

Notes on terrestrial molluscs of the island of Sulawesi. 1. The Pupinidae (Gastropoda Prosobranchia: Pupinidae)

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The species of the Pupinidae occurring on Sulawesi are revised. So far now five species have been found. Three species (*Sulapina theresiae*, *Moulinsia boucheti*, *Callianella incerta*) and a genus (*Sulapina*) are new. All the species are endemic to Sulawesi.

Key words: Gastropoda, Prosobranchia, Pupinidae, *Porocallia*, *Sulapina*, *Moulinsia*, *Callianella*, taxonomy, Indonesia, Sulawesi.

The subfamily Pupinae was divided into two sections by Kobelt (1902): Pupinelleae (without glaze and striate) and Pupinae (covered by a glaze and completely smooth). After Vaught (1989) this subfamily Pupininae had to be regarded as a family, Pupinidae, and the names of the old sections by Kobelt had to be interpreted as subfamilies and must be renamed: Pupinelleae to Pupinellinae and Pupinae to Pupininae.

So far, only two species were known from Sulawesi/Celebes (Sarasin & Sarasin, 1899). They belong to the genus *Porocallia* (subfamily Pupininae).

During collecting activities by Klaus and Theresia Kittel in 1991 and 1995, two more species were discovered, belonging to the subfamily Pupininae. Furthermore, during an expedition of the Muséum National d'Histoire Naturelle, Paris, to Sulawesi in order to collect freshwater molluscs, Dr. Philippe Bouchet (1991) found a third new species.

These three new species belong to three different genera. It is necessary to propose a new genus for one of the species because of the unique combination of conchological features.

Abbreviations: NMB, Naturhistorisches Museum, Basel (Sarasin collection); MNHN, Muséum National d'Histoire Naturelle, Paris; ZMA, Zoölogisch Museum, Amsterdam; private collections VL, Dr. J.J. Vermeulen, Leiden; KW, K. Kittel, Wiesthal; MD, W.J.M. Maassen, Duivendrecht.

Type material of the Sarasin species was received on loan from the Naturhistorisches Museum, Basel, and some other species from the Zoölogisch Museum, Amsterdam. Thanks are due to Dr. P. Bouchet, Dr. A. Hänggi and Mr. R. Moolenbeek for their help. Special thanks are due to Dr. J.J. Vermeulen for a lot of useful discussions. After each reference to material seen by the authors the number of specimens is given after a slash: /. The drawings were made by MD with a Wild M3 stereo microscope with camera lucida device.

Genus **Sulapina** gen.nov.

Type species. — *Sulapina theresiae* spec. nov.

Diagnosis. — Shell with a very shiny callus without any sculpture, with a channel in the angular edge, and with a tube on the shell-wall behind the lip at the columellar side ending in an open pore.

Distribution. — Known only from the type locality of the type species.

Notes. — 1. It was not possible to classify this new species in any existing genus. The unique combination of features, unknown in the subfamily Pupinae, made it necessary to name a new genus.

2. Within the subfamily Pupinellinae there exists a genus, *Bellardiella*, which shares the same combination of conchological features with *Sulapina*, although they belong to two different subfamilies.

Derivatio nominis. — The name is a combination of Sulawesi and *Pupina*.

Sulapina theresiae spec. nov., fig. 1

Material examined. — North Sulawesi: Tangkoko - Batu Angus Reserve, Gunung Dua Sudara, (NE. Manado), rainforest, under humid leaves, 16.8.1991, leg. K. Kittel (ZMA/3.96.011, holotype); Bolaäng Mongondow, Dumoga Valley: N. slope Gunung Mogogonipa, ladangs in undisturbed primary forest, 500 m alt., leg. J. Vermeulen (VL/2 fragments).

Shell dextral, ovoid, very slippery, shiny, covered by a thick glaze, somewhat translucent, reddish brown, with 4.5 whorls. Top obtuse. Last whorl just before the aperture distinctly ascending. Suture hardly impressed, whorls convex with the exception of the bodywhorl which is flattened above the aperture. Aperture rounded at the angular edge, with a distinct channel formed by the callus of the parietal side forming a sharp fold and a tooth like swelling inside the palatal lip. Halfway along the columellar side, behind the lip at the outside of the body whorl, there is a tube as long as a quarter of the ultimate whorl, which ends in an open pore. Height 6 mm; width 3.4 mm; height of aperture 1.5 mm.

Ecology. — The holotype, collected alive, was found on the ground between humid leaves in a rainforest.

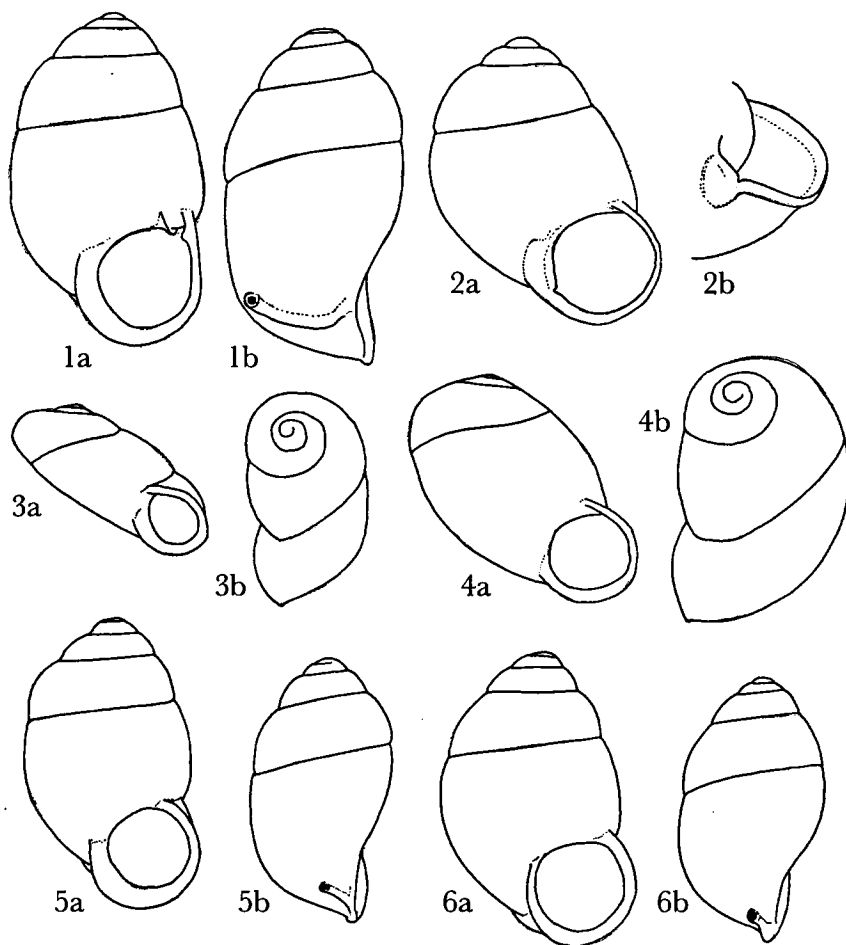
Note. — In juvenile shells, as not yet covered by the thick glaze, the sculpture consists of a very fine radial striation on the lower whorls with a silky sheen whereas the apical whorl is smooth.

Derivatio nominis. — The name refers to Theresia Kittel, wife of and the junior author's companion on many collecting trips in the tropics.

Moulinsia boucheti spec. nov., figs. 2, 7

Material examined. — Central Sulawesi: W. Tentena, Saluopa Waterfall near Tonusu, rainforest under humid leaves, 18.8.1995, leg. K. Kittel (ZMA/3.96.012, holotype; paratypes KW/3, MD/1).

Shell dextral, distorted ovoid, very smooth and glossy, covered by a thick glaze, somewhat transparent, reddish brown, with four whorls. Top acute, but not sharp. Last whorl just before the aperture distinctly ascending. Suture inconspicuously impressed, whorls convex with exception of the bodywhorl which is flattened just above the aperture. Aperture situated on the right side of the columellar axis. Aperture rounded,

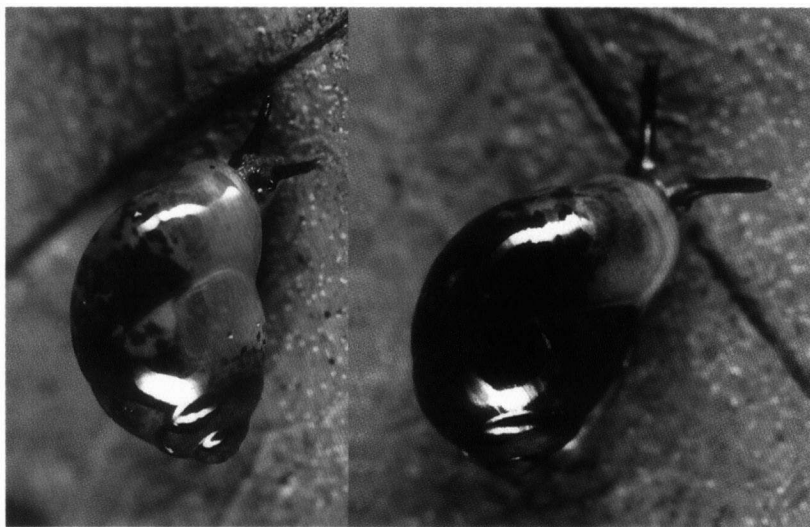


Figs. 1-6. Pupinidae from Sulawesi. 1. a, *Sulapina theresiae* spec. nov., holotype specimen, Sulawesi: Tangkoko-Batu NSG (ZMA), front view; b, left lateral view. 2. a, *Moulinsia boucheti* spec. nov., paratype specimen, Sulawesi: Saluopa Waterfall (KW), front view; b, left lateral view. 3. a, *Callianella incerta* spec. nov., paratype specimen, Sulawesi: Gunung Bawa Karaeng (MNHN), front view; b, apical view. 4. a, *Callianella wallacei* (L. Pfeiffer 1862), Ambon, ex. coll. D. Kimball, (ZMA), front view; b, apical view. 5. a, *Porocallia monticola* Sarasin & Sarasin, 1899, syntype specimen, Sulawesi: Vulkan Sudara (NMB), front view; b, left lateral view. 6. a, *Porocallia hygrophila* Sarasin & Sarasin 1899, lectotype specimen, Sulawesi: Bone (NMB), front view; b, left lateral view.

just at the basal edge on the columellar side, the lip bears a short, shallow fissure on the apertural side. This incision does not pierce the columellar side of the lip at all. Height 4.7-5.1 mm; width 3.7-3.9 mm.; height of aperture 1.6-1.8 mm.

Ecology. — The species was found under leaves on the ground near a waterfall in the rainforest, in a very humid environment.

Derivatio nominis. — The name refers to Philippe Bouchet, who collected a lot of very interesting land molluscs during an expedition to Sulawesi in 1991. He put the entire material at the disposal of the senior author for examination.



7a

7b

Fig 7. *Moulinsia boucheti* spec. nov., paratype specimens, Sulawesi: Saluopa Waterfall (KW).

***Callianella incerta* spec. nov., fig. 3**

Material examined. — South Sulawesi: Gunung Bawa Karaeng, north face above Lembana village, closed forest, in rotten wood, 1900-2100 m alt., leg. P.Bouchet, 12.9.1991 (MNHN/holotype; paratypes MNHN/6 alc., MNHN/20, ZMA/3.96.013, MD/2, VL/2).

Shell small, dextral, asymmetrical, flat, body whorl strongly drawn out to the right side, thin, glabrous, imperforate, smooth, glossy, transparent when fresh, white to yellow, with four whorls. Apex short but fairly sharp. Suture distinct but shallow, whorls separated by a fairly distinct suture. Aperture almost circular, peristome white and reflected, connected by an inconspicuous callus over the parietal side. Umbilicus closed by a thin callus in fully mature specimens; otherwise, the umbilicus is a narrow hole. Length of the shell: 3.1-4.0 mm; width: 1.7-2.3 mm; index: 1.7-1.8.

Ecology. — "The new pupinid from Bawa Karaeng has an interesting ecology. It lives deeply buried inside decaying fallen trunks, together with clausiliids. This is a habitat I knew from New Caledonia to be occupied by Poteriidae, and was pleased to see that it was also occupied by land snails in Sulawesi" (Bouchet in litt.)

Notes. — 1. The shell bears some likeness to *C. wallacei* (L. Pfeiffer, 1862) (fig. 4), but on closer examination the following differences are discernable: *C. wallacei* is on the average much larger: the suture of *C. wallacei* is less conspicuous; *C. wallacei* is not so flat, but more flat-ovoid.

2. Young specimens of 2-3 whorls are quite different in aspect from full grown ones in having a very wide open umbilicus. Only the last whorls produce the peculiar appearance proper to fully mature specimens.

Porocallia monticola Sarasin & Sarasin 1899, fig. 5

Porocallia monticola Sarasin & Sarasin 1899: 55, pl. 4 fig. 48; pl. 5 fig. 58; pl. 8 fig. 89 "Gipfel des Vulkans Sudara in der Minahassa", N. Celebes (NMB 2224a/lectotype; paralectotypes NMB 2224a'/7).

Material examined. — N. Sulawesi: Manado Bay, P. Bunaken. Vine thicket in leaf litter, 10.11.1991, leg. V. Kessner (VL/4). In addition the above type material.

Shell with closed umbilicus, ovoid, very smooth and glossy, with solid shell, light reddish brown; five whorls, body whorl accounts for more than half of the total height of the shell, aperture lies at the right side of the columellar axis, almost round, peristome light orange or whitish; strongly thickened, only at the parietal side is this thickness inconspicuous, at the columellar side, halfway, a white tube of 1/2-3/4 mm at the outside of the shell wall, which ends in a fine pore. Height: 5.0-6 mm; width: 2.8-3.5 mm; height of the aperture: 1.7-2.25 mm.

Porocallia hygrophila Sarasin & Sarasin 1899, fig. 6

Porocallia hygrophila Sarasin & Sarasin 1899: 56, pl. 4 fig. 49 and 49a "N. Celebes, Minahassa, Bone Gebirge, östlich von Gorontalo" (NMB 2223a/1); "Gipfel des Vulkans Lokon" (NMB 2223b/lectotype (lost)); "am Vulkan Soputan bei 1150 m." (NMB 2223c/1).

Material examined. — as above.

Shell with closed umbilicus, ovoid, very smooth and glossy with very fragile shell, light reddish brown; five whorls, body whorl accounts more than half of the total height of the shell, aperture lies at the right side of the columellar axis, almost round, peristome light orange or whitish; strongly thickened, only at the parietal side is this thickness inconspicuous, at the columellar side, about the middle, a white tube of 1/2 mm at the outside of the shell wall, which ends in a fairly big pore. Height: 5.0-5.5 mm; width: 3-3.5 mm; height of the aperture: 1.8 mm.

Notes. — This species is very close to *P. monticola*, only the tube at the outside of the shell is shorter, and the pore is bigger than in *P. monticola*. Furthermore, the two known shells are very thin and fragile, while in *P. monticola* the shells are solid.

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