The Malayan Streptaxidæ
Genera Huttonella and Sinoennea

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Introduction

IN DECEMBER 1954 the first part of the account of the family Streptaxidae of Malaya, dealing with the genera *Discartemon* and *Oophana* was published (Bull. Raffles Mus. no. 25, p. 71–106). In this paper I alluded to the fact that two other genera, *Sinoennea* and *Huttonella*, were still in preparation.

A survey of the species of the latter two genera is now presented. All shells are of ovoid, pupoid or cylindrical shape. Most of them were collected by Mr. M. W. F. Tweedie and his collaborators, and many proved to be new to science.

This Introduction can be very short, as many remarks concerning *Discartemon* and *Oophana* apply equally to *Huttonella* and *Sinoennea*. For some general information readers are referred to the above mentioned paper, pp. 71–79. In that paper I had to state that no Streptaxid except *Huttonella bicolor* had ever been found in Sumatra. Since that date, however, Mr. J. P. van Niel, then at Membang Muda, Sumatra, succeeded in collecting shells of a *Sinoennea* which will be described later on.

Holotypes of the new species of Malaya were presented by Mr. Tweedie to the Zoological Museum, Amsterdam. Paratypes, as far as available, were deposited in the British Museum (Natural History) London and in the Raffles Museum, Singapore.

The figures on Plates 1 to 7 are from drawings made by Mr. K. M. Foong, Artist, Raffles Museum. All are from the actual shells except Fig. 5 (*S. malaccana*) which is copied from a pencil sketch by the author.

List of Localities and Species

	Ovoid species	Cylindrical species
Kedah		
1. Bukit Baling (5° 41′ N., 100° 55′ E.)	*hungerfordiana*	
Perak and Peninsular Siam		
2. State of Jalor	*perakensis*	
3. Gua Badak ⎫ near Lenggong	*tweediei*	*lenggongensis*
4. Gunong Tasek ⎭ (5° 10′ N., 101° E.)	*tweediei*	
5. Gunong Pondok (4° 50′ N., 100° 50′ E.)	*perakensis* *hungerfordiana*	*subcylindrica*
6. Gunong Kantang (4° 46′ N., 101° 6′ E.)	*chrysallis*	*subcylindrica*
7. Sungei Siput (4° 52′ N., 101° 7′ E.)		*subcylindrica*
8. Kramat Pulai (4° 35′ N., 101° 05′ E.)		*lenggongensis*
9. Gunong Batu Kurau (4° 55′ N., 100° 50′ E.)		*tiarella*

	Ovoid species	Cylindrical species
Selangor		
10. Bukit Takun (3° 18′ N., 101° 38′ E.)	*kanchingensis*	*butleri*
11. Batu Caves (3° 10′ N., 101° 40′ E.) ..		*ridleyi*
		butleri
Kelantan		
12. Gua Musang (4° 53′ N., 101° 59′ E.)		*attenuata*
13. Gua Madu (4° 52′ N., 101° 58′ E.) ..		*attenuata*
14. Gua Nenek (4° 50′ N., 102° E.) ..	*crumenilla*	

Fig. 1. Map of the Malay Peninsula showing localities of limestone hills where shells were collected. Stippling indicates mountainous areas. Numbering follows the list of localities in the text, but 2 (Jalor) is extralimital. 3 stands for 3 & 4, 12 for 12 & 13, 18 for 18 & 19 and 20 for 20 & 21, these pairs of localities being too close to be separated on a map of this scale.

Pahang	Ovoid species	Cylindrical species
15. Goa Siput (4° 26′ N., 102° 15′ E.) ..		*lepida*
16. Gua Sai (4° 13′ N., 101° 59′ E.) ..	*apicata*	
17. Gua Bama (4° 12′ N., 101° 58′ E.) ..	*apicata* *pagodella*	
18. Kota Tongkat (3° 53′ N., 102° 29′ E.)	-	*baculum*
19. Kota Gelanggi (3° 53′ N., 102° 29′ E.)		*baculum*
20. Bukit Charas (3° 54′ N., 103° 09′ E.)	*charasensis* *lembingensis*	
21. Bukit Panching (3° 53′ N., 103° 08′ E.)	*lembingensis*	
22. Bukit Serdam (3° 51′ N., 101° 55′ E.)		*baculum* *dactylus*
23. Gunong Sinyum (3° 43′ N., 102° 26′ E.)	*callizonus*	
24. Bukit Chintamani (3° 27′ N., 102° 05′ E.)	*chintamanensis*	
25. Gua Che Yatin (4° 29′ N., 102° 25′ E.)	*bacca* *glebula*	
26. Ulu Kenyam Kechil (4° 37′N., 102° 25′ E.)	*leucostolos*	

List of Species (alphabetical order) referred to the numbered Stations in the previous List

apicata	16, 17	*hungerfordiana*	1, 5
attenuata	12, 13	*kanchingensis*	10
bacca	25	*lembingensis*	20, 21
baculum	18, 19, 22	*lenggongensis*	3, 8
butleri	10, 11	*lepida*	15
callizonus	23	*leucostolos*	26
charasensis	20	*pagodella*	17
chintamanensis	24	*perakensis*	2, 5
chrysallis	6	*ridleyi*	11
crumenilla	14	*subcylindrica*	5, 6, 7
dactylus	22	*tiarella*	9
glebula	25	*tweediei*	3, 4

S. malaccana is not included in the above lists because it has been recorded only from the State of Kelantan, not from any precise locality.

In the genus *Sinoennea* it is again demonstrated how very restricted are the areas of distribution of its species in Malaya. Of the 24 exactly localised species 14 have been recorded from one mountain only. A few others (*apicata, attenuata, butleri, lembingensis, tweediei*) occur on more than one limestone hill, but these hills are lying so close together that they form one mountain complex. Of four species (*perakensis, baculum, hungerfordiana* and *lenggongensis*) the distribution needs some discussion.

In species of *Sinoennea* the young stages of the shell—as far as they have been investigated—are already provided with an elaborate system of teeth and folds in the aperture. This juvenile apertural armature is generally different from that of the adult shell (Peile, 1929, Proc. Malac. Soc. London, Vol. 18, p. 153–154). During further growth the juvenile dentition is resorbed again. At the final peristome of the full grown shell the definite teeth and lamellae are formed anew.

For the sake of convenience the Malayan species of *Sinoennea* will be divided hereafter into *ovoid* and *cylindrical* species. This classification is not a natural one, as, firstly, the difference is based on shell characters only, giving no clue to the anatomical affinities of the species, and, secondly, because the difference between "ovoid" and "cylindrical" is not always well defined. Hence the Key to the Species and the Comparative Table must be employed with great reserve.

Key to the Ovoid Species of Sinoennea

1. Shell with wide umbilicus and free peristome 2
–. Shell with narrow umbilicus and adnate peristome 5
2. Distance between parieto-angular lamella and palatal tooth narrow 3
–. Distance between parieto-angular lamella and palatal tooth wider 4
3. With one palatal tooth ..... *hungerfordiana*
–. With two palatal teeth ..... *tweediei*
4. With 45–48 vertical ribs on the last whorl; distal part of last whorl just before peristome swollen ..... *perakensis*
–. With 30–32 ribs on the last whorl; distal part of the last whorl just before peristome without swelling ..... *charasensis*
5. Very small shell, almost no ribs visible ..... *lembingensis*
–. Larger, ribs distinct 6
6. Large, spindle-shaped shell, without palatal teeth ..... *kanchingensis*
–. Smaller, with palatal teeth 7
7. Peristome adnate or just free ..... *pagodella*
–. Peristome adnate 8
8. Short distance between parieto-angular lamella and palatal teeth 9
–. Distance between parieto-angular lamella and palatal teeth larger 10
9. Large, ventricose shell, with 8 whorls ..... *chrysallis*
–. Smaller, more cylindrical-ovoid shell, with 6 whorls ..... *crumenilla*
10. With 1 palatal tooth ..... *apicata*
—. With 2 palatal teeth 11
11. The two palatal teeth are implanted on a common base ..... *chintamanensis*
—. The two palatal teeth are separate 12
12. With two columellar teeth ..... *bucca*
—. With one columellar tooth 13
13. Ribs on last whorl 32, weakly developed, shell somewhat compressed laterally .. *malaccana*
—. Ribs on last whorl not more than 25, strongly developed, shell normally rounded 14
14. Ribs on last whorl about 24; lower palatal tooth at base of aperture ..... *glebula*
—. Ribs on last whorl 18–20; lower palatal tooth at palatal side 15
15. Shell moderately large, with weak ribs and distinct swelling in the distal part of the last whorl behind the peristome ..... *leucostolos*
—. Shell smaller, with stronger ribs, but without swelling in the distal part of the last whorl behind the peristome ..... *callizonus*

Sinoennea apicata n.sp. Plate 1, Fig. 2

Shell high-ovoid or pupoid, glassy transparent and shining. Two top whorls smooth, following ones with regular vertical ribs. On the 3rd and 4th whorls the ribs are rather close set, but on the three last whorls they stand wider apart. There are about 14 to 16 ribs on the last whorl. No spiral striation.

Whorls about 7, regularly increasing till about the middle of the total height of the shell, then attenuating towards the base. Profile of each whorl convex, suture deep.

Top pointed, but not sharp. Base rounded. Umbilicus narrow. Aperture mostly vertical, quadrangular with rounded angles.

Peristome adnate, continuous, thickened and reflected. At the parieto-angular corner the right margin recedes distinctly, then curves forward, receding again towards the base. Parieto-angular lamella strong, undulating. On the palatal side one tooth, on the columellar side one small tooth at the peristome margin and a much stronger one deeper down in the throat. The latter corresponds with a groove on the exterior side of the last whorl in the umbilical region. Between the groove and the peristome the distal part of the last whorl is somewhat swollen.

Dimensions (Gua Bama) (in 1/10 mm.)	Holotype	Paratypes													
Height	38	40	39	37	37	36	35	35	35	35	34	34	34	34	34	32
Width	17	17	18	18	17	17	17	17	17	17	18	17	17	17	17	18
Height of aperture ..	13	13	12	13	12	11	12	12	12	12	11	12	12	12	11	12

Dimensions (Gua Sai) (in 1/10 mm.)	Paratypes																			
Height	34	32	32	32	32	32	32	32	31	31	31	31	30	30	29	29	29	28	28	27
Width	16	16	15	16	16	16	16	16	16	15	15	15	16	15	16	15	15	16	15	15
Height of aperture	12	11	11	11	11	11	11	10	11	12	10	10	11	10	11	11	10	11	10	10

Habitat: Gua Bama, near Padang Tengku, Pahang, September 1941 (type locality); Gua Sai, near Padang Tengku, Pahang, 1947, coll. H. Service.

The salient points of discrimination in this species are: the curiously receding angular corner and the single tooth on the palatal side.

For a comparison with the other ovoid *Sinoennea* the widely umbilicated species: *charasensis, perakensis, hungerfordiana* and *tweediei* can directly be excluded, and the minute *S. lembingensis* as well.

S. kanchingensis is large and spindle-shaped, without palatal teeth, and *S. malaccana* is somewhat compressed.

S. chintamanensis is more obese than *S. apicata,* and it possesses two teeth on a common base at the palatal margin. It has a few more ribs on the last whorl, and the angular corner of the peristome, although receding a little, is not curved so much backward as in *S. apicata.*

In *S. pagodella* there are two free palatal teeth, and a free peristome, moreover *S. pagodella* is a much smaller species than *S. apicata.*

S. crumenilla and *S. chrysallis* are both more obese than *S. apicata*, and in both species the tooth at the margin of the columellar side is lacking.

S. bacca is about twice as wide as *S. apicata* and has two distinct teeth on the palatal margin. Moreover the vertical ribs seem to wear away easily in some places.

In *S. glebula* the ribs on the last whorl are more numerous, and all the ribs are finer and weaker than in *S. apicata*.

In *S. leucostolos* and *S. callizonus* there are two distinct teeth on the palatal side and none on the columellar side.

Sinoennea bacca n.sp. Plate 1, Fig. 3

Shell high-ovoid to pupoid, glassy transparent, shining. Two top whorls smooth, following ones ribbed by distantly placed, delicate ribs, about 16 on the last whorl. The ribs have the tendency to wear off easily, leaving the whorls smooth at irregular spots. Remnants are only to be seen along the suture. There is no spiral striation.

Whorls about 7, regularly increasing till about the 4th whorl. The nos. 5 and 6 are of almost equal width, no. 7 tapers towards the base. Profile of each whorl convex, suture distinct. Top pointed, but not sharp. Base rounded. Umbilical opening narrow, almost hidden by a swelling of the distal part of the last whorl.

Aperture vertical, quadrangular with rounded angles. Peristome continuous, adnate, thickened and reflected. At the parieto-angular corner the right margin recedes, then curves forward in the middle, receding again towards the base. Parieto-angular lamella strong and undulating. Of the two teeth at the palatal side the upper one lies almost at the peristome edge, the lower one somewhat deeper in the throat. At the columellar side there is one small tooth at the peristome edge, a second one somewhat lower down. The latter corresponds with a groove in the distal part of the last whorl in the umbilical area. Between this groove and the peristome the shell is somewhat swollen.

Dimensions (in 1/10 mm.)	Holotype	Paratypes					
Height	35	43	36	35	35	35	32
Width	19	19	19	20	19	19	17
Height of aperture	15	15	14	14	14	14	13

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

Sinoennea bacca has a much narrower umbilicus than either *S. charasensis, hungerfordiana, perakensis* or *tweediei*. *S. kanchingensis* is a large spindle-shaped shell without palatal teeth. From the minute *S. lembingensis* and from the compressed *S. malaccana* the new species differs in size, shape, ribs, etc.

S. chintamanensis, although rather similar, has a different style of ribbing. Moreover the palatal teeth of *S. chintamanensis* are implanted on a common base, whereas those of *S. bacca* are free.

S. pagodella is a much smaller shell, and has the peristome just free from the previous whorl.

S. apicata is more cylindrical and possesses only one tooth at the palatal margin.

S. crumenilla and *S. chrysallis* both lack the tooth at the columellar edge and are both more obese than *S. bacca*. In both *S. crumenilla* and *S. chrysallis* the distance between the upper palatal tooth and the parieto-angular lamella is much narrower than in *S. bacca*.

S. glebula is much smaller than *S. bacca*, with more numerous ribs. The lower palatal tooth of *S. glebula* has moved almost to the basal side of the aperture.

In *S. leucostolos* the top is less pointed and it has no tooth at the edge of the columellar side.

S. callizonus is smaller, with strong ribs. It equally lacks the tooth at the columellar side.

Sinoennea glebula n.sp. Plate 1, Fig. 4

Shell high-ovoid or pupoid, glassy transparent, shining. Two top whorls smooth, the following ones ribbed by delicate vertical ribs, about 24 on the last whorl. The ribs wear away easily, leaving the whorls smooth at irregular spots. No spiral striation.

Whorls 7, regularly increasing towards the middle of the shell, then diminishing again towards the base. Profile of each whorl moderately convex. The greatest diameter lies a little above the periphery. Top pointed, but not sharp. Base rounded. Umbilicus open, but not wide.

Aperture vertical, quadrangular with rounded corners. Peristome continuous, adnate to the previous whorl, or just free from it, thickened, reflected. With a strong, undulating parieto-angular lamella. To the right of this the peristome recedes, then protrudes in the middle, receding again towards the base. Of the two palatal teeth the upper one stands at the edge of the peristome margin, the lower one much deeper in the throat, and almost at the base of the aperture. Columellar side with two teeth, one at the edge of the peristome and one lower down. There is almost no swelling in the distal part of the last whorl behind the peristome.

Dimensions (in 1/10 mm.)	Holotype	Paratypes		
Height	30	28	28	26
Width	15	15	15	15
Height of aperture ..	10	10	10	9

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

S. glebula has a much narrower umbilicus than either *S. charasensis, hungerfordiana, perakensis* or *tweediei*. *S. kanchingensis* is a large, spindle-shaped species without palatal teeth.

From the very small *S. lembingensis* and from the compressed *S. malaccana* the new species differs in size, shape, ribs, etc.

S. chintamanensis is a larger and more ventricose shell. Its palatal teeth are implanted on a common base whereas in *S. glebula* they are free.

S. pagodella has a smaller shell, with coarser ribs. Its palatal teeth are standing close together whereas in *S. glebula* the lower palatal tooth lies at the base of the aperture.

S. apicata is much larger than *S. glebula* and has only one palatal tooth.

S. crumenilla and *S. chrysallis* both lack the tooth at the columellar edge and are more obese than *S. glebula*. In both species the distance between the upper palatal tooth and the parieto- angular lamella is narrower than in *S. glebula*.

S. bacca is larger than *S. glebula* and its ribs are less numerous.

S. leucostolos and *S. callizonus* lack the tooth at the exterior margin of the columellar side. Besides the two palatal teeth are placed close together whereas in *S. glebula* the lower one has been transferred to the basal side of the aperture. *S. leucostolos* is, moreover, somewhat more ventricose than *S. glebula*.

Sinoennea malaccana (Moellendorff, 1902). Plate 1, Fig. 5

1902 Moellendorff, Nachr. Blatt D. Malak. Ges. Vol. 34, p. 136 (*Ennea* (*Microstrophia*)) (Kelantan).
1904 Moellendorff & Kobelt, in: Mart.-Chemn. N. Syst. Conch. Cab. Vol. 1, Part 12B1, p. 287, pl. 33a, fig. 15–16 (*Ennea* (*Sinoennea*)) (Landschaft Kelantan).
1933 Laidlaw, Journ. Mal. Branch Roy. As. Soc. Vol. 11, p. 232 (*Indoennea*) (Kelantan).

Shell ovoid-pupoid, slightly compressed dorso-ventrally (but not so extreme as in *S. irregularis* Mlldff). White, glassy transparent. Two top whorls smooth, following ones ribbed with weak, distantly placed, vertical ribs, 32 on the last whorl. The ribs are well developed in the sutural region, but weaker on the convex part of the whorls. No spiral striation. Top pointed, but not sharp, base rounded, umbilicus open, narrow.

Whorls 6, convex, regularly increasing in size, the last whorl narrower. At each half turn of the whorls one or two ribs are stronger than the others, thus strengthening the impression that the shell is compressed. Suture distinct.

Aperture almost vertical, irregularly quadrangular with rounded angles. Peristome continuous, thickened and reflected, especially on the parietal side where it is fixed to the penultimate whorl. Parieto-angular lamella strong, somewhat projecting forward. Upper palatal tooth strong, at the edge of the exterior peristome margin. Lower palatal tooth weaker, lying deeper in the shell at the basal side. On the columellar side a weak fold in the interior of the aperture. At this point the exterior of the shell is somewhat inflated in the umbilical region.

Dimensions (in 1/10 mm.)	Holotype (unique specimen)
Height	22
Width	13 (Senckenberg Museum Frankfurt No. 111494)
Height of aperture	9

Habitat: Kelantan, Malaya (type locality).

Sinoennea callizonus n.sp. Plate 2, Fig. 6

Shell ovoid-cylindrical, glassy transparent, shining. Top whorls smooth, the following ones ribbed with elegantly off-standing ribs, about 20 on the last whorl. There is no spiral striation.

Whorls 6, regularly increasing in size. The 4th and 5th whorls are of almost equal width, the 6th whorl attenuating towards the base. Profile of each whorl convex, the greatest diameter somewhat above the middle, causing a certain "shouldering" of the whorls. Top a little pointed, base rounded. Umbilicus open, but not wide, not obscured by swelling of the distal part of the last whorl.

Aperture almost vertical, quadrangular with rounded angles. Peristome continuous, adnate to the previous whorl, thickened, reflected, with a strong parieto-angular lamella. Exterior margin receding near the angular sinus, then protruding in the middle, receding again towards the base. On the palatal side there are two teeth, of almost equal size. The upper one lies at the edge of the peristome, the lower one deeper in the throat. Columellar side with only one tooth, a rather strong plate, deep in the aperture. It corresponds with a shallow groove on the distal part of the exterior of the last whorl in the umbilical region.

Dimensions (in 1/10 mm.)	Holotype	Paratypes											
Height	28	27	27	27	27	27	26	26	26	25	25	25	24	23
Width	14	15	14	14	14	14	15	15	14	14	14	14	14	14
Height of aperture	11	10	11	10	10	10	10	10	9	10	9	9	10	9

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

Sinoennea callizonus has a much narrower umbilicus than either *charasensis, hungerfordiana, perakensis* or *tweediei. S. kanchingensis* is a large, spindle-shaped species without palatal teeth. *S. malaccana* is somewhat compressed dorso-ventrally. The minute *S. lembingensis* is quite different in size, shape and style of ribbing. *S. chintamanensis* is a much larger, ventricose shell, with two columellar teeth. Its two palatal teeth are implanted on a common base.

S. pagodella is much more slender, with a blunt top. It possesses two columellar teeth, and the peristome is just free.

S. apicata is more pointed at the top, with fewer ribs on the last whorl. In the aperture it has only one palatal, but two columellar teeth.

S. crumenilla has a more obese shell, with a distinct swelling at the distal end of the last whorl in the umbilical region behind the peristome. The distance between parieto-angular lamella and palatal teeth is very narrow.

S. chrysallis is about twice as high as *S. callizonus* and much more ventricose. Like *S. crumenilla* it has a swelling in the distal end of the last whorl in the umbilical region behind the peristome. The distance between parieto-angular lamella and palatal teeth is very narrow.

S. bacca is distinctly higher, with more pointed apex. It has more whorls, but fewer ribs on the last whorl. Both palatal and columellar sides bear two teeth.

S. glebula, although of about the same height as *S. callizonus,* has one whorl more. It carries two teeth on the columellar side and two on the palatal side. Of the latter two the lower tooth lies almost at the basal side.

S. leucostolos is somewhat larger than *S. callizonus* and the ribbing is weaker. It has a distinct swelling in the distal part of the last whorl in the umbilical region, whereas *S. callizonus* is not inflated in this spot.

Sinoennea leucostolos n.sp. Plate 2, Fig. 7

Shell ovoid-cylindrical, glassy transparent, shining. Two top whorls smooth, the following ones ribbed by rather distantly placed, often obsolete, ribs, 18 on the last whorl. There is no spiral striation.

Whorls 6¼, regularly increasing in diameter, the 4th and 5th of almost equal width, the 6th whorl attenuating towards the base. Profile of each whorl moderately convex, the greatest diameter lying a little above the periphery. Top a little pointed, base rounded. Umbilicus open, but not wide, somewhat hidden by a swelling of the distal part of the last whorl, just behind the peristome.

Aperture almost vertical, quadrangular with rounded angles. Peristome continuous, adnate to the previous whorl, thickened, reflected, with a strong parieto-angular lamella. On the palatal side with two teeth, the upper, weaker one at the peristome edge, the lower, stronger one deep in the throat. Columellar side with one tooth only, a rather strong plate deep in the aperture. It corresponds with a groove or pit at the exterior of the distal part of the last whorl in the umbilical region. Distally from this pit the last whorl is somewhat swollen.

Dimensions (in 1/10 mm.)	Holotype (unique specimen)
Height	32
Width	17
Height of aperture ..	12

Habitat: Ulu Kenyam Kechil, Ulu Tembeling, Pahang, April 1952 (type locality).

S. leucostolos has a much narrower umbilicus than either *S. charasensis, hungerfordiana, perakensis* or *tweediei*. *S. kanchingensis* is a large, spindle-shaped species without palatal teeth and *S. malaccana* is slightly compressed. From the minute *S. lembingensis* the new species differs in size, shape, ribbing, etc. *S. chintamanensis* is a larger and more ventricose shell, with two columellar teeth, and the palatal teeth implanted on a common base.

S. pagodella is a much smaller shell with two columellar teeth and the peristome adnate or just free from the last whorl.

S. apicata, although being of about the same height, is more slender, with pointed apex. It has only one palatal tooth.

S. crumenilla and *S. chrysallis* are more obese, with a greater average of ribs on the last whorl and a very short distance between the parieto-angular lamella and the upper palatal tooth. *S. chrysallis* is, moreover, a much larger species.

S. bacca is higher ovoid than *S. leucostolos* and possesses two teeth on the columellar side of the aperture.

S. glebula is more slender, with numerous vertical ribs and the lower palatal tooth placed at the basal side of the last whorl, instead of at the palatal side.

S. callizonus is very similar to *S. leucostolos,* but has a more slender shape and more closely placed ribs.

Sinoennea chintamanensis Tomlin, 1941. Plate 2, Fig. 8

1941 Tomlin, Journ. of Conch. Vol. 21, p. 320, pl. 13, fig. 5 (*Sinoennea*) (Bukit Chintamani, between Bentong and Karak, Pahang).

Shell ventricose-ovoid, spire somewhat pointed, then broadening till about the middle of the entire shell-height, after that narrowing towards the aperture. Glassy-white, hyaline, ribbed with strong transverse ribs, standing away wing-like from the shell surface. There are 16–19 ribs on the last whorl. No spiral striation.

Whorls 6¼–6⅓, the two first smooth, the following ones ribbed with widely placed ribs. All whorls rather convex in profile. In the central whorls the greatest diameter lies a little above the periphery, rendering the profile slightly "shouldered". Suture well impressed. Top projecting, but not sharp, base rounded. Umbilicus open, but not wide. Last whorl slightly ascending towards the peristome.

Aperture almost vertical, narrow, elongate-oval, or quadrangular with rounded angles. Peristome continuous, thickened, adnate and reflected. With a sinus at the junction of parietal and palatal angle. From this meeting point a high, undulating lamella enters the aperture for quite a long distance. On the columellar side the shell possesses two teeth, a small round knob at the margin, an elongate tooth deeper down. The latter corresponds with a small groove or pit on the exterior of the last whorl in the umbilical area. Between this pit and the peristome the last whorl is somewhat swollen. At the parietal wall the two teeth are confluent at their bases, with two tops, a small upper one and a strong lower one. Behind this compound tooth the exterior wall of the shell shows a depression.

The immature shell has four teeth, of which the parietal one is strongest. During further development this juvenile dentition is resorbed again. In the full-grown shell there are no teeth whatever in the spire; they appear only at the peristome.

The holotype is in the British Museum (Natural History).

Dimensions (in 1/10 mm.)	Paratypes		Bukit Chintamani, June 1954							
Height	31	31	36	36	35	35	35	35	35	35
Width	20	19	21	19	19	19	20	20	20	19
Height of aperture	13	13	15	14	15	14	14	14	13	14

Habitat: Bukit Chintamani, between Bentong and Karak, Pahang, 1935 (type locality); Bukit Chintamani, June 1954.

Sinoennea crumenilla n.sp. Plate 2, Fig. 9

Shell ovoid-pupoid, glassy transparent, shining. Two top whorls smooth, the following ones with regular, rather widely placed vertical ribs, elegantly standing off from the whorls. There are 22 ribs on the last whorl in the holotype. Spiral striation absent.

Whorls 6, regularly increasing in size, last one somewhat narrower than the previous one. Profile of each whorl convex, a condition which is accentuated by the wing-like appearance of the ribs. Suture rather deep. Top pointed, but not sharp. Base rounded. Umbilicus distinct, partly obstructed by a swelling in the distal part of the last whorl.

Aperture rather small, vertical, quadrangular with rounded angles. Peristome adnate, continuous, thickened, reflected. Parieto-angular lamella strong. Right margin of peristome receding at the angular sinus, then protruding, and in this part with two strong palatal teeth which correspond with a groove or pit on the exterior distal region of the last whorl, just behind the peristome. Between the palatal tooth and the free end of the parieto-angular lamella there is only a very short distance. Columellar side of peristome without tooth at the exterior edge, but with a blade-like lamella somewhat deeper down. This lamella corresponds with a groove on the exterior distal part of the last whorl, in the umbilical region. Between this groove and the peristome the shell is slightly swollen.

Dimensions (in 1/10 mm.)	Holotype
Height	29
Width	16
Height of aperture ..	10

Habitat: Gua Nenek, Kelantan, July 1939 (type locality). Two shells, the holotype and an immature paratype.

Compared with the other non-cylindrical species *Sinoennea crumenilla* has a much narrower umbilicus than *S. charasensis, perakensis, hungerfordiana* or *tweediei*. *S. kanchingensis* is a large species, without palatal teeth. The little *S. lembingensis* and the compressed *S. malaccana* must be excluded on account of their size, shape and style of ribbing.

S. pagodella and *S. apicata* are different because they possess a tooth at the edge of the columellar side, *S. apicata* having, moreover, only one tooth at the palatal side instead of two as in the new species. *S. pagodella* is much smaller and narrower than *S. crumenilla*.

S. chintamanensis is more obese and larger than *S. crumenilla*.

S. chrysallis is much larger and more ventricose than *S. crumenilla*. The margins of the peristome are less sinuous.

S. bacca is considerably higher, with one tooth at the columellar peristome edge. The style of the ribs is also different.

S. glebula although being of about the same height as *S. crumenilla*, is slenderer, and has a less sinuous peristome. The parieto-angular lamella of *S. glebula* is less strong and the columellar side bears a tooth at the exterior edge.

S. leucostolos is rather similar to *S. crumenilla*, but it is broader, with the ribs standing wider apart. Here again the peristome is less sinuous. Because the parieto-angular lamella is less strong, the distance between this lamella and the palatal teeth is greater than in *S. crumenilla*.

S. callizonus is somewhat more cylindrical, with a larger aperture, a less powerful parieto-angular lamella and a less sinuous peristome margin.

Sinoennea chrysallis n.sp. Plate 3, Fig. 10

Shell ovoid-cylindrical, glassy transparent, shining. Two top whorls smooth, following ones with rather strong, widely spaced vertical ribs, about 20 on the last whorl. No spiral striation.

Whorls 8, the nos. 1–5 gradually increasing in width, 6 and 7 widest of all. After this the shell is tapering to the base. Profile of each whorl convex, somewhat "shouldered" in its upper part. Suture rather deep. Top pointed, but not sharp, base rounded, umbilicus distinct and partly hidden by a swelling in the distal part of the last whorl.

Aperture narrow, almost vertical, quadrangular with rounded angles. Peristome continuous, adnate, broadened, reflected especially at basal and columellar side, with a strong, undulating lamella in the upper corner. To the right of this lamella the angular sinus recedes very distinctly. After this the palatal margin protrudes again, then curves backward towards the base. There are two strong teeth on the palatal side, the upper one at the edge of the peristome, the lower one deeper down. Between the upper palatal tooth and the free end of the parieto-angular lamella there is only a very short distance. Columellar margin without teeth at the free edge, but with a plate-like lamella somewhat deeper down. This lamella corresponds with a groove on the exterior of the distal part of the last whorl in the umbilical region. Between this groove and the aperture the shell is slightly swollen.

Dimensions (in 1/10 mm.)	Holotype	Paratypes			
Height	45	42	41	41	40
Width	22	22	22	22	22
Height of aperture ..	15	15	15	15	15

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

Compared with the other non-cylindrical species *Sinoennea chrysallis* has a much narrower umbilicus than either *S. charasensis, perakensis, hungerfordiana* or *tweediei*. From the minute *S. lembingensis* and the compressed *S. malaccana* it differs in shape, size and style of ribbing.

S. kanchingensis is a large, spindle-shaped species without palatal teeth.

S. chintamanensis is much smaller and has the two palatal teeth on a common base. Besides it possesses a tooth at the free margin of the columellar side. In *S. chintamanensis* the distance between the parieto-angular lamella and the palatal tooth is larger than in *S. chrysallis*.

S. pagodella and *S. apicata* are much smaller species with a more cylindrical outline. Both possess a tooth at the columellar peristome margin.

S. crumenilla is also smaller and has a more sinuous peristome than *S. chrysallis*.

S. bacca and *S. glebula* are more cylindrical, and have a tooth at the free edge of the columellar margin. *S. glebula* is, moreover, much smaller.

S. leucostolos and *S. callizonus* are smaller, somewhat more cylindrical, with a greater distance between the parieto-angular lamella and the palatal tooth. In addition the peristome is not quite so expanded as in *S. chrysallis*.

Sinoennea pagodella n.sp. Plate 3, Fig. 11

Shell high-ovoid or cylindrical-pupoid, probably glassy transparent in fresh shells, but opaque in dead shells. Two top whorls smooth, following ones with vertical, widely spaced ribs, about 15–16 on the last whorl. No spiral striation.

Whorls 6–6½, the three first regularly increasing in diameter, the following ones of nearly equal width. Profile of each whorl convex, suture well impressed. Top blunt, base rounded, umbilicus narrow.

Aperture almost vertical, quadrangular with rounded angles. Peristome continuous, adnate or just free from the penultimate whorl, broadened, reflected, with a strong, undulating lamella in the upper corner. On the palatal margin there are two knobs, the lower of which is strongest, corresponding with a depression on the exterior side of the last whorl, just behind the peristome. At the columellar side a knob-like tooth lies at the peristome edge, a second weaker elevation somewhat lower down in the throat. On the exterior side of the distal part of the last whorl there is a small groove or pit, corresponding with the lower columellar tooth. Between the groove and the peristome the shell is somewhat swollen in the umbilical region.

Dimensions (in 1/10 mm.)	Holotype	Paratypes								
Height	25	25	24	23	23	23	23	23	23	23
Width	13	13	13	13	13	13	13	13	12	12
Height of aperture	9	9	9	8	8	8	8	8	8	8

Habitat: Gua Bama, near Padang Tengku, Pahang, September 1941 (type locality).

Sinoennea pagodella has a narrower umbilicus than *S. charasensis, perakensis, hungerfordiana* or *tweediei*. From the large, spindle-shaped *S. kanchingensis*, the compressed *malaccana* and the very small *lembingensis* the new species differs in size, shape and ribbing.

S. chintamanensis is like a double-sized edition of *S. pagodella*, but has the two palatal teeth on a common base, whereas in *S. pagodella* they are distinctly separate. Moreover the peristome of *S. chintamanensis* is always adnate, reaching rather high up against the previous whorl, but in *S. pagodella* the peristome is generally just free from the last whorl and it does not reach so high.

S. apicata is more spindle-shaped, has an adnate peristome and only a minute tooth at the edge of the columellar side of the aperture. It is, moreover, about twice as large as *S. pagodella*.

S. crumenilla and *S. chrysallis* have a more ventricose shell, without a tooth at the edge of the columellar margin. *S. chrysallis* is, moreover, twice the size of *S. pagodella*.

S. bacca is a much larger shell in which the vertical ribs curiously wear away in patches. The umbilicus of *S. bacca* is wider than in *S. pagodella*.

S. glebula has a more obese larger shell and relatively smaller aperture.

S. leucostolos and *S. callizonus* are again of larger size. They lack the tooth at the edge of the columellar margin of the peristome.

Sinoennea charasensis Tomlin, 1941. Plate 3, Fig. 12

1941 Tomlin, Journ. of Conch. Vol. 21, p. 319, pl. 13, fig. 3 (*Sinoennea chatasensis*) (Bukit Chatas, Sungei Lembing, Pahang).
1948 Tomlin, Proc. Malac. Soc. London, Vol. 27, p. 225 footnote (emendation of *chatasensis* and Chatas into *charasensis* and Charas).

Shell high-ovoid, tapering to the top, broader at the base. Glassy hyaline, somewhat transparent. Ornamented with transverse ribs, 30–32 on the last whorl.

Whorls 6–7, the first two smooth, the subsequent ones ribbed with strong, regular, rather distantly placed, vertical ribs, now and then interrupted by a stronger, obliquely placed rib, marking an old rest stage. Whorls rounded, suture well impressed. Last whorl narrower than the penultimate one, a little pinched round the rather wide umbilicus. Top pointed.

Aperture small, almost vertical, interior more or less trefoil-shaped. Peristome continuous, broad, thickened, adnate or just free from the penultimate whorl, reflected, with a strong sinus, flanked by a strong lamella at the upper side. This lamella continues interiorly as an undulating plate for nearly 1 mm. length. On the columellar side only one tooth which corresponds with a groove on the exterior of the last whorl in the umbilical area. The palatal margin bears two teeth, an upper, strong one at the edge of the peristome, and a lower, weaker one somewhat deeper down. The upper one corresponds with a small pit on the exterior of the last whorl.

Dimensions (in 1/10 mm.)	Bukit Charas, February 1953																			
Height	32	32	32	32	31	31	31	31	31	31	31	30	30	30	30	30	30	30	29	28
Width	17	17	17	16	17	17	17	17	16	16	16	17	16	16	16	16	16	16	16	16
Height of aperture	11	10	10	10	11	10	10	9	11	10	10	9	10	10	10	10	9	9	9	8

The holotype is in the British Museum (Natural History).

Habitat: Bukit Charas, Sungei Lembing, Pahang (type locality); Bukit Charas, Pahang, 1947 and February 1953.

Sinoennea perakensis (Godwin Austen & Nevill, 1879). Plate 4, Fig. 13

1879 Godwin Austen & Nevill, Proc. Zool. Soc. London, p. 735, pl. 59, fig. 2 (*Ennea*) (Buket Pondong cave).
1885 Tryon, Man. of Conch. (2) Vol. 1, p. 92, pl. 16, fig. 15 (*Ennea*) (Buket Pondong cave, Perak).
1886 Moellendorff, Journ. As. Soc. Bengal, Vol. 55, p. 300 (*Ennea*) (Buket Pondong).
1888 Ancey, Bull. Soc. Malac. France, Vol. 5, p. 341 (*Ennea*) (no loc.).
1888 Tenison Woods, Proc. Linn. Soc. N.S. Wales (2) Vol. 3, p. 1009 (*Ennea*) (Bukit Pondok, Gapis Pass, Perak).
1891 Moellendorff, Proc. Zool. Soc. London, p. 331, pl. 30, fig. 1, 1a (*Ennea* (*Microstrophia*)) (Bukit Pondong).
1902 Collinge, Journ. Malac. Vol. 9, p. 72 (*Ennea* (*Microstrophia*)) (Caves near Biserat, State of Jalor).

1904 Moellendorff & Kobelt, in: Mart.-Chemn. N. Syst. Conch. Cab. Vol. 1, Part 12B[1], p. 345, pl. 40, fig. 18–20 (*Ennea* (*Indoennea*)) (Perak).
1929 Peile, Proc. Malac. Soc. London, Vol. 18, p. 154, fig. 2 (*Indoennea*) (Perak).
1933 Laidlaw, Journ. Mal. Branch Roy. As. Soc. Vol. 11, p. 232 (*Indoennea*) (Perak).

Shell ovoid-cylindrical, with blunt top. Glassy white, transparent, shining, with numerous equally spaced transverse ribs, about 45–48 on the last whorl. Two top whorls smooth. Just behind the peristome about 4–5 ribs are standing closer together. No spiral striation.

Whorls 6–7, rounded in the first 4 whorls, more flattened in the later whorls. In the two last whorls the greatest diameter lies somewhat above the middle, giving the whorls a slightly "shouldered" appearance. At a short distance (about ¾ mm.) from the peristome the last whorl is somewhat compressed laterally, then widening again. Suture well impressed. Umbilicus open, wide.

Aperture almost vertical, quadrangular, with rounded angles, the basal part somewhat receding. Peristome free from the last whorl. Continuous, thickened and reflected, with a distinct flexure at the parieto-angular corner, projecting interiorly as a rather high ridge. Palatal teeth two, the lower one more interiorly than the upper one. The lower one corresponds with a pit on the exterior of the shell behind the peristome. At the columellar side a broad fold lies deep in the throat.

Dimensions (in 1/10 mm.)	Gunong Pondok, April 1939								
Height	46	44	44	42	42	41	41	41	40
Width	19	21	20	20	20	21	20	20	19
Height of aperture	16	16	15	15	15	15	16	15	14

Habitat: Bukit Pondok, cave, Perak (type locality); caves near Biserat, State of Jalor; Gunong Pondok, Perak, April 1939.

As Peile (1929, p. 154) already pointed out the dentition of immature shells of *S. perakensis* consists of four teeth, differently shaped and differently arranged from the teeth in adult shells.

The shell of *S. perakensis* from the Skeat Expedition (Collinge, 1902), labelled "Caves near Biserat, State of Patani, Skeat Expedition" is preserved in the Zoological Museum of Cambridge, MacAndrew Collection. The shell is in rather bad condition and little can be said on its identity.

Sinoennea hungerfordiana (Moellendorff, 1886). Plate 4, Fig. 14

1886 Moellendorff, Journ. As. Soc. Bengal, Vol. 55, p. 301 (*Ennea*) (Buket Pondong).
1888 Tenison Woods, Proc. Linn. Soc. N.S. Wales (2) Vol. 3, p. 1010 (*Ennea*) (Bukit Pondok, Perak).
1891 Moellendorff, Proc. Zool. Soc. London, p. 331, pl. 30, fig. 2, 2a (*Ennea* (*Microstrophia*)) (Bukit Pondong).
1904 Moellendorff & Kobelt, in: Mart.-Chemn. N. Syst. Conch. Cab. Vol. 1, Part 12B[1], p. 345, pl. 40, fig. 21–22 (*Ennea* (*Sinoennea*)) (Buket Pondong, in Perak).
1933 Laidlaw, Journ. Mal. Branch Roy. As. Soc. Vol. 11, p. 232 (*Indoennea*) (Perak).

Shell short, cylindrical-ovoid, with low or somewhat tapering apex. Glassy white, transparent, with widely spaced transverse ribs, about 25–30 on the last whorl. Two top whorls smooth. Just behind the peristome about 4–5 ribs are standing somewhat closer together. No spiral striation.

Whorls 5½–6¼, periphery moderately convex, in some specimens somewhat flattened in the 4th and 5th whorls. All shells have the last whorl narrower than the preceding one. At a short distance from the aperture the exterior of the last whorl is somewhat compressed laterally, with a slight crest-like transverse inflation towards the peristome. Suture well impressed. Umbilicus rather wide.

Aperture almost vertical, long-oval. Peristome not adnate, although not so trumpet-shaped as in *S. tweediei*. Continuous, forming an oblique sinus at the upper outer margin. All margins thickened and reflected. The lower wall of the parieto-angular sinus projects into the aperture, forming a blunt tooth in the interior of the aperture and a groove or pit on the exterior side. Between the palatal tooth and the free end of the parieto-angular lamella there is only a very short distance. Below this tooth a second knob may occur somewhat deeper down. At the columellar side a long, flat vertical fold lies deep in the throat.

Dimensions (in 1/10 mm.)	Lectotype (Senckenberg Museum, No. 111497)	Paratypes (Senckenberg Museum, No. 111498)					
Height	31	31	31	30	30	29	28
Width	17	16	16	17	16	17	16
Height of aperture	13	13	12	12	12	11	11

Topotypes Gunong Pondok, April 1939													
Height	32	32	32	32	32	31	31	30	30	28	28	82	
Width	18	17	17	17	17	17	17	18	16	17	17	17	
Height of aperture ..	13	13	13	13	13	13	13	12	12	11	11	11	

Habitat: Bukit Pondok, Perak (type locality); Gunong Pondok, Perak, April 1939; Bukit Baling, Kedah, December 1938.

The shells from Bukit Baling are more finely and closely ribbed than those from Gunong Pondok. I give here an account of the numbers of ribs on the last whorl (only for the *coarse* ribs, not the very thin ones just behind the peristome) for specimens of the type locality and of Bukit Baling:

Bukit Pondong Godwin Austen Coll. Brit. Mus. (N.H.)	25,	24,	24	Perak Beddome Coll. Brit. Mus. (N.H.)	25,	24,	23			
Bukit Baling ..	29,	28,	28,	27,	26,	26,	26,	26,	25,	24

The locality Bukit Baling is situated about 60 miles to the North of Gunong Pondok. I do not consider the above mentioned differences sufficient for separating the Bukit Baling specimens either specifically or subspecifically.

Sinoennea tweediei Tomlin, 1941. Plate 5, Fig. 15

1941 Tomlin, Journ. of Conch. Vol. 21, p. 320, pl. 13, fig. 4 (*Sinoennea*) (Lenggong, Perak).

Shell short, ovoid-pupoid, with low, but pointed apex. Glassy white, transparent, with rather widely spaced transverse ribs, 35 on the last whorl of the holotype in the British Museum (Natural History). Just behind the peristome about five ribs are standing somewhat closer together. No spiral striation.

Whorls 6–7; the holotype has 6 whorls. First two smooth, subsequent ones ribbed. Profile of the whorls convex. At a short distance from the aperture the last whorl is somewhat compressed laterally, with a slight crest-like transverse inflation. Last part of last whorl free, trumpet-shaped for about ½ mm. Periphery of first four whorls rounded, of nos. 5 and 6 flattened. Last whorl higher, but narrower than the preceding one. The 5th whorl is somewhat overhanging in the shell profile. Suture well impressed. Umbilicus open, wide, angular by the lateral compressing of the last whorl.

Aperture almost vertical, long-oval. Peristome free, continuous, forming an oblique sinus at the upper outer margin. All margins thickened and reflected. The lower wall of the marginal sinus projects into the aperture, forming a blunt tooth in the interior and a groove or pit in the exterior side. Below this tooth a second knob is deeply seated at some distance from the peristome. Columellar side with a vertical lamella deep in the aperture. The reflected peristome edge can develop a low tooth (as in the figure), but is smooth in other cases. Between the palatal tooth and the free end of the parieto-angular lamella there is only a very short distance.

Dimensions (in 1/10 mm.)	(Gua Badak shells)																		
Height	32	31	31	31	31	31	30	30	30	30	29	29	28	28	28	28	28	27	27	27
Width	17	17	17	17	17	17	17	17	17	16	17	16	17	17	17	16	16	17	16	16
Height of aperture	13	13	12	12	12	12	12	12	12	13	12	12	11	11	12	12	11	11	11	

	(Gunong Tasek shells)									
Height	33	33	32	32	32	31	31	30	30	30
Width	19	18	19	19	19	19	18	19	19	18
Height of aperture	13	13	13	13	13	14	12	13	12	13

Habitat: Lenggong, Perak, March 1939 (type locality); Gua Badak near Lenggong, Perak, October 1950; 1 mile North of Gua Badak, near Lenggong, Perak, March 1939; Gunong Tasek, near Lenggong, Perak, March 1939.

The specimens from Gua Badak are on the average a little smaller, with a narrower umbilical opening and a less pinched keel at the base. These features are not important enough to separate these shells taxonomically.

Sinoennea kanchingensis Tomlin, 1948. Plate 5, Fig. 16

1948 Tomlin, Proc. Malac. Soc. London, Vol. 27, p. 224, pl. 11, fig. 2 (*Sinoennea*) (Bukit Kanching, Selangor).

Shell high-pupoid, greatest diameter at about 1/3 of the total height, glassy white, transparent. Two top whorls smooth, subsequent ones with regular vertical ribs of which there are about 46–48 on the last whorl. No spiral striation. Top pointed, but not acute, base rounded, umbilicus open, but narrow.

Whorls about 9, the 5th whorl broadest of all, and after this tapering to the much narrower base. Profile of the whorls moderately convex, suture well defined.

Aperture almost vertical, irregularly quadrangular with rounded angles. Peristome continuous, broad, especially on the parietal side where it extends over a great part of the penultimate whorl, nearly touching the suture above it. Parieto-angular lamella crest-like, entering the aperture over more than one mm. There are no palatal teeth. On the columellar side a long, high fold is visible in the interior of the aperture. At this point the exterior of the last whorl is somewhat compressed vertically in the umbilical region.

Dimensions (in 1/10 mm.)	Paratypes	
Height	63	51
Width	26	25
Height of aperture	20	18

Habitat: Bukit Takun (= Bukit Kanching), Selangor, March 1938 (type locality).

The holotype, according to Tomlin (1948) is 5·5 mm. high, with a diameter of 3 mm. It is preserved in the British Museum (Natural History).

Sinoennea lembingensis Tomlin, 1941. Plate 5, Fig. 17

1941 Tomlin, Journ. of Conch. Vol. 21, p. 319, pl. 13, fig. 2 (*Sinoennea*) (Bukit Charas, near Sungei Lembing, Pahang).

Shell small, spindle-shaped to ovoid, glassy white, transparent, with very delicate growth lines and widely placed ribs. These ribs wear off easily, and are generally only present behind the aperture.

Whorls 5¼ (in the holotype in the British Museum, London), regularly increasing in size. Rounded, with well impressed suture. Top pointed, but not sharp. Umbilicus open, narrow.

Aperture irregularly triangular to quadrate, only the basal part a little inclined backward. Without basal ridge. Peristome continuous, adnate, thickened and reflected, with a distinct flexure at the parietal side, projecting interiorly as a high crest. Columellar lamella weak, deeply seated at some distance from the edge of the aperture. Of the two palatal teeth the upper, stronger, is lying flush with the edge of the aperture, the lower, weaker one more interiorly. Behind the upper palatal tooth there is a shallow depression on the outside of the last whorl.

Dimensions (in 1/10 mm.)	Topotypes					Bukit Panching					
Height	19	19	19	19	18	21	21	21	21	21	20
Width	9	9	9	9	9	10	10	10	10	9	9
Height of aperture ..	7	7	7	7	6	8	8	8	7	8	7

Habitat: Bukit Charas, near Sungei Lembing, Pahang, 1938 (type locality); Bukit Panching, near Sungei Lembing, Pahang, 1947.

Key to the Cylindrical Species of Sinoennea

1. Shell very large, over 5 mm. high, ribs normally absent on the last 4–5 whorls .... *ridleyi*
–. Shell under 5 mm. high, ribs normally present on all whorls 2
2. Shell minute, the two palatal teeth on a common base. Distance between parieto-angular lamella and palatal tooth very short ..... *dactylus*
–. Shell larger, the two palatal teeth free. Distance between parieto-angular lamella and palatal tooth normal 3
3. Very narrow, high-cylindrical shell, whorls little convex, ribs generally worn away on most of the shell surface ..... *baculum*
–. Not so extremely cylindrical, whorls more convex, ribs better preserved 4
4. Peristome free ..... *tiarella*
–. Peristome adnate 5
5. No swelling in distal part of last whorl behind peristome 6
–. With a swelling in distal part of last whorl behind peristome 7
6. Low-cylindrical, with 6–7 whorls and 26–32 ribs on the last whorl ..... *butleri*
–. Higher cylindrical, with 7–8 whorls and 36–40 ribs on the last whorl ..... *lenggongensis*
7. Top somewhat pointed, whorls convex 8
–. Top flatter, whorls flatter ..... *attenuata*
8. Whorls 6–6½, ribs distinct, 29–32 on the last whorl ..... *subcylindrica*
–. Whorls 7–7½, ribs obsolete on curved part of whorls, with 22–24 ribs on the last whorl *lepida*

Sinoennea ridleyi (Peile, 1926). Plate 5, Fig. 18

1926 Peile, Proc. Malac. Soc. London, Vol. 17, p. 116, fig. 1 (*Indoennea*) (Kuala Lumpur, Selangor, probably on the limestone rocks near the Batu Caves).
1929 Peile, Proc. Malac. Soc. London, Vol. 18, p. 154, fig. 5 (*Indoennea*) (Batu Caves, Selangor).
1932 Laidlaw, Bull. Raffles Mus. no. 7, p. 38 (*Indoennea*) (Batu Caves, Gua Tembus).
1933 Laidlaw, Journ. Mal. Branch Roy. As. Soc. Vol. 11, p. 232 (*Indoennea*) (Batu Caves and Gua Tembus, Selangor).
1947 Tweedie, Malayan Nature Journ. Vol. 2, no. 2, p. 4 (*Sinoennea*) (Batu Caves).

Shell large, cylindrical, with blunt top. White, glassy transparent, shining. First 2½ whorls smooth, the three following ones transversely ribbed with equally spaced transverse ribs. After this the whorls are almost smooth, with an occasional irregular transverse rib (or couple of ribs), till on the last half whorl the ribs become again regular.

Whorls 8½–10 (in the holotype in the British Museum nearly 9). Top whorls well rounded, later ones more flattened at the periphery. Suture distinct, but not deep. Umbilicus narrow, almost hidden by the last part of the last whorl.

Aperture almost vertical, the lower part receding. Rounded-quadrangular, with two strong lamellae and one tooth. Peristome adnate, the parietal part attached to the penultimate whorl, covering almost the entire height of it. Free margins thickened and reflected. At the parieto-angular angle it possesses a distinct flexure, protruding as a high, sinuous ridge into the aperture. Columellar lamella deeply seated, not more than a blunt conical knob on a broad base. There is one palatal tooth, corresponding to a small pit on the exterior of the shell behind the peristome. Between this pit and the peristome the distal part of the last whorl is inflated.

Dimensions (in 1/10 mm.)	Batu Caves near Kuala Lumpur
Height	91 87 87 86 85 83 82 82 82 81 80 80 80 79 79 78 77 70 75 70
Width	32 32 32 33 31 31 32 32 31 30 34 31 30 31 30 32 31 31 31 30
Height of aperture	29 33 30 31 30 27 31 26 28 27 27 30 27 27 27 27 28 26 27 24

Habitat: Batu Caves, near Kuala Lumpur (type locality); Gua Tembus, Batu Caves, Selangor.

Peile (1929, p. 154) figured an immature shell. It has four teeth which are, however, differently arranged from those in the adult shell.

Sinoennea dactylus n.sp. Plate 6, Fig. 19

Shell minute, cylindrical, glassy transparent, shining. Two top whorls smooth, following ones with regular vertical ribs. On the 3rd to 6th whorls the ribs are standing rather close, but on the last whorl more widely apart. There are 20–22 ribs on the last whorl. No spiral striation.

Whorls about 6, the nos. 3–6 forming a regular cylinder. Profile of each whorl slightly convex, suture distinct, but not deep. Top blunt, base rounded, umbilicus narrow, partly obstructed by a swelling of the last whorl just before the aperture.

Aperture almost vertical, obliquely quadrangular with rounded angles. Peristome adnate, continuous. In the parieto-angular corner a strong lamella, on the palatal side two teeth implanted on a common base. Of these the stronger, upper tooth almost at the margin of the peristome, the weaker, lower one somewhat deeper in the interior. The distance between the parieto-angular lamella and the upper palatal tooth is very narrow. At the columellar side there is a deeply seated tooth or plate, corresponding with a groove at the exterior side of the last part of the whorl in the umbilical region. Between this groove and the peristome the distal part of the last whorl is somewhat swollen.

Dimensions (in 1/10 mm.)	Holotype	Paratypes			
Height	22	22	22	21	21
Width	10	10	10	10	10
Height of aperture ..	8	8	8	8	7

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

The minute size distinguishes this species at once from the other cylindrical *Sinoennea*. The only other *Sinoennea* of such small size in Malaya is *S. lembingensis*, but this species is not cylindrical.

Sinoennea baculum n.sp. Plate 6, Fig. 20

Shell high, narrowly cylindrical, glassy transparent, shining. Two top whorls smooth, following ones with vertical ribs at regular distance, about 20 on the last whorl. These ribs are, however, often worn off, the shell assuming a smooth appearance, with traces of the ribs only along the suture.

Whorls 7, regularly increasing in size, little convex, suture not deep. Top obtuse, base rounded, umbilicus narrow.

Aperture small, quadrangular with rounded angles, position almost vertical. Peristome adnate, continuous, with a strong parietal lamella, entering the aperture and folded. Columellar fold somewhat in the interior of the aperture. On the palatal side two teeth, the upper, larger one just at the margin, the lower, smaller one somewhat deeper down. Behind the peristome the distal part of the last whorl is a little inflated.

Dimensions (in 1/10 mm.)	Holotype	Paratypes from Bukit Serdam, near Raub																	
Height	28	31	30	30	29	29	28	28	28	28	28	28	28	28	27	27	27	27	27
Width	9	9	9	9	9	9	10	9	9	9	9	9	9	8	9	9	9	9	8
Height of aperture ..	8	8	8	8	8	8	8	8	8	8	8	7	7	8	7	7	8	7	7

Habitat: Bukit Serdam, near Raub, Pahang, August 1950 (type locality); Kota Gelanggi, Pahang; Kota Tongkat, Pahang, 1947.

The new species is related to *Sinoennea attenuata, lenggongensis* and *subcylindrica*, but is smaller and more slender than any of these, with a narrower umbilicus and with very weak ribs. *S. ridleyi* is so much larger that a comparison is out of the question. *S. butleri, dactylus* and *tiarella* are less slender, with well developed ribs.

Although the shells in the various samples differ somewhat these differences are not important enough to classify them as separate taxonomic units.

The single shell from Kota Gelanggi and the lot from Bukit Serdam, although the localities lie some 70 miles distance, resemble each other more than the Kota Gelanggi and Kota Tongkat shells, two sites forming one mountain complex. In spite of these differences I did not find reason to separate them by infra-specific classification.

Sinoennea tiarella n.sp. Plate 6, Fig. 21

Shell cylindrical, glassy transparent, shining. Two top whorls smooth, following ones sculptured by distantly placed vertical ribs, about 25 on the last whorl. No spiral striation.

Whorls 7, the first three regularly increasing in width, the 4th to 7th in general cylindrical although slightly attenuating towards the base. Profile of each whorl convex. Suture distinct. Top blunt, base rounded, umbilicus moderately open. The swelling in the distal part of the last whorl hardly conceals the umbilical opening.

Aperture almost vertical, quadrangular with rounded angles. Peristome free from preceding whorl, continuous, with broad, reflected margin. In the parieto-angular corner with a strong, undulating lamella. On the palatal margin there are two teeth, the upper one at the exterior rim, the lower one deeper down. Both are of about equal strength. On the columellar side a strong, plate-like tooth lies deep in the throat. This tooth corresponds with a short groove on the exterior side of the last whorl in the umbilical region. Between this groove and the peristome the distal part of the last whorl is somewhat inflated.

Dimensions (in 1/10 mm.)	Holotype	Paratypes								
Height	35	34	32	31	31	31	30	30	30	30
Width	17	16	15	16	16	15	16	16	15	15
Height of aperture ..	13	11	11	12	10	11	10	10	11	10

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

Compared with the other cylindrical *Sinoennea* the new species is of fair size, although not being so big as *S. ridleyi*.

S. subcylindrica has less convex whorls and a less developed peristome which is, moreover, not free from the last whorl.

S. attenuata and *S. baculum* are much more narrow, and *S. lenggongensis*, although about as high as *S. tiarella*, is only $\frac{2}{3}$ of its width. Neither species, *attenuata* or *baculum*, have a free peristome, and in *lenggongensis*, although it can be just free from the preceding whorl, it never protrudes so distinctly as in *S. tiarella*.

S. butleri is more closely ribbed and has an adnate peristome.

Sinoennea butleri (Peile, 1929). Plate 6, Fig. 22

1929 Peile, Proc. Malac. Soc. London, Vol. 18, p. 153, fig. 1, 1a (*Indoennea*) (Batu Caves, Selangor).
1932 Laidlaw, Bull. Raffles Mus. no. 7, p. 38 (*Indoennea*) (Gua Tembus).
1933 Laidlaw, Journ. Mal. Branch Roy. As. Soc. Vol. 11, p. 233 (*Indoennea*) (Batu Cave, Selangor).

Shell almost cylindrical, with blunt top. Hyaline, glassy, ornamented with transverse, equally distant ribs, about 26–32 on the last whorl. The holotype in the British Museum (Natural History) has 26 ribs. Just behind the peristome about 4–5 ribs are standing somewhat closer together. No spiral striation.

Whorls 6–7, the holotype with $6\frac{1}{2}$ whorls. Two top whorls smooth, following ones with elegant, equally spaced ribs. Periphery rounded, in the later whorls the broadest part lies somewhat above the middle of each whorl, giving the whorls a slightly "shouldered" appearance. Suture well impressed. Umbilicus open, but not wide.

Aperture almost vertical, quadrangular with rounded angles. Peristome adnate or just free, continuous, thickened and reflected, with a distinct flexure at the parietal side, projecting interiorly as a high ridge. The columellar lamella enters the aperture about 1 mm. or more, first as a high ridge, more interiorly as a low ridge. The corresponding area on the exterior of the shell in the umbilical region is slightly grooved. On the palatal side there are two more or less triangular teeth. A weak additional third tooth can occur in the parieto-palatal region. The strongest tooth corresponds with a pit on the exterior of the shell behind the peristome.

Dimensions (in 1/10 mm.)	Bukit Takun, March 1938																			
Height	30	30	30	29	28	28	27	27	27	27	27	27	27	27	26	26	26	26	25	24
Width	14	14	13	14	14	13	14	14	14	13	13	13	14	13	14	14	14	13	14	14
Height of aperture	11	11	10	11	10	10	10	10	10	10	10	10	9	10	10	10	9	10	9	9

Habitat: Batu Caves, Selangor (type locality); Bukit Takun, Selangor, March 1938.

As Peile already pointed out (1929, p. 154) the dentition of the immature shells, although consisting of four teeth as well, is different in arrangement from that of the adult shells.

Sinoennea lenggongensis Tomlin, 1939. Plate 7, Fig. 23

1939 Tomlin, Journ. of Conch. Vol. 21, p. 146, pl. 12, fig. 1 (*Sinoennea*) (Lenggong, Perak).

Shell high-cylindrical, with nearly flat top and little narrowing last whorl. In some specimens the shell profile is somewhat concave in the central part. Glassy, transparent, ribbed with regular transverse ribs, 36–40 on the last whorl. No spiral striation.

The presence of *Sinoennea perakensis* in the State of Jalor (Peninsular Siam) is somewhat doubtful, because the only shell collected during the Skeat Expedition is in bad condition and hardly recognisable.

Sinoennea baculum occurs at Kota Gelanggi and Kota Tongkat, two hills forming one mountain complex. The other locality, Bukit Serdam, lies about 70 miles to the West. Although the shells differ a little, the lots of the two areas must be considered conspecific.

A similar fact occurs in *Sinoennea hungerfordiana*, Bukit Baling lying about 60 miles to the North of Gunong Pondok. The B. Baling specimens are more closely ribbed. In the Systematic Part of this paper further attention is given to this subject.

A somewhat shorter distance (about 40 miles) separates the two stations where *Sinoennea lenggongensis* has been collected. Yet the two lots are absolutely conspecific.

Systematic Part

Genus **Huttonella** L. Pfeiffer, 1855

Only one species in Malaya: **Huttonella bicolor** (Hutton, 1834).

1834 Hutton, Journ. As. Soc. Bengal, Vol. 3, p. 86 and 93 (*Pupa*) (Mirzapur, India).
1871 Stoliczka, Journ. As. Soc. Bengal, Vol. 40, p. 169, pl. 8, fig. 7–8 (*Ennea* (*Huttonella*)) (Malayan Peninsula).
1878 Nevill, Hand List Moll. Indian Mus. Vol. 1, p. 6 (*Ennea* (*Huttonella*)) (Singapore).
1885 De Morgan, Bull. Soc. Zool. France, Vol. 10, p. 372 (*Ennea*) (P. Pinang).
1933 Laidlaw, Journ. Mal. Branch Roy. As. Soc. Vol. 11, p. 233 (*Ennea*) (Penang and Selangor).

Habitat: Singapore, P. Pinang and Selangor.

Huttonella bicolor is a tropical cosmopolite. Hutton's type locality was Mirzapur, India, but as the species has been introduced into all tropical regions, it is not possible to say if Mirzapur was, indeed, its native country. It is even more likely that Africa or one of the outlying islands of this continent was the place of origin, because almost all species of *Huttonella* are inhabitants of Africa, the Comores, Seychelles and Mascarene Islands.

A description and a figure of shell and radula were published in my paper on Javanese land snails (Treubia, Vol. 20, 1950, p. 503–505, fig. 106 and 107). Contrary to what we will see in *Sinoennea* the immature shells of *Huttonella bicolor* never possess any teeth in the aperture.

Huttonella bicolor occurs in cultivated plains, mostly in the coast region, but occasionally somewhat farther inland. It lives on the ground, among fallen leaves, decaying wood, preferably in damp places. It forms no element of the mollusc population of the limestone hills in Malaya.

Genus **Sinoennea** Kobelt, 1904 (syn. **Indoennea** Kobelt, 1904)

The identity of *Sinoennea* and *Indoennea* was propounded by Peile (1935, Proc. Malac. Soc. London, Vol. 21, p. 382).

It is a fairly large genus, with about 60 species in India, Burma, Indo-China, Japan, Siam, Malaya and Sumatra.

From the Malay Peninsula 12 species were known until now. Mr. Tweedie's investigations have more than doubled that number.

Whorls 7–8, the first two smooth, the following ones ribbed with elegantly curved ribs. Profile of the whorls evenly rounded. In the lower ones the greatest diameter lies close to the upper suture, rendering the whorls a somewhat "shouldered" appearance. Suture well impressed. Top little elevated, apex blunt. Umbilicus open, but not wide. Last whorl somewhat compressed in the umbilical area.

Aperture almost vertical, more or less quadrangular. Peristome adnate or just free, continuous, thickened and reflected, with, on the parietal side, a sinus bordered by a high and strong undulating lamella. On the columellar side with a knob-like, horizontal lamella. It corresponds with a pit on the exterior side of the shell in the umbilical region. On the palatal side with two teeth, the upper, larger one at about the palatal margin, the lower and smaller one deeper down. The upper tooth corresponds with a pit on the exterior of the last whorl. The peristome can be adnate to the last whorl, but mostly stands just clear from it.

The immature shell possesses a square aperture with 4 teeth, placed cross-wise. The tooth on the parietal wall is strongest. During further development this juvenile dentition is resorbed again. In the full grown shell there are no teeth in the spire; they appear only at the peristome.

The holotype is in the British Museum (Natural History).

Dimensions (in 1/10 mm.)	1 mile North of Gua Badak, Lenggong
Height	36 35 34 33 33 33 33 32 32 32 32 31 31 31 30 30 30 30 30 30
Width	13 13 13 13 13 13 13 13 13 13 13 13 13 13 12 12 12 12 12 12
Height of aperture	10 11 10 10 10 10 10 11 10 10 10 10 10 10 11 11 10 10 10 10

Habitat: Lenggong, Perak, 1938 (type locality); 1 mile North of Gua Badak, Lenggong, Perak, March 1939; Kramat Pulai, Perak, March 1939.

Sinoennea subcylindrica (Moellendorff, 1891). Plate 7, Fig. 24

1891 Moellendorff, Proc. Zool. Soc. London, p. 331, pl. 30, fig. 3 (*Ennea* (*Microstrophia*)) (Bukit Pondong).
1904 Moellendorff & Kobelt, in: Mart.-Chemn. N. Syst. Conch. Cab. Vol. 1, Part 12B[1], p. 346, pl. 40, fig. 23 (*Ennea* (*Indoennea*)) (Buket Pondong in Perak).
1929 Peile, Proc. Malac. Soc. London, Vol. 18, p. 270 (*Indoennea*) (Cherrapunji).
1933 Laidlaw, Journ. Mal. Branch Roy. As. Soc. Vol. 11, p. 232 (*Indoennea*) (Bukit Pondong, Perak).
1938 Tomlin, Journ. of Conch. Vol. 21, p. 75, pl. 11, fig. 6 (*Sinoennea siputana*) (Sungei Siput, Perak).

Shell cylindrical, with blunt top and little attenuated base. Glassy white, transparent, with numerous equally spaced ribs, 29–32 on the last whorl, the holotype in Senckenberg Museum Frankfurt (no. 111493) has 29 ribs. No spiral striation.

Whorls 6–6½, the two top whorls smooth and rounded, the lower ones ribbed and somewhat flattened. Base rounded. Suture well impressed. Umbilicus narrow.

Aperture almost vertical, the lower part somewhat receding. Quadrangular with rounded angles. In the parieto-angular corner with a strong fold, stretching interiorly as a high, undulating ridge. Columellar lamella deeply seated. The corresponding area on the exterior of the shell bears a small pit in the umbilical region. On the palatal side with two teeth, the lower one deeper than the upper one. The lower one corresponds with a pit on the exterior of the whorl behind the peristome. Between this pit and the

peristome the distal part of the last whorl is somewhat swollen. Peristome continuous, thickened and reflected, adnate to the penultimate whorl. The long axis of the peristome makes an oblique angle with that of the shell.

Dimensions (in 1/10 mm.)	Holotype	Paratypes of *S. siputana*													
Height	29	31	31	30	30	30	30	30	30	29	29	28	28	28	28
Width	13	13	12	13	13	12	12	12	12	12	12	12	12	12	12
Height of aperture ..	9	10	10	10	10	10	10	10	10	10	9	10	10	9	9

Habitat: Bukit Pondok, Perak (type locality); Gunong Pondok, Perak, 1939; Sungei Siput, Perak (type locality of *Sinoennea siputana*); hill 5 miles N.E. of Sungei Siput, Perak, 1936; Gunong Kantang, Perak, November 1950.

The occurrence of *S. subcylindrica* at Cherrapunji, Khasi Hills, Assam (Peile, 1929, p. 270) seems rather doubtful and has to be confirmed by new material. I have not seen the shells from Cherrapunji.

Sinoennea attenuata n.sp. Plate 7, Fig. 25

Shell narrowly cylindrical, glassy transparent, shining. Two top whorls smooth, the following ones with vertical ribs, about 30 on the last whorl. These ribs wear off easily, leaving regions of the shell surface smooth here and there. No spiral striation.

Whorls 7, the three first regularly increasing in width, the 4th to 7th all of the same diameter, giving the shell its cylindrical form. Profile of each whorl slightly convex, suture distinct, but not deep. Top blunt, base rounded, umbilicus narrow, partly obstructed by a swelling of the last whorl, just before the aperture.

Aperture obliquely quadrangular with rounded angles. Peristome adnate, broadened and reflected, with a strong, undulating lamella at the parieto-angular corner. On the palatal margin there are two teeth, the upper one lying flush with the peristome edge, the lower one somewhat more in the throat. On the columellar edge a strong plate-like tooth lies somewhat deeper down. This tooth corresponds with a short groove on the exterior side of the last whorl in the umbilical region. Between this groove and the peristome the distal part of the last whorl is somewhat inflated.

Dimensions in 1/10 mm.)	Holotype	Paratypes from Gua Musang														
Height ..	32	36	34	33	32	32	32	32	32	32	31	31	29	29	28	27	27
Width ..	13	14	14	14	14	14	13	13	13	13	14	14	14	13	13	14	13
Height of aperture	11	12	11	12	11	11	11	11	11	11	11	11	11	10	10	9	8

Habitat: Gua Musang, Kelantan, 1939 (type locality); Gua Madu, Kelantan.

From the other cylindrical species of *Sinoennea* the new species differs in being less slender than *S. baculum*, higher and broader than *S. dactylus*, of narrower shape and with finer ribs than *S. tiarella*. From *S. subcylindrica* it differs in the slightly greater size and the differently shaped aperture and peristome; the long axis of the aperture is almost parallel with that of the shell, whereas in *S. subcylindrica* these two make an oblique

angle. The differences with *S. lenggongensis* consist chiefly in the more cylindrical form and more numerous whorls of the last species and in the differently shaped aperture. Compared with *S. butleri* the new species is higher cylindrical with finer ribs. *S. ridleyi* can be excluded because of its large size and irregular arrangement of the ribs.

Sinoennea lepida n.sp. Plate 7, Fig.

Shell cylindrical with low top and little attenuated base. Glassy white, transparent, ribbed with numerous transverse ribs which are generally obsolete on the curve of the whorl and only visible at the suture. There are about 22–24 ribs on the last whorl; towards the aperture they are placed close together, on the rest of the shell surface the intervals are wider. No spiral striation.

Whorls 7–7½, the two top whorls smooth, the following ones ribbed. Top whorls rounded, the following ones somewhat flattened. Suture distinct. Base rounded. Umbilicus narrow.

Aperture vertical, the lower part a little receding. Quadrangular-oval with rounded angles. Peristome adnate to previous whorl, thickened and reflected. In the parieto-angular corner with a strong, undulating lamella. Columellar lamella well developed and deeply seated. On the outer margin the peristome bears two palatal teeth of about equal strength. The upper one lies at the peristome edge, the lower one deeper down. On the exterior of the shell, just behind the peristome there is a shallow longitudinal groove. Between this groove and the peristome the distal part of the last whorl is inflated.

Dimensions (in 1/10 mm.)	Holotype	Paratypes	
Height	38	35	34
Width	15	15	14
Height of aperture ..	13	13	12

Habitat: Goa Siput, near Batu Lompat, Pahang, 1949 (type locality).

S. lepida is very similar to *S. subcylindrica,* but it is larger, with more whorls. The ribs on the last whorl are standing wider apart. The nature of the ribs is weaker, so that they often wear off on a great part of the shell, only visible along the suture. *S. attenuata* has also some likeness to *S. lepida,* but the latter is somewhat larger and possesses fewer ribs on the last whorl.

Explanation of Plates

PLATE 1

2. *Sinoennea apicata* n.sp. Gua Bama, near Padang Tengku, Pahang, September 1941. Front view of shell. Side view of distal part of last whorl and aperture, more enlarged.
3. *Sinoennea bacca* n.sp. Gua Che Yatin, Ulu Tembeling, Pahang, May 1953. Front view of shell. Aperture more enlarged.
4. *Sinoennea glebula* n.sp. Gua Che Yatin, Ulu Tembeling, Pahang, May 1953. Front view of shell. Aperture more enlarged.
5. *Sinoennea malaccana* (Mlldff). Kelantan. Front and side view of shell, after a pencil sketch by the Author.

PLATE 2

6. *Sinoennea callizonus* n.sp. Gunong Sinyum, Pahang, June 1954. Front view of shell. Aperture more enlarged.
7. *Sinoennea leucostolos* n.sp. Ulu Kenyam Kechil, Ulu Tembeling, Pahang, April 1952. Front view of shell. Umbilical region and aperture, more enlarged.
8. *Sinoennea chintamanensis* Tomlin. Bukit Chintamani, Pahang, June 1954. Front view of shell. Aperture more enlarged.
9. *Sinoennea crumenilla* n.sp. Gua Nenek, Kelantan, July 1939. Front view of shell. Umbilical region. Aperture more enlarged.

PLATE 3

10. *Sinoennea chrysallis* n.sp. Gunong Kantang, Perak, November 1950. Front view of shell. Umbilical region more enlarged.
11. *Sinoennea pagodella* n.sp. Gua Bama, Padang Tengku, Pahang, September 1941. Front view of shell. Aperture more enlarged.
12. *Sinoennea charasensis* Tomlin. Bukit Charas, Pahang, February 1953. Front view of shell. Umbilical region and aperture, more enlarged.

PLATE 4

13. *Sinoennea perakensis* (Godw. Aust. & Nev.). Gunong Pondok, Perak, April 1939. Front view of shell. Umbilical region more enlarged.
14. *Sinoennea hungerfordiana* (Mlldff). Bukit Baling, Kedah, December 1938. Front view of shell. Umbilical region, exterior of distal part of last whorl, and aperture, more enlarged.

PLATE 5

15. *Sinoennea tweediei* Tomlin. Gunong Tasek, near Lenggong, Perak, March 1939. Front view of shell. Umbilical region and aperture, more enlarged.
16. *Sinoennea kanchingensis* Tomlin. Bukit Takun, Selangor, March 1938. Front view of shell. Aperture more enlarged.
17. *Sinoennea lembingensis* Tomlin. Bukit Charas, near Sungei Lembing, Pahang, 1938. Front view of shell. Aperture more enlarged.
18. *Sinoennea ridleyi* (Peile). Batu Caves, near Kuala Lumpur, Selangor. Front view of shell. Aperture more enlarged.

PLATE 6

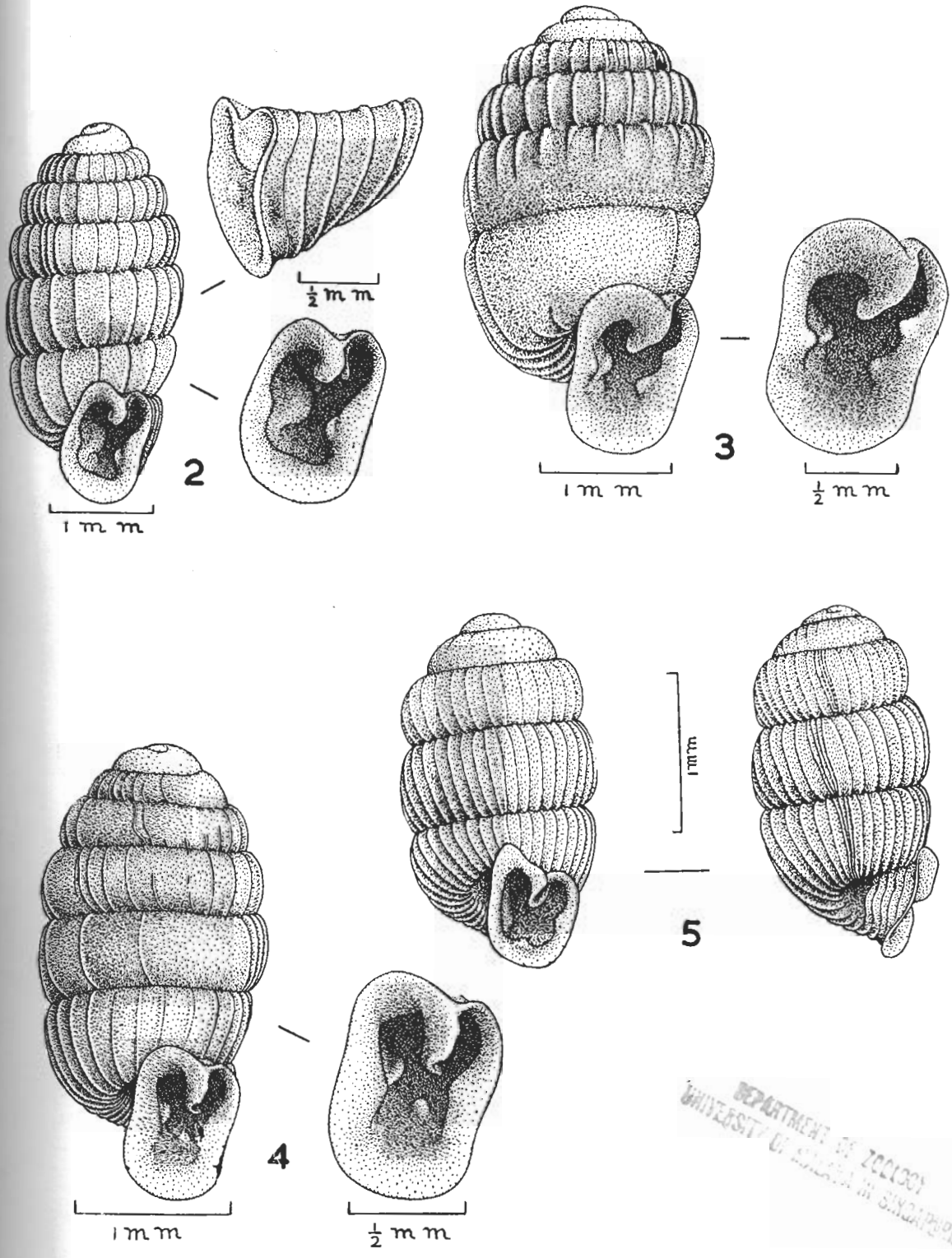
19. *Sinoennea dactylus* n.sp. Bukit Serdam near Raub, Pahang, August 1950. Front view of shell. Umbilical region and aperture more enlarged.
20. *Sinoennea baculum* n.sp. Bukit Serdam, near Raub, Pahang, August 1950. Front view of shell. Aperture more enlarged.
21. *Sinoennea tiarella* n.sp. Gunong Batu Kurau, Perak, November 1950. Front view of shell. Umbilical region and aperture, more enlarged.
22. *Sinoennea butleri* (Peile). Bukit Takun, Selangor, March 1938. Front view of shell. Aperture more enlarged.

PLATE 7

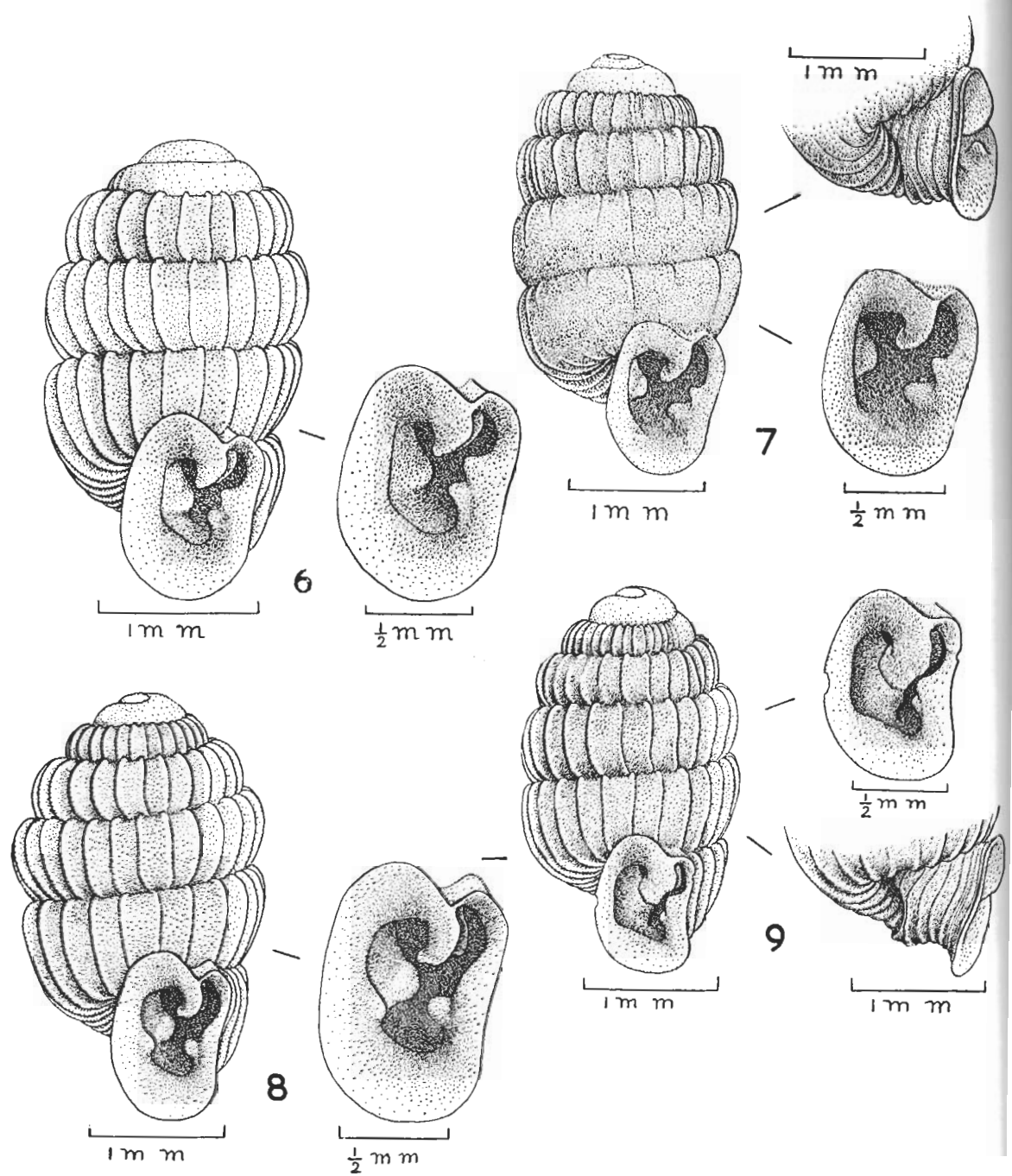
23. *Sinoennea lenggongensis* Tomlin. Lenggong, Perak, March 1939. Front view of shell. Umbilical region and aperture, more enlarged.
24. *Sinoennea subcylindrica* (Mlldff). Sungei Siput, Perak, 1935. Front view of shell. Aperture more enlarged.
25. *Sinoennea attenuata* n.sp. Gua Musang, Kelantan, 1939. Front view of shell. Umbilical region and aperture more enlarged.
26. *Sinoennea lepida* n.sp. Gua Siput, near Batu Lompat, Pahang, 1949. Front view of shell. Side view of umbilical region. Aperture more enlarged.

COMPARATIVE TABLE OF MALAYAN SPECIES OF SINOENNEA

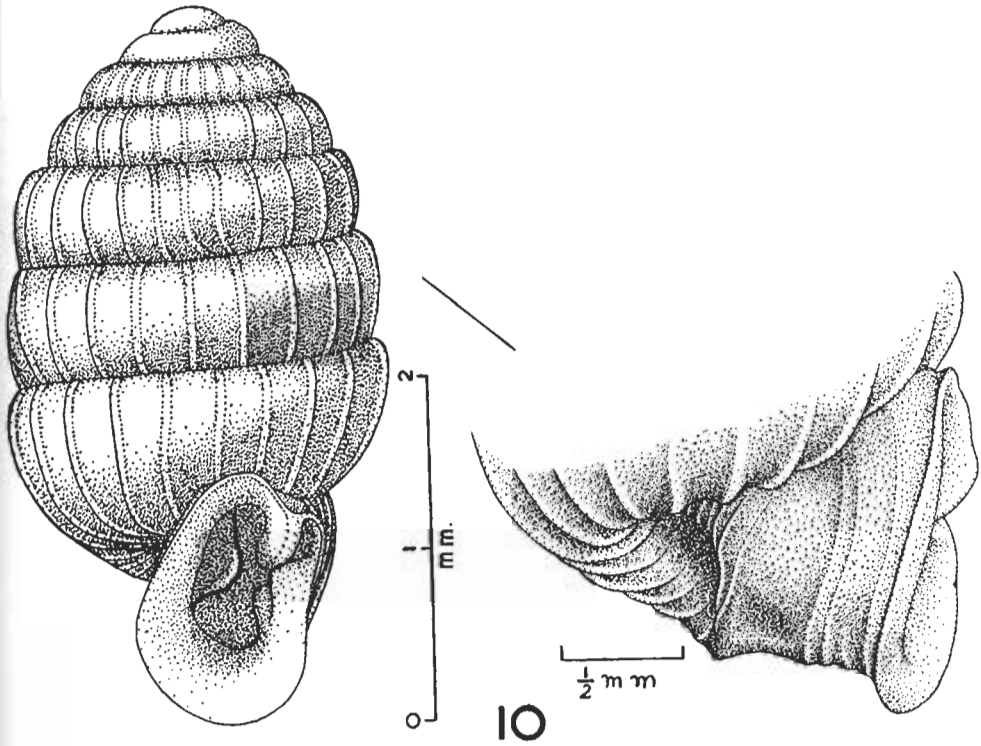
Name	Shape	No. of ribs on last whorl	No. of whorls	Profile of whorls	Top	Umbilicus	Form of aperture	Peristome	No. of palatal teeth	Distance palatal teeth to angular lamella	No. of columellar teeth	Swelling	Height	Width	Height of aperture
Ovoid Species															
apicata ..	high ovoid	14–16	±7	convex	pointed	narrow	quadrang.	adnate	1	normal	2	present	2.7–4.0	1.5–1.8	1.0–1.3
bacca ..	high ovoid	16	7	convex	pointed	narrow	quadrang.	adnate	2	normal	2	present	3.2–4.3	1.7–2.0	1.3–1.5
glebula ..	high ovoid	24	7	convex	pointed	narrow	quadrang.	adnate	2	normal	2	none	2.6–3.0	1.5	0.9–1.0
malaccana ..	ovoid pupoid	32	6	convex	pointed	narrow	quadrang.	adnate	2	normal	1	present	2.2	1.3	0.9
callizonus ..	ovoid cyl.	20	6	convex	pointed	narrow	quadrang.	adnate	2	normal	1	none	2.3–2.8	1.4–1.5	0.9–1.1
leucostolos ..	ovoid cyl.	18	6¼	convex	pointed	narrow	quadrang.	adnate	2	normal	1	present	3.2	1.7	1.2
chintamanensis	ventr. ovoid	16–19	6¼–6¾	convex	pointed	narrow	quadrang.	adnate	2 on common base	normal	2	present	3.1–3.6	1.9–2.1	1.3–1.5
crumenilla ..	ovoid pupoid	22	6	convex	pointed	narrow	quadrang.	adnate	2	short	1	present	2.9	1.6	1.0
chrysallis ..	ovoid cyl.	20	8	convex	pointed	narrow	quadrang.	adnate	2	short	1	present	4.0–4.5	2.2	1.5
pagodella ..	high ovoid	15–16	6 –6½	convex	blunt	narrow	quadrang.	free	2	normal	2	present	2.3–2.5	1.2–1.3	0.8–0.9
charasensis ..	high ovoid	30–32	6 –7	convex	pointed	wide	quadrang.	free	2	normal	1	none	2.8–3.2	1.6–1.7	0.8–1.1
perakensis ..	ovoid cyl.	45–48	6 –7	convex	pointed	wide	quadrang.	free	2	normal	1	present	4.0–4.6	1.9–2.1	1.4–1.6
hungerfordiana	ovoid cyl.	25–30	5½–6½	convex	pointed	wide	long oval	free	1	short	1	present	2.8–3.1	1.6–1.8	1.1–1.3
tweediei ..	ovoid pupoid	35	6 –7	convex	pointed	wide	long oval	free	2	short	1	present	2.7–3.3	1.6–1.9	1.1–1.4
kanchingensis..	high pupoid	46–48	9	convex	pointed	narrow	quadrang.	adnate	none	wide	1	none	5.1–6.3	2.5–2.6	1.8–2.0
lembingensis ..	ovoid, very small	obsolete	5½	convex	pointed	narrow	quadrang.	adnate	2	normal	1	none	1.8–2.1	0.9–1.0	0.6–0.8
Cylindrical Species															
ridleyi ..	large cyl.	smooth	8½–10	little convex	rounded	narrow	quadrang.	adnate	1	normal	1	present	7.0–9.1	3.0–3.4	2.4–3.1
dactylus ..	cylindrical	20–22	6	convex	blunt	narrow	quadrang.	adnate	2 on common base	short	1	present	2.1–2.2	1.0	0.7–0.8
baculum ..	very high cylindrical	20	7	little convex	blunt	narrow	quadrang.	adnate	2	normal	1	present	2.7–3.1	0.8–1.0	0.7–0.8
tiarella ..	cylindrical	25	7	convex	blunt	narrow	quadrang.	free	2	normal	1	present	3.0–3.5	1.5–1.7	1.0–1.3
butleri ..	cylindrical	26–32	6 –7	convex	blunt	narrow	quadrang.	adnate	2	normal	1	none	2.4–3.0	1.3–1.4	0.9–1.1
lenggongensis..	cylindrical	36–40	7 –8	convex	blunt	narrow	quadrang.	adnate	2	normal	1	none	3.0–3.6	1.2–1.3	1.0–1.1
subcylindrica ..	cylindrical	29–32	6 –6½	convex	blunt	narrow	quadrang.	adnate	2	normal	1	present	2.8–3.1	1.2–1.3	0.9–1.0
attenuata ..	cylindrical	30	7	convex	blunt	narrow	quadrang.	adnate	2	normal	1	present	2.7–3.6	1.3–1.4	0.8–1.2
lepida ..	cylindrical	22–24	7 –7½	convex	blunt	narrow	quadrang.	adnate	2	normal	1	present	3.4–3.8	1.4–1.5	1.2–1.3

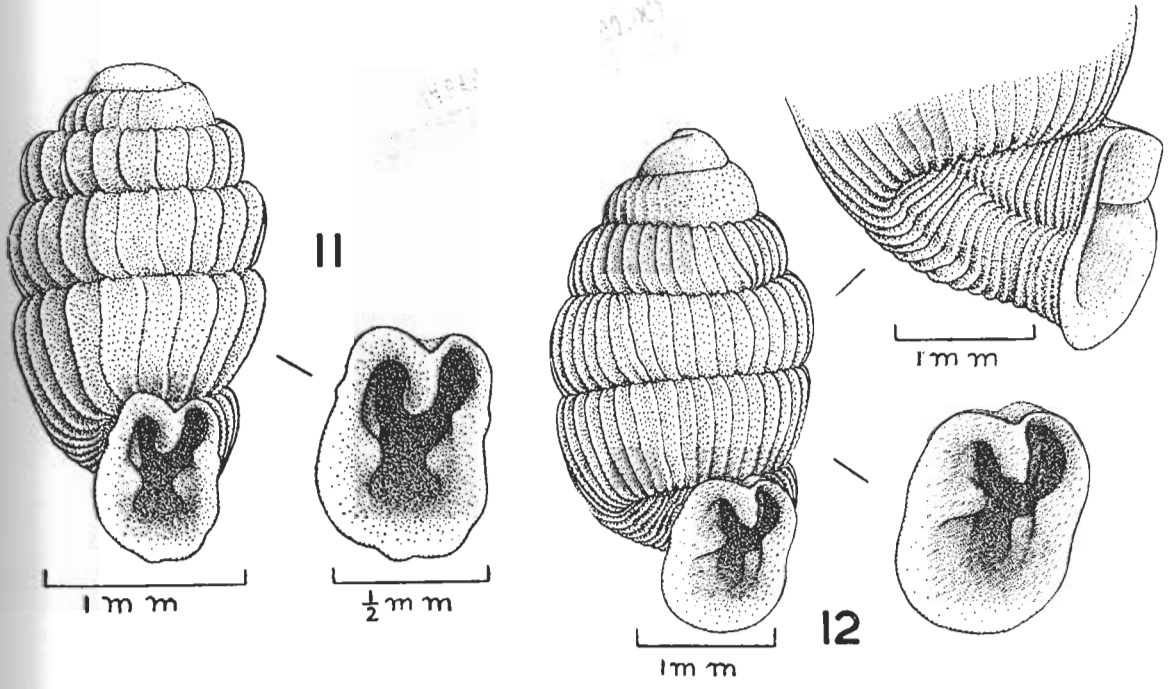


Malayan Streptaxidae (W. S. S. van Benthem Jutting).

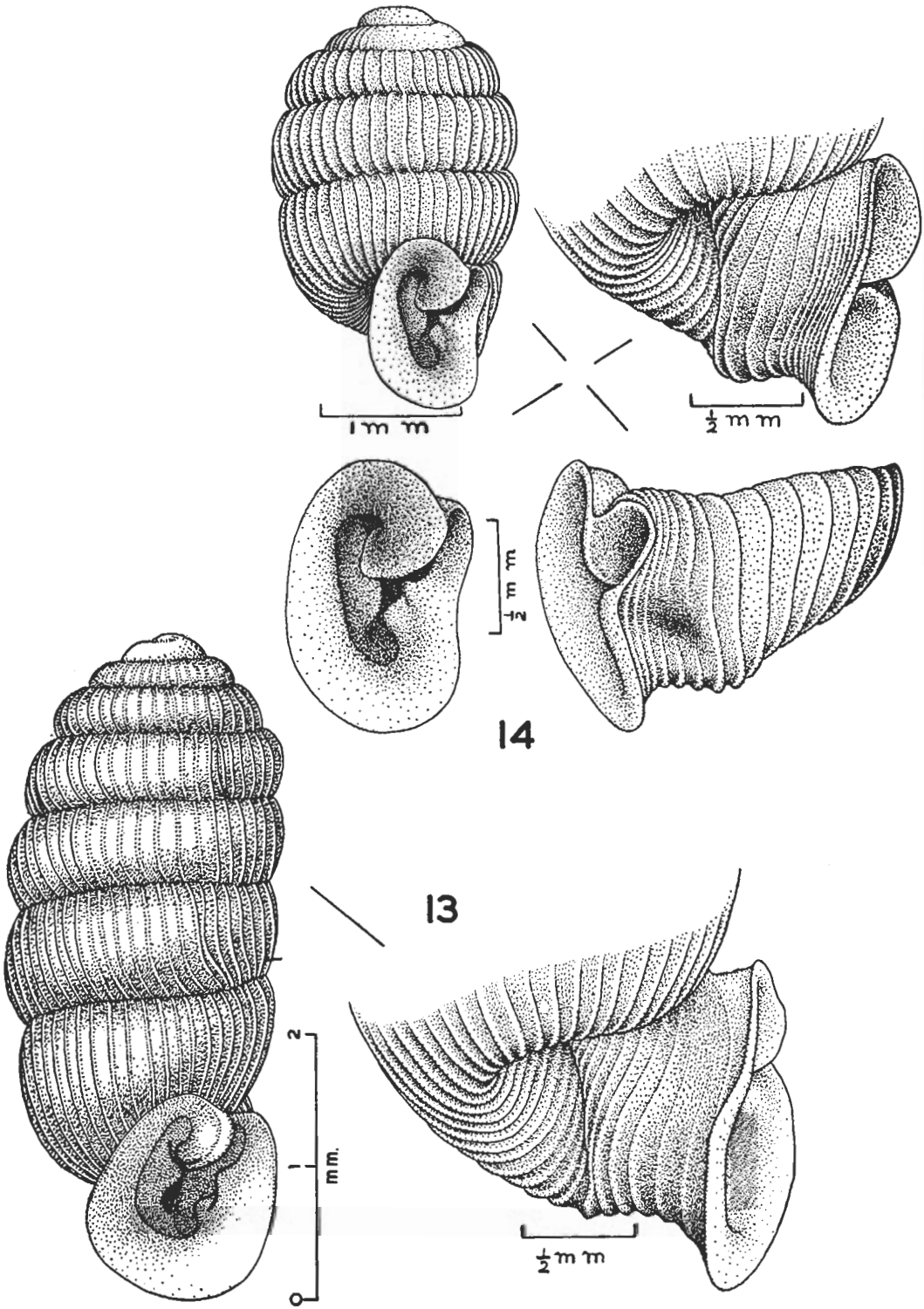


Malayan Streptaxidae (W. S. S. van Benthem Jutting).

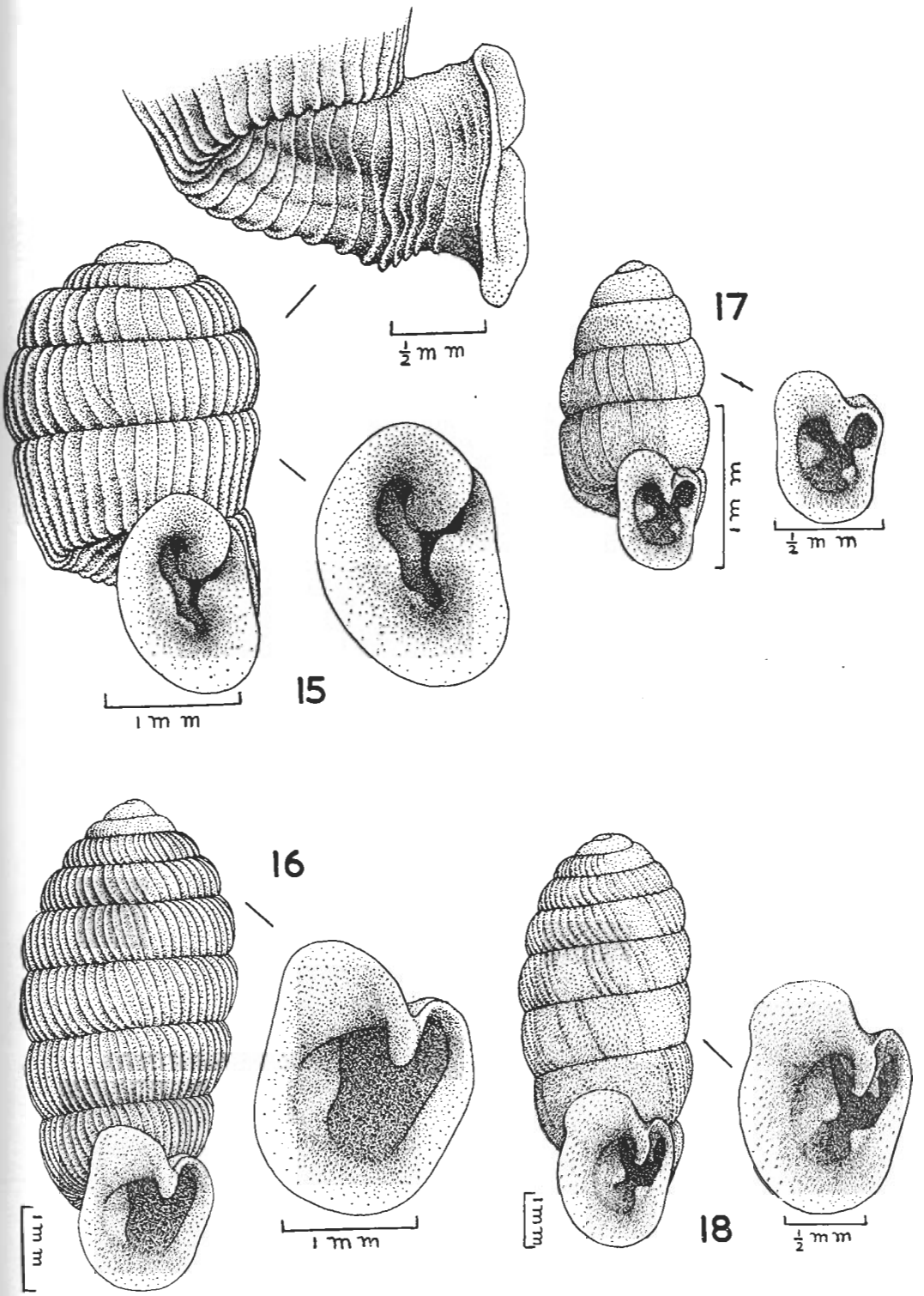




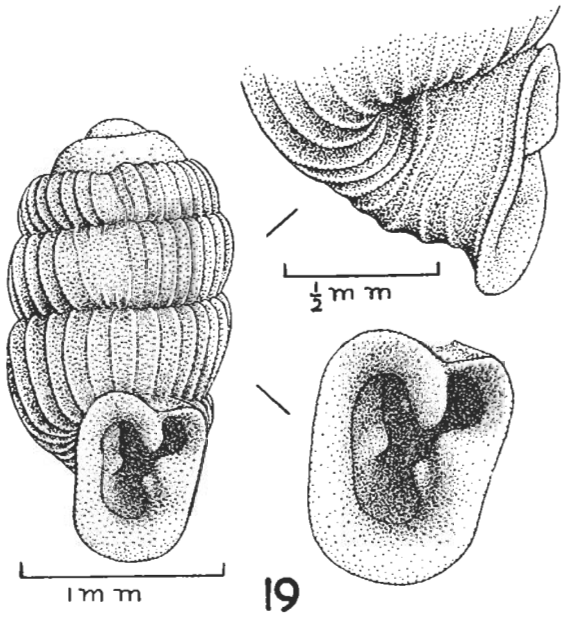
Malayan Streptaxidae (W. S. S. van Benthem Jutting).



Malayan Streptaxidae (W. S. S. van Benthem Jutting).



Malayan Streptaxidae (W. S. S. van Benthem Jutting).



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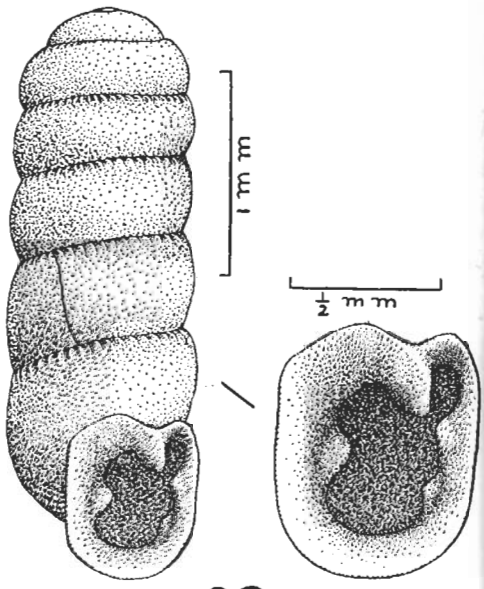

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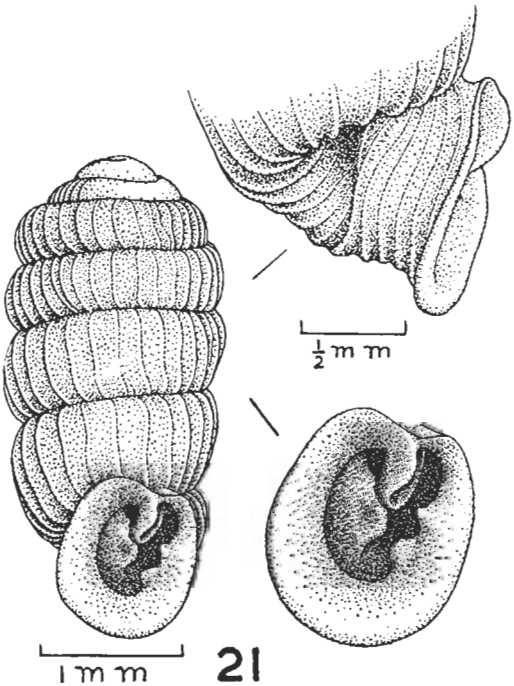

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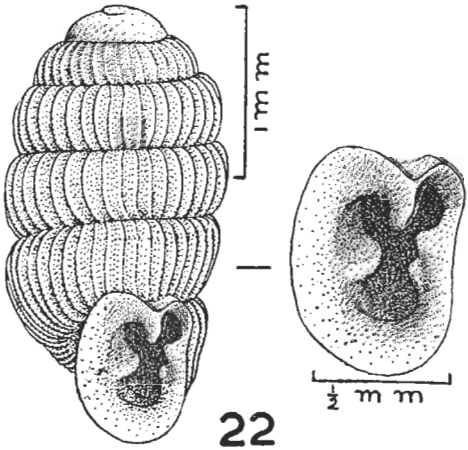

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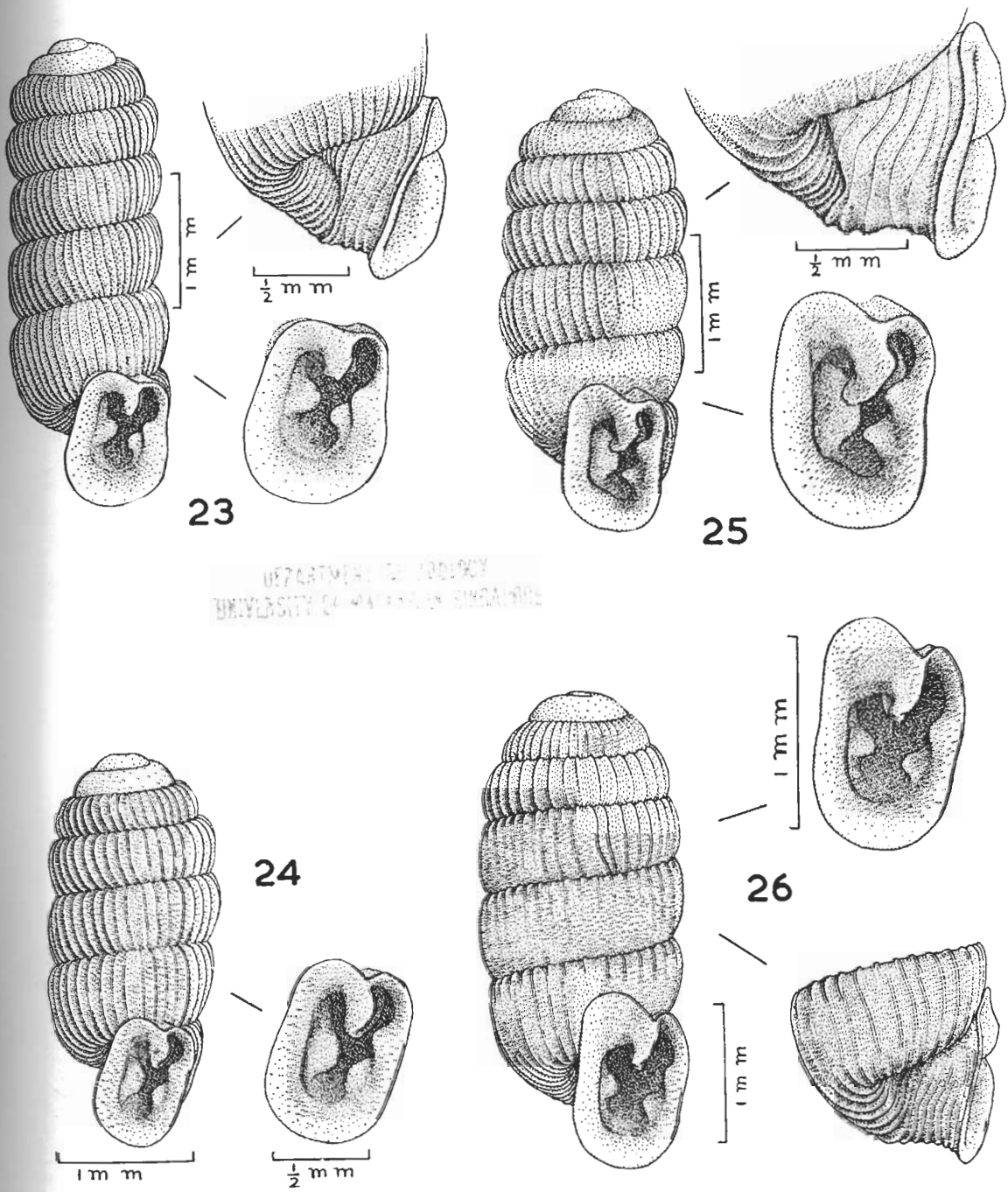
Malayan Streptaxidae (W. S. S. van Benthem Jutting).



Malayan Streptaxidae (W. S. S. van Benthem Jutting).