is found mainly in the environs of gardens, but also in primaeval forest.

Comments. In the description of this species SOÓS (1911) does not mention hairy shells. However, a comparison of shells with and without hairs indicates that they are conspecific. I often found both forms in the same locality. The sites where hairy shells were collected are marked with an asterisk.



29



30

Figs. 29–30. *Durgellina capillacea* Soós, 1911. 29 – shell of a specimen from locality no. 49, devoid of hairs; 30 – specimen with hairy shell from locality no. 48

***Durgellina subglobosa* (Soós, 1911)**

Sitala subglobosa SOÓS 1911: 352, Fig. 8. Locus typicus: Jomba (New Guinea). Type: probably burnt with the collection of Budapest.

Sitala subglobosa: LESCHKE 1912: 132.

Material: 23 alcohol-preserved specimens + 2 shells.

Locality: 93.

Shell (Fig. 31) breadth 4.2 mm, height 3.2 mm. Shell golden yellow, transparent, shining, its surface delicately irregularly striated. Umbilicus closed.

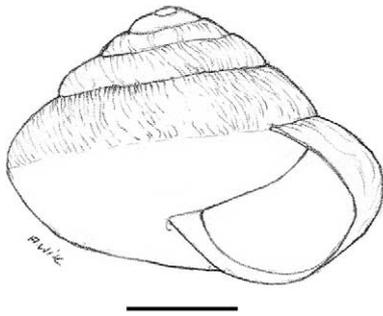


Fig. 31. *Durgellina subglobosa* (Soós, 1911) – shell of a specimen from locality no. 93

The only locality of the species known to me is situated below the peak of a volcano on Karkar Island, where primaeval forest, burnt by a volcanic eruption, regenerates naturally. The snail was found on ground flora.

***Liardetia doliolum* (Pfeiffer, 1846)**

Helix doliolum PFEIFFER 1846: 41. Locus typicus: Sibonga on Cebu. Type: no information available.

Liardetia doliolum: VAN BENTHEM JUTTING 1964: 26

Material: 2 alcohol-preserved specimens + 3 shells.

Localities: 53, 68.

Shell ca. 1.6 mm broad, with distinct fine ribs on the surface of the last two whorls. Umbilicus partly covered. Colour golden yellow.

I collected the species in primaeval rain forest. It probably has more numerous localities, because the two sites mentioned above are situated rather far apart. It is difficult to find this snail due to its small size, the thin shell certainly decomposing very quickly.

Comments. VON BENTHEM JUTTING (1964) records this species from Pagun, Mapia Isl.

***Liardetia indifferens* (Boettger, 1891)**

Kaliella indifferens BOETTGER 1891: 256, pl. 3, Figs 4, 4a, 4b. Terra typica: “Ema auf Südamboina; Hitulama auf Nordamboina und Sirisori auf Sapa-rua”. Type: ?

Material: 9 alcohol-preserved specimens + 2 shells.

Localities: 30, 69, 91, 94.

Shell ca. 2.5–4 mm in breadth and ca. 1.8–2.2 mm high, cone-shaped, with very convex whorls (Fig. 32). Umbilicus partly covered. The shell surface irregularly delicately sculptured with growth lines in the form of striae, partly glittering. The colour of shell golden yellow.

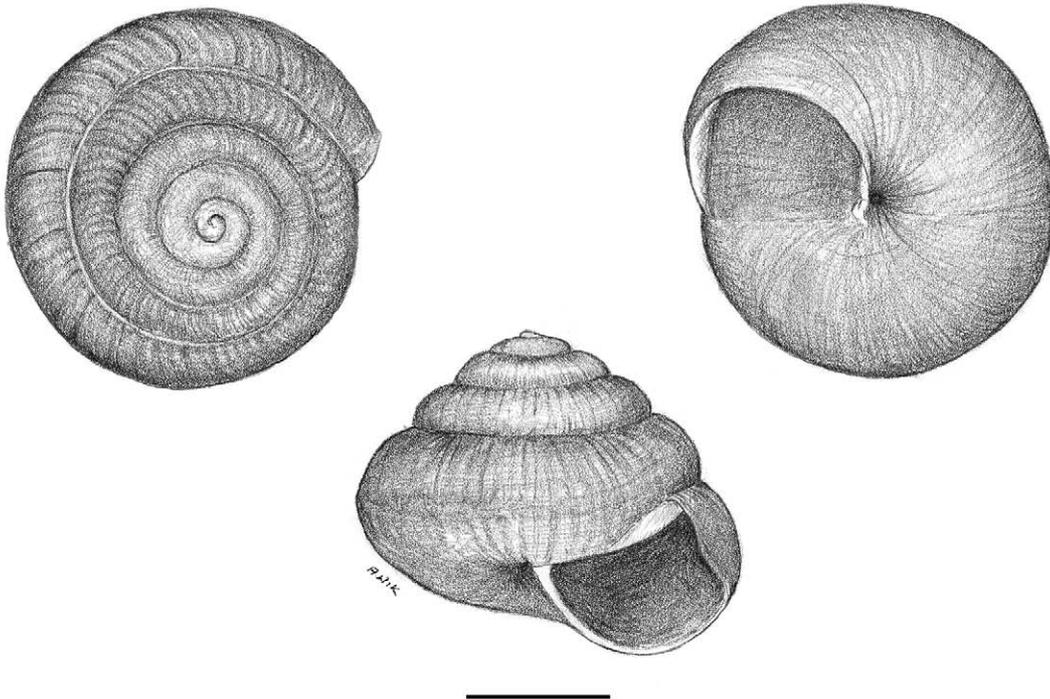


Fig. 32. *Liardetia indifferens* (Boettger, 1891) – shell of a specimen from locality no. 30, viewed from three different sides

The localities are far apart. Like the former species, this one also presumably occurs at more sites but its small size and the easily decomposing shell render it difficult to collect this snail.

VAN BENTHEM JUTTING (1964) records it from the Indonesian part of New Guinea.

Comments. This snail is very similar to *L. doliolum* but it is slightly larger, has a more elevated spire, and the surface of its shell is smoother, the sculpture consisting of irregular growth lines in the form of striae, not ribs.

In the NMNL collection there is a series of shells of the species discussed but they differ in smaller size, the general appearance being nearly identical.

Family: Subulinidae

Subulina octona (Bruguière, 1792)

Bulimus octonus BRUGUIÈRE 1792: Encycl. Meth. Vers. 1, p. 325 (after SOLEM 1988). Locus typicus: Dondon (Haiti). Original specimen: SMF 145454a (see: ZILCH 1959–1960: 342, Fig. 1256; 1973: 107).

Subulina octona: VAN BENTHEM JUTTING 1964: 61; SOLEM 1988: 521.

Material: 273 alcohol-preserved specimens + 41 shells.

Localities: 1, 2, 4, 13, 28, 30, 32, 36, 43, 48, 49.

Identification of this snail raises no doubts (Fig. 33). This is a circum-tropical species, in Province

Madang introduced. It occurs in cultivations of different type, e.g. coconut plantations, gardens, especially deserted, in secondary bush grown after destroyed jungle, exceptionally on the fringe of primaeval forest. It is always found in abundance, on the ground in herbaceous vegetation. In some localities I collected only empty shells, which bears evidence to the fact that some populations become extinct.

Lamellaxis (Allopeas) gracilis (Hutton, 1834)

Bulimus gracile HUTTON 1834: 84–85, 93. Locus typicus: Djampang (Java). Type: SMF 63910 (ZILCH 1973).

Opeas gracile: SOÓS 1911: 356; LESCHKE 1912: 144; VAN BENTHEM JUTTING 1933: 92; 1952: 378, Figs. 55, 56a.

Lamellaxis gracilis: VAN BENTHEM JUTTING 1964: 62; SOLEM 1988: 521, Figs. 117–120.

Material: 30 alcohol-preserved specimens + 18 shells.

Localities: 14, 28, 36, 41, 49, ?50, ?53, 74, 83, 86, 87, 94.

The appearance of shell shown in Fig. 34.

The snail's preferable habitats are gardens and degraded environments. However, some of the habitats where I collected it seemed to be quite natural, of the type of rain forest. According to SOLEM (1988), it is a circum-tropical species.

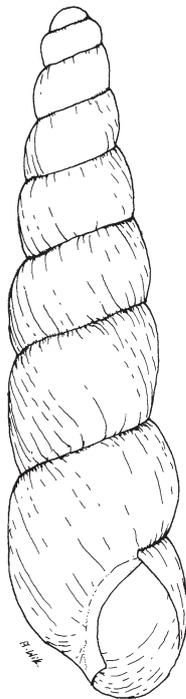


Fig. 33. *Subulina octona* (Bruguière, 1792) – shell of a specimen from locality no. 2

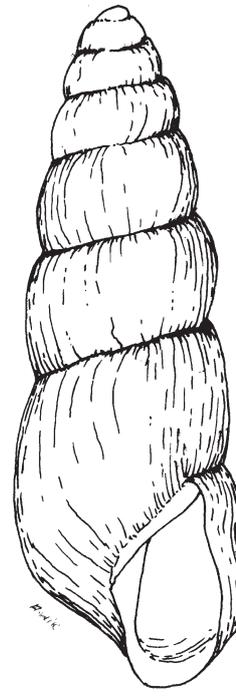


Fig. 34. *Lamellaxis (Allopeas) gracilis* (Hutton, 1834) – shell of a specimen from locality no. 74

Family: Streptaxidae***Gulella (Huttonella) bicolor* (Hutton, 1834)**

Pupa bicolor HUTTON 1834: 86, 93 Terra typica:

Mirzapur, India. Type: I do not know if it still exists.

Gulella (Huttonella) bicolor: VAN BENTHEM JUTTING 1950: 504, Fig. 107; SOLEM 1988: 531, Figs 126, 135–136.

Huttonella bicolor: VAN BENTHEM JUTTING 1950: 8; 1961: 8; 1964: 69.

Material: 2 alcohol-preserved specimens + 1? shell.

Locality: 28.

The appearance of shell is illustrated in Fig. 35.

The site where I found the snail (coconut-tree plantation) indicates that most probably the species has been introduced here.

Comments. VAN BENTHEM JUTTING (1950) defines the species as circum-tropical, which is confirmed by SOLEM (1988).

Family: Rhytididae***Macrocycloides cf. caliginosus* van Benthem Jutting, 1964**

Macrocycloides caliginosus VAN BENTHEM JUTTING 1964: 67, Figs. 54–56. Locus typicus: Puindalkamp (=Scree Valley Camp), foot of Mt. Wilhelm, 3,800 m a.s.l. Holotype: ZMA.

Material: shells 7 + 1?

Localities: 56, 74, 77, 83, 84.

Shell up to 8 mm broad, to 5 mm high, globose-umbilicus in shape, with a distinct yet partly covered umbilicus, strongly glittering, transparent, copper gold in colour. Its surface covered by irregular radial striae (Fig. 36).

Body unknown; I managed to find shells only.

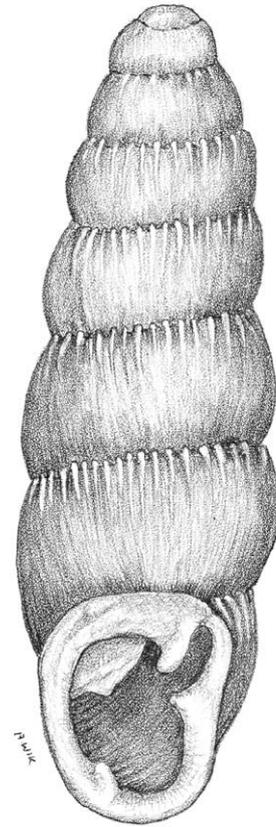


Fig. 35. *Gulella (Huttonella) bicolor* (Hutton, 1834) – shell of a specimen from locality no. 28

I collected the shells mainly in primaeval rain forest, both in the lowland and in the mountains up to 2,300 m a.s.l. The snail seems to be a species native to New Guinea.

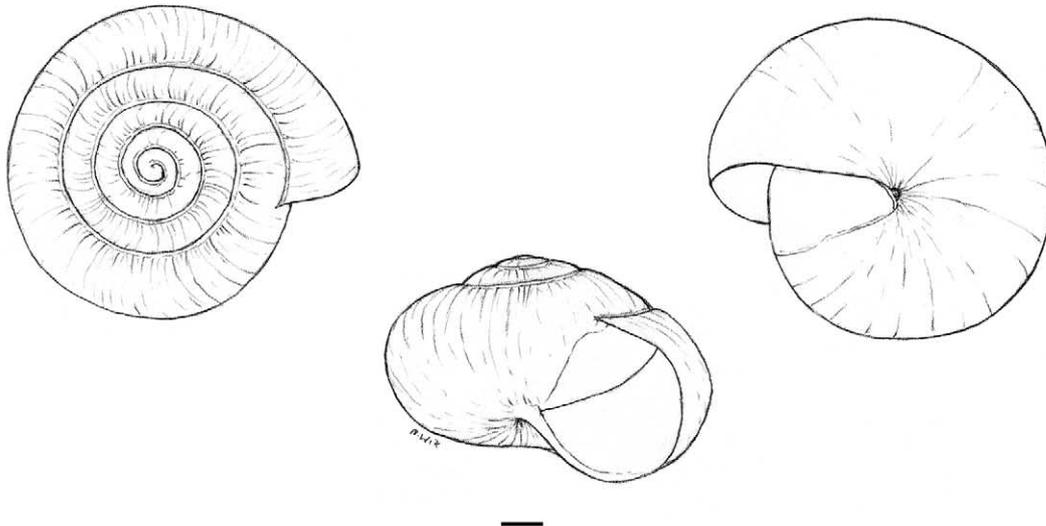


Fig. 36. *Macrocycloides cf. caliginosus* van Benthem Jutting, 1964 – shell of a specimen from locality no. 77, shown from three different sides

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