Additional new Species and new Localities of the Family Vertiginidae and the Genera Oophana and Opisthostoma from Malaya

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(Received May, 1957)

SINCE THE PUBLICATION of my papers on the Malayan species of Vertiginidae and the genera *Oophana* and *Opisthostoma* (Bull. Raffles Mus. No. 21, 1950, No. 24, 1952 and No. 25, 1954) Mr. M. W. F. Tweedie has succeeded in making additional collections of these small land shells in the limestone mountains of Malaya. Among these shells there were a good many new species. They will be described here together with new records of localities of species already known before. The figures illustrating this paper (Plates 8 to 14) are from drawings by Mr. K. M. Foong of the Raffles Museum.

Of the new species the holotypes are deposited in the Zoological Museum, Amsterdam. Paratypes are divided between the Amsterdam Museum, the British Museum (Natural History) and the Raffles Museum, Singapore.

Family **Streptaxidae**

Oophana (Haploptychius) acuti-carinata n.sp. Plate 8, Fig. 1

Shell depressed-conical, glassy-white, shining and transparent. Upper surface transversely ribbed with delicate, curved ribs, about 6 to the mm. on the last whorl. Towards the base these ribs fade away.

Whorls 6, first 2¼ whorls smooth. The spire is regular for about 4 whorls. In the fifth, however, the axis of the shell is pressed obliquely to the side, so that the previous whorl which is acutely carinated at the periphery (more acute and more pinched than in *Oophana atopospira*), projects sideways. After that the carination disappears again. Only on the last ¼ part of the last whorl two new angulations originate, a larger one at the periphery and a smaller one between the periphery and the umbilicus. Both are directed spirally and both are more evenly rounded (not sharp or pinched) than the above-mentioned carination. The side of the shell facing the umbilicus is distantly ribbed. There is no spiral striation.

Spire low-conical, base rounded. Umbilicus wide and eccentric, but not so wide as in *O. balingensis* (Tomlin) and *O. atopospira* v. B. Jutting.

Aperture almost rectangular, with rounded angles, not so spout-shaped as in *O. mirifica* (Moellendorff) and *O. atopospira*. Its position is very oblique, both in vertical and horizontal directions. Peristome not continuous. Free margin reflexed and thickened. Parietal lamella strong, undulating, entering the aperture for about 4 mm. Exterior point of attachment of the lamella somewhat thickened, but never bifid as in *O. atopospira* and *O. mirifica*. Upper and outer margins of aperture each with a short, conical

tooth. Lower margin with a broad, indistinctly defined tooth which is hardly more than a local thickening of the peristome.

Dimensions (in mm.)	Holotype	Paratypes						
Greatest diam.	12.0	11.0	11.0	10.5	12.25	12.5	10.75	10.5
Height	5.0	4.5	4.5	4.25	5.25	5.0	4.5	5.0
Length of aperture	5.5	5.0	5.0	5.0	5.5	5.25	5.0	5.0

The first paratype has been figured.

Habitat: Gunong Sinyum, Pahang, June 1954 (type locality).

The new species is related to *Oophana hanleyana* (Stoliczka), *O. mirifica* (Moellendorff), *O. balingensis* (Tomlin) and *O. atopospira* v. B. Jutting.

From *O. hanleyana* it differs in the greater size (max. diam. *O. hanleyana* 7½ mm. *O. acuti-carinata* 10–12 mm.), and in the absence of ribs on the base of the whorls.

From *O. mirifica* it differs in the greater size (max. diam. *O. mirifica* 9 mm., *O. acuti-carinata* 10–12 mm.), in the less spout-shaped aperture, in the absence of a bifurcation at the exterior point of attachment of the parietal lamella and in the presence of teeth at the free peristome margin.

From *O. balingensis* it differs in the narrower umbilicus, the sharply pinched carination of the overhanging part of the fourth whorl, and in the presence of teeth at the free margin of the peristome.

From *O. atopospira* it differs in the greater size (max. diam. *O. atopospira* 9–10 mm., *O. acuti-carinata* 10–12 mm.), in the less spout-shaped aperture, the absence of a bifurcation at the exterior point of attachment of the parietal lamella and the sharper and more pinched carination of the overhanging part of the last whorl.

In the following key the characteristics of the above-mentioned five species are summarized:—

1. Transverse riblets on both upper and basal side of the shell ..... *hanleyana*
–. Transverse riblets on upper side of the shell only 2
2. Aperture with a parietal lamella only 3
–. Aperture with a parietal lamella and teeth along the free margin of the peristome 4
3. Aperture narrow, spout-shaped. Shell acutely carinated along overhanging part of the fourth whorl ..... *mirifica*
–. Aperture wider, not spout-shaped. Shell rounded or hardly angular along overhanging part of the fourth whorl ..... *balingensis*
4. Aperture narrow, spout-shaped. Exterior attachment of parietal lamella bifid. Carination of overhanging part of the fourth whorl sharp, but not pinched ..... *atopospira*
–. Aperture wider, not spout-shaped. Exterior attachment of parietal lamella simple. Carination of overhanging part of the fourth whorl very acute and pinched .... *acuti-carinata*

Family **Vertiginidae**

Paraboysidia frequens v. B. Jutting 1956

The following three stations are new records for this species:—

Gua Sai, Pahang, 1947; Bukit Sagu, Pahang, 1947 and Gunong Sinyum, Pahang, June 1954.

Paraboysidia laidlawi (Collinge). Plate 8, Fig. 2b

In my 1950 paper (p. 19) I referred to the fact that Collinge (1902, Journ. Malac. Vol. 9, p. 83) described *Hypselostoma laidlawi* as having 4 teeth in the aperture whereas the specimen in the British Museum (Natural History) which I received on loan under the name *Hypselostoma laidlawi* had only 2 teeth.

A newly collected lot from Gua Che Yatin, Ulu Tembeling, Pahang, May 1953 now brings the clue to this riddle. The sample contained five specimens with 5 teeth (1 angular, 1 parietal, 1 basal, 1 lower and 1 upper palatal) and nine specimens having 2 teeth.

The five first-mentioned shells correspond with Collinge's *Hypselostoma laidlawi* (Fig. 2b).[1] On account of the adnate peristome and the separation of angular and parietal teeth it must now be classified as *Paraboysidia laidlawi*.

The nine last-mentioned shells and the one in the British Museum mentioned above are a different species which I introduce here as:

Paraboysidia neglecta n.sp. Plate 8, Fig. 2a

It differs from *P. laidlawi* in being not so slender, the last whorl bulging out more in the profile of the spire. The lamella in the parieto-angular corner may better be called the angular lamella (not parieto-angular lamella). Consequently the parietal lamella is missing. The adnate peristome characterises the species as a *Paraboysidia*.

The synonymy of the two species is summarised hereafter:

Paraboysidia laidlawi (Collinge, 1902).

1902 Collinge, Journ. of Malac. Vol. 9, p. 83, pl. 5, fig. 29, 30 (*Hypselostoma laidlawi*) non *Hypselostoma laidlawi* v. B. Jutting, Bull. Raffles Mus. No. 21, 1950, p. 19, fig. 9.

Type locality: Biserat Caves, State of Jalor.

Habitat: Gua Che Yatin, Ulu Tembeling, Pahang, May 1953.

Dimensions (in mm.)	Gua Che Yatin shells				
Height	1.4	1.4	1.4	1.4	1.4
Width	1.5	1.5	1.5	1.4	1.4
Height of aperture	0.6	0.6	0.5	0.6	0.5

The first specimen has been figured.

Paraboysidia neglecta n.sp.

1950 Van Benthem Jutting, Bull. Raffles Mus. No. 21, p. 19, fig. 9 (*Hypselostoma laidlawi* non *laidlawi* Collinge).

Habitat: Gua Luas, Kuala Kenyam, Pahang, April 1952, leg. J. A. Hislop (type locality).
Gua Che Yatin, Ulu Tembeling, Pahang, May 1953.

Dimensions (in mm.)	Holotype	Paratypes (from type locality)						
Height	1.5	1.8	1.7	1.7	1.7	1.6	1.6	1.5
Width	1.9	1.8	1.9	1.8	1.7	1.9	1.7	1.7
Height of aperture	0.8	0.7	0.8	0.8	0.8	0.8	0.7	0.7

The third specimen (the second of the paratypes) has been figured.

1. It seems that either Collinge overlooked one tooth in the aperture, or that the specimen which he studied had indeed only four teeth. This must remain an open question as the unique shell from the "Skeat Expedition", now in the Zoological Museum at Cambridge, is in such a delapidated condition that it could not be re-investigated.

As a consequence of the foregoing discussion it will be evident that the measurements given in my 1950 paper (p. 19) refer to *Paraboysidia neglecta*, not to *P. laidlawi*.

Paraboysidia oreia n.sp. Plate 9, Fig. 3

Shell moderately small, with conical spire on a rather broad base, and with a wide aperture. The peristome is adnate to the previous whorl. Reddish-brown, not transparent.

First 1½ whorls smooth and polished, the following ones striated, or weakly ribbed according to the growth lines. No spiral striation.

Whorls 4½–5, the last one ending straight (not ascending or descending). Sides of the whorls convex, only in the last whorl the periphery is a little pinched, forming an obsolete spiral keel. A similar keel encircles the umbilicus. Suture rather deep. Umbilicus open, moderately wide.

Aperture wide, with angular and parietal lamellae separate. The angular tooth is small; it reaches almost the edge of the peristome. The parietal tooth is larger and lies deeper down. Columellar, upper and lower palatal teeth of almost equal strength, lying at about the same distance from the peristome edge in the throat. In some shells a weak infrapalatal tooth may occur.

Peristome continuous, thickened and broadly expanded.

Dimensions (in mm.)	Holotype	Paratypes									
Height	2.9	3.1	3.0	3.0	2.9	2.9	2.9	2.9	2.9	2.8	2.7
Width	2.4	2.3	2.5	2.4	2.4	2.3	2.2	2.2	2.2	2.2	2.3
Height of aperture ..	1.2	1.3	1.4	1.3	1.2	1.2	1.2	1.2	1.2	1.1	1.2

Dimensions (in mm.)	Paratypes									
Height	2.7	2.7	2.7	2.7	2.7	2.7	2.6	2.6	2.5	2.5
Width	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.2	2.1
Height of aperture ..	1.1	1.3	1.2	1.2	1.2	1.1	1.3	1.1	1.2	1.1

The framed-in specimen has been figured.

Habitat: Gunong Batu Kurau, Perak, November 1950 (type locality).

Paraboysidia oreia differs from *P. serpa* v. B. Jutting in the smaller size, the more slender shape, especially in the less inflated last whorl which is not—or only obtusely—carinated. The umbilicus of *P. oreia* is narrower, and the aperture bears only five teeth.

Compared with *P. frequens* v. B. Jutting the new species has a less inflated last whorl and a weaker peripheral keel. *P. oreia* has only 5 teeth in the aperture whereas *P. frequens* possesses 7 or 8 teeth.

P. oreia differs from *P. kelantanensis* (Sykes) and subspecies in the more slender shape, the higher spire, the less convex whorls and the smaller number of teeth in the aperture.

Gyliotrachela salpinx n.sp. Plate 10, Fig. 4

Shell consisting of a low-conical spire and a broad last whorl, ending in a free, trumpet-shaped part. Yellowish-brown. First 1½ whorls mamillate, smooth, polished. The others are irregularly striated by oblique growth lines. This striation is crossed by still finer spiral lines, especially visible on the last whorl below the periphery. Not transparent.

Whorls about 4, the first 3½ regularly coiled, the last half whorl widening towards the aperture and in the distal part disconnected from the rest of the shell forming a small, oblique, ascending trumpet.

Two first whorls well-rounded, forming a mamillar apex. Third and fourth whorls more flattened. Just above and below the periphery the last whorl is pinched so as to give the shell an angulate appearance. The angulation continues on the free part, up to the aperture. Opposite this keel, and on the dorsal and ventral sides the trumpet bears three other keels, rendering the free part almost quadrangular in diameter. Umbilicus open, wide, showing the previous whorls.

Aperture little oblique. Peristome continuous, thickened, expanded. Angular and parietal lamellae separate, the angular thin, nearly reaching the peristome edge, the parietal thicker, deeper down in the throat. On the parietal side there is further one (or two) weak infraparietal tooth. The columellar side bears a weak supracolumellar, a strong columellar and a weak infracolumellar tooth. Along the palatal side there occur 1 upper palatal, 2 interpalatal, 1 lower palatal and 2 infrapalatal teeth.

Dimensions (in mm.)	Holotype	Paratypes									
Height	1.7	1.9	1.9	1.9	1.9	1.8	1.8	1.8	1.8	1.8	1.8
Width	2.7	2.7	2.7	2.6	2.5	2.7	2.7	2.6	2.6	2.6	2.6	2.5
Height of aperture ..	1.2	1.0	1.1	1.0	1.0	1.0	1.0	1.1	1.1	1.0	1.0	1.1

Dimensions (in mm.)	Paratypes									
Height	1.8	1.8	1.8	1.8	1.7	1.7	1.7	1.7	1.6	1.6
Width	2.5	2.5	2.5	2.4	2.7	2.6	2.5	2.4	2.6	2.5
Height of aperture ..	1.0	1.0	1.0	1.0	1.1	1.2	1.0	1.0	1.1	1.0

The framed-in specimen has been figured.

Habitat: Bukit Serdam, near Raub, Pahang, August 1950 (type locality).

Gyliotrachela salpinx differs from *G. hungerfordiana* (Mlldff) in having a much lower spire, a shorter trumpet, and more teeth in the aperture.

From *G. depressispira* v. B. Jutting the new species differs in having a narrower umbilicus, and a somewhat higher spire. In addition the aperture is directed obliquely sidewards and upwards, whereas in *G. depressispira* the aperture points to the sky.

Compared with *G. transitans* (Mlldff) and subspecies *Gyliotrachela salpinx* has a lower spire, a wider umbilicus and more teeth in the aperture.

From *G. modesta* v. B. Jutting and *G. emergens* v. B. Jutting the new species differs in having a lower spire, a wider umbilicus, a more conspicuously keeled periphery, and in possessing more teeth in the aperture.

G. salpinx differs from *G. troglodytes* v. B. Jutting in having a slightly lower spire, a wider umbilicus, a more conspicuously keeled periphery and a longer trumpet. In addition the number of teeth in the aperture is larger in *G. salpinx*.

The nearest relative is *G. luctans* v. B. Jutting. From this species *G. salpinx* differs in being smaller, with a shorter trumpet. The colour of the new species is more yellowish-brown, instead of reddish-brown, as in *G. luctans*. The number of teeth is about the same in both species.

Family **Cyclophoridae**

Genus **Opisthostoma,** Subgenus **Plectostoma**

Opisthostoma (Plectostoma) salpidomon v. B. Jutting 1952.

New material of this species was collected in May 1953 at Gua Che Yatin, Ulu Tembeling, Pahang.

Opisthostoma (Plectostoma) umbilicatum v. B. Jutting 1952.

An additional series of about 60 shells was collected in June 1954 at Gunong Senyum, Pahang.

Opisthostoma (Plectostoma) crassipupa v. B. Jutting 1952.

Additional material was collected at Ulu Kenyam Kechil, Ulu Tembeling, Pahang, April 1952, leg. J. A. Hislop (80 spec.) and Batu Besar, Ulu Kenyam Kechil, Pahang, August 1954, leg. J. R. Hendrickson (65 spec.).

Both samples contain shells which are a trifle smaller than the original lot from the type locality Gua Musang in Kelantan, 1939 (Van Benthem Jutting, 1952, Bull. Raffles Mus. No. 24, p. 51). The measurements of 20 shells taken at random from the lot of Ulu Kenyam Kechil, Ulu Tembeling, Pahang, April 1952 clearly demonstrate this difference.

Dimensions (in mm.)	Paratypes																			
Height	2.1	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.7
Width	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.2	1.2	1.3	1.3	1.3	1.3	1.2	1.2	1.2	1.2	1.2
Height of aperture ..	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.7	0.8	0.8	0.8	0.7	0.7	0.8	0.8	0.8	0.7	0.7	0.7

For the rest there are no differences.

Opisthostoma (Plectostoma) siphonostomum v. B. Jutting 1952.

A large series of shells was collected at Gua Che Yatin, Ulu Tembeling, Pahang, May 1953.

Opisthostoma (Plectostoma) praeco n.sp. Plate 11, Fig. 5

Shell with regular, broad-conical spire, ending in an abnormally coiled and detached last whorl, with a trumpet-shaped aperture. At the transition of the regular spire into the abnormal terminal part the whorl is transversely constricted.

White or very light-pink, shining and somewhat transparent. First 1¼ whorls smooth, following ones ornamented with delicate, oblique, transverse, white ribs, standing away wing-like from the shell. There are 30 ribs on the last normal whorl before the constriction. After the constriction the ribs stand wider apart. In the holotype there are 12 ribs between the constriction and the aperture, a distance of 2½ mm. There is a delicate spiral striation.

Whorls 6 (the detached trumpet not included), convex. Suture deep. The convexity is accentuated by the wing-like ribs. Top pointed, but not sharp. Base rounded. Umbilicus distinct and deep, but not wide.

Last whorl irregular, transversely constricted in the middle, then widening towards the aperture, at the same time turning back and a little upward, free from the spire. Aperture facing obliquely up and back, thus falsely suggesting a sinistral shell. Aperture round. Peristome continuous, circular. Just behind the peristome, and parallel with it the terminal part of the trumpet bears a wing-like collar.

Operculum unknown.

Dimensions (in mm.)	Holotype	Paratypes (from type locality)									
Height	2.4	2.4	2.4	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.2
Width (including aperture)	3.0	3.0	3.0	3.2	3.1	3.0	3.0	2.9	2.9	2.9	2.9	3.0
Diam. aperture ..	1.0	1.2	1.1	1.2	1.1	1.1	1.0	1.1	1.1	1.1	1.0	1.1

Dimensions (in mm.)	Paratypes (from type locality)									
Height	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.0
Width (including aperture)	3.0	2.9	2.9	2.9	2.8	2.8	2.8	2.9	2.9	3.0
Diam. aperture ..	1.0	1.1	1.0	1.0	1.0	1.0	1.0	1.1	1.1	1.0

The framed-in specimen has been figured.

Habitat: Batu Che Derani, Ulu Kenyam Kechil, Pahang, August 1954, J. R. Hendrickson coll. (type locality), holotype and 84 paratypes.
Ulu Kenyam Kechil, Ulu Tembeling, Pahang, April 1952, J. A. Hislop coll., 46 paratypes.

The new species is related to *Opisthostoma* (*Plectostoma*) *charasense* Tomlin and *O.* (*Pl.*) *laidlawi* Sykes. From *O.* (*Pl.*) *charasense* it differs in the greater size, the narrower spire and the more numerous vertical ribs.

From *O.* (*Pl.*) *laidlawi* it differs in the greater size, the more pointed apex and the more numerous vertical ribs.

Opisthostoma (Plectostoma) laemodes n.sp. Plate 11, Fig. 6

Shell with regular, conical, rather plump spire, the last whorl ending in an irregular curve. At the transition of the normal spire and the irregular last part the whorl is transversely constricted. Straw-colour or light-pink, not transparent or shining. First 1½ whorls smooth, the following ones ornamented with fine, oblique ribs of the same colour

as the shell. These ribs are rather distantly placed; on the last normal whorl before the constriction I counted 18 ribs in the holotype. After the constriction the ribs are placed at irregular intervals, sometimes closer together, sometimes wider apart. On the terminal part I counted 12 ribs in the holotype. There is a delicate spiral striation.

Whorls 6–7, the twisted part included and counted as if it were regular. Convex, suture deep. Apex pointed, but not sharp, base rounded. Umbilicus narrow.

Last whorl about halfway constricted transversely, then widening again towards the aperture, at the same time turning back, thus falsely suggesting a sinistral shell.

Aperture circular, vertical or a little oblique. Peristome continuous, adnate to the penultimate whorl. Just behind the peristome a wing-like collar runs parallel with it.

Operculum unknown.

Dimensions (in mm.)	Holotype	Paratypes	
Height	2.4	2.5 2.5 2.4 2.4	I
Width (aperture included)	2.5	2.5 2.5 2.4 2.4	
Diam. aperture ..	1.0	1.0 1.0 1.0 1.0	

The first paratype has been figured.

Dimensions (in mm.)	Paratypes	
Height	2.6 3.0 2.8	II
Width (aperture included) ..	2.2 2.7 2.6	
Diam. aperture ..	0.9 1.0 1.0	

Dimensions (in mm.)	Paratypes	
Height	2.8 2.6 2.6	III
Width (aperture included) ..	2.7 2.6 2.6	
Diam. aperture ..	1.0 1.1 1.0	

Habitat: Batu Tai Gadjah, Ulu Kenyam Kechil, Pahang, August 1954, coll. J. R. Hendrickson (type locality) No. I of above-mentioned table.

Ulu Kenyam Kechil, Pahang, April 1952, coll. J. A. Hislop No. II of above-mentioned table.

Batu Che Derani, Ulu Kenyam Kechil, Pahang, August 1954, coll. J. R. Hendrickson No. III of above-mentioned table.

The shells were not in good condition. Probably the riblets, which are now somewhat obsolete, are better developed in fresh shells.

The only Malayan species of the subgenus *Plectostoma* which is in some degree related to our new species is *O.* (*Pl.*) *salpidomon* v. B. Jutting. This species is, however, more slender, has more numerous ribs and a detached terminal part of the last whorl.

Genus **Opisthostoma** sens. str.

Group I

Opisthostoma (Opisthostoma) tenuicostatum v. B. Jutting 1952

One single specimen from Ulu Kenyam Kechil, Ulu Tembeling, Pahang, April 1952, collected by J. A. Hislop agrees very well with the holotype and paratypes from the type locality Goa Siput, Batu Lompat, Pahang.

Opisthostoma (Opisthostoma) plagiostomum v. B. Jutting

Additional material was collected at the following localities:—

Gunong Sinyum, Pahang, June 1954; Gua Che Manan, Ulu Tembeling, Pahang, December 1952, leg. C. S. Ogilvie; Batu Che Derani, Ulu Kenyam Kechil, Pahang, leg. J. R. Hendrickson, August 1954.

Group II

Opisthostoma (Opisthostoma) platycephalum v. B. Jutting

Four additional shells were collected at Bukit Sagu, Pahang, 1947.

Opisthostoma (Opisthostoma) atalum n.sp. Plate 12, Fig. 7

Shell short-cylindrical, slightly oblique, white, a little shining and transparent in fresh shells. First whorl smooth, following ones ribbed by fine white, transverse ribs, placed at greater distance than either in *O.* (*O.*) *obtusum* v. B. Jutting, *O.* (*O.*) *platycephalum* v. B. Jutting or *O.* (*O.*) *uranoscopium* v. B. Jutting. With fine spiral striation in the intervals between the ribs.

Whorls 4, convex. The top whorls almost in one plane, and placed somewhat obliquely on the axis of the shell. Suture deep. Last whorl without deviation, widening towards the aperture and directed upward. Umbilicus open, but not wide.

Aperture round, horizontal, facing the sky. Peristome continuous, circular, or rounded triangular, duplex. The parietal margin is pressed against the penultimate whorl, reaching nearly the upper suture of that whorl.

Operculum unknown.

Dimensions (in mm.)	Holotype	Paratypes														
Height ..	0.75	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.75	0.75	0.75	0.75	0.7	0.7	0.7	0.7
Width (aperture included) ..	1.3	1.2	1.2	1.2	1.2	1.2	1.2	1.15	1.25	1.25	1.25	1.2	1.25	1.2	1.2	1.15
Diam. aperture ..	0.5	0.5	0.5	0.5	0.5	0.5	0.45	0.45	0.5	0.5	0.5	0.5	0.5	0.5	0.4	0.5

The framed-in specimen has been figured.

Habitat: Gua Che Yatin, Ulu Tembeling, Pahang, May 1953 (type locality).

Opisthostoma (*O.*) *atalum* differs from *O.* (*O.*) *obtusum*, *O.* (*O.*) *platycephalum* and *O.* (*O.*) *uranoscopium* in being larger and much more coarsely ribbed, not only in the last whorl, as in *O.* (*O.*) *obtusum*, but all over the shell.

Opisthostoma (Opisthostoma) hypermicrum n.sp. Plate 12, Fig. 8

Shell short-cylindrical, slightly oblique, white, not or hardly shining or transparent. First whorl smooth, subsequent ones ornamented with fine, white, transverse ribs, close together on the early whorls, and not much wider apart (not so wide as in *O.* (*O.*) *obtusum* v. B. Jutting or *O.* (*O.*) *atalum* n.sp.) on the last whorl. With a very delicate spiral sculpture.

Whorls 3¼–4, convex. The top whorls in one plane and somewhat oblique on the axis of the shell. Suture deep. Last whorl widened towards the aperture, but not so trumpet-shaped as in *O.* (*O.*) *platycephalum* v. B. Jutting. The aperture is directed to the sky. It is round and adnate to the penultimate whorl, reaching about halfway up the height of that whorl.

Peristome continuous, circular or rounded triangular, duplex.

Operculum unknown.

Dimensions (in mm.)	Holotype	Paratypes									
Height	0.6	0.6	0.6	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55
Width (aperture included)	1.0	1.0	0.9	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Diam. aperture ..	0.35	0.35	0.3	0.4	0.4	0.35	0.35	0.35	0.35	0.35	0.35

Dimensions (in mm.)	Paratypes									
Height	0.55	0.55	0.5	0.55	0.5	0.55	0.5	0.5	0.55	0.55
Width (aperture included)	1.0	0.95	0.95	0.95	0.95	0.9	0.9	0.9	0.9	0.9
Diam. aperture ..	0.35	0.35	0.35	0.3	0.3	0.35	0.3	0.3	0.3	0.3

The framed-in specimen has been figured.

Habitat: Bukit Chintamani, Pahang, June 1954 (type locality).

Opisthostoma (*O.*) *hypermicrum* is smaller than either *O.* (*O.*) *obtusum* v. B. Jutting, *O.* (*O.*) *platycephalum* v. B. Jutting or *O.* (*O.*) *uranoscopium* v. B. Jutting. In shape it is nearest to *O.* (*O.*) *platycephalum* and not so high as the other two species just mentioned. The distal part of the last whorl is not so trumpet-shaped as in *O.* (*O.*) *platycephalum*. The ribs are placed closer together than in *O.* (*O.*) *obtusum* or *O.* (*O.*) *atalum* n.sp.

Group III

Opisthostoma (Opisthostoma) pollux v. B. Jutting

Three additional series were collected at:—

Gua Che Manan, Ulu Tembeling, Pahang, December 1952, leg. C. S. Ogilvie; Gua Che Yatin, Ulu Tembeling, Pahang, May 1953 and Gunong Sinyum, Pahang, June 1954.

Opisthostoma (Opisthostoma) micridium n.sp. Plate 13, Fig. 9

Shell white, obliquely low-cylindrical, more oblique than *O.* (*O.*) *castor* v. B. Jutting and *O.* (*O.*) *pollux* v. B. Jutting. First whorl smooth, following ones finely ribbed with white, transverse ribs all over the shell. No spiral sculpture.

Whorls 3¾, convex. The top whorls almost in one plane, slightly oblique on the axis of the shell. The two large whorls convex, the third one bulging out far in the shell profile. Last whorl a little flattened and broadened at the basal side. Suture deep. Last whorl directed upwards and adnate, with almost no deviation. It reaches till about midway up the height of the preceding whorl. Umbilicus open.

Aperture rounded, obliquely directed to the sky. Peristome continuous, circular to rounded-triangular, duplex.

Operculum unknown.

Dimensions (in mm.)	Holotype	Paratypes		
Height	0.65	0.7	0.6	0.6
Width (aperture included) ..	1.2	1.1	1.1	1.0
Diam. apert.	0.4	0.3	0.35	0.3

The second paratype has been figured.

Habitat: Gunong Sinyum, Pahang, June 1954 (type locality).

The new species differs from *O.* (*O.*) *castor* and *O.* (*O.*) *pollux* in the slightly smaller size and the more oblique shape. It has the greatest affinities to *O.* (*O.*) *pollux*, but the aperture of *O.* (*O.*) *micridium* does not reach so high up against the penultimate whorl, and the trumpet-shaped part of the last whorl is less twisted.

Opisthostoma (Opisthostoma) fallax n.sp. Plate 13, Fig. 10

Shell white, obliquely cylindrical, more oblique than in *O.* (*O.*) *castor* v. B. Jutting and *O.* (*O.*) *pollux* v. B. Jutting. First whorl smooth, following ones ribbed with fine, white, transverse ribs, close-set in the earlier whorls, but wider apart in the last one. No spiral striation visible.

Whorls 4, convex. The top whorls almost in one plane with the third whorl, and placed obliquely on the axis of the shell. Two last whorls convex, the third distinctly bulging out in the shell profile, although not so much as in *O.* (*O.*) *micridium* n.sp. Suture deep. Terminal part of last whorl first constricted, then widening again, continuing in a double bend towards the aperture.

Aperture rather small, directed obliquely towards the sky, adnate to penultimate whorl, but not reaching higher than the middle of the last whorl. Umbilicus open, wider than in *O.* (*O.*) *castor*, *O.* (*O.*) *pollux* or *O.* (*O.*) *micridium*. Peristome continuous, circular, sometimes duplex.

Operculum unknown.

Dimensions (in mm.)	Holotype	Paratypes														
Height ..	0.7	0.8	0.8	0.75	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.65	0.65	0.65
Width (aperture included) ..	1.3	1.3	1.3	1.25	1.35	1.3	1.3	1.3	1.3	1.3	1.3	1.25	1.2	1.3	1.2	1.2
Diam. aperture	0.4	0.4	0.35	0.35	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.35	0.35	0.4	0.35	0.35

The framed-in specimen has been figured.

Habitat: Sungei Siput, Perak, 1936, 1946 (type locality).

From *O.* (*O.*) *castor* and *O.* (*O.*) *pollux* the new species differs in the more oblique shape, the wider umbilicus and the more twisted terminal part of the last whorl.

O. (*O.*) *fallax* bears some resemblance to *O.* (*O.*) *michaelis* v. B. Jutting, but this species is smaller, less oblique and has a narrower umbilicus.

Group IV

Opisthostoma (Opisthostoma) tenerum v. B. Jutting [illegible]

Additional material was collected on Bukit Sagu, Pahang, 1947.

Opisthostoma (Opisthostoma) paranomon v. B. Jutting [illegible]

In September 1941 shells of this species were collected at Gua Bama, Pahang.

Opisthostoma (Opisthostoma) per'isanum n.sp. Plate 14, Fig. 11

Shell short-cylindrical, pupaeform, with little elevated apex, very similar to, but less elevated than *O.* (*O.*) *tenerum* v. B. Jutting. White or very light-yellow. First whorl smooth, later ones transversely ribbed with fine, white ribs, placed close together on the upper whorls, but more distantly on the last. Between the ribs there is a delicate spiral striation. Not or little transparent, not shining.

Whorls 5, convex. First two placed a little obliquely on the axis of the shell. Spire a little elevated (not so much as in *O.* (*O.*) *tenerum*). Third whorl broader than the preceding or the following ones. Hence it bulges out in the shell profile. Suture deep. Last whorl somewhat constricted in the middle, then widening again and deviating, so that the aperture faces obliquely upwards and backwards, falsely suggesting a sinistral shell. Umbilicus open, but not wide.

Aperture round, somewhat oblique, adnate to the upper part of the third whorl. Peristome continuous, circular, or rounded-triangular, duplex.

Operculum unknown.

Dimensions (in mm.)	Holotype	Paratypes								
Height	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0.9	0.9	0.9
Width (aperture included) ..	1.4	1.3	1.3	1.3	1.3	1.3	1.2	1.35	1.3	1.3
Diam. aperture	0.5	0.5	0.5	0.5	0.5	0.5	0.45	0.5	0.45	0.4

Dimension (in mm.)	Paratypes									
Height	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.85	0.8	0.8
Width (aperture included) ..	1.3	1.25	1.25	1.2	1.2	1.2	1.2	1.2	1.25	1.2
Diam. aperture	0.4	0.5	0.45	0.45	0.45	0.4	0.4	0.4	0.4	0.45

The first paratype has been figured.

Habitat: Bukit Lagi, Perlis, 1951 (type locality).

Compared with *O.* (*O.*) *tenerum*, *O.* (*O.*) *perlisanum* differs in the following points: the apex is less projecting, the third whorl is broader, bulging out in the shell profile and the aperture is facing obliquely up- and backward.

Compared with *O.* (*O.*) *javanum* v. B. Jutting the new species has a less projecting apex, a wider umbilicus, more distantly placed ribs and a broader third whorl which bulges out in the shell profile.

Opisthostoma (Opisthostoma) hemistreptum n.sp. Plate 14, Fig. 12

Shell short-cylindrical. White, in fresh shells probably a little shining and transparent. Last whorl a little narrower than the preceding one. First whorl smooth, following ones ornamented with fine, white, distantly placed vertical ribs, standing off wing-like away from the shell. Between the ribs there is a fine spiral striation.

Whorls 4½, the first small and little projecting, the others comparatively large and convex, separated by a deep suture. In the holotype there are 18 ribs on the last whorl, counting from the aperture to the spot where the distal part of the last whorl touches the penultimate one. On the penultimate whorl the holotype has 22 ribs. In the paratype from Ulu Kenyam Kechil, Ulu Tembeling, Pahang, leg. J. A. Hislop, April 1952 these numbers are 17 resp. 21. Distal part of last whorl directed upward and obliquely backward, adnate. Umbilicus open, but not wide.

Aperture round, obliquely facing backward. Peristome continuous, circular or rounded-triangular, duplex.

Operculum unknown.

Dimensions (in mm.)	Holotype	Paratype (from Ulu Kenyam Kechil, Ulu Tembeling, April 1952)	
Height	1.1	1.0	
Width (aperture included) ..	1.4	1.4	this paratype has been figured
Diam. aperture	0.5	0.5	

Paratypes (from Batu Besar, Ulu Kenyam Kechil, August 1954)

Height	1.1	1.1	1.1	1.1	1.1		
Width	1.45	1.4	1.4	1.3	1.3		
Diam.	0.5	0.5	0.5	0.5	0.5		

Habitat: Ulu Kenyam Kechil, Ulu Tembeling, Pahang, leg. J. A. Hislop, April 1952 (type locality); Batu Besar, Ulu Kenyam Kechil, Pahang, J. R. Hendrickson, August 1954.

In general outline the shape of the shell is intermediate between the Groups IV and V. It has a higher spire than *O.* (*O.*) *coronatum* v. B. Jutting or *O.* (*O.*) *trapezium* v. B. Jutting and, therefore, should be regarded as a member of Group IV. The ornamentation, on the other hand, the flatter top and the wider umbilicus (although not so wide as in *O.* (*O.*) *coronatum* or *O.* (*O.*) *trapezium* suggest a classification in Group V.

From *O.* (*O.*) *tenerum* v. B. Jutting the new species differs in the smaller number of ribs in the distal part of the last whorl, distally of the constriction. In this part the number of ribs is 11–12 in *O.* (*O.*) *tenerum*, but only 7–8 in *O.* (*O.*) *hemistreptum*.

The new species differs from *O.* (*O.*) *coronatum* in the higher cylindrical shell, the narrower umbilicus and the position of the aperture which is directed obliquely backwards and only slightly upwards.

When working at my account of Malayan *Opisthostoma* in 1952 I did not have at my disposal such a good stereoscopic microscope as I have used for the present report. Consequently at that time I had often to record that a spiral striation was not visible on certain shells. Working with the superior modern instrument I find that such sculpture does indeed appear in the majority of the species.

The following is a list of the species in which, on renewed investigation, spiral striae proved to be present (those in which the spiral sculpture was already mentioned in 1952, are not now repeated).

paulucciae Crosse & Fischer
pulvisculum v. B. Jutting
plagiostomum v. B. Jutting
granunculum v. B. Jutting
megalomphalum v. B. Jutting
platycephalum v. B. Jutting
obtusum v. B. Jutting
thersites v. B. Jutting
castor v. B. Jutting
pollux v. B. Jutting
charasense Tomlin
salpidomon v. B. Jutting
turriforme v. B. Jutting
siphonostomum v. B. Jutting

In *O. michaelis* v. B. Jutting, *O. kakiense* Tomlin and *O. senex* v. B. Jutting the spiral sculpture is definitely absent.

Finally it can be added that the two Javanese species *O. uranoscopium* v. B. Jutting and *O. javanum* v. B. Jutting are also striated spirally.

Explanation of Plates

PLATE 8

Fig. 1. *Oophana* (*Haploptychius*) *acuti-carinata* n.sp. Gunong Sinyum, Pahang, June 1954. Shell from top, base and two sides.

Fig. 2a. *Paraboysidia neglecta* n.sp. Gua Luas, Kuala Kenyam, Pahang, April 1952. Front view of shell.

Fig. 2b. *Paraboysidia laidlawi* (Collinge). Gua Che Yatin, Ulu Tembeling, Pahang, May 1953. Front view of shell.

PLATE 9

Fig. 3. *Paraboysidia oreia* n.sp. Gunong Batu Kurau, Perak, November 1950. Shell from front, base and back. Aperture more enlarged.

PLATE 10

Fig. 4. *Gyliotrachela salpinx* n.sp. Bukit Serdam near Raub, Pahang, August 1950. Shell from two sides and base. Aperture more enlarged.

PLATE 11

Fig. 5. *Opisthostoma* (*Plectostoma*) *praeco* n.sp. Batu Che Derani, Ulu Kenyam Kechil, Pahang, August 1954. Shell from two sides and base.

Fig. 6. *Opisthostoma* (*Plectostoma*) *laemodes* n.sp. Batu Tai Gadjah, Ulu Kenyam Kechil, Pahang, August 1954. Shell from two sides and base.

PLATE 12

Fig. 7. *Opisthostoma* (*Opisthostoma*) *atalum* n.sp. Gua Che Yatin, Ulu Tembeling, Pahang, May 1953. Shell from side, top and base.

Fig. 8. *Opisthostoma* (*Opisthostoma*) *hypermicrum* n.sp. Bukit Chintamani, Pahang, June 1954. Shell from side, top and base.

PLATE 13

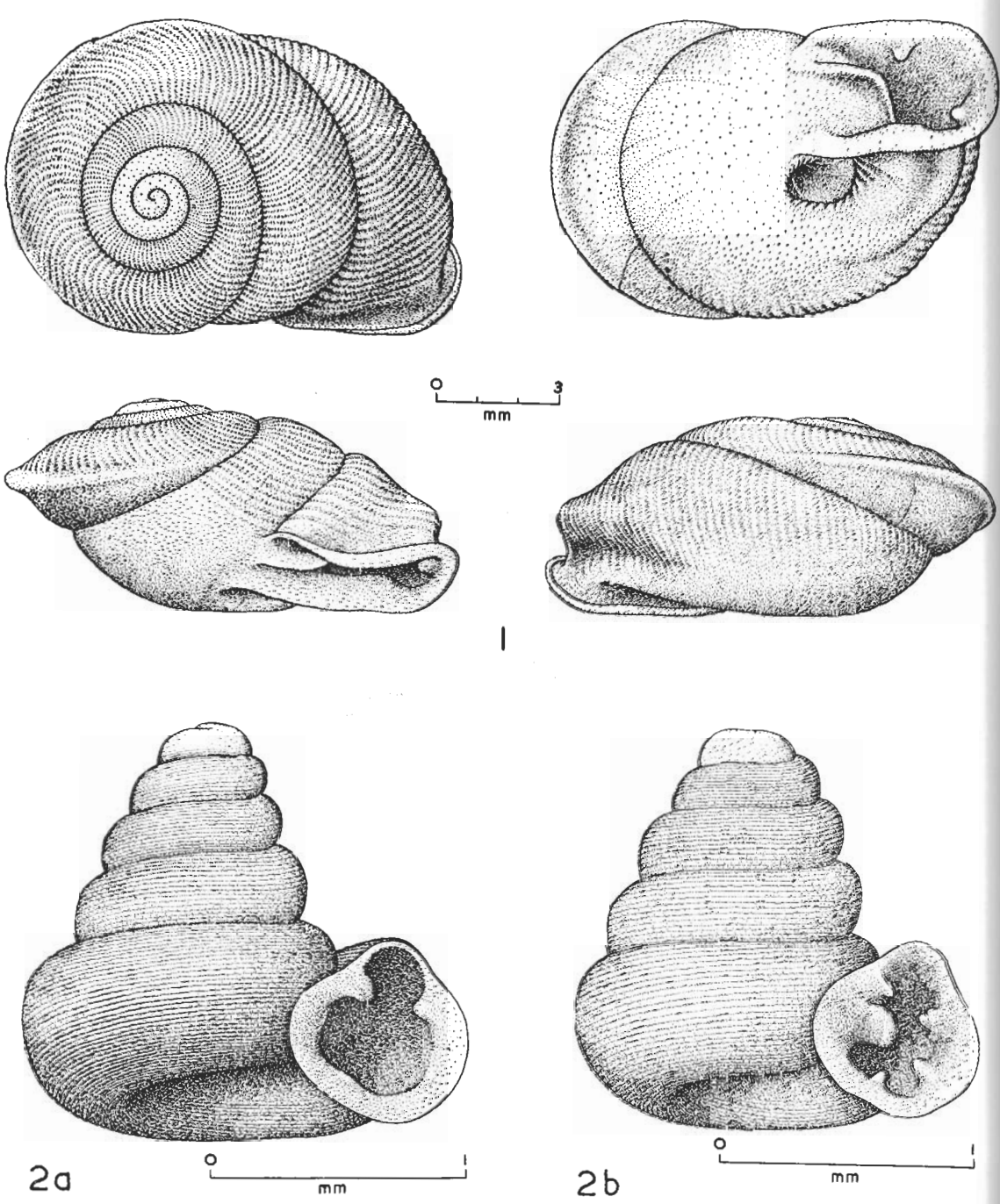
Fig. 9. *Opisthostoma* (*Opisthostoma*) *micridium* n.sp. Gunong Sinyum, Pahang, June 1954. Shell from side, top and base.

Fig. 10. *Opisthostoma* (*Opisthostoma*) *fallax* n.sp. Sungei Siput, Perak, 1936–1946. Shell from side, top and base.

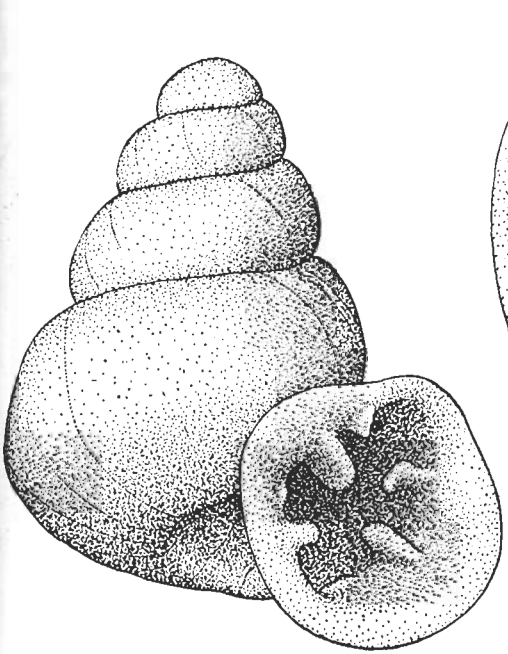
PLATE 14

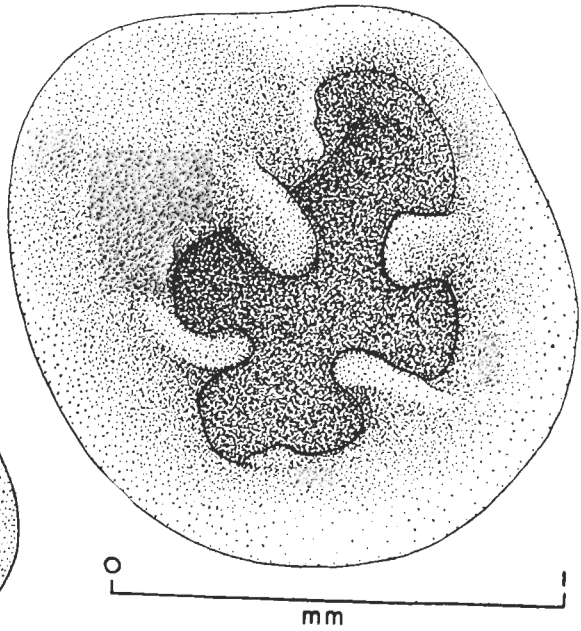
Fig. 11. *Opisthostoma* (*Opisthostoma*) *perlisanum* n.sp. Bukit Lagi, Perlis, 1951. Shell from side, top and base.

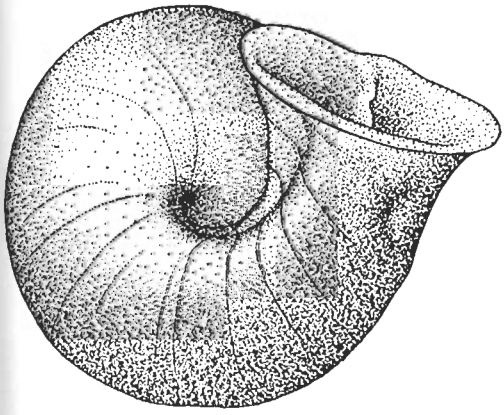
Fig. 12. *Opisthostoma* (*Opisthostoma*) *hemistreptum* n.sp. Ulu Kenyam Kechil, Ulu Tembeling, Pahang, April 1952. Shell from two sides and base.

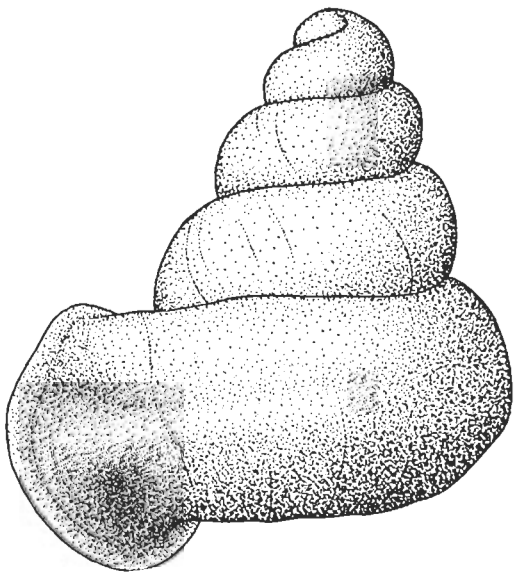


Malayan land molluscs (W. S. S. van Benthem Jutting).









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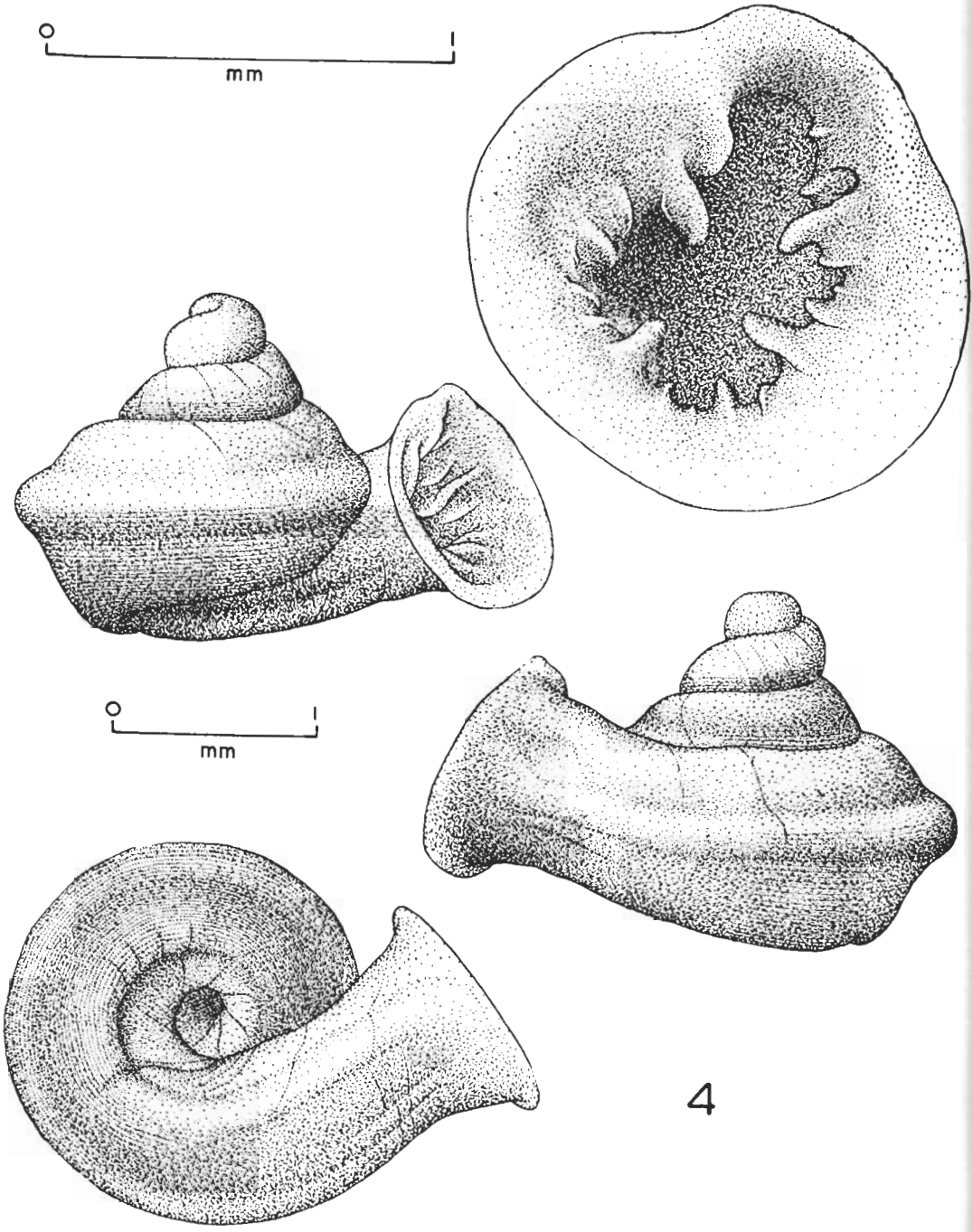
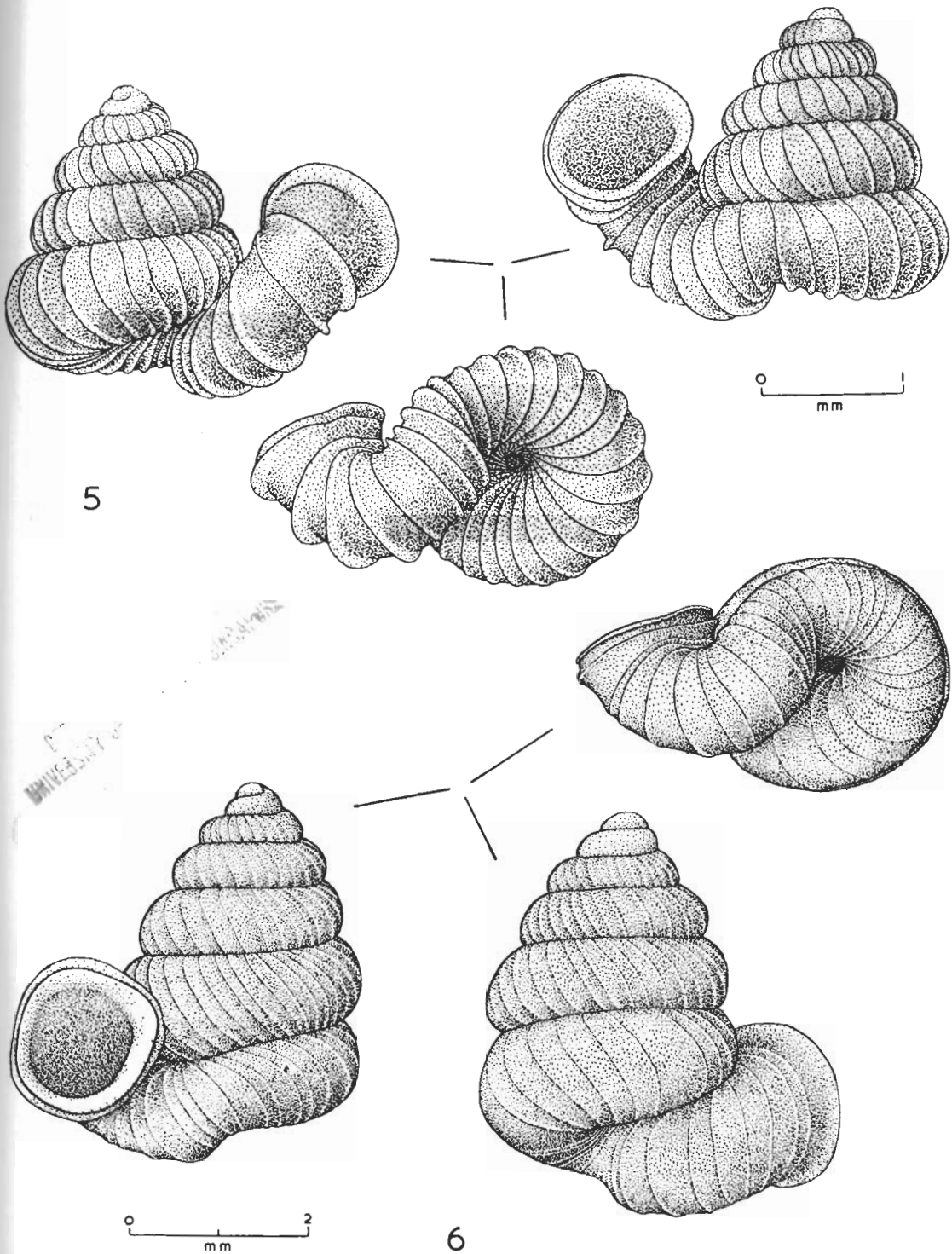
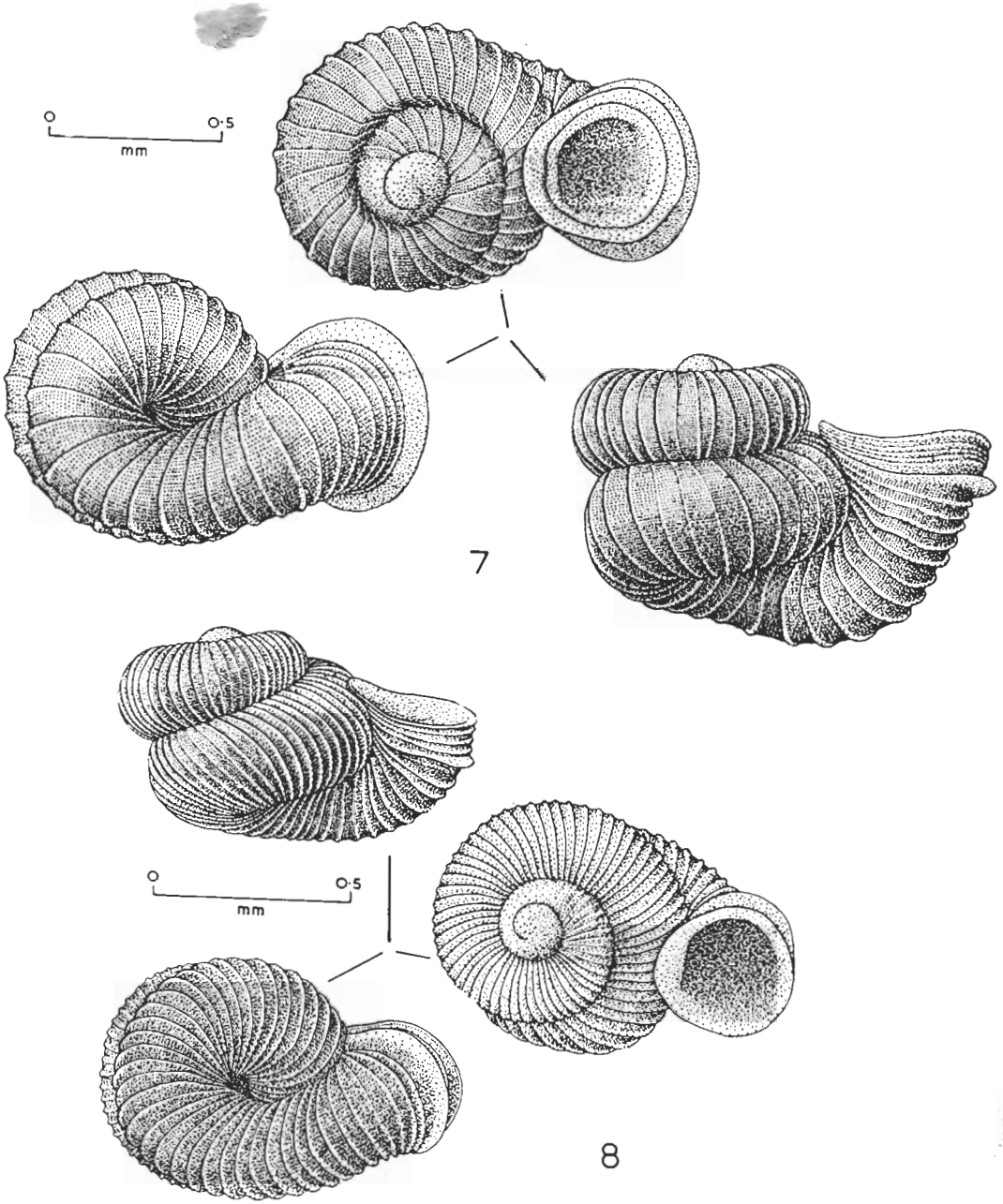
Malayan land molluscs (W. S. S. van Benthem Jutting).



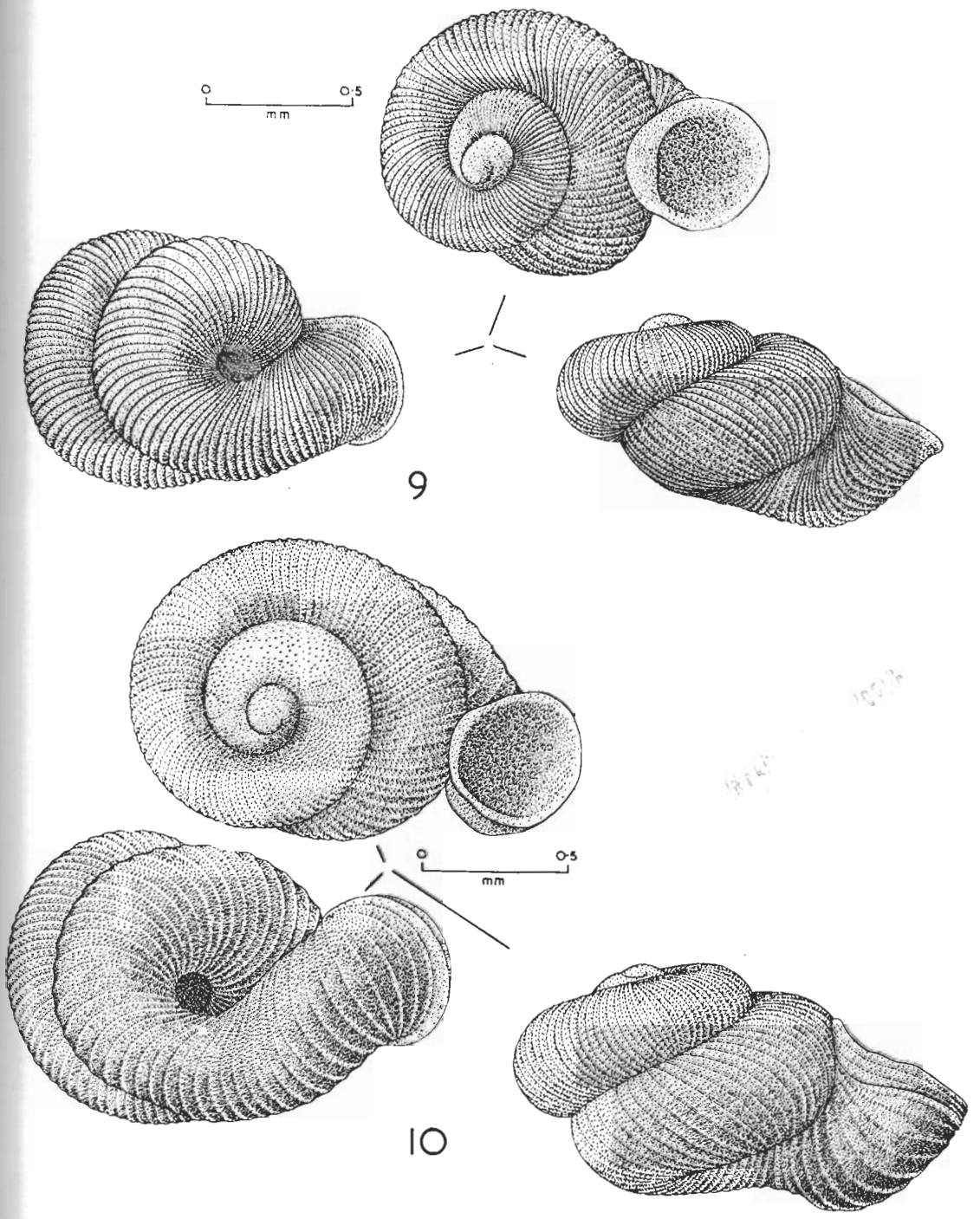
Malayan land molluscs (W. S. S. van Benthem Jutting).



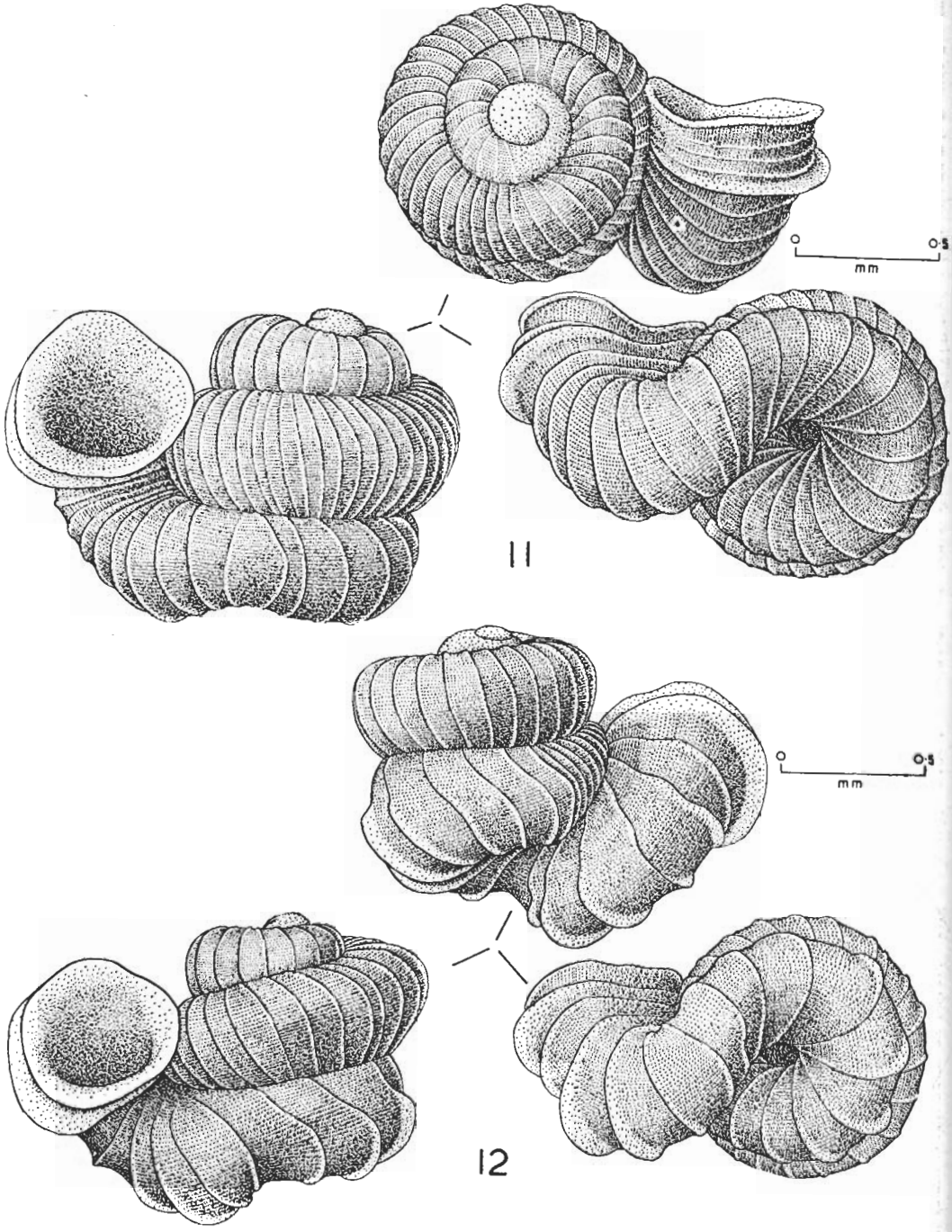
Malayan land molluscs (W. S. S. van Benthem Jutting).



Malayan land molluscs (W. S. S. van Benthem Jutting).



Malayan land molluscs (W. S. S. van Benthem Jutting).



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