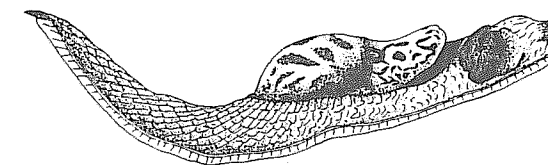


A. A. Schileyko

TREATISE ON RECENT TERRESTRIAL
PULMONATE MOLLUSCS

Part 9

Helicarionidae, Gymnarionidae,
Rhysotinidae, Ariophantidae



Ruthenica, Supplement 2
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CONTENTS

KALIELLINAE Thiele, 1931	1167
TROCHOMORPHIDAE Moellendorff, 1890 (additions)	1180
HELICARIONIDAE Bourguignat, 1883	1183
GEOTROCHINAE Iredale, 1941	1183
HELICARIONINAE Bourguignat, 1883	1185
Chronini Thiele, 1931	1185
Helicarionini Bourguignat, 1883	1188
PAPUARIONINAE Schileyko, subf. nov.	1217
Papuarionini Schileyko, trib. nov.	1218
Laocaini Schileyko, trib. nov.	1219
UROCYCLINAE Simroth, 1889	1219
Atoxonini Schileyko, trib. nov.	1219
Buettneriini Schileyko, trib. nov.	1225
Urocyclini Simroth, 1889	1228
GYMNARIONIDAE Van Mol, 1970	1230
RHYSOTINIDAE Schileyko, fam. nov.	1233
ARIOPHANTIDAE Godwin-Austen, 1888	1234
EREPTINAE Godwin-Austen, 1908	1234
TROCHOZONITINAE Iredale, 1914	1242
Trochozonitini Iredale, 1914	1242
Sheldoniini Connolly, 1925	1260
? Upembellini Van Goethem, 1977	1266
Zonitarionini Schileyko, trib. nov.	1267
Acantharionini Schileyko, trib. nov.	1274
TROCHONANININAE Connolly, 1912	1274
ARIOPHANTINAE Godwin-Austen, 1888	1280
Ariophantini Godwin-Austen, 1888	1280
References	1302

Additions to part 8
I. Addition to Euconulidae

KALIELLINAE Thiele, 1931

Thiele, 1931: 612.

Shell generally as in Euconulinae.

Anatomically differs from Euconulinae by presence of a small flagellum (calc-sac) which lacks axial thread.

DISTRIBUTION. Japan, Philippines, Hindustan Peninsula, Ceylon, Seychelles, Madagascar, Indonesia, Papua-New Guinea, Carolines, Moluccas, Solomon Islands, New Hebrides, N Australia.

REMARK. In the diagnosis of Euconulidae it was said (p. 1065), that epiphallus without lime-sac, flagellum or much calc. On this ground Baker (1941) included *Kaliella* to Sesarinae (Helicarionidae). However, having analyzed, in route of work on this part, the taxonomic structure of Helicarionidae and Ariophantidae, I came to the conclusion, that *Kaliella* and related genera would be better placed in Euconulidae as a subfamily. Moreover, Kaliellinae, in my opinion, is the most archaic group among

Euconulidae, since I consider the presence of calc-sac as a plesiomorphic character.

Queridomus Iredale, 1937

Fig. 1525

Iredale, 1937a: 322. B. Smith, 1992: 241.

TYPE SPECIES — *Helix (Conulus ?) grenvillei* Brazier, 1876; OD.

Shell turbinate, thin, of 4.25-6.5 very convex whorls. Last whorl (sub)angulate at periphery or with 2 keels. Color corneous. Embryonic whorls with a few widely spaced spiral threadlets which retained on later whorls; besides, there are moderately coarse radial wrinkles and short periostracal hair-like projections. Aperture ovate, well oblique, with almost vertical columellar margin. Umbilicus minute. Height 1.7-2.2, diam. 1.8-2.4 mm (1.4 × 1.9 mm).

Cephalopodium with a caudal horn.

Ovotestis bilobed, each lobe consists of many small acini. Hermaphroditic duct scarcely convoluted. Epiphallus not long, thick-walled, with a minute flagellum (calc-sac) located at epiphallus/penis junction; enters penis through a simple pore. Penis

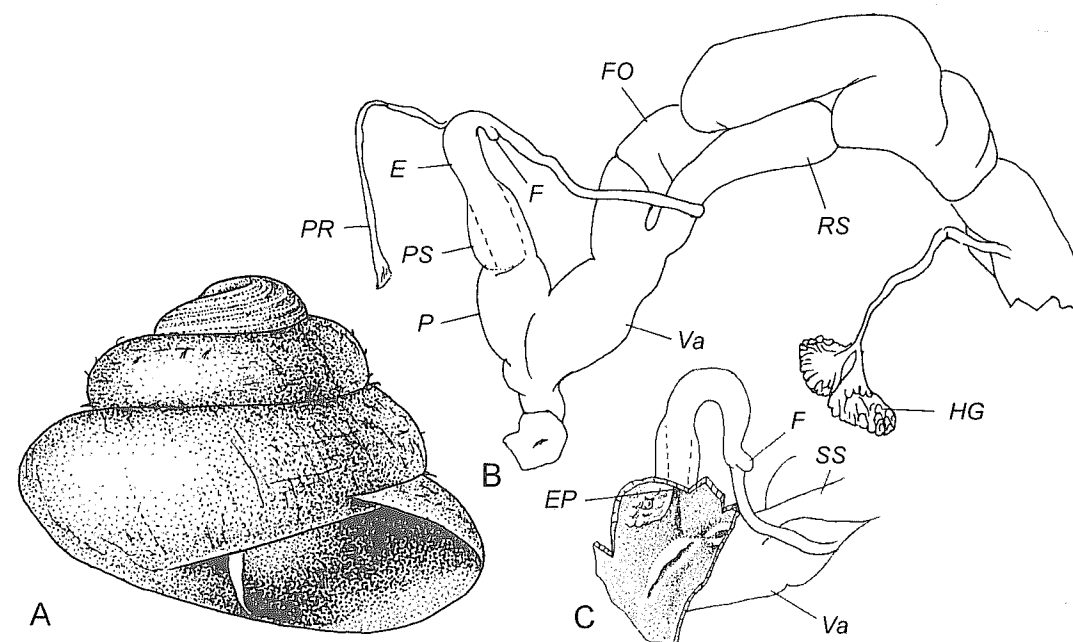


Fig. 1525. *Queridomus grenvillei* (Brazier, 1876). A — shell: Vine thicket, between Banyo Beach and Yanga Danga, Melville I., N[orthern] T[erritory]. Chicago No. 201588. B — reproductive tract. C — interior of penis. After Solem, 1988.

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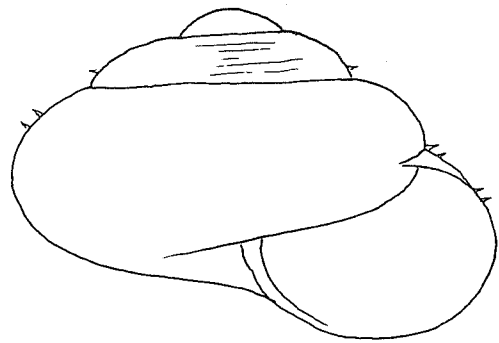


Fig. 1526. *Striokaliella crenicincta* (Godwin-Austen, 1883).
After Godwin-Austen, 1883.

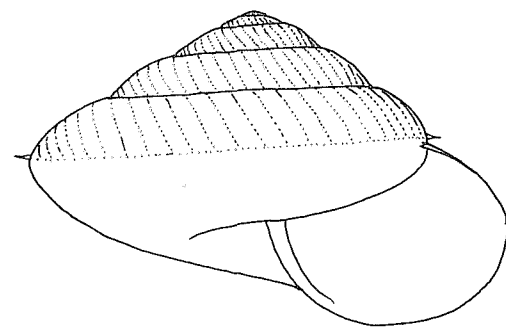


Fig. 1527. *Pseudokaliella nevillei* (Godwin-Austen, 1883).
After Godwin-Austen, 1883.

very short, internally with an area covered with rounded tubercles. Penis sheath covers lower part of epiphallus. Penial retractor attached to boundary between penis and epiphallus. Free oviduct stout, of moderate length. Vagina of about same length, opens into atrium through a slit-like pore. Spermatheca short, clavate, without distinct boundary between stalk and reservoir.

DISTRIBUTION. Bali Island, Papua-New Guinea, Carolines (Ponape Island), Moluccas (Beilan Beilan Island), Solomon Islands (Florida Island), New Hebrides; N Australia (Home Island, off Cape Grenville, Queensland). 3-4 spp.

Striokaliella Thiele, 1931
Fig. 1526

Thiele, 1931: 613 (*Kaliella* sect.).

TYPE SPECIES — *Sitala crenicincta* Godwin-Austen, 1883; monotypy.

Shell depressedly turbinata, thin, of 4 convex whorls. Last whorl rounded at periphery. Color brownish-corneous. Postembryonic whorls obliquely striated and decussated with fine, rather close impressed lines both above and below; there are 2 spiral parallel rows of fine hairs. Aperture semiovalately lunate, oblique, with simple

margins; columellar margin vertical. Umbilicus dot-like. Height 1.50-1.75, diam. 2.25-2.70 mm.

DISTRIBUTION. Hindustan Peninsula. 1 sp.

Pseudokaliella Godwin-Austen, 1910
Fig. 1527

Godwin-Austen, 1910: 296.

TYPE SPECIES — *Kaliella ? nevillei* Godwin-Austen, 1883; OD.

Shell depressed-trochiform, thin, of about 5 moderately convex whorls. Last whorl somewhat angulated, ornamented with thin hairs, either pointed or blunt. Color dull ochraceous. Postnuclear whorls finely radially ribbed. Aperture semilunate, with thin peristome. Umbilicus narrowly open. Height 4-6, diam. 8-12 mm.

DISTRIBUTION. Hindustan Peninsula. 2 or 3 spp.

Kaliella Blanford, 1863
Fig. 1528

Blanford, 1863: 83.

TYPE SPECIES — *Helix barrakporensis* L. Pfeiffer, 1852; SD Godwin-Austen, 1882.

Shell trochiform, very thin, translucent, of 5-9.5 convex whorls. Last whorl bluntly

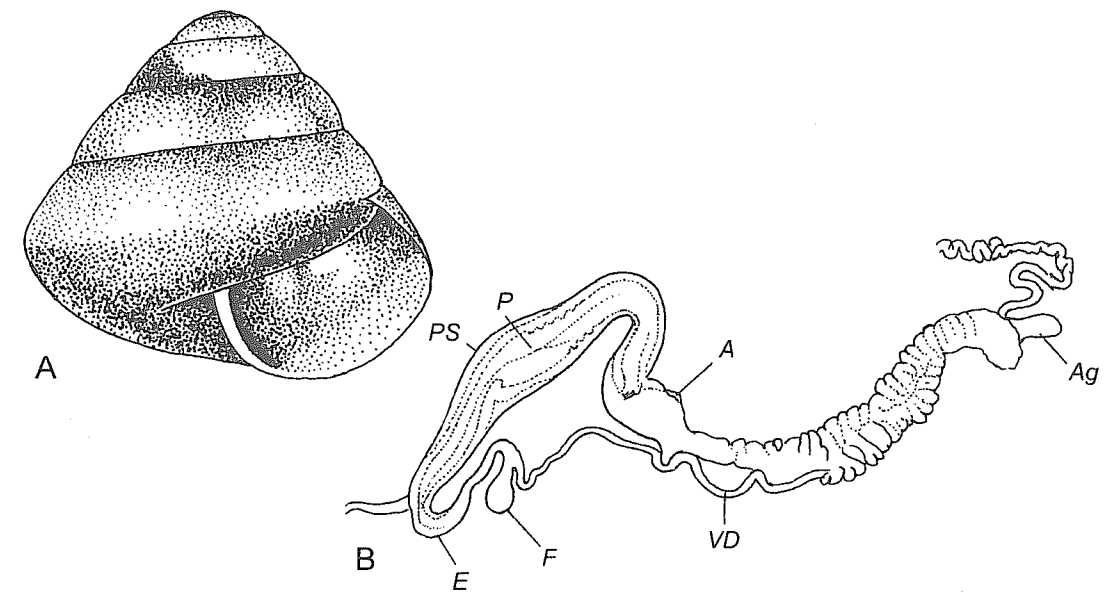


Fig. 1528. *Kaliella barrakporensis* (L. Pfeiffer, 1852).
A — shell: Tsimbazaza, Madagascar. Paris. B — reproductive tract. After Godwin-Austen, 1883.

angulate. Color (light) corneous. Embryonic whorls practically smooth. Upper surface of postnuclear whorls with accurate, thin radial striae, below peripheral angle with delicate spiral striae. Aperture broadly lunate, almost vertical, with thin margins. Umbilicus closed to narrowly open. Height 1.1-5.3, diam. 1.5-7.0 mm (2.2 × 2.5 mm).

Cephalopodium with a distinct caudal foss and caudal horn.

Vas deferens enters epiphallus apically. Boundary between vas deferens and epiphallus marked by a prominent, clavate flagellum (calc-sac). Epiphallus short, internally with longitudinal plicae. Penis without verge, its inner surface with a few axial pilasters and numerous small, transverse folds. Penial caecum missing. Penis sheath wanting. Penial retractor attached to penis/epiphallus junction. Spermatheca absent.

DISTRIBUTION. India, Ceylon, Madagascar. At least 50 spp.

Nesokaliella Gerlach, 1998
Fig. 1529

Gerlach, 1998: 18; 2001: 205.

TYPE SPECIES — *Helix (Conulus) subturritula* G. et H. Nevill, 1871; OD.

Shell conic, thin, slightly glossy, translucent, of 5-6 nearly flat whorls. Apex blunted. Last whorl with distinct peripheral angle. Color of thin periostracum corneous. Embryonic whorls smooth. Later whorls with fine radial lines; microscopic radial ridges or 4-10 spiral striae may be present. Aperture narrow, angulated in baso-columellar and palatal margins. Umbilicus minutely open. Height 1.4-4.9, diam. 1.6-4.7 mm.

Sole tripartite. Cephalopodium with or without caudal horn.

Vas deferens rather long, thin, free. Flagellum absent. Epiphallus vestigial. Penis simple, elongate, sometimes inflated terminally, surrounded by a thin sheath. Penial retractor attached to upper end of penis. Free oviduct moderately long. Vagina absent. Spermo-oviduct elongate, simple or inflated basally. Spermathecal stalk long, narrow.

DISTRIBUTION. Seychelles (Mahé & Silhouette Islands). 3 spp.

Macroceras Semper, 1870
Fig. 1530

Semper, 1870: 49.

TYPE SPECIES — *Helix spectabilis* L. Pfeiffer, 1845; monotypy.

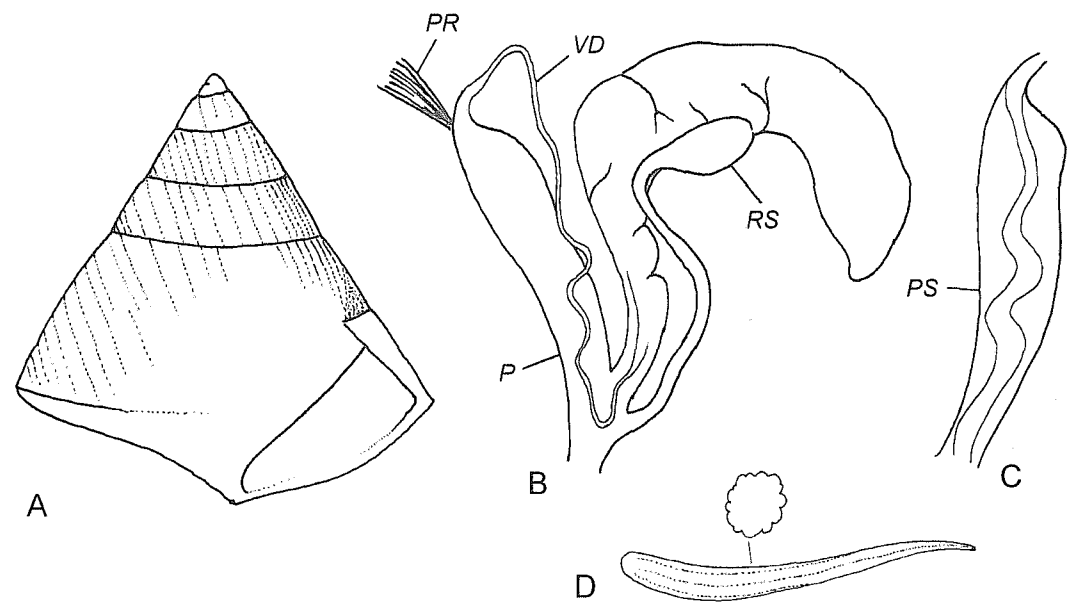


Fig. 1529. A, B, C — *Nesokaliella subturritula* (G. Nevill et H. Nevill, 1871).
A — shell. B — reproductive tract. C — interior of penis. After Gerlach, 1998. D —
! *Nesokaliella intermedia* Gerlach, 2001. Spermatophore. After Gerlach, 2001.

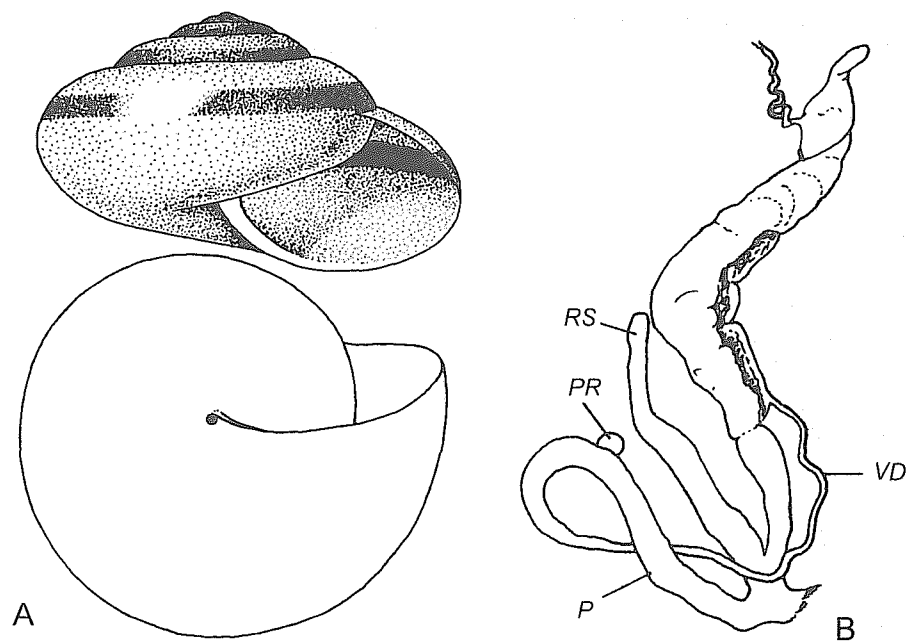


Fig. 1530. *Macroceras spectabilis* (L. Pfeiffer, 1845).
A — shell: Philippines. Moscow No. Lc-21522. B — reproductive tract. After Semper, 1870.

Shell depressed-conic, thin, shining, of 5 rather convex whorls. Last whorl rounded to angulated peripherally. Color yellow, greenish-fulvous or dark-reddish-brown, often with distinct dark band above periphery. Embryonic whorls glabrous, polished. Later whorls practically smooth, with only very weak, irregular radial wrinklets and microscopic elements of spiral striation. Aperture ovate, a little oblique, with thin, simple margins. Umbilicus dot-like. Height 9-10, diam. 14.5-17.0 mm (9.7 × 14.8 mm).

Cephalopodium with well-developed, sharp caudal horn.

Talon not evident. Vas deferens thin, free, entering epiphallus terminally. Epiphallus gradually passes into subcylindrical penis, boundary between these parts marked by insertion of penial retractor. Free oviduct moderately long, vagina almost absent. Spermatheca rather long, sleeve-like, ending at middle of spermo-viduct, without distinct subdivision into stalk and reservoir.

DISTRIBUTION. Philippines. 3-4 spp.

? *Pseudhelicarion* Moellendorff, 1894
Fig. 1531

Moellendorff in Quadras & Moellendorff, 1894:
86 (*Macrochlamys* subg.).

TYPE SPECIES — *Helix ceratodes* L. Pfeiffer, 1845; SD Moellendorff, 1898.

Shell somewhat vitrinoid, thin, shining, of 4-5 slightly convex, rapidly increasing whorls. Last whorl rounded or slightly angulated. Color amber or yellowish, sometimes with darker peripheral band. Embryonic whorls nearly smooth. Later whorls very finely radially striated. Aperture broadly ovate, moderately oblique, margins simple or with inner lip. Umbilicus narrowly open. Height 4-12, diam. 8-20 mm (8.1 × 13.0 mm).

DISTRIBUTION. Philippines. 12 spp.

REMARK. Superficially *Pseudhelicarion* is somewhat similar to *Macroceras*, therefore I tentatively place it in Kaliellinae until the anatomy of *Pseudhelicarion ceratodes* is known.

Vitrinoidea Semper, 1873
Fig. 1532

Semper, 1873: 86.

TYPE SPECIES — *Vitrinoidea alabajensis* Semper, 1873; monotypy.

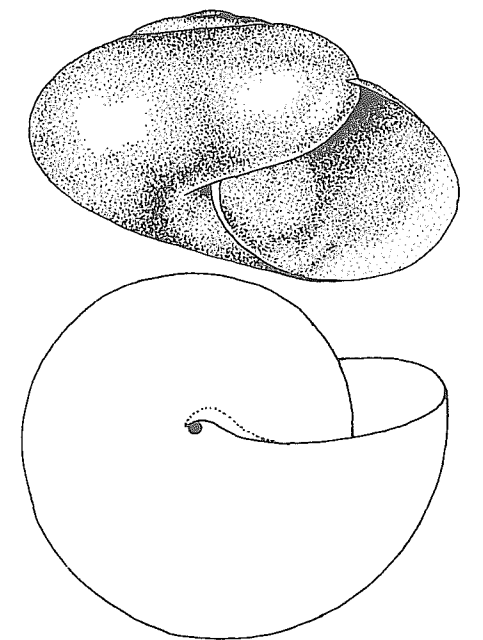


Fig. 1531. *Pseudhelicarion ceratodes* (L. Pfeiffer, 1845).
Cebu Island. Geneva.

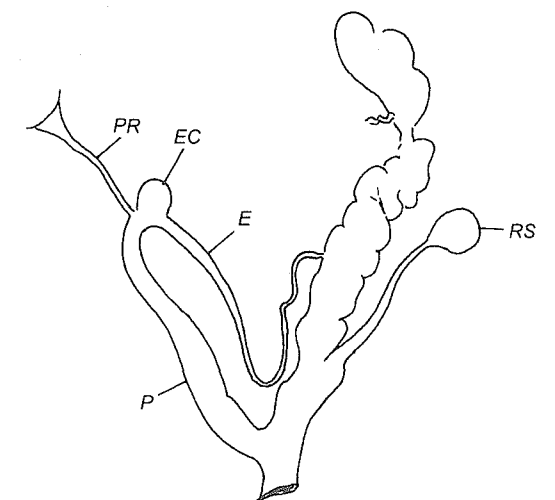


Fig. 1532. *Vitrinoidea alabajensis* Semper, 1873.
Reproductive tract. After Semper, 1873.

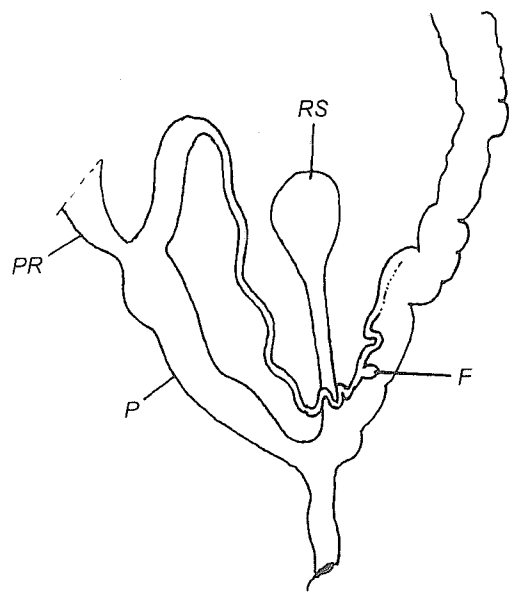


Fig. 1533. *Vitrinopsis tuberculata* Semper, 1873. Reproductive tract. After Semper, 1873.

Slugs. Shell ear-shaped, very thin, of 3.5 whorls, completely covered by mantle. Visceral hump voluminous, situated on anterior part of cephalopodium. Shell diam. about 10 mm.

Vas deferens rather short, entering epiphallus without sharp boundary. Epiphallus with ovoid caecum. Penis subcylindrical. Penial retractor inserting on penis at base of caecum. Free oviduct rather long, expanded. Vagina moderately long. Atrium not long. Spermathecal stalk rather long, reservoir globular, embedded in upper section of spermoviduct.

DISTRIBUTION. Philippines (Luzon Island). 2 spp.

Vitrinopsis Semper, 1873
Fig. 1533

Semper, 1873: 86.

TYPE SPECIES — *Vitrinopsis tuberculata* Semper, 1873; SD Zilch, 1959.

Semislugs. Shell zonitoid to ear-shaped, very thin, translucent, of 2-4.5 whorls, more or less covered by mantle. Aperture subhorizontal. Diam. 5-7 mm.

Vas deferens rather long, convoluted in

proximal part which adhering to female section. Distal part of vas deferens somewhat widened and probably represents an epiphallus. Penis bulky. Penial retractor inserting at base of epiphallus. Free oviduct rather long, vagina extremely short. Atrium long. Spermathecal stalk rather short, reservoir subglobular, embedded in lower half of spermoviduct.

DISTRIBUTION. Philippines, Java, Timor Island. 8-10 spp.

Trochochlamys Habe, 1946
Fig. 1534

Habe, 1946: 209. Azuma, 1995: 103.

TYPE SPECIES — *Kaliella crenulata* Gude, 1900; OD.

Shell trochiform, thin, translucent, of 6-7 slightly convex whorls. Color light-corneous. Embryonic whorls with fine radial riblets and extremely delicate spiral striae. Later whorls densely, finely, radially striated. Aperture semilunate, somewhat angulated, subvertical, columellar margin a little dilated, partly covering dot-like umbilicus. Height 2.2-5.5, diam. 2.0-6.5 mm (3.28 × 3.04 mm).

Cephalopodium with shallow caudal foss and short, blunt caudal horn.

Ovotestis of 1 cluster of a few ovoid acini. Hermaphroditic duct not strongly convoluted. Talon hidden. Vas deferens thin, entering poorly demarcated epiphallus at base of minute flagellum (calc-sac). Penis long, subcylindrical, with blunt basal caecum. Free oviduct and vagina of about equal length. Spermathecal stalk nearly cylindrical, reservoir lanceolate, attending albumen gland.

DISTRIBUTION. Japan. 13-18 spp. & subspp.

Japanochlamys Habe, 1946
Fig. 1535

Habe, 1946: 215.

TYPE SPECIES — *Macrochlamys cerasina* Pilsbry, 1902; OD.

Shell depressed-trochiform, semitransparent, brilliantly glossy, translucent, of 5.5-6 (moderately) convex whorls. Color dark-reddish amber. Embryonic whorls smooth. Postapical whorls without regular sculpture above; basal surface with exceptionally fine, very dense, wavy radial striae.

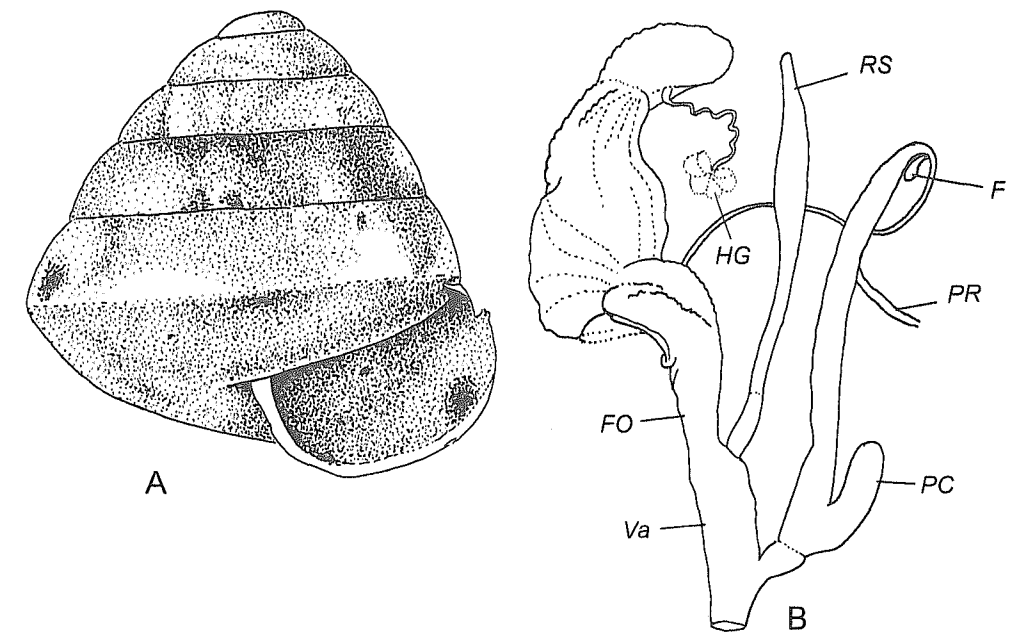


Fig. 1534. *Trochochlamys crenulata* (Gude, 1900). A — shell: Shukunegimura, Sado, Japan. Phil. No. 84763. B — reproductive tract. After Azuma, 1995.

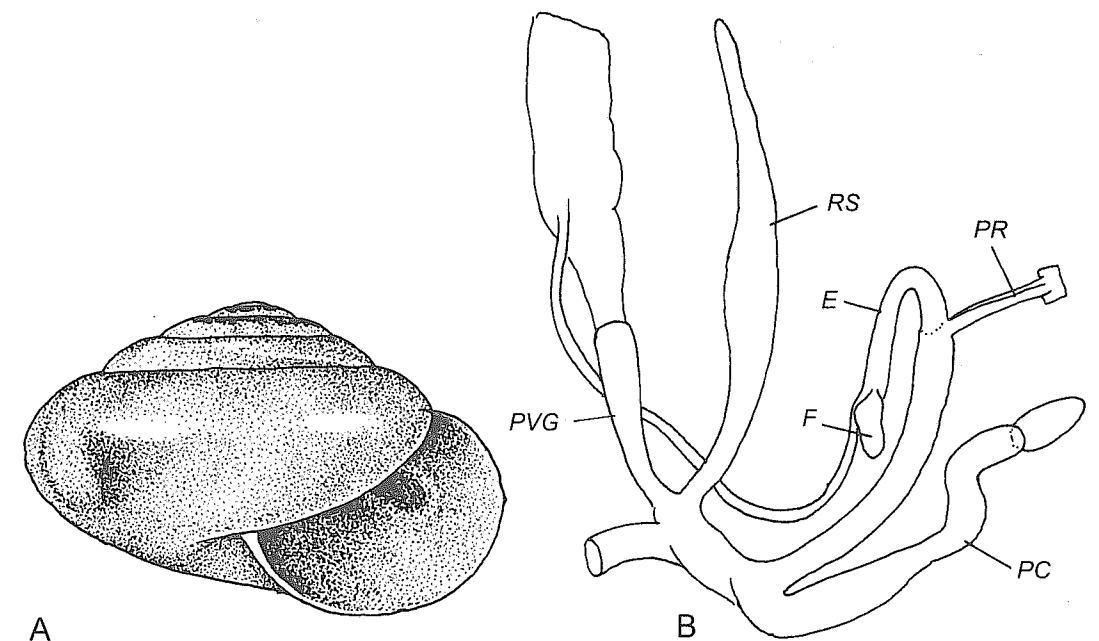


Fig. 1535. A — ! *Japanochlamys cerasina* (Pilsbry, 1902). Shell: Tobishima, Ugo, Japan. Holotype. Phil. No. 82600a. B — ! *Japanochlamys crenata* Kuroda et Azuma, 1982. Reproductive tract. After Azuma, 1995.

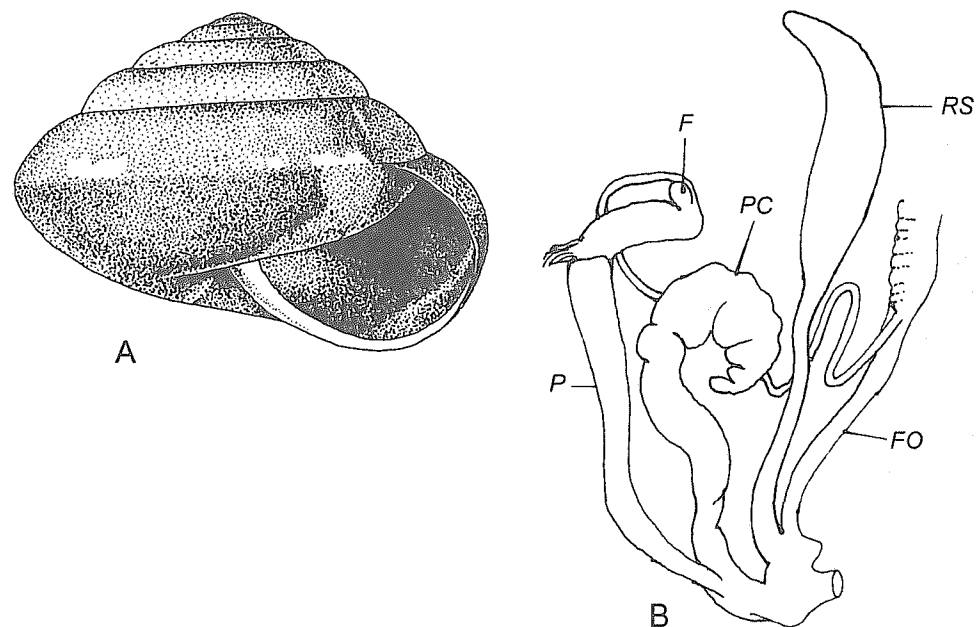


Fig. 1536. *Takemasaia gudei* (Pilsbry, 1901).
A — shell: Kunchaa, Okinawa, Loo Choo Islands. Holotype. Phil. No. 81234a. B — reproductive tract. After Azuma & Minato, 1976.

Aperture widely lunate, subvertical. Umbilicus dot-like, semicovered. Height 3.4-5.8, diam. 5.4-8.8 mm (5.7 × 8.6 mm).

Vas deferens free, entering epiphallus subapically. Flagellum short, rounded apically. Epiphallus not long, subcylindrical. Penis rather long, supplied with long caecum located in lower half of penis. Free oviduct long. Perivaginal gland evident. Vagina almost absent. Spermatheca large, fusiform, without distinct subdivision into stalk and reservoir.

DISTRIBUTION. Japan. 6 spp.

Takemasaia Azuma et Minato, 1976
Fig. 1536

Azuma & Minato, 1976: 1.

TYPE SPECIES — *Macrochlamys gudei* Pilsbry, 1901; OD.

Shell depressed, dome-shaped, thin, translucent, shining, of 6.5-7 rather convex whorls. Last whorl bluntly angulate. Color yellowish-corneous. Embryonic whorls smooth, subsequent whorls with smoothed, weak, radial wrinklets. Aperture ovate, moderately oblique, with sharp, simple margins; columellar margin oblique, expanded.

Umbilicus, a minute perforation. Height 6.0-7.5, diam. 9-11 mm (7.3 × 10.5 mm).

Vas deferens enters epiphallus almost apically. Flagellum (calc-sac) small, ovate. Epiphallus rather short. Penis long, subcylindrical, surrounded by thin sheath. Basal section of penis furnished with a very large caecum of irregular shape. Penial retractor attached to penis/epiphallus junction. Free oviduct long, vagina extremely short, swollen. Spermathecal stalk quite long, reservoir elongated-fusiform.

DISTRIBUTION. Japan. 1 sp.

Yamatochlamys Habe, 1945
Fig. 1537

Habe, 1945: 23.

TYPE SPECIES — *Microcystina vaga* Pilsbry et Hirase, 1904; OD.

Shell turbinate, dome-shaped, very thin, translucent, shining, of 4.5-6 slightly convex whorls. Last whorl with smoothed, indistinct peripheral angle. Color reddish- or yellowish-corneous. Embryonic whorls vaguely granulate (practically smooth). Later surface indistinctly radially wrinkled above and glabrous beneath. Aperture semi-

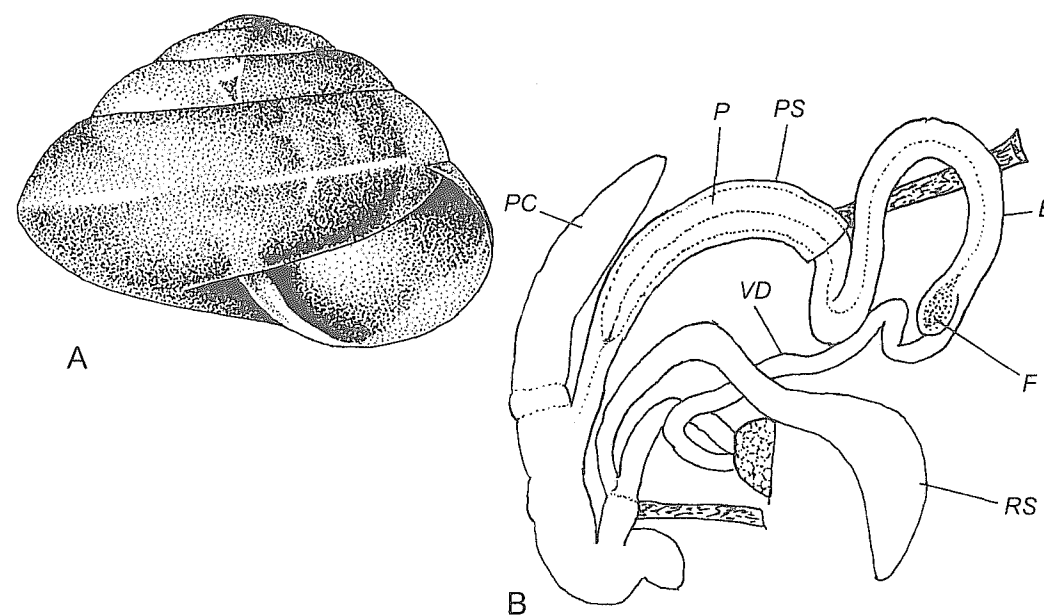


Fig. 1537. *Yamatochlamys vaga* (Pilsbry et Hirase, 1904).
A — shell: Muya, Awa, Shikoku, Japan. Holotype. Phil. No. 84439a. B — reproductive tract. After Habe, 1945.

lunate, subvertical, with sharp, simple margins. Umbilicus, a tiny perforation. Height 2.0-3.5 diam. 3.4-4.4 mm (3.4 × 4.4 mm).

Vas deferens comparatively stout, moderately long. Flagellum small, ovoid. Epiphallus rather long. Penis long, almost cylindrical, surrounded by thin sheath, with a large, tapering caecum. Penial retractor inserting on penis/epiphallus junction. Free oviduct moderately long, vagina very short, supplied with its own retractor. Spermathecal stalk moderately long, not expanded at base; reservoir elongate, pointed at summit.

DISTRIBUTION. Japan. 4-5 spp.

Nipponochlamys Habe, 1945
Fig. 1538

Habe, 1945: 22.

TYPE SPECIES — *Macrochlamys semisericata* Pilsbry, 1902; OD.

Shell depressed, semitransparent, shining, of 4.25-5 rather convex whorls. Last whorl evenly rounded. Color generally corneous, sometimes with a light reddish tint. Embryonic whorls finely but distinctly reticulate because of crossing weaker spiral and stronger radial lines. Upper surface of postapical

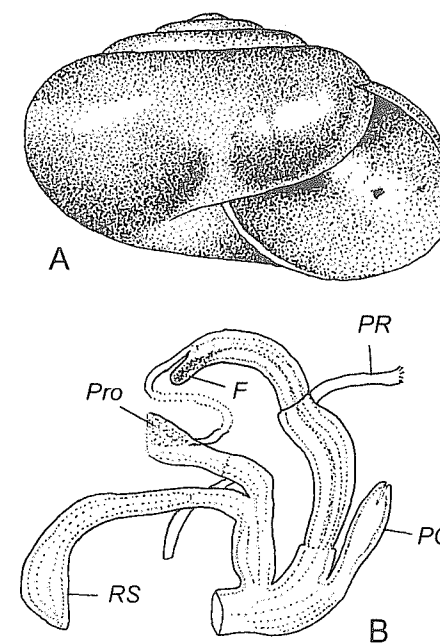


Fig. 1538. *Nipponochlamys semisericata* (Pilsbry, 1902).
A — shell: Kurozu, Kii, Japan. Holotype. Phil. No. 83374a. B — reproductive tract. After Habe, 1945.

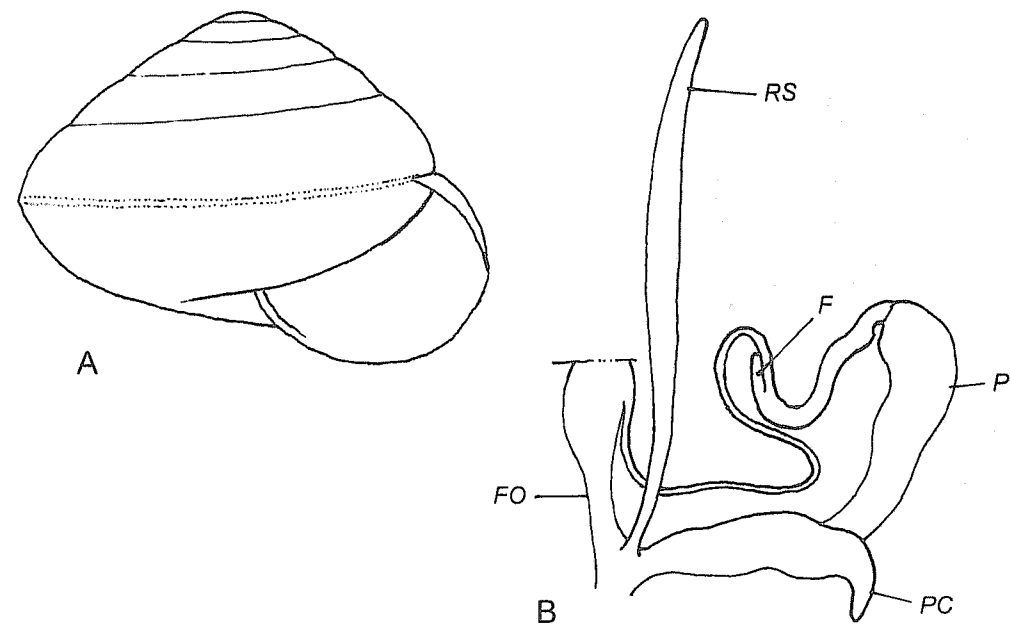


Fig. 1539. *Ceratochlamys ceratodes* (Gude, 1900).

A — shell. After Azuma, 2001. B — reproductive tract. After Habe, 1961.

whorls with very dense microscopical radial striation, basal surface lacking regular sculpture. Aperture broadly lunate, a little oblique; margins thin; columellar margin very shortly reflexed. Umbilicus narrow, often covered by a thin, transparent film. Height 2.5-4.2 diam. 4.0-7.5 mm (3.9 × 5.6 mm).

Vas deferens short, thin, free, entering epiphallus laterally at base of short, blunt flagellum (calc-sac). Epiphallus short, scarcely demarcated from penis. Penis somewhat expanded, furnished with caecum in its basal portion and surrounded by sheath above base of caecum. Penial retractor attached to border between penis and epiphallus at upper margin of penis sheath. Internally penis with longitudinal folds. Free oviduct and vagina not long, subequal in length. Spermathecal stalk slightly, gradually widened upward, reservoir poorly demarcated.

DISTRIBUTION. Japan. 7 spp.

Ceratochlamys Habe, 1946

Fig. 1539

Habe, 1946: 214.

TYPE SPECIES — *Arnouldia ceratodes* Gude, 1900; OD.

Shell turbinate, thin, semitransparent, brilliant, of 5-6 a little convex whorls. Last whorl more or less angulated, with fine, thread-like keel. Color pale-yellow or reddish-corneous. All surface practically without sculpture except for much smoothed, irregular, shallow radial wrinkles. Aperture semilunate, a little oblique. Umbilicus minutely open, semicovered. Height 2.0-3.5, diam. 3.4-5.0 mm.

Vas deferens entering epiphallus subapically. Flagellum short, thin, tightly bound to side of vas deferens. Epiphallus thin. Penis provided with conic basal caecum and a sheath. Penial retractor insertion marks boundary between epiphallus and penis. Free oviduct moderately long. Vagina as such absent since spermatheca enters atrium. Spermatheca sleeve-like, without distinct division into stalk and reservoir.

DISTRIBUTION. Japan. 2 spp.

Bekkochlamys Habe, 1957

Fig. 1540

Habe, 1957: 171.

TYPE SPECIES — *Macrochlamys perfragilis* Pilsbry, 1901; OD.

Shell zonitoid, depressed, thin, subtran-

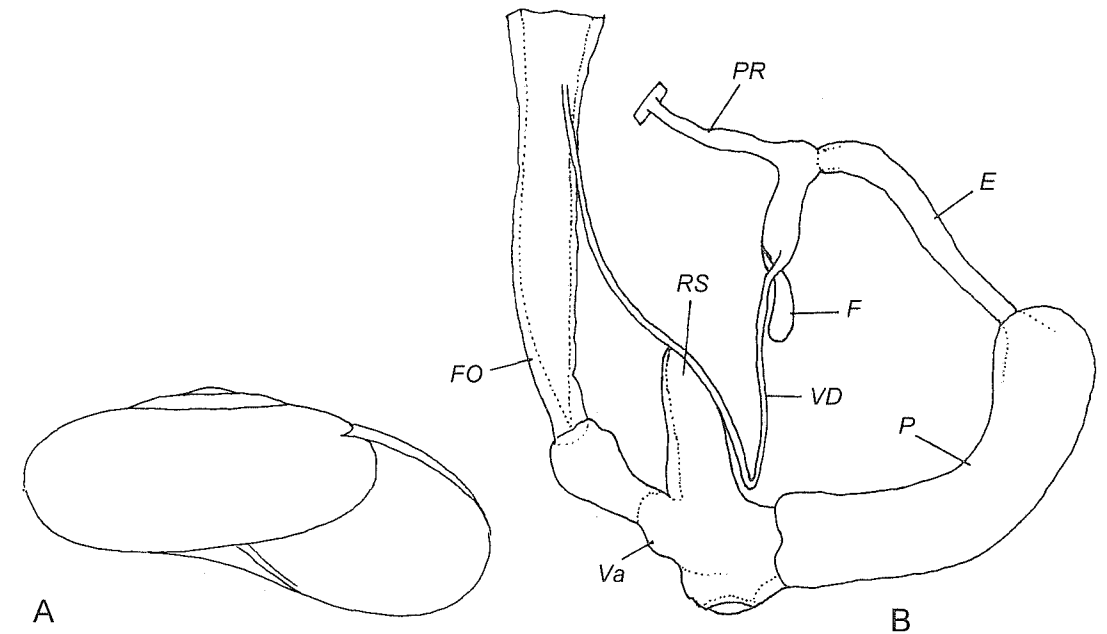


Fig. 1540. A — ! *Bekkochlamys dulcis* (Pilsbry, 1902).

Shell. B — *Bekkochlamys perfragilis* (Pilsbry, 1901). Reproductive tract. After Azuma, 1995.

parent, strongly shining, of 4.5-5 weakly convex whorls. Last whorl rounded at periphery. Color yellowish. Regular sculpture wanting. Aperture widely ovate, moderately oblique, with simple margins. Umbilicus minutely open to nearly closed. Height 4.8-12.0, diam. 9.6-20.0 mm (10.0 × 17.0 mm).

Vas deferens entering epiphallus at some distance from its apex leaving short, drop-like flagellum. Epiphallus slender, passing to rather large penis. Penis sheath surrounds penis and lower part of epiphallus. Penial retractor attached to proximal part of epiphallus. Free oviduct long, stout. Vagina as such not present: spermatheca sits on enlarged atrium. Spermathecal stalk extraordinary short, enlarged; reservoir subglobular.

DISTRIBUTION. Japan. 10 spp. & subspp.

Danjochlamys Y. Azuma et

M. Azuma, 1993

Fig. 1541

Azuma Y. & Azuma M., 1993: 235.

TYPE SPECIES — *Danjochlamys meshimaensis* Y. Azuma et M. Azuma, 1993; OD.

Shell depressed, thin, shining, of 5-5.5 slightly convex whorls. Last whorl rounded at periphery. Spire low, conic. Color dull

reddish-brown. Embryonic whorls smooth, next 2 whorls nearly so; penultimate and last whorls with distinct radial threads and spiral striae; basal surface glossy. Aperture rather wide, semicircular, a little oblique. Columellar margin slightly expanded, shortly reflexed. Umbilicus minutely open. Height 3.5-3.7, diam. 6.4-7.0 mm.

Vas deferens unusually stout. Epiphallus rather long, slender, coated, together with penis, by thickened penis sheath. Penis with a short caecum. Penial retractor attached to proximal part of epiphallus under sheath. Free oviduct long, thickened. Vagina almost absent. Spermathecal stalk long, swollen basally; reservoir lanceolate.

DISTRIBUTION. Japan (Kyushu Island). 1 sp.

Ovachlamys Habe, 1946

Fig. 1542

Habe, 1946: 201.

TYPE SPECIES — *Macrochlamys fulgens* Gude, 1900; OD.

Shell depressed subglobular, thin, much translucent, shining, of 3.5 slightly convex whorls. Suture margined. Color pale yellowish-corneous. Embryonic whorls microscopically spirally striated, later whorls with

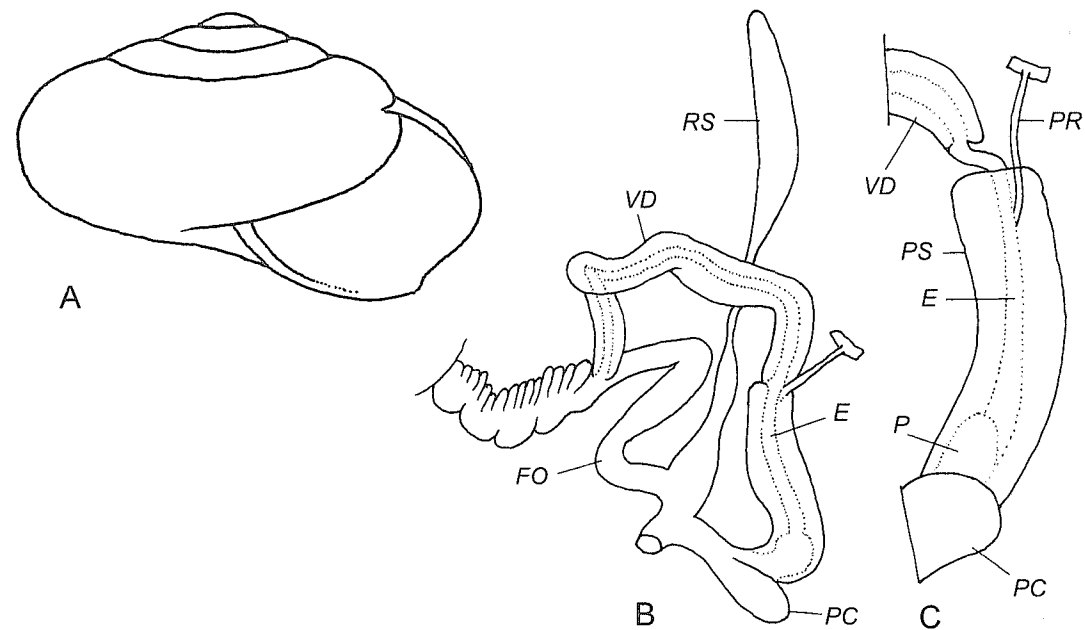


Fig. 1541. *Danjochlamys meshimaensis* Y. Azuma et M. Azuma, 1993.
A — shell. B — reproductive tract. C — distal male section. After Y. Azuma & M. Azuma, 1993.

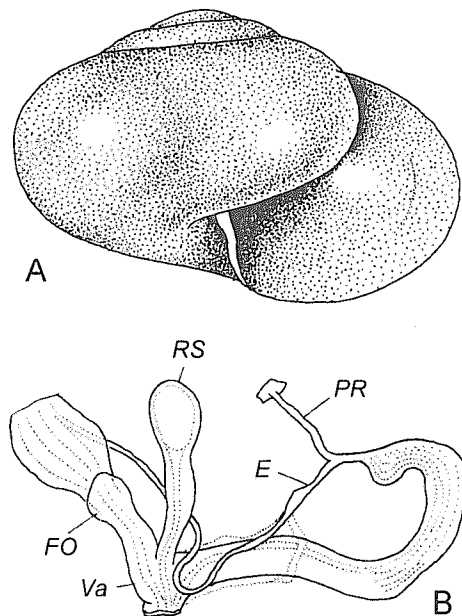


Fig. 1542. A — *Ovachlamys fulgens* (Gude, 1900).
Riukiu [Ryukyu], Japan. Phil. No. 266908.
B — ! *Ovachlamys kandoi* Azuma, 1978.
Reproductive tract. After Azuma, 1995.

similar sculpture. Aperture widely semilunate, slightly oblique, with simple margins; columellar margin vertical, dilated, thin or scarcely thickened. Umbilicus narrow, cylindrical. Height 3.0-4.5, diam. 4.5-7.2 mm (3.3 × 4.8 mm).

Vas deferens thin, free, entering slender epiphallus. Penis long, somewhat expanded proximally. Penial retractor inserted on lower portion of epiphallus. Free oviduct rather long, stout. Vagina very short; spermatheca enters nearly atrium between female and male ducts. Spermathecal stalk not long, stout; reservoir ovoid.

DISTRIBUTION. Japan. 2 spp.

Otesiopsis Habe, 1946
Fig. 1543

Habe, 1946: 203.

TYPE SPECIES — *Nanina japonica* Moellendorff, 1885; OD.

Shell obesely lentiform, thin, transparent, shining, of 5.5-7.5 slightly convex whorls. Last whorl with cord-like peripheral keel. Color corneous or grayish-yellow. Embryonic whorls smooth. Postapical whorls superficially looking smooth, with vague,

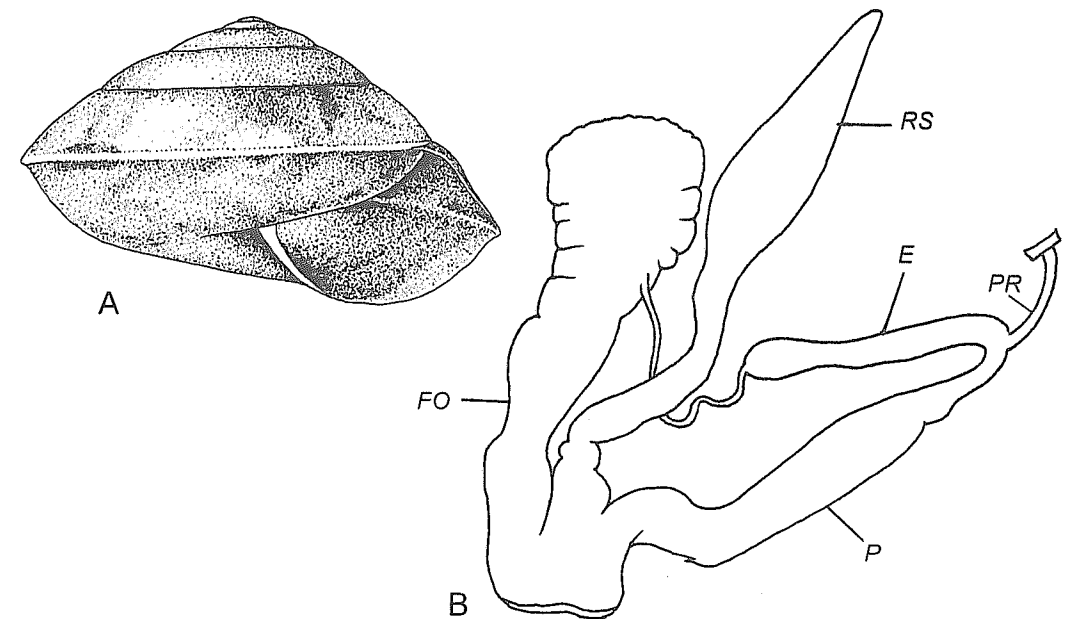


Fig. 1543. A — *Otesiopsis japonica* (Moellendorff, 1885).
Kagoshima, Satsuma, Kiusiu [Japan]. Phil. No. 81582. B — ! *Otesiopsis yamamotoaizoi*
Minato, 1974. Reproductive tract. After Azuma, 1995.

broad, irregular radial wrinkles. Aperture widely lunate, angulated, moderately oblique, with sharp margins; palatal margin rostrate according to keel. Umbilicus narrow, often covered up by thin, transparent film. Height 5.2-8.0, diam. 8.7-13.0 mm (6.8 × 11.0 mm).

Vas deferens thin, free, entering epiphallus apically or subapically. In latter case there is a short, ovate flagellum. Epiphallus rather long, subcylindrical. Penis somewhat wider, also nearly cylindrical, swollen basally, surrounded by a sheath. Free oviduct (moderately) long. Vagina short or absent. Spermathecal stalk moderately long, reservoir indistinct or lanceolate.

DISTRIBUTION. Japan. 4 spp.

Parakaliella Habe, 1946
Fig. 1544

Habe, 1946: 211.

— *Trochoconulus* Reinhardt, 1883: 86 (part.; *Conulus* "Gruppe"; t-sp. not designated).

Azuma, 1995: 106.

TYPE SPECIES — *Kaliella harimensis* Pilsbry, 1901; OD.

Shell trochiform, thin, shining, of 3.5-

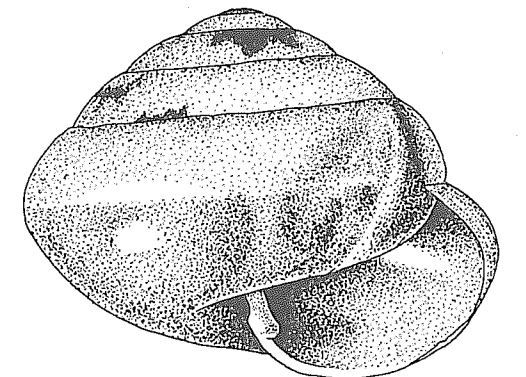


Fig. 1544. *Parakaliella harimensis* (Pilsbry, 1901).
Kashima, prov. Harima, Japan. Holotype.
Phil. No. 81219.

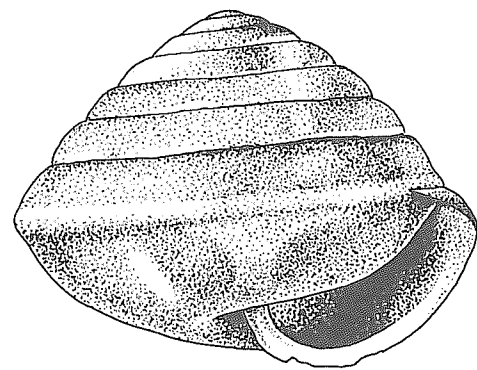


Fig. 1545. *Gastrodонтella stenogyra* (A. Adams, 1868). Kashima, prov. Harima, Japan (holotype of *Kaliella multivolvis* Pilsbry, 1900). Phil. No. 78825a.

6.5 slightly convex whorls. Last whorl with rounded angle at periphery. Color yellowish- or (pale)-corneous. Embryonic whorls microscopically radially striated. Later whorls with very fine radial wrinklets above and finer spiral striae on base. Aperture broadly semilunate, slightly oblique. Columellar margin thickened, sometimes with a more or less distinct nodule. Umbilicus closed. Height 2.0-4.4, diam. 2.5-4.5 mm (2.4 × 2.8 mm).

DISTRIBUTION. Japan. 8 spp.

Gastrodонтella Moellendorff, 1901
Fig. 1545

Moellendorff, 1901: 38.

— *Trochoconulus* Reinhardt, 1883: 86 (part.; *Conulus* "Gruppe"; t.-sp. not designated).

Azuma, 1995: 108.

TYPE SPECIES — *Gastrodонтella japonica* Moellendorff, 1901 (= *Helix stenogyra* A. Adams, 1868; = *Kaliella multivolvis* Pilsbry, 1900); OD.

Shell trochiform, with convex base, very thin, translucent, of about 8 moderately convex whorls. Last whorl with filiform peripheral keel. Color pale-yellow or yel-

lowish-corneous. Embryonic whorls vaguely granulated. Postnuclear whorls finely radially striated. Aperture narrowly lunate, a little oblique, with thin margins. Within last whorl there are a few (3) basal lips visible from outside as whitish streaks. Umbilicus dot-like. Height 1.7-1.8, diam. 2.0-2.4 mm (1.76 × 2.32 mm).

DISTRIBUTION. Japan. 1 sp.

2. Addition to Trochomorphidae

The following three taxa agree with diagnosis of Trochomorphidae and should be added next to *Trochositala* (p. 1143):

Santotrochus Solem, 1959
Fig. 1546

Solem, 1959: 102 (*Dendrotrochus* subgen.).

TYPE SPECIES — *Oxychona layardi* Hartman, 1889; OD.

Shell trochoid, rather solid, of 5-6 slightly convex whorls. Last whorl not descending, with sharp peripheral angle. Color light-corneous to whitish, lip usually pinkish. Embryonic and later whorls with very fine, microscopic spiral striae. Aperture angulate-ovate, well oblique, with a little thickened margins. Umbilicus absent. Height 8.5-16.6, diam. 12.6-18.0 mm (9.5 × 14.0 mm).

Vas deferens long, slender, entering epiphallus terminally. Flagellum (calc-sac) small. Epiphallus long, of almost same diameter as vas deferens. Penis short, internally with a small verge flanked by 2 pilasters and a large, flat stimulator at one side of atrium. Penis sheath surrounds upper part of penis and adjacent part of epiphallus. Penial retractor attached to boundary between penis and epiphallus. Free oviduct and vagina subequal in length. Spermathecal stalk moderately long, reservoir not large.

DISTRIBUTION. New Hebrides. 2 or 3 spp.

Ponapea Baker, 1941
Fig. 1547

Baker, 1941: 255, 257 (*Dendrotrochus* subgen.).

TYPE SPECIES — *Dendrotrochus* (*Ponapea*) *ponapensis* Baker, 1941; OD.

Shell trochoid, thin but opaque, dullish

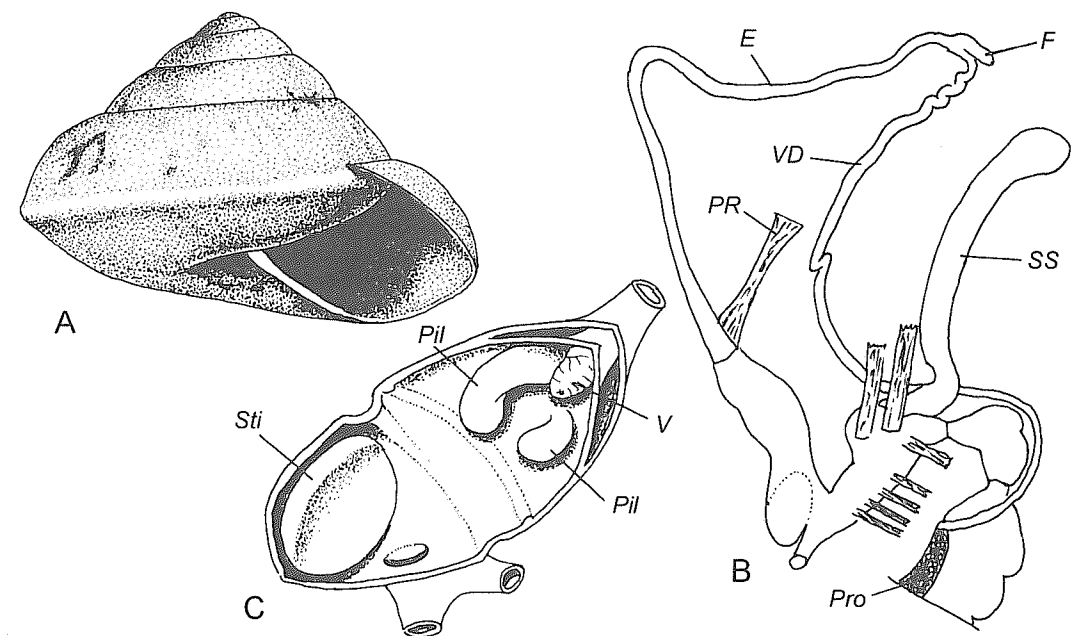


Fig. 1546. A — ! *Santotrochus eva* (Reeve, 1853). Shell: New Hebrides. Basel No. 8501-a. B, C — *Santotrochus layardi* (Hartman, 1889). B — reproductive tract. C — interior of penis. After Solem, 1959.

or weakly glossy above and glossy below, of about 4.5 a little convex whorls. Last whorl with thread-like peripheral angle. Color fulvous-corneous or whitish. Embryonic whorls with fine, low, regular radial threads, later whorls with weak radial wrinkles and fine, wavy spiral striae; on base radial elements obsolete. Aperture large, almost evenly rounded, markedly oblique; margins narrowly expanded and weakly thickened on palatal and basal walls but rounded and thickened toward columella. Umbilicus tiny. Height 10.85, diam. 14.1 mm (holotype).

Sole tripartite, with median zone narrower than lateral. Caudal horn small, not covering large sagittiform foss.

Ovotestis of 3-4 groups of acini. Hermaphroditic duct rather short. Talon clavate, weakly bipartite. Carrefour large, chalky-white. Vas deferens opening shortly below tip of small flagellum. Epiphallus expanded below apex, thickened at its base, on which penial retractor inserts, and entering penis through an ovate verge. Penis consists of a subglobose, rather thin-walled, apical chamber containing verge and demarcated basally by sudden thickening of

penial wall to form a low fold, and a larger stout, thick-walled part, which internally develops a double thickening (stimulator) on its ventral side and a broad, irregular pilaster on dorsal side. Penis sheath fused to penis until slightly below vergic chamber, of which it invests less than half, and attached to base of epiphallus by fibers continuous with penial retractor. Free oviduct thick-walled at both ends but, most of its length, with thinner walls surrounded by perivaginal gland. Vagina almost absent. Spermatophore smooth, long fusiform, with heavy walls, more attenuated at tail than at apex.

DISTRIBUTION. Carolines (Ponape Island). 1 sp.

Dendrotrochus Pilsbry, 1894
Fig. 1548

Pilsbry, 1894 (1893-1895): 143 (*Papuina* sect.).

TYPE SPECIES — *Helix helicinooides* Hombron et Jacquinot, 1849 (non Mousson, 1849; = *Helix cleryi simboana* E. Smith, 1885); OD.

Shell trochoid, thin, translucent, of about 5 moderately convex whorls. Last

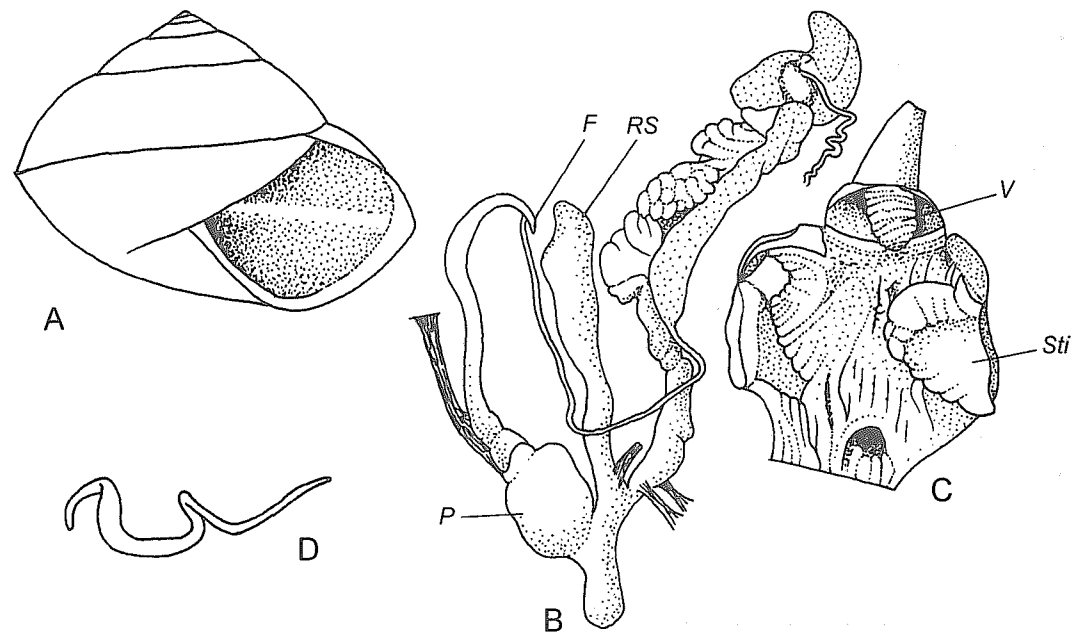


Fig. 1547. *Ponapea ponapensis* (Baker, 1941).
A — shell. B — reproductive tract. C — interior of penis. D — spermatophore. After Baker, 1941.

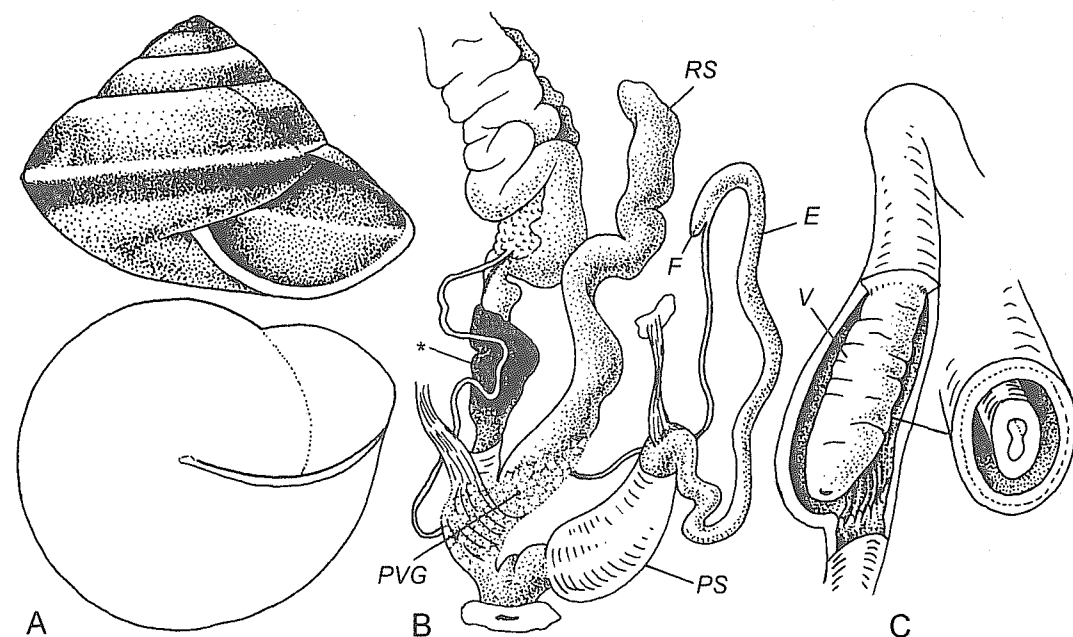


Fig. 1548. ! *Dendrotrachus cleryi* (Récluz, 1851).
Bio Island, Solomon Islands, December 22, 1976. A — shell. B — reproductive tract. C — interior of penis and cross-section through verge. Moscow No. Lc-16399. Asterisk — additional gland on free oviduct.

whorl not descending in front, with sharp peripheral angle. Color uniformly yellow or with brown bands above and below peripheral angle. Embryonic sculpture of fine, crowded radial wrinklets and microscopic spiral striae. Postapical whorls with fine, smoothed, spaced, radial wrinkles; basal surface covered with wavy, crowded, very fine spiral striae. Aperture angulate-ovate, well oblique, with thin, reflexed margins. Umbilicus absent. Height 6-12, diam. 7-18 mm (9.6 × 15.7 mm).

Vas deferens very long, slender, entering epiphallus subapically. Flagellum short, conic. Epiphallus long, cylindrical. Penis somewhat swollen, internally with a large verge containing circular intrapapillar cavity. Sheath surrounds penis except for its basal part. Penial retractor attached to boundary between epiphallus and penis. Free oviduct rather long, with dark-colored gland; another (perivaginal) gland coats vagina and base of spermathecal shaft. There is a strong vaginal retractor. Spermatheca without distinct division into stalk and reservoir. Spermatophore, a simple, spirally coiled tube.

DISTRIBUTION. Papua-New Guinea, Admiralty, Solomon, and Bismarck Islands. 12-15 spp.

HELICARIONIDAE Bourguignat, 1883

- Bourguignat, 1883: 9 (as Helixarionidae; ICZN Opinion 1678, Bull. Zool. Nomencl., 49, No. 2, 1992: 160).
- Nitoridae Iredale, 1937c: 2.
- Gudeoconchidae Iredale, 1944: 326.
- Epiglyptidae Iredale, 1944: 328.

Shell helicoid to plate-like, generally medium-sized. Last whorl in shelled taxa rounded, angulated at periphery or with cord-like keel. Spiral sculpture usually present; radial sculpture weak. Aperture toothless. Umbilicus narrow to closed (only exception — *Platymma* with broad umbilicus). Frontal organ absent.

Caudal foss and caudal horn well developed.

Jaw oxygnathous.
Ovotestis of 1 to several compact clusters of tightly packed acini. Hermaphroditic duct con-

voluted, at least in distal part. Talon hidden or exposed. Flagellum, when present, in form of calc-sac (= lime-sac) without axial thread; cryptae in walls of flagellum rarely present. Epiphallic caecum developed to various degree, never spirally coiled, often missing. Penis with or without verge, internally with longitudinal folds or numerous tubercles. Penial gland absent. Penis sheath present or missing. Penial retractor attached to penis or epiphallus, never to caecum. Sarcobelum present or absent; when present, it is penial or atrial, without apical retractor. Atrium of common structure.

DISTRIBUTION. S and SE Asia, Japan, Philippines, Indonesia, New Guinea, tropical islands of Pacific, islands of Indian Ocean, Africa.

REMARKS. 1. Since referring of most of taxa to a subfamily in the Helicarionidae depends mainly upon anatomical characters, almost all genera assigned to some subfamily without anatomical data occupy their position tentatively.

2. Some problems concern the African taxa. Two careful revisions of Urocyclidae (auct.) exist: by Van Mol (1970) who included in his book 17 genera of "Urocyclinae" and by Van Goethem (1977) who reviewed 26 another genera. The former author mentioned one article of the latter (of 1968) while Van Goethem did not mention at all the book of Van Mol. As a result we have two systems of different groups of urocyclid genera which are not connected to each other and scarcely comparable. Above all, these two monographs do not cover the whole African helicarionoid fauna. Thus I was forced to compile the data obtained by both mentioned authors; unfortunately, I managed to dissect only few members of African taxa.

GEOTROCHINAE Iredale, 1941

Iredale, 1941b: 72 (pro fam.).

Shell lenticular or conic, last whorl with a sharp peripheral angle or keel. Embryonic whorls smooth or look like very thin chagreen. Postapical whorls with very fine spiral threads or radial riblets above peripheral keel; basal surface smooth or with delicate radial striae and close-set microscopic spiral lines.

DISTRIBUTION. S China, Java, Bali, Norfolk Island.

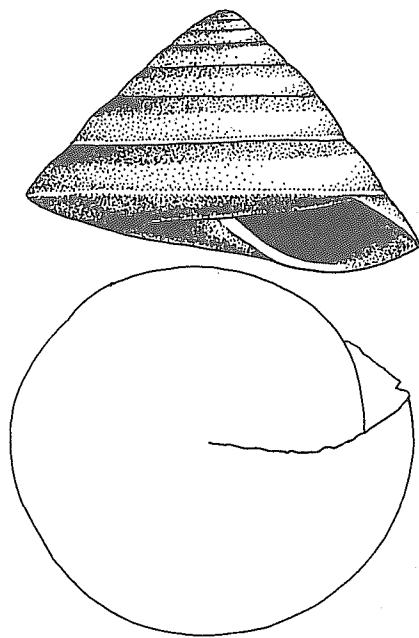


Fig. 1549. *Geotrochus zonatus* Hasselt, 1823. Soekaboemi, Java. Leiden (as *conus* Philippi).

REMARK. This taxon is evidently artificial, even from geographical point of view. I tentatively retain it as such until anatomy of included genera is known.

Geotrochus Hasselt, 1823
Fig. 1549

Hasselt, 1823: 233.

— *Chiroktisma* Gude, 1913b: 390 (t.-sp. *Helix conus* Philippi, 1841; OD).

TYPE SPECIES — *Geotrochus zonatus* Hasselt, 1823 (= *Helix conus* Philippi, 1841); SD Pilsbry, 1935.

Shell trochoid to lentiform, thin, of 7-8 much flattened whorls. Last whorl with sharp peripheral keel. Coloration consisting of whitish background and 2 subequal bands: subsutural brown and light-corneous or whitish below it; keel light. Embryonic whorls smooth. Postnuclear whorls with very fine spiral threads above, smooth below. Aperture rather narrow, rostrate, oblique, with simple margins; columellar margin oblique, shortly reflexed. Umbilicus very narrow or closed. Height 3.0-9.5, diam. 5-15 mm (8.9 × 13.6 mm).

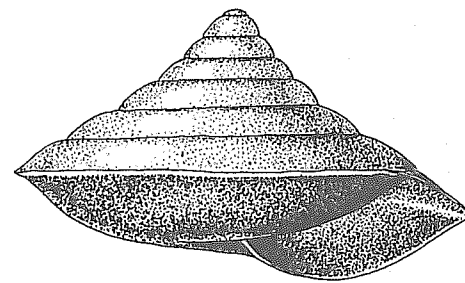


Fig. 1550. *Tegumen petasussinensis* (Heude, 1890). Badung, Prov. Hubei, China. Senck. No. 42799.

DISTRIBUTION. Indonesia (Java, Bali). 3-4 spp.

REMARK. *Geotrochus* differs from *Trochomorpha* and related taxa mainly by narrow or closed umbilicus; it is possible, however, that it does belong to Trochomorphidae. Hedley (1892) gives the anatomical illustrations of a number of species of "*Geotrochus*"; actually most (if not all) of these species are Camaenidae (Papuinae).

Tegumen Gude, 1913
Fig. 1550

Gude, 1913b: 390.

TYPE SPECIES — *Conulus Petasus sinensis* Heude, 1890; OD.

Shell trochoid, thin, translucent, shining, of about 7 rather convex whorls. Outlines of spire concave. Last whorl with sharp peripheral keel. Color corneous. Embryonic whorls smooth, later with regular fine radial riblets above; basal surface with very delicate radial striation and dense microscopic spiral lines. Aperture lunate, rostrate, slightly oblique, margins thin and sharp. Umbilicus closed. Height 8, diam. 13 mm.

DISTRIBUTION. S China. 1 sp.

Roybellia Preston, 1913
Fig. 1551

Preston, 1913b: 526. B. Smith, 1992: 241.

TYPE SPECIES — *Trochonanina platysoma* Sykes, 1900; OD.

Shell lens-shaped, strongly depressed, very thin, fragile, shining, semitransparent, of about 5 flat whorls. Last whorl with strong, sharp keel at periphery furnished with delicate periostracal fringe. Color corneous or yellowish-brown. Surface of embryonic whorls looking like very fine chagreen. Later whorls finely radially ribbed; termination of ribs projecting beyond keel. Aperture narrow, sharply rostrate, quite oblique, with simple margins. Umbilicus absent. Height 2.0-2.5, diam. 6.5-7.5 mm (2.0 × 6.7 mm).

DISTRIBUTION. Norfolk Island. 2 spp.

HELICARIONINAE
Bourguignat, 1883

Shell helicoid, vitrinoid, or reduced to a mere plate, of medium size. Last whorl rounded, angulated at periphery or with cord-like keel. Embryonic whorls smooth to spirally striated. Postapical whorls smooth, radially or spirally striated.

Flagellum bean-shaped, vermiform or turbospirally coiled. Epiphallus with or without cryptae in its walls. Epiphallic caecum at most small. Penis long, with or without verge or stimulator. Penial retractor attached to epiphallus. Sarcobelum absent.

DISTRIBUTION. Japan, Taiwan, Indonesia, Malay Peninsula, Papua-New Guinea, Bismarck, Solomon, Lord Howe, Norfolk, Philip, Nepean Islands, Fiji, New Hebrides, Australia, Tasmania, ? New Zealand.

REMARK. Nevill (1881: 126) has erected the subgenus *Pseudotrochatella* (genus *Helicina*) with *Helicina undulata* as the type species. Despite the presence of operculum, Baker (1941: 264) tentatively included *Pseudotrochatella* in Helicarioninae. Seemingly, it was an erroneous decision.

Chronini Thiele, 1931

Thiele, 1931: 626 (? Ariophantidae subf.).

Prostate consists of large, quite distinct acini. Penis thick-walled, internally with

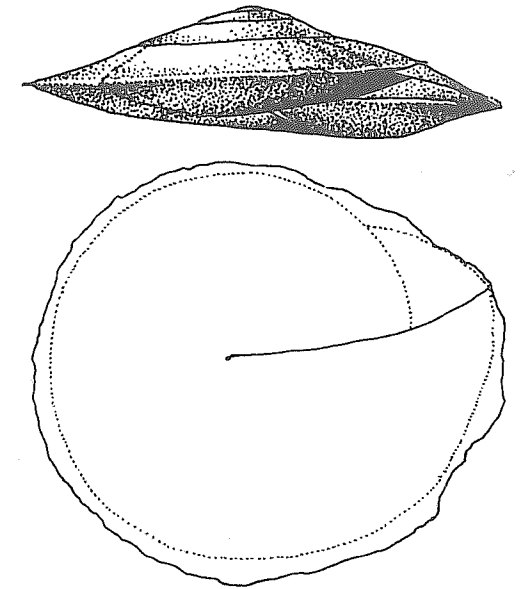


Fig. 1551. *Roybellia platysoma* (Sykes, 1900). Norfolk Island. Leiden.

strong, corrugated folds; verge missing. Penis sheath absent.

DISTRIBUTION. W New Guinea (Irian Jaya), Malay Peninsula.

Chronos Robson, 1914
Fig. 1552

Robson, 1914b: 292.

TYPE SPECIES — *Chronos sublimis* Robson, 1914; OD.

Shell depressed-conic, thin, fragile, semitransparent, shining, of 3-4 rather convex whorls. Last whorl not descending in front, rounded at periphery. Color generally olivaceous, apex brown-pinkish. Embryonic whorls delicately spirally striated. Postnuclear whorls with very gentle, irregular radial wrinkles. Aperture large, more or less rounded, quite oblique, with thin, sharp margins; columellar margin shortly reflexed. Umbilicus minutely open. Height 4.7-13.0, diam. 7.0-21.6 mm (4.7 × 7.0 mm).

Sole tripartite. Cephalopodium with posterior-dorsal foss and caudal horn.

Talon hidden. Prostate composed of many large acini. Vas deferens a little convoluted, joining epiphallus at sharp angle.

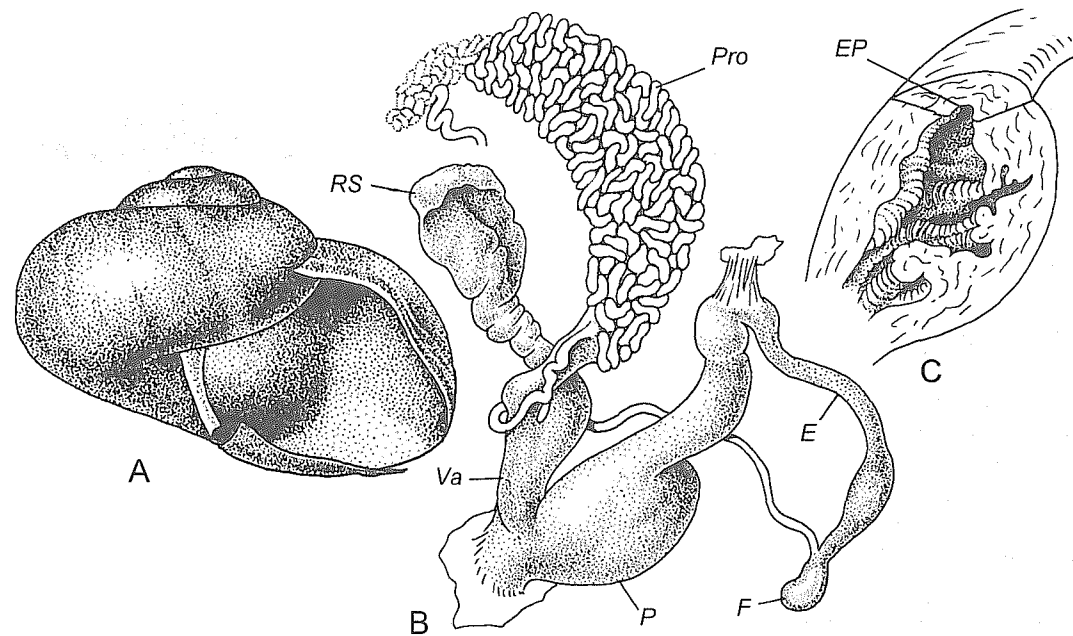


Fig. 1552. *Chronos sublimis* Robson, 1914.
A — shell: "Dutch New Guinea" [Irian Jaya]. Cardiff. B, C — "Dutch New Guinea, Mt. Carstenz [= Puncak Jaya], snow-line". B — reproductive tract. C — interior of penis. Paratype. London No. 1914.1.7.403-424.

Flagellum (calc-sac) bean-shaped. Epiphallus subcylindrical, moderately long. Penis greatly swollen in basal half; this expanded section thick-walled, internally with several very strong, corrugated folds. Penial retractor inserting on penis/epiphallus junction; just below insertion there is a small, subglobose swelling. Free oviduct and vagina subequal in length, rather short. Spermathecal stalk somewhat expanded, reservoir voluminous, embedded in spermoviduct.

DISTRIBUTION. W New Guinea (Irian Jaya). 2 spp.

Antinous Robson, 1914
Fig. 1553

Robson, 1914b: 290.

TYPE SPECIES — *Antinous anthropophagorum* Robson, 1914; OD.

Shell depressed-semiglobose, rather thin, glossy, of about 4.5 flattened whorls. Last whorl not descending, bluntly carinated at periphery. Spire dome-shaped. Color rich dark chestnut-brown, keel and aperture margins slightly lighter. Embryonic whorls with faint spiral striation. Later whorls

smooth, weakly irregularly radially wrinkled; on early postapical whorls also can be seen traces of spiral striae. Aperture broadly ovate, well oblique, with somewhat thickened, scarcely reflexed margins. Umbilicus minutely open. Height 9.6-16.0, diam. 16-24 mm (9.6 × 16.4 mm).

Caudal pore present, caudal horn missing.

Vas deferens entering epiphallus apically. Flagellum short, bean-shaped. Epiphallus swollen just below flagellum. Penis long, internally plicated. Penial retractor attached to upper part of epiphallus. Free oviduct expanded, not long. Vagina greatly swollen. Spermatheca without defined reservoir.

DISTRIBUTION. New Guinea. 1 spp.

Hemiglyptopsis Thiele, 1931
Fig. 1554

Thiele, 1931: 624 (*Antinous* subg.).

TYPE SPECIES — *Helix foullioyi* Le Guillou, 1845; monotypy.

Shell depressed-semiglobose, rather thin, of about 5 moderately convex whorls. Apex

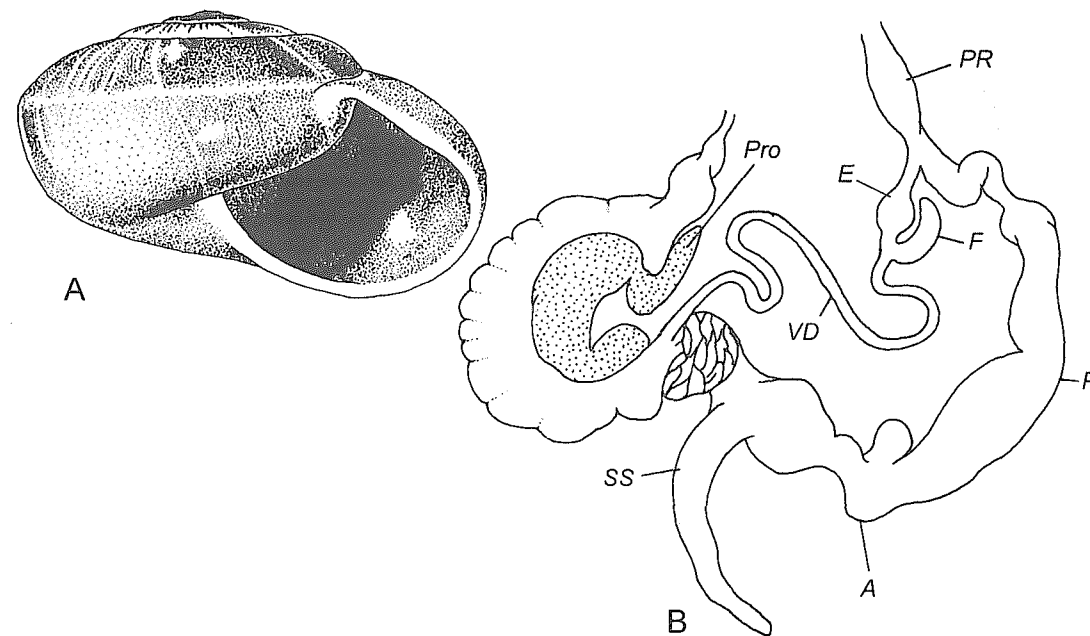


Fig. 1553. *Antinous anthropophagorum* Robson, 1914.
A — shell: Dutch New Guinea. Holotype. London No. 1914.1.7.396. B — reproductive tract. After Robson, 1914b.

broadly rounded. Last whorl not descending, evenly rounded at periphery. Color chestnut, with yellowish peripheral band and light zone around umbilicus; sometimes upper surface yellowish, basal chestnut. First 0.5 whorl smooth, then radial wrinkles appear and become coarser toward aperture. On 2nd and subsequent whorls there are spiral grooves, which give, in combination with radial sculpture, an impression of fine granulation. Aperture broadly ovate, moderately oblique, with simple margins. Umbilicus minute, semicovered. Height 12.5-32.0, diam. 24-68 mm (28.2 × 48.4 mm).

Epiphallus with flagellum (calc-sac).

DISTRIBUTION. Papua-New Guinea. 5-6 spp.

Platymma Tomlin, 1938
Fig. 1555

Tomlin, 1938: 116.

TYPE SPECIES — *Platymma tweediei* Tomlin, 1938; OD.

Shell much depressed, rather solid, of 6.5 moderately convex whorls. Last whorl

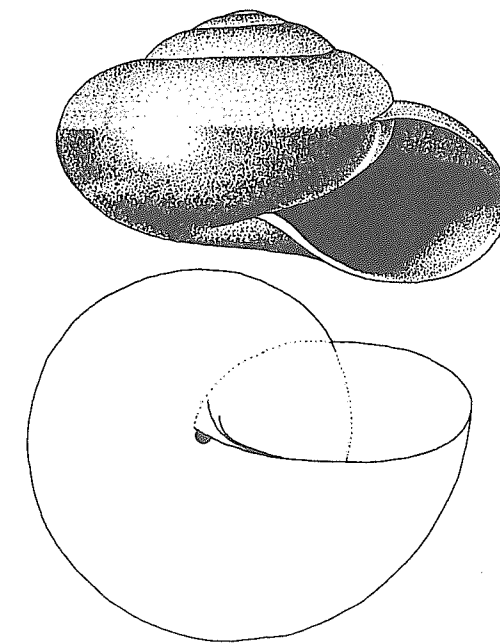


Fig. 1554. *Hemiglyptopsis foullioyi* (Le Guillou, 1845).
Papua-New Guinea. Syntype. Paris.

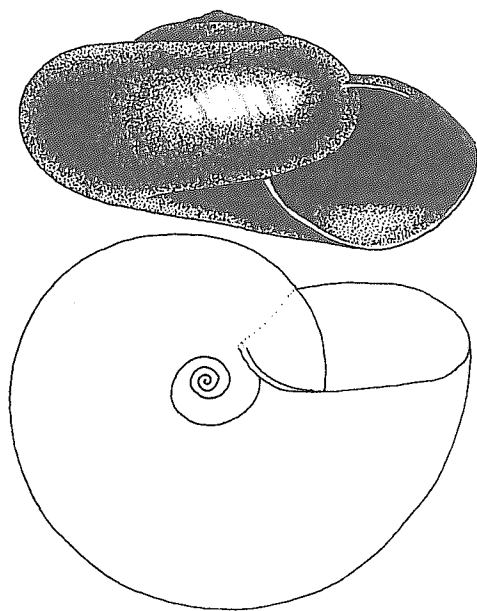


Fig. 1555. *Platymma tweediei* Tomlin, 1938.
"Larut Hills, Perak" [almost certainly an error; actually Kuala Terla, Telom Valley, Cameron Highlands, Pahang; Tomlin, 1938, p. 116]. Holotype. London No. 1924.4.29.1.

not descending, rounded at periphery. Color chestnut, with weak, diffuse, darker band above periphery. Apex smooth, with traces of radial wrinklets; rest whorls with fine, rather regular radial wrinkles and shallow spiral incised lines. Aperture ovate, well oblique, margins simple; palatal margin (as seen from right side) somewhat sinuous. Umbilicus very broad. Height 38-44, diam. 70-79 mm (38.0 × 71.9 mm).

Jaw thick, solid, with distinct median projection.

DISTRIBUTION. Malay Peninsula. 1 sp.

Helicarionini Bourguignat, 1883

Prostate consists of small, indistinct acini. Penis (rather) thin-walled, internally with not strong folds; verge present or absent. Penis sheath present.

DISTRIBUTION. Japan, Taiwan, Indonesia, Australia, Tasmania, New Zealand, New Guinea, New Hebrides, Solomon, Bismarck, Norfolk, Philip, Nepean, Lord Howe and Fiji Islands, Louisiade Archipelago, New Caledonia.

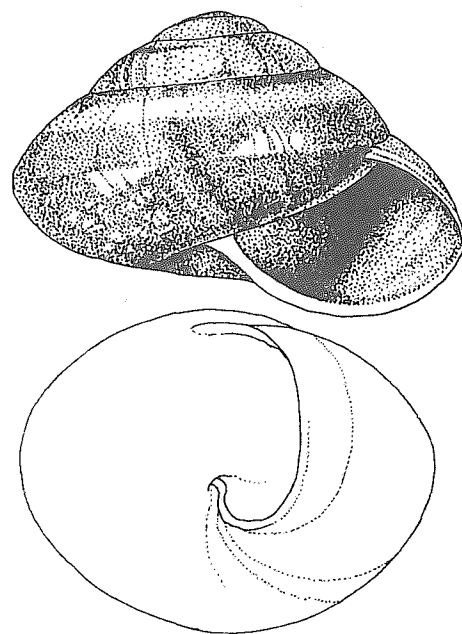


Fig. 1556. *Quintalia stoddarti* (Gray, 1834). Philip Island, Australia. Syntype. London No. 1982240.

Quintalia Preston, 1913

Fig. 1556

Preston, 1913b: 527. B. Smith, 1992: 241.

TYPE SPECIES — *Caracolla stoddarti* Gray, 1834; OD.

Shell depressed-conic, rather solid but somewhat translucent, of 4.5 slightly convex whorls. Last whorl straight or a little descending at very aperture, weakly angulated at periphery. Color ivory with 1-2 chestnut bands; if lower band well developed (as in one of syntypes), it occupies most part of shell surface, and background seen as a light band above periphery. Embryonic sculpture practically absent. Later whorls almost smooth, just with extremely fine spiral striae which missing on base. Aperture ovate, slightly angulated, moderately oblique, with thin margins; columellar margin running spirally inside as a low lamella with thickened ridge. Umbilicus absent. Height 8-10, diam. 10-15 mm (9.8 × 15.0 mm).

DISTRIBUTION. Norfolk, Philip and Nepean Islands. 2 or 3 spp.

Quirosella Clench, 1958

Fig. 1557

Clench, 1958: 175.

TYPE SPECIES — *Quirosella coultasi* Clench, 1958; OD.

Shell (depressed) conic, rather solid, of 5-6 slightly convex whorls. Last whorl straight, evenly rounded at periphery. Color corneous, with paler, indistinct, diffuse peripheral band. Embryonic whorls smooth. Postapical whorls lack regular sculpture except weak traces of spiral striae on last whorl. Aperture irregularly ovate, well oblique, with thickened, reflexed margins. Umbilicus closed. Height 11-17, diam. 14.4-24.5 mm (12.0 × 16.4 mm).

DISTRIBUTION. Solomon Islands. 2-3 spp.

Nesonanina C. Boettger, 1916

Fig. 1558

Boettger C., 1916: 288.

TYPE SPECIES — *Nesonanina wolfi* C. Boettger, 1916; OD.

Shell subglobular, solid, a little glossy, of 6-6.5 slightly convex whorls. Last whorls scarcely descending in front. Color greyish-corneous. Embryonic whorls smooth, shin-

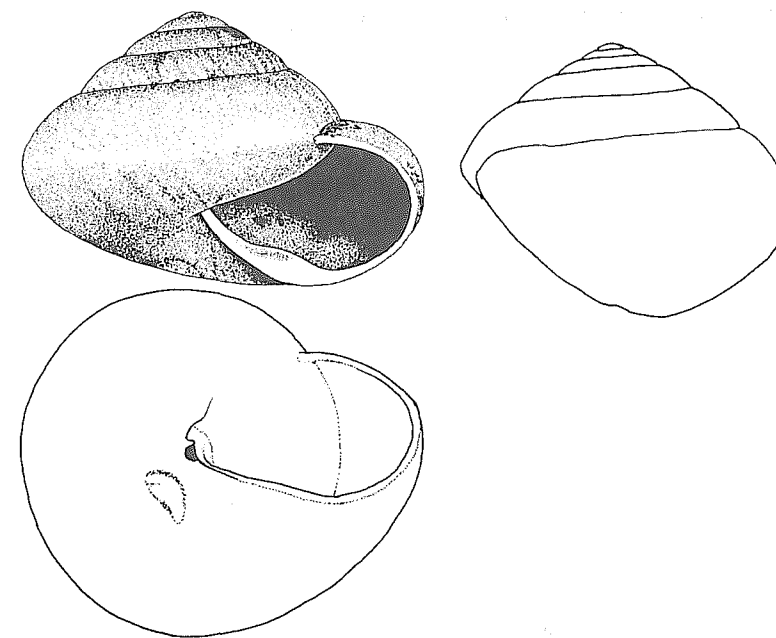


Fig. 1558. *Nesonanina wolfi* C. Boettger, 1916. Maitland, New Mecklenburg [Papua-New Guinea]. Paratype. Berlin No. 75982.

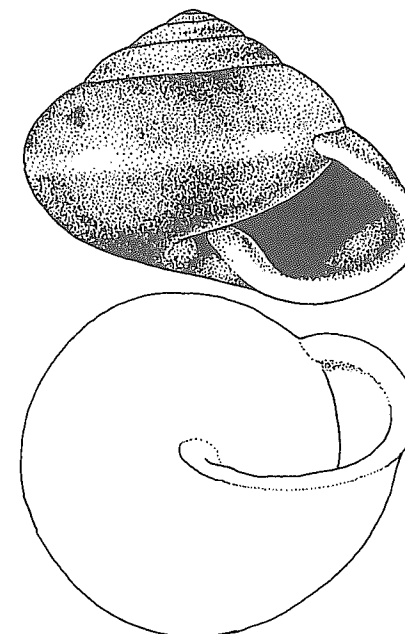


Fig. 1557. *Quirosella coultasi* Clench, 1958. Rennell Island, Solomon Islands. Chicago No. 111061.

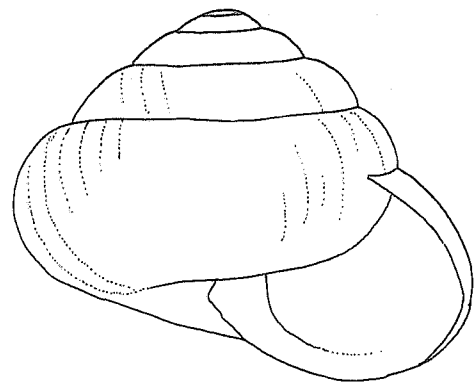


Fig. 1559. *Melloconcha delecta* Iredale, 1944.
After Iredale, 1944.

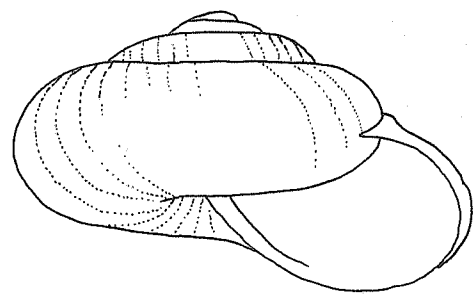


Fig. 1560. ! *Innesoconcha princeps* Iredale, 1944.
After Iredale, 1944.

ing. Postapical whorls with irregular, smoothed wrinkles; basal surface with rough, irregular spiral grooves. Aperture ovate-quadrangular, quite oblique, with a little thickened, slightly rolled inwardly margins; baso-columellar margin with a weak thickening. Umbilicus minute. Height 12.0-12.2, diam. 17-18 mm (12.2 x 18.0 mm).

DISTRIBUTION. New Mecklenburg [= New Ireland], Papua-New Guinea. 2 spp.

Melloconcha Iredale, 1944
Fig. 1559

Iredale, 1944: 323.

— *Tribocystis* Iredale, 1944: 323 (t.-sp. *Tribocystis rosacea* Iredale, 1944; OD).

— *Annacharis* Iredale, 1944: 324 (t.-sp. *Annacharis miranda* Iredale, 1944; monotypy).

B. Smith, 1992: 237.

TYPE SPECIES — *Melloconcha delecta* Iredale, 1944; OD.

Shell subdiscoidal to nearly globular, dome-shaped, thin, of 5-6 moderately convex whorls. Last whorl evenly rounded or a little angled at periphery. Color deep-brown to pale-greenish. Embryonic whorls smooth

or microscopically radially striated. Later whorls without regular sculpture or with very weak radial striation. Aperture subcircular, somewhat oblique; columellar margin broadly reflexed, expanded. Umbilicus closed. Height 1.5-5.0, diam. 4-7 mm.

DISTRIBUTION. Lord Howe Island. 7 spp.

Innesoconcha Iredale, 1944
Fig. 1560

Iredale, 1944: 325. B. Smith, 1992: 234.

TYPE SPECIES — *Helix (Microcystis) catletti* Brazier, 1872; OD.

Shell flattened to subconic, thin, of about 5 moderately convex whorls. Last whorl rounded to carinated at periphery, scarcely descending in front. Color uniformly pale-green or banded with brown and white. Embryonic whorls smooth. Postapical whorls lack regular sculpture. Aperture ovate-semilunar, somewhat oblique, with simple margins; columellar margin steeply inclined. Umbilicus narrow. Height 4.5-6.5, diam. 7.0-11.5 mm.

DISTRIBUTION. Lord Howe Island. 3 spp.

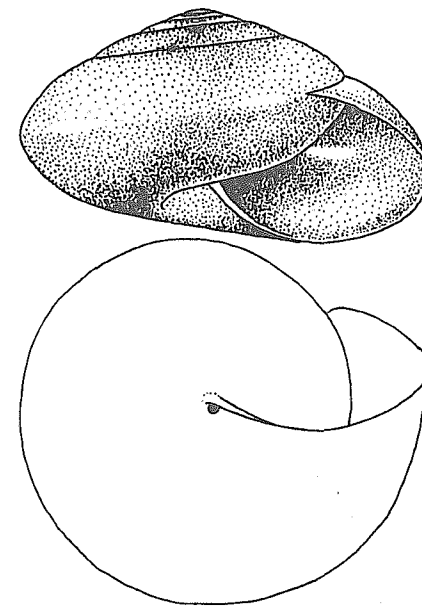


Fig. 1561. *Nitor subrugata* (Reeve, 1852).
Numinbah Valley, McPherson Range, South Queensland. Chicago No. 109638.

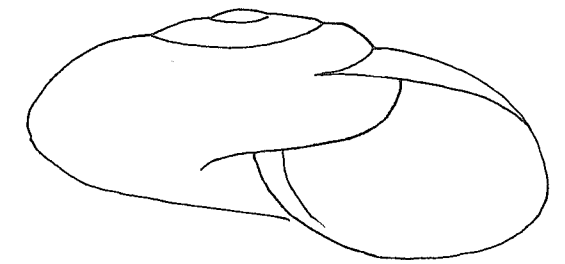


Fig. 1562. ! *Pravonitor krefftii* (Cox, 1864).
After Cox, 1868.

Nitor Gude, 1911
Fig. 1561

Gude, 1911a: 270 (nom. nov. pro *Thalassia* Martens, 1860).

— *Thalassia* Martens in Albers, 1860: 59 (nom. praeocc., non Bonaparte, 1856; t.-sp. *Helix subrugata* Reeve, 1852; OD).

— *Modonitor* Iredale, 1937c: 3 (*Nitor* subg.; t.-sp. *Helix pudibunda* Cox, 1868; monotypy).

B. Smith, 1992: 239.

TYPE SPECIES — *Helix subrugata* Reeve, 1852; OD.

Shell depressed-conic, thin, translucent, glossy, of 5.5 slightly convex whorls. Last whorl narrowly rounded to bluntly angulated at periphery. Color yellowish or pale-corneous. Embryonic whorls smooth. Later whorls with very fine, close-set radial lines which somewhat coarser on upper surface than on basal. Aperture narrowly ovate, rather oblique, with simple margins; columellar margin inclined, very shortly reflexed. Umbilicus minutely open. Height 4.5-9.5, diam. 8.2-16.0 mm (9.5 x 16.0 mm).

DISTRIBUTION. Papua-New Guinea, E Australia. 6-8 spp.

Pravonitor Iredale, 1937
Fig. 1562

Iredale, 1937c: 3 (*Nitor* subg.). B. Smith, 1992: 241.

TYPE SPECIES — *Helix krefftii insularum* Iredale, 1937; monotypy.

Shell orbicular, depressed, thin, pellucid, very shining, of about 5 slightly convex whorls. Last whorl narrowly rounded at periphery. Spire broad, convex. Color reddish-yellow, sometimes with darker supra-peripheral band. Aperture lunate, slightly pearly within; peristome thin, simple, straight; columellar margin rather sloping, thickened above, with a callus inwardly, slightly reflexed outwardly. Umbilicus minute. Height 6-8, diam. 12-14 mm.

DISTRIBUTION. NE Queensland, Coen to Murray Islands in Torres Strait (Australia). 1 sp.

Dendronitor Iredale, 1933
Fig. 1563

Iredale, 1933: 56. B. Smith, 1992: 228.

TYPE SPECIES — *Microcystis inscensa* Hedley, 1913; OD.

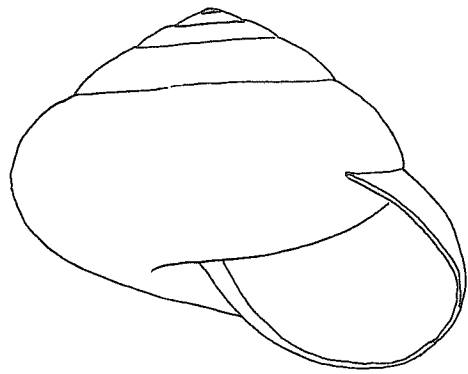


Fig. 1563. *Dendronitor inscensa* (Hedley, 1913).
After Hedley, 1913.

Shell globose-turbinate, thin, glossy, translucent, of 5 slightly convex whorls. Last whorl straight, rounded at periphery. Color olive-buff, uniform or with darker and lighter radial streaks. Embryonic whorls with faint, close, spiral, incised lines which gradually disappear. Later whorls with delicate, irregular radial ridgelets. Aperture ovate-lunate, oblique, with simple, thin margins; columellar margin a little thickened, expanded over part of umbilicus. A thin callus with shagreened surface spread over penultimate whorl. Umbilicus minutely open. Height 7, diam. 10 mm.

DISTRIBUTION. Australia (Queensland). 1 sp.

Mathewsoconcha Preston, 1913
Fig. 1564

Preston, 1913b: 528.

— *Belloconcha* Preston, 1913b: 529 (t.-sp. *Belloconcha elevata* Preston, 1913; OD).

B. Smith, 1992: 236.

TYPE SPECIES — *Mathewsoconcha belli* Preston, 1913; OD.

Shell helicoid, depressedly turbinate to subglobose, comparatively solid, semitrans-

parent, of 4-5 moderately convex whorls. Last whorl straight, sometimes with blunt peripheral angle. Color light-corneous to pale-olivaceous. Embryonic whorls smoothish. Later whorls with very delicate spiral striation over fine, irregular radial wrinklelets. Aperture broadly lunate, columellar margin thickened and inwardly bulging. Umbilicus closed. Height 5-11, diam. 7.5-14.0 mm (*belli*: 5.0 × 7.5 mm; *elevata*: 10.5 × 13.5).

DISTRIBUTION. Norfolk and Nepean Islands. 8 spp.

Nevelasta Iredale, 1937
Fig. 1565

Iredale, 1937c: 13. B. Smith, 1992: 239.

TYPE SPECIES — *Helix (Conulus) pampini* Cox, 1868; OD.

Shell globose subconic, thin, pellucid, shining, translucent, of 5 slightly convex whorls. Last whorl inflated, widely rounded at periphery. Color pale-corneous. Postapical whorls faintly striated above, smooth beneath. Aperture ovate, oblique, with thin, simple, straight margins; columellar margin slightly expanded above. Umbilicus closed. Height 0.20, diam. 0.23 inch (i.e. approximately 5 × 6 mm).

DISTRIBUTION. E Australia. 1 sp.

Orpiella J. Gray, 1855
Fig. 1566

Gray J., 1855: 147.

— *Euryptus* Semper, 1870: 36 [nom. praeocc., non Kirby, 1819; t.-sp. *Nanina casca* Gould, 1852 (= *Helix scorpio* Gould, 1847); SD Martens, 1871].

— *Fretum* Sykes, 1900b: 140 (t.-sp. *Nanina casca* Gould, 1852; OD).

Baker, 1941: 239.

TYPE SPECIES — *Helix scorpio* Gould, 1847; monotypy.

Shell orbicular, less convex above than below, thin, translucent, polished, of 4.5-5 slightly convex whorls. Last whorl (early 5th) angulate. Color pallid to light-corneous. Embryonic whorls smoothish, with traces of impressed spiral lines. Later whorls with weak radial wrinklelets and fairly sharp, distinct but extremely fine spiral striae above. Aperture quite narrow, distinctly angulate, slightly oblique; columellar margin in juvenile shells with weak and sometimes

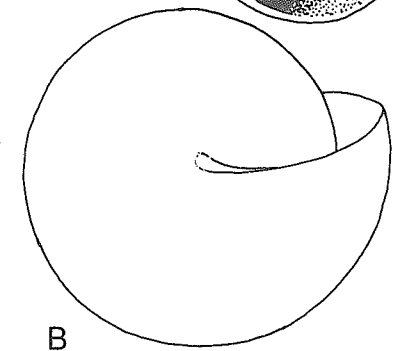
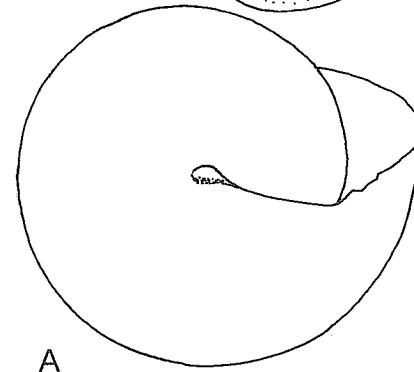
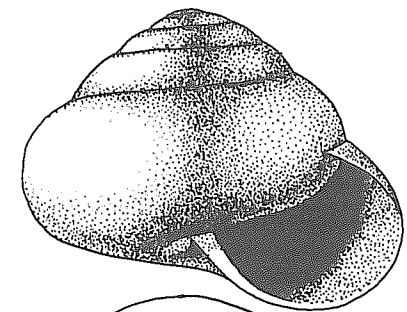
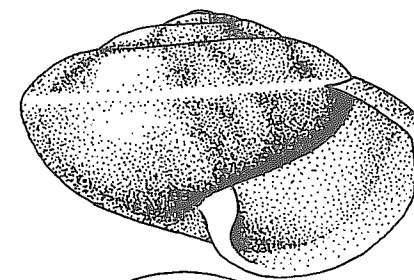


Fig. 1564. A — *Mathewsoconcha belli* Preston, 1913. Norfolk Island (subadult shell). Leiden. B — *Mathewsoconcha elevata* (Preston, 1913). Nepean Islet, Norfolk Island (old shell). Leiden.

angular swelling; in larger shells only slightly convex, quite abruptly thickened, reflexed, hiding most of minutely open umbilicus. Height 5.50-14.85, diam. 9.0-23.7 mm.

Vas deferens somewhat shortened. Flagellum ovoid, small. Epiphallus rather long, stout. Penis short, internally with 2 branching pilasters, of which 1 develops a small projecting knob. Penis sheath coats penis and most of epiphallus. Penial retractor attached to epiphallus under sheath. Free oviduct rather long, vagina extremely short. Spermathecal stalk not long, reservoir elongate.

DISTRIBUTION. Fiji. 4 spp.

Eufretum Baker, 1941
Fig. 1567

Baker, 1941: 239, 240 (*Orpiella* subg.).

TYPE SPECIES — *Euryptus similis* Semper, 1870; OD.

Shell depressed-turbinate to suborbicular, thin to rather solid, polished, (very) translucent, more or less pearly, of 4.5-6 moderately convex whorls. Last whorl weakly angulate on 4th whorl, becoming almost evenly rounded on 5th. Color pallid to

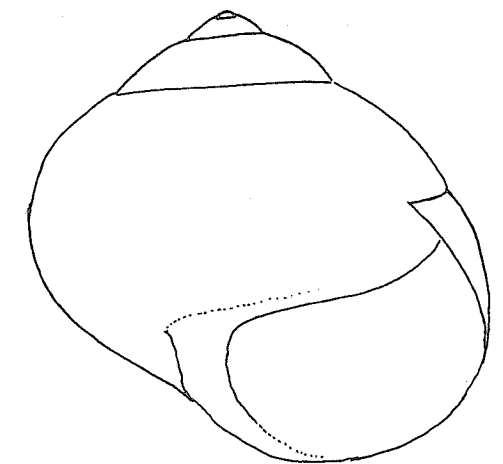


Fig. 1565. *Nevelasta pampini* (Cox, 1868).
After Cox, 1868.

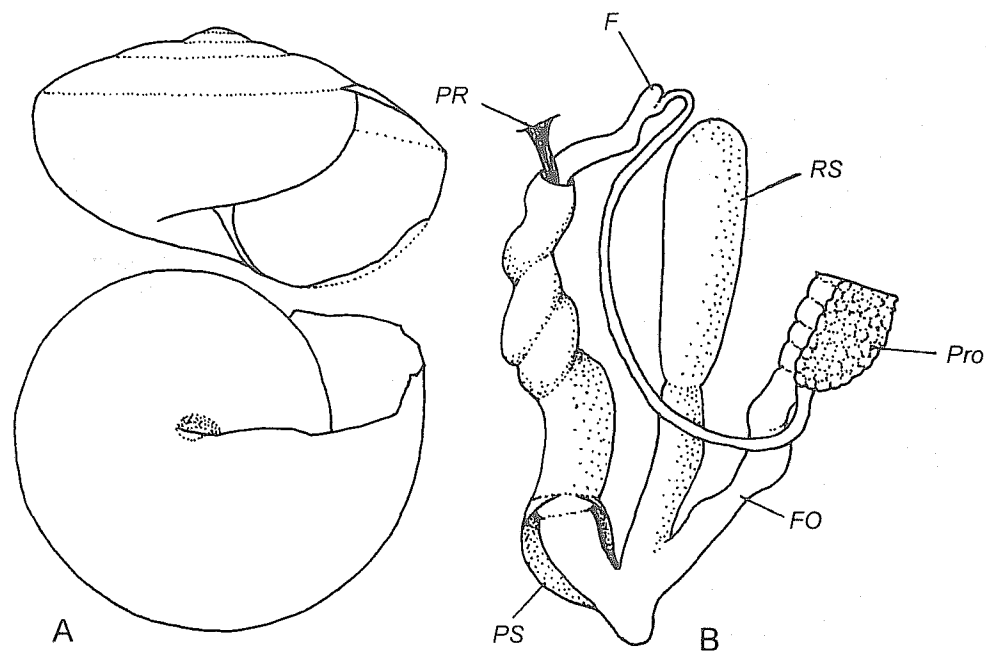


Fig. 1566. ! *Orpiella fragillima* (Mousson, 1870).
A — shell. B — reproductive tract. After Baker, 1941.

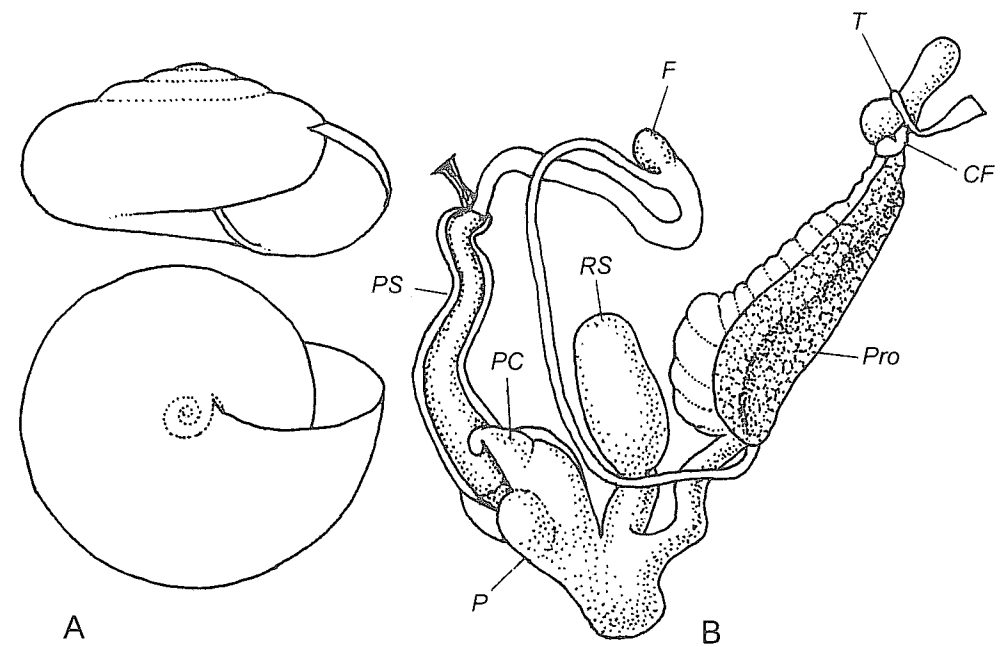


Fig. 1568. *Halozonites cookensis* (Gude, 1905).
A — shell. B — reproductive tract. After Baker, 1941.

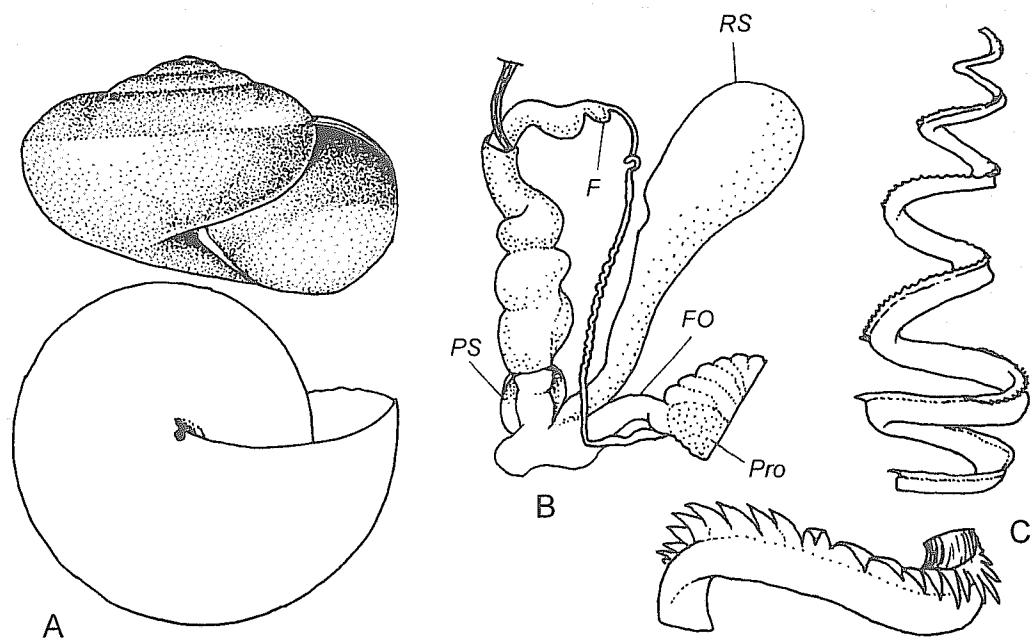


Fig. 1567. *Eufretum similis* (Semper, 1870).
A — shell: Viti Levu Island, Fiji. Phil. No. 49155. B — reproductive tract. C — spermatophore and its enlarged fragment. After Baker, 1941.

bright-corneous or with upper surface fuscous corneous, often accentuated near suture and periphery. Embryonic whorls with very weak spiral striae. Later whorls with fairly regular radial wrinkles and more or less obscure spiral striae; base with obsolescent, blurred spiral lines. Aperture wide, evenly rounded, slightly oblique, with simple peristome; columellar margin gradually but quite widely reflexed and weakly thickened. Umbilicus dot-like. Height 4.82-14.70, diam. 8.2-20.7 mm (14.0 × 20.7 mm).

Tail of cephalopodium bears dorsal flat area edged by carina.

Ovotestis of 5 clusters of clavate acini. Talon bilobed. Vas deferens slender, long. Flagellum (calc-sac) minute. Epiphallus coiled inside penis sheath. Penis rather short, stout, internally with a few axial folds and a small, clavate verge with free end toward atrium. Free oviduct not long. Vagina very short. Spermatheca with rather stout duct and voluminous reservoir. Spermatophore elongate, spirally coiled; 1st of 5.5 whorls with continuous thin carinal expansion, which later becomes undulate and, on flattened tail, breaks up into triangular serrations.

DISTRIBUTION. Fiji. 3-5 spp.

Halozonites Pilsbry et Cooke, 1941
Fig. 1568

Pilsbry & Cooke in Baker, 1941: 239, 240 (*Orpiella* subg.).

TYPE SPECIES — *Thalassia cookensis* Gude, 1905; OD.

Shell depressed, thin, with satin-like gloss above, more polished below, of 4-5 moderately convex whorls. Last whorl rounded or somewhat compressed laterally. Color corneous. Embryonic whorls smoothish, with traces of spiral lines. Postapical whorls with very fine, low, radial, anastomosing threads and weak spiral striae above; basal surface almost polished, with very weak impressed spiral lines. Aperture fairly broad, quite evenly rounded, slightly oblique; columellar margin scarcely reflexed. Umbilicus narrowly open. Height 1.95-4.88, diam. 4.50-8.92 mm.

Talon small, rod-like. Vas deferens free, entering epiphallus at base of very short, subglobular flagellum. Penis heart-shaped, not much longer than broad, with a short apical caecum; internally with lateral thickenings but without free stimulator. Penis sheath surrounds epiphallus up to penial re-

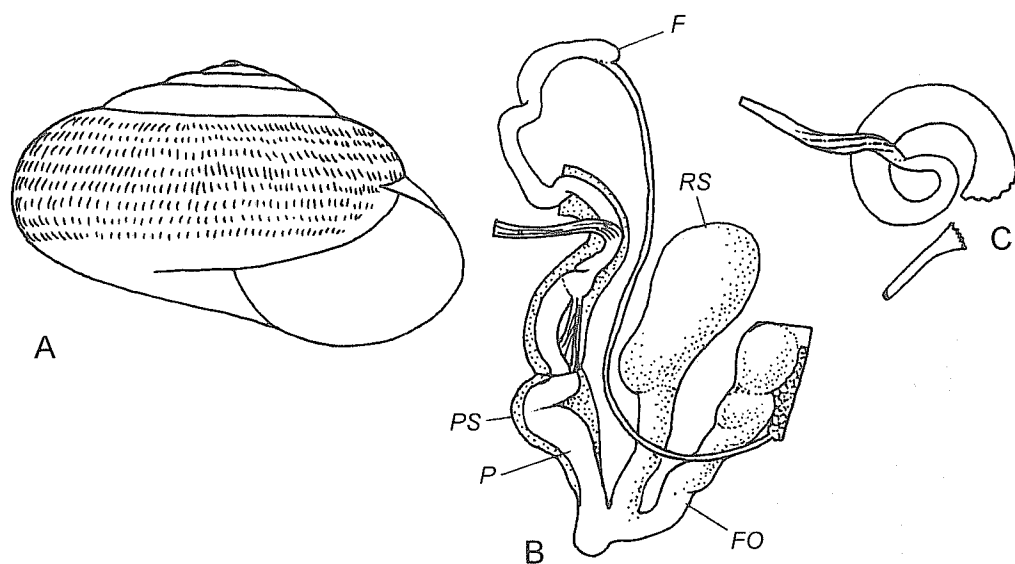


Fig. 1569. *Fijia macgillivrayi* Gude, 1913.
A — shell. After Baker, 1940a. B — reproductive tract. C — spermatophore. After Baker, 1941.

tractor. Penial retractor inserting between basal and middle thirds of epiphallus. Free oviduct moderately long, vagina practically absent. Spermathecal shaft short, stout; reservoir ovate, voluminous.

DISTRIBUTION. Fiji. 3 spp. (1 sp. introduced in Cook Islands).

Fijia Gude, 1913
Fig. 1569

Gude, 1913a: 325. Baker, 1941: 239 (*Orpiella* subg.).

TYPE SPECIES — *Fijia macgillivrayi* Gude, 1913; OD.

Shell depressed-turbinata, thin, pellucid, dull above and glossy below, of about 4 moderately convex whorls. Color yellowish-brown. 1st embryonic whorl almost polished, with very faint spiral striae and radial lines, last half with closely spaced radial wrinklets. Later whorls radially ribbed, decussated by spiral lines. Aperture rounded subtrapezoidal, markedly oblique; columellar margin shortly reflexed. Umbilicus rather wide. Height 2.0-7.2, diam. 4.1-12.0 mm.

Caudal horn spatulate, not reaching tip of cephalopodium.

Vas deferens long, evenly thin. Flagellum small. Penis relatively long, separated from epiphallus by heavy sphincter, internally with 3 strong and many finer, axial folds, without distinct stimulator. Free oviduct quite long, vagina extremely short (nearly absent). Spermathecal stalk short, reservoir voluminous. Spermatophore long, fusiform, with coarse, smooth, spiral threads around most of tail.

DISTRIBUTION. Fiji Islands. 1 or 2 spp.

Irenella Gude, 1913
Fig. 1570

Gude, 1913a: 326.

— *Aulacopus* Pfeffer, 1878: 258, 273 [nom. praecoc., non Serville, 1832 (Coleoptera); t.-sp. *Nanina hoyti* Garrett, 1872; monotypy].

Baker, 1941: 245.

TYPE SPECIES — *Helix nouleti* Le Guillou, 1842; OD.

Shell turbinata or depressed conoid, comparatively solid, shining, of 5.5-6.5 whorls. Color chocolate to brownish-olive

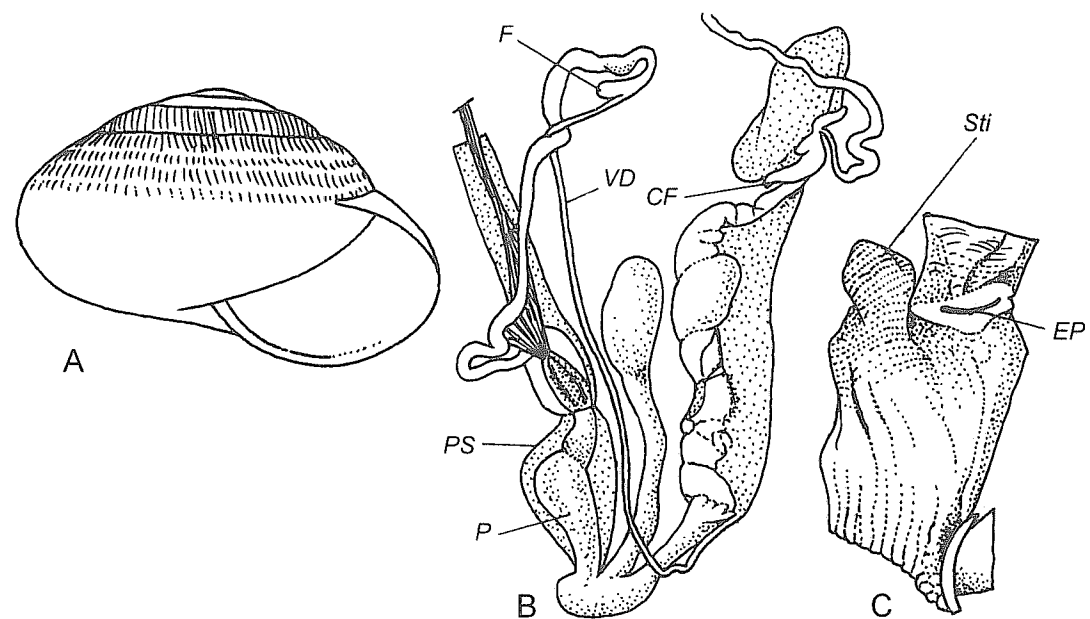


Fig. 1570. *Irenella nouleti tawalekae* (Baker, 1841).
A — shell. B — reproductive tract. C — interior of penis. After Baker, 1941.

or livid purplish, uniform or with subsutural fulvous-brown band. Embryonic whorls smooth or (rarely) with weak radial wrinkles. Later whorls smooth or striated and decussated by spiral lines. Aperture widely lunate, markedly oblique. Umbilicus slit-like to closed. Height 12-25, diam. 20.0-38.6 mm.

Ovotestis consisting of many (about 10) clusters of clavate acini. Hermaphroditic duct fairly long, slightly convoluted. Talon small, rod-like. Carrefour ovoid. Vas deferens caught into peni-oviducal angle by right ommatophoran retractor. Flagellum small, ovate. Epiphallus very long, slender. Penis short, clavate, internally separated from epiphallus by 2 heavy sphincteric folds, obliquely rugate and containing a large, transversely wrinkled stimulator. Penis sheath consisting of 2 parts; a thin basal sac surrounding penis and base of epiphallus and a heavy muscular cylinder enclosing more than 0.5 of epiphallus; marked off from each other by a constriction which attached near base of epiphallus by muscular bands. Penial retractor arising from diaphragm, entering penis sheath and inserting near middle of epiphallus but continued by muscular investment of epiphallus and by free bands of muscle that bind constriction

of penial sheath to base of epiphallus. Free oviduct moderately long, without evident perivaginal gland. Vagina extremely short or absent. Spermathecal stalk rather long, reservoir elliptic.

DISTRIBUTION. Fiji Islands. 7 spp. and subspp.

Owaraha Baker, 1941
Fig. 1571

Baker, 1941: 239, 240 (*Orpiella* subg.).

TYPE SPECIES — *Helix solidiuscula* E. Smith, 1885; OD.

Shell turbinata, thin, weakly glossy above, almost polished below, of 5.5-6.5 moderately convex whorls. Last whorl scarcely angulated at periphery. Color chestnut above, paler below, shading into white around umbilicus. Embryonic whorls with weak spiral lines. Later whorls with impressed spiral lines crossing fine, rounded, closely spaced radial wrinkles above and weaker spiral lines on basal surface. Aperture narrowly lunate, becoming evenly rounded; markedly oblique. Columellar margin quite gradually reflexed and thickened, almost completely hiding superficial,

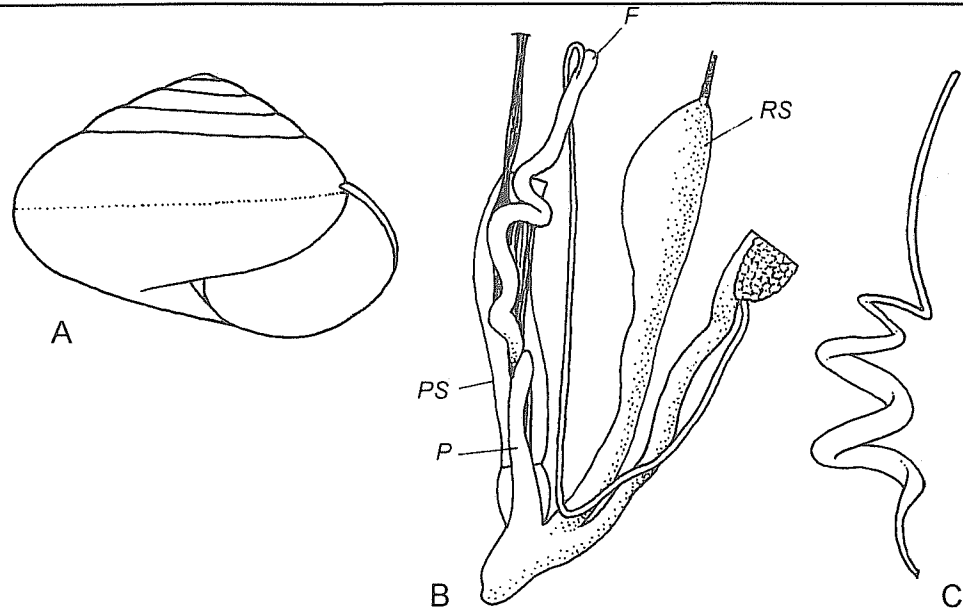


Fig. 1571. *Owaraha solidiuscula* (E. Smith, 1885).
A — shell. B — reproductive tract. C — spermatophore. After Baker, 1941.

minute umbilicus. Height 9.93-12.00, diam. 14.9-18.0 mm.

Vas deferens thin, slender. Flagellum small, ovoid. Epiphallus comparatively long but shorter than in *Irenella*, separated by slight constriction from penis which almost as long as epiphallus. Internally penis with 6 thin, high, longitudinal folds. Penis sheath surrounds penis and lower half or more of epiphallus. Penial retractor attached to middle of epiphallus under sheath. Free oviduct quite long, vagina practically absent. Spermathecal stalk rather long, reservoir voluminous. Spermatophore smooth, with flattened ampulla and rounded tail.

DISTRIBUTION. Solomon Islands. 1 sp.

Kalendyma Gude, 1911
Fig. 1572

Gude, 1911a: 273.

TYPE SPECIES — *Helix compluviata* Cox, 1871; OD.

Shell depressed-conoid, rather thin, shining, of 5 slightly convex whorls. Last whorl with very fine, filiform keel above mid-line. Suture narrow, unusually deep. Color yellowish-corneous. Embryonic whorls smooth, polished. Later whorls lack-

ing regular sculpture. Aperture large, widely lunate, slightly oblique; columellar margin inclined, somewhat dilated above. Umbilicus dot-like. Height 15-16, diam. 24-28 mm (15.3 × 24.8 mm).

Vas deferens long, slender, strongly convoluted. Flagellum small, blunt. Epiphallus slender, rather long, internally with relief reflecting surface of spermatophore. Penis long, subcylindrical, internally without regular relief. Penis sheath surrounds penis and distal part of epiphallus. Penial retractor attached to lower half of epiphallus well above upper edge of sheath. Free oviduct moderately long; vagina almost absent. Spermathecal stalk of about same length as free oviduct, reservoir thin-walled, capacious. Spermatophore with 2 longitudinal ridges, one of them serrated.

DISTRIBUTION. Solomon Island. 1 sp.

Sundavitrina B. Rensch, 1932
Fig. 1573

Rensch B., 1932: 79, 81 (*Vitrinopsis* subg.).

TYPE SPECIES — *Helicarion fruhstorferi* Moellendorff, 1897; OD.

Shell vitrinoid, very thin, shining, polished, of 4.5-5 weakly convex whorls. Last

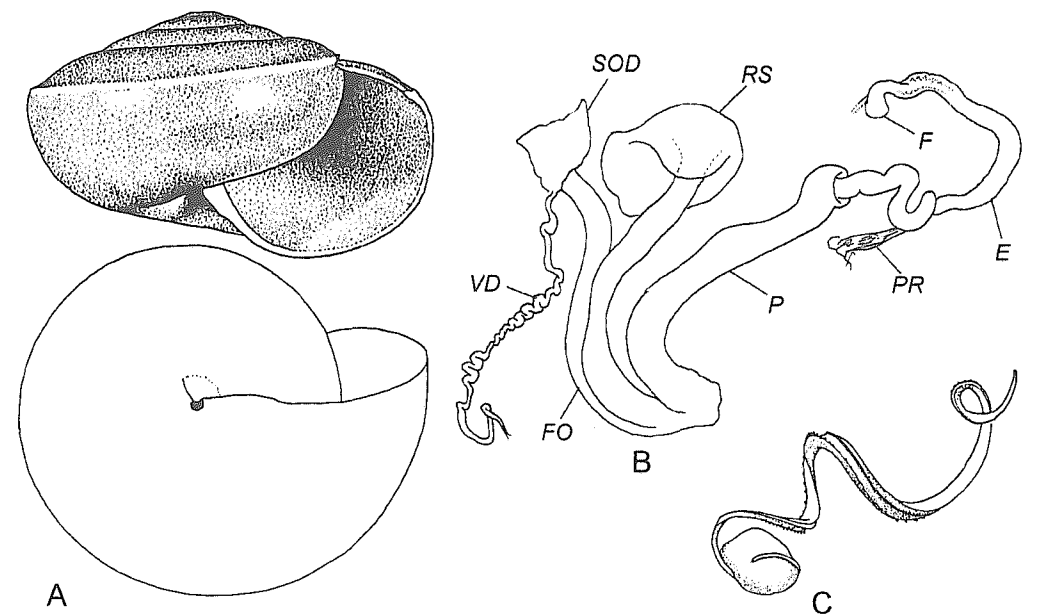


Fig. 1572. *Kalendyma compluviata* (Cox, 1871).
A — shell: Solomon Islands. Zürich No. 501104. B — reproductive tract. Malaita [Solomon Island]. Basel No. 4228b (Forcart's slide). C — spermatophore. After I. Rensch & B. Rensch, 1936.

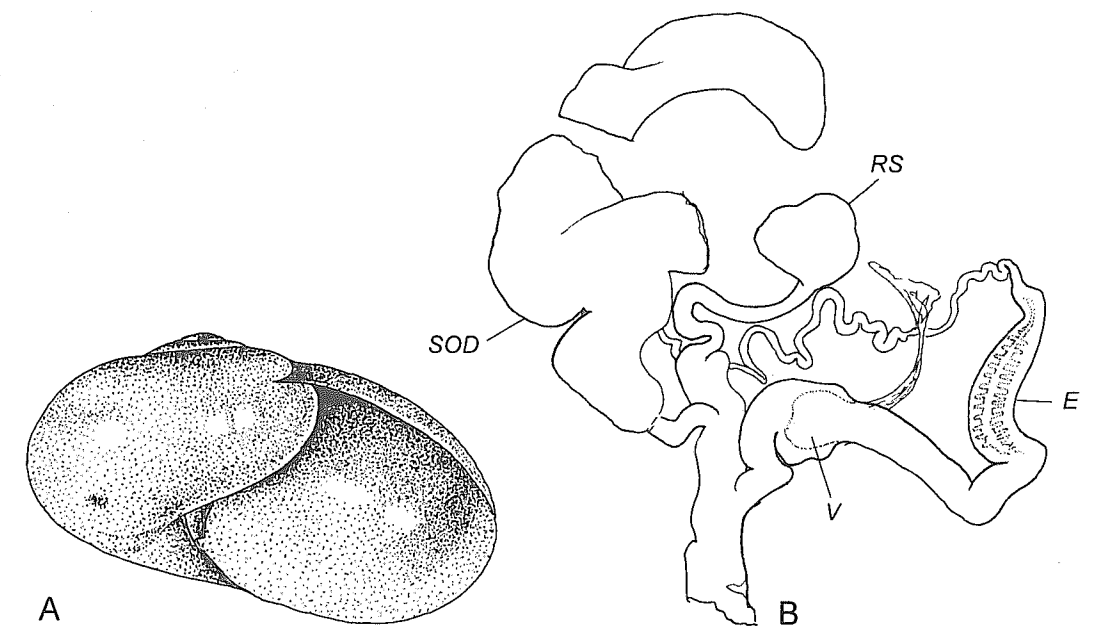


Fig. 1573. *Sundavitrina fruhstorferi* (Moellendorff, 1897).
Tjamba, Celebes [= Sulawesi], IV. 1927. A — shell. B — reproductive tract. Basel No. 5234a (Forcart's slide).

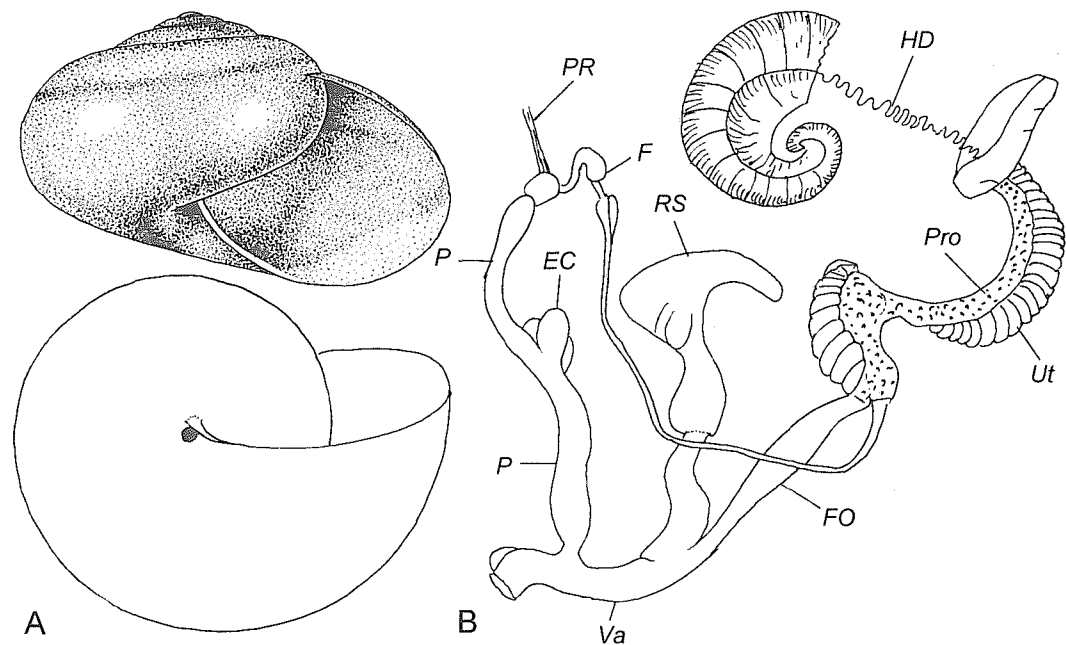


Fig. 1574. *Amenixesta hunsteini* (E. Smith, 1887).

A — shell: New Guinea. Geneva (Brot collection). B — reproductive tract. After Hedley, 1892.

whorl not descending, with rounded periphery. Color yellowish or (pale) olive-brown. Embryonic whorls with spiral rows of microscopic dots, rest whorls with very fine traces of spiral striation. Aperture ample, broad, slightly oblique, with sharp, simple margins; columellar margin somewhat dilated. Umbilicus absent. Height 8-10, diam. 11-15 mm (8.6 × 13.5 mm).

Vas deferens thin, long, convoluted, entering epiphallus apically. Flagellum missing. Epiphallus quite long, internally with numerous narrow cryptae in its walls. Penis short, swollen, with fleshy verge. Penial retractor inserting on base of epiphallus, at its border with penis. Free oviduct rather long, surrounded by perivaginal gland; vagina somewhat shorter. Spermathecal stalk slender, swollen basally, moderately long, with globular reservoir embedded in middle part of spermoviduct. Atrium comparatively long.

DISTRIBUTION. Indonesia (Java, Sulawesi, Bali, Lombok, Sumbawa, Flores, Tanimbar, ? Timor Islands). 1 or 2 spp.

Amenixesta Iredale, 1941

Fig. 1574

Iredale, 1941b: 69.

TYPE SPECIES — *Nanina hunsteini* E. Smith, 1887; OD.

Shell semiglobose, thin but comparatively firm, silky glossy, of 5-6 slightly convex whorls. Last whorl straight, evenly rounded at periphery. Color corneous with slightly darker supraperipheral band. Embryonic whorls glabrous, polished. Early postnuclear whorls almost smooth, 2 last whorls with crowded, wavy, regular spiral striae and weak, smoothed radial wrinklets. Aperture large, ovate, moderately oblique; columellar margin inclined, evenly concave. Umbilicus minutely open. Height 21-25, diam. 30-40 mm (22.7 × 35.2 mm).

Vas deferens thin, long, free, entering epiphallus laterally. Flagellum small, subglobular. Epiphallus short, at first slender, forms a small swelling at its boundary with penis. Penis rather long, (sub)cylindrical, with not large, short, rounded caecum in middle. Penial retractor attached to swelling of epiphallus. Free oviduct slender, rather long, vagina noticeably shorter. Spermathecal shaft not long, reservoir boot-shaped, with distal and proximal swellings separated by constriction; apex of reservoir not reaching albumen gland.

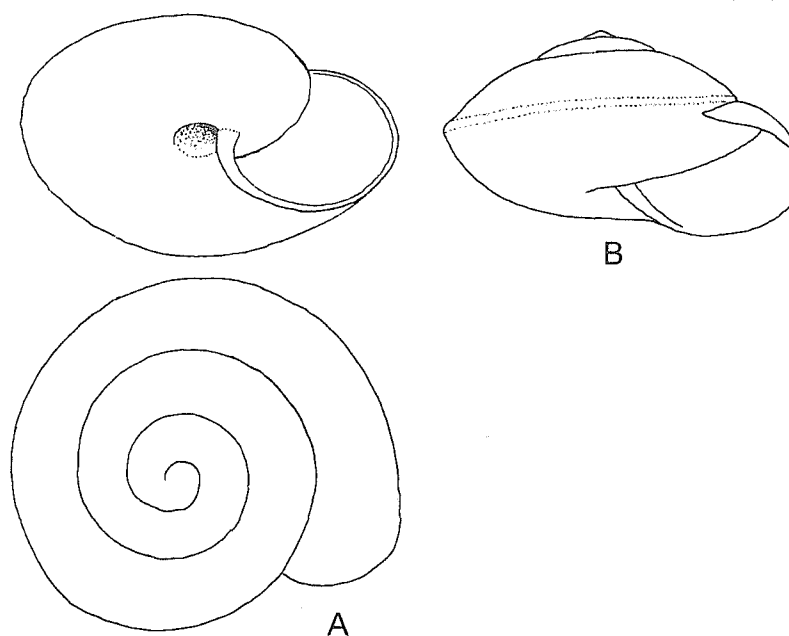


Fig. 1575. A — ! *Echonitor albumenoidea* (Cox, 1868).

B — ! *Echonitor waterhousei* (Cox, 1868). After Cox, 1868.

DISTRIBUTION. Papua-New Guinea. 2 spp.

Echonitor Iredale, 1937

Fig. 1575

Iredale, 1937b: 27. B. Smith, 1992: 229.

TYPE SPECIES — *Thalassia cyrtochila* Gude, 1905; OD.

Shell depressedly subglobose or obesely lenticular, thin, glossy but not shining, of 4.5 slightly convex whorls. Last whorl rounded to subangulate at periphery. Color golden-brown, pale-greenish or white. Embryonic whorls smooth or with a faint, regular spiral lines. Postapical whorls without regular sculpture. Aperture broadly lunate, moderately oblique, with simple margins. Umbilicus minute to moderately wide. Height 7-9, diam. 11-13 mm.

DISTRIBUTION. S Australia. 3 spp.

Zagmena Iredale, 1941

Fig. 1576

Iredale, 1941b: 69.

— ? *Hunsteinia* Iredale, 1941b: 71 (t.-sp. *Oxytes hercules* Hedley, 1892; OD).

TYPE SPECIES — *Helix inclinata* L. Pfeiffer, 1863; OD.

Shell lenticular, solid, of 6-6.5 flattened whorls. Last whorl straight, strongly carinated at periphery. Color brown-red to pale-fusces. Embryonic whorls with fine, curved, radial wrinkles. Later whorls with thread-like radial wrinkles or malleation above and smooth to finely striated below. Aperture lunate, angular, with thin margins. Umbilicus very narrow, sometimes semi-covered. Height 13-34, diam. 23.0-66.0 mm.

DISTRIBUTION. Papua-New Guinea, Louisiade Archipelago, New Caledonia. About 15 spp.

Delinitesta Iredale, 1933

Fig. 1577

Iredale, 1933: 54. Stanisc, 1988: 475.

TYPE SPECIES — *Helix (Thalassia) gayndahensis* Brazier, 1875; OD.

Shell depressed, thin, of 4.5-5 (or a little more) slightly convex whorls. Last whorl with peripheral cord-like keel and noticeable supraperipheral sulcus, flattened above and rounded below keel. Color creamy yellow-corneous. Embryonic whorls with

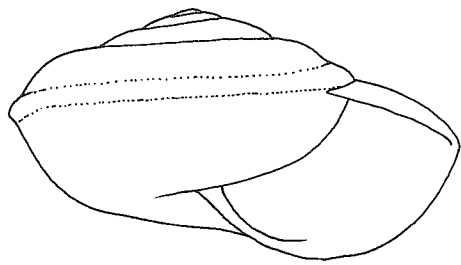


Fig. 1576. ! *Zagnena jonsoni* (E. Smith, 1895).
After Iredale, 1941b.

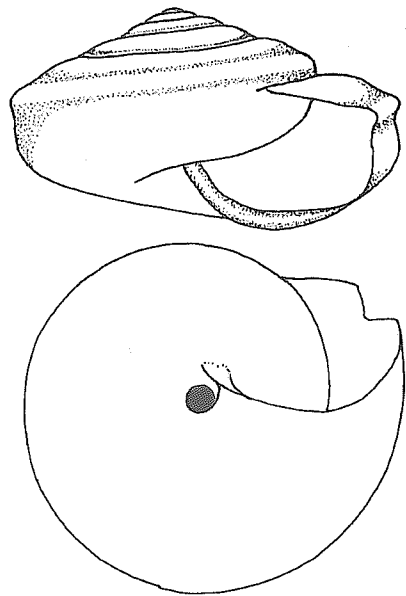


Fig. 1577. *Delinitesta gayndahensis* (Brazier, 1875).
After Stanisc, 1988.

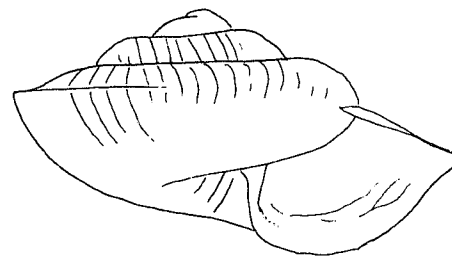


Fig. 1578. *Deliciola charis* Iredale, 1944.
After Iredale, 1944.

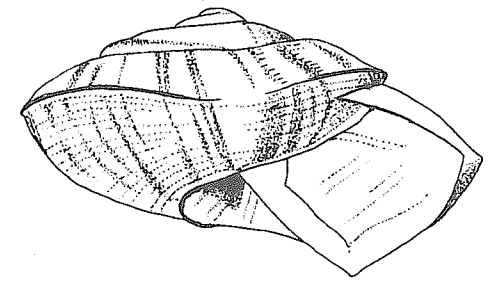


Fig. 1579. *Dignamoconcha dulcissima* Iredale, 1944.
After Iredale, 1944.

about 20 incised spiral striae regularly notched along their length. Postapical sculpture of numerous, very close-set, wavy spiral lines, interrupted by weak radial wrinkles. Aperture irregularly ovate, well oblique; columellar margin markedly reflexed. Umbilicus open, moderately narrow. Height 4.43-5.49, diam. 7.09-8.57 mm.

DISTRIBUTION. Queensland (Australia). 1 sp.

Deliciola Iredale, 1944
Fig. 1578

Iredale, 1944: 325.

TYPE SPECIES — *Deliciola charis* Iredale, 1944; OD.

Shell subdiscoidal, flat-topped, of about 4 rather convex whorls. Apex a little elevated. Last whorl with very strong, sharp keel at periphery. Base very convex. Color greenish-fawn. Embryonic whorls smooth. Sculpture of upper surface of later whorls of radial, closely set, a little raised threads; basal surface sculptured by microscopic radial wrinklelets. Aperture rostrate, a little broader than high; columellar margin vertical, reflexed. Umbilicus small, deep. Height 1, diam. 2 mm.

DISTRIBUTION. Lord Howe Island. 1 sp.

Dignamoconcha Iredale, 1944
Fig. 1579

Iredale, 1944: 324.

TYPE SPECIES — *Dignamoconcha dulcissima* Iredale, 1944; OD.

Shell obesely lentiform, thin, translucent, of 5 slightly convex whorls. Last whorl with fine peripheral and sharp basal keels. Coloration greyish-fawn, flamed with brownish. Postapical sculpture of minute radial wrinkles crossed by minute spiral striae; on basal surface radial sculpture more prominent. Aperture quadrangular, with palatal and basal angles. Umbilicus wide, crater-like, deep, perspective. Height 3, diam. 6 mm.

DISTRIBUTION. Lord Howe Island. 1 sp.

Pseudosesara Solem, 1962
Fig. 1580

Solem, 1962: 227.

TYPE SPECIES — *Pseudosesara tabwemasana* Solem, 1962; OD.

Shell depressed, thin, of about 4 flattened whorls. Last whorl with peripheral angle. Color light-buff. Embryonic whorls minutely radially ribbed. Subsequent whorls with very fine, numerous radial riblets be-

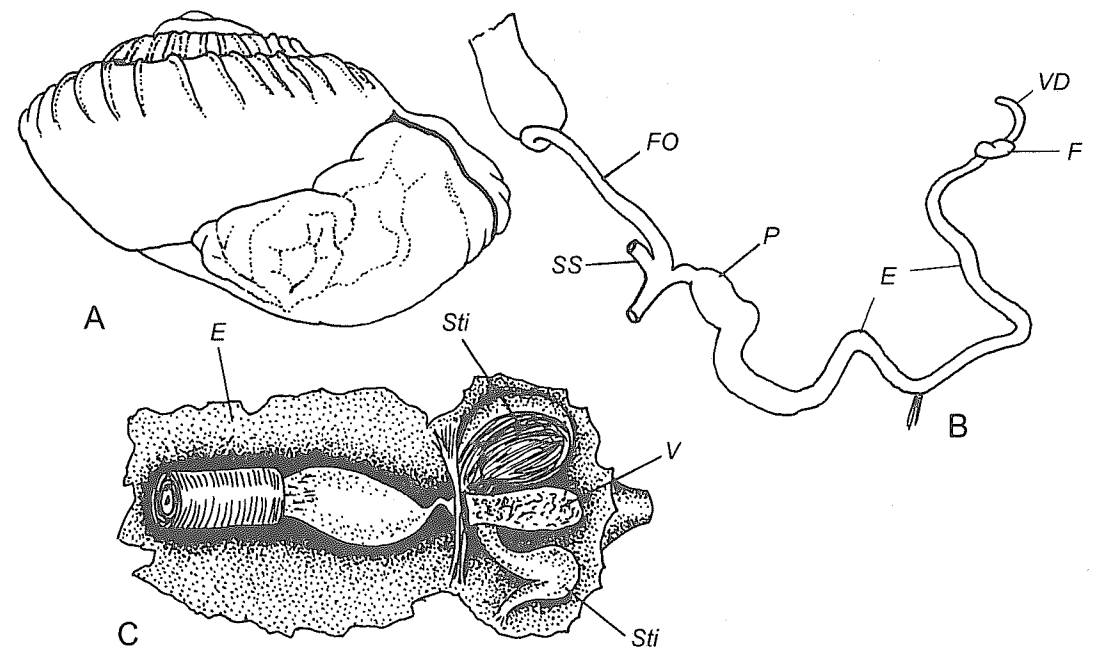


Fig. 1580. *Pseudosesara tabwemasana* Solem, 1962.
A — shell. B — reproductive tract. C — interior of penis. After Solem, 1962.

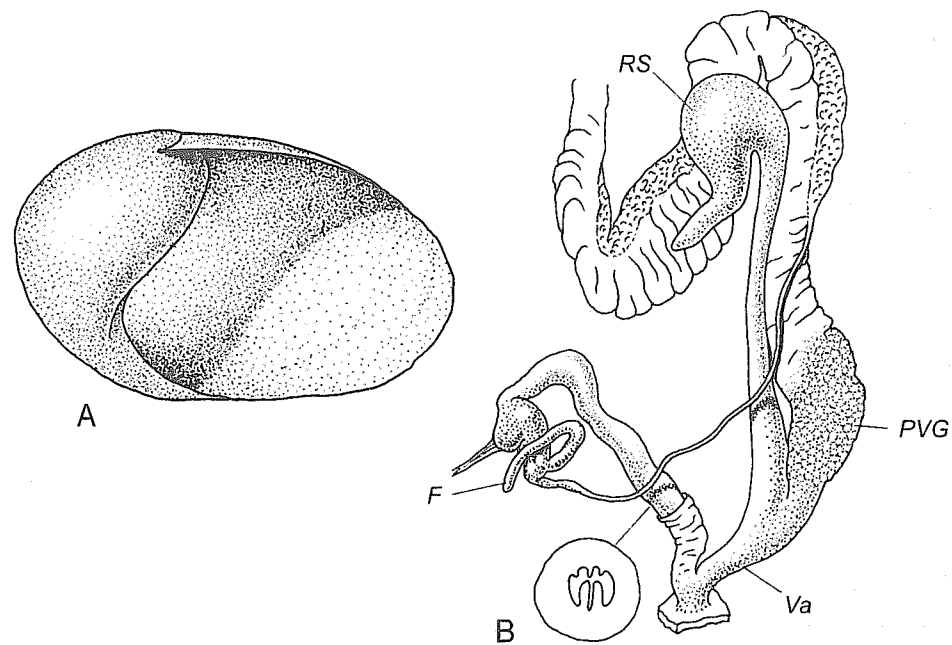


Fig. 1581. *Sitalarion planospira* (L. Pfeiffer, 1853).
A — shell: Bio Island, Solomon Islands. Moscow No. Lc-21498. B — reproductive tract. Bougainville Island, Solomon Islands. Vienna No. 44.049.

tween high lamellar periostracal ribs, which ending slightly below periphery. Basal surface smooth, shining, with thin subperiostracal radial lines. Aperture broadly lunate. Umbilicus minutely open. Height 5.40, diam. 10.82 mm (holotype).

Sole tripartite.

Epiphallus long, slender, with distinct flagellum (calc-sac). Penis small, subglobose, its lumen separated from epiphallus by partition ("diaphragm", after Solem). Internally penis with verge, margined by 2 large stimulatory pads: a large dished hemisphere whose base anchored to partition and whose body lies free in cavity, and a smaller, U-shaped pad attached to wall of penial cavity with base of "U" elevated and quite swollen. Penial retractor attached slightly below mid-point of epiphallus. Free oviduct rather long, vagina practically absent.

DISTRIBUTION. Espiritu Santo Island (New Hebrides). 1 sp.

Sitalarion Baker, 1941
Fig. 1581

Baker, 1941: 265 (*Helicarion* subg.).

TYPE SPECIES — *Vitrina planospira* L. Pfeiffer, 1853; OD.

Shell vitrinoid, thin, very fragile, glossy, semitransparent, of 3-3.5 flat whorls. Last whorl widely rounded. Color pale-yellow or whitish. Embryonic whorls smooth. Later whorls lacking regular sculpture. Aperture ample, ovate, well oblique, with simple margins. Umbilicus absent. Height 6-7, diam. 10-13 mm (6.5 × 10.4 mm).

Sole tripartite. Back of cephalopodium with very high, sharp keel.

Vas deferens long, thin, free, entering epiphallus apically. Flagellum finger-shaped, internally with axial thread. Epiphallus short, with subglobular caecum filled with milky-white buffer. Penis rather long, subcylindrical, internally with few thin, high, locally anastomosing axial folds; 2 neighbouring folds larger than other. Basal part of penis surrounded by muscular sheath. Penial retractor inserted on top of epiphallic caecum. Free oviduct rather long, coated by well developed perivaginal gland. Vagina short. Spermathecal stalk slightly expanded basally; reservoir ovate, pointed, not reaching albumen gland.

DISTRIBUTION. Solomon Islands. 1 spp.

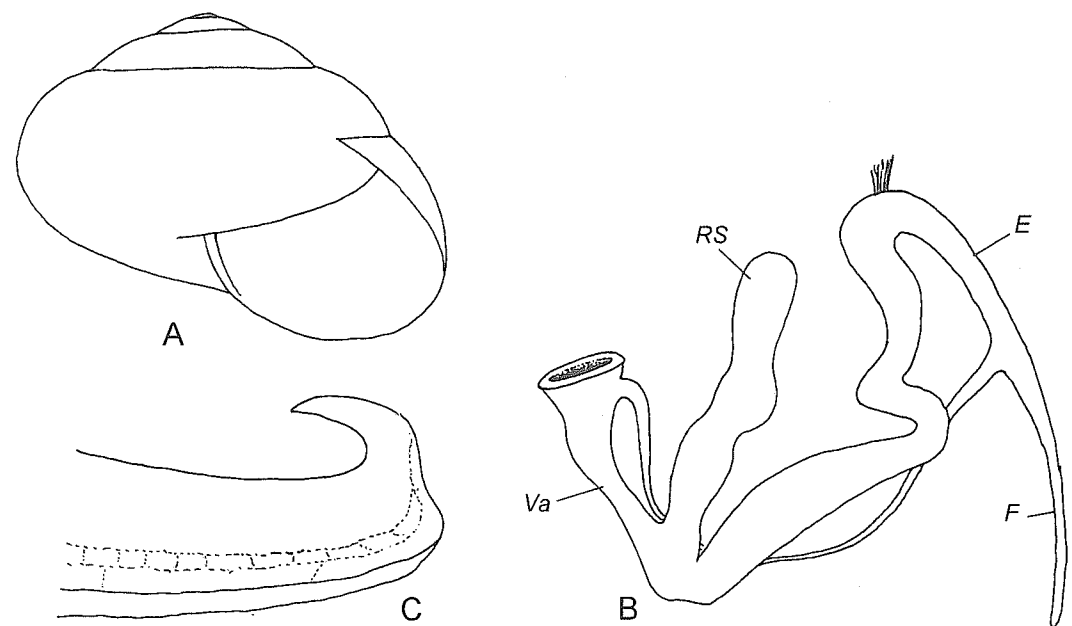


Fig. 1582. *Malandena suturalis* (Odhner, 1917).
A — shell. B — reproductive tract. C — posterior end of cephalopodium. After Odhner, 1917.

Malandena Iredale, 1937
Fig. 1582

Iredale, 1933: 56 (nom. nud.); 1937c: 7. B. Smith, 1992: 236.

TYPE SPECIES — *Macrochlamys suturalis* Odhner, 1917; OD.

Shell depressed-semiglobose, thin, pellucid, shining, of about 5 weakly convex whorls. Last whorl not descending, with rounded periphery. Color yellowish-brown; suture darker. Embryonic whorls smooth, rest with very fine irregular radial wrinklets. Aperture broadly lunate, slightly oblique, with sharp, simple margins. Umbilicus minutely open. Height up to 11.5, diam. up to 15.5 mm.

Sole tripartite. Caudal foss slit-like, caudal horn long.

Vas deferens entering epiphallus laterally. Flagellum rather long, tapering. Epiphallus rather short, penis markedly longer. Penial retractor attached to penis/epiphallus junction. Spermatheca large.

DISTRIBUTION. Queensland. 1 or 2 spp.
REMARK. In the description of anatomy of *Malandena suturalis* Odhner did not men-

tion spermatheca. I suspect that the organ which he designated as sarcobelum is in fact the spermatheca. Odhner writes that this organ contains conchiolinous, cord-like thorn. In all probability, this "thorn" is a remnant of spermatophore.

Ellarion Iredale, 1941
Fig. 1583

Iredale, 1941b: 66.

TYPE SPECIES — *Helicarion visi* Hedley, 1892; OD.

Shell depressed, thin, brittle, glossy, transparent, of 3.5 rather rapidly increasing whorls. Last whorl rounded at periphery, swollen around umbilical depression. Color pale-yellow. Postembryonic sculpture of fine radial striae. Aperture ovate-lunate, with sharp, simple margins joined by a slight callus; columellar margin reflexed. Umbilicus absent. Height 4, diam. 8 mm.

Cephalopodium with truncate tail; caudal foss well developed, caudal horn vestigial.

DISTRIBUTION. Papua-New Guinea [Moresby (= Basilaki) Island]. 1 sp.

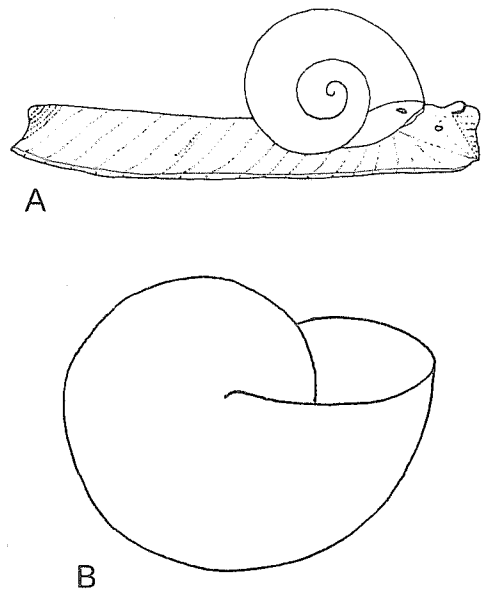


Fig. 1583. *Ellarion visi* (Hedley, 1891).
A — external view of animal. B — umbilical view of shell. After Hedley, 1892.

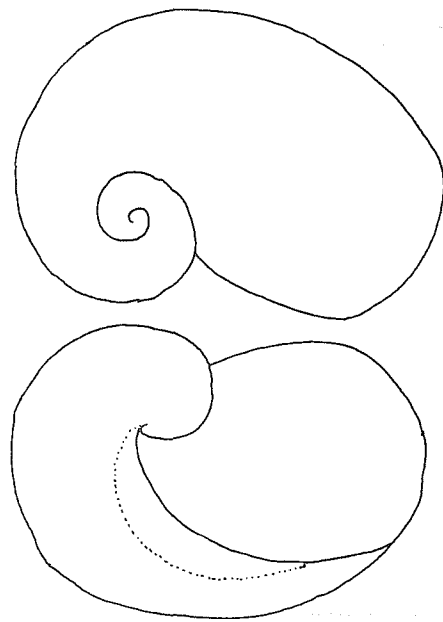


Fig. 1584. *Parmavitrina planilabris* (Cox, 1865).
After Cox, 1866.

Parmavitrina Iredale, 1937

Fig. 1584

Iredale, 1937c: 8 (*Helicarion* subg.). B. Smith, 1992: 240.

TYPE SPECIES — *Vitrina planilabris* Cox, 1865; monotypy.

Shell vitrinoid, auriform, thin, glossy, semitransparent, of about 3 whorls. Last whorl rapidly increasing. Spire very much depressed. Color of periostracum olive-green, aperture pearly within. Postembryonic whorls with a few spiral engraved lines. Aperture ample, much oblique. Umbilicus absent. Height: 0.10-0.26, diam. 0.45-0.80 inch, i.e. about 2.5-6.5 × 11.25-20.0 mm.

DISTRIBUTION. NE Australia. 2 spp.

Parmellops Iredale, 1944

Fig. 1585

Iredale, 1944: 329. B. Smith, 1992: 240.

TYPE SPECIES — *Vitrina* (*Parmella*) *etheridgei* Brazier, 1889; OD.

Shell vitrinoid, thin, glossy, semitransparent, of about 2 whorls. Basal wall reduced, with periostracal fringe. Surface lacks regular sculpture. Shell not completely

covered by mantle. Length of preserved animal from muzzle to posterior end of visceral hump 16 mm.

Cephalopodium with caudal foss and caudal horn.

Vas deferens entering epiphallus laterally leaving long, subcylindrical flagellum. Epiphallus rather short, slender; penis noticeably more stout, subcylindrical. Free oviduct long, enlarged. Vagina almost absent. Spermathecal stalk slightly expanded basally, entering shallow atrium; reservoir ovate, embedded in lower part of spermooviduct.

DISTRIBUTION. E Australia, Lord Howe Island. 1 sp.

Parmacochlea E. Smith, 1884

Fig. 1586

Smith E., 1884: 273. B. Smith, 1992: 239

TYPE SPECIES — *Parmacochlea fischeri* E. Smith, 1884; monotypy.

Shell flattened, ovate-subquadrangular, in form of a slightly convex, thinnish disk, which, viewed externally, appears to consist of 2 whorls. Shell not completely covered by mantle. Nuclear whorl very small, trans-

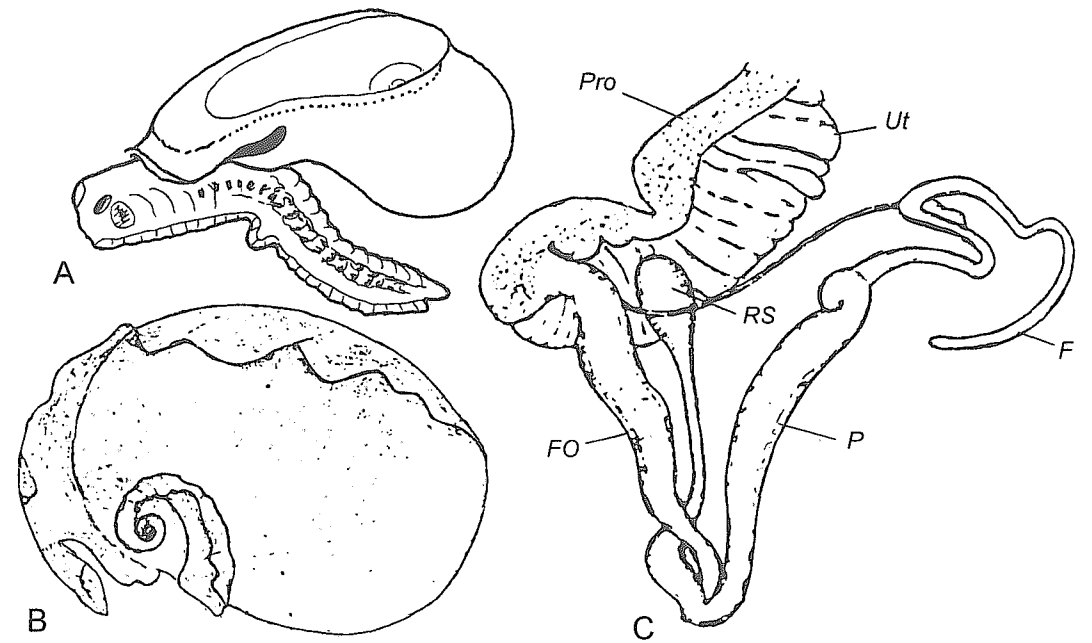


Fig. 1585. *Parmellops etheridgei* (Brazier, 1889).
A — external view of animal. B — shell. C — reproductive tract. After Hedley, 1890.

parent white. 2nd whorl large, glossy, thin, covered with a thin periostracum, marked with fine radial lines, attached only to left or curved side of 1st whorl, right side of which nearly straight. Beneath, 1st whorl white. Length 7, width 4 mm.

Sole narrow, tripartite. Caudal pore present, caudal horn absent.

Penis internally with strongly nodulose pustules and a verge having a terminal pore.

DISTRIBUTION. NE Australia. 2 spp.

? *Suterella* Iredale, 1915

Fig. 1587

Iredale, 1915: 478.

TYPE SPECIES — *Helix novarvae* L. Pfeiffer, 1861; OD.

Shell depressed, thin, fragile, dull, transparent, of 4-5 slightly convex whorls. Last whorl with blunt peripheral angle. Color pale or greenish-corneous. Surface, including embryonic whorls, covered by microscopic, close-set spiral lines. Aperture irregularly ovate, moderately oblique. Umbilicus narrowly open, cylindrical. Height 2.25-4.00, diam. 5.8-7.5 mm (3.0 × 5.8 mm).

DISTRIBUTION. New Zealand. 1 sp.

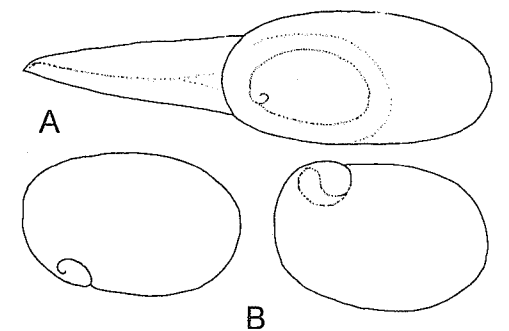


Fig. 1586. *Parmacochlea fischeri* (E. Smith, 1884).
After E. Smith, 1884.

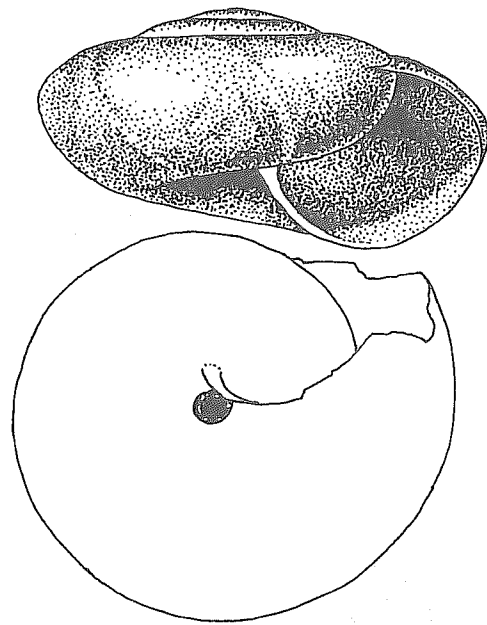


Fig. 1587. *Suterella novarae* (L. Pfeiffer, 1861). Auckland, New Zealand. Senck. No. 157864.

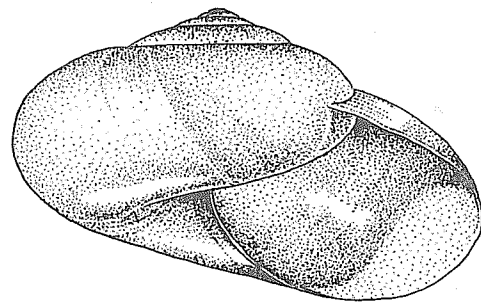


Fig. 1588. *Gudeoconcha sophiae* (Reeve, 1854). Lord Howe Island. Vienna.

REMARK. *Suterella* is believed to be a single New Zealand representative of Helicarionidae. Perhaps, actually it is a member of Rhytididae.

Gudeoconcha Iredale, 1944
Fig. 1588

Iredale, 1944: 327. B. Smith, 1992: 232.

TYPE SPECIES — *Helix sophiae* Reeve, 1854; OD.

Shell depressed-conic, thin, translucent, dull above, shining below, of 4.5-5 slightly convex whorls. Color yellow. Embryonic whorls smooth. Later whorls with smoothed radial wrinkles and weak, wavy spiral grooves; on base spiral sculpture nearly missing. Aperture large, ovate, oblique. Umbilicus minutely open, partly closed by reflection of columellar margin and often covered by transparent film. Height 11.5-21.0, diam. 26-33 mm (20.5 × 32.5 mm).

DISTRIBUTION. Lord Howe Island. 1 sp. with 2 subspp.

Mysticarion Iredale, 1941
Fig. 1589

Iredale, 1941a: 7. B. Smith, 1992: 238.

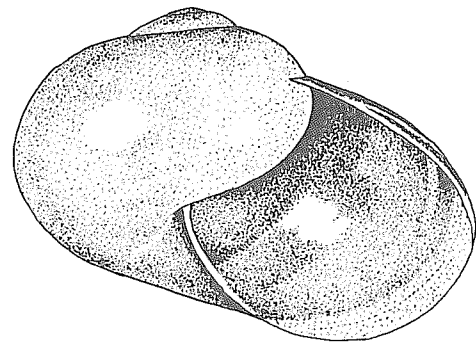


Fig. 1589. ! *Mysticarion leucospira* (L. Pfeiffer, 1857). Lismore, Richmond River, New South Wales, Australia. Phil. No. 63515.

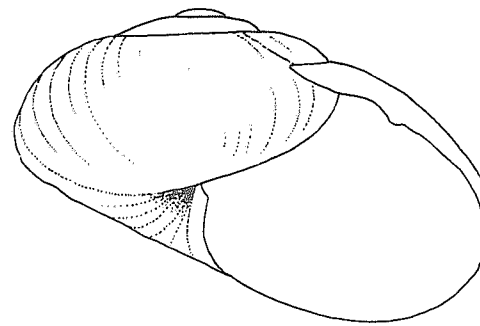


Fig. 1590. *Howearion belli* Iredale, 1944. After Iredale, 1944.

TYPE SPECIES — *Mysticarion leucospira insuetus* Iredale, 1941; OD.

Shell subglobular, very thin, strongly shining, translucent to semitransparent, of about 3.5 slightly convex whorls. Last whorl rounded, much inflated. Color yellowish. Sculpture of embryonic and later whorls of microscopical, very dense spiral striation. Aperture ample, ovate, well oblique. Umbilicus absent. Height 9-10, diam. 12-13 mm (9.6 × 12.7 mm).

DISTRIBUTION. E Australia (New South Wales). 1 sp. with 2 subspp.

Howearion Iredale, 1944
Fig. 1590

Iredale, 1944: 329. B. Smith, 1992: 234.

TYPE SPECIES — *Howearion belli* Iredale, 1944; OD.

Shell vitrinoid, semiglobose, thin, shining, of about 3.5 slightly convex whorls. Last whorl evenly rounded at periphery. Color greenish. Regular sculpture absent. Aperture ample, broadly ovate, moderately oblique. Umbilicus tiny. Height 6.2-8.0, diam. 8.5-18.0 mm.

DISTRIBUTION. Lord Howe Island. 2 or 3 spp.

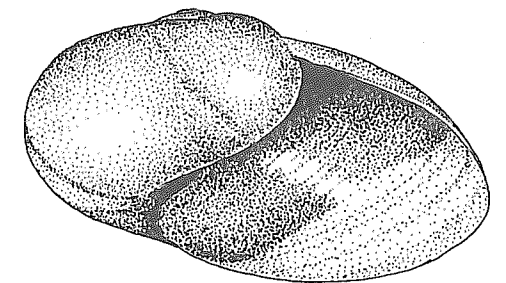


Fig. 1591. *Fastosarion superba* (Cox, 1871). Queensland. Vienna.

Fastosarion Iredale, 1933
Fig. 1591

Iredale, 1933: 37, 57.

— *Vercularion* Iredale, 1933: 38 (t.-sp. *Helicarion bullaceus* Odhner, 1917; OD).

B. Smith, 1992: 231.

TYPE SPECIES — *Vitrina superba* Cox, 1871; OD.

Shell vitrinoid, thin, glossy, semitransparent, of 3-3.5 flattened whorls. Last whorl evenly rounded at periphery. Color greenish. Embryonic whorls smooth. Later whorls with indistinct radial wrinklets and exceptionally fine, dense spiral striation. Aperture ample, ovoid, well oblique. Umbilicus absent. Height 18-23, diam. 28-34 mm (18.3 × 28.0 mm).

DISTRIBUTION. E Australia (Queensland, New South Wales). 10 spp.

Helicarion Férussac, 1821
Fig. 1592

Férussac, 1821: 20.

— *Helixarion* Férussac, 1821: xxxi (t.-sp. *Helixarion cuvieri* Férussac, 1820; SD J. Gray, 1847). Bull. Zool. Nomencl., 1992, vol.49, No. 2: 160. Opinion 1678.

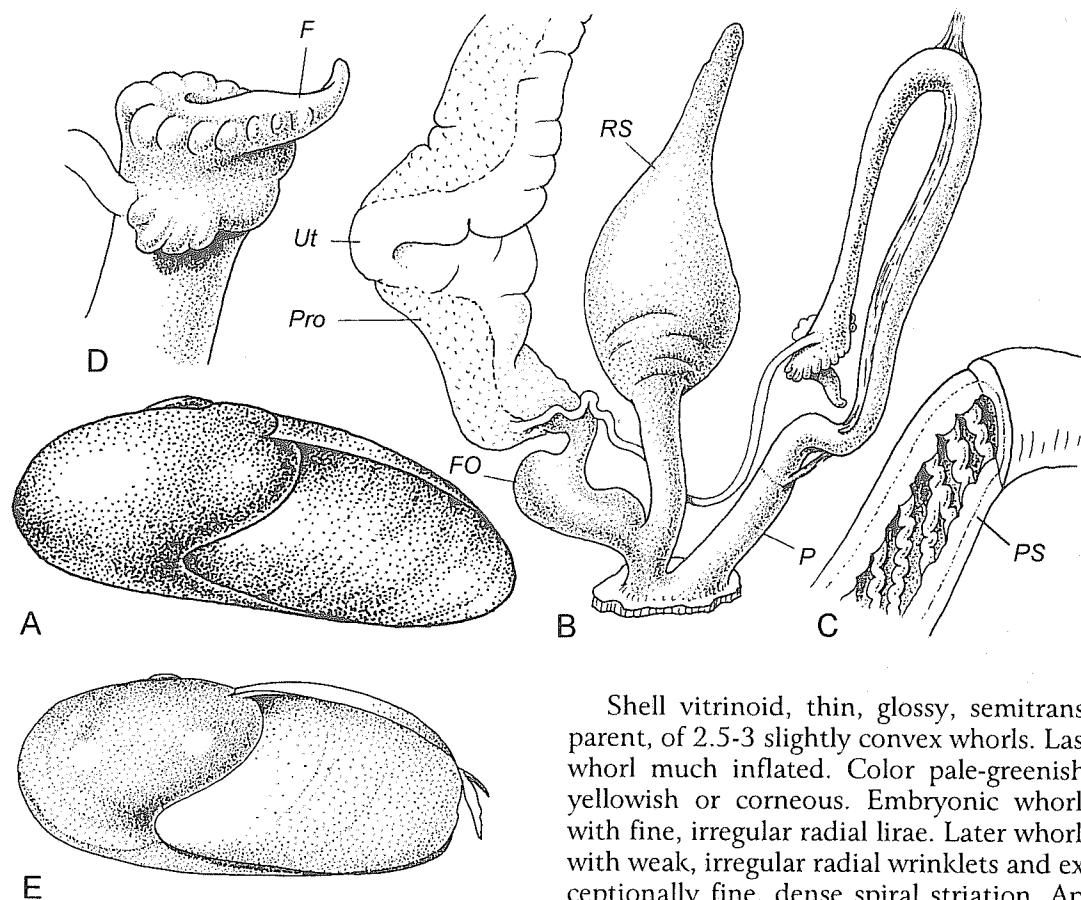


Fig. 1592. A, B, C, D — *Helicarion cuvieri* Férussac, 1821.
A — shell: Tasmania. Chicago No. 103361.
B, C, D — SW Tasmania. Neotype. Paris.
B — reproductive tract. C — interior of penis. D — apical area of epiphallus from other side. E — ! *Helicarion castanea* (L. Pfeiffer, 1853). Australia. Paris.

- *Platycloster* Hasselt, 1824: 24 (t.-sp. *Platycloster corneus* Hasselt, 1824; monotypy).
 - *Helicarium* Agassiz, 1846: 174 (nom. nov. pro *Helicarion* Férussac, 1843).
 - *Laconia* J. Gray, 1855: 51, 63 [t.-sp. *Laconia ferussaci* Gray, 1855 (nom. dub.); monotypy].
 - *Luinarion* Iredale, 1933: 38 (t.-sp. *Helicarion thomsoni* Ancey, 1889; OD).
 - *Desidarion* Iredale, 1941a: 8 (t.-sp. *Desidarion dispositus* Iredale, 1941; monotypy).
- Kershaw, 1979: 145; 1981: 17-18. B. Smith, 1992: 233.

TYPE SPECIES — *Helicarion cuvieri* Férussac, 1821; SD J. Gray, 1847.

Shell vitrinoid, thin, glossy, semitransparent, of 2.5-3 slightly convex whorls. Last whorl much inflated. Color pale-greenish, yellowish or corneous. Embryonic whorls with fine, irregular radial lirae. Later whorls with weak, irregular radial wrinklets and exceptionally fine, dense spiral striation. Aperture ample, elongated-ovate, quite oblique. Umbilicus absent. Height 3-10, diam. 8-22 mm (*cuvieri*: 5.0 x 11.1 mm; *castanea*: 6.8 x 14.1 mm).

Vas deferens moderately long, free, entering epiphallus laterally. Flagellum short, conic, spirally coiled, filled with milky-white fluid, with series of rounded protuberances on outer side that contain narrow cryptae corresponding to spines of spermatophore. Epiphallus long, subcylindrical, with muscular band running along its length. Externally epiphallus not demarcated from penis, entering penis through simple pore. Penis internally with many spirally directed, corrugated folds. Epiphallus and penis with double walls (outer wall is probably modified sheath). Penial retractor attached to mid-point of epiphallus. Free oviduct swollen in middle. Vagina almost absent. Spermathecal stalk rather short, stout; reservoir pear-shaped, with pointed tip, embedded in lower half of spermoviduct.

DISTRIBUTION. Java, Papua-New Guinea, Australia, Tasmania, New Caledonia. At least 15 spp. & subspp.

Peloparion Iredale, 1937
Fig. 1593

Iredale, 1937c: 8. B. Smith, 1992: 240.

TYPE SPECIES — *Helicarion helenae* Godwin-Austen, 1883; SD Iredale, 1941b.

Shell vitrinoid, very thin, strongly shining, translucent to semitransparent, of about 2 whorls; base conchyolinous, sometimes absent. Color greenish-yellow. Sculpture of fine radial wrinkles (at first glance shell looking glabrous). Aperture very large, quite oblique. Umbilicus absent. Height up to 5, diam. up to 9 mm (4.0 x 7.3 mm).

DISTRIBUTION. E Australia. 2 spp.

Epiglypta Pilsbry, 1893
Fig. 1594

Pilsbry, 1893 (1892-1893): 133 (*Nanina* sect.).
Baker, 1941: 264.

TYPE SPECIES — *Helix howinsulae* Cox, 1873; OD.

Shell depressed, somewhat lentiform, thin, translucent, of 5-6 slightly convex whorls. Last whorl keeled. Color greenish. Embryonic whorls with fine, obliquely-radial wrinklets. Later whorls with radial ribs furnished with periostracal fringe (especially on keel) above and smooth below; besides, there are microscopical radial lines and uneven spiral striation. Aperture roundly-lunate, rostrate, oblique. Umbilicus rather narrow, partly covered. Height 15-18, diam. 30-35 mm (17.2 x 34.0 mm).

Sole indistinctly tripartite. Caudal horn broad, crescentic, overhanging a wide foss.

Vas deferens long, entering epiphallus laterally. Flagellum slender, rather long. Epiphallus moderately long, bent; on its curvature there is a small, conic caecum to which penial retractor attached. Penis long, internally with not large, conic verge; basal section of penis surrounded by a muscular sheath; inner surface of penis without regular sculpture. Free oviduct and vagina subequal in length. Spermathecal stalk quite short, reservoir longer, elongated-ovate.

DISTRIBUTION. Lord Howe Island. 1 sp.

Westracystis Iredale, 1939
Fig. 1595

Iredale, 1939: 44. Solem, 1982: 178.

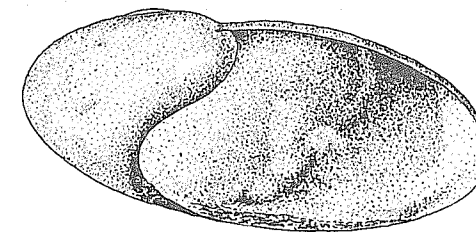


Fig. 1593. *Peloparion helenae* (Godwin-Austen, 1883).
Elizabeth Bay near Sydney, New South Wales, Australia. Phil. No. 132636.

TYPE SPECIES — *Lamprocystis lissa* E. Smith, 1894; OD.

Shell flattened, thin, translucent, dull, of 4.5-5.25 flattened whorls. Last whorl evenly rounded at periphery. Color corneous. Embryonic whorls smooth. On postnuclear whorls regular sculpture almost absent. Aperture widely semilunate, quite oblique, with simple margins; columellar margin shortly reflexed. Umbilicus narrow, cylindrical, sometimes slightly covered, internally with a few spiral grooves; cavity of umbilicus often occupied by wax-like secret. Height up to 5.5, diam. up to 11 mm (5.2 x 8.9 mm).

Shell lobes of mantle collar prominent.

Hermaphroditic duct convoluted. Talon hidden. Vas deferens long, entering epiphallus laterally. Flagellum long, vermiform. Epiphallus narrow, long, with a caecum which is similar externally to flagellum; penial retractor attached at base of caecum. Penis long, its distal half surrounded by a sheath; internally with axial, locally corrugated pilasters connected to each other by bridges; verge missing. Free oviduct long, vagina almost absent. Spermathecal stalk moderately long, rather stout, reservoir poorly defined, adhering to middle part of spermoviduct.

DISTRIBUTION. N Australia. 2 spp.

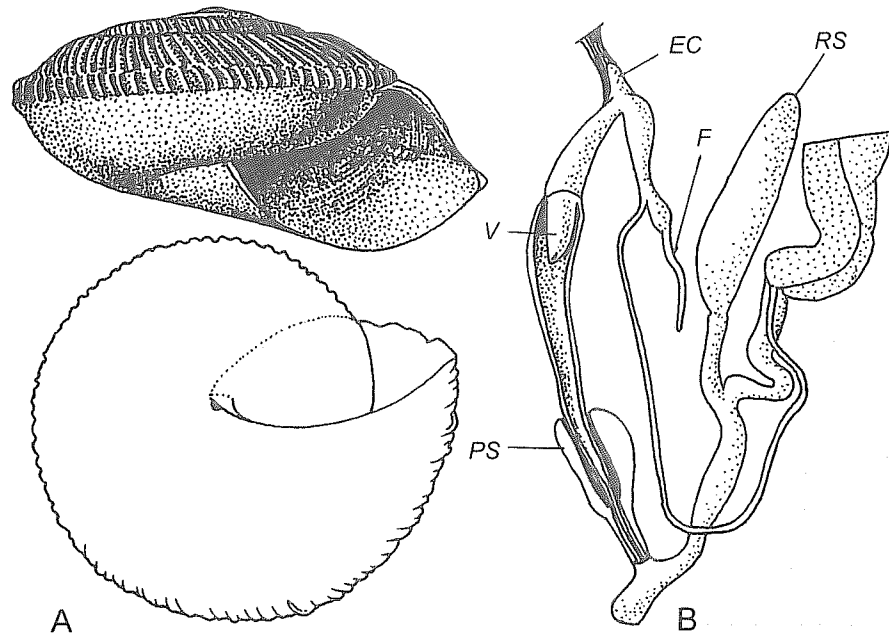


Fig. 1594. *Epiglypta howinsulae* (Cox, 1873).
A — shell: Lord Howe Island. Leiden. B — reproductive tract. After Baker, 1941.

Eungarion Stanisc, 1993
Fig. 1596

Stanisc, 1993b: 27.

TYPE SPECIES — *Eungarion mcdonaldi* Stanisc, 1993; OD.

Semislugs. Shell vitrinoid, very thin, glossy, translucent to semitransparent, of nearly 3 whorls. Shell walls poorly calcified, with membranous base and incomplete internal whorls. Color yellow to golden, apex creamy-white. Sculpture obsolete. Umbilicus absent. Diam. 9.74-11.30 mm.

Ovotestis multilobate. Hermaphroditic duct convoluted. Talon with spherical head and short stalk. Prostate band-like, appressed to surface of sacculate uterus. Vas deferens arising as a thin tube, descending to atrium, then ascending a short distance before entering a much thicker epiphallus. Flagellum rather long. Epiphallus with a long caecum, internally with longitudinal rib-like thickening below level of caecum, pustulose above. Penis relatively short, cylindrical, muscular, with a thick sheath surrounding lower 2/3; internally with bold, nodulose pustules apically, becoming transversely elongate basally, and 2 pustulose

longitudinal pilasters. Verge smooth, conic, with terminal pore. Penial retractor short, attached at base of caecum. Male distal genitalia coated by a thin sheath. Free oviduct expanded, twice as long as vagina, internally with spongy transverse folds. Vagina short, with subapical entrance of free oviduct; internally with fleshy axial thickenings. Spermathecal stalk short, expanded; reservoir attached about halfway along uterus. Spermatophore with elongately ovoid head and a long tail lacking spines.

DISTRIBUTION. Queensland (Australia). 1 sp.

Thularion Stanisc, 1993
Fig. 1597

Stanisc, 1993a: 2.

TYPE SPECIES — *Helicarion semoni* Martens, 1894; OD.

Semislugs. Shell much reduced, ear-shaped, thin, poorly calcified, with incomplete internal walls and membranous base, of 2.5-nearly 3 whorls. Last whorl greatly inflated, slightly descending in front. Color yellow, with whitish apex. Embryonic whorls (1.25) with fine, crowded, incised

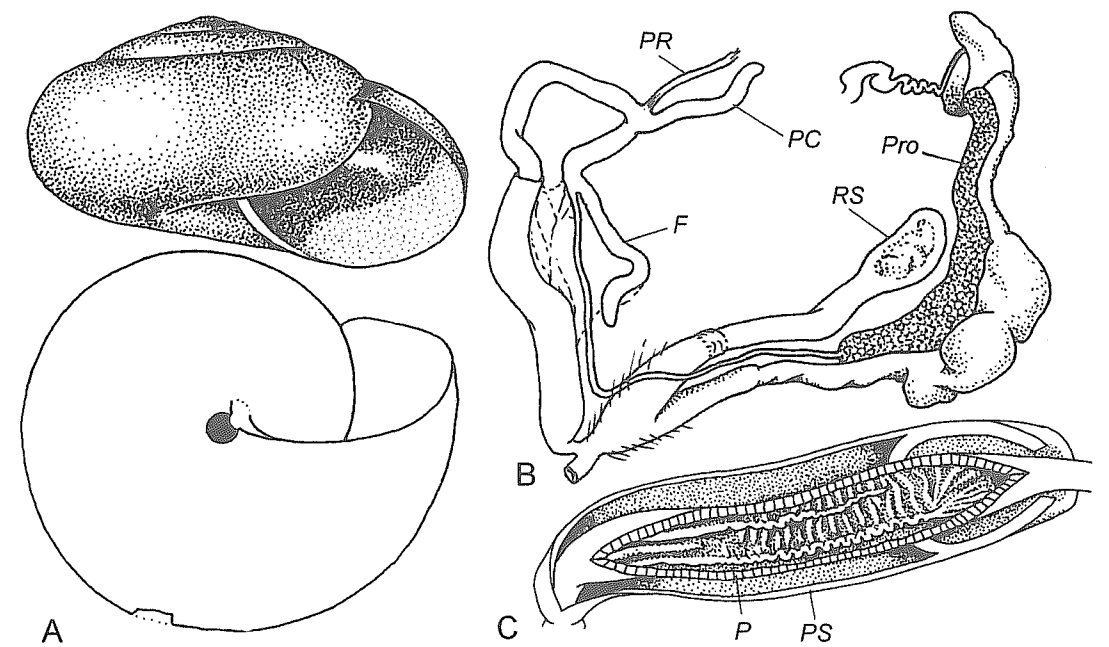


Fig. 1595. *Westracystis lissus* (E. Smith, 1894).
A — shell: W slope Walsh Point Rd., Mitchell Plateau, N Australia. Chicago No. 199808. B — reproductive tract. C — interior of penis. After Solem, 1982.

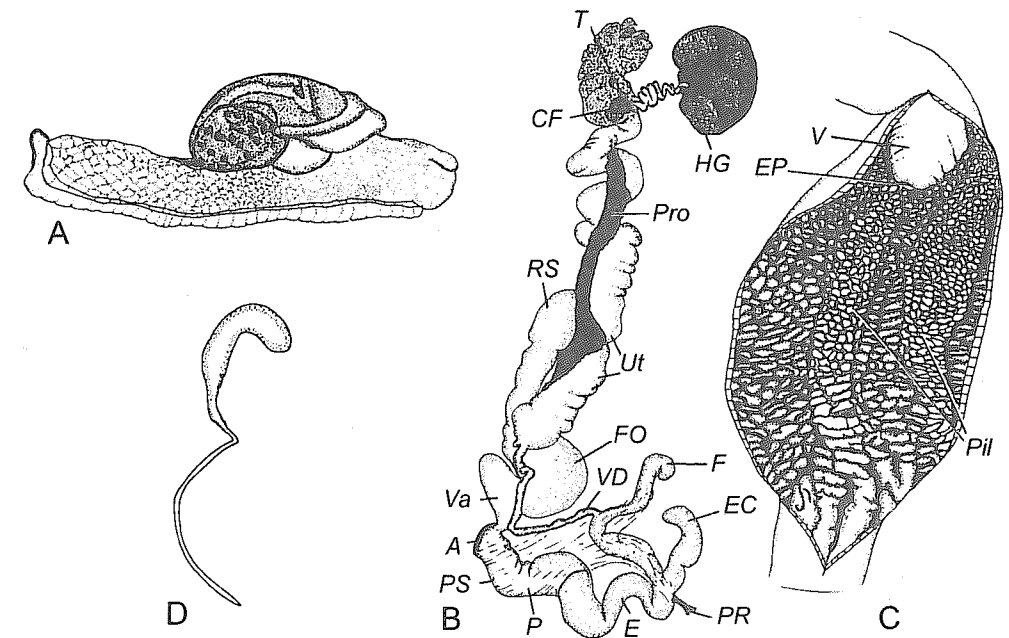


Fig. 1596. *Eungarion mcdonaldi* Stanisc, 1993.
A — external view of animal. B — reproductive tract. C — interior of penis. D — spermatophore. After Stanisc, 1993b.

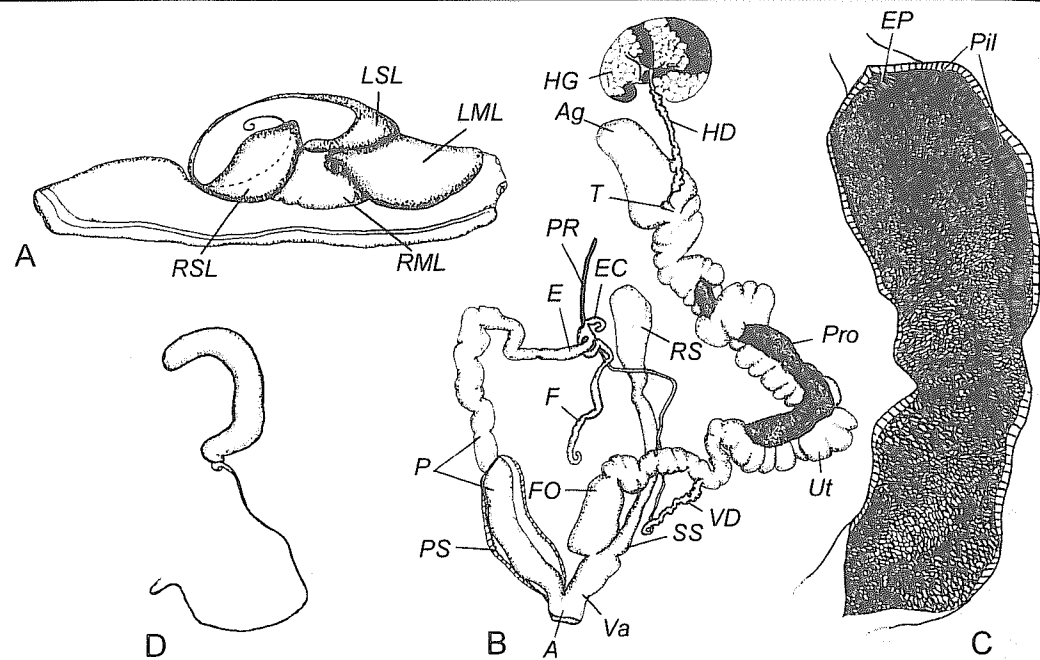


Fig. 1597. *Thularion semoni* (Martens, 1894).
A — external view of animal. B — reproductive tract. C — interior of penis. D — spermatophore.
After Stanisc, 1993a. LML — left mantle lobe. LSL — left shell lobe. RML — right mantle lobe. RSL — right shell lobe.

spiral lines. Later whorls with fine radial wrinklelets and sparse spiral furrows on body whorl; microsculpture of very fine, almost obsolete, periostracal, spiral ridgelets. Aperture ample, very oblique. Height 6.49-11.69, diam. 22.0-25.3 mm.

Foot slender, tripartite. Tail relatively long, sharply keeled mid-dorsally. Caudal foss, a long vertical slit; caudal horn vestigial.

Right mantle lobe small, with short, lobate anterior extension. Left mantle lobe large, with a triangular, tapered lobe posteriorly, expanded into a cephalic shield and fused with left shell lap anteriorly. Right shell lap fused with mantle lobe at lower margin and with left shell lap posteriorly.

Ovotestis of a few clusters of globular acini. Hermaphroditic duct long, convoluted. Talon, a blind spherical pouch on a short stalk embedded in albumen gland. Vas deferens arising as a highly convoluted, thin tube, descending to peni-oviducal angle, then ascending along penis as a straight narrow tube to enter a wider, muscular epiphallus. Flagellum long, vermiform. Epiphallus with a short, club-shaped caecum in its upper part, internally with longitudinal pilasters basally, becoming trans-

verse apically. Penis long, reflexed centrally; apical region with simple epiphallic pore and short, crowded, transversely elongate pustules that become less crowded in some areas, and a long, slender, lamellate pilaster; basal region with a sheath, internally with short, narrow, crowded, transverse pustules, tending to be more crowded centrally. Penial retractor inserting onto epiphallus at base of caecum. Free oviduct expanded, internally with axial thickenings that become transverse apically. Vagina short, with irregularly arranged, thin, longitudinal thickenings. Spermathecal stalk quite long, reservoir not attending albumen gland. Spermatophore as in *Eungarion*.

DISTRIBUTION. NE Queensland (Australia). 1 sp.

Cucullarion Stanisc, 1998

Fig. 1598

Stanisc, 1998: 597.

TYPE SPECIES — *Cucullarion parkini* Stanisc, 1998; OD.

Semislugs. Shell much reduced, almost plate-like, thin, glossy, with incomplete internal walls, of 2 3/8-2 7/8 whorls. Sculp-

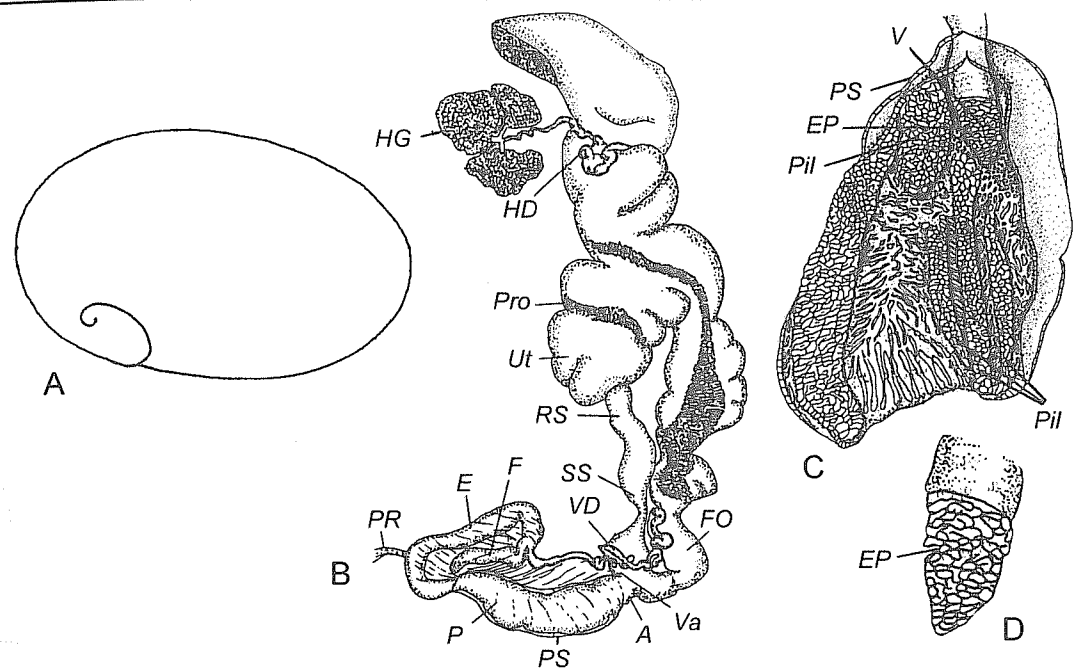


Fig. 1598. *Cucullarion parkini* Stanisc, 1998.
A — shell. B — reproductive tract. C — interior of penis. D — verge. After Stanisc, 1998.

ture obsolete. Height 1.95-3.25, diam. 14.94-15.58 mm.

Foot slender, tripartite. Caudal foss and horn very prominent.

Talon pear-shaped, with a short stalk. Vas deferens long, strongly convoluted. Flagellum moderately long. Epiphallus muscularised, bound to penis sheath by connective-tissue membrane, internally with several rows of longitudinally arranged, subrectangular pustules. Penis cylindrical, with a muscularised sheath for its entire length, internally with a long central, sculptured longitudinal pilaster and several narrower, sculptured axial pilasters; otherwise with low, irregularly shaped, sometimes subcircular (particularly apically) but generally elongate pustules and low, very narrow, longitudinal thickenings basally. Verge conic, corrugated, with lateral pore. Penial retractor inserting on epiphallus at about 1/3 of its length from penis. Free oviduct short, internally with transverse thickenings. Vagina extremely short, internally with transverse thickenings. Spermathecal stalk expanded, reservoir clavate, appressed to spermo-oviduct about 3/4 distance along its length from free oviduct.

DISTRIBUTION. SE Queensland (Australia). 1 sp.

Parmella H. Adams, 1867

Fig. 1599

Adams H., 1867: 308.

— ? *Dendrolamellaria* Preston, 1913b: 522 (t.-sp. *Dendrolamellaria mathewsi* Preston, 1913; OD).

TYPE SPECIES — *Parmella planata* H. Adams, 1867; monotypy.

Semislugs. Shell plate-like, thin, transparent, of 2-3 slightly convex whorls; basal part missing. Color whitish. Embryonic whorls smooth. Later whorls minutely radially striated. Aperture rounded or rounded-rectangular. Columellar margin strongly oblique, concave above. Height 15-16, diam. 15-19 mm (15.4 × 16.4 mm).

Hermaphroditic duct convoluted. Talon hidden. Vas deferens markedly convoluted, entering epiphallus subapically. Flagellum rather long, subcylindrical. Epiphallus consisting of 2 sections: somewhat swollen proximal, filled with milk-white fluid and cylindrical distal; boundary between them marked by attachment of finger-shaped cae-

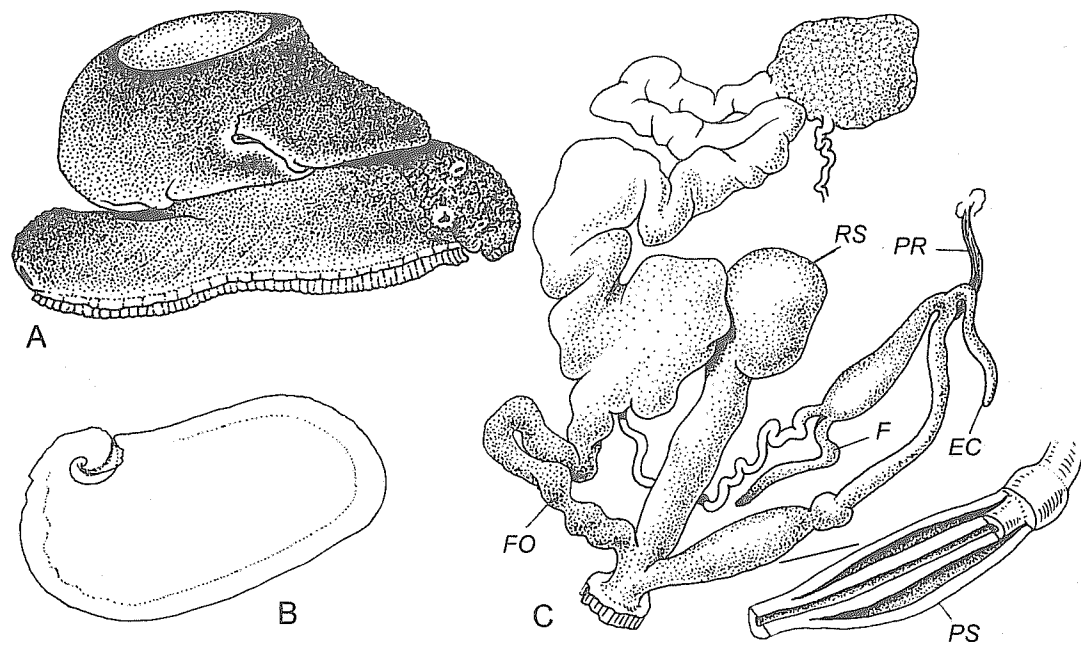


Fig. 1599. *Parmella planata* H. Adams, 1867. Fiji. A — external view. B — shell. C — reproductive tract and interior of penis. London.

cum. Penial retractor inserted at base of caecum. Penis comparatively short, with globular thickening at boundary with epiphallus, coated by rather thick sheath that attached at both ends. Penial tube narrow, internally without special sculpture. Free oviduct long, thick, sinuous. Vagina absent. Spermathecal stalk stout, straight, not long; reservoir subglobular, not attending albumen gland.

DISTRIBUTION. Fiji and Lord Howe Islands. 2 or 3 spp.

Urazirochlamys Habe, 1946
Fig. 1600

Habe, 1946: 200. Habe, 1957: 175 (as syn. of *Petalochlamys* Godwin-Austen, 1907).

TYPE SPECIES — *Hyalina doenitzii* Reinhardt, 1877; OD.

Shell depressed-conic, thin, shining, of 5-5.5 moderately convex whorls. Last whorl evenly rounded. Color yellowish. Embryonic and later whorls with close-set microscopic spiral striae; radial sculpture very weak, irregular. Aperture widely lunate, slightly oblique. Umbilicus dot-like. Height 3.5-3.7, diam. 6.4-7.0 mm (3.7 × 6.4 mm).

Vas deferens thin, entering epiphallus apically. Flagellum wanting. Epiphallus short. Small caecum located on penis/epiphallus junction. Penial retractor attached to apex of flagellum. Penis long, slender. Free oviduct moderately long, surrounded by perivaginal gland. Vagina very short. Spermatheca somewhat rudimentary, clavate, without clear division into stalk and reservoir.

DISTRIBUTION. Japan. 1 sp.

Petalochlamys Godwin-Austen, 1907
Fig. 1601

Godwin-Austen, 1907: 212. Baker, 1941: 264 (? syn. of *Pseudhelicarion*).

TYPE SPECIES — *Macrochlamys formosana hypograpta* "Pilsbry et Hirase" sensu Godwin-Austen, 1907 (= *Macrochlamys formosana* Schmacker et Boettger, 1891); OD.

Shell depressed, very thin, shining, transparent, of 5-5.5 slightly convex whorls. Color light yellowish-corneous. Embryonic whorls smooth. Postnuclear sculpture of delicate spiral striation below suture; periphery glabrous, base again spirally stri-

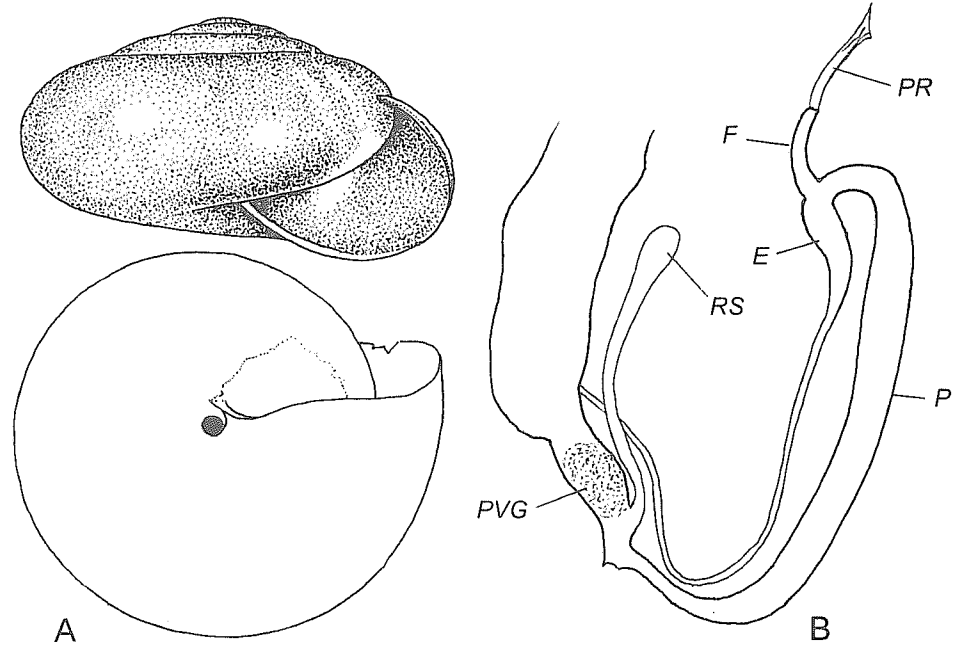


Fig. 1600. *Urazirochlamys doenitzii* (Reinhardt, 1877). A — shell: Jado, Kitayama-Kyo, Kii Prov. Basel No. 9114-b. B — reproductive tract. After Habe, 1957.

ated. Aperture ovate, slightly oblique. Umbilicus narrowly open. Height 7-8, diam. 14.5-15.5 mm (8.0 × 14.8 mm).

Sole tripartite. Caudal foss well developed, caudal horn vestigial.

Vas deferens entering epiphallus apically at base of flagellum. Flagellum slender, short; vermiform. Epiphallus consisting of 2 sections: inner surface of fusiform proximal section covered with numerous, small, close-set papillae and bears a strong axial pilaster; distal section internally with somewhat larger papillae. On boundary between these sections a small, tuberculiform caecum situated, to which penial retractor attached. Lumen of epiphallus separated from lumen of penis by a strong sphincter. Penis rather long, surrounded by muscular sheath; internally with strong axial pilasters covered with same papillae as in epiphallus. Free oviduct long. Vagina absent. Spermathecal stalk rather short, with thick, muscular walls, protruding into reservoir through a conic papilla; reservoir voluminous, with extremely thin, transparent walls.

DISTRIBUTION. Taiwan, ? Bismarck Archipelago. 2-4 spp.

PAPUARIONINAE
Schileyko, subfam. nov.

Type genus — *Papuarion* Van Mol, 1973.

Semislugs or slugs. Shell vitrinoid or plate-like.

Flagellum absent. Epiphallus very short or absent, without cryptae in its walls. Epiphallic caecum missing. Penis short, bulky, internally with verge or a large stimulator. Penial retractor attached to epiphallus or penis/vas deferens junction. Sarcobelum absent.

DISTRIBUTION. New Guinea and Vietnam.

REMARK. Two genera included in Papuarioninae differ from Helicarioninae by the shortened distal male loop and by the negative characters (absence of both flagellum and caecum). At the same time they markedly differ from each other (see diagnoses of the tribes), thus, they perhaps have different origin, all the more they have quite different ranges. At the moment it is impossible to say if the absence of accessory organs is an initial state or the result of secondary disappearance.

Papuarionini Schileyko, trib. nov.

Shell external, vitrinoid.
Epiphallus short. Penis internally with verge of complex structure having apical pore. Penis sheath well developed.
DISTRIBUTION. New Guinea.

***Papuarion* Van Mol, 1973
Fig. 1602**

Van Mol, 1973: 224.

TYPE SPECIES — *Papuarion novaguineae* Van Mol, 1973; monotypy.

Shell somewhat vitrinoid, thin, of about 3.5 flattened whorls.

Vas deferens comparatively short, entering very short epiphallus. Epiphallus internally with longitudinal fleshy pilaster covered with numerous small papillae. Penis bulky, with muscular sheath; upper edge of sheath connected with epiphallus by muscular band. Internally penis with delicate, close-set, transverse grooves and a strong axial pilaster; epiphallus opens into penis on top of subglobular verge whose orifice has complex shape. Penial retractor attached to epiphallus. Free oviduct long, stout; vagina almost missing. Spermathecal stalk moderately long, entering enlarged atrium. Reservoir irregularly ovate.

DISTRIBUTION. New Guinea. 1 sp.

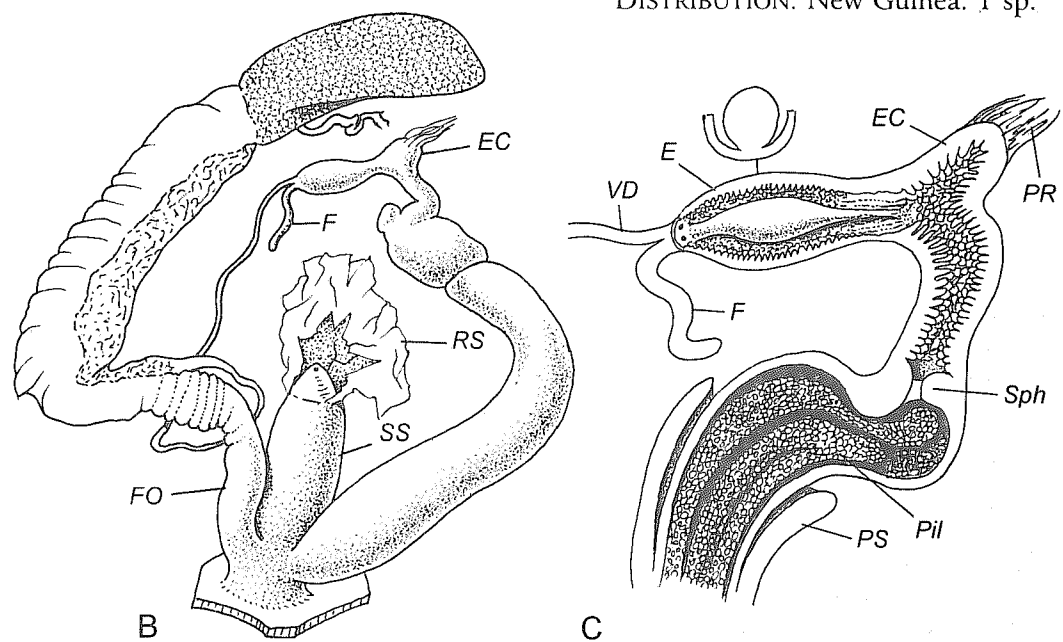
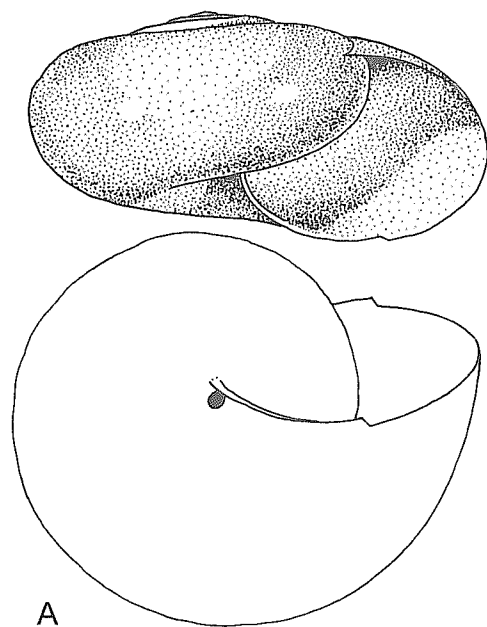


Fig. 1601. *Petalochlamys formosana* (Schmacker et Boettger, 1891).
A — shell: Taiwan. Paris. B, C — Suisha, Formosa [Taiwan], June 2, 1934. B — reproductive tract. C — interior of epiphallus and penis. Phil. No. A-13934.

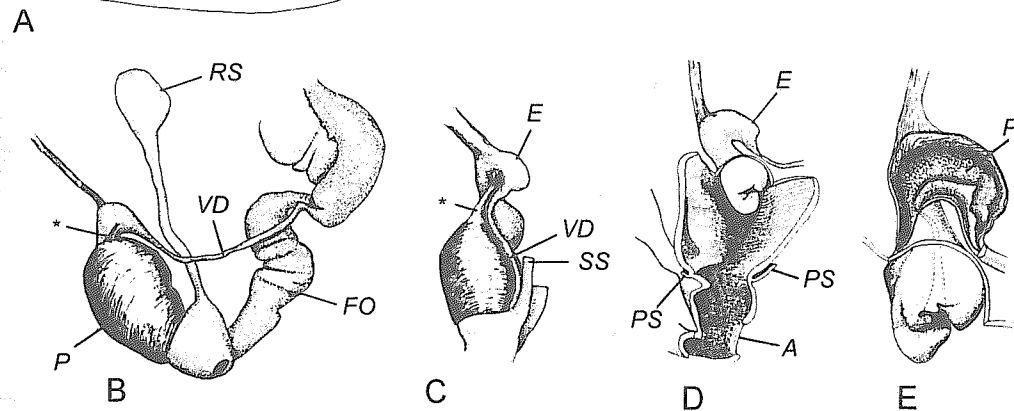
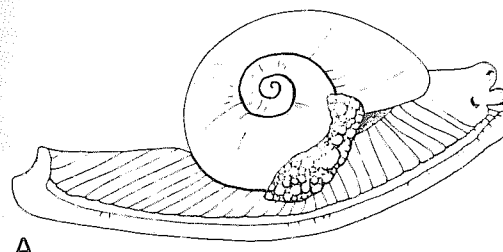


Fig. 1602. *Papuarion novaguineae* Van Mol, 1973.
A — external view of animal. B — distal section of reproductive tract. C — penis from other side. D — interior of penis. E — interior of epiphallus. After Van Mol, 1973. Asterisk — muscular band between penis sheath and epiphallus.

Laocaini Schileyko, trib. nov.

Type genus — *Laocaina* Kuzminykh, 1999.

Shell internal, plate-like.
Epiphallus absent. Penis internally with a large conic stimulator with basal pore. Penis sheath absent.

DISTRIBUTION. N Vietnam.

***Laocaina* Kuzminykh, 1999
Fig. 1603**

Kuzminykh, 1999: 47.

TYPE SPECIES — *Laocaina attenuata* Kuzminykh, 1999; OD.

Slugs. Shell very thin, non-spiral, internal.

Jaw without median projection.
Caudal foss rather small, caudal horn small, hooked.

Talon hidden. Carefour elongate, exposed. Vas deferens unusually short, stout, entering penis almost apically through a simple pore. Epiphallus as such absent. Penis short, bulky, internally with a large, conic stimulator at pore of vas deferens. In-

ner surface of penis and surface of stimulator with numerous tubercles. Free oviduct rather long. Vagina absent. Spermathecal stalk short and stout or moderately long and slender, entering atrium between penis and free oviduct.

DISTRIBUTION. N Vietnam. 2 spp.

UROCYCLINAE Simroth, 1889

Simroth, 1889: 62 (pro fam.).

Slugs. Shell plate-like, completely covered by mantle.

Flagellum drop-shaped, (very) small. Epiphallus without cryptae in its walls. Epiphallic caecum moderate to very long. Penis internally with variously developed verge. Penial retractor attached below base of caecum. Sarcobelum present or absent.

DISTRIBUTION. Africa, Madagascar, Mascarene Islands.

Atoxonini Schileyko, trib. nov.

Type genus — *Atoxon* Simroth, 1888.
Sarcobelum or atrial appendix absent.

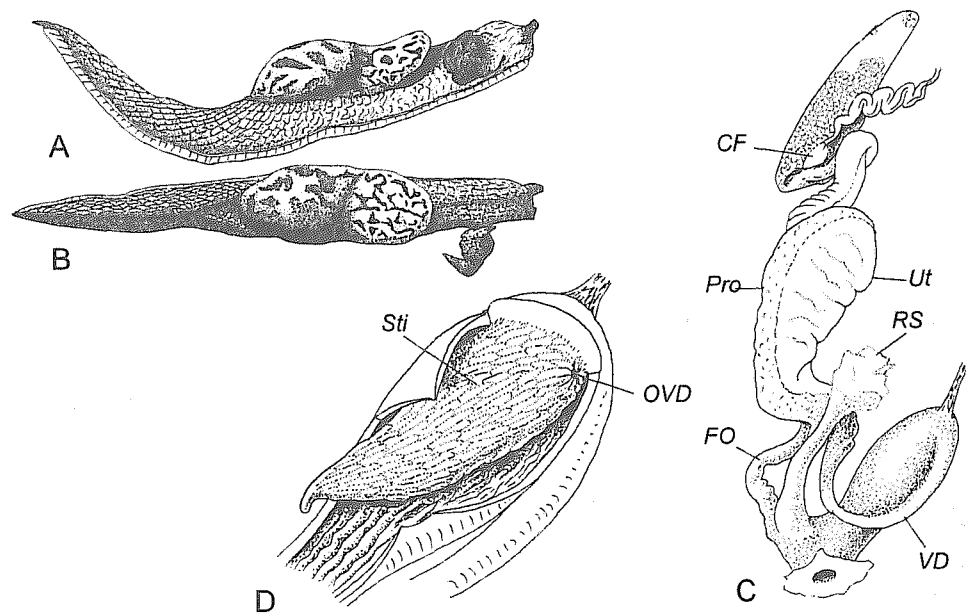


Fig. 1603. *Laocaia attenuata* Kuzminykh, 1999. N Vietnam, Lao Cai Prov., Sa Pa District, Fan Si Pan massif, 5 km SW of Sa Pa town, 1900-2000 m above sea level, November 30, 1996. A, B — external view of animal (from right side and from above). C — reproductive tract. D — interior of penis. Holotype. Moscow No. Lc-23419.

DISTRIBUTION. Africa.

Phaneroporos Simroth, 1888
Fig. 1604

Simroth, 1888: 88; Van Goethem, 1977: 190.

TYPE SPECIES — *Phaneroporos reinhardti* Simroth, 1888; monotypy.

Epiphallus rather long, thin, its diameter almost equal to that of vas deferens. Epiphallic caecum comparatively short, finger-shaped. Penis voluminous, bulky, internally with thin, weak axial folds. Penis proper entering prepuce by a flexible stylet (derivative of verge?) which is concave on one side and convex on the other side. Penis sheath very thick, muscular, attached at both ends. Penial retractor inserted on upper half of penis. Free oviduct long, swollen in lower portion. Vagina very short. Spermatheca sleeve-like, with short stalk and elongate reservoir. Spermatophore smooth except for 1 tiny tubercle that marks border between capsula and tail part.

DISTRIBUTION. SE Africa (Tanzania, Zambia). 1 sp.

Atoxonooides Van Goethem, 1973
Fig. 1605

Van Goethem, 1973: 1; 1977: 160.

TYPE SPECIES — *Atoxon meridionalis* Forcart, 1967; 0D.

Shell plate-like, more or less bilaterally symmetrical. Apex circular, median in position. Tail of cephalopodium long. Visceral organs penetrate tail up to its end.

Epiphallus moderately long, with vermiform caecum. Penis short, bulky, internally with simple or tubercular verge which has double walls. Penis sheath thin, coating penis and very distal part of epiphallus. Penial retractor attached to epiphallus close to penis. Free oviduct and vagina long to short. Atrial appendix vestigial or absent. Atrium, base of penis and vagina provided with many thin retractors; besides, there is a pair of rather strong vaginal retractors. A minute vaginal appendix may be present. Shaft of spermatheca not long, reservoir rather small, attending about middle of spermoviduct.

DISTRIBUTION. SE Africa (KwaZulu-Natal and eastern highlands of Zimbabwe). 3 spp.

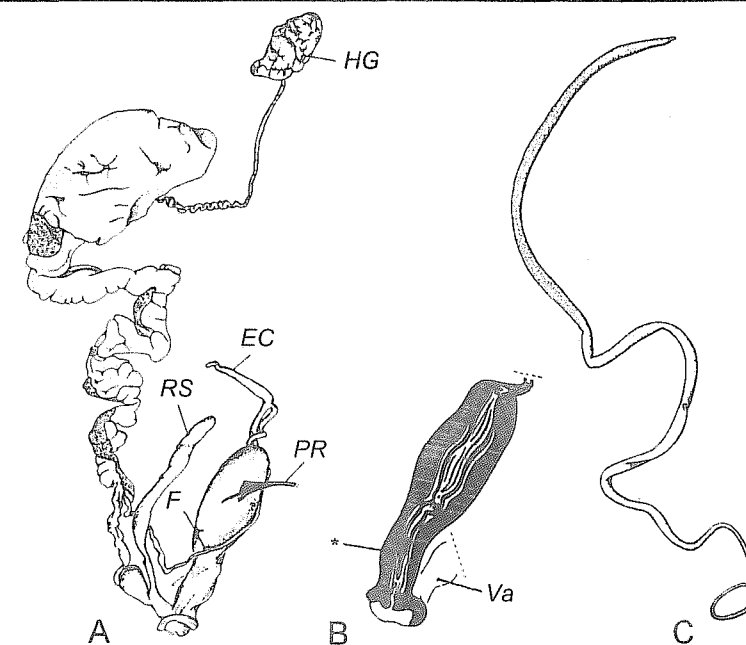


Fig. 1604. *Phaneroporos reinhardti* Simroth, 1888. A — reproductive tract. B — interior of penis. C — spermatophore. After Van Goethem, 1977. Asterisk — stylet in penis.

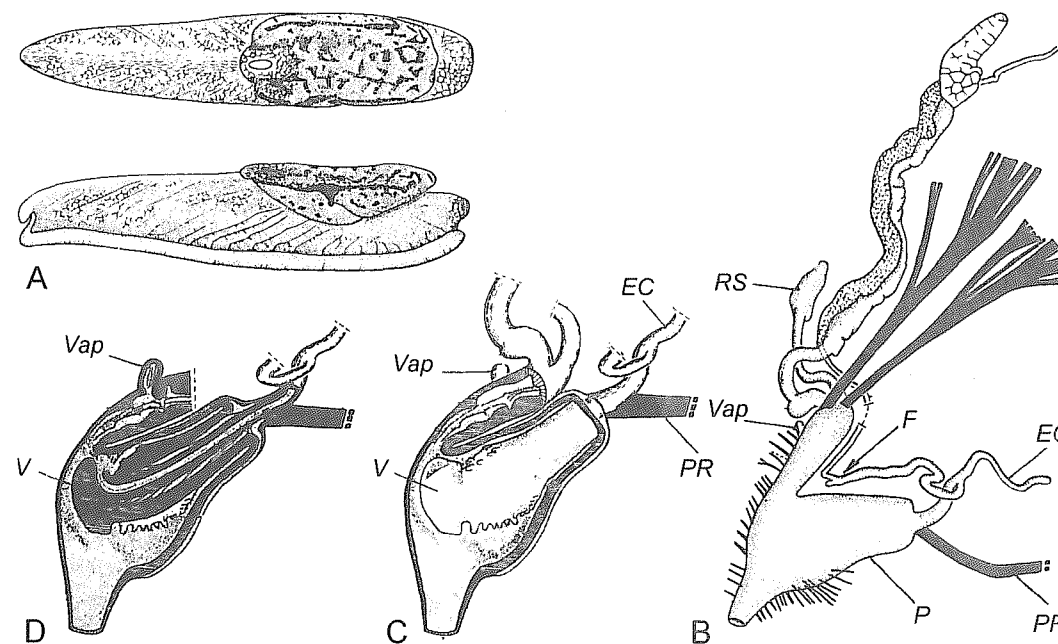


Fig. 1605. ! *Atoxonooides aberrans* Van Goethem, 1973. A — external view of animal. B — reproductive tract. C — interior of penis. D — sagittal section of penis and vagina. After Van Goethem, 1973.

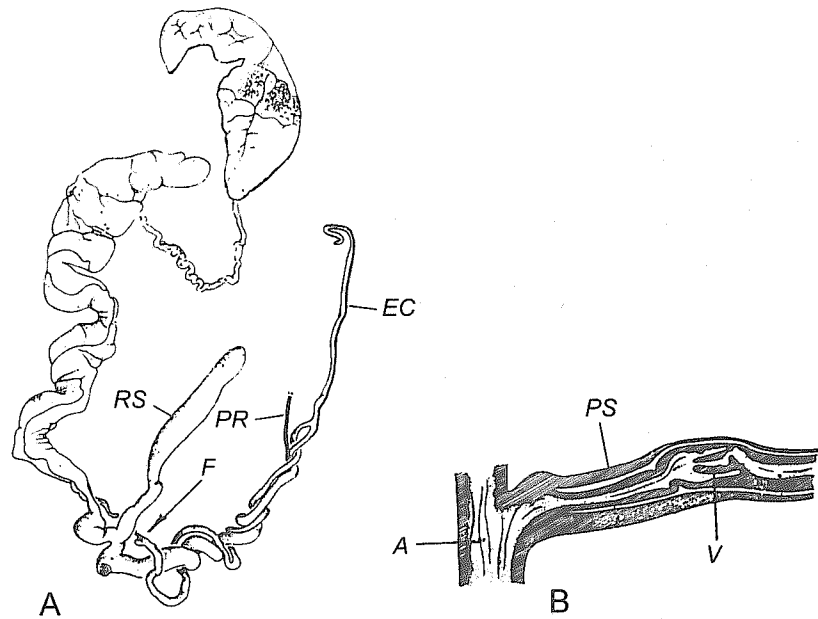


Fig. 1606. *Atoxon hildebrandti* Simroth, 1889.
A — reproductive tract. B — longitudinal section of penis. After Van Goethem, 1977.

Atoxon Simroth, 1888
Fig. 1606

Simroth, 1888: 87.

— ? *Parmarionopsis* Piersanti, 1941: 263 [*Urocyclus* subg.; t.-sp. *Urocyclus* (*Parmarionopsis*) *elbannoensis* Piersanti, 1941; monotypy].

Van Goethem, 1977: 132.

TYPE SPECIES — *Atoxon hildebrandti* Simroth, 1889; SD Pilsbry, 1919.

Vas deferens comparatively short. Epiphallus long, with long, slender caecum. Penis long, thin, internally with rather small verge. Penis sheath rather thick. Penial retractor attached to lower part of epiphallus. Free oviduct not long, vagina short. Tail of spermatophore with delicate keels which rarely minutely denticulated.

DISTRIBUTION. E Africa (Somalia, Ethiopia, Kenya, Uganda, Tanzania, Zaïre). About 10 spp.

REMARK. Both species mentioned by Simroth (1888) under "*Atoxon* n. sp." [sic!] (*A. hildebrandti* Simroth & *A. schulzei* Simroth) are *nomina nuda*, i.e. formally the genus *Atoxon* has been established without nominal species included. In 1889, Simroth gave the descriptions of these species. Pilsbry (1919: 287) has designated *Atoxon hildebrandti* Simroth as the type species, despite the species had been de-

scribed one year later than the genus. Nevertheless, this designation is valid, according to the ICZN Art. 67.2.2.

Pseudatoxon Van Goethem, 1975
Fig. 1607

Van Goethem, 1975b: 863; 1977: 157.

TYPE SPECIES — *Atoxon fasciatum* Verdcourt, 1965; OD.

Vas deferens rather short. Epiphallic caecum quite long. Penis very short, containing short, wide, thick-walled verge which enters atrium. Penis sheath thin, surrounds penis and basal part of epiphallus. Penial retractor inserting on distal portion of epiphallus. Free oviduct rather short, expanded in middle; vagina somewhat shorter. Atrium large, swollen, with numerous retractors. Spermatophore with rows of minute denticles occupying most part of middle section and tail.

DISTRIBUTION. Tanzania. 1 sp.

Pembatoxon Van Goethem, 1975
Fig. 1608

Van Goethem, 1975a: 207.

TYPE SPECIES — *Pembatoxon insulare* Van Goethem, 1975; OD.

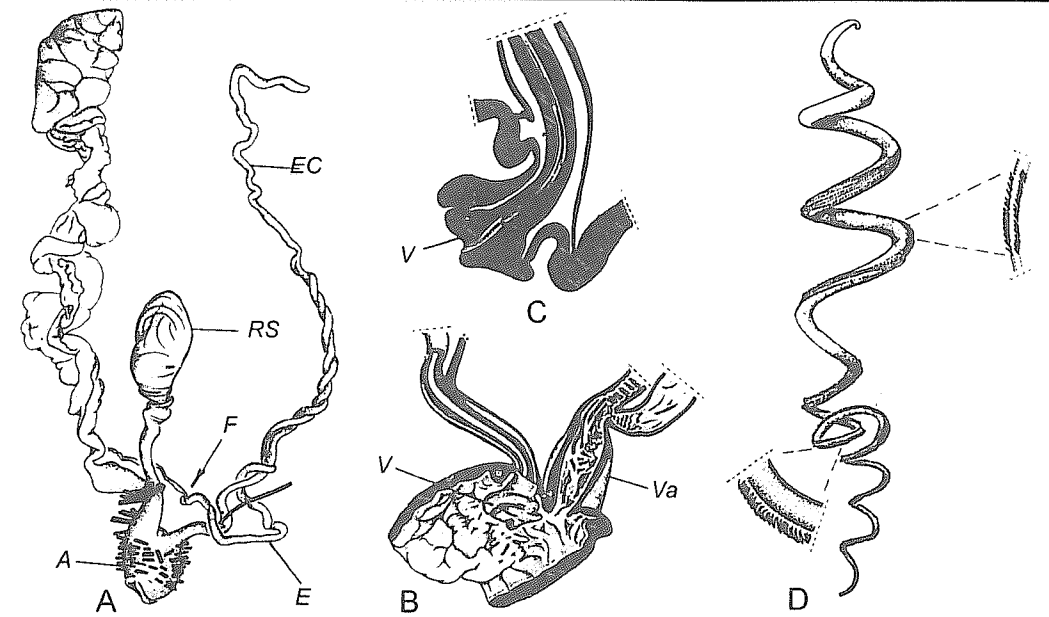


Fig. 1607. *Pseudatoxon fasciatum* (Verdcourt, 1965).
A — reproductive tract. B — interior of atrium, penis and vagina. C — longitudinal section of distal part of penis. D — spermatophore and its fragments. After Van Goethem, 1977.

Vas deferens comparatively short. Epiphallus long, coiled around penis, with a long, tubular caecum. Penis long, spirally coiled, internally with a short verge at basal end. Penis sheath coating lower part of the organ. Penial retractor attached to upper end of sheath. Free oviduct rather long, swollen basally. Vagina almost absent. Atrium well developed, with numerous retractors. Spermatheca sleeve-like, without distinct division into stalk and reservoir. Spermatophore spirally coiled, its outer side with 4-5 irregular rows of forwardly directed scaly spines over about its whole length; tail very short.

DISTRIBUTION. Pemba Island (E Africa). 1 sp.

Microcyclus Simroth, 1896
Fig. 1609

Simroth, 1896: 303. Van Goethem, 1977: 194.

TYPE SPECIES — *Microcyclus baumanni* Simroth, 1896; monotypy.

Epiphallus long, slender. Epiphallic caecum very long, entering penis through a tiny verge. Penis short, internally with weak axial folds. Penis sheath covers penis and distal portion of epiphallus. Penial retractor

inserting on lower part of epiphallus. Free oviduct moderately long, vagina markedly shorter, a small appendix situated on vagina and supplied with a few retractors. Spermathecal stalk not long, reservoir lies on basal part of spermoviduct. Spermatophore with tiny denticles on tail part.

DISTRIBUTION. W Africa (Côte d'Ivoire, Togo, Nigeria). 1 sp.

Atrichotoxon Simroth, 1910
Fig. 1610

Simroth, 1910: 605. Van Goethem, 1977: 205.

TYPE SPECIES — *Atrichotoxon punctatum* Simroth, 1910; monotypy.

Flagellum somewhat larger than in related genera. Epiphallus coiled around penis. Epiphallic caecum long, vermiform. Penis short, with rather small verge. Penis sheath surrounds penis and distal part of epiphallus, attached at both ends. Free oviduct moderately long. Vagina somewhat longer, swollen, thick-walled, its inner surface covered with numerous rounded tubercles. Spermatheca with very short shaft and irregularly elongated-ovate reservoir.

DISTRIBUTION. E Africa (Kenya, Tanzania). 2-3 spp.

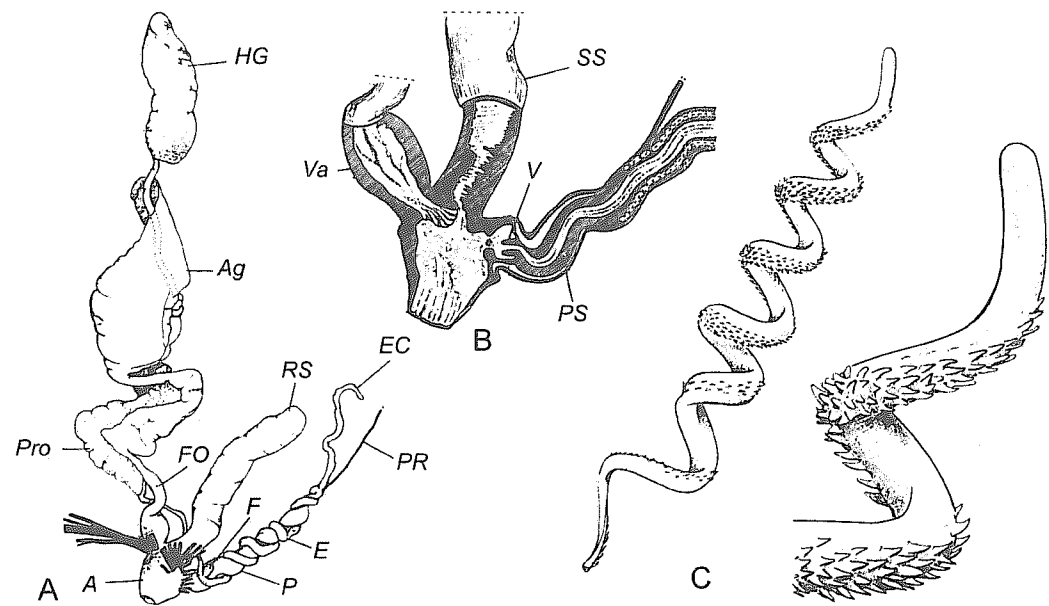


Fig. 1608. *Pembatoxon insulare* Van Goethem, 1975.
A — reproductive tract. B — interior of distal part of genitalia. C — spermatophore. After Van Goethem, 1975a.

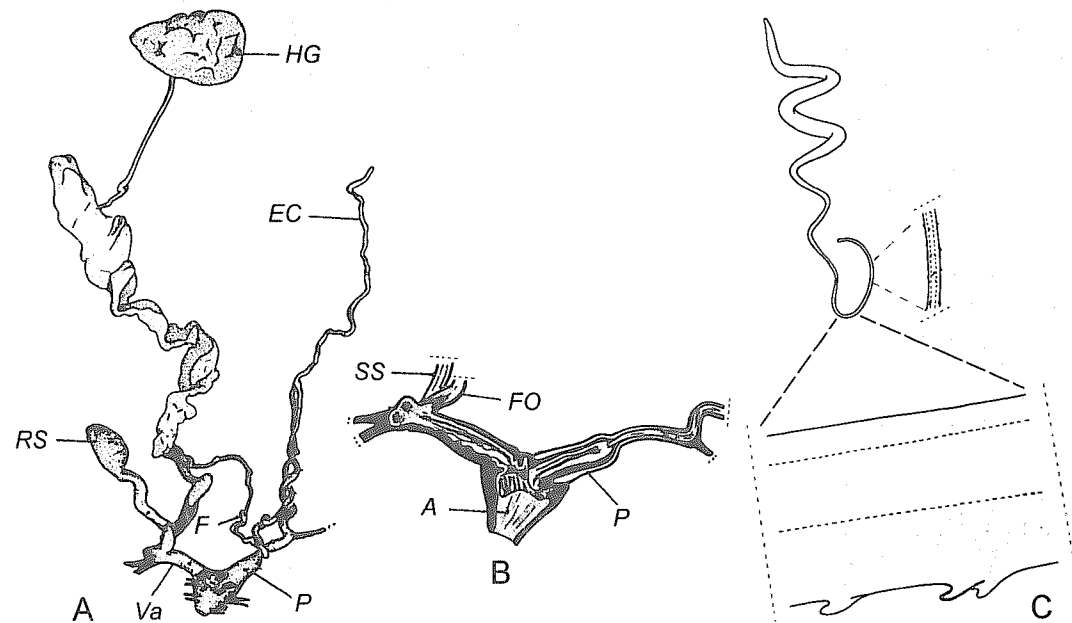


Fig. 1609. *Microcyclus baumanni* Simroth, 1896.
A — reproductive tract. B — interior of distal portion of genitalia. C — spermatophore and its fragments. After Van Goethem, 1977.

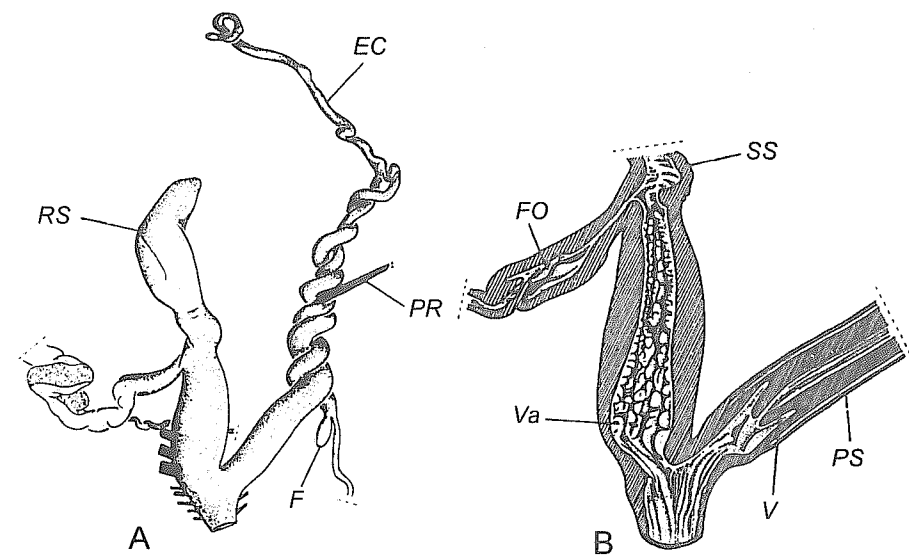


Fig. 1610. ! *Atrichotoxon usambarense* (Verdcourt, 1961).
A — distal part of reproductive tract. B — interior of penis, free oviduct and vagina. After Van Goethem, 1977.

Buettneriini Schileyko, trib. nov.

Type genus — *Buettneria* Simroth, 1888.
Atrium with appendix lacking calcareous elements.

DISTRIBUTION. Tropical Africa.

***Elisolimax* Cockerell, 1893**

Fig. 1611

Cockerell, 1893: 187, 205 (nom. nov. pro *Elisa* Heynemann, 1882).

— *Phosphorax* Mörch, 1867: 255 (non Webb et Berthelot, 1833; nom. inquirendum).

— *Aspidoporus* Martens, 1879: 736 (nom. praeocc., non Fitzinger, 1833; t.-sp. *Aspidoporus fasciatus* Martens, 1879; OD).

— *Elisa* Heynemann, 1882: 180 (nom. praeocc., non Gray, 1855 (Aves); t.-sp. *Elisa bella* Heynemann, 1882; monotypy).

— ? *Kirkia* Pollonera, 1909: 192 (t.-sp. *Kirkia flavescens* Pollonera, 1909; monotypy).

— *Urocyclina* Dupouy, 1965: 267 [*Urocyclus* subg.; t.-sp. *Urocyclus (Urocyclina) subcarinata* Dupouy, 1965; OD].

Van Goethem, 1977: 210.

TYPE SPECIES — *Elisa bella* Heynemann, 1882; monotypy.

Vas deferens rather short. Epiphallic caecum moderately to quite long. Penis long,

with a small, simple, sphincter-like verge. Penis and vagina enter atrium on one side, penis above vagina. Free oviduct more or less swollen. Atrial appendix (diverticle) greatly developed, supplied with several smaller lateral and a strong apical retractors. Internally appendix with 2 elevated, corrugated axial folds; its head ovoid, with thin, circular folds. Spermathecal stalk short, subglobose reservoir reaching very base of spermoviduct. Spermatophore smooth or with 2-4 thin keels.

DISTRIBUTION. E and SE Africa, Madagascar (with Nossi-Bé and Nossi-Comba Islands), Comoro Islands. 15-18 spp.

***Nuphus* Van Goethem, 1975**

Fig. 1612

Van Goethem, 1975b: 866; 1977: 245.

TYPE SPECIES — *Nuphus improvisus* Van Goethem, 1975; OD.

Flagellum tiny. Epiphallic caecum long. Penis subcylindrical, slender, internally with a massive verge. Free oviduct long, vagina extremely short. Atrial appendix (diverticle) elongated, supplied with apical and few smaller lateral retractors, internally with 2 or more high, lamellar pilasters which fused distally; inner

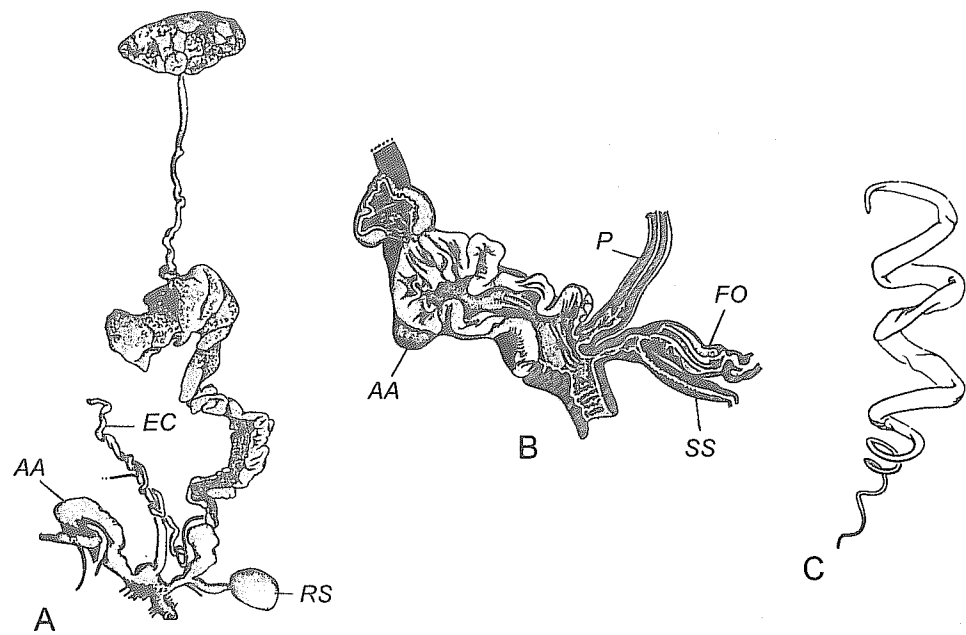


Fig. 1611. *Elisolimax bella* (Heynemann, 1882).
A — reproductive tract. B — interior of distal parts of genitalia. C — spermatophore. After Van Goethem, 1977.

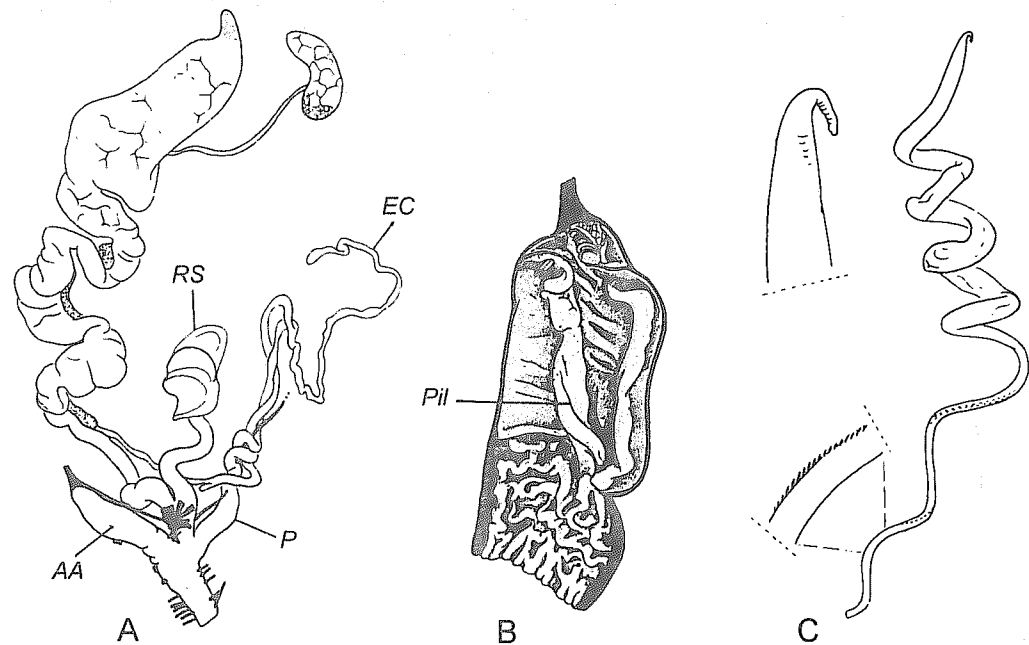


Fig. 1612. *Nuphus improvisus* Van Goethem, 1975.
A — reproductive tract. B — interior of atrial appendix. C — spermatophore and its fragments. After Van Goethem, 1977.

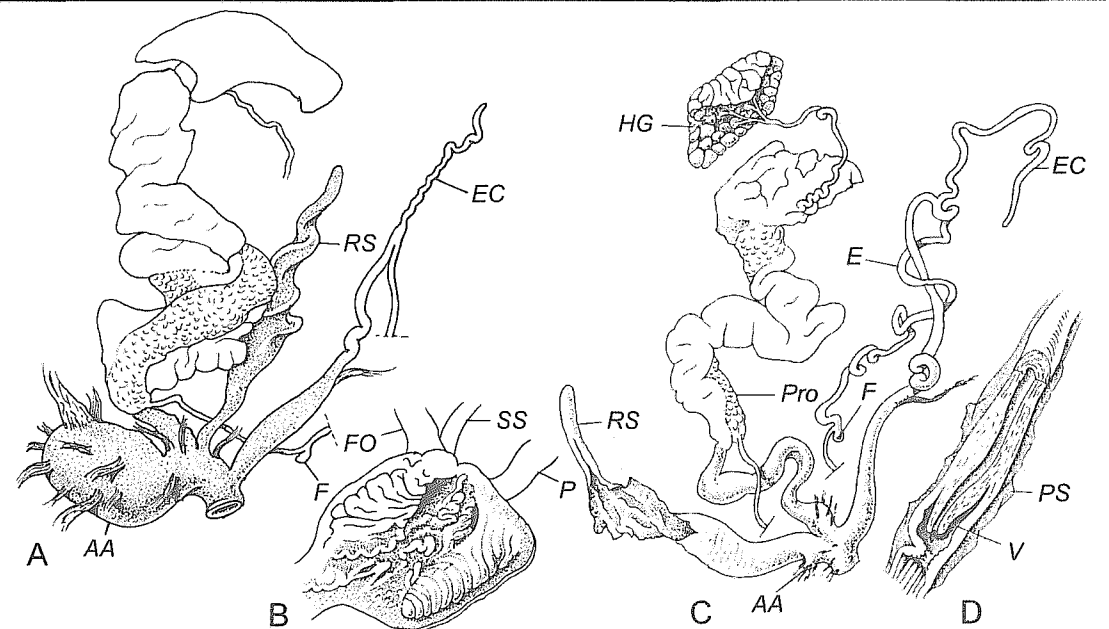


Fig. 1613. A, B — *Bukobia picta* Simroth, 1895.
"Tanzanie, Ile Bussiru près de Bukoba, arbuste. VIII.1908". Neotype. A — reproductive tract. B — interior of atrial appendix. Geneva No. 1490/78. C, D — ! *Bukobia splendens* Van Goethem, 1975. "Zaire, Urwald hinter Randbergen b. Tanganika (NW Ufer), 1800-2200 m, IV.1910". Holotype. C — reproductive tract. D — longitudinal section of penis. Vienna No. 47985.

surface of basal chamber of appendix with many corrugated folds. Spermathecal stalk rather stout, reservoir very thin-walled, embedded in middle portion of spermoviduct. Spermatophore with rows of minute denticles directed to its head.

DISTRIBUTION. E Africa (Zaire, Zambia). 4 spp.

Bukobia Simroth, 1895

Fig. 1613

Simroth, 1895: 11 (nom. nov. pro *Stuhlmannia* Simroth, 1893).

— *Stuhlmannia* Simroth, 1893: 59 (nom. praeocc., non Michaelsen, 1890; t.-sp. "*Stuhlmannia* n. sp.").

— *Bucobia* Heynemann, 1906: 38 (nom. err. pro *Bukobia* Simroth, 1895).

— *Mesocyclus* Pollonera, 1906: 1 [*Urocyclus* subg.; t.-sp. *Urocyclus* (*Mesocyclus*) *zonatus* Pollonera, 1906; monotypy].

— *Microcyclus* Pollonera, 1906: 3 (part.; non Simroth, 1906).

Van Goethem, 1977: 166.

TYPE SPECIES — *Bukobia picta* Simroth, 1895; monotypy.

Vas deferens rather short. Epiphallus

very long. Penis moderately long, subcylindrical, internally with conic verge occupying upper chamber of penis which separated from lower chamber by variously developed sphincter; inner surface of lower chamber with few axial folds. Atrial appendix variously developed, without apical retractor, although there are several minor retractors. Apical portion of appendix not differentiated into pouch. Spermathecal stalk moderately long. Spermatophore with 1 or 2 axial filiform keels in posterior end, lacking spines.

DISTRIBUTION. E Africa (Zaire, Rwanda, Burundi, Uganda, Kenya, Tanzania, Malawi). 10 spp.

Buettneria Simroth, 1888

Fig. 1614

Simroth, 1888: 87 [non Karsch, 1889 (Orthoptera)].

— *Buettnerella* Simroth, 1910: 611 (nom. nov. pro *Buettneria* Simroth, 1888).

Van Goethem, 1977: 199.

TYPE SPECIES — *Buettneria leuckarti* Simroth, 1888; monotypy.

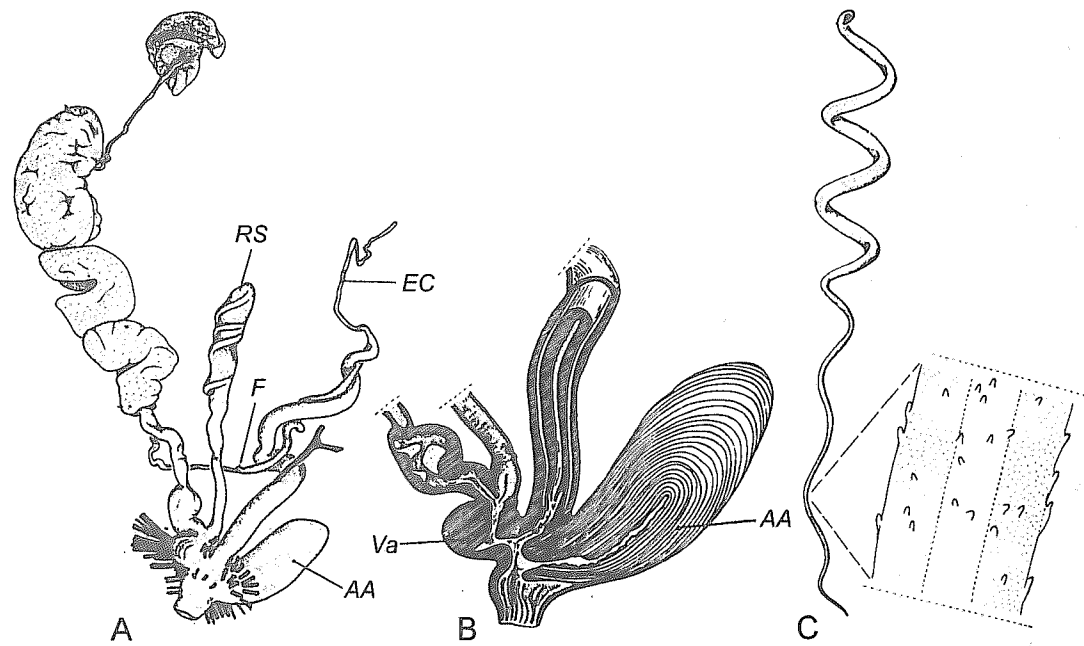


Fig. 1614. ! *Buettneria garambaensis* Van Goethem, 1975.
A — reproductive tract. B — interior of distal part of genitalia. C — spermaphore and its fragment. After Van Goethem, 1977.

Flagellum tiny. Epiphallus comparatively short, thick-walled, with a very narrow lumen. Epiphallic caecum moderately long, slender. Penis short, internally with a minute verge. Penis sheath thick. Free oviduct long, somewhat swollen distally; this enlarged chamber separated from proximal part by a sphincter and contains a few short, transversal folds. Vagina small, thick-walled. Atrial appendix large, muscular, lacking apical retractor, with very narrow lumen, internally with a short papilla. Spermaphore with tiny, scattered denticles on tail part.

DISTRIBUTION. Africa (Angola, Zaïre). 3 spp.

Urocyclini Simroth, 1889

Atrium with sarcobelum containing calcareous elements.

DISTRIBUTION. Africa.

Urocyclus J. Gray, 1864 Fig. 1615

Gray J., 1864: 250.

— *Spirotoxon* Simroth, 1897: 149 (t.-sp. *Spirotoxon elegans* Simroth, 1897; monotypy).

Van Goethem, 1977: 285.

TYPE SPECIES — *Urocyclus kirki* J. Gray, 1864; monotypy.

Vas deferens moderately long. Epiphallus slender, comparatively short. Penis thin, internally with a very small verge. Free oviduct much longer than vagina. Sarcobelum large, lacking retractors, containing 1 large, smooth dart and 1 or 2 dart papillae. Spermathecal shaft rather long, slender; ovate reservoir attending upper half of spermoviduct. Spermaphore with more or less distinctly defined ampulla and very long tail bearing a few rows of tiny denticles.

DISTRIBUTION. E Africa, from Ethiopia to Natal. 3 spp.

Anisotoxon Van Goethem, 1975 Fig. 1616

Van Goethem, 1975b: 869; 1977: 282.

TYPE SPECIES — *Anisotoxon deconincki* Van Goethem, 1975; OD.

Epiphallus quite long, coiled around penis. Epiphallic caecum long, slender. Penis tubular, internally with a small simple verge. Prepuce of penis lacking spines. Penis sheath thick. Sarcobelum large, with nume-

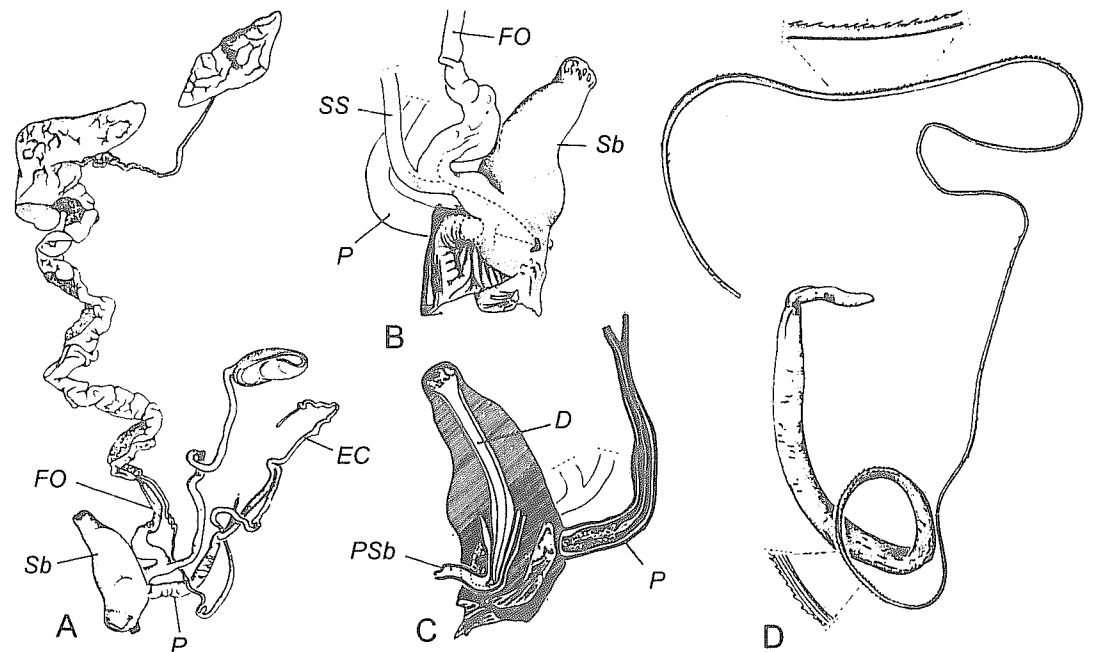


Fig. 1615. *Urocyclus kirki* J. Gray, 1864.
A — reproductive tract. B — distal parts of genitalia. C — longitudinal section of distal parts of genitalia. D — spermaphore and its fragments. After Van Goethem, 1977. D — dart.

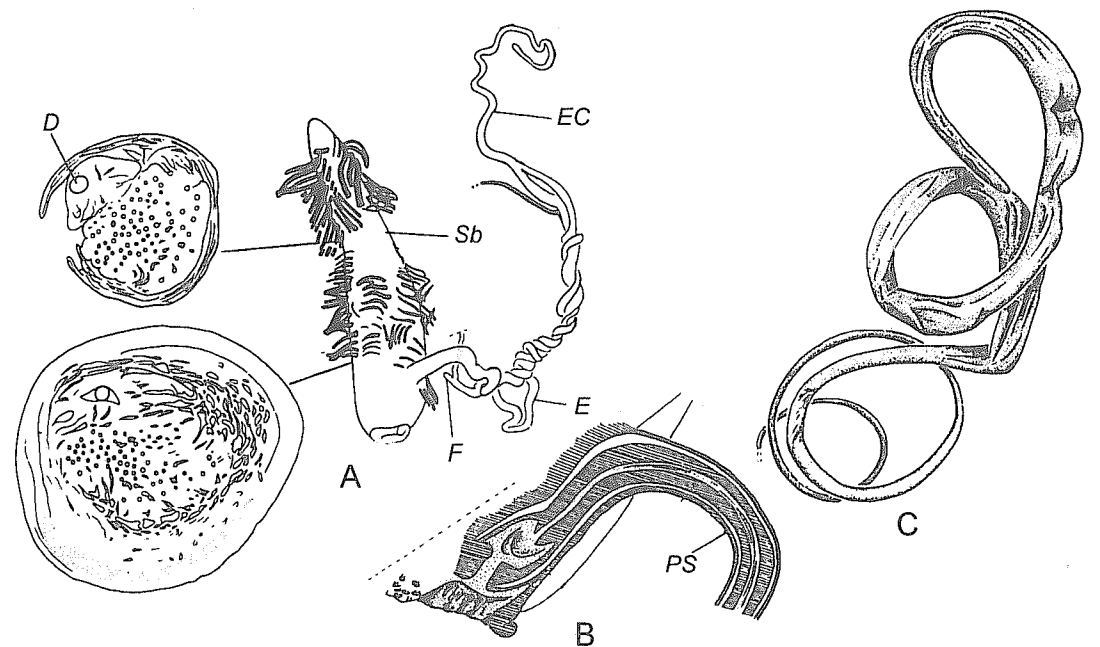


Fig. 1616. *Anisotoxon deconincki* Van Goethem, 1975.
A — distal parts of reproductive tract and cross-sections through sarcobelum. B — longitudinal section of penis. C — spermaphore. After Van Goethem, 1977.

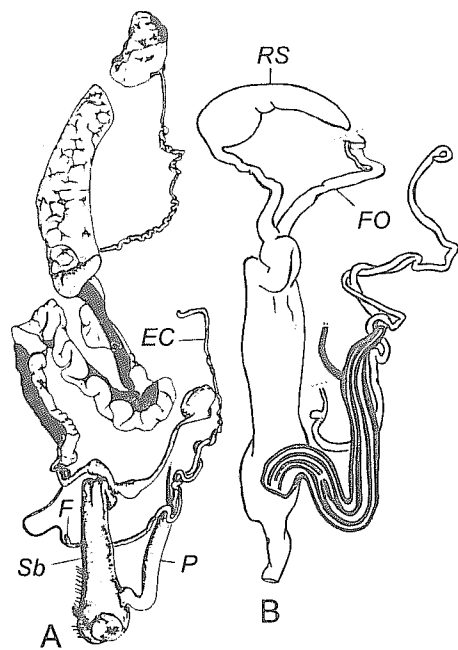


Fig. 1617. *Trichotoxon heynemanni* Simroth, 1888. A — reproductive tract. B — distal part of the same, with longitudinal section of penis. After Van Goethem, 1977.

rous retractors, entering atrium, containing 1 large and more than 70 minute calcareous darts. Spermatophore without spines or denticles.

DISTRIBUTION. Tanzania. 1 sp.

Trichotoxon Simroth, 1888
Fig. 1617

Simroth, 1888: 87.

— *Diplotoxon* Simroth, 1897: 150 [*Trichotoxon* subg.; t.-sp. *Trichotoxon (Diplotoxon) heynemanni* Simroth, 1888; monotypy].

— *Dendrotoxon* Pollonera, 1911: 332 [*Trichotoxon* subg.; t.-sp. *Trichotoxon (Dendrotoxon) keniense* Pollonera, 1911; SD Verdcourt, 1961].

Van Goethem, 1977: 267.

TYPE SPECIES — *Trichotoxon heynemanni* Simroth, 1888; SD Pilsbry, 1919.

Vas deferens comparatively short. Epiphallus longer, with slender, vermiform caecum. Penis short, internally with a rather small verge. Penis sheath thin, surrounds penis and distal section of epiphallus. Penial retractor attached to epiphallus close to upper edge of sheath. Free oviduct not long,

swollen basally. Atrium transformed into a paired sarcobelum ("sac du dard", after Van Goethem, 1977) composed of 2 elongated sacs; each sac contains 2 calcareous darts. Vagina short, entering upper part of sarcobelum. Spermathecal stalk slender, somewhat expanded in lower part, reservoir scarcely attends middle of spermoviduct.

DISTRIBUTION. Equatorial E Africa (Kenya, Tanzania, Pemba Island, Uganda, Zaïre). 3 spp.

Polytoxon Simroth, 1897
Fig. 1618

Simroth, 1897: 149 (*Trichotoxon* subg.). Van Goethem, 1977: 255.

TYPE SPECIES — *Trichotoxon (Polytoxon) aurantiacum* Simroth, 1897 (= *Trichotoxon robustum* Simroth, 1896); monotypy.

Vas deferens very thin, moderately long. Epiphallus very long, much convoluted in distal part, entering short penis through a large verge. Epiphallic caecum long, slender. In walls of penis there are many narrow holes containing calcareous needles; I observed that some needles penetrate walls of verge by their sharp points. Penial retractor weak, inserting on epiphallus. Free oviduct rather long, convoluted. Vagina very short. Spermathecal stalk rather long, with poorly defined reservoir. Penis entering base of a large sarcobelum. Preputial part of sarcobelum separated by a sphincter. Sarcobelum contains numerous longitudinal canals in which long calcareous darts situated; some canals empty.

DISTRIBUTION. Africa (Sudan, Kenya, Tanzania, Uganda, Zaïre, Rwanda). 1 highly variable sp.

GYMNARIONIDAE Van Mol, 1970

Van Mol, 1970: 29 (Urocyclidae subf.).

Snails or semislugs. Shell more or less vitrinoid, moderately solid to thin.

Most of species with peculiar eversible frontal organ of various structure situated on head of animal between ommatophores.

Caudal foss normally developed, caudal horn mostly short.

Jaw oxygnathous.

Flagellum absent. Epiphallus weakly defined, with cryptae in its walls. Epiphallic

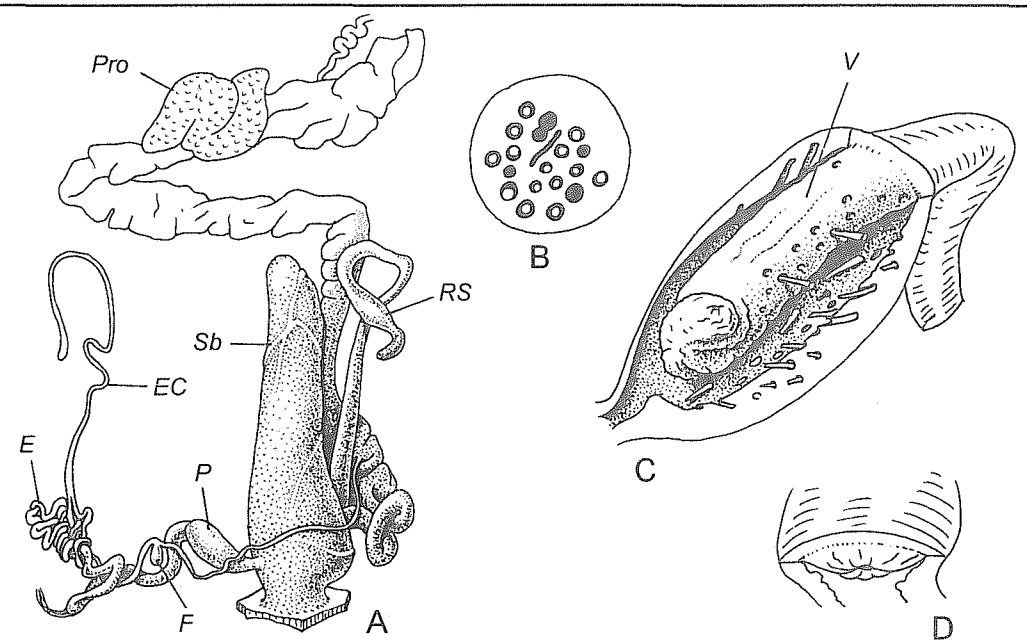


Fig. 1618. *Polytoxon robustum* (Simroth, 1896). "Zaïre, Urwald hinter N.W. Randbergen d. Tanganika, IV. 1910". A — reproductive tract. B — cross-section through sarcobelum (solid black dots — empty canals, dots with white circles — canals containing darts). C — interior of penis. D — sphincter in preputial part of sarcobelum. Vienna No. 47.981.

caecum absent. Penis consisting of 2 chambers; apical chamber small, subglobular, internally with a small verge. Penial gland absent. Penis sheath surrounds penis except for globular part, attached at both ends. Penial retractor inserted on head of penis apically. Sarcobelum absent. Atrium with a well developed appendix.

DISTRIBUTION. Africa.

Lacrimarion Connolly, 1939
Fig. 1619

Connolly, 1939: 121 (*Gymnarion* subg.).

TYPE SPECIES — *Gymnarion lacrimosus* Connolly, 1929; OD.

Shell helicoid, depressed-globose, comparatively solid, dull, somewhat translucent, of 4 rather convex whorls. Last whorl slightly, gradually descending in front, rounded at periphery. Color corneous yellow-brown, with diffuse paler streaks. Embryonic sculpture of fine, regular spiral grooves. Postnuclear whorls with close-set, coarse, regular, oblique radial wrinkles which cut up into granules by continuous

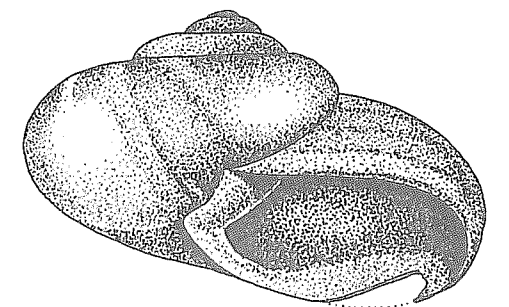


Fig. 1619. *Lacrimarion lacrimosus* (Connolly, 1929). Kaokootavi, Kaokoveld, SW Africa. Paratype. Senck. No. 157892.

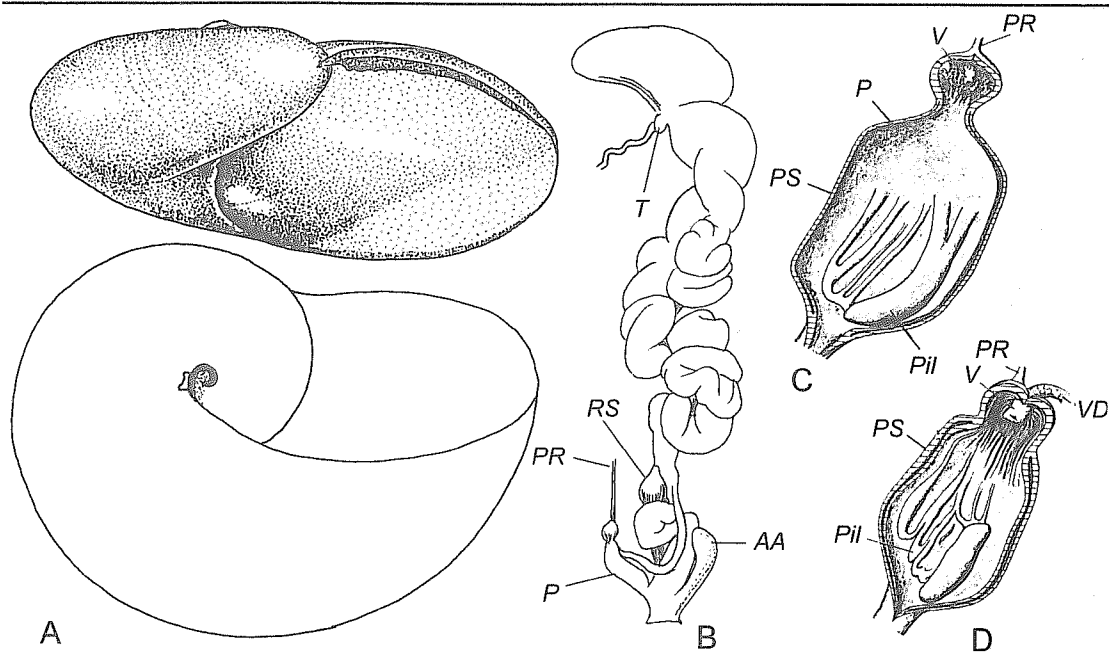


Fig. 1620. A, B — *Gymnarion aloysiisabaudiae* (Pollonera, 1906). A — shell: "Maluba, Parc Albert, Congo Belge" [Virunga National Park, Congo]. Geneva. B — reproductive tract. After Pilsbry, 1919. C — ! *Gymnarion columna* Binder, 1971. Interior of penis. D — ! *Gymnarion scutum* Binder, 1971. Interior of penis. After Binder, 1976.

spiral lines; wrinkles becoming coarser and granules longer on each succeeding whorl. Same sculpture continues almost to umbilicus, but spiral elements extremely fine on base. Aperture subcircular, well oblique, with well developed parietal callus. Umbilicus narrowly open. Height 8.9-9.0, diam. 12.8-13.0 mm (9.0-13.0 mm).

DISTRIBUTION. SW Africa. 1 sp.

Gymnarion Pilsbry, 1919
Fig. 1620

Pilsbry, 1919: 275.

TYPE SPECIES — *Helicarion aloysii-sabaudiae* Pollonera, 1906; OD.

Shell depressed-subglobose, thin, semi-transparent, dull above, polished and shining below, of 3-3.5 whorls. Apex somewhat prominent. Color yellow, sometimes with very light greenish tint. Postapical sculpture with fine radial plicae above. Aperture very large, ovate, well oblique. Umbilicus absent.

Height 7.5-20.0, diam. 11.5-32.0 mm (19.2 × 30.7 mm).

Talon small, exposed. Vas deferens short, indistinctly separated from epiphallus which enters penis subapically through a minute verge. Walls of epiphallus contain numerous, variously developed cryptae. Penis small, with subglobular apical part containing a small verge; inner surface of this part covered by many small, axial folds which sometimes broken up into minute tubercles. Distal part of penis internally with 1 to many longitudinal, irregular pilasters of variable shape. Penis sheath surrounds penis except for globular part, attached at both ends. Penial retractor inserting on head of penis terminally. Free oviduct rather long, more or less folded. Vagina absent. Spermathecal shaft short, reservoir adherent to free oviduct and lower section of spermoviduct. Atrium with a rather long appendix.

DISTRIBUTION. W and S Africa. About 20 spp. and subspp.

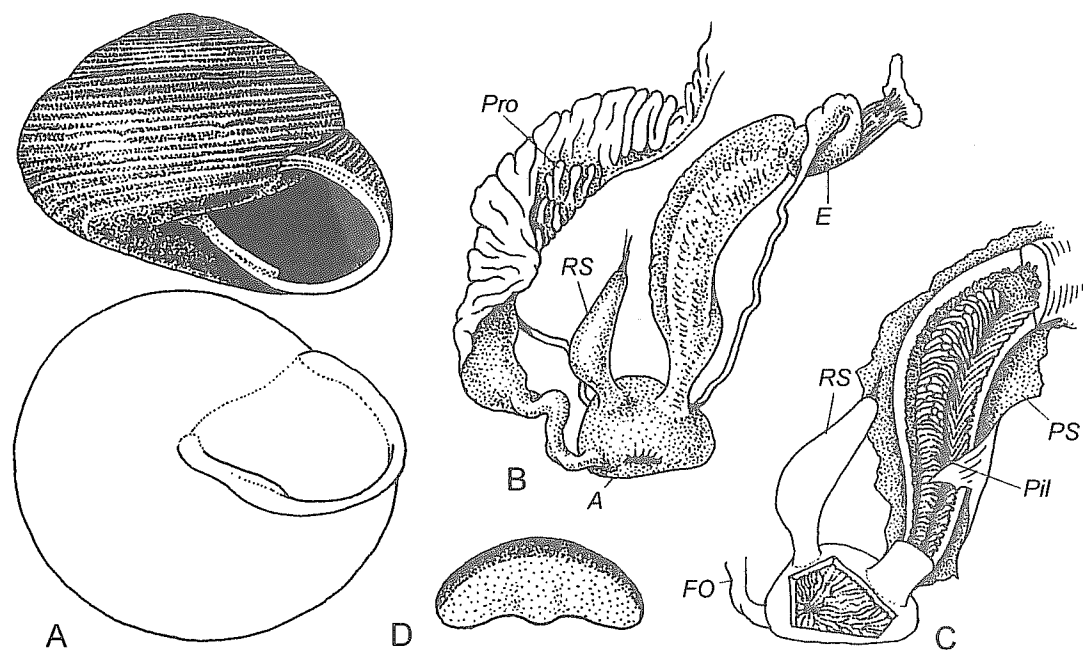


Fig. 1621. *Rhyсотina welwitschi* (Morelet, 1866). Monte Café, 800-900 m above sea level, São Thomé Island. A — shell. B — reproductive tract. C — interior of penis and atrium. D — jaw. Moscow No. Lc-19555 (shell), Lc-19629 (soft parts) (Leiden).

RHYSOTINIDAE
Schileyko, fam. nov.

Type genus — *Rhyсотina* Ancey, 1887.

Shell subglobose, of medium size. Last whorl rounded at periphery. Embryonic whorls with radial sculpture. Postapical whorls with distinct, well spaced, rough spiral cords and irregular radial wrinkles. Aperture with comparatively stout margins and columellar thickening. Umbilicus closed.

Frontal organ absent.

Caudal foss spacious, caudal horn vestigial.

Jaw oxygnathous.

Flagellum absent. Epiphallus short, without cryptae in its walls. Epiphallic caecum missing. Penis lacking verge, internally with a large axial pilaster. Penial gland absent. Penis sheath surrounds penis, attached at both ends. Penial retractor attached to epiphallus. Sarcobelum absent. Atrium enormously swollen, sac-like, internally with many small folds which directed to orifices of penis, free oviduct and spermathecal stalk.

DISTRIBUTION. W Africa (São Thomé Island in Gulf of Guinea).

REMARK. The unique character of Rhyсотinidae is a very peculiar structure of atrium. Since flagellum and epiphallic caecum are absent, it is hard to judge about phylogenetic relations of the family. Probably, it is a side branch of common helicarionid stock.

Rhyсотina Ancey, 1887
Fig. 1621

Ancey, 1887: 53.

— *Thomeonanina* Germain, 1909: 99 (t.-sp. *Helix welwitschi* Morelet, 1866; designated here).

TYPE SPECIES — *Helix welwitschi* Morelet, 1866; SD Zilch, 1959.

Shell subglobose to slightly depressed, quite solid, of 5-6 slightly convex whorls. Last whorl descending in front, widely rounded. Color uniformly fulvous or corneous. Embryonic whorls finely radially wrinkled. Spiral cords on postapical whorls quite prominent, regular; radial wrinkles much

weaker, irregular. Aperture rounded, well oblique, with thickened, blunt margins. Columellar margin with tooth-like thickening. Height 14-15, diam. 19.5-20.5 mm (14.2 × 19.6 mm).

Prostate consists of many elongated acini. Vas deferens thin, free, entering epiphallus apically. Epiphallus rather short, separated from penis by narrow circular groove. Penis large, thin-walled, internally with a strong axial pilaster; surface of pilaster covered with transversal, elongated rugae. Opposite to pilaster there are numerous obliquely-transversal folds. Penis surrounded by thin, semitransparent sheath, attached below and above. Penial retractor strong, short, arising from diaphragm, attaching to mid-point of epiphallus. Free oviduct rather long. Short, nearly sessile spermatheca entering atrium between penis and free oviduct and furnished with apical ligament.

DISTRIBUTION. São Thomé Island. 2 spp.

ARIOPHANTIDAE Godwin-Austen, 1888

Godwin-Austen, 1888: 253 (Zonitidae subf.).

— Durgellinae Godwin-Austen, 1888: 253 (Zonitidae subf.).

— Sitalinae Godwin-Austen in Sykes, 1900: 283 (Zonitidae subf.).

— Girasiidae Collinge, 1902: 71, 73

— Xestinae Gude et Woodward, 1921: 185.

— Sesarinae Thiele, 1931: 620.

Solem, 1966: 23.

Shell helicoid to plate-like, small to medium-sized. Last whorl in shelled taxa rounded to carinated. Spiral sculpture often present; radial sculpture weak to rather strong. Aperture toothless (except for *Sesara*). Umbilicus narrow to closed.

Frontal organ absent.

Caudal foss and caudal horn well developed.

Jaw oxygnathous.

Ovotestis of 1 to a few compact clumps of very small acini. Hermaphroditic duct convoluted. Talon usually exposed, small, drop-shaped. Flagellum of various length, initially with cryptae in its walls and axial thread. Epiphallic caecum straight, spirally coiled or missing. Penis with or without verge. Penial gland absent or present (in Tro-

chonanininae). Penis sheath at most thin. Penial retractor attached to epiphallic caecum. Sarcobelum present or absent; when present, it is vaginal, with apical retractor. Atrium of common structure.

DISTRIBUTION. Africa, Madagascar, Mascarene Islands, Central Asia, Hindustan Peninsula, Ceylon, Andaman Islands, Maldives, SE Asia, Taiwan, Philippines, Molucas, Indonesia, New Guinea.

EREPTINAE Godwin-Austen, 1908

Godwin-Austen, 1908b: 432.

Shell normally developed, subglobose to depressed.

Flagellum (rather) long. Epiphallic caecum absent. Penis lacking gland, with or without verge. Penis sheath well developed to reduced. Penial retractor attached to epiphallus. Sarcobelum or atrial appendix absent.

DISTRIBUTION. Madagascar, Mascarene Islands.

Plegma Gude, 1911 Fig. 1622

Gude, 1911b: 361 (nom. nov. pro *Coelatura* L. Pfeiffer, 1877).

— *Coelatura* L. Pfeiffer, 1877: 8 [nom. praeocc., non Conrad, 1853 (*Unionidae*); *Hemicycla* subsect.; t.-sp. *Helix* (*Helicigona*) *coelatura* Férussac, 1821; monotypy].

— *Caelatura* P. Fischer, 1887: 1339 (nom. praeocc., non Conrad, 1865; in index).

— *Ariocaelatura* Germain, 1921: 461 (nom. nov. pro *Coelatura* L. Pfeiffer, 1877; t.-sp. *Helix* *coelatura* Férussac, 1821; OD).

Rosenberg et al., 1990: 29.

TYPE SPECIES — *Helix* (*Helicigona*) *coelatura* Férussac, 1821; monotypy.

Shell subglobose, moderately thin to rather solid, only slightly translucent, of 4-5 a little convex whorls. Last whorl gradually descending in front. Color corneous or slightly greenish, sometimes with diffuse brown streaks and bands. Embryonic whorls smooth. Later whorls with fine but rather sharp radial wrinkles and distinct, close-set spiral lines. Aperture ovate, with more or less thickened margins. Columellar margin expanded, sometimes with thicken-

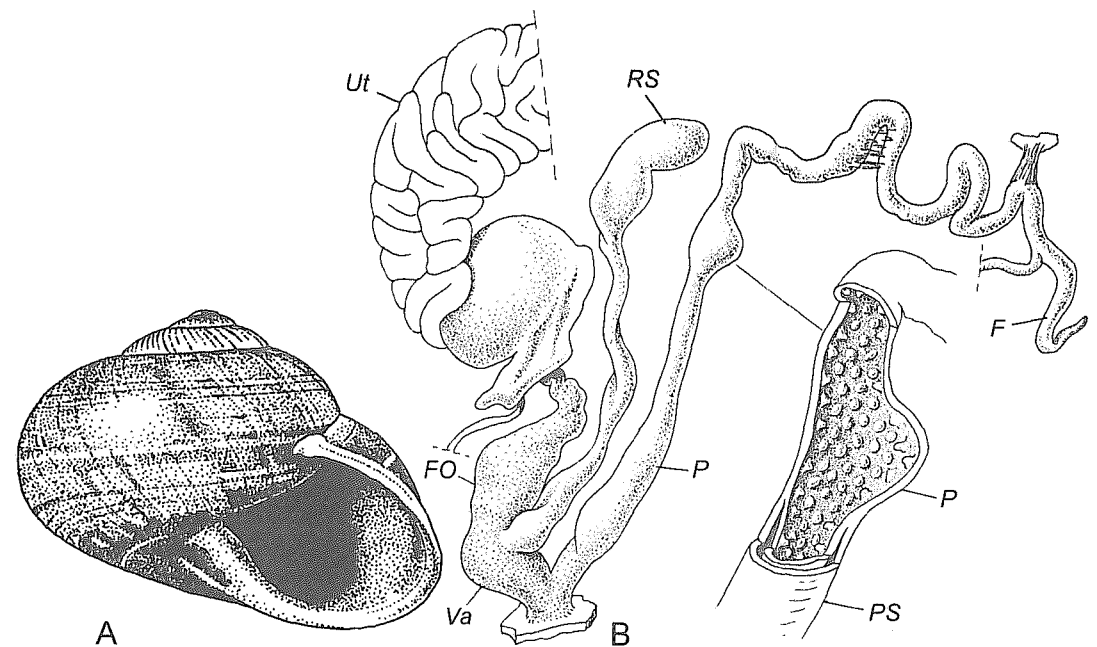


Fig. 1622. *Plegma coelatura* (Férussac, 1821).

A — shell: "Ile de Bourbon" [Reunion]. Phil. No. 2743. B — reproductive tract and interior of penis. "I. de la Reunion". Paris.

ing. Umbilicus closed. Height 10-30, diam. 20-48 (23.2 × 30.0 mm).

Caudal foss present, caudal horn very weak.

Vas deferens entering epiphallus laterally. Flagellum not long, tapering. Epiphallus long, more or less sinuous, its boundary with penis poorly demarcated; some loops of epiphallus connected by fine fibers. Penis subcylindrical, with simple, sac-like caecum in upper part; internally with numerous conic tubercles; lower part of penis below caecum surrounded by sheath attached above and below. Penial retractor arising on diaphragm, inserting on epiphallus at short distance from entrance of vas deferens. Free oviduct moderately long, expanded; vagina much shorter. Spermathecal stalk quite long, reservoir nearly approaching albumen gland.

DISTRIBUTION. Mascarene Islands. 3-4 spp.

Pachystyla Mörch, 1852 Fig. 1623

Mörch, 1852: 2.

TYPE SPECIES — *Helix* (*Helicigona*) *inversicolor* Férussac, 1821; monotypy.

Shell obesely lens-shaped, moderately

solid, with slightly dome-shaped contour of spire, of 6-6.5 nearly flat whorls. Last whorl straight, with sharp peripheral angle or keel. Color corneous to chestnut, keel somewhat lighter. Embryonic whorls with smoothed malleate sculpture. Later whorls with fine radial irregular wrinkles and finer, dense spiral striae. Aperture ovate, bluntly angulated, well oblique, with a little thickened, nearly straight margins. Columellar margin reflexed, often nodulose. Umbilicus closed. Height 10.0-35.5, diam. 20-40 mm (22.2 × 34.2 mm).

Vas deferens thin, free, entering epiphallus laterally. Flagellum quite long, sinuous. Epiphallus cylindrical, gradually passing into penis. Penis longer than epiphallus, also cylindrical, its basal half surrounded by sheath which is free at upper margin. Internally penis with several longitudinal folds; one of them transformed locally into crest-like stimulator. Penial retractor arising on diaphragm, attaching to penis/epiphallus junction. Free oviduct and vagina subequal in length. Spermathecal stalk not long, reservoir very large, thin-walled, poorly defined, embedded in middle section of spermo-viduct.

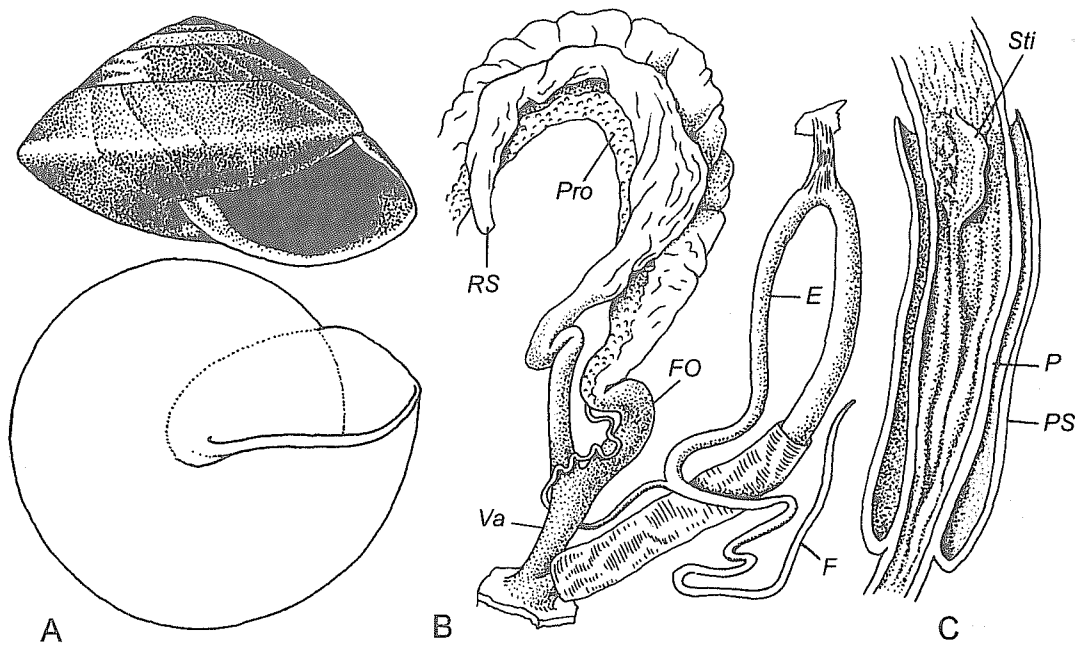


Fig. 1623. *Pachystyla inversicolor* (Férussac, 1821).
A — shell. B — reproductive tract. C — interior of penis. Mauritius. Moscow No. Lc-20641.

DISTRIBUTION. Mascarene Islands. 3 spp. with many forms.

Erepta Albers, 1850
Fig. 1624

Albers, 1850: 109 (*Stylodonta* subg.).

— *Microstylodonta* Germain, 1921: 123, 462 (t.-sp. *Helix stylodon* L. Pfeiffer, 1842; designated here).

TYPE SPECIES — *Helix stylodon* L. Pfeiffer, 1842; monotypy.

Shell depressed-conic, rather thin, translucent, with nearly conic outline of spire, of 5-6 moderately convex whorls. Last whorl straight, rounded. Color corneous, sometimes with darker suprapерipheral band. Embryonic whorls with distinct, regular spiral cordlets. Later whorls finely, irregularly radially striated and with microscopic, silky spiral lines. Aperture rounded, moderately oblique, with thin, sharp, slightly reflexed margins; columellar margin with rounded, callus-like nodule. Umbilicus dot-like. Height 6-9, diam. 9-10 mm (8.7 × 10.2 mm).

Mantle without shell-lobes; right dorsal lobe small, left dorsal lobe in 2 parts.

Vas deferens thin. Flagellum long, ver-

miform. Epiphallus more or less long. Penis also long, its basal section more or less swollen. Penial retractor attached to penis/epiphallus junction. Free oviduct and vagina moderately long, subequal in length. Spermathecal stalk long, reservoir poorly defined, extending close up to albumen gland. Spermatophore with very long tail lacking spines.

DISTRIBUTION. Mauritius. 3 spp.

Dupontia Godwin-Austen, 1908
Fig. 1625

Godwin-Austen, 1908b: 428 (*Erepta* subg.).

TYPE SPECIES — *Macrochlamys perlucida* H. Adams, 1867; OD.

Shell depressed, thin, fragile, shining, transparent, of 5-5.5 much flattened whorls. Last whorl evenly rounded at periphery. Color pale-greenish. Embryonic whorls with variously developed spiral striation. Later whorls polished, with microscopical spiral striation. Aperture lunate-ovoid, slightly oblique, with sharp or a little thickened margins. Umbilicus small, circular. Height 2.7-3.5, diam. 6-11 mm (3.4 × 6.3 mm).

Flagellum very long. Epiphallus curved,

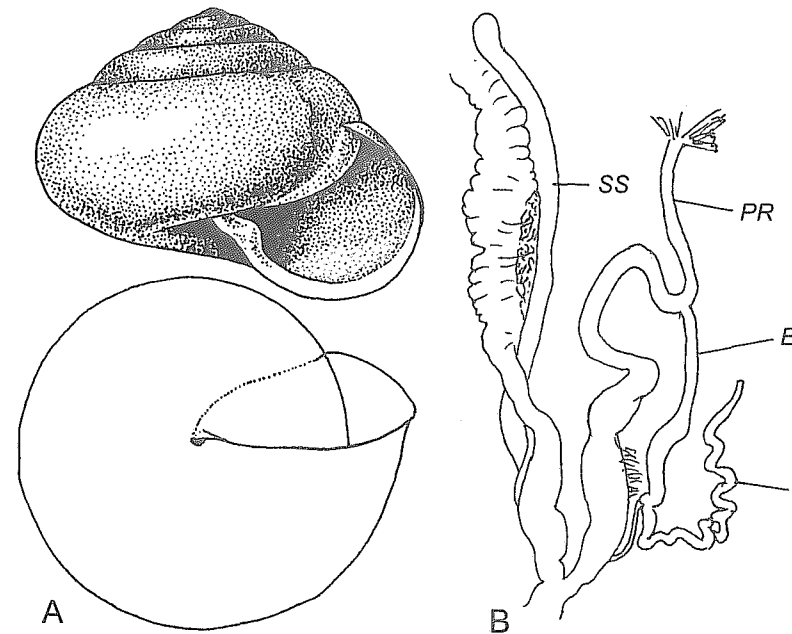


Fig. 1624. A — ! *Erepta odontina* (Morelet, 1851). Mauritius. SPb (as *suffulta* Benson, 1853). B — ! *Erepta leucostyla* (L. Pfeiffer, 1855). Reproductive tract. After Godwin-Austen, 1908b.

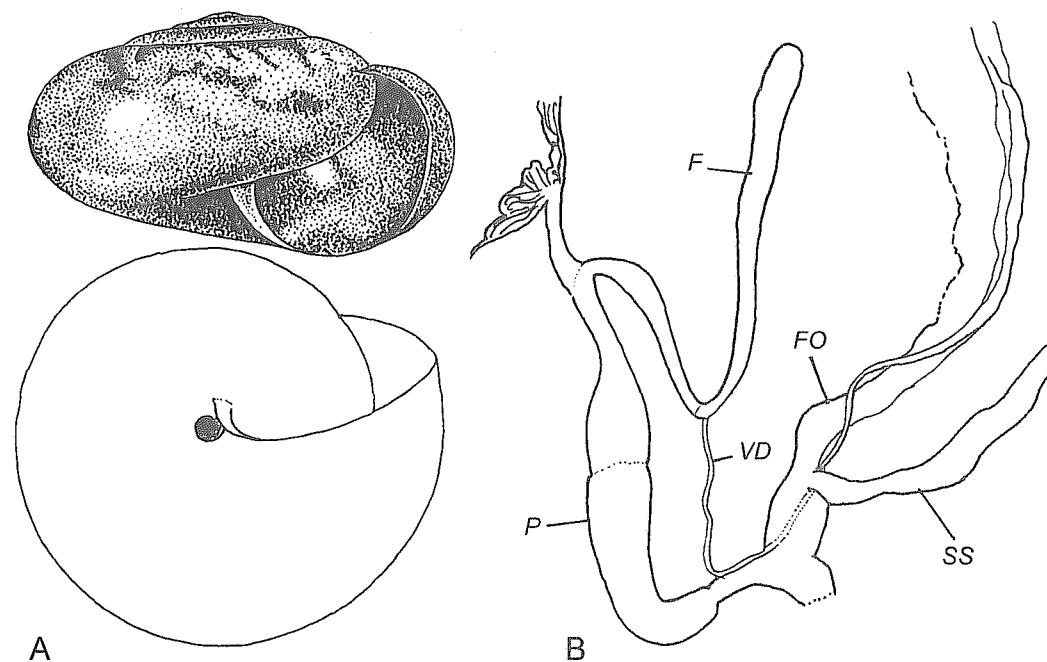


Fig. 1625. A — *Dupontia perlucida* (H. Adams, 1867). Shell: Mauritius. Holotype. London No. 1878.1.28.233. B — ! *Dupontia levis* (Godwin-Austen, 1908). Reproductive tract. After Godwin-Austen, 1908b.

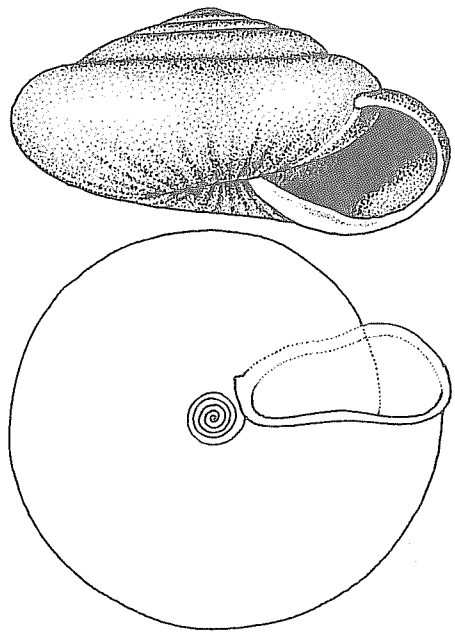


Fig. 1626. *Ctenoglypta newtoni* (G. Nevill et H. Nevill, 1871). Mauritius. Geneva.

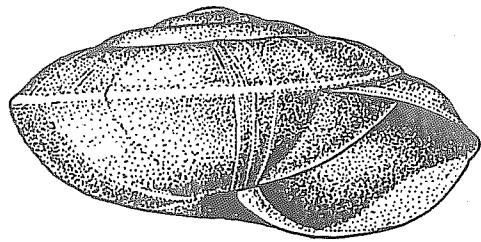


Fig. 1627. *Harmogenanina detecta* (L. Pfeiffer, 1837). A — shell. B — reproductive tract. "Ile de Bourbon" [= Reunion]. Phil. No. 2745.

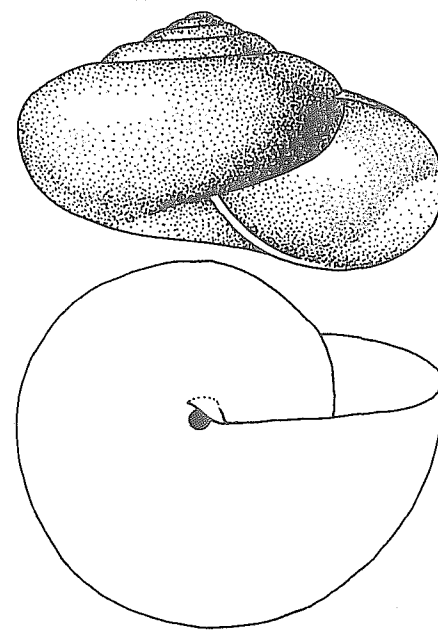


Fig. 1628. *Dancea scalpta* (Martens, 1877). Mare-aux-Vacans, Mauritius. Leiden.

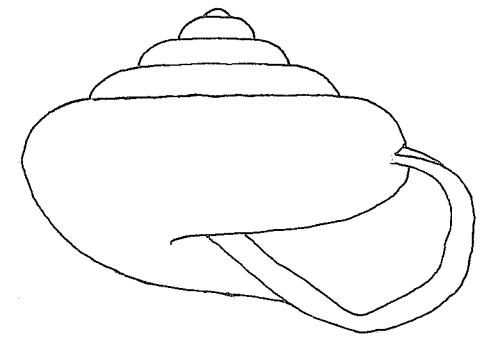


Fig. 1629. *Pseudophasis nevillei* (H. Adams, 1867). After H. Adams, 1867.

of moderate length. Penis surrounded by a thin sheath. Penial retractor attached to curvature of epiphallus. Free oviduct markedly longer than vagina. Spermatheca not long, without distinct division into stalk and reservoir.

DISTRIBUTION. Madagascar and Mascarene Islands. 8-10 spp.

Ctenoglypta Ancey, 1904
Fig. 1626

Ancey, 1904: 307.

TYPE SPECIES — *Helix newtoni* G. Nevill et H. Nevill, 1871; OD.

Shell depressed, rather thin, shining, translucent, of 5.5-6 moderately convex whorls. Last whorl straight, narrowly rounded at periphery. Color light-brown. Embryonic whorls nearly smooth. Postapical sculpture of distinct, dense spiral striae and similar radial lines, so this combination gives fine but quite clear, regular granulation. Basal surface, above all, with smoothed, broad, rounded radial ribs. Aperture ovate, well oblique, with slightly thickened and shortly reflexed margins; baso-columellar margin somewhat caloused. Parietal callus well developed. Um-

bilicus not wide but perspective. Height 3.5-4.0, diam. 7.0-7.5 mm (4.0 × 7.5 mm).

DISTRIBUTION. Mauritius. 1 sp.

Harmogenanina Germain, 1918
Fig. 1627

Germain, 1918: 517; 1921: 92.

— *Rotula* Albers, 1850: 115 [nom. praeocc., non Agassiz, 1841 (Echinodermata); *Helix* subg.; t.-sp. *Helix detecta* L. Pfeiffer, 1837; SD Martens in Albers, 1860].

— *Cycliscus* Gude, 1911a: 270 (nom. praeocc., non Schönherr, 1843; nom. nov. pro *Rotula* Albers, 1850).

TYPE SPECIES — *Helix detecta* L. Pfeiffer, 1837; OD.

Shell depressed, thin, moderately shining, of 5-6 slightly convex whorls. Last whorl straight, with distinct peripheral keel or angle. Color corneous. Embryonic whorls glabrous. Later whorls with some sort of network consisting of fine radial and delicate spiral lines. Aperture rather narrow, ovate, oblique, with thin, simple margins; columellar margin reflexed. Umbilicus minute or closed. Height 6-12, diam. 12.0-16.5 mm (8.5 × 15.2 mm).

DISTRIBUTION. Mascarene Islands. 6 spp.

Dancea Zilch, 1960
Fig. 1628

Zilch, 1960: 730 (nom. nov. pro *Pseudocaelatura* Wenz, 1947).

— *Pseudocaelatura* Wenz, 1947: 36 [nom. praeocc., non Germain, 1921; nom. nov. pro *Ariocaelatura* Thiele, 1931; t.-sp. *Pachystyla scalpta* Martens, 1877; OD].

— *Ariocaelatura* sensu Thiele, 1931: 615 [non Germain, 1921; t.-sp. *Pachystyla scalpta* Martens, 1877; designated here].

TYPE SPECIES — *Pachystyla scalpta* Martens, 1877; OD.

Shell depressed-conic, thin, translucent, shining, of about 6 moderately convex whorls. Last whorl straight or scarcely descending in front, with rounded periphery. Color corneous or whitish. Embryonic whorls smooth. Later whorls with dense, fine, silky radial striation and (locally) with still finer spiral striae. Aperture broadly semilunate, moderately oblique, with simple margins. Umbilicus narrowly open. Height 9-15, diam. 16-24 mm (11.5 × 18.5 mm).

DISTRIBUTION. Mauritius and Réunion Islands. 1 sp.

Pseudophasis Germain, 1918
Fig. 1629

Germain, 1918: 520 (*Tachyphasis* subg.).

TYPE SPECIES — *Stylodonta nevillei* H. Adams, 1867; SD Thiele, 1931.

Shell (depressed) conic, rather thin, translucent, of 5-7 quite convex whorls. Last whorl rounded or subangulate at periphery, nearly straight. Color whitish or pale-corneous. Embryonic whorls nearly smooth. Later whorls with delicate, irregular radial riblets and fine spiral lines. Aperture irregularly semilunate, moderately oblique, with somewhat thickened margins; columellar margin simple. Umbilicus closed or minute. Height 4.00-7.25, diam. 7.00-12.25 mm.

DISTRIBUTION. Mascarene Islands. 2-3 spp.

Ctenophila Ancey, 1882
Fig. 1630

Ancey, 1882: 69.

— *Tachyphasis* Germain, 1918: 519, 520 (t.-sp. *Helix caldwelli* Benson, 1859; designated here).

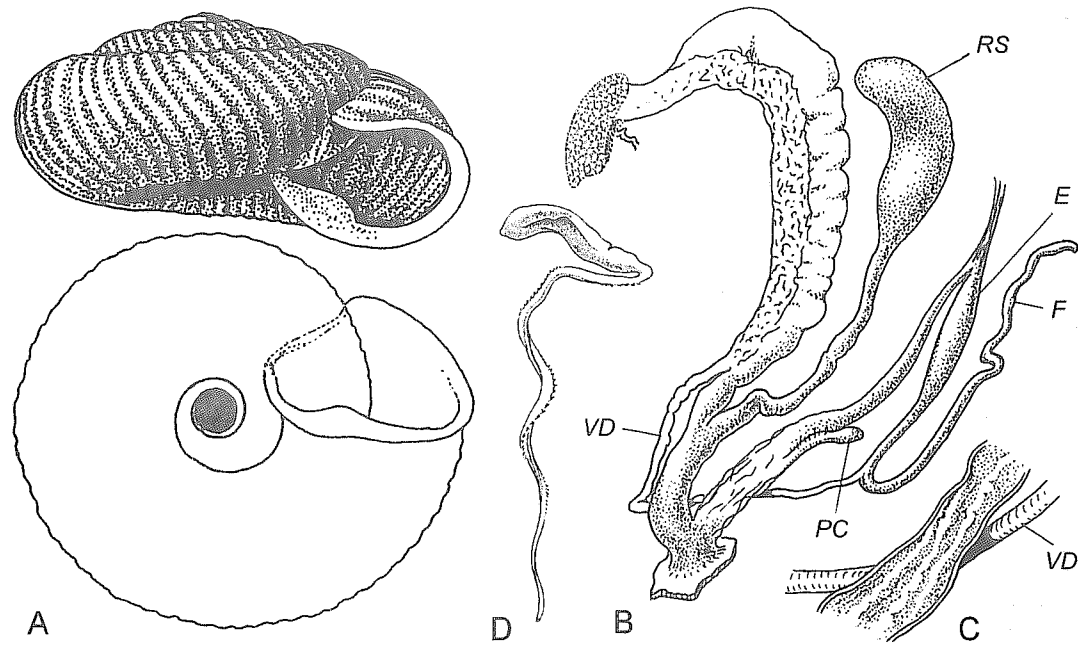


Fig. 1630. *Ctenophila caldwelli* (Benson, 1859).
A — shell: Mauritius. Leiden. B, C, D — Mauritius. B — reproductive tract. C — interior of penis. D — spermatophore. Phil. No. A-1285.

TYPE SPECIES — *Helix caldwelli* Benson, 1859; OD.

Shell depressed, rather thin, shining, translucent, of 5 moderately convex whorls. Last whorl somewhat descending in front. Color pale-yellowish, ribs white. Embryonic whorls almost smooth to microscopically reticulate. Later whorls with rounded radial ribs and delicate spiral striae in intervals and over ribs. Aperture ovate, well oblique, with thickened, shortly reflexed margins; baso-columellar margin with callus-like nodule. Umbilicus open, moderately wide. Height 3.8-5.0, diam. 7-9 mm (3.9×7.7 mm).

Caudal foss large, without overhanging horn.

Talon not visible. Vas deferens free, thin. Flagellum long, vermiform. Epiphallus roughly fusiform. Penis slender, consisting of 2 parts: thin, subcylindrical proximal and somewhat expanded distal; latter furnished with a short caecum and surrounded by very thin, transparent sheath. Internally penis with very weak relief of more or less longitudinal, anastomosing folds. Penial retractor attached to penis/epiphallus junction. Free oviduct short, vagina about 2

times longer. Spermathecal stalk quite long, reservoir large, nearly attending lower edge of albumen gland. Spermatophore composed of smooth ampulla and long tail which bears 2 spirally coiled keels, one of them smooth, the other serrated.

DISTRIBUTION. Mauritius. 2-4 Recent spp.

Kalidos Gude, 1911
Fig. 1631

Gude, 1911a: 273.

— *Propebloyetia* Germain, 1913: 477 (t.-sp. *Helix chastelli* Férussac, 1832; OD).

TYPE SPECIES — *Helix ekongoensis* Angas, 1877; OD.

Shell more or less depressed, fragile to comparatively solid, of 5-7 moderately convex whorls. Last whorl not descending in front, rounded or slightly angled at periphery. Color white to brown, uniform or with corneous band(s). Embryonic whorls almost smooth, later whorls with regular spiral striation and weak, irregular radial lines. Aperture broadly ovate, slightly to moder-

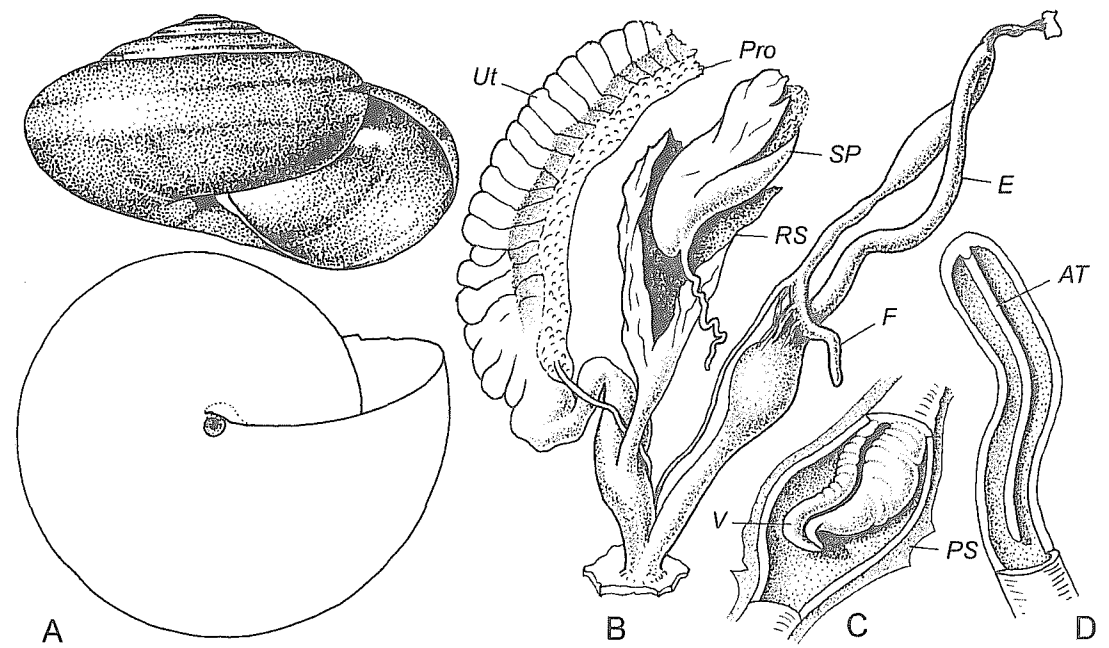


Fig. 1631. A — *Kalidos ekongoensis* (Angas, 1877).
Shell: Madagascar. Phil. No. 49107. B, C, D — ! *Kalidos oleatus* (Ancey, 1902). Region of Antserasera, ca. 12 km SW of Antalaha, Diego-Suarez Province, Madagascar. B — reproductive tract. C — interior of penis. D — interior of flagellum. Phil. No. A-16374.

ately oblique, with simple margins. Umbilicus minutely open, sometimes partly covered. Height 10-18, diam. 18-30 mm (10.5×19.0 mm).

Vas deferens entering epiphallus laterally. Flagellum vermiform, fastened to penis by several muscular bands, internally with a long axial thread. Epiphallus very long, subcylindrical, sharply bent in middle where penial retractor attached. Penis clavate, internally with a rather large verge furnished with a deep longitudinal groove. Free oviduct markedly longer than vagina. Spermatheca with very short stalk and capacious, thin-walled reservoir. Spermatophore consists of large capsula and thin, short tail.

DISTRIBUTION. Madagascar. About 60 spp.

Methvenia Robson, 1914
Fig. 1632

Robson, 1914a: 386.

TYPE SPECIES — *Hemiplecta oleata* Ancey, 1902; monotypy.

Shell depressed-globose, thin, of about 5 rather convex whorls. Apex blunt. Last whorl scarcely angulated. Postembryonic whorls irregularly granulated above, with fine radial lines decussated by wavy spiral striae below. Aperture ample, lunate, somewhat oblique, with simple margins; columellar margin slightly thickened. Umbilicus narrow. Diam. 37 mm.

Sole undivided. Caudal foss large, vertical.

Jaw remarkably thick, with well developed median projection.

Hermaphroditic duct convoluted. Vas deferens thin, long; finger-shaped flagellum situated on vas deferens at considerable distance from epiphallus. Epiphallus slender, rather long; attachment of penial retractor marks boundary between vas deferens and epiphallus. Penis long, with incidental, superficial, transversal grooves. Free oviduct rather short, swollen; vagina about 2 times longer. Spermatheca clavate, without distinct division into stalk and reservoir, not reaching albumen gland.

DISTRIBUTION. Madagascar. 1 sp.

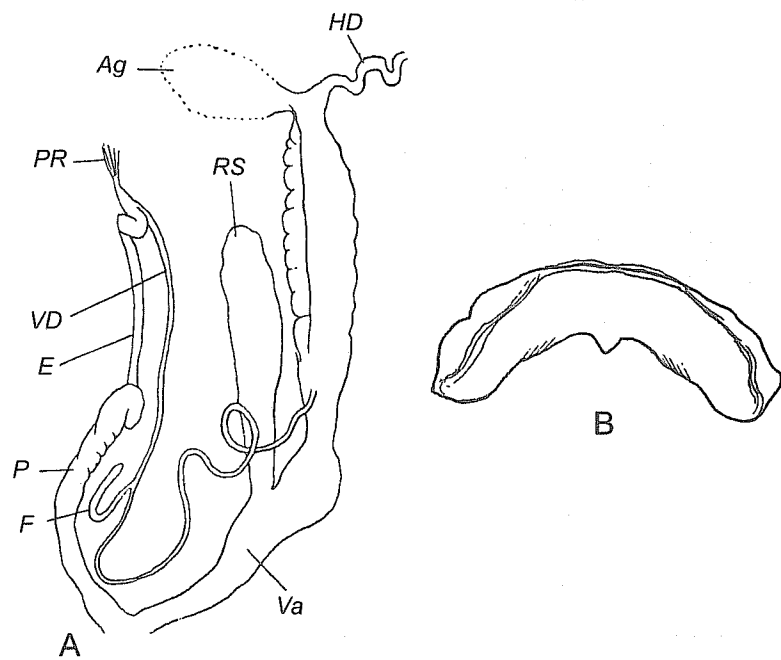


Fig. 1632. *Methvenia oleata* (Ancey, 1902).
A — reproductive tract. B — jaw. After Robson, 1914a.

? *Bathia* Robson, 1914
Fig. 1633

Robson, 1914a: 383.

TYPE SPECIES — *Bathia madagascariensis* Robson, 1914; monotypy.

Shell flat, obese, thin, much translucent, of 5.5-6.25 convex whorls. Last whorl not descending, with angle running on upper surface of whorls and shallow sulcus above it. Color pale-yellow. Embryonic whorls smooth, polished. Later whorls with dense, wavy spiral lines; radial sculpture very weak and irregular. Aperture lunate, angled above, only slightly oblique, with thin, simple margins. Umbilicus minutely open. Height 9.50-9.75, diam. 18.5-19.0 mm (9.5 × 18.5 mm).

DISTRIBUTION. Madagascar. 1 sp.

REMARK. A very peculiar shell of *Bathia* is not similar to any other Helicarionoidea so I am not sure that it is correct place for this genus (it would not be surprising if it is a representative of Endodontidae, such as, for example, *Trachycystis*), and I include *Bathia* in Ereptinae tentatively, mainly by the geographical reason.

TROCHOZONITINAE Iredale, 1914

Iredale, 1914: 122 [nom. nov. pro Trochonanininae Connolly, 1912].

Shell helicoid or trochoid to plate-like. Flagellum moderately long. Epiphallic caecum well developed. Penis lacking gland, with or without verge (in *Malagarion* with 2 verges). Penis sheath thin or absent. Penial retractor attached to caecum apically or to epiphallus below caecum. Sarcobelum or atrial appendix may be present.

DISTRIBUTION. Africa, Madagascar, Mascarene Islands, Rodriguez Island, Fernando Poo Island.

Trochozonitini Iredale, 1914

— Leptichneini Van Goethem, 1977: 91.

— Dendrolimacini Van Goethem, 1977: 100.

Penis internally mostly with not large verge, having various shape (subglobular or of complex structure), without spines. Penial retractor attached to epiphallus at base of caecum or at some distance below it. Vagina of common structure. Atrium without appendix or sarcobelum.

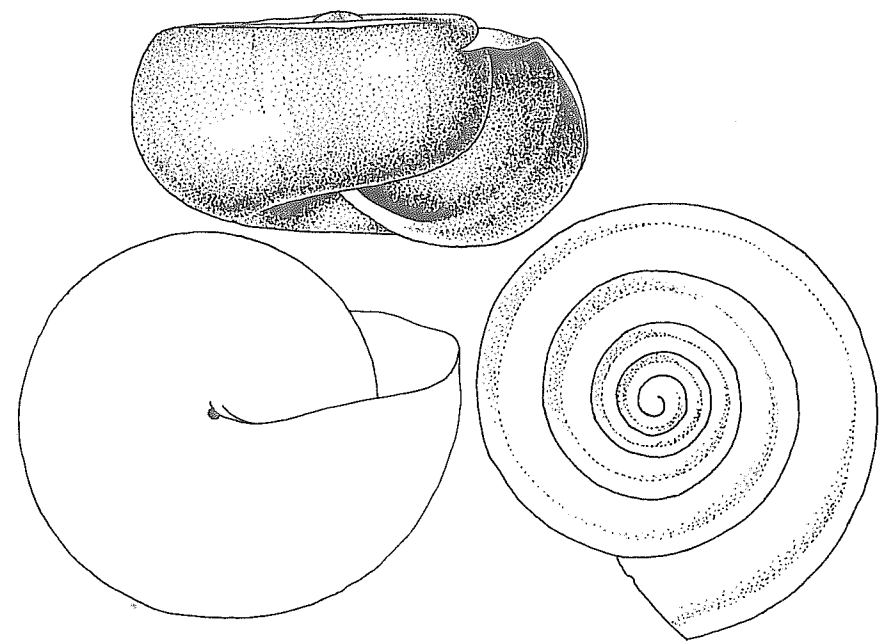


Fig. 1633. *Bathia madagascariensis* Robson, 1914.
Nanoroku (Ambongo) desert, Madagascar. Holotype. London No. 1914.2.26.30.

DISTRIBUTION. Africa, Madagascar, Mascarene Islands, Rodriguez Island, Fernando Poo Island.

REMARK. This tribe is composed of 3 groups of taxa: 1. True snails with carinated shells (figs. 1634-1639); 2. Semislugs with vitrinoid to globose shells (figs. 1640-1650); 3. Slugs with (nearly) internal shells (figs. 1651-1657). However, they all correspond to the diagnosis given above, therefore I unite them in one tribe.

Amphiblema Gude, 1911
Fig. 1634

Gude, 1911a: 273.

TYPE SPECIES — *Helix eucharis* Deshayes, 1840; OD.

Shell trochoid, very thin, fragile, silky glossy, semitransparent, of 5.5-6 flattened whorls. Last whorl with cord-like peripheral keel. Color light-yellow, keel white. Embryonic whorls smooth, polished. Rest whorls with fine, dense radial wrinkles and crowded, undulating radial striae; on base sculpture weaker. Aperture large, angulated, slightly oblique, with simple margins; columellar margin scarcely reflexed. Umbili-

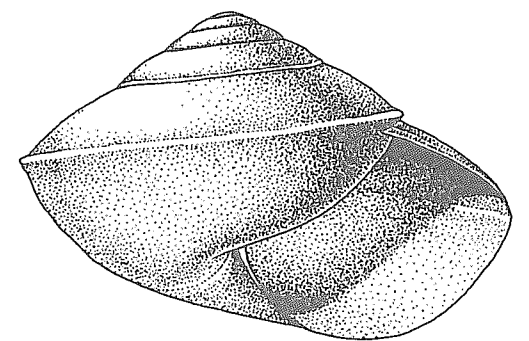


Fig. 1634. *Amphiblema eucharis* (Deshayes, 1840).
"NW Madagascar d'après Pilsbry". Holotype. Paris.

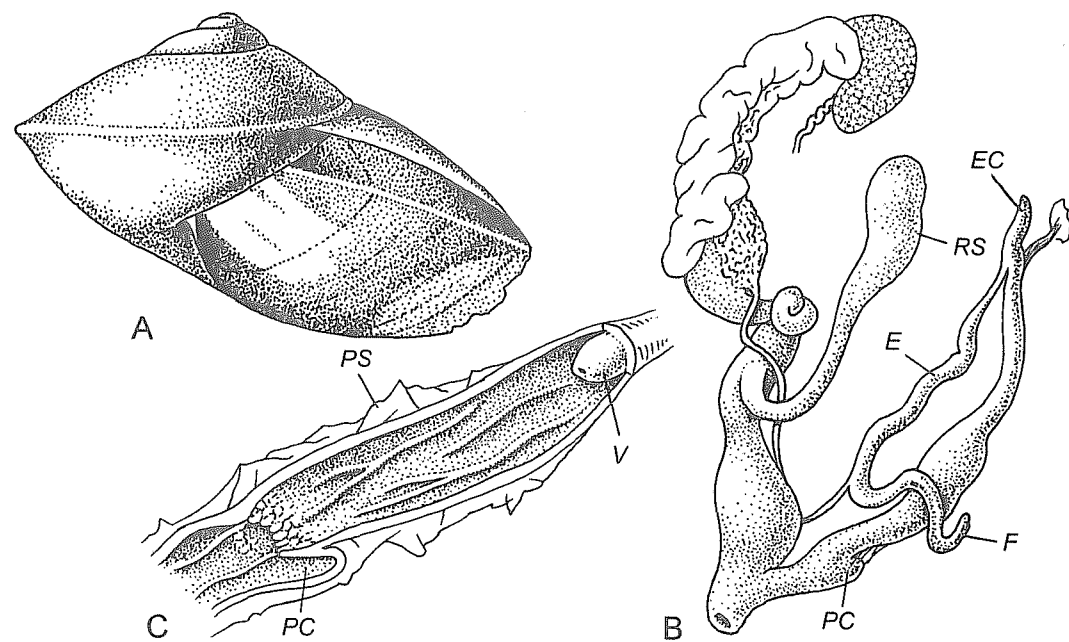


Fig. 1635. A — *Caldwellia philyrina* (Morelet, 1851). Shell: Mauritius. Leiden. B, C — ! *Caldwellia imperfecta* (Deshayes, 1863). B — reproductive tract. C — interior of penis. Mauritius. Phil. No. A-1279.

cus dot-like, semicovered. Height 18.9, diam. 27.4 mm.

DISTRIBUTION. Madagascar. 1 sp.

Caldwellia H. Adams, 1873
Fig. 1635

Adams H., 1873: 209 (*Stylodonta* subg.).

TYPE SPECIES — *Helix philyrina* Morelet, 1851; OD.

Shell trochiform, thin, very fragile, translucent, of 3-3.5 flattened whorls. Last whorl straight, with sharp peripheral angle. Color whitish to corneous. Embryonic whorls with weak spiral striae that on later whorls become more distinct; radial sculpture very weak, irregular. Aperture large, angled, well oblique, with simple margins. Umbilicus closed. Height 3.5-14.0, diam. 7-25 mm (7.1 × 14.0 mm).

Talon hidden. Vas deferens thin, entering epiphallus laterally. Flagellum rather long, internally with axial thread. Epiphallus slender, sharply bent. A short conic caecum situated on curvature of epiphallus. Penis moderately long, internally with a small ovoid verge and a number of weak, scattered, longitudinal, locally forked folds. In

basal part of penis there is a small pocket-like caecum; this part of penis separated from rest part by a sphincter-like narrowing. Penis coated by very thin, transparent sheath. Penial retractor attached at base of epiphallic caecum. Free oviduct and vagina subequal in length, latter noticeably swollen. Spermathecal stalk moderately long, subcylindrical, reservoir ovoid, embedded in upper half of spermoviduct.

DISTRIBUTION. Mauritius, Madagascar. 4-5 spp.

Trochozonites Pfeffer, 1883

Pfeffer, 1883: 23.

—? *Moaria* Chaper, 1885: 49 (t.-sp. *Moaria conica* Chaper, 1885; OD).

TYPE SPECIES — *Trochonanina percarinata* Martens, 1876; SD Connolly, 1912.

Shell depressedly to highly conic, thin, of 5.5-7 almost flat to slightly convex whorls. Last whorl angulate or carinate. Color mostly corneous-brown. Embryonic whorls smooth, spirally striated or with radial riblets. Postapical sculpture of variously developed radial riblets above; base almost smooth. Aperture more or less rhomboid,

moderately oblique, with simple margins. Umbilicus narrow.

DISTRIBUTION. Central and W Africa.

Trochozonites (*Trochozonites* s. str.)
Fig. 1636

Embryonic whorls with spiral striation. Height 4-8, diam. 4-8 mm (6.6 × 7.7 mm). DISTRIBUTION. W Africa. About 15 spp. & forms.

Trochozonites (*Zonitotrochus*
Pilsbry, 1919)
Fig. 1637

Pilsbry, 1919: 253.

TYPE SPECIES — *Trochonanina medjensis* Pilsbry, 1919; OD.

Embryonic whorls practically smooth. Height 5-8, diam. 5-8 mm (7.7 × 6.5 mm).

Vas deferens rather long, free, entering epiphallus laterally. Flagellum long, contorted. Epiphallus moderately long. Epiphallic caecum sometimes with thickened head. Penis slender, its basal part surrounded by a thin sheath. Penial retractor

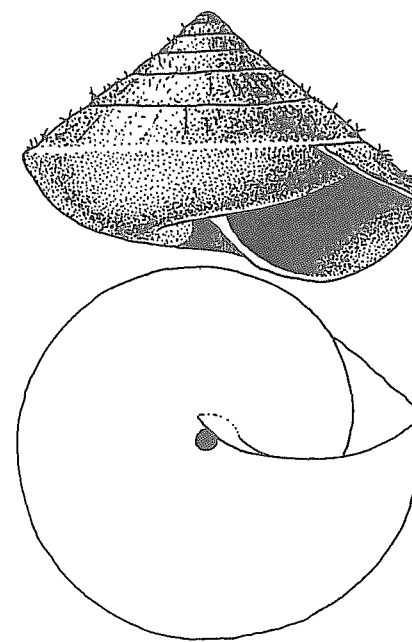


Fig. 1636. *Trochozonites* (*Trochozonites*) *percarinata* (Martens, 1876). Buca [? Baca], Cameroon. Leiden.

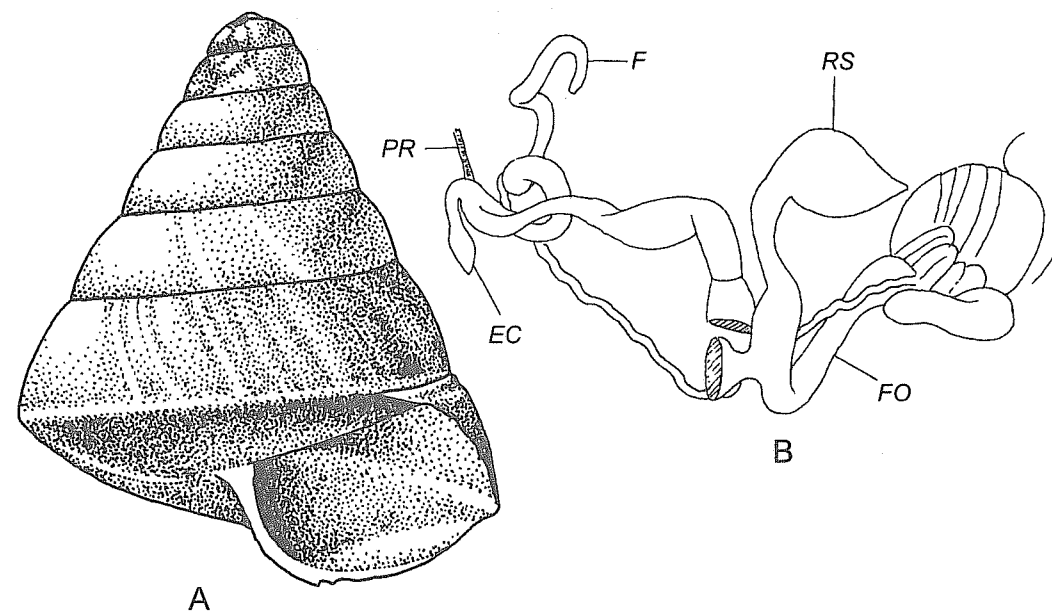


Fig. 1637. *Trochozonites* (*Zonitotrochus*) *medjensis* (Pilsbry, 1919). A — shell: Medje, [Democratic Republic] Congo. Phil. No. 118546. B — reproductive tract. After Verdcourt, 1984.

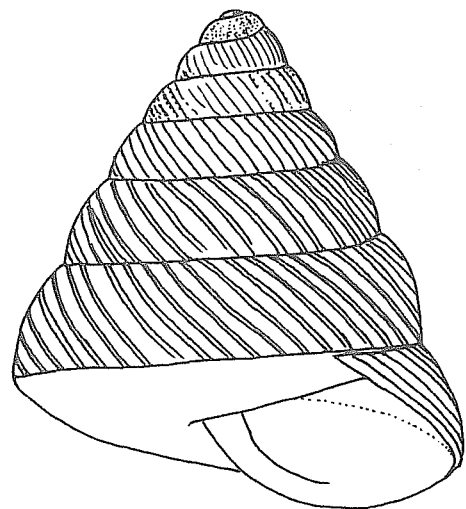


Fig. 1638. *Trochozonites (Teleozonites) adansoniae* (Morelet, 1848).
After Pilsbry, 1919.

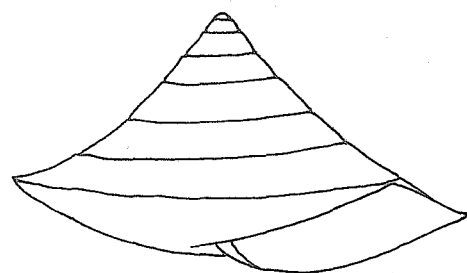


Fig. 1639. *Trochozonites (Crenatinanina) crenulata* (Germain, 1905).
After Zilch, 1959.

attached to caecum apically or to epiphallus at base of caecum. Free oviduct rather long, vagina almost absent. Spermathecal stalk swollen basally, reservoir ovoid. Spermatophore with longitudinal ridges, lacking spines.

DISTRIBUTION. Central and E Africa, Fernando Poo Island. About 15 spp.

Trochozonites (Teleozonites)
Pilsbry, 1919
Fig. 1638

Pilsbry, 1919: 255.

TYPE SPECIES — *Helix adansoniae* Morelet, 1848; OD.

Embryonic whorls with radial riblets. Height 7-8, diam. 6-7 mm.

DISTRIBUTION. Africa (Congo Basin). 1-3 spp.

Trochozonites (Crenatinanina)
Germain, 1920
Fig. 1639

Germain, 1920: 75 (*Trochonanina* subg.).

TYPE SPECIES — *Trochonanina (Crenatinanina) crenulata* Germain, 1905; OD.

Shell trochiform, thin, with conic, con-

icave outlines, of 9 almost flat whorls. Last whorl with sharp peripheral angle. Color corneous. Postembryonic sculpture of thin, irregular, obliquely-radial wrinkles. Aperture rostrate, rather narrow, moderately oblique, with simple margins. Umbilicus dot-like. Height 9.0, diam. 15.5 mm.

DISTRIBUTION. E Africa (Zanzibar). 1 sp.

Centrafricarion Van Mol, 1970
Fig. 1640

Van Mol, 1970: 187.

TYPE SPECIES — *Centrafricarion granulatus* Van Mol, 1970; OD.

Shell vitrinoid, of 3-3.5 whorls. Apex prominent, excentric. Embryonic whorls with dots arranged in close-set spiral rows. Last whorl densely radially striated. Height 4, diam. 8.5 mm.

Vas deferens comparatively short, not convoluted. Flagellum internally with axial thread and ramified cryptae in walls; length of flagellum variable. Epiphallus with a rather short, nearly straight caecum. Penis rather short, internally with subglobular verge. Penis sheath surrounds entire length of penis. Penial retractor attached at short

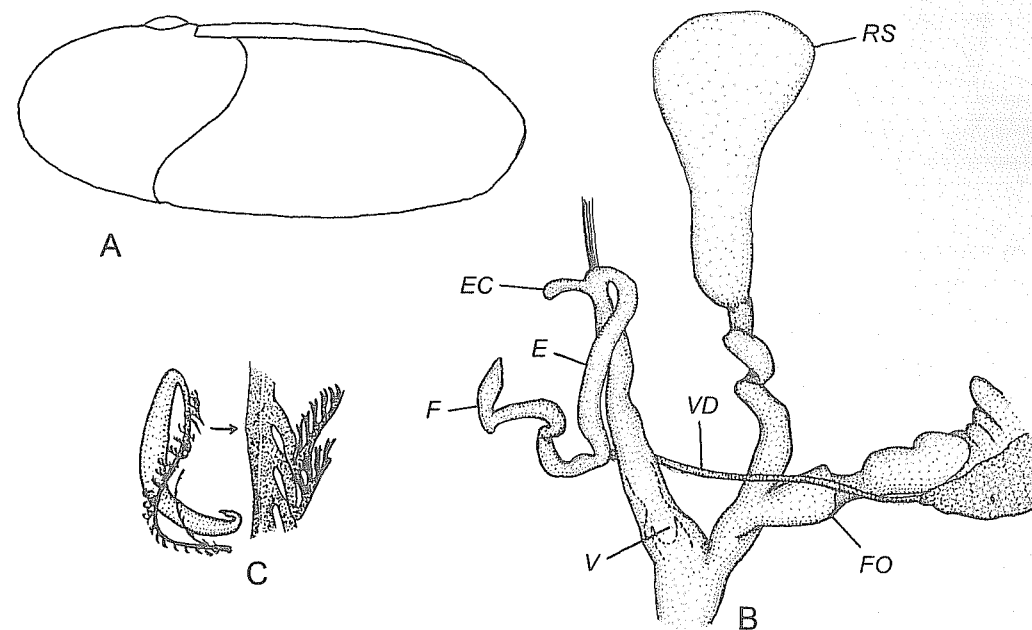


Fig. 1640. *Centrafricarion granulatus* Van Mol, 1970.

A — shell. B — reproductive tract. C — spermatophore. After Van Mol, 1970.

distance above caecum. Free oviduct swollen basally. Vagina very short. Spermathecal stalk comparatively long, sometimes twisted; reservoir generally ovate, voluminous.

DISTRIBUTION. Tropical Central Africa (Burundi, Rwanda, Congo, Malawi). 3 spp.

Senegalarion Van Mol, 1970
Fig. 1641

Van Mol, 1970: 91.

TYPE SPECIES — *Senegalarion flavus* Van Mol, 1970; OD.

Shell subglobular, very thin, fragile, of about 3 whorls. Apex flat. Last whorl much inflated. Embryonic sculpture of minute dots arranged in dense spiral and radial rows. Last whorl smooth. Aperture very large. Height 5, diam. 8 mm.

Vas deferens comparatively short, somewhat convoluted in proximal part. Flagellum without cryptae in its walls. Epiphallus rather long. Epiphallic caecum short, blunt. Penis internally with verge and 3 axial pilasters covered with minute papillae. Penis sheath surrounds penis and basal part of epiphallus. Penial retractor attached to epiphallus at short distance downward from

caecum. Free oviduct moderately long, somewhat expanded. Vagina almost absent. Spermathecal stalk stout, reservoir ovate. Spermatophore smooth, with fusiform ampulla having long apical process, and thin tail part.

DISTRIBUTION. W Africa (Senegal). 1 sp.

Africarion Godwin-Austen, 1883
Fig. 1642

Godwin-Austen, 1883: 154. Van Mol, 1970: 83.

TYPE SPECIES — *Helicarion pallens* Morelet, 1872; OD.

Shell vitrinoid, thin, of about 3 whorls. Embryonic sculpture of minute dots arranged in spiral and radial series. Last whorl without regular sculpture. Aperture ample. Height 8.5, diam. 13-16 mm.

Vas deferens not convoluted, entering epiphallus at base of flagellum. Flagellum lacking cryptae in its walls. Epiphallus not long, with finger-shaped caecum. Penis strongly swollen, internally with well developed verge and several longitudinal pilasters covered with minute papillae. Penis sheath surrounds penis along its length. Penial retractor inserting on penis/epiphallus junction. Free oviduct not long, markedly ex-

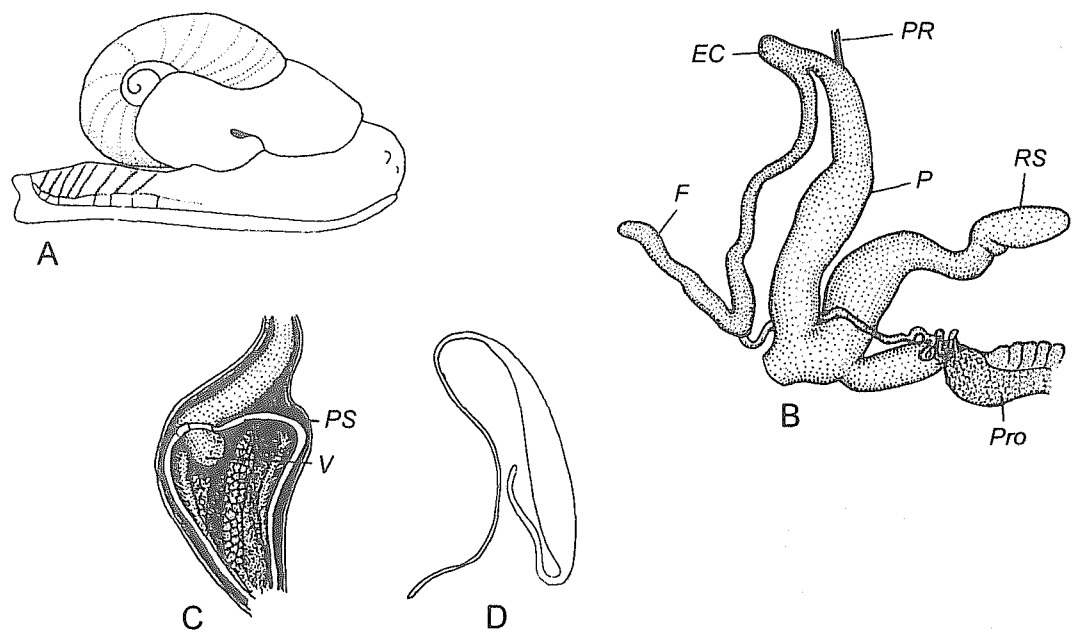


Fig. 1641. *Senegalarion flavus* Van Mol, 1970.
A — external view. B — reproductive tract. C — interior of penis. D — spermatophore.
After Van Mol, 1970.

panded. Vagina practically absent. Spermathecal stalk not long, swollen, narrowed toward voluminous reservoir. Spermatophore smooth, elongated ampulla lacks apical process, tail part thin.

DISTRIBUTION. NE Africa (Ethiopia, E Sudan). 3 spp.

Camerunarium Van Mol, 1970
Fig. 1643

Van Mol, 1970: 124.

TYPE SPECIES — *Helicarion pertenuis* d'Ailly, 1896; OD.

Shell vitrinoid, of 3 whorls. Embryonic sculpture of microscopical dots arranged in spiral rows and radial striae. Last whorl smooth. Height 6.5, diam. 10 mm.

Vas deferens rather short, slender. Flagellum long, internally with axial thread. Epiphallus rather long, plicate internally, with finger-shaped caecum. Penis short, internally with axial folds and subglobular verge. Penis sheath surrounds penis and distal part of epiphallus. Penial retractor attached at short distance from upper edge of sheath. Free oviduct long, with well developed perivaginal gland. Atrial appendix ("glande annexe", after Van Mol) supplied

with 2 retractors; one of them attached to base of organ, the other nearer to apex. Spermathecal stalk rather long, reservoir capacious. Spermatophore with elongate ampulla lacking apical process and filiform tail bearing a row of minute, branched spines.

DISTRIBUTION. Equatorial W Africa (Cameroon). 1 sp.

Sylvarion Van Mol, 1970
Fig. 1644

Van Mol, 1970: 222.

TYPE SPECIES — *Sylvarion brieni* Van Mol, 1970; OD.

Shell vitrinoid, much reduced, thin, of 2 whorls, most of it covered with mantle. Embryonic whorl with fine dots arranged in spiral rows.

Ovotestis compact, of many ovoid acini. Hermaphroditic duct at first convoluted, in distal section nearly straight. Vas deferens rather short, stout. Flagellum with narrow cryptae in its walls. Epiphallus moderately long, with finger-shaped caecum. Penis somewhat swollen, internally with a short sphincter-like verge and axial, close-set, corrugated folds. Penis sheath coats penis and basal part of epiphallus. Penial retractor at-

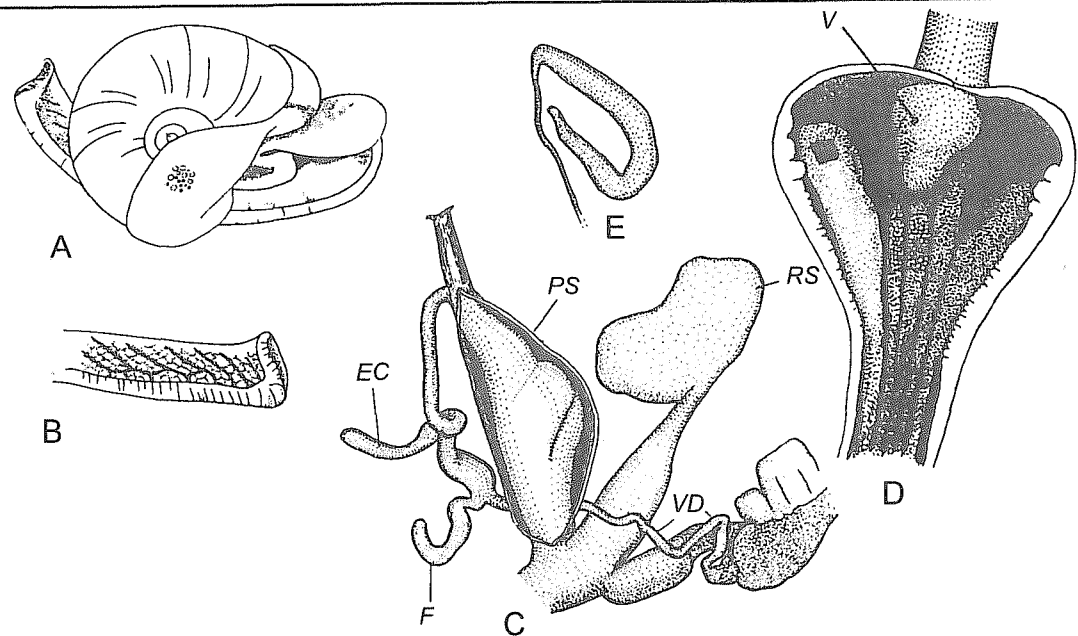


Fig. 1642. *Africarion pallens* (Morelet, 1872).
A — external view. B — posterior end of cephalopodium. C — reproductive tract. D — interior of penis. E — spermatophore. After Van Mol, 1970.

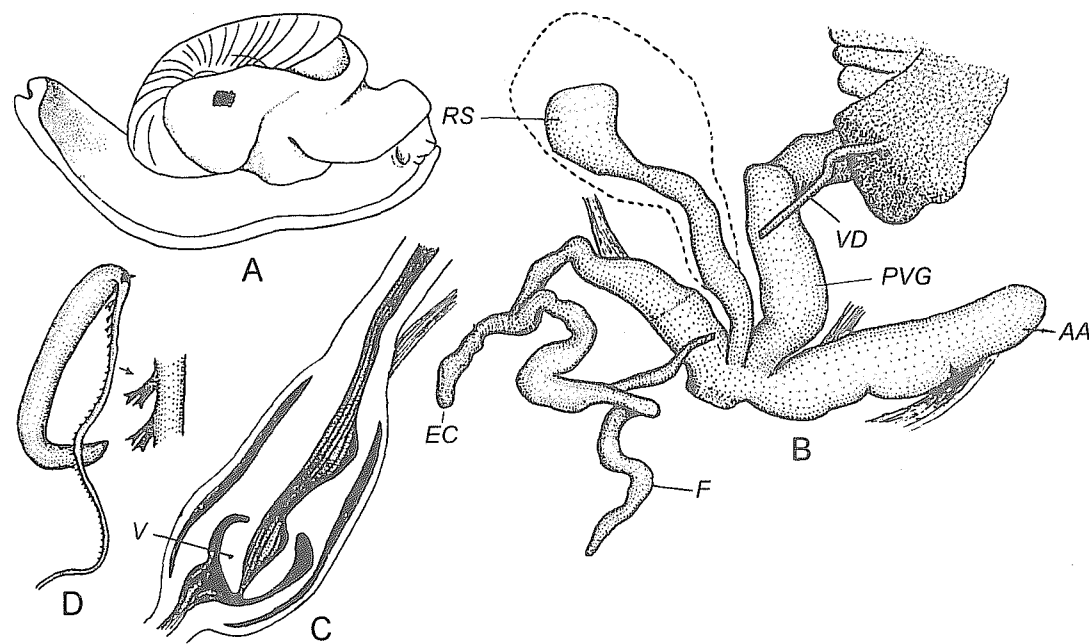


Fig. 1643. *Camerunarium pertenuis* (d'Ailly, 1896).
A — external view. B — reproductive tract. C — longitudinal section of penis. D — spermatophore and its fragment. After Van Mol, 1970.

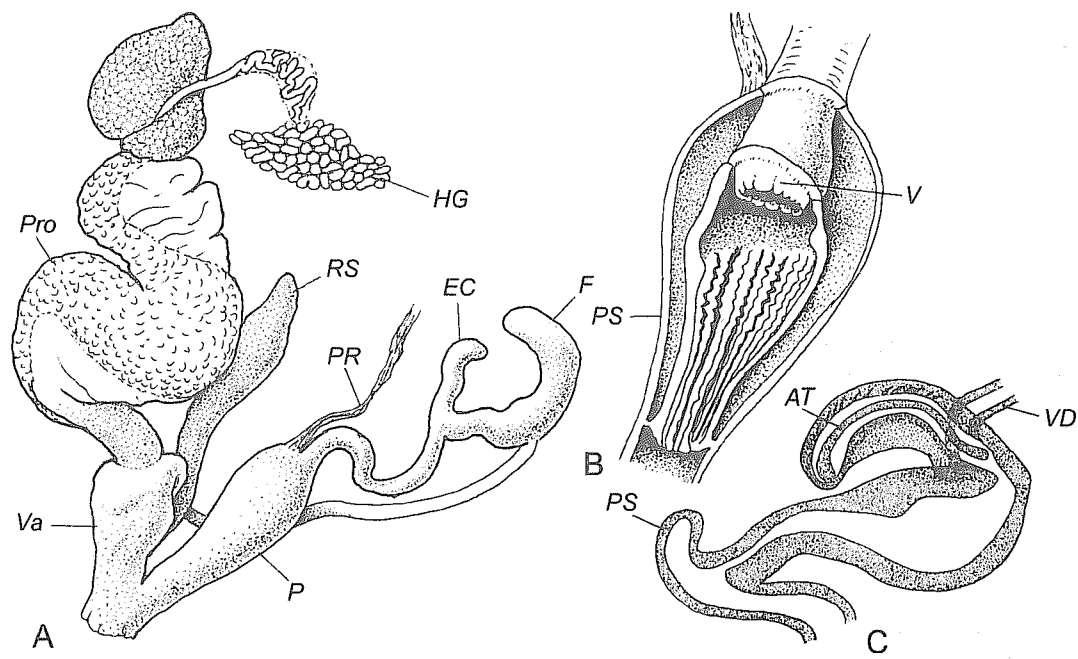


Fig. 1644. *Sylvarium brieni* Van Mol, 1970.
A, B — "Forêt du Banco, Côte d'Ivoire, 1-5-1964". A — reproductive tract. B — interior of penis. Paratype. Geneva No. 970.204. C — longitudinal section through epiphallus, caecum and flagellum. After Van Mol, 1970.

tached to epiphallus at upper margin of sheath. Free oviduct rather long, greatly swollen. Vagina very short. Spermatheca without distinct division into stalk and reservoir.

DISTRIBUTION. W Africa (Côte d'Ivoire). 1 sp.

Paragranularion Van Mol, 1970
Fig. 1645

Van Mol, 1970: 161.

TYPE SPECIES — *Helicarion subglobosus* d'Ailly, 1896; OD.

Shell globose, thin, of about 3 whorls. Last whorl much inflated. Embryonic sculpture of fine spiral lines. Last whorl lacks regular sculpture. Umbilicus closed. Height 5, diam. 8 mm.

Vas deferens comparatively short, entering epiphallus laterally, leaving rather long flagellum which contains axial thread but lacking cryptae in its walls. Penis subcylindrical, internally with a long verge. Penis sheath coating penis and very distal part of epiphallus. Penial retractor attached to epiphallus at upper boundary of sheath. Free oviduct much swollen. Vagina practi-

cally absent. Spermathecal stalk very short, reservoir poorly demarcated, supplied with an apical ligament.

DISTRIBUTION. Equatorial W Africa (Cameroon). 1 sp.

Verrucarion Van Mol, 1970
Fig. 1646

Van Mol, 1970: 66.

TYPE SPECIES — *Helicarion columellaris* d'Ailly, 1896; OD.

Shell vitrinoid, thin, of 2.5-3 whorls. Basal part with membranaceous fringe. Embryonic sculpture of dots arranged in spiral and radial rows. Height 5.0-8.9, diam. 11.5-16.1 mm.

Flagellum well developed, sometimes convoluted or spirally coiled. Length of epiphallus variable. Epiphallus with short to long caecum which situated nearer to flagellum than to penial retractor insertion. Penis internally with short to long verge or pointed stimulator. Penis sheath surrounds entire length of penis and connected with latter by numerous fibers. Free oviduct long, expanded in distal part. Vagina long to very short. Ampulla of spermatophore

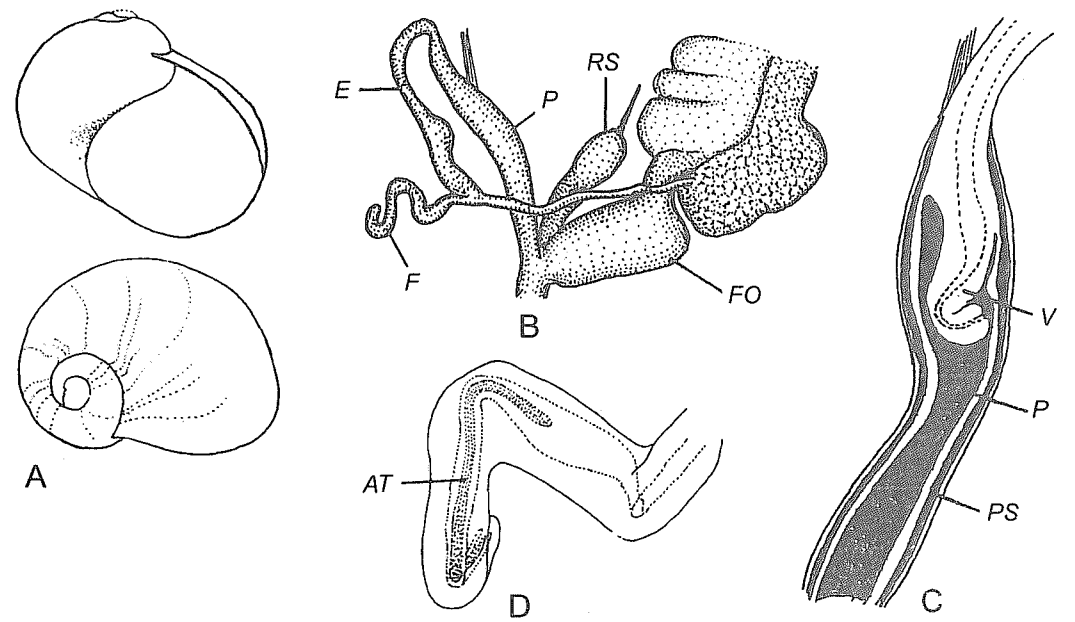


Fig. 1645. *Paragranularion subglobosus* (d'Ailly, 1896).
A — shell. B — reproductive tract. C — interior of penis. D — interior of flagellum. After Van Mol, 1970.

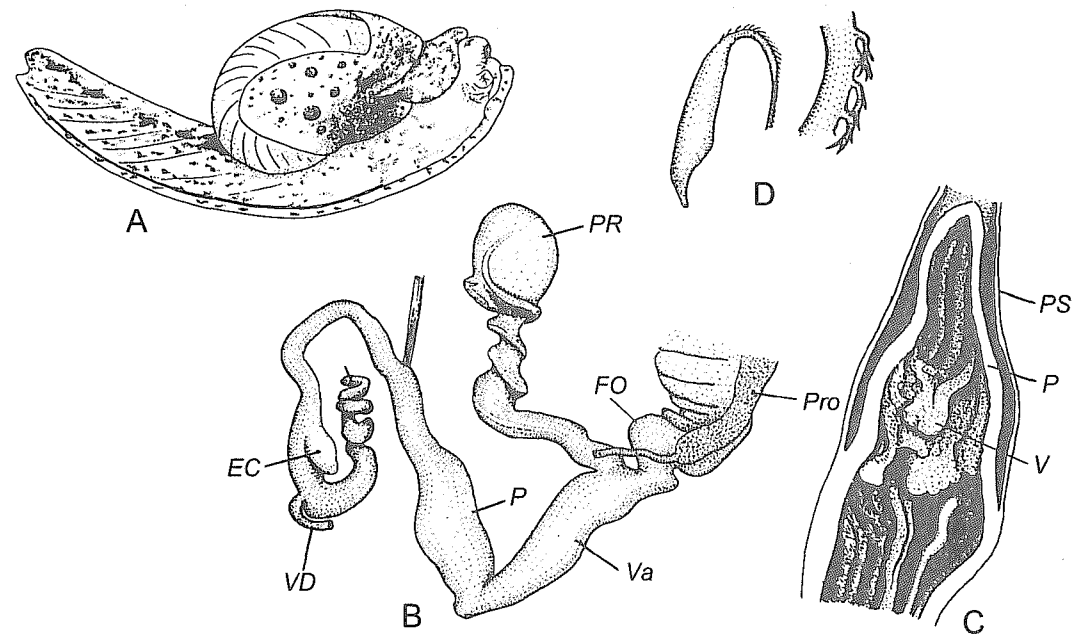


Fig. 1646. *Verrucarion columellaris* (d'Ailly, 1896).
A — external view. B — reproductive tract. C — interior of penis. D — details of spermatophore. After Van Mol, 1970.

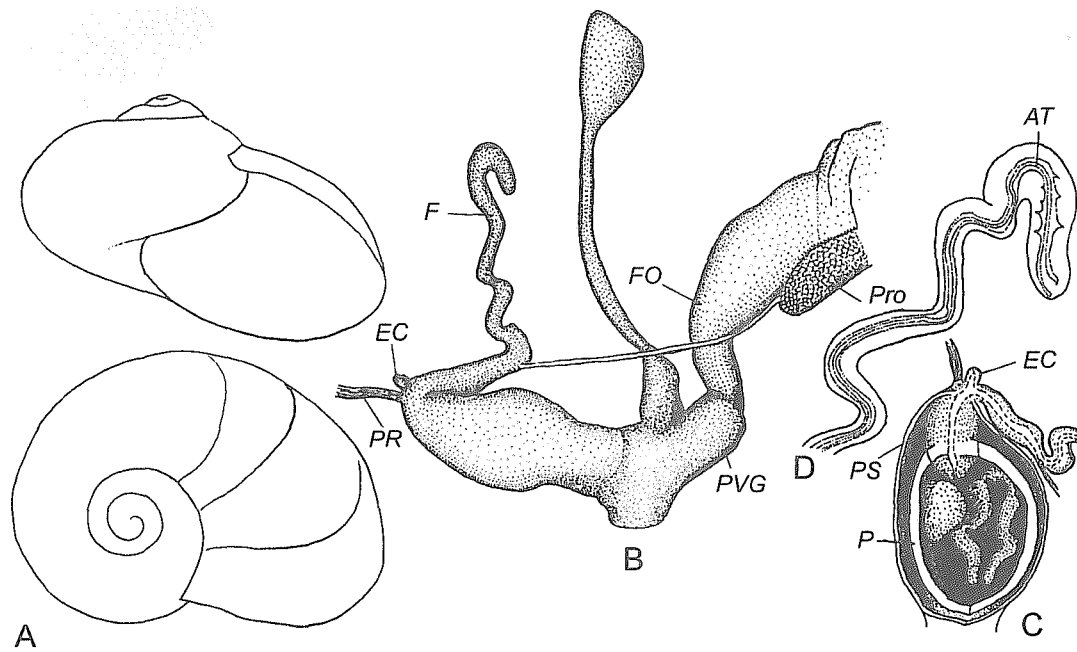


Fig. 1647. *Amatarion verrucosus* Van Mol, 1970.
A — shell. B — reproductive tract. C — interior of penis. D — longitudinal section of flagellum. After Van Mol, 1970. AT — axial thread.

smooth, with short apical process; tail with minute bifid horns.

DISTRIBUTION. Equatorial W and Central Africa (Cameroon, Congo). 6 spp.

Amatarion Van Mol, 1970
Fig. 1647

Van Mol, 1970: 164.

TYPE SPECIES — *Amatarion verrucosus* Van Mol, 1970; OD.

Shell vitrinoid, thin, of about 3 whorls. Embryonic whorls with dots arranged in spiral rows; on later whorls these rows transformed in spiral lines. Umbilicus absent. Height 9.5, diam. 15 mm.

Vas deferens thin, straight, rather short. Flagellum long, vermiform, internally with axial thread and few weakly developed cryptae in upper part. Epiphallus very short. Epiphallic caecum vestigial. Penis greatly swollen, sac-like, internally with a short verge, pad-like stimulator and 3 strong axial pilasters. Penis sheath surrounds penis and lower part of epiphallus up to level of caecum. Penial retractor inserting at base of caecum. Free oviduct rather long, stout, its distal section expanded, containing peri-

vaginal gland. Vagina almost absent. Spermathecal stalk rather long, somewhat widened basally; reservoir roughly ovate.

DISTRIBUTION. Equatorial W Africa (Côte d'Ivoire). 1 sp.

Verdcourtia Van Mol, 1970
Fig. 1648

Van Mol, 1970: 167.

TYPE SPECIES — *Helicarion auriformis* Thiele, 1910; OD.

Shell vitrinoid, much reduced, very thin but opaque, of 2.5-3 whorls. Embryonic sculpture of minute dots arranged in spiral rows. Postnuclear whorls smooth. Height of holotype 9, diam. 17.5 mm.

Vas deferens moderately long, more or less convoluted. Flagellum variable in length, turned into a hollow process lacking axial thread or cryptae. Epiphallus rather short, with or without caecum. Penis somewhat looped within sheath which surrounds all length of the organ. Internally penis with a short axial pilaster and small verge in lower part. Penial retractor inserting on penis/epiphallus junction. Free oviduct rather long, with thickened walls (perivaginal

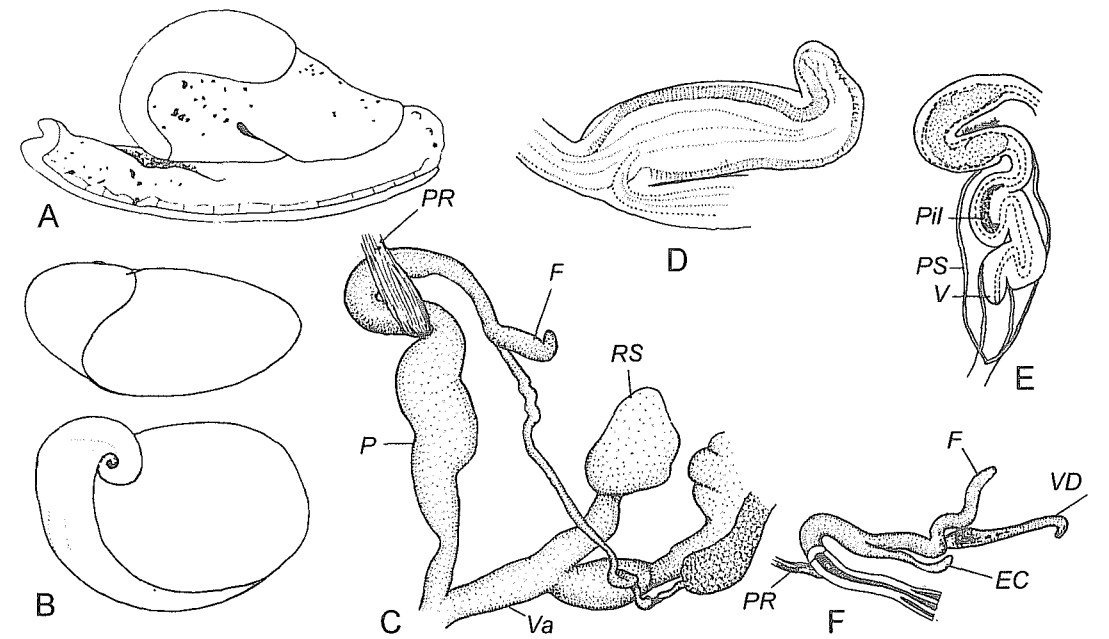


Fig. 1648. *Verdcourtia auriformis* (Thiele, 1910).
A — external view. B — shell. C — reproductive tract. D — interior of flagellum. E — longitudinal section of penis and epiphallus. F — interior of distal section of epiphallus and proximal section of penis of specimen having epiphallic caecum. After Van Mol, 1970.

gland?). Length of vagina variable. Spermathecal stalk short, capacious reservoir adhering to lower part of spermoviduct. Spermatophore consists of only ampulla having smooth surface.

DISTRIBUTION. Equatorial Africa (Democratic Republic Congo). 1 sp.

REMARK. The organ which I designate here as flagellum, Van Mol names caecum because it lacks axial thread. However topographically this organ is flagellum; besides, in some specimens true caecum is present (fig. 1648,F). Probably, this is a case of secondary simplification of flagellum connected with simplification of spermatophore which lacks tail.

Chlamydarion Van Mol, 1968
Fig. 1649

Van Mol, 1968: 261; 1970: 94.

TYPE SPECIES — *Helicarion insularis* Thiele, 1911 sensu Pilsbry, 1919 (= *Chlamydarion congoensis* Van Mol, 1968); OD.

Shell vitrinoid, thin, of 3-3.5 whorls. Body whorl greatly swollen. Embryonic sculpture of dots arranged in spiral rows.

Last whorl without regular sculpture. Height 5.5-10.0, diam. 12.5-17.5 mm.

Vas deferens rather short. Flagellum long, vermiform, convoluted, internally without axial thread and with very narrow, sinuous lumen. Epiphallus externally scarcely demarcated from penis. Penis long, twisted or convoluted within sheath, internally with variable relief and short verge of various, sometimes very complex, shape. Penial retractor attached to epiphallus well below caecum. Free oviduct somewhat swollen, rather short, as well as vagina. Spermathecal shaft stout, of moderate length, reservoir globular.

DISTRIBUTION. Equatorial Central and E Africa (E Congo, Uganda, Kenya, Tanzania). 8 spp.

Mesafricanion Pilsbry, 1919
Fig. 1650

Pilsbry, 1919: 259. Van Mol, 1970: 182.

TYPE SPECIES — *Mesafricanion maculifer* Pilsbry, 1919; OD.

Shell vitrinoid, of 2.25-2.75 whorls. Embryonic whorls with spiral lines consisting

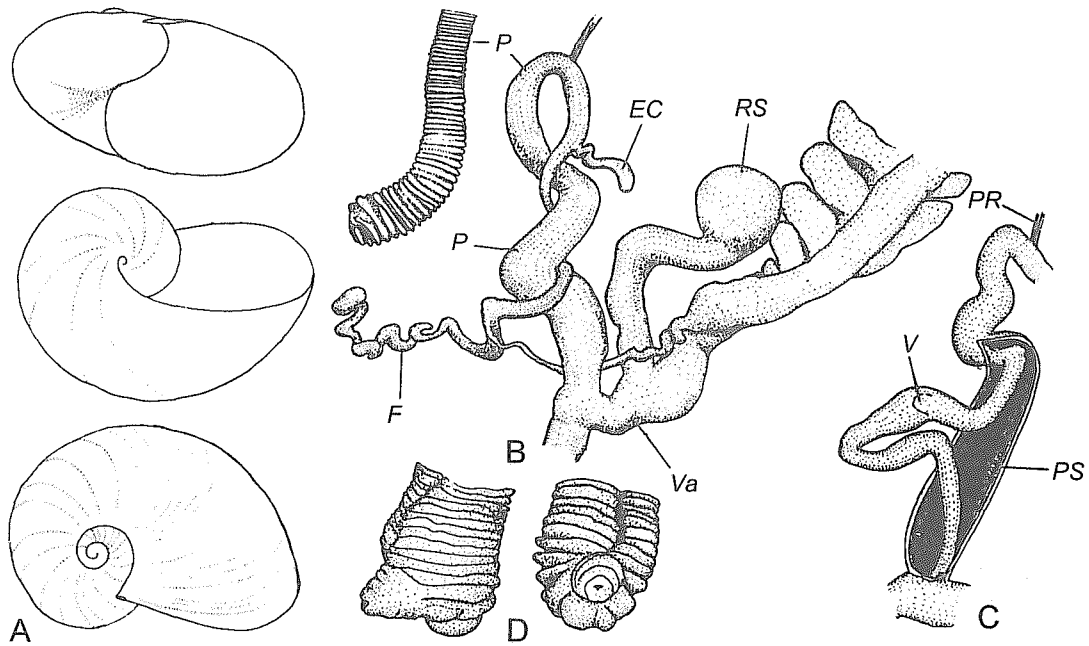


Fig. 1649. *Chlamydarion congoensis* Van Mol, 1968.
A — shell. B — reproductive tract. C — penis, penis sheath open. D — verge in two positions. After Van Mol, 1970.

of rows of dots. Last whorl without regular sculpture. Height 5.5-6.5, diam. 12-13 mm.

Vas deferens moderately long, somewhat thickened. Flagellum ("bourse épiphallienne" after Van Mol) transformed into very short, subglobular process, internally lined with cubic and ciliar epithelium; axial thread missing. Epiphallus short, its distal portion somewhat convoluted within sheath. Caecum also short. Penis large, internally demarcated from lumen of epiphallus and sheath by a thin partition which forms a peculiar verge having double walls (fig. 1650, F) and complex tubercular relief. Besides, penis forms a short diverticle penetrating sheath lumen. Penial retractor attached to epiphallus, shifted downward from caecum. Free oviduct rather long, stout. Vagina very short. Spermathecal shaft stout, short; reservoir voluminous.

DISTRIBUTION. Equatorial E Africa (E Congo). 1 sp.

Colparion Laidlaw, 1938

Fig. 1651

Laidlaw, 1938: 9.

TYPE SPECIES — *Colparion madgei* Laidlaw, 1938; OD.

Shell vitrinoid, much depressed, somewhat reduced, of about 2.5 whorls; last whorl increasing rapidly, its basal part membranous. Color light milky-brown. Embryonic and later whorls with microscopic radial striae. Aperture ample, with thin, simple margins. Diam. 15 mm.

Caudal foss vertical, slit-like, extending into overhanging horn.

Vas deferens opens into long epiphallus laterally. Flagellum slender, vermiform. Epiphallus long, at level of insertion of penial retractor epiphallus bent sharply on itself at acute angle. Penis subcylindrical. Penial retractor attached to epiphallus at base of caecum. Vagina dilated to form large sac with thin, transparent walls, which are given silky appearance by presence of delicate circular muscle fibers in them. Sac irregularly lobulated and clearly visible through thin skin of animal. Its lobulate appearance is due to presence of 8-9 eggs within it. Spermatheca small, pyriform, with short duct. Spermatophore consists of thin cylindrical ampulla, from either end of which runs long, hair-like tube of concholin.

DISTRIBUTION. Rodriguez Island, Indian Ocean. 1 sp.

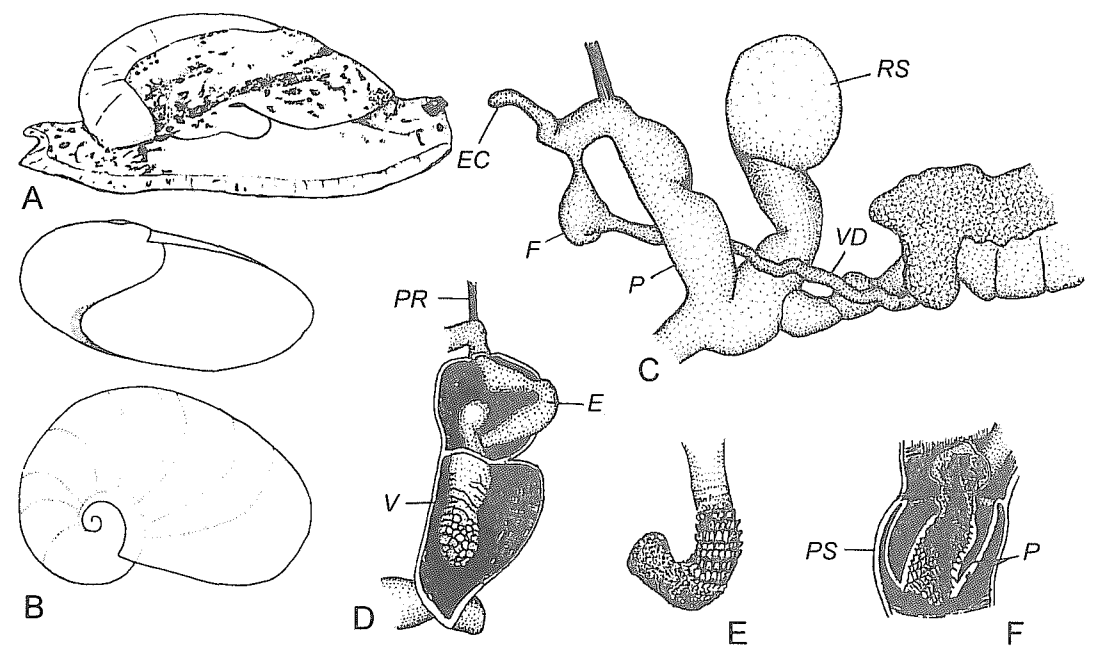


Fig. 1650. *Mesafricarion maculifer* Pilsbry, 1919.
A — external view. B — shell. C — reproductive tract. D — interior of penis. E — verge. F — longitudinal section of verge. After Van Mol, 1970.

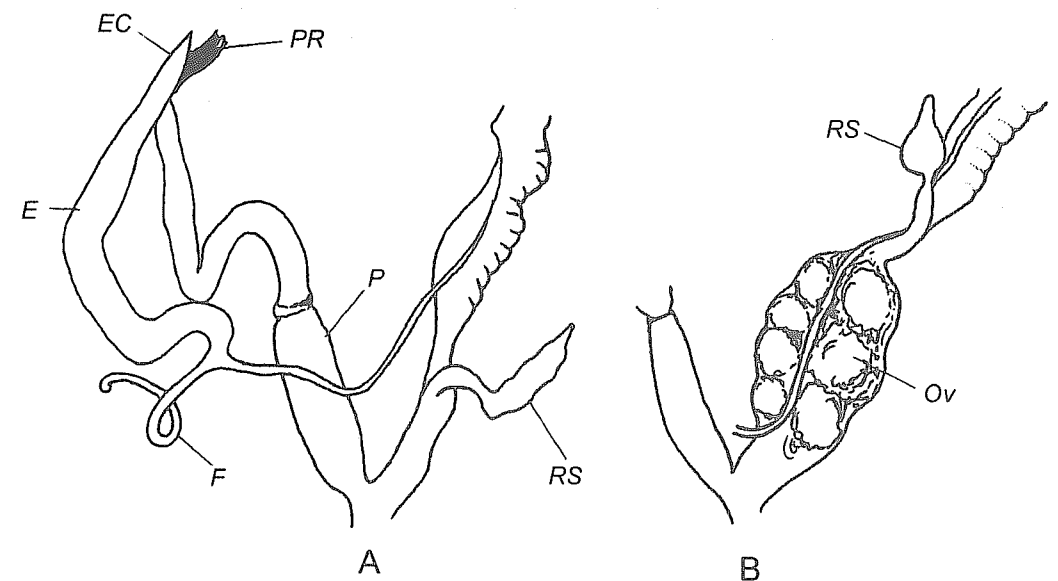


Fig. 1651. *Colparion madgei* Laidlaw, 1938.
A — reproductive tract. B — distal part of genitalia. After Laidlaw, 1938.

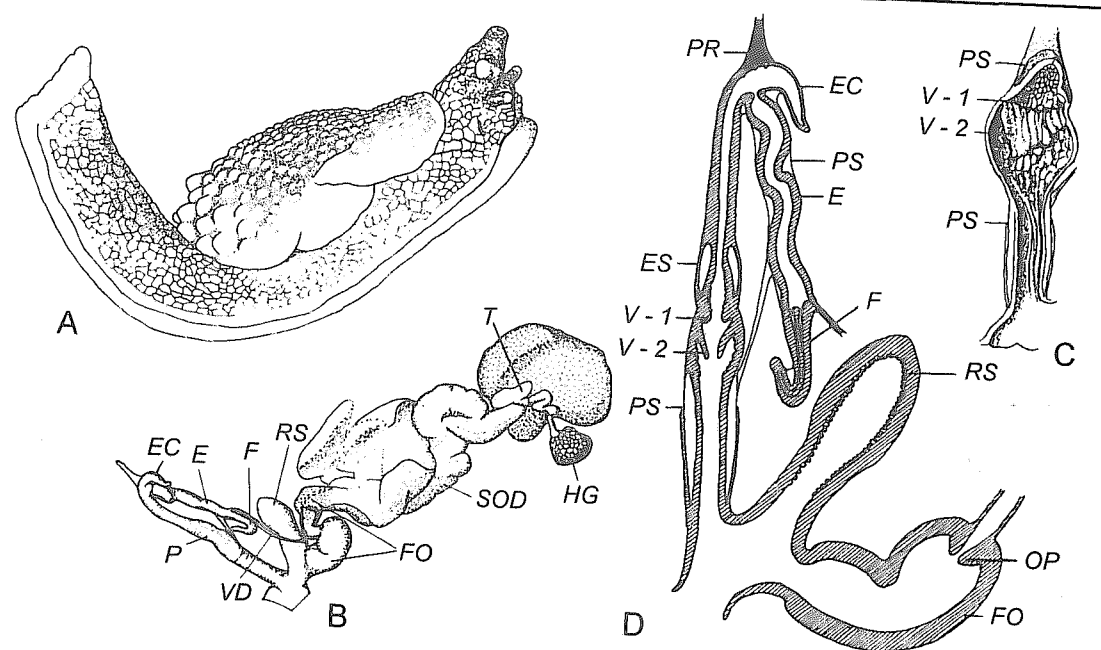


Fig. 1652. *Malagarion paenelimax* Tillier, 1979. A — external view of holotype; B — reproductive tract; C — penis structure; D — schematic longitudinal section through distal genitalia. After Tillier, 1979. AT — axial thread. ES — epiphallallic sheath. OP — papilla in free oviduct.

Malagarion Tillier, 1979

Fig. 1652

Tillier, 1979: 361.

TYPE SPECIES — *Malagarion paenelimax* Tillier, 1979; OD.

Slugs. Shell much reduced, almost completely noncalcified, of about 1.5 whorls.

Sole tripartite. Mantle without lobes. Visceral cavity not enters posterior part of cephalopodium which depressed by visceral hump lying on it.

Ovotestis compact, subglobular, formed by numerous acini. Hermaphroditic duct rather short, becomes broader and twisted in distal part. Talon short, broad. Vas deferens comparatively short, entering epiphallus at base of flagellum containing axial thread; walls of flagellum not contain cryptae. Epiphallus rather long, subcylindrical, with conic caecum, entering penis through 2 verges. Penis sheath moderately thick, surrounds distal half of penis and joined epiphallus by a thin connective bridge. Epiphallus also has its own sheath which is thicker than penial and surrounds distal-most section of epiphallus. Penial retractor

attached at base of epiphallallic caecum. Free oviduct consists of 3 sections: proximal thick-walled, probably glandular (? perivaginal gland); next section is a simple tube which opens by a prominent papilla (ovipositor) into swollen distal section. Vagina practically absent. Spermatheca rather short, with poorly defined stalk.

DISTRIBUTION. Madagascar. 6 spp.

Dendrolimax Heynemann, 1868
Fig. 1653

Heynemann, 1868: 32.

—? *Comorina* Simroth, 1910: 603 (t.-sp. *Comorina johanna* Simroth, 1910; monotypy).

Van Goethem, 1977: 101, 294.

TYPE SPECIES — *Dendrolimax heynemanni* Dohrn in Heynemann, 1868; monotypy.

Shell plate-like, ovate.

Ovotestis more or less compact, of numerous minute acini. Hermaphroditic duct short, somewhat convoluted. Vas deferens entering epiphallus laterally. Flagellum rather long, slender. Epiphallus somewhat sinuous, provided with finger-like caecum.

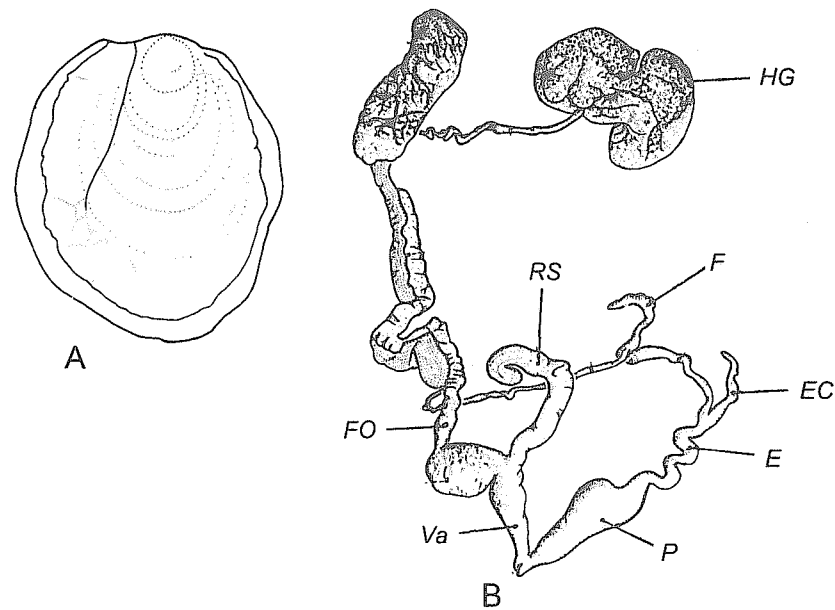


Fig. 1653. *Dendrolimax heynemanni* Dohrn, 1868. A — shell. B — reproductive tract. After Van Goethem, 1977.

Penis not long, swollen, internally with 2 verges (as in *Malagarion*). Penis sheath surrounds penis and distal part of epiphallus. Penial retractor attached to epiphallus below base of caecum. Free oviduct considerably expanded in its lower half, with glandular walls (perivaginal gland). Vagina quite long. Spermatheca sleeve-like, without distinct division into stalk and reservoir.

DISTRIBUTION. Africa (São Thomé and Príncipe, Annobón Island, Ghana, Togo, Cameroun, Zaïre, Uganda, Kenya, ? Comoro Islands); S Africa (introduced?). 9-10 spp.

Tresia Van Goethem, 1975
Fig. 1654

Van Goethem, 1975b: 861; 1977: 79.

TYPE SPECIES — *Estria maassi* Degner, 1932; OD.

Flagellum moderately long, somewhat twisted. Epiphallus with clavate caecum. Penis short, thick-walled, internally with very short verge. Penis sheath short, attached at both ends. Penial retractor com-

paratively very strong. Free oviduct long, with markedly swollen basal part; this part internally with a pair of longitudinal folds. Vagina very short, thick-walled. Spermathecal stalk stout, subglobular reservoir adherent to middle part of spermoviduct. Lower section of free oviduct and vagina supplied with strong retractors. Spermatophore with rather long apical process; tail with branched horns.

DISTRIBUTION. W Africa (SW Liberia, SE Guinea). 2-5 spp.

Estria Poirier, 1887
Fig. 1655

Poirier, 1887: 181, 182. Van Goethem, 1977: 64.

TYPE SPECIES — *Estria alluaudi* Poirier, 1887; OD.

Shell plate-like, rather convex. Nucleus smooth.

Ovotestis of 2 clumps of acini. Vas deferens moderately long. Flagellum not long, with many narrow cryptae in its walls. Epiphallus comparatively short, vaguely demarcated from penis. Epiphallallic caecum

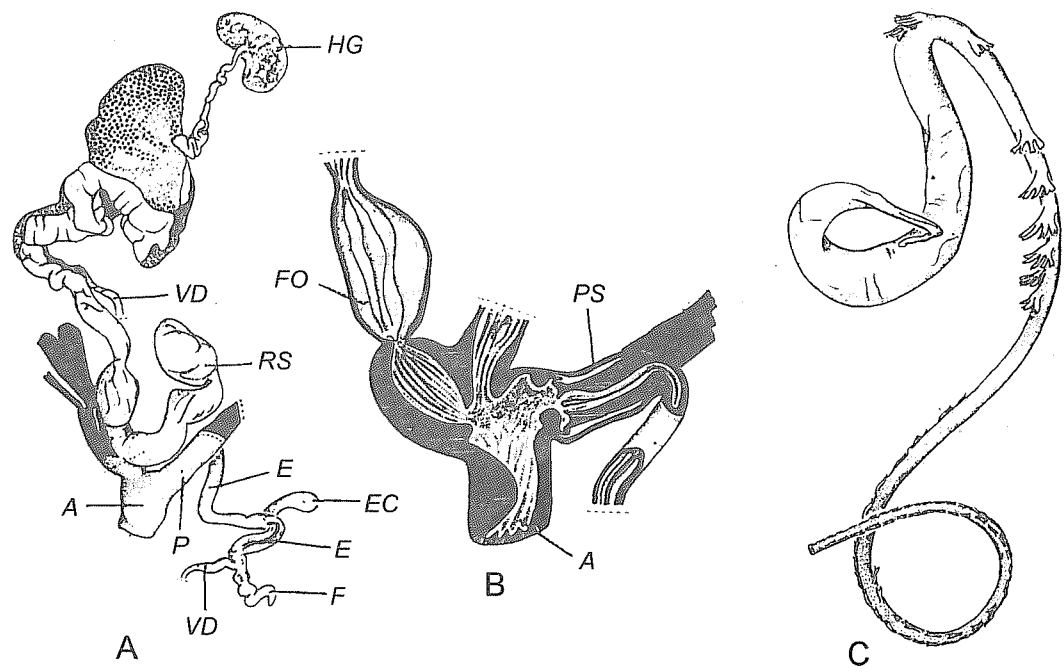


Fig. 1654. *Tresia maassi* (Degner, 1932).
A — reproductive tract. B — interior of distal part of reproductive tract. C — spermatophore.
After Van Goethem, 1977.

rather short. Penis thick-walled, internally with many short, small, axial folds; verge absent. Penis sheath surrounds penis and distal part of epiphallus. Penial retractor inserted on epiphallus at upper edge of penis sheath. Free oviduct quite long. Vagina short to rather long. Spermathecal stalk short, greatly widened at base, reservoir attending lower part of spermoviduct. Spermatophore with smooth ampulla and long tail bearing branched horns.

DISTRIBUTION. W Africa (Liberia, Côte d'Ivoire, Ghana, ? Togo). 4-5 spp.

Aspidotomium Degner, 1932
Fig. 1656

Degner, 1932: 170. Van Goethem, 1977: 59.

TYPE SPECIES — *Aspidotomium dubiosum* Degner, 1932; monotypy.

Talon not evident. Vas deferens enters epiphallus laterally. Flagellum well developed, internally with cryptae in its walls. Epiphallus moderately long, with ovoid caecum. Penis not long, muscular, internally without verge. Penis sheath surrounds entire length of penis, attached at both ends.

Penial retractor insertion marks boundary between epiphallus and penis. Free oviduct with glandular walls, internally with a series of small, oblique plicae. Vagina absent. Base of spermathecal stalk greatly swollen, thick-walled, internally with numerous small papillae; reservoir capacious, embedded in lower portion of spermoviduct. Basal parts of reproductive tract with numerous small retractors; stronger retractors attached to upper part of swollen section of spermathecal stalk. Spermatophore with thin-walled ampulla and long tail; upper section of tail with several large denticles, lower section with very small denticles.

DISTRIBUTION. W Africa (Liberia). 1 sp.

Leptichnus Simroth, 1896
Fig. 1657

Simroth, 1896: 296.

— *Leptichnus* Germain, 1907: 114 (nom. err. pro *Leptichnus* Simroth, 1896).

Van Goethem, 1977: 92.

TYPE SPECIES — *Leptichnus fischeri* Simroth, 1896; monotypy.

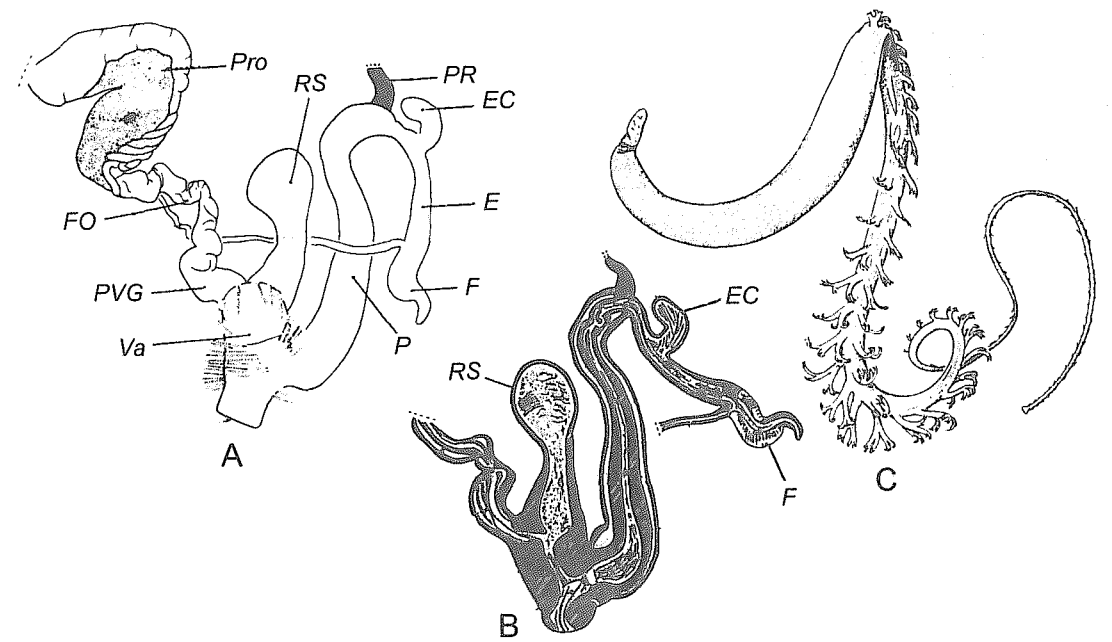


Fig. 1655. ! *Estria adscita* Van Goethem, 1977.
A — reproductive tract. B — interior of distal part of genitalia. C — spermatophore. After Van Goethem, 1977.

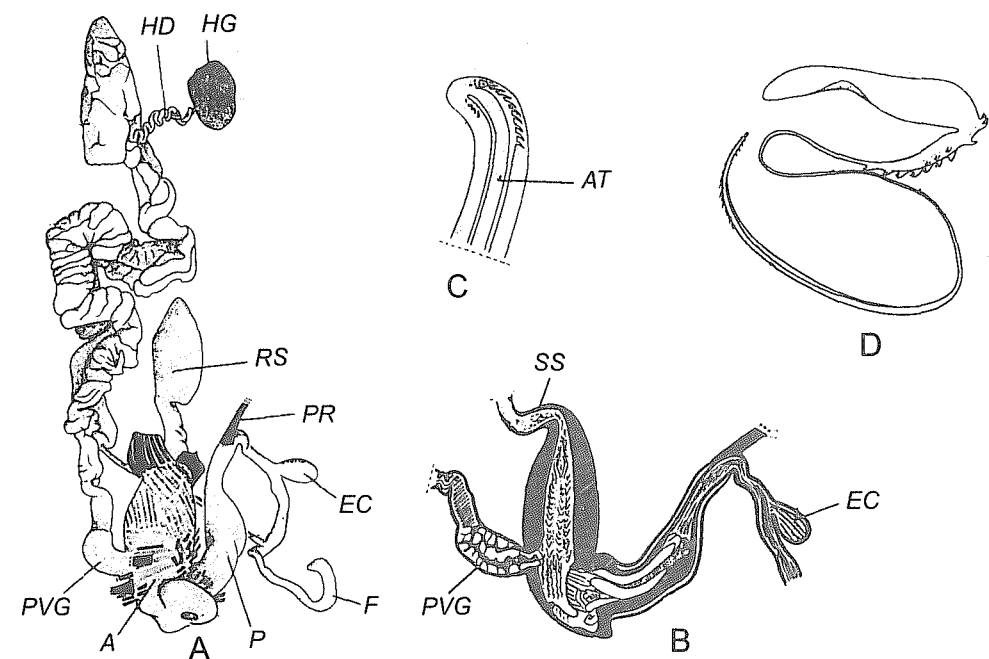


Fig. 1656. *Aspidotomium dubiosum* Degner, 1932.
A — reproductive tract. B — interior of distal part of reproductive tract. C — interior of flagellum. D — spermatophore. After Van Goethem, 1977. AT — axial thread.

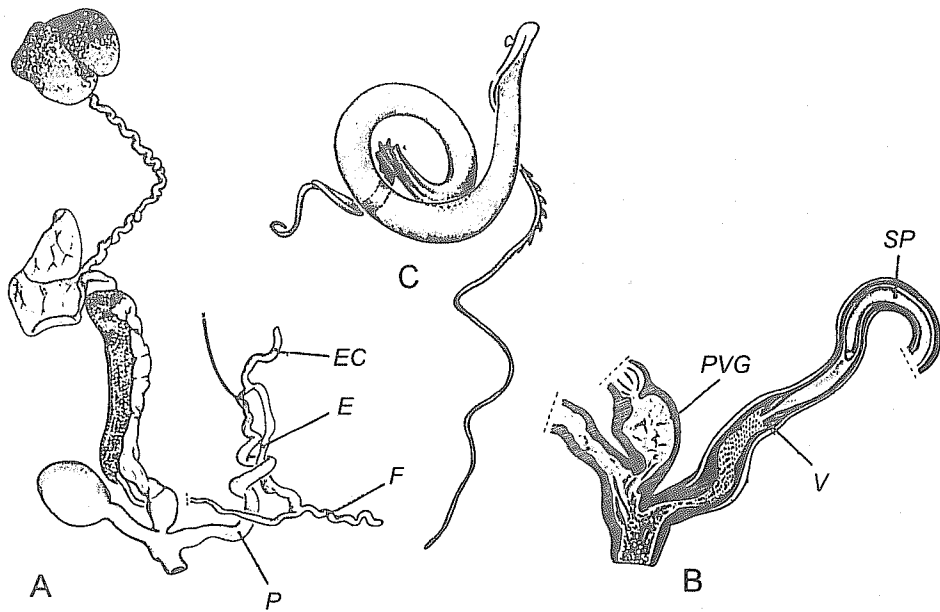


Fig. 1657. *Leptichnus fischeri* Simroth, 1896.
A — reproductive tract. B — interior of penis, atrium and free oviduct. C — spermatophore.
After Van Goethem, 1977.

Shell, a convex plate with almost median nucleus.

Ovotestis compact, of many small, tightly packed acini. Hermaphroditic duct convoluted. Vas deferens thin, moderately long. Flagellum rather long, slender. Epiphallus long. Penis internally with verge and minute papillae. Penis sheath covers penis and part of epiphallus. Penial retractor attached to epiphallus below retractor. Free oviduct swollen, with thick (?glandular) walls, internally with sphincter. Vagina absent. Spermathecal stalk short, reservoir globular, adhering to lower half of spermo-viduct.

DISTRIBUTION. E Tanzania and SE Kenya. 2 spp.

Sheldoniini Connolly, 1925

Connolly, 1925: 467 (Zonitidae subf.).

— *Peltatinae* Godwin-Austen, 1912: 124 (based on *Peltatus* which is a junior synonym of *Sheldonia*).

Penis internally with variously developed verge, without spines. Penial retractor

attached to epiphallic caecum apically. Vagina of common structure. Atrium lacking appendix or sarcobelum.

DISTRIBUTION. Africa.

Sheldonia Ancey, 1887

Fig. 1658

Ancey, 1887: 53.

— *Peltatus* Godwin-Austen, 1908a: 131 (t.-sp. *Helix hudsoniae* Benson, 1864; OD).

— *Kerkophorus* Godwin-Austen, 1912: 127 (t.-sp. *Zingis inuncta* Melvill et Ponsonby, 1899; OD).

— *Microkerkus* Godwin-Austen, 1912: 128 (t.-sp. *Helix symmetrica* Craven, 1880; OD).

— ? *Andrarion* Godwin-Austen, 1912: 582 (t.-sp. *Helicarion pumilio* Melvill et Ponsonby, 1909; OD).

Connolly, 1939: 122, 132.

TYPE SPECIES — *Helix trotteriana* Benson, 1848; SD Connolly, 1925.

Shell more or less globose, thin, translucent, somewhat shining, of 4-5 moderately convex whorls. Last whorl swollen, evenly rounded at periphery. Color (pale) corneous to yellowish, greenish-olive or dark-brown;

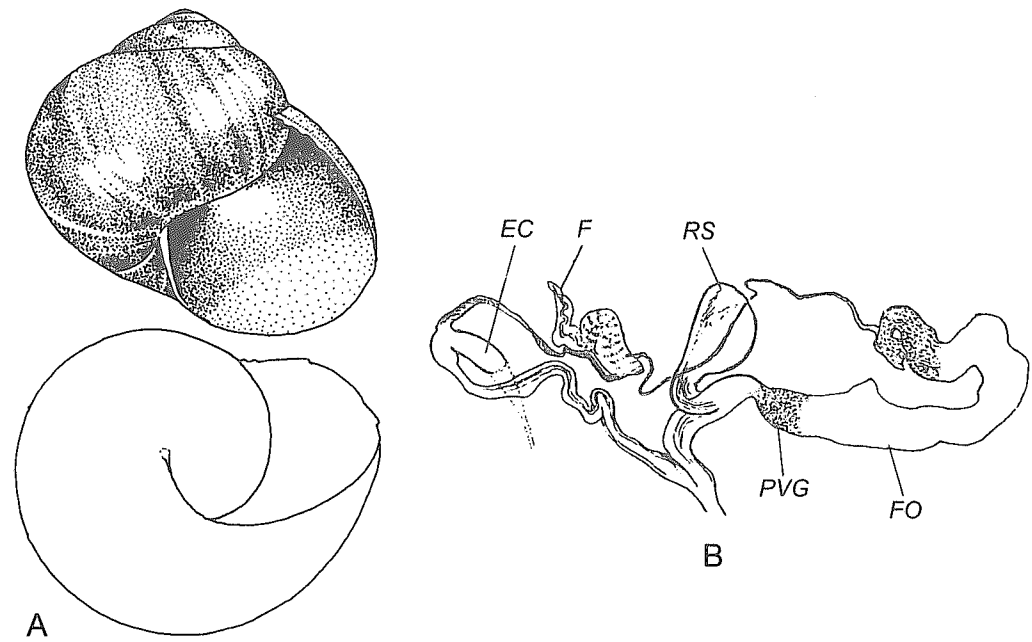


Fig. 1658. A — *Sheldonia trotteriana* (Benson, 1848).
Shell: S Africa. Leiden. B — ! *Sheldonia hudsoniae* (Benson, 1864). Reproductive tract.
After Godwin-Austen, 1908a.

sometimes with darker, irregular, diffused streaks; narrow dark suprapерipheral band may be present. Embryonic sculpture of extremely close, fine, microscopic spiral lines. Postembryonic whorls with delicate, irregular radial wrinkles and sometimes with traces of spiral striae. Aperture ample, roughly subcircular, well oblique, with simple margins; columellar margin shortly reflexed. Umbilicus closed. Height 3.5-16.2, diam. 6.8-24.5 mm (13.5 × 15.1 mm).

Sole tripartite. Cephalopodium with caudal pore and overhanging horn.

Vas deferens long, thin, entering epiphallus at base of a long, tapering flagellum. Epiphallus rather long, narrow, with elongated caecum. Penis long, subcylindrical. Penial retractor attached to summit of caecum. Free oviduct long, stout, with perivaginal gland in lower section; vagina much shorter. Spermathecal stalk short, reservoir large, globular, adhering to free oviduct. Spermatophore consisting of a large ampulla, on one side of which there is row of short, blunt spines.

DISTRIBUTION. S Africa. At least 30 spp. & subspp.

Morrumbalia Verdcourt, 1998

Fig. 1659

Verdcourt, 1998: 9 (*Zingis* subg.).

TYPE SPECIES — "*Zingis morrumbalensis* (Melvill et Ponsonby) Connolly, 1939"; OD.

Shell depressed globose, thin, transparent, somewhat dull above, glossy beneath, of 6 convex whorls. Last whorl rounded at periphery. Color corneous yellow-brown. Embryonic whorls smooth or with microscopical spiral lines. Later whorls with weak, curved, irregular, radial striae which become much weaker on base. Aperture broadly lunate, moderately oblique, with simple margins. Umbilicus narrowly open. Height 20-23, diam. 29-32 mm.

Vas deferens long, slender, convoluted. Flagellum long, internally with axial thread and numerous dendritic cryptae. Epiphallus short, caecum located in its distal section. Penis long, subcylindrical, internally with a minute verge and many thin, longitudinal plicae. Free oviduct moderately long, expanded basally; vagina somewhat shorter. Atrium swollen, internally with a large,

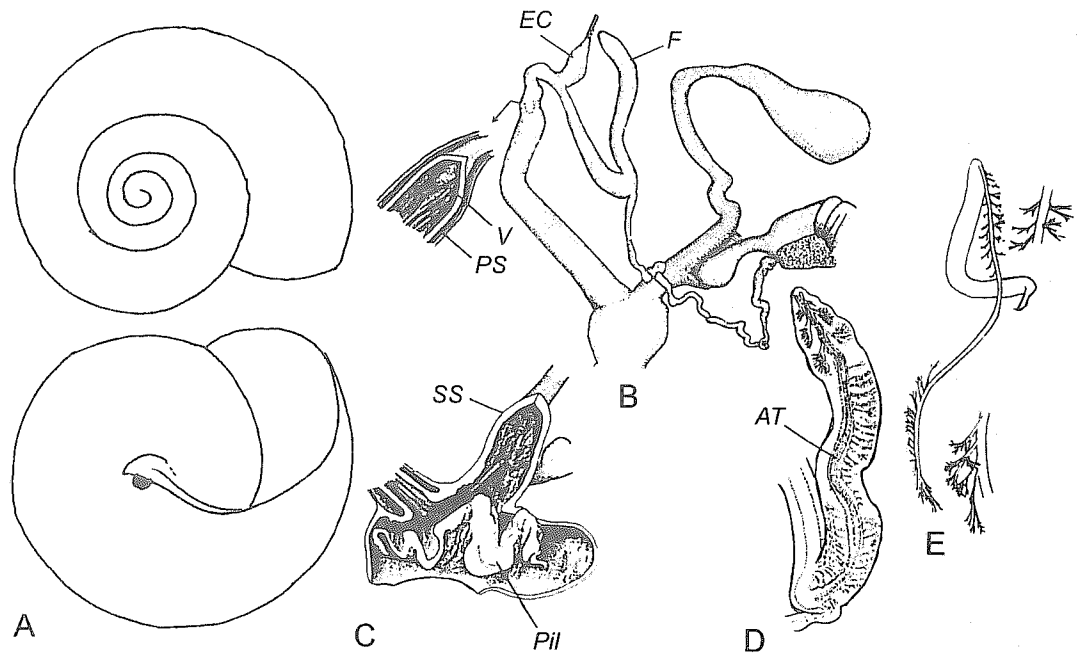


Fig. 1659. *Morrumbalia morrumbalensis* (Connolly, 1939).
A — shell. After Connolly, 1939. B — reproductive tract and interior of penis. C — interior of atrium. D — interior of flagellum. E — spermatophore and its fragments. After Verdcourt, 1998.

folded pilaster. Spermathecal stalk long, reservoir ovoid, capacious. Spermatophore with elongate, sausage-shaped ampulla having short apical process and long attenuate tail bearing branched spines.

DISTRIBUTION. E and S Africa (Tanzania, Zimbabwe, Mozambique, South Africa). 3-5 spp.

REMARK. It is generally believed that one of important diagnostic characters of *Zingis* is the presence of penial gland; Verdcourt pointed out that this gland is absent in *Morrumbalia*. All the rest features of *Morrumbalia* agree with those of *Sheldonia*, therefore I refer *Morrumbalia* to Sheldoniini. At the same time it should be taken into consideration that we do not know anatomy of type species of *Zingis*.

Falloonella Preston, 1914
Fig. 1660

Preston, 1914: 809.

TYPE SPECIES — *Falloonella exquisita* Preston, 1914; OD.

Shell depressedly turbinate, thin, dull above, shining below, of 5.5-6 slightly con-

vex, somewhat shouldered whorls. Last whorl with cord-like keel. Color pale-corneous to chestnut. First 0.5 whorl smooth, next 1-1.5 whorls finely spirally striated. Postnuclear whorls with very accurate periostracal riblets above and spiral lines below peripheral keel. Aperture subcircular, moderately oblique, with simple margins. Umbilicus narrowly open. Height 5.00-6.75, diam. 9.75-11.75 mm (6.6 × 10.0 mm).

DISTRIBUTION. E Africa. 2-3 spp.

Thapsia Martens, 1860
Fig. 1661

- Martens in Albers, 1860: 56 (*Nanina* subg.).
— *Thapsiella* Gude, 1911a: 272 [nom. praeocc., non Fischer, 1884 (Pectinibranchia); t.-sp. *Thapsia masukuensis* E. Smith, 1899; OD].
— *Gudeëlla* Preston, 1913a: 285 (nom. nov. pro *Thapsiella* Gude, 1911).
— *Thapsinella* Raemaekers, 1959: 62 (nom. nov. pro *Thapsiella* Gude, 1911).
— *Megathapsia* Raemaekers, 1959: 62 [*Thapsia* sect.; t.-sp. *Thapsia (Megathapsia) dartevellei* Raemaekers, 1959; monotypy].
Adam, 1960: 72.

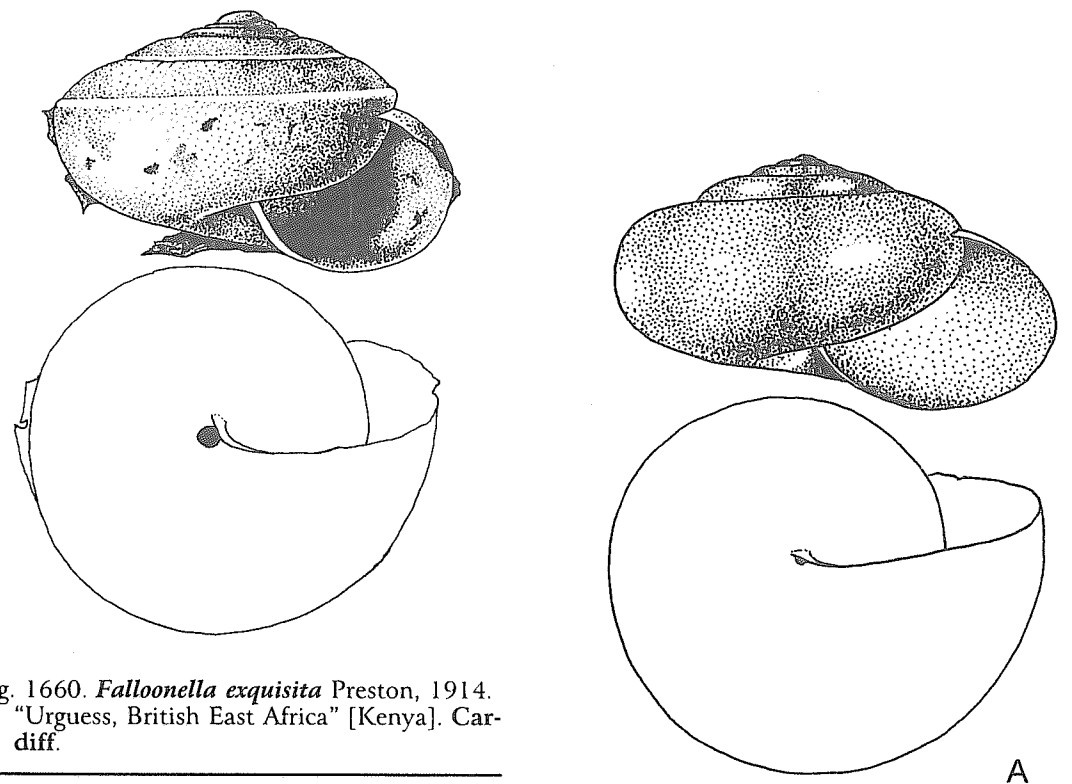


Fig. 1660. *Falloonella exquisita* Preston, 1914. "Urguess, British East Africa" [Kenya]. Cardiff.

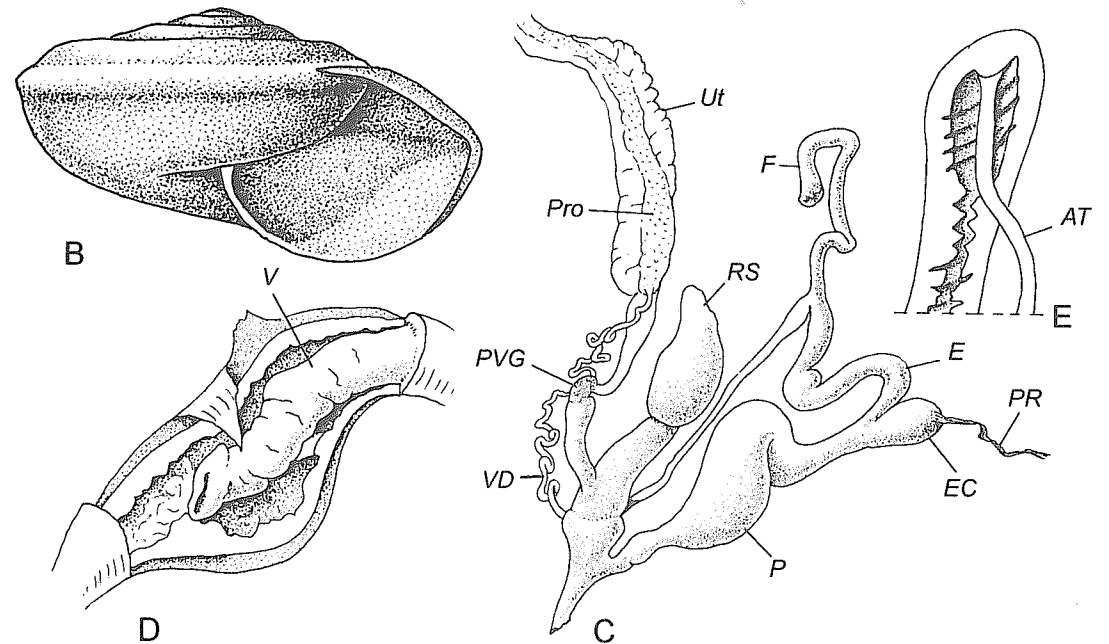


Fig. 1661. A — *Thapsia troglodites* (Morelet, 1848). Batate, Fernando Poo Island. Leiden. B, C, D, E — ! *Thapsia pellucida* (Gould, 1843). Alépé, about 50 air km ENE of Abijan, Côte d'Ivoire, February, 1964. B — shell. C — reproductive tract. D — interior of penis. E — interior of flagellum. Geneva. AT — axial thread.

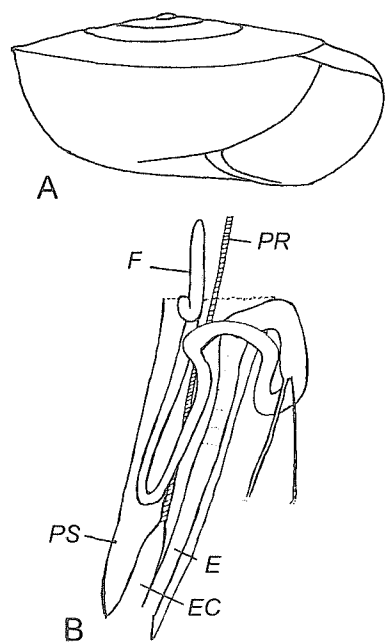


Fig. 1662. *Tropidocochlion depressa* (Germain, 1916).
A — shell. B — distal part of male division, penis sheath open. After Verdcourt, 1998.

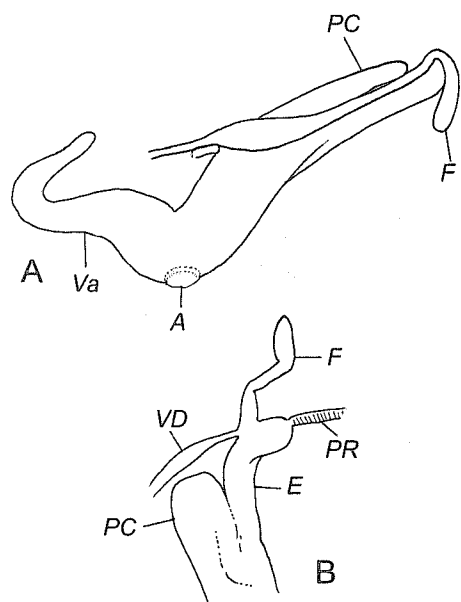


Fig. 1663. *Sjostedtina membranacea* (d'Ailly, 1910).
A — distal part of reproductive tract. B — upper part of male section. After Verdcourt, 1961.

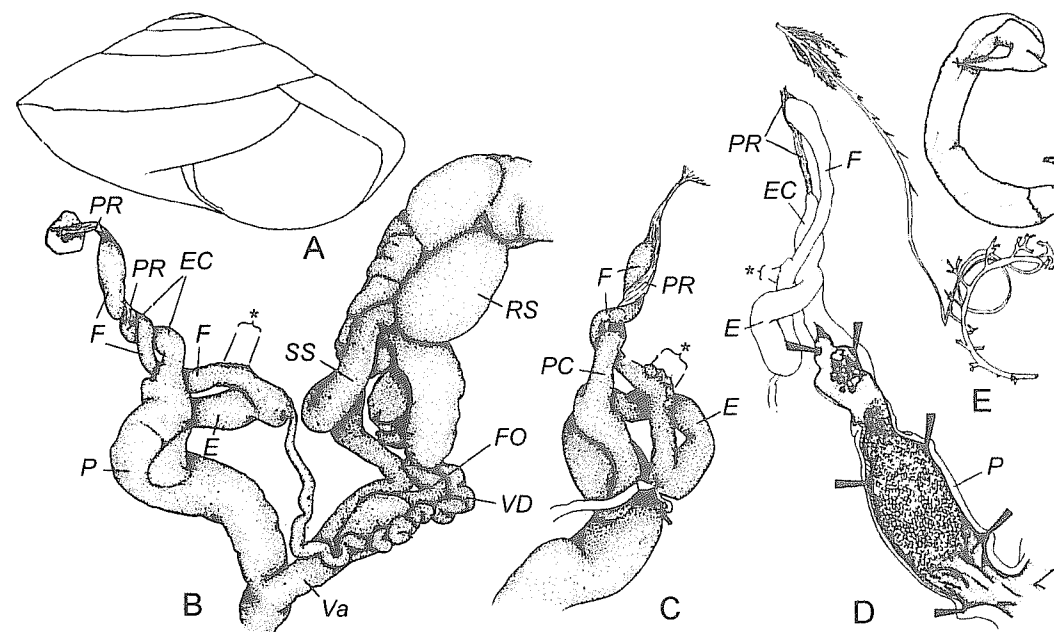


Fig. 1664. *Carinazingis regalis* Bruggen et Winter, 1990.
A — shell. B — reproductive tract. C — apical part of penial complex slightly turned around. D — interior of penis. E — spermatophore. After van Bruggen & de Winter, 1990. Asterisk — area with papillae in basal part of flagellum.

TYPE SPECIES — *Helix troglodites* Morelet, 1848; OD.

Shell depressed, thin, shining, of 5-6 moderately convex whorls. Last whorl evenly rounded to angulated or carinated. Color yellow, pale brown or greenish-corneous, sometimes with darker band. Embryonic whorls smooth. Postapical sculpture of fine, clear radial wrinklets crossed by close-set, spiral, engraved lines. Aperture widely lunate, a little oblique. Umbilicus minutely to narrowly open. Height 3-16, diam. 4-25 mm (*troglodites*: 15.0 × 25.0 mm; *pellucida*: 11.2 × 21.1 mm).

Vas deferens more or less convoluted in proximal section (along vagina), enters epiphallus laterally, leaving a long flagellum; perimeter of blunt apex of flagellum may bear small protuberances. Internally flagellum with axial thread, walls contain slit-like cryptae. Epiphallus long, with ovoid caecum, inner surface of caecum with short corrugated folds. Penis more or less swollen, coated by thin sheath, internally with a long verge. Penial retractor inserted on apex of caecum. Free oviduct long, with a small perivaginal gland. Vagina short, swollen. Spermathecal stalk short, stout; reservoir

ample, elongated, attending lower section of spermoviduct.

DISTRIBUTION. Central, western [including Fernando Poo (= Bioko) Island] and northern S Africa. At least 100 spp. & forms.

Tropidocochlion Verdcourt, 1998
Fig. 1662

Verdcourt, 1998: 12 (*Zingis* subg.).

TYPE SPECIES — *Zingis depressa* Germain, 1916; OD.

Shell depressed, thin, dull above, shining below, of about 5 moderately convex whorls. Base taller than spire. Last whorl with sharp keel above mid-line. Color generally chestnut. Embryonic whorls with fine microspiral lines. Postapical whorls with a fine microdecussate moiré sculpture. Aperture semilunate, slightly oblique, with thin margins. Umbilicus narrowly open. Height 13, diam. 27 mm.

Vas deferens slender, entering epiphallus laterally. Flagellum very long and narrow, not wrinkled. Epiphallus long, with a fairly short caecum. Penis internally conspicu-

ously tessellated, with a thin verge or stimulator. Penial retractor attached at apex of caecum. Free oviduct rather short, vagina very long, subcylindrical. Spermathecal stalk very short, reservoir ovoid. Spermatophore lacking spines, with sausage-shaped ampulla, long, narrow apical process and thin tail.

DISTRIBUTION. E Africa (Tanzania). Probably 1 sp.

REMARK. Remark to *Morrumbalia* (p. 1262) is true for *Tropidocochlion*.

Sjostedtina Verdcourt, 1961
Fig. 1663

Verdcourt, 1961: 124 (*Trochonanina* subg.; as *Sjostedtina*).

TYPE SPECIES — *Trochonanina membranacea* d'Ailly, 1910; OD.

Shell depressed-helicoid, very thin. Last whorl capacious, smoothly rounded at periphery. Color white with blackish-brown radial streaks. Embryonic whorls microspirally striated. Postapical whorls with close radial lines and very vague spiral striae above; on base spiral sculpture absent. Um-

bilicus, a small rim. Height 11, diam. 13 mm.

Caudal foss developed, caudal horn absent.

Vas deferens enters epiphallus at base of clavate flagellum. Epiphallus very short, with oval caecum located opposite to entrance of vas deferens. Penial retractor inserted on epiphallus caecum apically. Penis not long, with small, blunt caecum. Spermathecal stalk short.

DISTRIBUTION. E Africa (Kilimanjaro). 1 sp.

Carinazingis Bruggen et Winter, 1990
Fig. 1664

Bruggen van & Winter de, 1990: 236.

TYPE SPECIES — *Carinazingis regalis* Bruggen et Winter, 1990; OD.

Shell depressed, thin, much translucent, dull above, glossy beneath, of 4.5-5 nearly flat whorls. Last whorl sharply carinated. Color corneous yellowish-brown. Embryonic sculpture of fine, regular spiral lines. Postapical whorls with widely spaced, rib-like, oblique wrinkles; interstices with traces

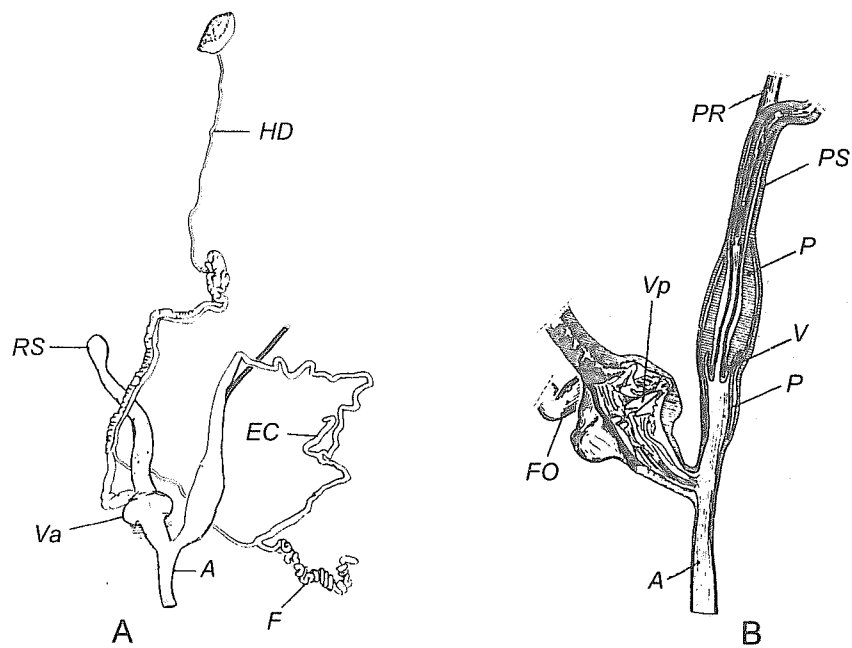


Fig. 1665. *Upembella adami* Van Goethem, 1969.
A — reproductive tract. B — interior of penis and vagina. After Van Goethem, 1977.

of spiral engraving. Aperture approximately semilunate, angled, moderately oblique, with simple, thin margins. Umbilicus narrowly open. Height 8.7-10.4, diam. 16.0-20.3 mm.

Sole tripartite. Caudal foss slit-like, almost horizontal, partly overhung by a short caudal horn.

There is a large frontal organ which may be withdrawn into head. It is prominent, consisting of an order assemblage of about 18 conic lobes or warts with acute apex, surrounded by a field of well-marked and close papillae.

Vas deferens in proximal section (along vagina) strongly convoluted, entering epiphallus laterally. Flagellum long, its basal part externally with conspicuous papillae, internally with axial thread. Epiphallus not long, supplied with a straight caecum. Penis long, contorted, internally without folds or verge; inner surface of lower, broad part of penis covered by a low stratum of small quadrangular "cells". Free oviduct long, expanded in lower part (perivaginal gland?). Vagina short. Spermathecal stalk long, somewhat convoluted; reservoir large, ovoid. Ampulla of spermatophore with a digitiform apical projection, tail with many branched spines.

DISTRIBUTION. E Africa (Malawi). 1 sp.

REMARK. Originally *Carinazingis* has been placed in *Gymnarioninae* because of the frontal organ presence. However the structure of reproductive tract of *Carinazingis* corresponds to the diagnosis of *Trochozonitinae* and drastically differs from those of *Gymnarion*. Since other examples of the presence of structures similar to frontal organ (for instance, in some *Camaenidae*) are known, I admit that frontal organ of *Carinazingis* might be a result of parallel evolution. Otherwise, *Gymnarion* should be referred to *Trochozonitinae* next to *Carinazingis* and estimated as derivative of the latter.

? *Upembellini* Van Goethem, 1977

Van Goethem, 1977: 121.

Penis internally with verge which has double walls; spines absent. Penial retractor attached to epiphallus well below caecum. Vagina greatly swollen, thick-walled, internally with few papillae. Atrium without appendix or sarcobelum.

DISTRIBUTION. Central and SE Africa (Mozambique, Zaire, Zimbabwe).

REMARK. Van Goethem (1977) placed *Upembellini* in *Urocyclinae* (in his sense) despite the presence of very long, convoluted flagellum in *Upembella*. Such a flagellum is characteristic for African *Ariophantidae*, but in *Upembella* this organ lacks axial thread. Therefore the position of *Upembellini* in *Ariophantidae* is under the question.

Upembella Van Goethem, 1969 Fig. 1665

Van Goethem, 1969: 1; 1977: 121.

TYPE SPECIES — *Upembella adami* Van Goethem, 1969; OD.

Slugs. Shell plate-like.

Flagellum very long, strongly convoluted, without axial thread. Epiphallus very long. Epiphallic caecum not long, vermiform. Penis short, with short verge having double walls. Penis sheath double. Penial retractor attached to penis/epiphallus junction. Vagina forms peculiar muscular organ containing internal papillae. Spermathecal stalk stout, moderately long; reservoir small.

DISTRIBUTION. Central Africa (Zaire). 1 sp.

Leptichnoides Van Goethem, 1975 Fig. 1666

Van Goethem, 1975b: 863; 1977: 125.

TYPE SPECIES — *Leptichnus verdcourti* Forcart, 1967; OD.

Slugs. Shell plate-like, asymmetrical, almost completely covered by mantle. Body length up to 31 mm.

Flagellum rather long. Epiphallus relatively short, with caecum which is somewhat shorter than flagellum. Penis not long, expanded, internally with short verge. Penial retractor attached below epiphallic caecum. Free oviduct enormously long and stout. Vagina absent. Spermathecal stalk rather stout and long, subglobular reservoir reaching middle of spermoviduct.

DISTRIBUTION. SE Africa (Mozambique, Zimbabwe). 1 sp.

Zonitarionini Schileyko, trib. nov.

Type genus — *Zonitarion* Pfeffer, 1883.

Penis internally with variously developed verge or stimulator, without spines. Penial retractor attached to caecum, below

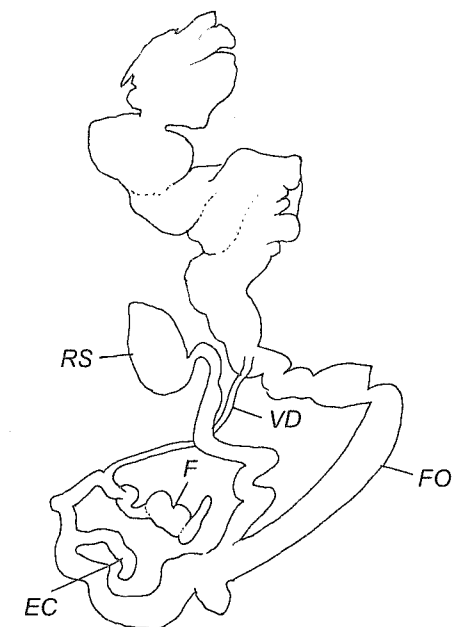


Fig. 1666. *Leptichnoides verdcourti* (Forcart, 1967).
Reproductive tract. After Forcart, 1967.

or above it. Vagina of common structure. There is atrial or penial appendix or sarcobelum lacking retractor.

DISTRIBUTION. Africa.

Zonitarion Pfeffer, 1883 Fig. 1667

Pfeffer, 1883: 11. Van Mol, 1970: 194.

TYPE SPECIES — *Helicarion semimembranaceus* Martens, 1876; SD Pilsbry, 1919 (footnote).

Shell vitrinoid, thin, of 2.5-3 whorls.

Vas deferens moderately long. Flagellum rather short. Epiphallus stout, without caecum, enters penis through small verge. Penis internally axially plicated. Penis sheath surrounds penis and adjacent section of epiphallus. Penial retractor attached at upper edge of sheath. Free oviduct of slender proximal and swollen distal parts. Vagina very short. Sarcobelum ovoid, not connected with penis, entering atrium through a short papilla. Spermathecal stalk short, stout, reservoir embedded in lower part of spermoviduct. Spermatophore with elongate ampulla lacking apical process, and long tail supplied in upper section with short, branched spines.

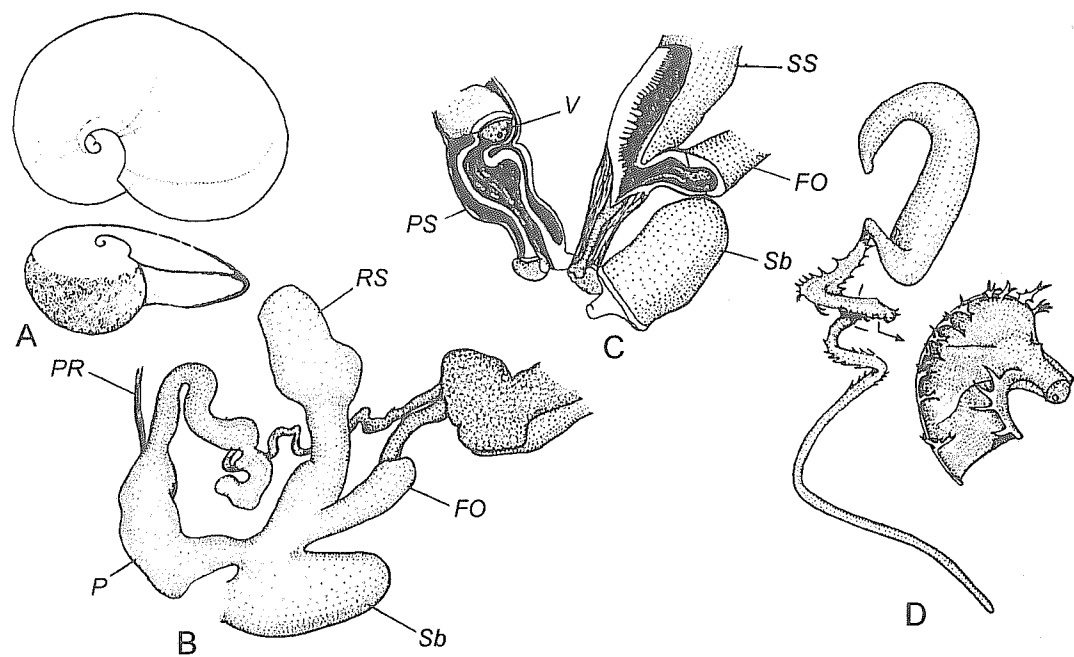


Fig. 1667. *Zonitarion semimembranaceus* (Martens, 1876).
A — shell. B — reproductive tract. C — interior of distal parts of genitalia. D — spermatophore and its fragment. After Van Mol, 1970.

DISTRIBUTION. W Africa (Cameroon, W Congo). 1 sp.

Belonarion Pilsbry, 1919
Fig. 1668

Pilsbry, 1919: 262 (*Mesafricanarion* subg.). Van Mol, 1970: 206.

TYPE SPECIES — *Mesafricanarion putzeysi* Pilsbry, 1919; OD.

Shell as in *Zonitarion*.

Vas deferens quite long. Epiphallus slender, with caecum that sometimes has vestigial coiling. Penis internally axially plicated. Penis looped within sheath, with verge of complex shape. Penial retractor attached to caecum apically. Free oviduct rather long, swollen in distal part. Vagina short. Sarcobelum ovoid, internally with long, conic papilla and narrow lumen; entering penis sheath. Spermathecal stalk (rather) long, slender, reservoir embedded in upper half of spermoviduct.

DISTRIBUTION. W Africa (Gabon, Congo, Cameroon). 12 spp.

Degneria Verdcourt, 1956
Fig. 1669

Verdcourt, 1956: 72 (*Helicarion* subg.). Van Mol, 1970: 172.

TYPE SPECIES — *Helicarion boranensis* Piersanti, 1939; OD.

Shell vitrinoid, very thin, of 3-3.5 whorls. Embryonic whorls finely spirally punctate. Rest surface smooth. Height 7-10, diam. 12-20 mm.

Vas deferens rather to very short. Flagellum long, somewhat convoluted, with axial thread and very narrow cryptae in walls. Epiphallus not long, with well developed caecum. Penis more or less tubular, looped within sheath, internally with a long verge. Penial retractor attached just below base of caecum. Penis and spermathecal stalk associated with voluminous sarcobelum. Latter consists of sac-like envelope comprising a long, fleshy papilla which arises from blind end of sarcobelum. Papilla of sarcobelum has a very narrow lumen.

DISTRIBUTION. NE Africa (Ethiopia). 2 spp.

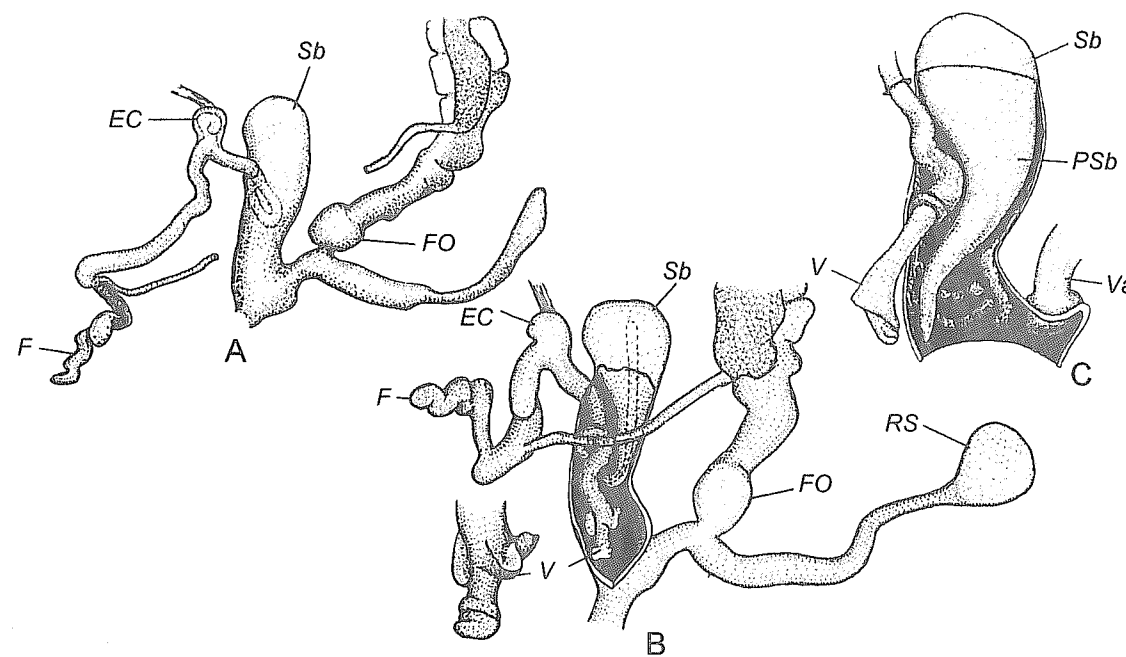


Fig. 1668. *Belonarion putzeysi* (Pilsbry, 1919).
A — reproductive tract. B — interior of penis sheath. C — interior of sarcobelum. After Van Mol, 1970.

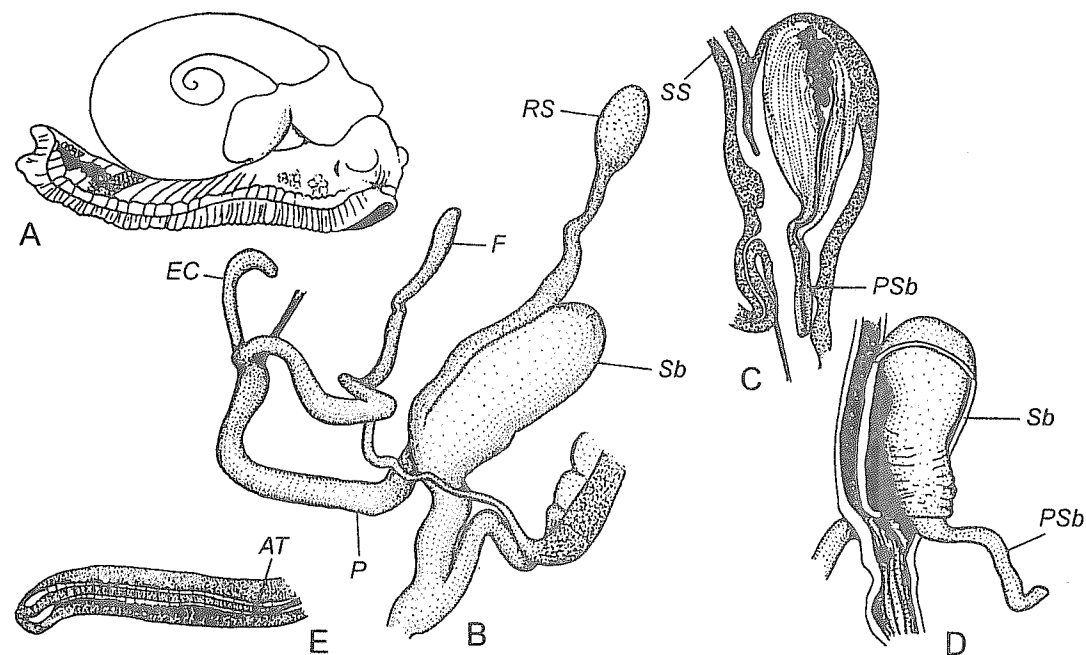


Fig. 1669. *Degneria boranensis* (Piersanti, 1939).
A — external view. B — reproductive tract. C — longitudinal section of sarcobelum. D — interior of sarcobelum. E — longitudinal section through flagellum. After Van Mol, 1970.
AT — axial thread.

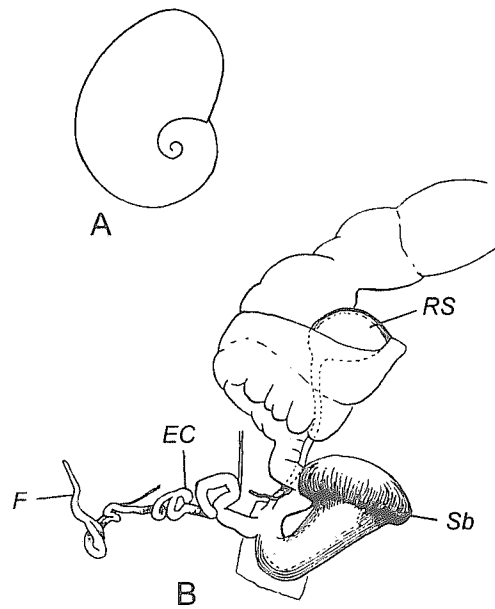


Fig. 1670. *Entagarius entagarius* (Pilsbry, 1919).
A — shell. B — reproductive tract. After Pilsbry, 1919.

Entagarius Pilsbry, 1919
Fig. 1670

Pilsbry, 1919: 268 (*Helixarion* subg.). Van Mol, 1970: 221.

TYPE SPECIES — *Helixarion entagarius* Pilsbry, 1919; OD.

Shell has a plane spire, thin, of 2.5 whorls, base partly membranous. Color yellow. Shell surface smooth except for slight radial wrinkles and some irregular impressions at right angle with them. Height of shell about 4 mm, diam. 7 mm; length of foot of type 27 mm, length of a more extended specimen 36 mm.

Caudal horn rather prominent.

Vas deferens entering rather long, irregularly convoluted epiphallus laterally leaving slender flagellum. Epiphallus with a small caecum ("lime gland", after Pilsbry). Externally boundary between epiphallus and penis poorly defined and seemingly marked by penial retractor attachment. Free oviduct short, vagina almost absent. Sarcobelum large, muchroom-shaped, with very thick muscular walls, situated on atrium between penis and base of female section. Spermathecal stalk moderately long, slender,

reservoir ovoid, embedded in middle of spermoviduct.

DISTRIBUTION. Central Africa (Democratic Republic Congo). 1 sp.

Rhopalogonium Degner, 1932
Fig. 1671

Degner, 1932: 176.

— ? *Aspidelus* Morelet, 1883: 395 (t-sp. *Aspidelus chaperi* Morelet, 1883; monotypy; gen. inquirendum).

— ? *Varania* Simroth, 1903: 710 (t-sp. *Varania loenbergi* Simroth, 1903; monotypy; gen. inquirendum).

Van Goethem, 1977: 50, 53, 57.

TYPE SPECIES — *Rhopalogonium enigmaticum* Degner, 1932; monotypy.

Slugs. Shell plate-like with smooth protoconch.

Vas deferens rather short, entering epiphallus laterally. Flagellum rather stout, with well developed axial thread and cryptae in walls. Epiphallus with subglobular caecum. Penis not long, internally with short verge. Penis sheath attached at both ends, forms a sort of "ultraverge". Penial retractor attached a little below caecum. Peculiar atrial appendix (sarcobelum) enters lower part of penis; prepuce of sarcobelum contains very short papilla. Free oviduct moderately long. Vagina almost absent. Spermathecal stalk short, small reservoir lies on lower part of spermoviduct.

DISTRIBUTION. W Africa (Cameroon); ? E Africa. 3 spp.

Fuellebornia Verdcourt, 1998
Fig. 1672

Verdcourt, 1998: 10 (*Zingis* subg.).

TYPE SPECIES — *Helix (Phasis) sesquicincta* Martens, 1900; OD.

Shell depressed, thin, shining, of 4.5 moderately convex whorls. Last whorl rounded at periphery. Color greenish-yellow, with 2 darker narrow bands: peripheral and subperipheral. Embryonic whorls microscopically spirally striated. Postapical sculpture of fine radial lines. Aperture broadly lunate, moderately oblique, with simple margins. Umbilicus narrow. Height 13, diam. 22 mm.

Vas deferens long, convoluted. Flagellum long, with a clavate apex, internally with numerous branched cryptae at apex. Epiphallus with a short caecum. Penis short,

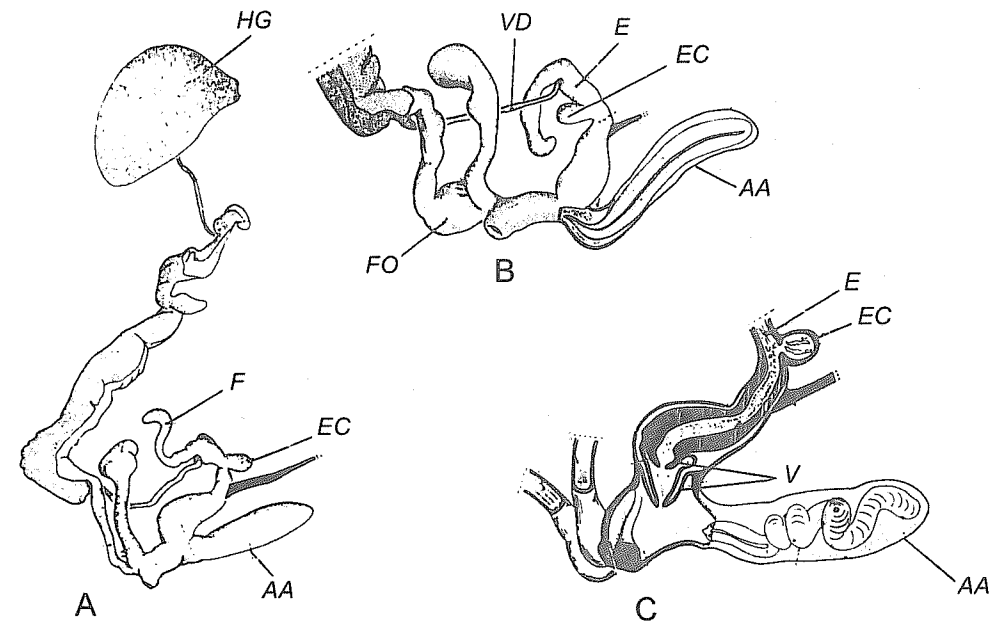


Fig. 1671. *Rhopalogonium enigmaticum* Degner, 1932.
A — reproductive tract. B — distal parts of genitalia, with sarcobelum longitudinally dissected. C — interior of penis and sarcobelum. After Van Goethem, 1977.

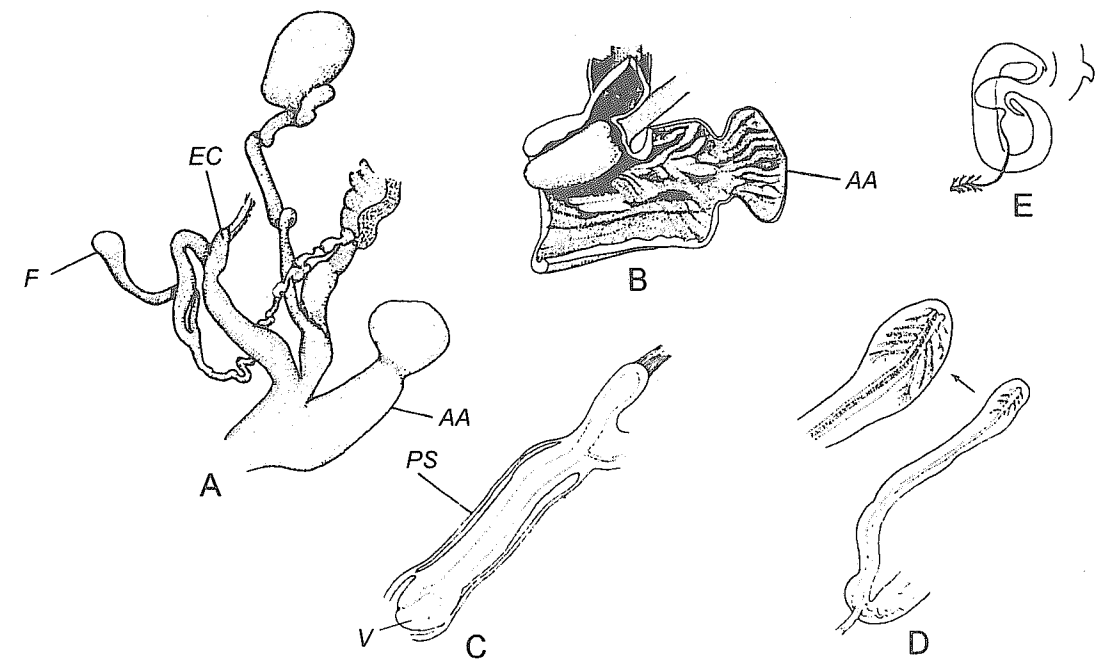


Fig. 1672. *Fuellebornia sesquicincta* (Martens, 1900).
A — reproductive tract. B — interior of atrial appendix. C — longitudinal section through epiphallus and penis. D — longitudinal section through flagellum. E — spermatophore. After Verdcourt, 1998.

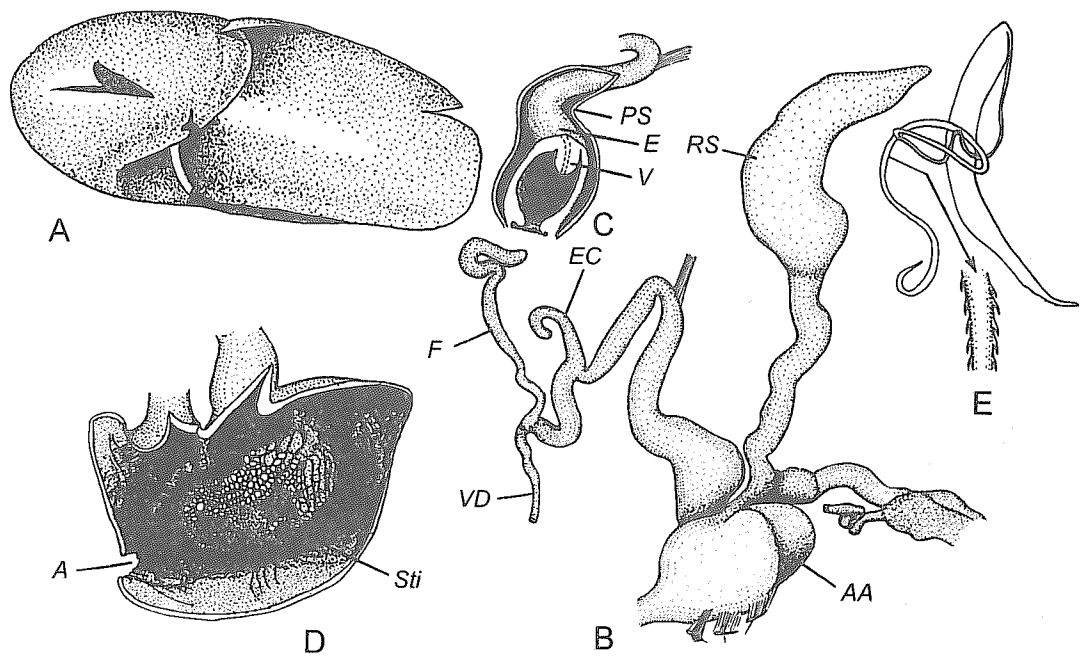


Fig. 1673. A — ! *Angustivestis bequaerti* (Pilsbry, 1919). Shell: Walikale, Zaïre. Holotype. Amer. Mus. of Natural Hist., New York No. 2164. B, C, D, E — *Angustivestis niger* (Pilsbry, 1919). B — reproductive tract. C — interior of penis. D — atrial appendix and atrial stimulator. E — spermatophore. After Van Mol, 1970.

with subglobular verge. Penis sheath surrounds epiphallus up to caecum. Penial retractor attached to apex of caecum. Free oviduct moderately long, vagina somewhat shorter. Atrial appendix consists of 2 chambers separated by clear narrowing, internally strongly plicated. Spermathecal stalk quite long, reservoir ovoid. Spermatophore consisting of sausage-shaped ampulla supplied with apical process and long attenuate tail with some branched spines at end.

DISTRIBUTION. S Tanzania. 1 sp.

REMARK. I do not understand why Verdcourt (1998) placed *Fuellebornia* to the genus *Zingis* since one of the most characteristic features of *Zingis* is the presence of penial gland which is absent in *Fuellebornia sesquicincta*. At the same time anatomical characters of this species are similar to some Zonitacionini.

Angustivestis Pilsbry, 1919
Fig. 1673

Pilsbry, 1919: 270 (*Helixarion* subg.). Van Mol, 1970: 34.

TYPE SPECIES — *Helixarion niger* Pilsbry, 1919; OD.

Shell thin, poorly calcified, semitransparent, shining, of 3-3.5 whorls. Basal part with membranaceous fringe. Color yellowish to chestnut. Embryonic whorls smoothish. Later whorls with very crowded, fine radial striae and widely spaced, shallow spiral grooves. Height 7-12, diam. 15-30 mm (10.3 × 23.4 mm).

Flagellum long. Epiphallus with well developed caecum. Penis long, internally with a small verge. Penis sheath surrounds part of penis below insertion of penial retractor. Free oviduct of various length. Vagina very short, sometimes absent. Atrium with ovoid appendix (diverticle), containing fleshy, papillose or plicate stimulator. Length of spermathecal stalk variable.

DISTRIBUTION. Equatorial Central Africa (Congo, Uganda, Zaïre). 12 spp.

Thielarion Van Mol, 1970
Fig. 1674

Van Mol, 1970: 120.

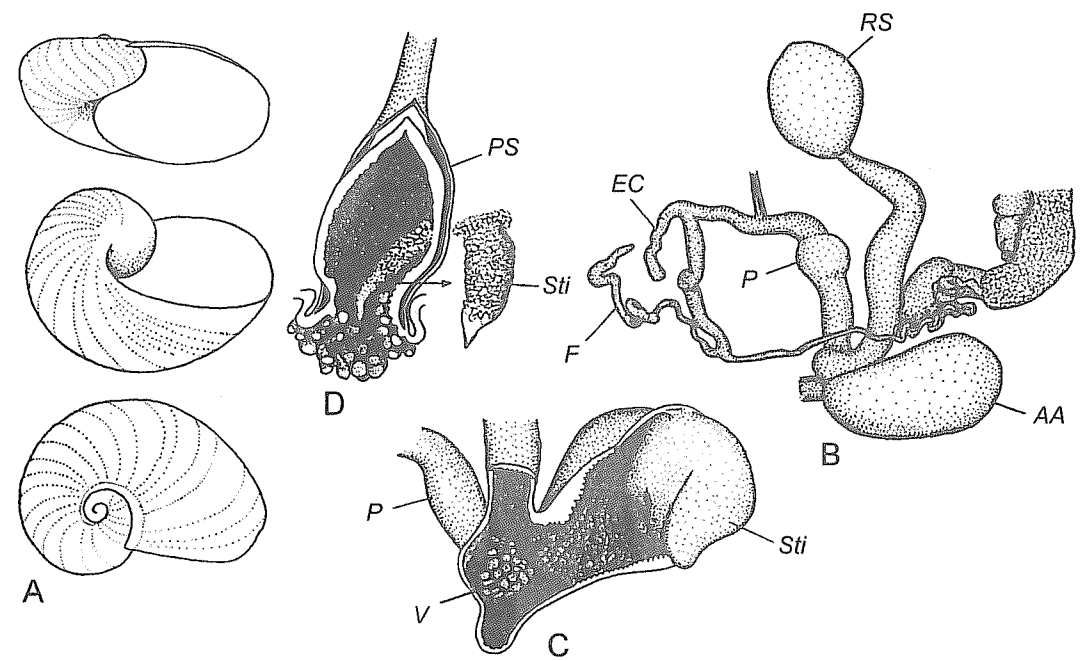


Fig. 1674. *Thielarion insularis* (Thiele, 1911). A — shell. B — reproductive tract. C — interior of penis. D — interior of atrium and atrial appendix. After Van Mol, 1970.

TYPE SPECIES — *Helicarion insularis* Thiele, 1911; OD.

Shell vitrinoid, thin, shining, of 3.3 whorls. Color yellow-greenish. Embryonic sculpture of delicate radial and spiral striae. Umbilicus absent. Height of holotype 12.5, diam. 17 mm.

Vas deferens slender, convoluted in proximal part. Flagellum long, sinuous. Epiphallus rather long, distinctly demarcated from penis. Penis clavate, its inner surface covered with numerous, small tubercles and bears a conic, pointed stimulator occupying lateral position; surface of stimulator also tubercular. Distalmost part of penis internally with verge ornamented by a series of larger tubercles. Penis sheath surrounds entire penis and distal part of epiphallus well below caecum. Penial retractor attached to distal half of epiphallus. Free oviduct and vagina approximately equal in length. Atrium with a large sac-like appendix, on blind end of which there is a fleshy stimulator. Spermathecal stalk rather thick, not long, reservoir globular.

DISTRIBUTION. Equatorial E Africa (Kivu area, Zaïre). 1 sp.

Granularion Germain, 1912
Fig. 1675

Germain, 1912: 256 (*Helicarion* subg.). Van Mol, 1970: 129.

TYPE SPECIES — *Helicarion (Granularion) duporti* Germain, 1912; OD.

Shell vitrinoid, of 2.5-3 whorls. Embryonic sculpture of radial striae and microscopical dots arranged in spiral rows. Height 4.0-7.5, diam. 10-17 mm.

Vas deferens unusually short. Flagellum long. Epiphallus with short caecum in its distal part. Penis short, internally with small verge. Free oviduct quite long, vagina practically absent. Spermathecal stalk rather long, reservoir attending upper half of spermoviduct. Atrium with or without appendix; appendix, when present, internally plicate, with narrow lumen.

DISTRIBUTION. W Africa (Guinea, Sierra Leone, Liberia, Côte d'Ivoire). 10 spp.

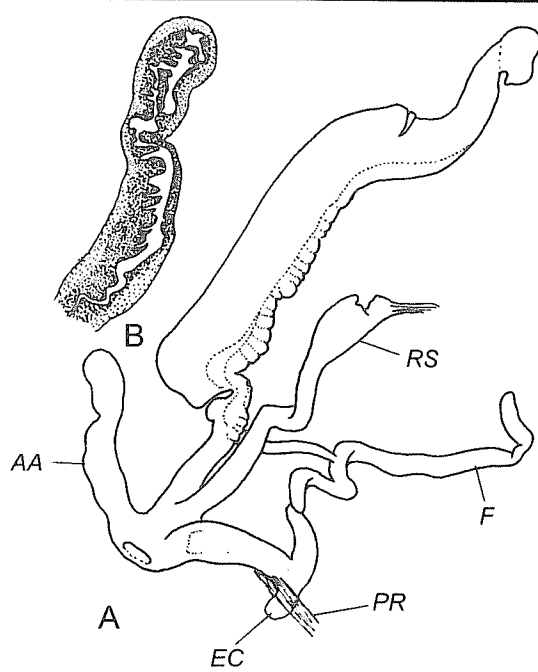


Fig. 1675. *Granularion duporti* (Germain, 1912).
A — reproductive tract (preparation in Canada balsam). Konakry [Guinea]. Neotype (subadult). Paris. B — interior of atrial appendix. After Van Mol, 1970.

Acantharionini Schileyko, trib. nov.

Type genus — *Acantharion* Binder et Tillier, 1985.

Penis internally with numerous spines of several sizes. Verge absent. Penial retractor attached to epiphallus. Vagina of common structure. Atrium without appendix or sarcobelum.

DISTRIBUTION. NE Africa.

Acantharion Binder et Tillier, 1985
Fig. 1676

Binder & Tillier, 1985: 178.

TYPE SPECIES — *Acantharion browni* Binder et Tillier, 1985; OD.

Shell vitrinoid, thin, of about 3 weakly convex whorl. Embryonic sculpture of series of spirally arranged dots. Height 9, diam. 17-20 mm.

Hermaphroditic gland of many clumps of small acini. Hermaphroditic duct scarcely convoluted. Talon small. Vas deferens rather long, entering epiphallus laterally.

Flagellum long. Epiphallus also long, convoluted in distal end. Penis internally with numerous concholinous thorns; one of them much longer and stronger than others. Penis sheath thin, transparent, surrounding penis and distal (convoluted) section of epiphallus. Penial retractor attached to epiphallus at upper edge of sheath. Free oviduct rather long, vagina much shorter. Spermathecal stalk long; a pouch in its basal part may be present. Reservoir of spermatheca ovoid, embedded in middle part of spermoviduct.

DISTRIBUTION. NE Africa (Ethiopia). 1 sp.

REMARK. In the original description (Binder & Tillier, 1985), the authors write that *Acantharion browni* has no flagellum and epiphallic caecum. However, in the paratype illustrated here, I found both these organs; besides, I had not found the complicated pouch on spermathecal stalk mentioned by Binder and Tillier. Anyway, *Acantharion* is not a member of Gymnarionidae as the authors state because it has no frontal organ, and structure of the distal part of male section in any case has nothing in common with that of *Gymnarion*.

TROCHONANININAE
Connolly, 1912

Connolly, 1912: 101 (Zonitidae subf.).

— Ledoulxiinae Pilsbry, 1919: 245 (Zonitidae subf.).

— Trochonanidae Germain, 1921: 92.

Shell mostly external, well developed. Flagellum small or absent. Epiphallic caecum short. Penis furnished with a peculiar penial gland of alveolar structure; verge absent or small, sphincter-like. Penis sheath thin, surrounds the organ entirely. Penial retractor attached to epiphallus or caecum. Sarcobelum wanting. Atrium sometimes with sac-like appendix.

DISTRIBUTION. Africa.

Zingis Martens, 1878

Martens, 1878: 290.

TYPE SPECIES — *Zingis radiolata* Martens, 1878; monotypy.

Shell generally helicoid, thin to moderately solid, of 5-6 whorls. Last whorl rounded, angulated or carinated. Embryonic whorls

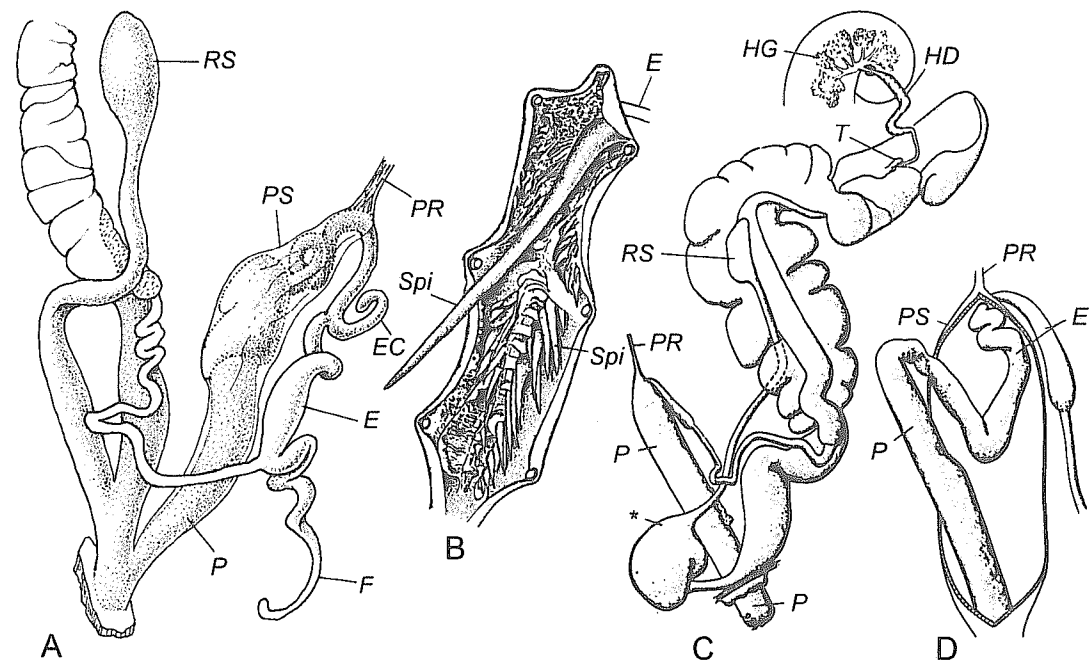


Fig. 1676. *Acantharion browni* Binder et Tillier, 1985. Tis Isat Falls, Ethiopia, August 22, 1965. A — reproductive tract. Paratype. Geneva No. 965.109. B — interior of penis. Paratype. Geneva No. 965.108. C — reproductive tract. D — penis, sheath open. Paratype No. 965.111. After Binder & Tillier, 1985. Asterisk — pouch on spermathecal stalk. SPi — thorns (spines) in penis.

nearly smooth or delicately spirally striated. Umbilicus narrowly open.

Flagellum short, without cryptae in its walls. Epiphallus also short, with vestigial caecum. Penial gland situated in distal part of penis.

DISTRIBUTION. E and S Africa.

Zingis (*Zingis* s. str.)
Fig. 1677

Verdcourt, 1998: 8.

Shell helicoid, thin to moderately solid, of 5-6 slightly to moderately convex whorls. Last whorl rounded or scarcely angulated at periphery. Color corneous to whitish, often with dark supraperipheral band and chalky radial streaks. Embryonic whorls almost smooth to microscopically spirally striated. Postapical whorls with thin to rather coarse, irregular radial striae. Aperture widely lunate to subcircular, with simple or shortly reflexed margins. Height 9.0-17.5, diam. 12-24 mm (17.2 × 23.0 mm).

DISTRIBUTION. E and S Africa. About 10 spp.

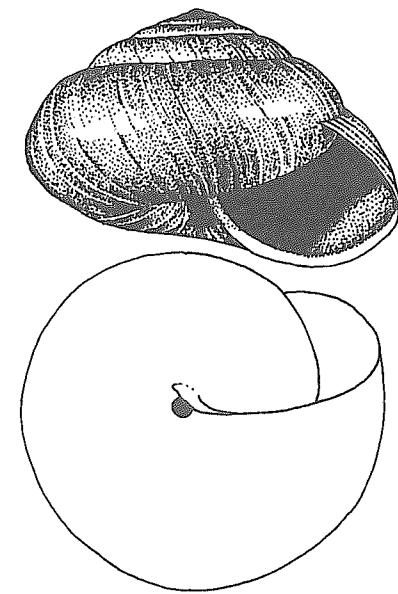


Fig. 1677. ! *Zingis* (*Zingis*) *leroyi* (Bourguignat, 1887). Mt. Kilimanjaro [Kenya]. Phil. No. 84343.

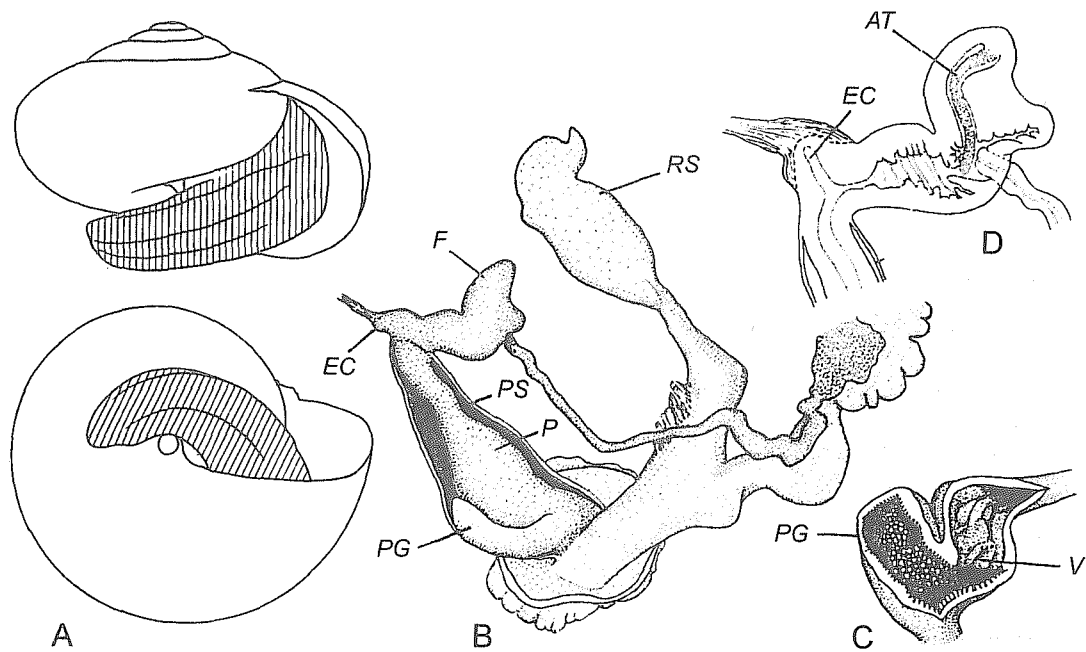


Fig. 1678. *Zingis (Chirinda) chirindensis* van Bruggen et Verdcourt, 1968.
A — shell. After van Bruggen & Verdcourt, 1968. B — reproductive tract. C — interior of penis. D — interior of flagellum and epiphallus. After Verdcourt, 1998. AT — axial thread.

Zingis (Chirinda) Verdcourt, 1998
Fig. 1678

Verdcourt, 1998: 9.

TYPE SPECIES — *Zingis chirindensis* van Bruggen et Verdcourt, 1968; OD.

Shell depressed-globose, thin, transparent, somewhat dull above, glossy beneath, of about 5 slightly convex whorls. Last whorl bluntly angulate at periphery. Color corneous yellowish-brown. Embryonic whorls with very fine spiral striae. Later whorls finely shagreened. Aperture approximately semi-lunate, with simple margins, moderately oblique. Height 15.5-18.0, diam. 24.5-27.5 mm.

Vas deferens joining epiphallus laterally. Flagellum short, stout, curved, with very short, rounded lateral appendage, internally with well developed axial thread. Epiphallus short, internally with a series of circular folds, provided with a very short caecum. Penis bulky, with basal caecum (? modified penial gland), internally with very short verge; inner surface of penis and penial caecum covered with numerous papillae. Penis sheath surrounds penis together with its caecum. Penial retractor attached to epiphallic caecum apically. Free oviduct and vagina stout, subequal in length. Sper-

mathecal stalk not long, somewhat swollen at base; reservoir voluminous.

DISTRIBUTION. E Africa (Tanzania). 1 sp.

Bloyetia Bourguignat, 1889
Fig. 1679

Bourguignat, 1889: 28 (nom. nov. pro *Guillainia* Bourguignat, 1885).

— *Guillainia* Bourguignat, 1885: 16 (nom. praeocc., non Crosse, 1864; t.-sp. not designated).

TYPE SPECIES — *Guillainia revoili* Bourguignat, 1885 (= *Trochonanina peliostoma* Martens, 1882; Verdcourt, 1960 and Fischer-Piette & Metivier, 1974); SD Zilch, 1959.

Shell helicoid, comparatively solid, of 5-7 slightly to moderately convex whorls. Last whorl rounded at periphery. Color yellowish or grayish, above periphery sometimes violet-corneous, paler below; there are lighter radial streaks. Aperture within dark-brown to black. Embryonic sculpture of microscopic, close-set, spiral striae. Postapical whorls irregularly radially wrinkled; spiral elements absent. Aperture lunate, with simple margins, slightly oblique. Umbilicus very narrow. Height 10-16, diam. 15-25 mm (14.7 × 20.8 mm).

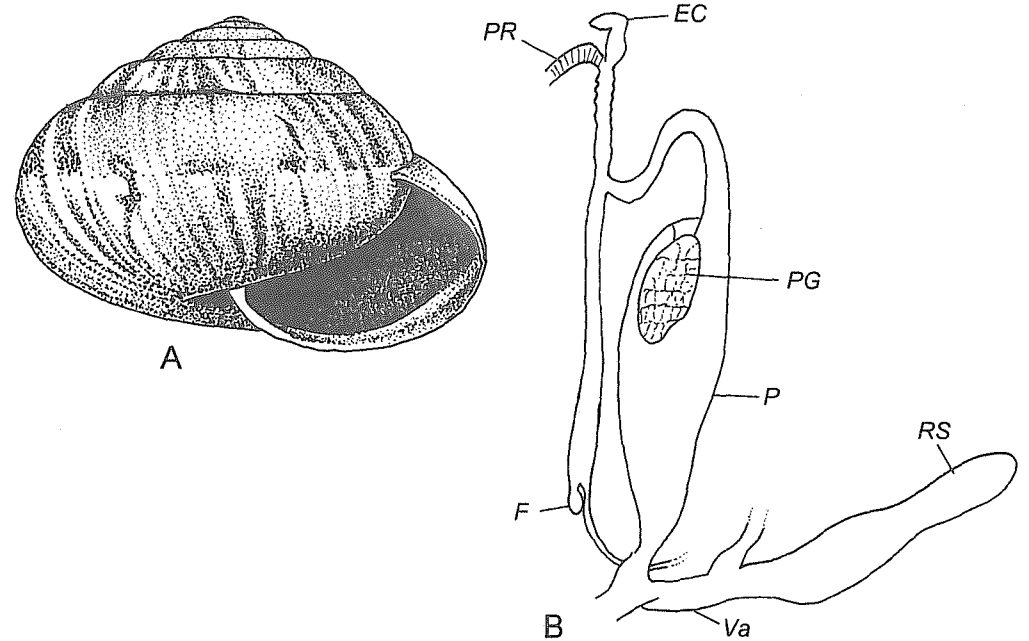


Fig. 1679. *Bloyetia peliostoma* (Martens, 1882).
A — shell: "Moguedouchou" [? Somalia] (lectotype of *Guillainia revoili* Bourguignat, 1885). Paris. B — reproductive tract. After Bourguignat, 1889.

Flagellum very short, knob-like. Epiphallus long, with caecum to which penial retractor attached laterally. Penis bulky, penial gland situated in its upper section. Vagina of moderate length. Spermatheca sleeve-like, without distinct subdivision into stalk and reservoir.

DISTRIBUTION. NE and E Africa. About 10 spp.

Percivalia Preston, 1914
Fig. 1680

Preston, 1914: 806.

TYPE SPECIES — *Percivalia nyiroënsis* Preston, 1914; OD.

Shell depressedly turbinata, rather thin, shining, of 6 slightly convex whorls. Last whorl weakly angulated at periphery. Color pale greenish-yellow, with supersutural chestnut band. Postembryonic whorls with oblique, arcuate, plicate, radial wrinkles above; basal surface with very fine, indistinct, wavy, spiral striae. Aperture widely semi-lunate, moderately oblique, with simple margins; columellar margin somewhat twisted above. Umbilicus very narrow. Height 6, diam. 10 mm.

DISTRIBUTION. E Africa (Mt. Nyiro, Kenya). 1 sp.

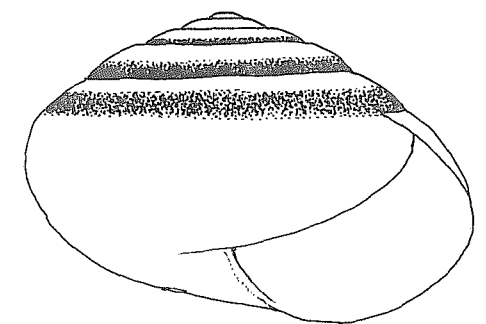


Fig. 1680. *Percivalia nyiroënsis* Preston, 1914. After Preston, 1914.

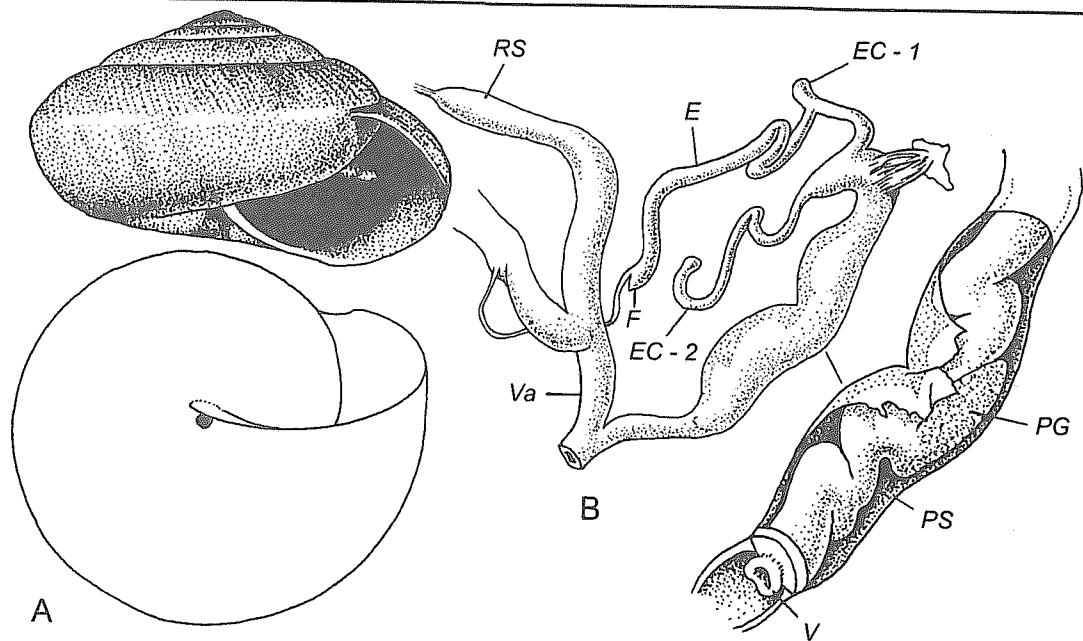


Fig. 1681. A — ! *Montanobloyetia simulans simulans* (Martens, 1895). Shell: "Kibotscho, German E-Afr." [= Kibosho, Tanzania]. Phil. No. 248064. B — ! *Montanobloyetia simulans meruensis* Verdcourt, 1961. Reproductive tract and interior of penis and epiphallus. E side, Mt. Meru, Tanganyika [Tanzania], October 28, 1957. Chicago No. 106125.

Montanobloyetia Verdcourt, 1961
Fig. 1681

Verdcourt, 1961: 128 (*Trochonanina* subg.).

TYPE SPECIES — *Zingis keniana* Preston, 1911; OD.

Shell depressed-conic, fragile, of 6 moderately convex whorls. Last whorl not descending, roundly angled at periphery. Coloration of light-yellow patches on dark-yellow background, sometimes with subsutural reddish-brown band. Postapical whorls with dense radial striation that diminishes abruptly below peripheral angle. Aperture broadly lunate, with simple margins. Umbilicus minutely open. Height 10-18, diam. 17-27 mm (10.5 × 17.5 mm).

Vas deferens short, slender, entering cylindrical epiphallus subapically, flagellum very short, conic, or absent. Epiphallus long, with 2 caeca: proximal one (EC-1) short, blunt, distal (EC-2) long, vermiform. Distal section of epiphallus expanded, surrounded by thin, semitransparent sheath. Penis short, slender, internally with a very short verge. Penial retractor attached to epiphallus near base of longer caecum. Free oviduct and vagina not long, of

about same length. Spermatheca is a continuation of vagina, sleeve-like, without distinct subdivision into stalk and reservoir, with apical ligament.

DISTRIBUTION. E Africa. 3-5 spp. & subspp.

REMARK. Verdcourt (1961) gives a short description and anatomical figures of *Trochonanina* (*Montanobloyetia*) *simulans meruensis* and *T. (M.) keniana*, which differ from one another and from data I got (the material I dissected has been identified by Verdcourt himself). For the type species (*keniana*) Verdcourt indicated that flagellum is absent; in his figure of *simulans meruensis* (fig. 4) he depicts very short flagellum which I saw in dissected specimen.

Trochonanina Mousson, 1869
Fig. 1682

Mousson, 1869: 329.

— *Martensia* Semper, 1870: 42 (nom. praeocc., non Agassiz, 1860; t.-sp. *Helix mozambicensis* L. Pfeiffer, 1855; SD Connolly, 1912).

— *Ledoulxia* Bourguignat, 1885: 4, 12 (t.-sp. *Helix mozambicensis* var. *albopicta* Martens, 1869; SD Iredale, 1914).

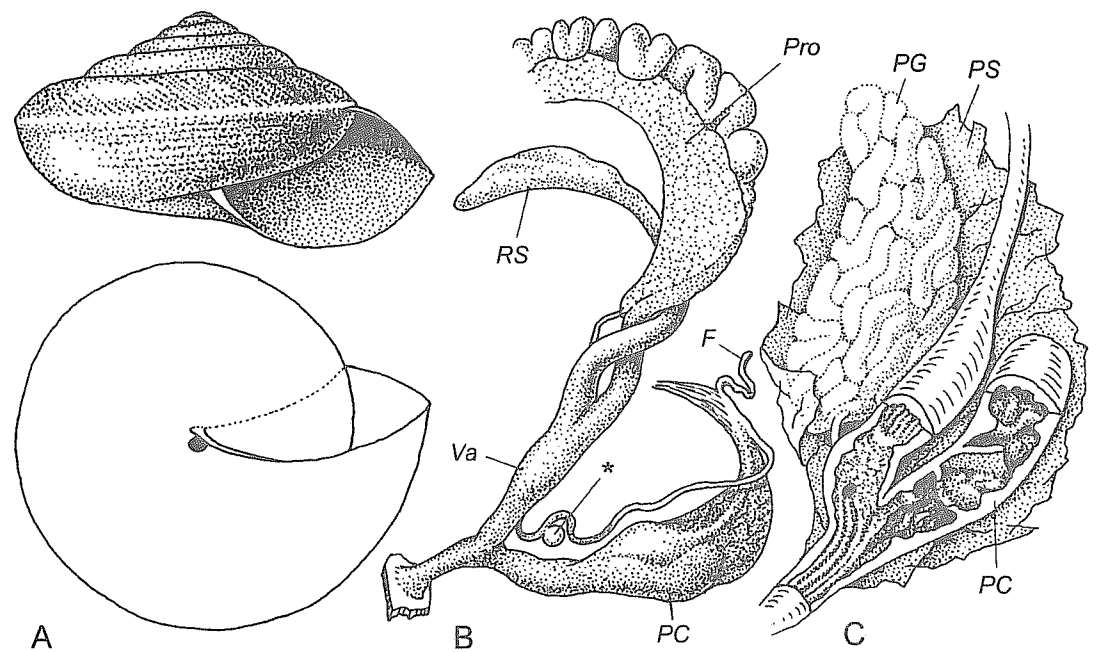


Fig. 1682. *Trochonanina mozambicensis* (L. Pfeiffer, 1855). Tanzania, Tarangire Nat. Park, Tarangire Safari Camp, on hill above Tarangire River, 1100 m, January 26, 1979. A — shell. B — reproductive tract. C — interior of penis. Leiden. Asterisk — globular process.

— *Eduardia* Hesse, 1926: 124 (nom. nov. pro *Martensia* Semper, 1870).

TYPE SPECIES — *Helix mozambicensis* L. Pfeiffer, 1855; SD Nevill, 1878.

Shell depressed-conic, thin, more or less shining, of 5-7 moderately convex whorls. Last whorl angulated to carinated at periphery. Color corneous to brown above, olivaceous to whitish below. Embryonic whorls at first smooth, soon assuming close-set, microscopical spiral lines which cut by vestigial radial striolae. Postnuclear whorls above with fine, regular, curved, oblique radial riblets, which become gradually stronger and more distant; basal surface almost smooth. Aperture rostrate, slightly oblique, with simple margins. Umbilicus narrowly open. Height 8-14, diam. 12-25 mm (9.6 × 15.4 mm).

Vas deferens free, entering epiphallus at sharp angle, sometimes with a small globular process on middle portion. Flagellum thin, short, vermiform. Epiphallus thin, long, surrounded, along with penis, by a thin sheath. Penis not large, subfusiform, furnished with a large gland and basal caecum. Penial gland, a cluster of tightly

packed, elongated acini; gland enters penis through thin duct by a simple pore. On opposite side penial caecum situated. Internally penis with few thin axial folds, some of them run into duct of penial gland, some — to caecum. Internally caecum with a few high, circular folds. Penial retractor fan-shapedly attached to epiphallus at base of flagellum. Free oviduct and vagina subequal in length; reservoir embedded in middle of spermoviduct.

DISTRIBUTION. Central and E Africa. At least 30 spp.

Plicatonanina Verdcourt, 1961
Fig. 1683

Verdcourt, 1961: 126 (*Trochonanina* subg.).

TYPE SPECIES — *Ledoulxia crassiplicata* Preston, 1914; OD.

Shell depressed-conic, thin, fragile, with narrowly rounded apex, of 5 strongly convex whorls. Last whorl straight, with thin, sharp, thread-like peripheral keel. Color corneous, basal surface whitish, keel white. Embryonic whorls with fine, distinct spiral cordlets broken into tubercles. Later whorls

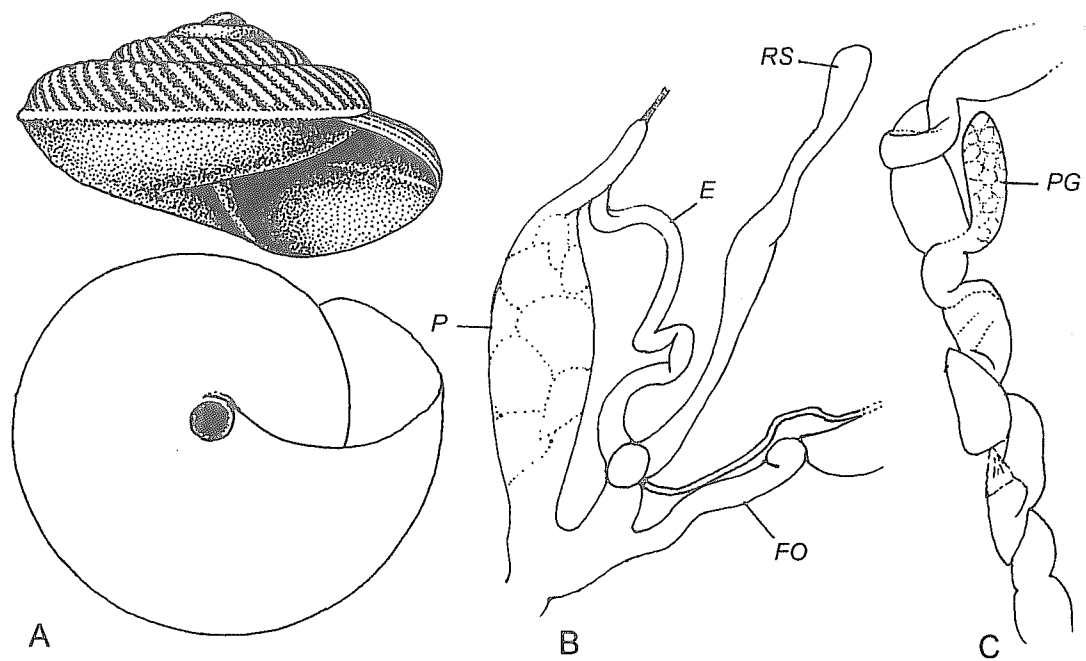


Fig. 1683. *Plicatnanina crassiplicata* (Preston, 1914).

A — shell: Chania Gorge, Thira, Kenya. Moscow No. Lc-19636 (gift of B. Verdcourt). B — reproductive tract. C — penis, sheath removed. After Verdcourt, 1961.

with clear, rather regular radial riblets which locally provided with periostracal fringe; on lower surface riblets absent, but distinct spiral grooves present. Aperture semilunate, well oblique, with thin, sharp margins. Umbilicus narrowly open. Height 6.0-6.5, diam. 11 mm (6.4 × 11.0 mm).

Vas deferens thin, entering more stout, rather long epiphallus apically. Flagellum absent. Epiphallic caecum finger-shaped. Penis long, twisted within penis sheath, provided with a rather small penial gland. Penial retractor attached to epiphallic caecum apically. Free oviduct long, vagina, on the contrary, very short. Spermathecal stalk long, somewhat swollen in middle; reservoir not large.

DISTRIBUTION. Kenya. 1 sp.

ARIOPHANTINAE Godwin-Austen, 1888

— Hemipterinae Gude et Woodward, 1921: 186.

— Naninidae Pfeffer, 1878: 251 (as Naniniden; based on praeocc. name *Nanina* J. Gray, 1834).

Shell from helicoid to plate-like, generally of medium size. Embryonic whorls

smooth, radially wrinkled or spirally striated. Postapical sculpture of radial and/or spiral elements. Aperture toothless (exception — *Sesara*). Umbilicus narrow to closed.

Flagellum with axial thread and cryptae in its walls, sometimes secondarily disappears. Epiphallus short to long.

DISTRIBUTION. Africa, Madagascar, Hindustan Peninsula, Ceylon, Maldives, Nicobares, Andaman Islands, SE Asia, S. China, Central Asia, Taiwan, Philippines, Moluccas, Indonesia, New Guinea.

Ariophantini Godwin-Austen, 1888

Epiphallic caecum not coiled.

DISTRIBUTION. E and SE Africa, Madagascar, Central Asia, Hindustan Peninsula, Ceylon, Andaman Islands, Indochina, Maldives, Moluccas, Indonesia, New Guinea.

Naninia Sowerby, 1842 Fig. 1684

Sowerby, 1842: 198.

— *Nanina* J. Gray, 1834: 58 (nom. praeocc., non Risso, 1826; t.-sp. *Helix citrina* Linnaeus, 1758; SD Herrmannsen, 1847).

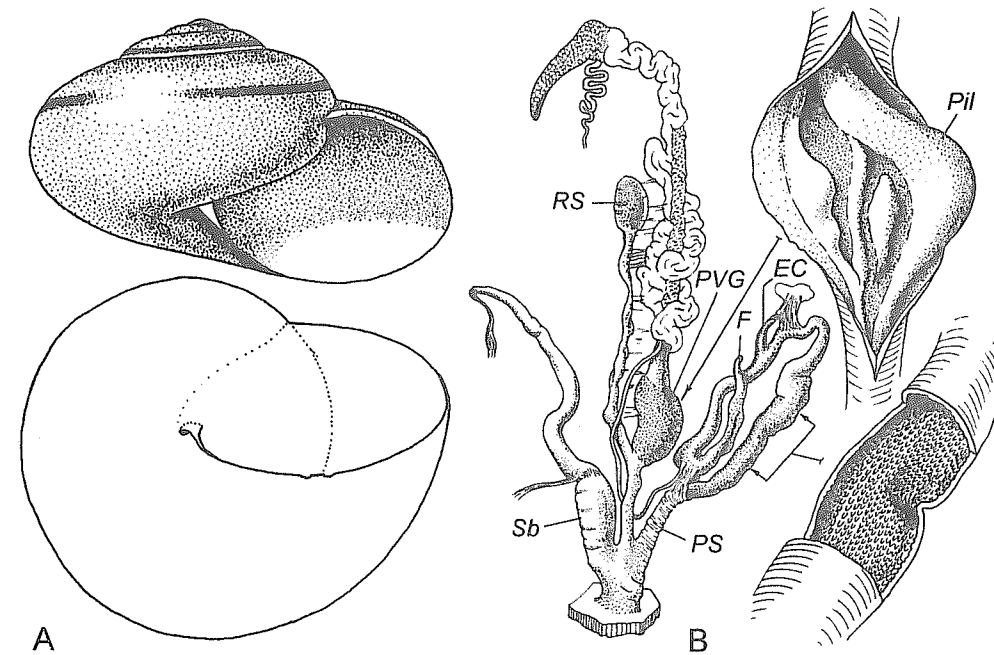


Fig. 1684. *Naninia citrina* (Linnaeus, 1758).

Botanical Garden, Lae, Papua-New Guinea, April, 1975. A — shell. B — reproductive tract, interior of penis and interior of free oviduct. Moscow No. Lc-20936 (shell); Lc-19625 (soft parts).

— *Xesta* Albers, 1850: 58 [t.-sp. *Helix citrina* Linnaeus, 1758; SD Martens in Albers, 1860 ("*N. Stuartiae* Sow. — *N. citrina* Linn.")].

TYPE SPECIES — *Helix citrina* Linnaeus, 1758; OD.

Shell low-conic, thin, fragile, much translucent, of 5-6 moderately to rather convex, slightly shouldered whorls. Color lemon-yellow to brown, often with variously developed dark peripheral band. Embryonic whorls smooth, later whorls nearly so, only with very vague radial wrinkles and, in places, with weak elements of spiral striation. Aperture large, ovate, moderately oblique, with thin and sharp margins. Umbilicus minutely open. Height 14-32, diam. 25-50 mm (27.8 × 37.0 mm).

Sole undivided. Caudal foss small, caudal horn vestigial.

Talon hidden. Vas deferens thin, free, entering epiphallus laterally, leaving rather long flagellum. Flagellum has no axial thread, but there is a strong longitudinal pilaster. Epiphallus moderately long, with a short uncoiled caecum at penis/epiphallus junction. Penis long, internally with numerous small papillae. Penis sheath surrounds basal part of penis, its upper margin con-

nected with base of flagellum by fibers. Penial retractor short, arising from diaphragm, attached by 2 arms to apex of caecum and epiphallus. Free oviduct rather long, internally with very strong principal axial pilaster and a few smaller ones; its lower section coated by thin layer of glandular tissue (perivaginal gland). Vagina of moderate length, slender. Sarcobelum well developed, internally with short, conic papilla lacking spine. Spermathecal stalk rather long, ovate reservoir adhering upper half of spermooviduct.

DISTRIBUTION. Indonesia, New Guinea. About 10 spp. with numerous forms.

Koratia Godwin-Austen, 1919 Fig. 1685

Godwin-Austen, 1919: 202.

TYPE SPECIES — *Helix distincta* L. Pfeiffer, 1850; OD.

Shell depressed-subglobose, moderately thin to rather solid, subopaque, a little translucent, of 5.5-6 slightly convex whorls. Last whorl scarcely descending just before aperture. Color yellowish- or pinkish-chestnut, with light band above periphery; lower

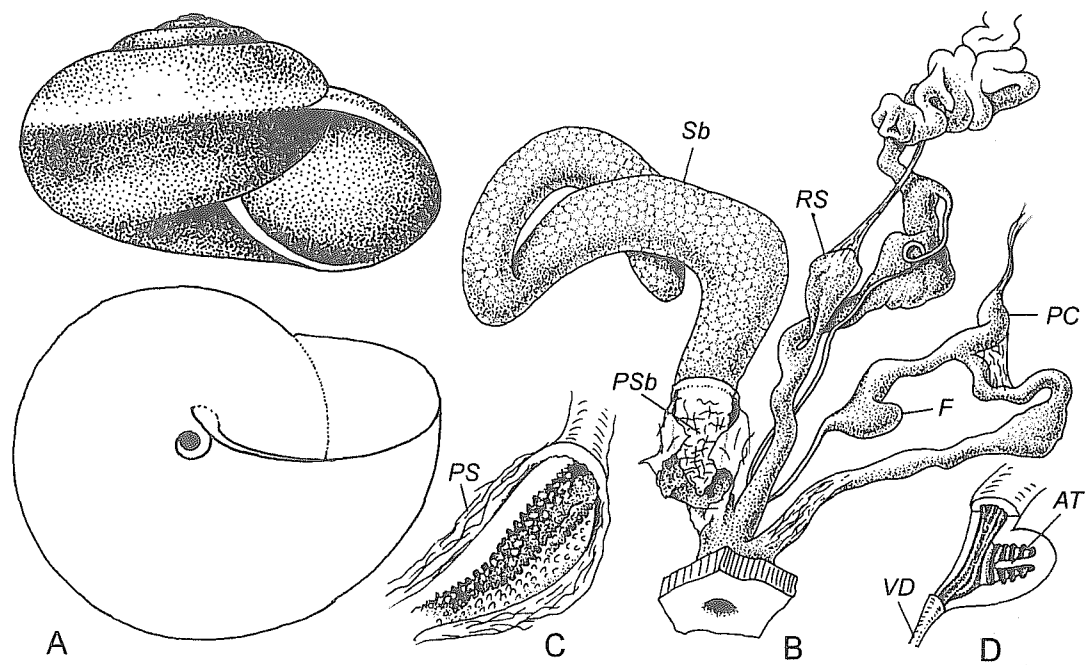


Fig. 1685. *Koratia distincta* (L. Pfeiffer, 1850).
A — shell: Baikan Islet near Kondao Island, S Vietnam, January 15, 1987. Moscow No. Lc-19496. B, C, D — Angkor Wat, Angkor, Cambodia. B — reproductive tract. C — interior of penis. D — interior of flagellum. Phil. No. A-14283. AT — axial thread.

edge of band distinct, upper blurred. Embryonic whorls smooth, rest whorls with weak irregular radial wrinkles, spiral wavy lines, and elements of malleate sculpture. Aperture ample, quite oblique, with scarcely thickened margins; columellar margin a little dilated. Umbilicus narrow, perspective-cylindrical. Height 25-35, diam. 45-68 mm (33.8 × 56.7 mm).

Sole tripartite. Caudal foss not large, caudal horn vestigial.

Vas deferens long, slender, entering epiphallus apically. Flagellum sac-like, lateral, internally with axial thread and circular folds. Epiphallus with uncoiled caecum provided with apical retractor. Penis long, with proximal swelling, internally with axial plicae covered by small, numerous tubercles. Sarcobelum large, covered with glandular layer, with weak apical retractor. Preputial section of sarcobelum with very thin, transparent walls, containing a large, fleshy papilla lacking a thorn. Free oviduct more or less swollen, long. Vagina also long, cylindrical. Spermathecal stalk very short, reservoir capacious, provided with apical ligament.

DISTRIBUTION. SE Asia. Probably 1 variable sp.

Hemiplecta Albers, 1850
Fig. 1686

Albers, 1850: 60 (*Nanina* sect.).

— *Hemiplecta* Solem, 1966: 27 (err. typogr. pro *Hemiplecta* Albers, 1850).

TYPE SPECIES — *Helix humphreysiana* Lea, 1841; SD Martens in Albers, 1860.

Shell low-conic to subglobose, moderately solid, with dome-shaped spire, of 5-7 slightly convex whorls. Last whorl with weak peripheral angle, not descending in front. Color yellowish to brown, usually with brownish-reddish peripheral band. Embryonic whorls nearly smooth, later whorls with spiral wavy lines. Aperture ovate, with simple, slightly thickened margins. Umbilicus rather narrow. Height 22-35, diam. 37-56 mm (32.1 × 54.0 mm).

Vas deferens comparatively short, slender, joining epiphallus laterally. Flagellum short, conic. Epiphallus long, with lower section bent on itself; both portions of it

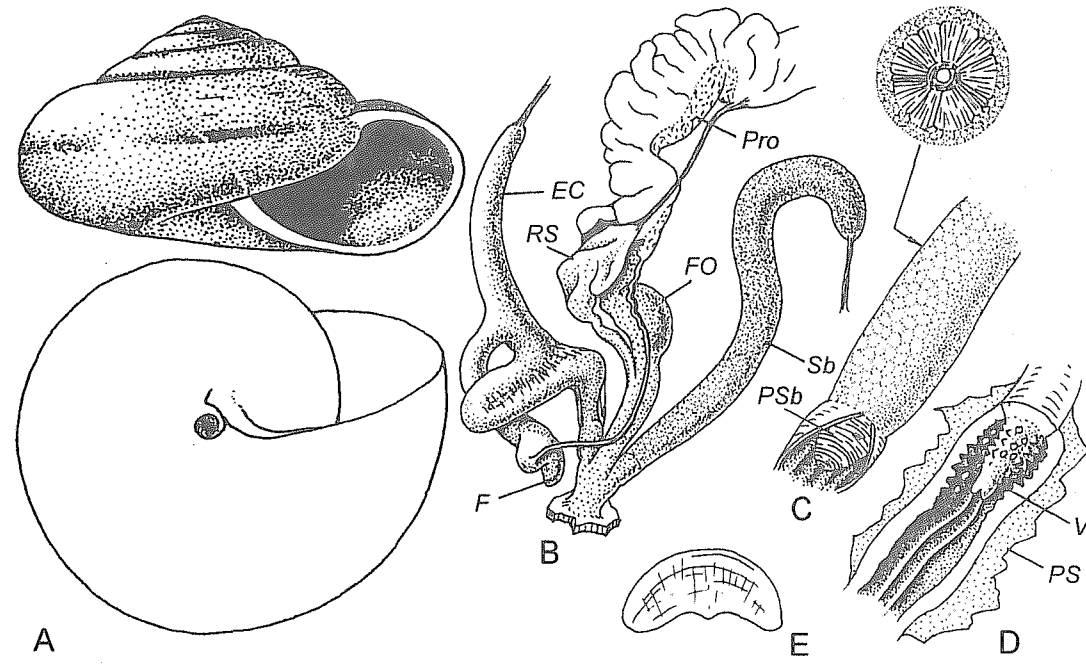


Fig. 1686. A — *Hemiplecta humphreysiana* (Lea, 1841). Shell: Moluccas. StB No. 18103. B, C, D, E — *Hemiplecta ceylanica* (L. Pfeiffer, 1850). Malé, Maldives, March 6, 1980. B — reproductive tract. C — interior of sarcobelum. D — interior of penis. E — jaw. Moscow No. Lc-25376.

connected with one another by numerous fibers. Penis small, internally with a pair of axial folds in distal part; proximal part with conic tubercles and fleshy verge which attached by one side to inner surface of penis. Verge covered with conic tubercles. Penial retractor inserted on apex of a long caecum. Free oviduct not long, more or less swollen; vagina subequal in length. Spermathecal stalk short, slender; reservoir voluminous, embedded in lower part of spermooviduct, with apical ligament that attached to uterus. Sarcobelum long, with apical retractor, its preputial section containing fleshy papilla lacking thorn. Glandular layer of sarcobelum covers muscular layer.

DISTRIBUTION. Indochina, Maldives, Moluccas, Indonesia, New Guinea. At least 20 spp.

Euplecta Semper, 1870
Fig. 1687

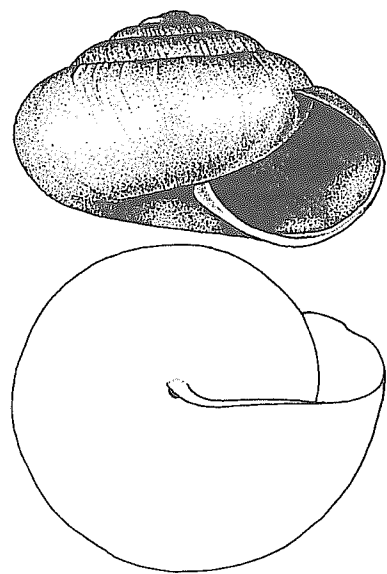
Semper, 1870: 14.

TYPE SPECIES — *Helix subopaca* L. Pfeiffer, 1853; SD Blanford, 1880.

Shell depressed to subturbinata, thin but opaque, of 5-6 moderately convex whorls. Last whorl rounded or slightly angulate at periphery. Color whitish to rich corneous-brown; in last case light peripheral band may be present. Embryonic whorls smooth or finely radially wrinkled. Later whorls with coarse, often wavy, close-set, radial wrinkles; on base this sculpture becomes much finer and diffused; in intervals between wrinkles there are distinct spiral striae retaining on basal surface, but there these striae much weaker. Aperture lunato-ovate, moderately oblique, margins scarcely thickened. Umbilicus, a tiny and shallow crack. Height 4-36, diam. 5.5-33.0 mm (10.6 × 16.1 mm).

Sole not tripartite, indistinctly folded in middle when contracted. Cephalopodium with a large caudal foss, sometimes with a small horn.

Talon exposed, ovate. Vas deferens free, short to long, entering epiphallus laterally. Flagellum short, stout, rounded or pointed at apex, with axial thread; walls of flagellum contain narrow holes where spines of spermatophore form. Epiphallus extremely



A

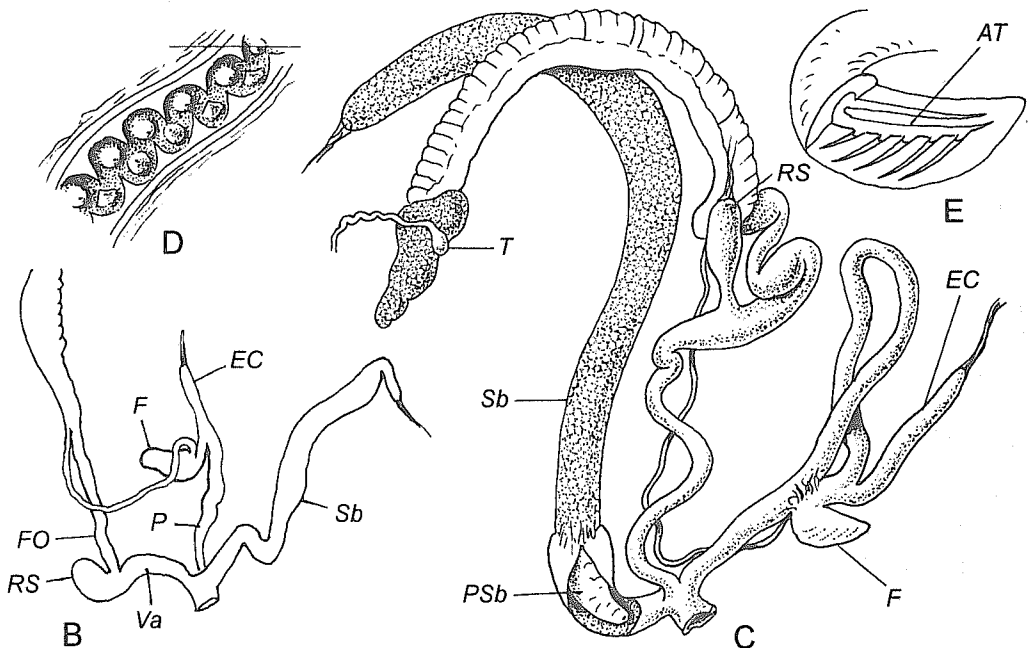


Fig. 1687. A, B — *Euplecta subopaca* (L. Pfeiffer, 1853).

A — shell: Ceylon. Geneva. B — reproductive tract. After Semper, 1870. C, D, E — ! *Euplecta gardeneri* (L. Pfeiffer, 1846). C — reproductive tract. D — interior of penis. E — interior of flagellum. Right side of Waterfield Stream ravine, Pidurutalagala Mt., Piduru Ridge, 1 km NNW of Nuwara-Eliya, Central Prov., Sri-Lanka, January 20, 1997. Moscow No. Lc-25381. AT — axial thread.

short, its boundary with penis marked with uncoiled caecum. Penis thin, long, subcylindrical, internally with series of large, conic tubercles. Penial retractor attached to apex of caecum. Free oviduct long, slender; vagina of various length. Sarcobelum long, with apical retractor; preputial section of sarcobelum with fleshy papilla. Outer layer of sarcobelum formed by glandular tissue. Spermatheca almost sessile.

DISTRIBUTION. Hindustan Peninsula, Ceylon, SE Asia, ? New Guinea. About 30 spp.

Ariophanta Des Moulins, 1829

Des Moulins, 1829: 235 (*Helix* subg.).

TYPE SPECIES — *Helix laevipes* Müller, 1774; monotypy.

Shell dextral or sinistral, helicoid, depressed to globose, rather solid, of 4-6 slightly convex whorls. Last whorl mostly descending in front, rounded or bluntly angulated at periphery. Color whitish to chestnut, often with 2-3 broad darker bands — near suture, above and below periphery. Embryonic whorls smooth, sculpture of rest

surface reticulate owing to crossing radial and spiral lines; on base sculpture usually weaker. Aperture ovate, well oblique, with straight, somewhat thickened margins. Umbilicus narrow. Height 15-28, diam. 20-45 mm (14.8 × 24.2 mm).

Sole not tripartite. Cephalopodium with a large caudal foss; caudal horn small and blunt or missing.

Talon hidden. Vas deferens entering base of flagellum or epiphallus apically. Flagellum absent or short, conic, with many narrow cryptae in its walls. Next to flagellum there is uncoiled caecum to which penial retractor attached. Penis long, looped. Free oviduct quite long, with variously developed perivaginal gland. Vagina absent since sarcobelum situated on atrium between free oviduct and penis. Sarcobelum large, its thin-walled preputial part contains a conic, fleshy papilla. Spermathecal stalk very to moderately short, reservoir lies on lower portion of spermoviduct.

DISTRIBUTION. Hindustan Peninsula, Indochina, Nicobar Islands.

Ariophanta (Celectella)
Schileyko, nom. nov.)

Fig. 1688

— *Euplectella* Jousseume, 1894: 276 [nom. praecoc., non Owen, 1841 (*Spongia*); t.-sp. *Euplectella trimeni* Jousseume, 1894; monotypy].

Derivatio nominis: the name is a combination of *Ce*(ylon) and (*Eup*)*lectella*.

TYPE SPECIES — *Euplectella trimeni* Jousseume, 1894.

Shell dextral, depressed-conic, thin, somewhat translucent, shining, of 5 slightly convex whorls; last whorl not descending, rounded. Color corneous. Embryonic whorls with weak radial wrinkles. Postapical sculpture of rounded, regular radial riblets. Aperture widely lunate, only slightly oblique, with sharp, simple margins; columellar margin shortly reflexed. Umbilicus very narrow. Height 6.4, diam. 10.0 mm.

DISTRIBUTION. Ceylon. 1 sp.

Ariophanta (Cryptozona)
Mörch, 1872)

Fig. 1689

Mörch, 1872: 334 (*Nanina* subg.).

— *Xestina* Pfeiffer, 1878: 257 (t.-sp. *Helix isabellina* Reeve 1854; monotypy).

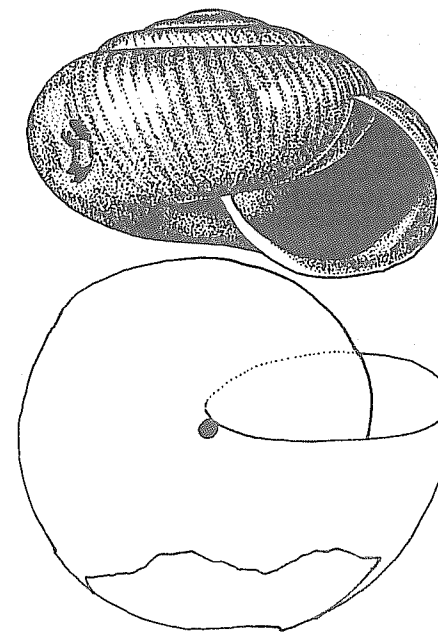


Fig. 1688. *Ariophanta (Celectella) trimeni* (Jousseume, 1894). Nuwara-Eliya, Ceylon. Holotype. Paris.

— *Nilgiria* Godwin-Austen, 1888: 253 (t.-sp. *Helix solata* Benson, 1848; OD).

TYPE SPECIES — *Helix ligulata* Férussac, 1819; SD Zilch, 1959.

Shell dextral, dome-shaped to globular, rather solid, of 5-6 slightly to moderately convex whorls. Last whorl straight, rounded or keeled at periphery. Color whitish to yellowish, often with darker, sometimes diffuse, supraperipheral band. Embryonic whorls smooth, subsequent whorls with microscopical sculpture consisting of radial wrinkles crossing by distinct, widely spaced, spiral lines. Aperture ovate to subtriangular, moderately oblique, with a little thickened margins. Umbilicus very narrow. Height 14-18, diam. 20-40 mm (18.5 × 26.0 mm).

Vas deferens entering epiphallus apically. Proximal section of epiphallus with cryptae in its walls. Spermatheca with moderately long stalk.

DISTRIBUTION. Hindustan and Indochina Peninsulæ. At least 20 spp.

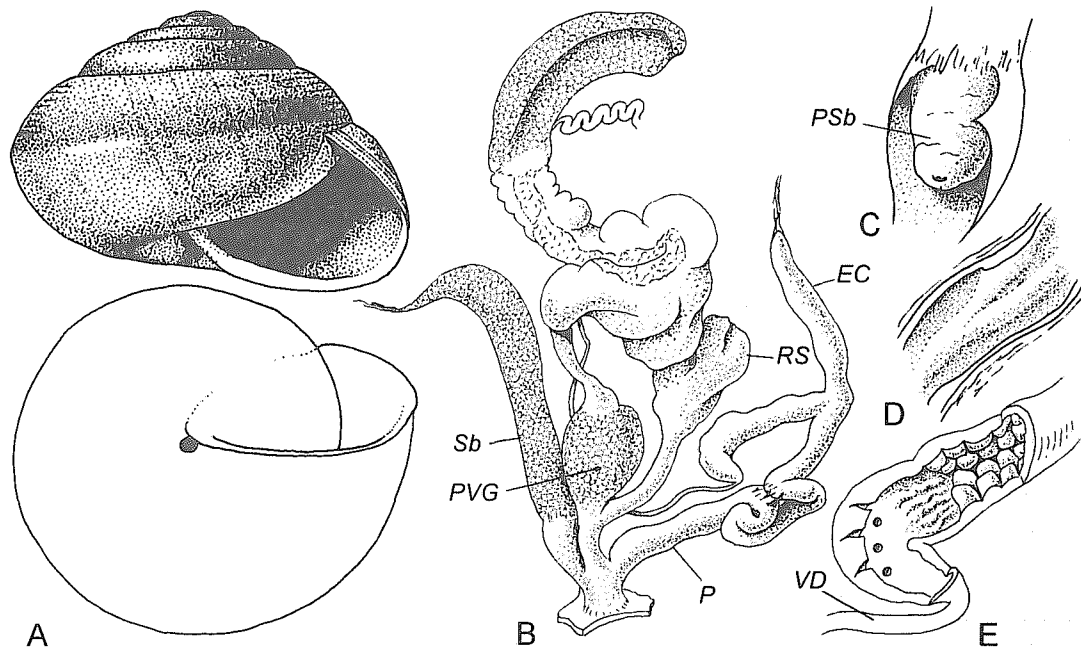


Fig. 1689. A — *Ariophanta (Cryptozona) ligulata* (Férussac, 1819). Shell: Bengal. Phil. No. 1309. B, C, D, E — ! *Ariophanta (Cryptozona) semirugata* (Beck, 1837). B — reproductive tract. C — interior of prepuce of sarcobelum. D — interior of penis. E — interior of epiphallus. Madurai, SE India, October 3-7, 2000. Moscow No. Lc-25379.

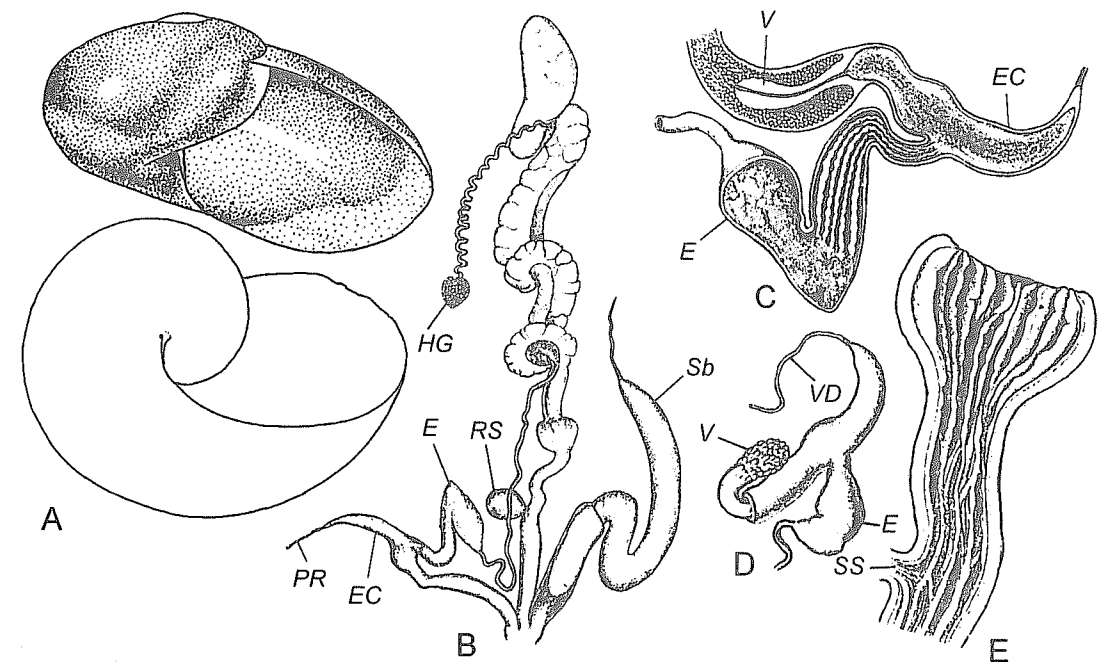


Fig. 1691. *Ratnadvipia irradians* (L. Pfeiffer, 1852). A — shell: Ceylon. Leiden. B — reproductive tract. C — interior of epiphallus, penis and caecum. D — terminal end of penis of a young specimen, showing everted penis. E — interior of free oviduct. After Collinge, 1901.

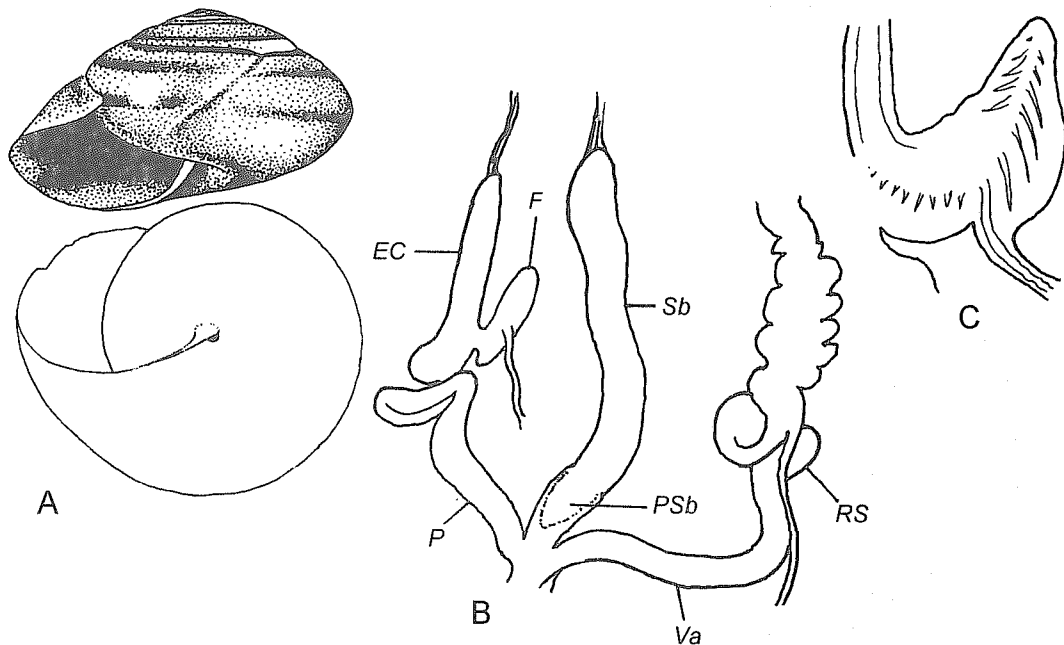


Fig. 1690. *Ariophanta (Ariophanta) laevipes* (Müller, 1774). A — shell: S India. Leiden. B — reproductive tract. C — interior of flagellum. After Blanford & Godwin-Austen, 1908.

Ariophanta (Ariophanta s. str.)
Fig. 1690

Shell sinistral. Other conchological characters overlapping with those of *Cryptozona*. Vas deferens enters epiphallus not apically, leaving a short flagellum. Spermatheca with a short stalk.

DISTRIBUTION. Hindustan Peninsula, (?) Ceylon. About 15 spp.

Ratnadvipia Godwin-Austen, 1899
Fig. 1691

Godwin-Austen, 1899: 253. Collinge, 1901: 64. TYPE SPECIES — *Vitrina irradians* L. Pfeiffer, 1852; monotypy.

Shell vitrinoid, very thin, semitransparent, shining, of 3.5-4 moderately convex whorls. Color corneous or olivaceous. Embryonic whorls smooth. Postnuclear whorls at first with delicate regular wrinklets, then this sculpture transforms into series of elongated granules; spiral striation as such nearly absent. Aperture large, ovate, moderately oblique, with simple margins. Umbili-

cus tiny or closed. Height 11-17, diam. 18-25 mm (15.5 × 22.0 mm).

Cephalopodium with a large caudal pore, caudal horn poorly developed.

Ovotestis compact, subglobular, of many small acini. Hermaphroditic duct convoluted. Vas deferens passes into epiphallus apically. Epiphallus bent, more or less clavate, its proximal part internally nearly smooth, filled with a mass of minute, white, calcareous granules, while a long, hollow spicule arises from base of epiphallus cavity. Distal portion of epiphallus internally axially plicate. Epiphallic caecum nearly straight. Penis rather long, subcylindrical, its inner surface studded with numerous, minute, fleshy, knob-like papillae. Verge well developed, with internal canal; its surface also covered with minute papillae. Sarcobelum large, with a blunt, muscular papilla. Free oviduct quite long, just beyond its middle it expands and forms a thick-walled cavity. Vagina long, internally strongly axially plicate. Spermatheca sessile, globular.

DISTRIBUTION. Ceylon. 1 or 2 spp.

Sarika Godwin-Austen, 1907

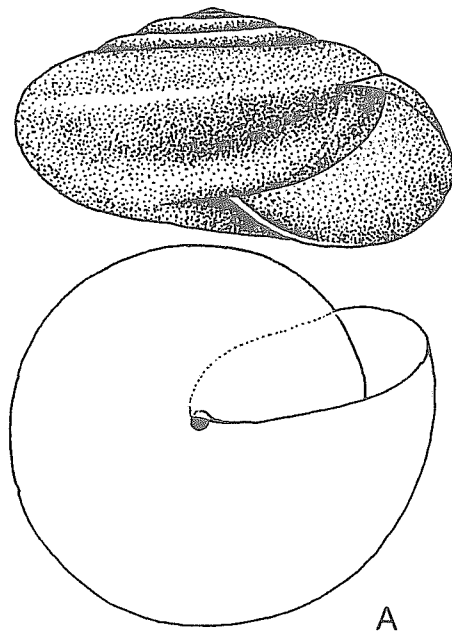
Fig. 1692

Godwin-Austen, 1907: 179.

TYPE SPECIES — *Helix resplendens* Philippi, 1846; OD.

Shell depressed-conic, thin, translucent, shining, of 6.5-7 slightly convex whorls. Last whorl not descending, sometimes scarcely angled above mid-line. Color light-yellow, light-grey or shell colorless. Embryonic whorls smooth, polished. Postnuclear whorls looking smooth; under power magnification microscopical radial striation visible. Aperture widely lunate, only slightly oblique, with simple, sharp margins; columellar margin a little reflexed. Umbilicus tiny, semicovered. Height 8-12, diam. 14.0-25.5 mm (8.0 × 14.2 mm).

Talon small, exposed, ovoid. Vas deferens rather short, entering epiphallus subapically. Flagellum rather long, with distinct axial thread. Epiphallus short, with uncoiled caecum supplied with terminal retractor. Penis not long, clavate to subcylindrical, internally with ovate, verrucose verge. Lower 2/3 of penis surrounded by a thin sheath. Sarcobelum large, with muscular layer covered by thin glandular one; internally with



A

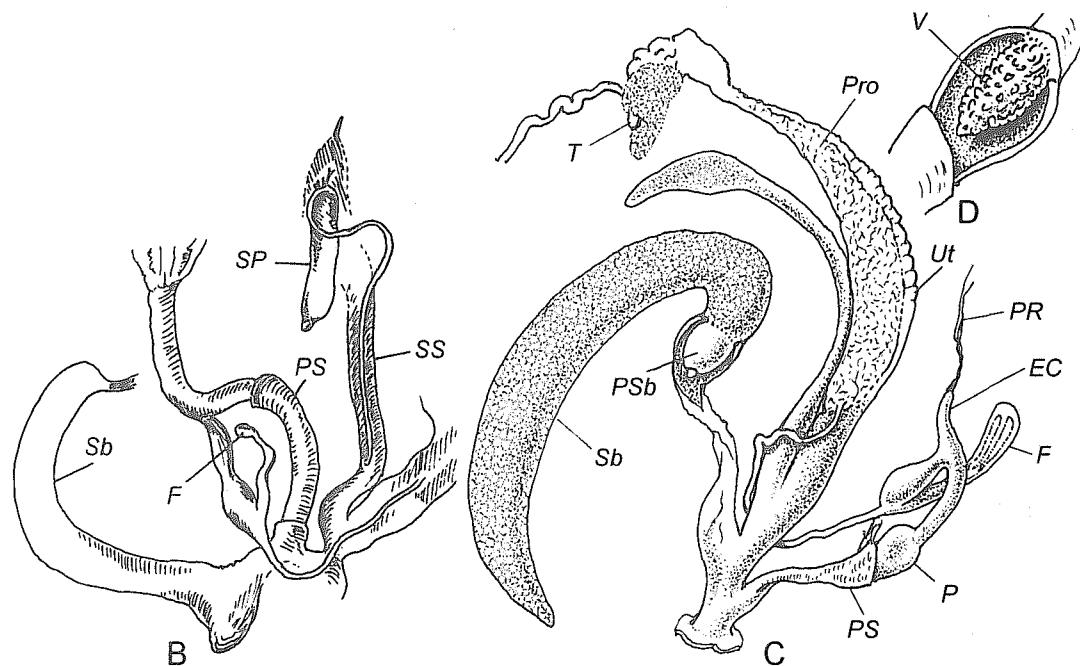


Fig. 1692. A, B — *Sarika resplendens* (Philippi, 1846).

A — shell: Vaggio, Burma [= Myanmar]. SPb. B — reproductive tract. After Blanford & Godwin-Austen, 1908. C, D — ! *Sarika hainesi* (L. Pfeiffer, 1856). Pah Meeung Mt., Thailand. C — reproductive tract. D — interior of penis. Phil. No. A-14287.

Ravana Godwin-Austen, 1901

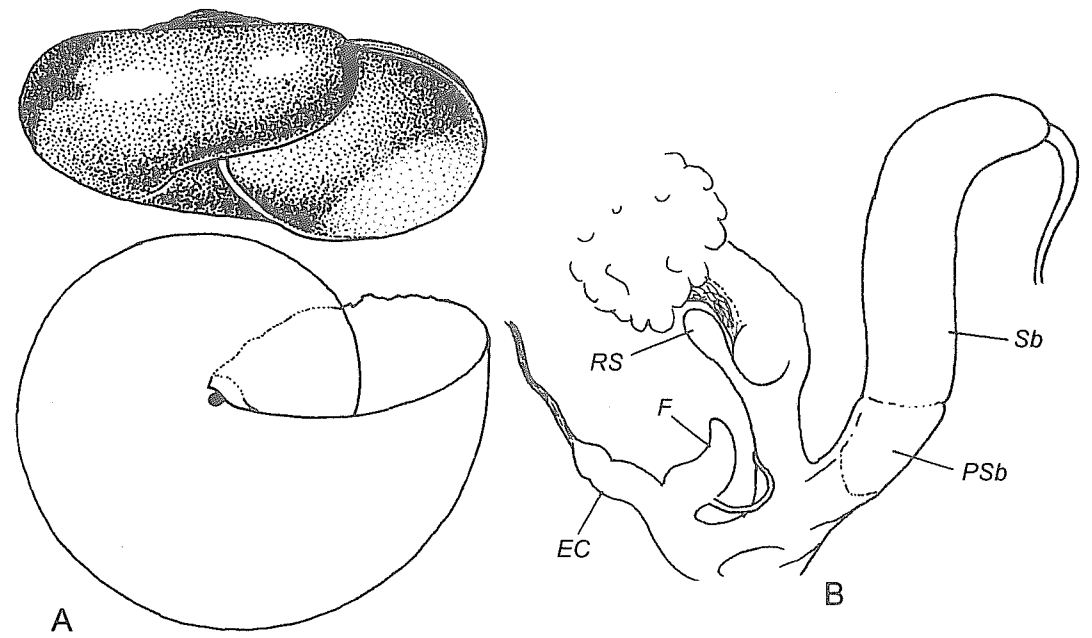
Fig. 1693

Godwin-Austen, 1901b: 261.

TYPE SPECIES — *Helix politissima* L. Pfeiffer, 1853; monotypy.

Shell much depressed, thin, fragile, semi-transparent, shining, of 4.5-5 rather convex whorls; last whorl not descending, evenly rounded. Color uniformly yellowish-corneous, greenish or chestnut. Embryonic and later whorls smooth, polished, with exceptionally delicate spiral striae. Aperture roundly lunate, only slightly oblique, with sharp, simple margins; columellar margin shortly reflexed above. Umbilicus minute. Height 11-12, diam. 23-24 mm (12.0 × 23.0 mm).

Mantle without shell-lobes.



A

B

Fig. 1693. *Ravana politissima* (L. Pfeiffer, 1853).

A — shell: Ceylon. Phil. No. 4351. B — reproductive tract. After Godwin-Austen, 1901b.

a short papilla. Free oviduct short, somewhat expanded. Vagina short to very short. Spermathecal stalk rather long, variously defined reservoir (nearly) reaching albumen gland. Tail of spermatophore spineless.

DISTRIBUTION. S China, Indochina Peninsula, Malaya. At least 10 spp.

Ravana Godwin-Austen, 1901

Fig. 1693

Godwin-Austen, 1901b: 261.

TYPE SPECIES — *Helix politissima* L. Pfeiffer, 1853; monotypy.

Shell much depressed, thin, fragile, semi-transparent, shining, of 4.5-5 rather convex whorls; last whorl not descending, evenly rounded. Color uniformly yellowish-corneous, greenish or chestnut. Embryonic and later whorls smooth, polished, with exceptionally delicate spiral striae. Aperture roundly lunate, only slightly oblique, with sharp, simple margins; columellar margin shortly reflexed above. Umbilicus minute. Height 11-12, diam. 23-24 mm (12.0 × 23.0 mm).

Mantle without shell-lobes.

Sole undivided, narrow. Caudal foss large, caudal horn short.

Vas deferens rather short, slender, entering epiphallus laterally. Flagellum short, conic. Epiphallus extremely short, with thick, straight caecum. Penis also very short. Penial retractor attached to apex of caecum. Free oviduct with smooth, ovoid swelling; perhaps, it is modified perivaginal gland. Vagina short. Spermatheca somewhat rudimentary, with short, thin stalk and drop-like reservoir attending lower part of spermoviduct. Sarcobelum very large, with massive, conic papilla and apical retractor.

DISTRIBUTION. Ceylon. 1 sp.

Sitala H. Adams, 1865

Fig. 1694

Adams H. in Wallace, 1865: 408.

— *Conulema* Stoliczka, 1871: 236 (t.-sp. *Helix attega* Benson, 1859; OD).

— ? *Moaria* Chaper, 1885: 49 (t.-sp. *Moaria conica* Chaper, 1885; OD).

TYPE SPECIES — *Helix infula* Benson, 1848; OD.

Shell turbinoid, thin, translucent, with

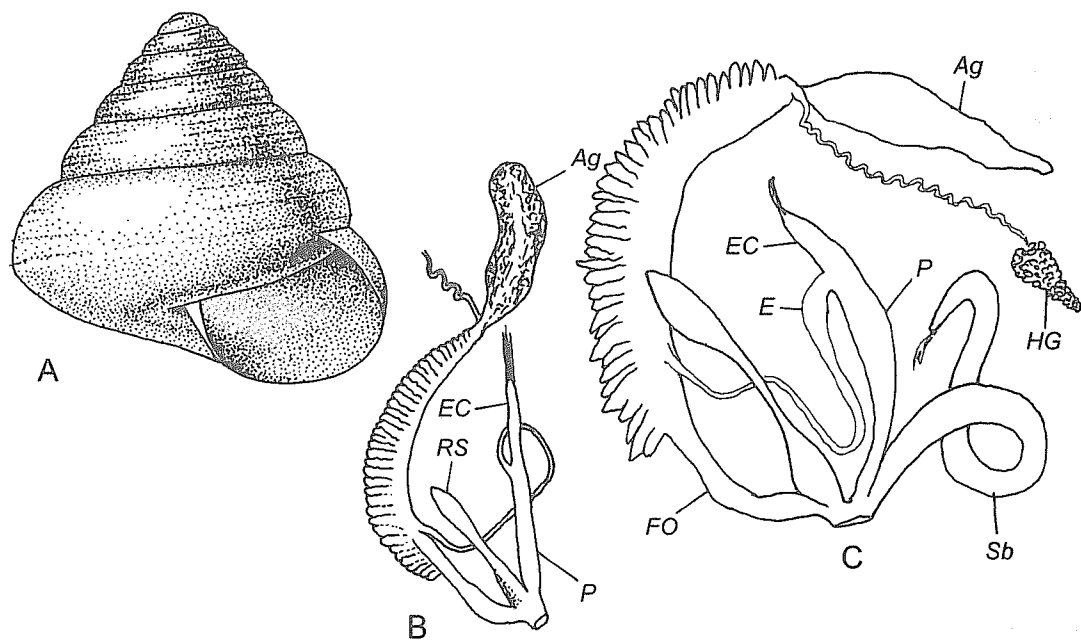


Fig. 1694. *Sitala infula* (Benson, 1848).
A — shell: Bengal, India. SPb. B — reproductive tract. ! C — *Sitala ategia* (Stoliczka, 1871). Reproductive tract. After Stoliczka, 1871.

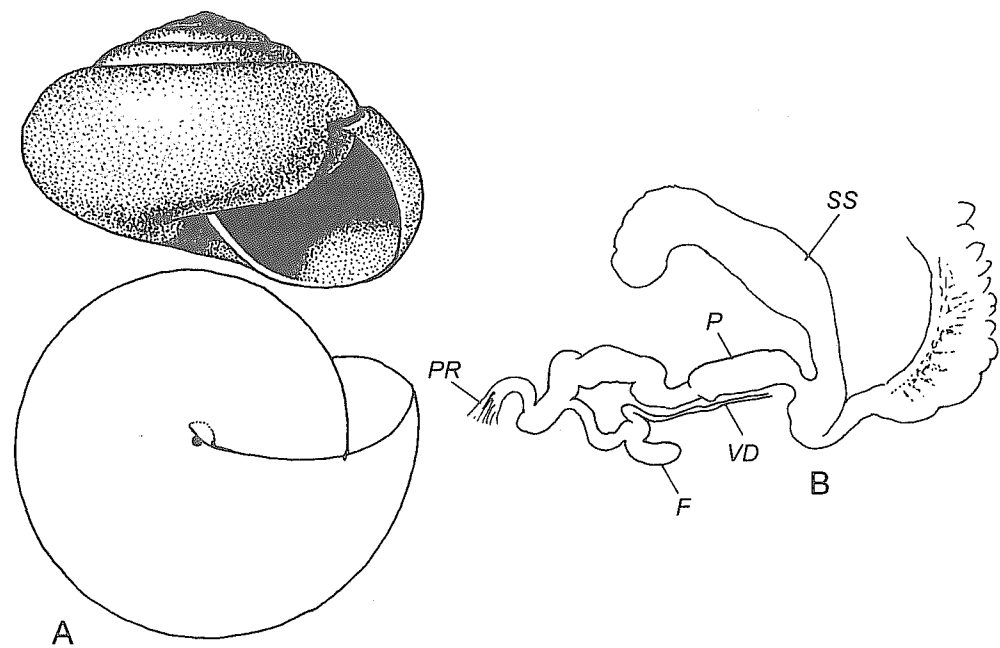


Fig. 1696. *Taphrospira convallata* (Benson, 1856).
A — shell: Sabang, Sumatra. Leiden. B — ! *Taphrospira bathycharax* (Godwin-Austen, 1888). Reproductive tract. After Godwin-Austen, 1907.

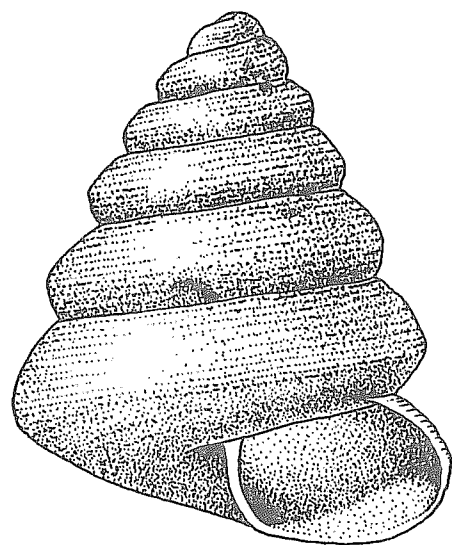


Fig. 1695. *Sitalinopsis conulus* (Blanford, 1865).
Jatinga Valley, Manipur, India. "Type".
London No. 1995076.

conic outlines of spire and narrowly rounded summit, of 5.5-7 convex whorls. Last whorl not descending, with smoothed peripheral angle. Color greyish-corneous, pale-yellowish or (light) brown. Embryonic and subsequent whorls covered with spiral sculpture of two sorts: widely spaced threads and extremely delicate silky striation. Aperture ovate, peristome insertions remoted, margins thin, sharp; columellar margin shortly reflexed. Umbilicus minute, partially covered. Height 3-9, diam. 5-10 mm (8.0 × 8.0 mm).

Caudal foss large, superseded by distinct horn.

Ovotestis compact, of many tightly packed acini. Hermaphroditic duct convoluted. Vas deferens entering epiphallus laterally. Epiphallus short, with simple caecum produced into penial retractor. Penis sub-cylindrical, moderately long. Free oviduct rather long, vagina practically absent. Sarcobelum present or wanting. Spermathecal stalk enlarged basally, reservoir elongated, embedded in spermoviduct.

DISTRIBUTION. Hindustan Peninsula, Ceylon, Andaman Islands, SE Asia, E and SE Africa, Madagascar. 25-30 spp.

? *Sitalinopsis* Thiele, 1931
Fig. 1695

Thiele, 1931: 612-613 (*Kaliella* subg.).

TYPE SPECIES — *Nanina* (*Kaliella*?) *conula* Blanford, 1865; monotypy.

Shell trochiform, very thin, translucent, of 6-7 very convex whorls. First 4-5 whorls angulate, 2 last whorls bicarinate: one keel above, the other below periphery. Color (light) corneous. Embryonic and later whorls sculptured with fine but distinct spiral threadlets; on postapical whorls fine radial striae added. Aperture rhomboidally lunate, oblique, with thin margins. Umbilicus dot-like. Height 2-3, diam. 1.75-2.20 mm (2.8 × 2.1 mm).

DISTRIBUTION. NE India and Myanmar; ? Andaman Islands. 1-3 spp.

REMARK. Perhaps, this peculiar genus is actually a member of Endodontidae like *Philalanka* (see p. 924).

Taphrospira Blanford, 1905
Fig. 1696

Blanford, 1905: 441.

TYPE SPECIES — *Macrochlamys convallata* Benson, 1856; OD.

Shell depressedly conic, thin, translucent, glossy, of 5-7 convex whorls. Last whorl evenly rounded, not descending. Suture channeled. Color whitish. Embryonic whorls smooth, subsequent whorls with extremely fine spiral striae. Aperture ovate-lunate, with thin, scarcely reflexed margins. Umbilicus minutely open. Height 9.5-10.5, diam. 10-15 mm (9.8 × 14.0 mm).

Caudal foss overhung by a pointed horn.

Vas deferens thin, free, entering short to moderately long epiphallus laterally. Flagellum rather short. Epiphallus rather long, with subglobular caecum, to which penial retractor attached. Penis elongate, internally with a large verge. Free oviduct short, vagina almost absent. Sarcobelum absent. Spermathecal stalk rather short, reservoir elongate, capacious. Spermatophore with branched spines.

DISTRIBUTION. SE Asia, Andaman Islands, Indonesia. 4 spp.

Dalingia Godwin-Austen, 1907
Fig. 1697

Godwin-Austen, 1907: 149 (*Bensonina* subg.).

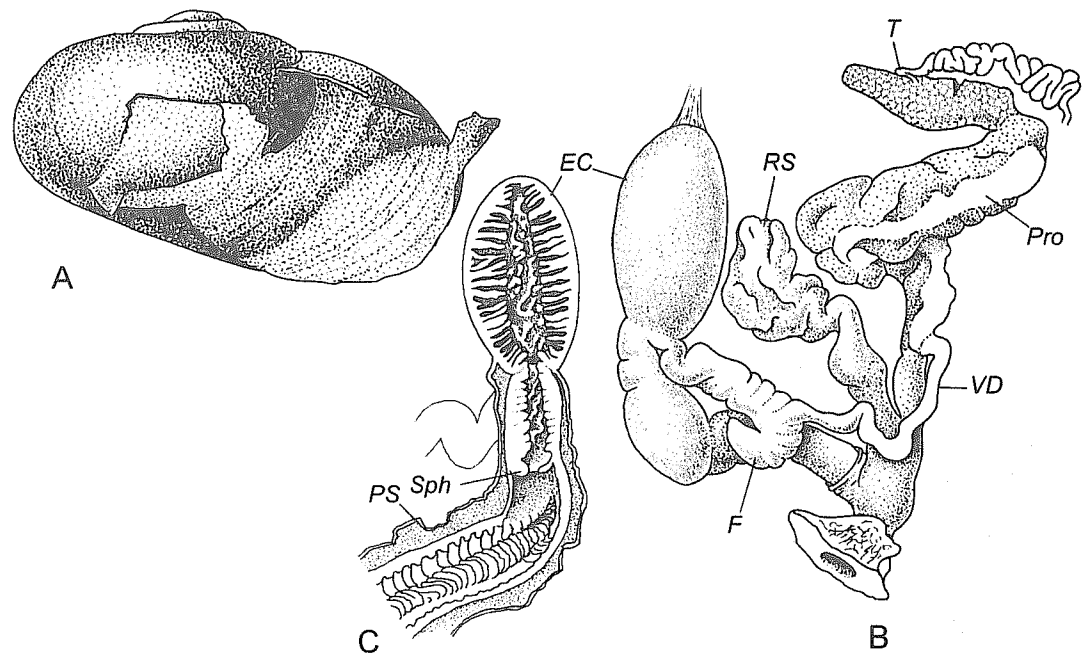


Fig. 1697. *Dalingia bhutanensis* Godwin-Austen, 1907.
A — shell: "Richila Peak, W Bhutan". "Type". London No. 1995072. B, C — Rechila Peak, Sikkim [= Sikkim]. B — reproductive tract. C — interior of penis. London No. 1995066.

TYPE SPECIES — *Dalingia bhutanensis* Godwin-Austen, 1907; OD.

Shell vitrinoid, depressed-conic, very thin and fragile, of 4 rather convex whorls. Color olive-greenish. Embryonic whorls densely, microscopically, spirally striated; upper surface of later whorls with somewhat coarser striation and has smoothed radial wrinkles; basal surface smooth, shining, polished. Aperture ample, ovoid, oblique, with simple margins. Umbilicus absent. Height 12.5, diam. 20.5-20.8 mm (12.5 × 20.8 mm).

Sole distinctly tripartite.

Hermaphroditic duct strongly convoluted. Talon, a simple curvature of hermaphroditic duct. Vas deferens short, unusually stout, entering epiphallus laterally at almost right angle. Flagellum short, conic, with axial thread. Epiphallus short, thick-walled, separated from penis by sphincter. Epiphallic caecum very large, ovate. Internally caecum with numerous, irregular, high papillae and folds. Penis not long, internally with large corrugated pilaster. Penis sheath thin, coating penis and epiphallus. Free oviduct short, vagina very

short. Sarcobelum absent. Spermathecal stalk stout, reservoir ample, thin-walled.

DISTRIBUTION. North of Hindustan Peninsula. 1 sp.

Megaustenia Cockerell, 1912

Fig. 1698

Cockerell, 1912: 70 (nom. nov. pro *Cryptosoma* Theobald, 1857).

— *Cryptosoma* Theobald, 1857: 252 (nom. praeocc., non Milne-Edwards, 1837; t-sp. *Vitrina praestans* Gould, 1843; monotypy).

TYPE SPECIES — *Vitrina praestans* Gould, 1843; OD.

Shell vitrinoid, comparatively solid, glossy, of about 3 flattened whorls; last whorl widely rounded, slightly descending in front. Color corneous to yellowish. Embryonic whorl smooth, remaining surface with very fine spiral striae. Aperture large, widely ovate, with scarcely thickened margins. Umbilicus absent. Height 5.5-20.0, diam. 11-40 mm.

Sole tripartite. Large caudal foss lacking horn. Vas deferens entering epiphallus later-

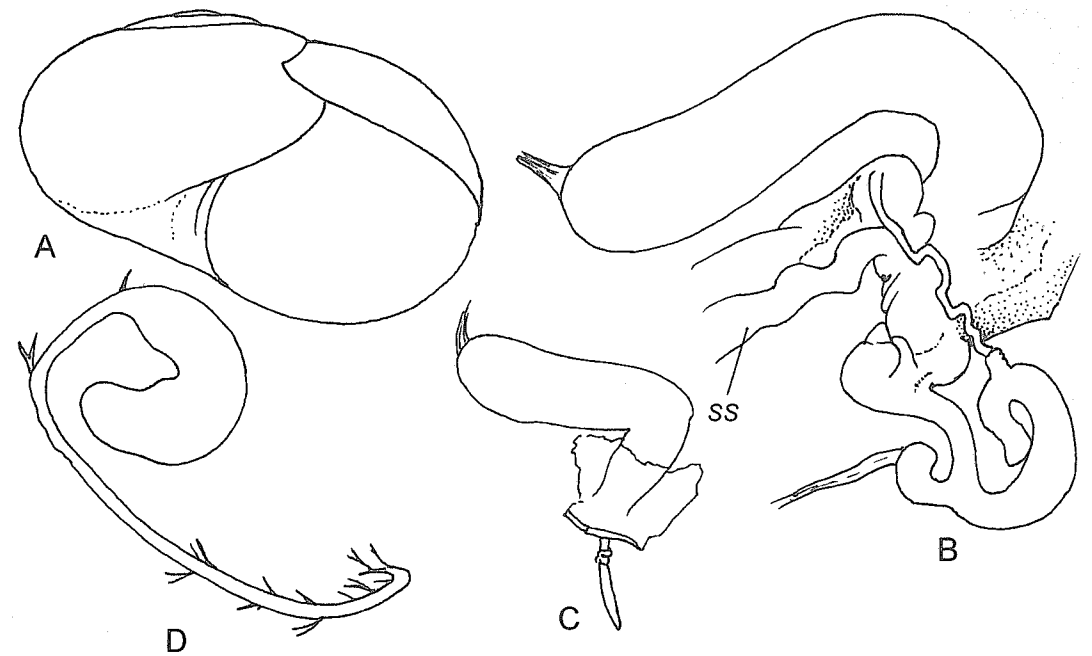
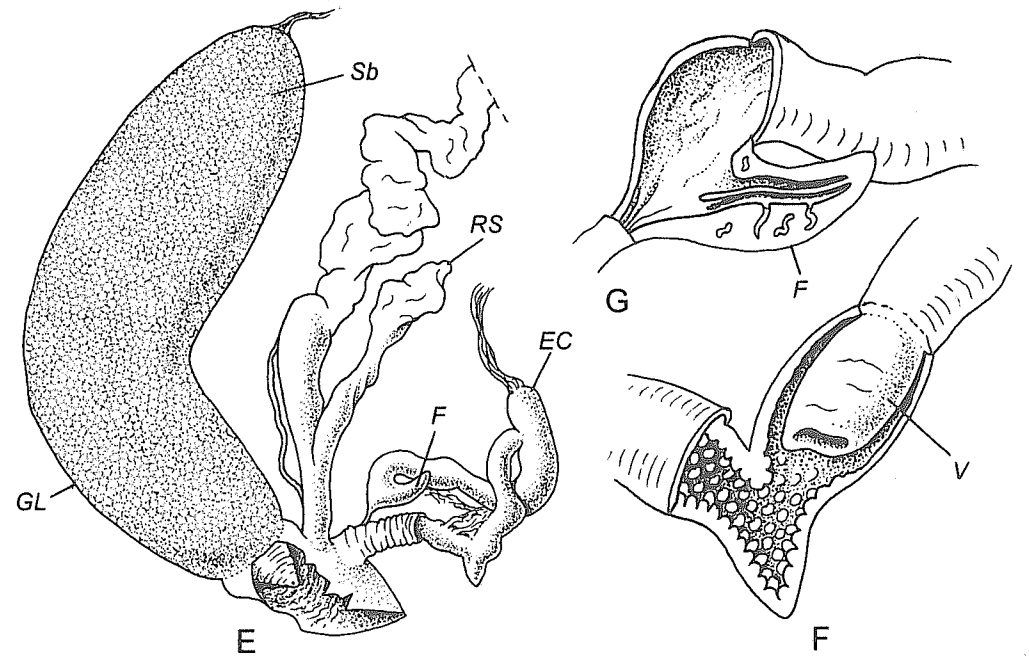


Fig. 1698. A — *Megaustenia praestans* (Gould, 1843). Shell. B, C, D — ! *Megaustenia inusitata* (Godwin-Austen, 1898). B — reproductive tract. C — interior of sarcobelum. D — spermatophore. After Godwin-Austen, 1898. E, F, G — ! *Megaustenia siamensis* (Haines, 1858). Pah Meeung mountain, Thailand. E — reproductive tract. F — interior of penis. G — interior of flagellum. Phil. No. A-14302.



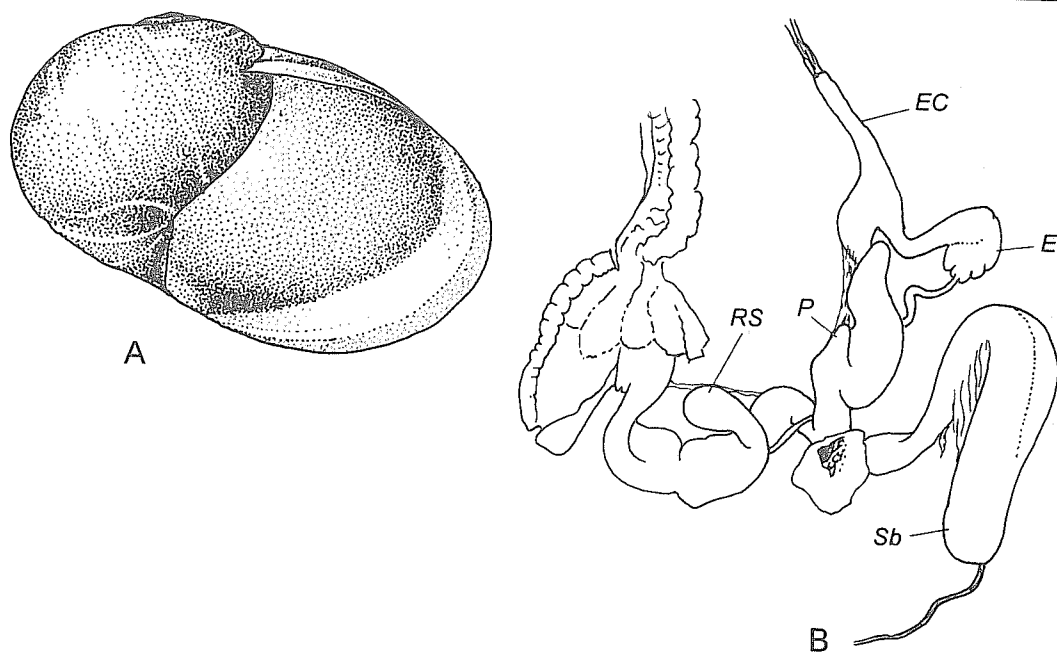


Fig. 1699. *Indrella ampulla* (Benson, 1850).
A — shell: S India. Phil. No. 5540. B — reproductive tract. After Godwin-Austen, 1901a.

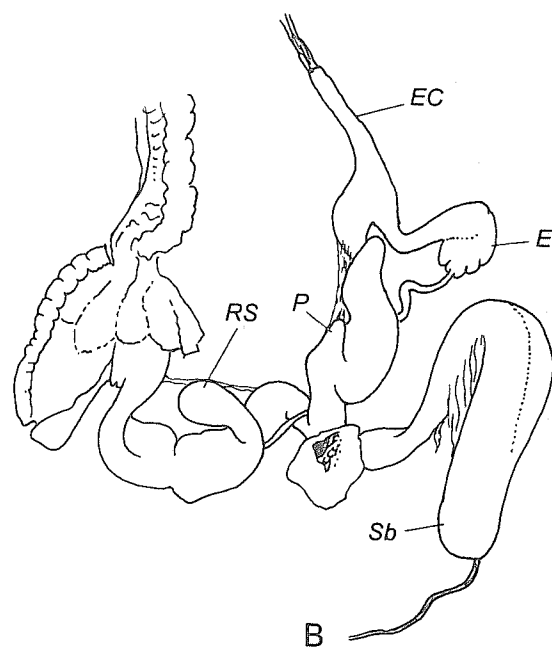
ally, leaving short, conic or ovate flagellum. Internally flagellum with axial thread and narrow cryptae in walls. Epiphallus moderately long, internally without regular relief, opens to penis through an ovoid verge; inner surface of upper portion of penis covered with numerous tubercles. Penial retractor attached to short, uncoiled caecum. Basal part of penis surrounded by a sheath which attached below and free above; at short distance from upper edge of penis sheath a small process may be present. Free oviduct moderately long, internally with axial folds; vagina somewhat shorter. Sarcobelum very large, its outer surface covered by glandular layer; inner muscular layer thin. Papilla of sarcobelum small. Spermathecal stalk rather short, cylindrical; reservoir thin-walled, embedded in lower section of spermo-viduct. Spermatophore with voluminous ampulla lacking apical process, and long tail furnished with few biramous spines.

DISTRIBUTION. From Myanmar to S China and N Vietnam. 10-12 spp.

Indrella Godwin-Austen, 1901
Fig. 1699

Godwin-Austen, 1901a: 187.

TYPE SPECIES — *Helix ampulla* Benson, 1850; monotypy.



Shell vitrinoid, very thin, of 3-3.5 slightly convex whorls. Color in general greenish or brownish-olive, with weak, diffuse, irregularly alternating lighter (more opaque) and darker (more translucent) radial streaks. Embryonic whorl finely radially ribbed, later whorls with delicate, dense spiral striation. Aperture ample, subcircular or broadly ovate, well oblique, with simple margins; columellar margin curved inwards. Umbilicus absent. Height 30-40, diam. 50-63 mm (40.0 × 51.2 mm).

Sole undivided. Cephalopodium with caudal foss of moderate size; caudal horn small or nearly absent.

Flagellum very short, conic. Epiphallus moderately long, with long, straight caecum. Penis sinuous. Penial retractor attached to caecum apically. Free oviduct rather long, vagina markedly shorter. Sarcobelum long, stout, with apical retractor. Spermathecal stalk very short; reservoir ovate.

DISTRIBUTION. W and S India. 1 sp.

Bapuia Godwin-Austen, 1918
Fig. 1700

Godwin-Austen, 1918: 589.

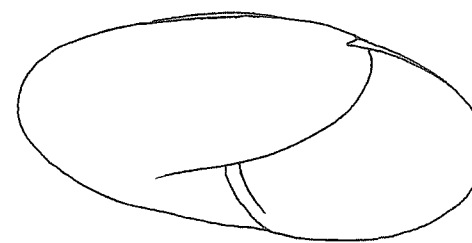


Fig. 1700. *Bapuia rengineensis* Godwin-Austen, 1918.
After Godwin-Austen, 1918.

TYPE SPECIES — *Bapuia rengineensis* Godwin-Austen, 1918; OD.

Shell flattened, thin, shining, of 5 slightly convex, rapidly increasing whorls. Color dark-ochraceous. Postembryonic whorls strongly radially striated, stronger below suture. Aperture broadly lunate, only slightly oblique, with thin margins; columellar margin almost straight, subvertical. Umbilicus dot-like. Height 3.5, diam. 12.25 mm.

Sole indistinctly divided. Caudal foss well developed, caudal horn short.

Penial caecum missing. Sarcobelum normally developed. Spermatheca short, globose.

DISTRIBUTION. India (Renging). 1 sp.

Dihangia Godwin-Austen, 1916
Fig. 1701

Godwin-Austen, 1916: 552.

TYPE SPECIES — *Dihangia koboensis* Godwin-Austen, 1916; monotypy.

Shell ovately spatulate, broad, nearly flat, shining, angular towards apex, of 1 whorl. Color amber-brown, apex white. Sculpture of spiral striae. Aperture with thin margins. Height 5.5, diam. 12.5 mm.

Sarcobelum long, cylindrical. Spermatheca, elongate sac.

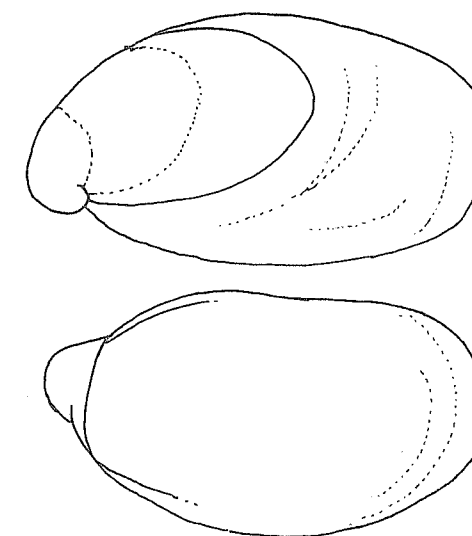


Fig. 1701. *Dihangia koboensis* Godwin-Austen, 1916.
After Godwin-Austen, 1916.

DISTRIBUTION. India (Assam). 1 sp.

Galongia Godwin-Austen, 1916
Fig. 1702

Godwin-Austen, 1916: 553.

TYPE SPECIES — *Galongia kempfi* Godwin-Austen, 1916; monotypy.

Shell flat, spatulate, seen from below it is solid, not concave, and this represents probably protoconch. Color pale ochraceous, white on apex. Surface smooth. Diam. 2.7 mm.

DISTRIBUTION. India (Assam). 1 sp.

Girasia J. Gray, 1855
Fig. 1703

Gray J., 1855: 61.

— *Hoplites* Theobald, 1864: 244 (no species included).

TYPE SPECIES — *Girasia hookeri* Gray, 1855; SD Godwin-Austen, 1888.

Semislug. Shell much reduced, thin, fragile, membranaceous, shining, transparent, of about 1 whorl. Color olivaceous. Whorls lacking regular sculpture. Diam. up to 40 mm.

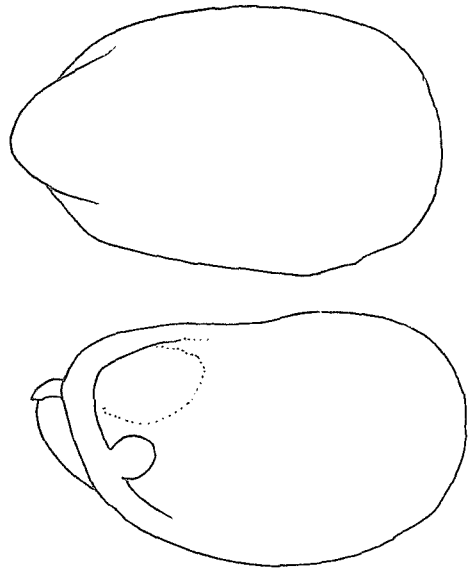


Fig. 1702. *Galongia kempii* Godwin-Austen, 1916.
After Godwin-Austen, 1916.

Shell covered by mantle lobes except for a narrow area on posterior left margin.

Vas deferens slender, entering epiphallus laterally. Flagellum rather short, with additional protuberances containing complex cryptae. Epiphallus U-shaped, with conic caecum. Penis rather short, internally with axial folds and folded verge which attached to inner surface of penis by one side; however its end free. Penis sheath well developed, with free upper edge. Free oviduct quite long, vagina short. Sarcobelum large, with apical ligament; papilla of sarcobelum with many circular folds. Spermathecal shaft very short, reservoir enormously large. Spermatophore with apical process, large ampulla and rather short tail; at border between ampulla and tail there are 2-3 large, branched spines.

DISTRIBUTION. Himalayas, Assam. About 10 spp.

Cryptogirasia Godwin-Austen, 1908
Fig. 1704

Godwin-Austen in Blanford & Godwin-Austen, 1908: 203.

Cockerell, 1891: 99 (nom. nud.).

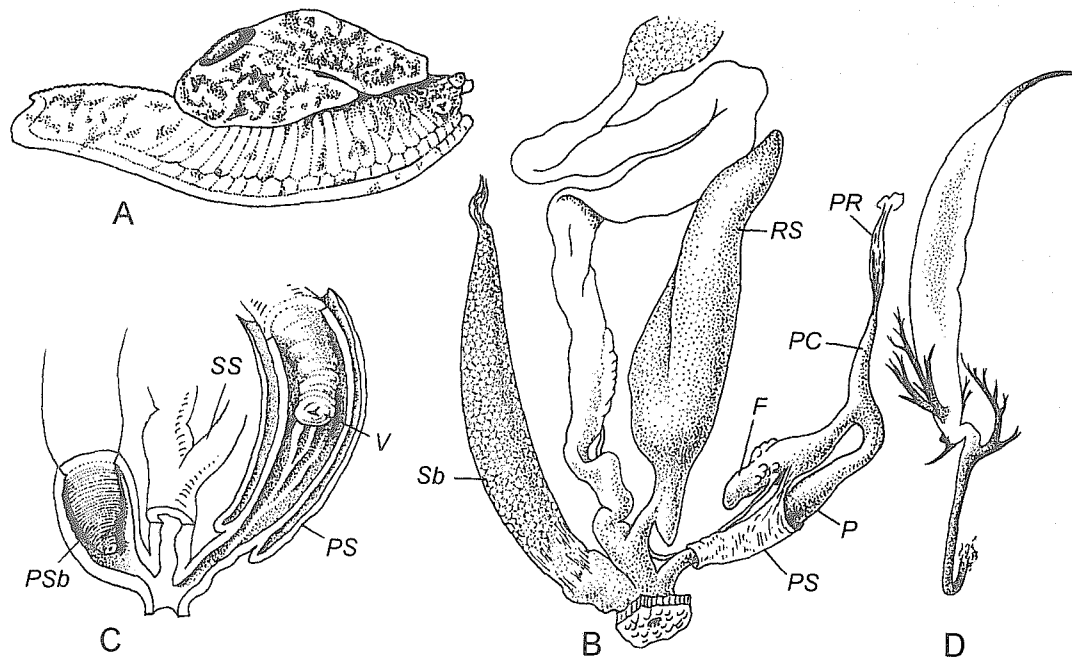


Fig. 1703. *Girasia hookeri* Gray, 1855.
Teria Ghat, Khasi Hills [India]. A — external view of preserved animal. B — reproductive tract. C — interior of distal section of genitalia. D — spermatophore. London.

TYPE SPECIES — *Parmarion ? rubra* Godwin-Austen, 1875; OD.

Slugs. Shell reduced to an ovate shelly disk, completely covered by mantle. Posterior end of mantle resting in a V-shaped depression. Body color orange-pink, sole grey. Shell length about 3.5 mm; length of animal when moving 45 mm.

Caudal foss with long overhanging horn.
DISTRIBUTION. India (Naga Hills). 1 sp.

Durgella Blanford, 1863
Fig. 1705

Blanford, 1863: 84 (*Nanina* subg.).

TYPE SPECIES — *Nanina levicula* Benson, 1859; SD Nevill, 1878.

Shell more or less vitrinoid, very thin, shining, of 3-4 slightly convex whorls. Color light-corneous to brown. Embryonic whorls smooth, subsequent nearly so, but on slopes of umbilicus and around umbilicus there are distinct, engraved, spiral lines. Aperture ovate, quite oblique, with thin, sharp margins. Umbilicus narrow. Height 4-14, diam. 7.0-19.0 mm (4.4 × 7.5 mm).

Sole tripartite. Caudal foss well developed, with large overhanging horn.

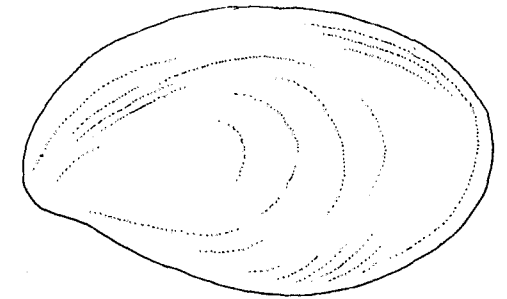


Fig. 1704. *Cryptogirasia rubra* (Godwin-Austen, 1875).
After Godwin-Austen in Blanford & Godwin-Austen, 1908.

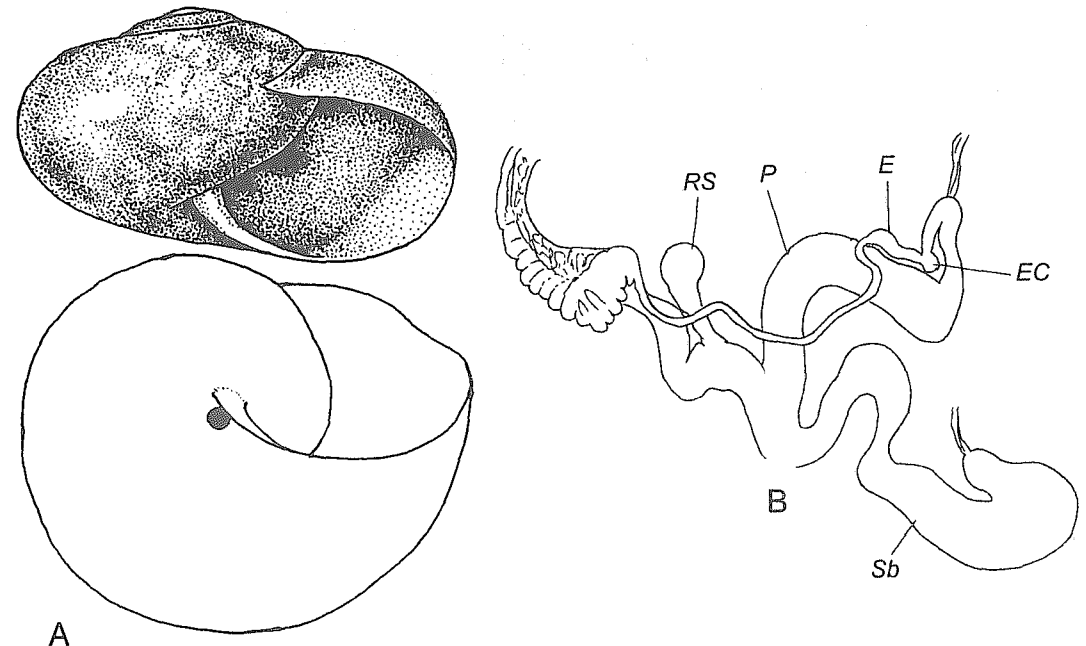


Fig. 1705. *Durgella levicula* (Benson, 1859).
A — shell: Pegu, Burma [Myanmar]. Paris. B — reproductive tract. After Blanford & Godwin-Austen, 1908.

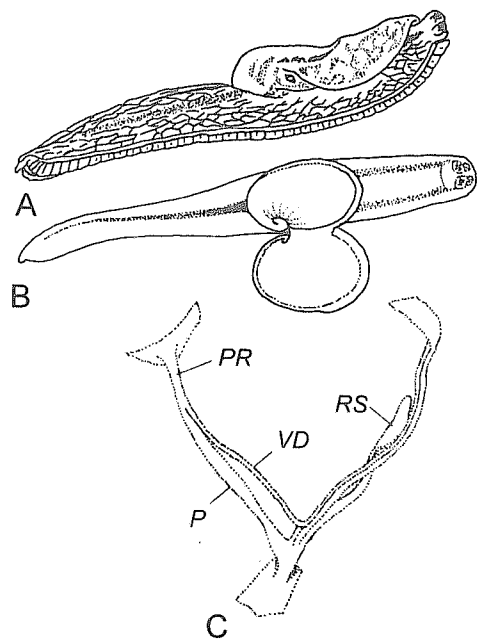


Fig. 1706. *Muangnua limax* Solem, 1966.
A — external view of animal. B — same, mantle open to show shell. C — reproductive tract. After Solem, 1966.

ceral hump rounded, resting in "V"-shaped body groove. Length 21.6 mm.

Jaw thin, without median projection. Kidney bilobed, with heart at left central margin.

Reproductive apparatus simple, without appendages. Spermatheca long, reaching 2/3 of way to albumen gland.

DISTRIBUTION. Thailand. 1 sp.

Khasiella Godwin-Austen, 1899
Fig. 1707

Godwin-Austen, 1899: 129.

TYPE SPECIES — *Euplecta vidua* Hanley et Theobald, 1876; OD.

Shell depressed or conoidly turbinate, generally rather thin, of 5-8 moderately convex whorls. Last whorl keeled or subangulate at periphery. Color gray or corneous. Embryonic whorls finely radially wrinkled. Rest whorls with distinct, regular radial ribs above, beneath often smooth. Aperture rather narrow, lunate, only slightly oblique, with thin margins. Umbilicus dot-like or nearly closed. Height 4-9, diam. 7.5-21.0 mm (6.7 × 11.0 mm).

Sole tripartite. Caudal foss well developed, caudal horn short.

Vas deferens joins epiphallus close to base of a long, blunt, knobbed flagellum. Epiphallus rather long. Penial retractor short and solid, attached to flexure of a short, free, bent epiphallic caecum. Penis subcylindrical. Free oviduct moderately long, vagina very short. Sarcobelum moderately developed. Spermathecal stalk comparatively short, reservoir bulbous, embedded in spermoviduct.

DISTRIBUTION. Hindustan Peninsula (E Himalayas, Assam, Arakan Hills, N Myanmar). 13 spp.

Sesara Martens, 1860
Fig. 1708

Martens in Albers, 1860: 91 (*Helix* subg.).

TYPE SPECIES — *Helix infrendens* Gould, 1844; monotypy.

Shell depressed, turbinate or trochiform, moderately to rather solid, of 5.75-7.5 slightly convex whorls. Last whorl straight, with weak, rounded peripheral angle. Color corneous to chestnut. Embryonic whorls smooth, later whorls accurately ribbed above and glabrous below. Aperture narrow,

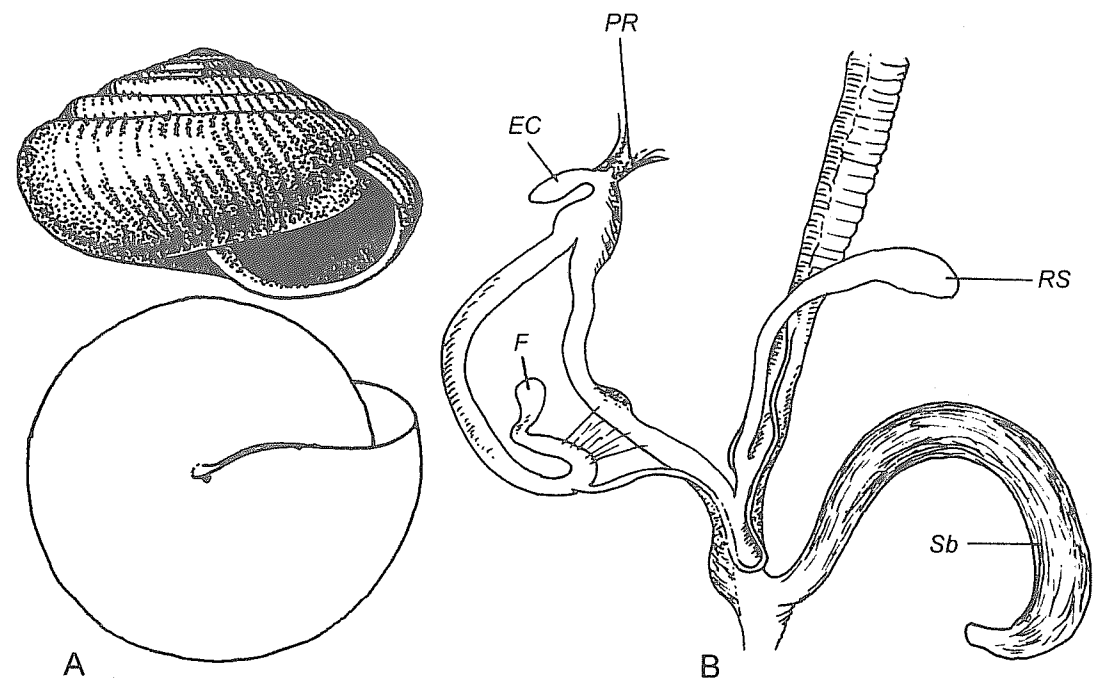


Fig. 1707. *Khasiella vidua* (Hanley et Theobald, 1876).
A — shell: Naga Hills, India. Leiden. B — reproductive tract. After Blanford & Godwin-Austen, 1908.

Vas deferens entering short epiphallus terminally. There is no distinct flagellum, though expansion may be noticed at junction of vas deferens with epiphallus. Epiphallic caecum small. Penial retractor attached to epiphallus below caecum. Sarcobelum large or absent. Spermathecal stalk short, sometimes swollen at base, reservoir ovoid, attending lower part of spermoviduct.

DISTRIBUTION. Hindustan and Indochina Peninsulae, Indonesia. 10-12 spp.

Muangnua Solem, 1966
Fig. 1706

Solem, 1966: 65.

TYPE SPECIES — *Muangnua limax* Solem, 1966; OD.

Slugs. Shell reduced to partially calcified cap having only single remnant of coiling and completely covered by fused shell laps. Mantle lobes forming large cephalic shield nearly reaching tentacles. Tail long, very slender, with hooked caudal horn. Color yellow, with black stripes. Posterior of vis-

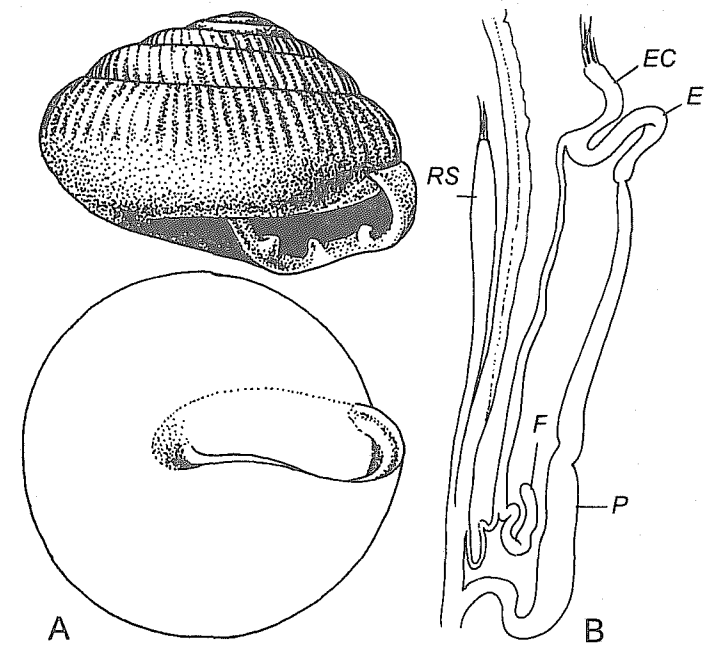


Fig. 1708. *Sesara infrendens* (Gould, 1844).
A — shell: Burma [= Myanmar]. Leiden. B — reproductive tract (subadult specimen). Burma. London No. 1995069.

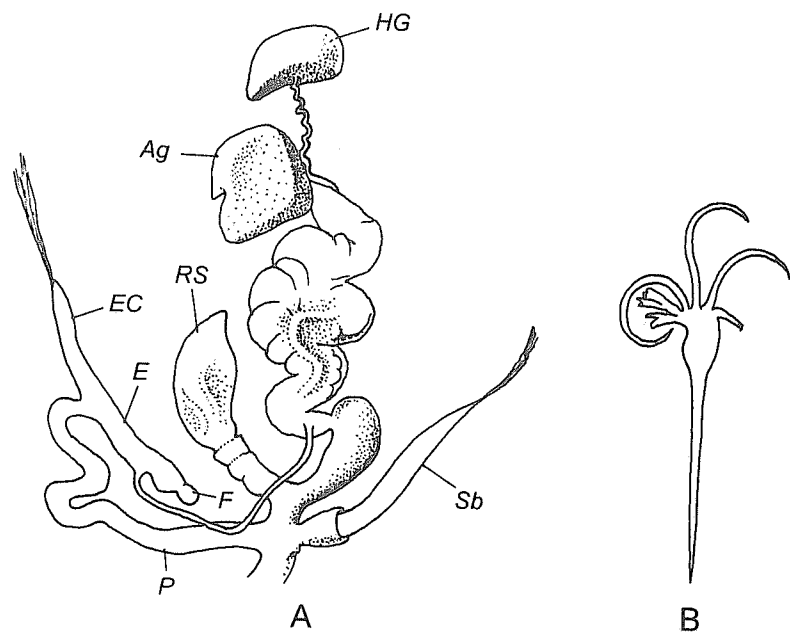


Fig. 1709. *Mariaella dussumieri* J. Gray, 1855.

A — reproductive tract. B — spermatophore. After W. Webb, 1899.

with double baso-palatal tooth, to which a light depression on neck corresponds; another tooth situated on columellar or baso-columellar margin. Umbilicus minute or closed. Height 3.5-7.0, diam. 6.0-17.5 mm (6.0 × 8.6 mm).

Sole tripartite. Caudal foss and overhanging horn normally developed.

Ovotestis compact, of many ovoid acini. Hermaphroditic duct straight. Talon small, drop-like. Vas deferens unusually short, enters at base of vermiform or roughly fusiform flagellum. Epiphallus long, with vermiform caecum which sometimes retains spiral coiling. Penis, a simple tube, long. Base of penis surrounded by poorly defined sheath. Penial retractor attached to epiphallic caecum apically. Sarcobelum absent. Spermathecal stalk long, reservoir with or without apical ligament. Spermatophore consisting of long, thin apical process, short, swollen ampulla and long tail bearing numerous, branched spines.

DISTRIBUTION. Hindustan Peninsula, Myanmar, Thailand, Laos. About 20 spp.

REMARK. My data differ from those presented by Stoliczka (1871). After that

author, penis of *Sesara infrendens* lacks epiphallic caecum and has a long vas deferens, while flagellum ("... appendage corresponding with the calc-sac") is clavate rather than vermiform; but it should be taken into consideration that the specimen dissected by me, was subadult. At the same time my data generally agree with the description of *Sesara parva* Solem, 1966 (Solem, 1966: 31-34, fig. 4).

Mariaella J. Gray, 1855

Fig. 1709

Gray J., 1855: 62.

— *Tennentia* Humbert, 1862: 427 [t.-sp. *Tennentia thwaitesi* Humbert, 1862 (= *Mariaella dussumieri* Gray, 1855); OD].

— *Vega* Westerlund, 1883: 164 [t.-sp. *Vega nordenskioldi* Westerlund, 1883 (= *Mariaella dussumieri* Gray, 1855); monotypy].

TYPE SPECIES — *Mariaella dussumieri* J. Gray, 1855; monotypy.

Slugs. Shell not coiled, ovate, solid, convex above, flatly concave beneath, with a small apex.

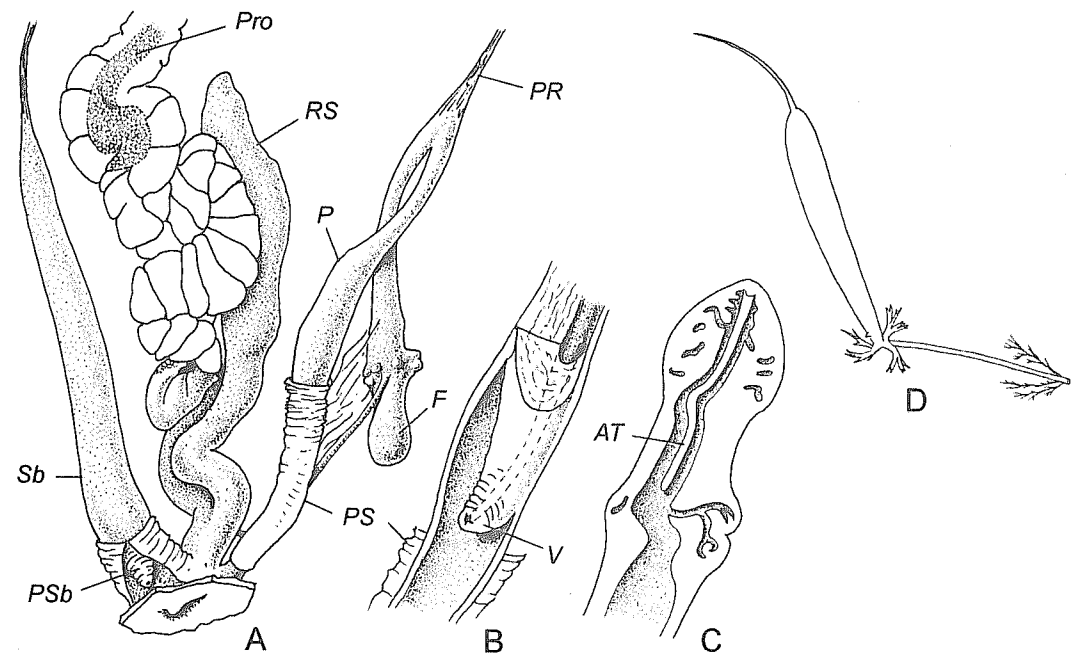


Fig. 1710. *Dekhania beddomei* (Godwin-Austen, 1888).

"Coonoor et Palnis (Inde merid.), jungle, December 1926". A — reproductive tract. B — interior of penis. C — interior of flagellum. D — spermatophore. Geneva. AT — axial thread.

Soil tripartite. Caudal foss large, vertical, slit-like. Caudal horn absent.

Hermaphroditic gland compact. Talon hidden. Vas deferens enters epiphallus laterally. Flagellum short, with rounded head. Epiphallus with well developed caecum to which penial retractor attached. Penis cylindrical, externally demarcation between epiphallus and penis not seen. Free oviduct moderately long, much swollen. Sarcobelum with apical retractor. Spermathecal stalk short, reservoir voluminous. Spermatophore with long spines at posterior end; tail seemingly absent.

DISTRIBUTION. Hindustan Peninsula, Ceylon. 1 sp.

Dekhania Godwin-Austen, 1888

Fig. 1710

Godwin-Austen, 1888: 242 (*Girasia* subg.).

TYPE SPECIES — *Girasia (Dekhania) beddomei* Godwin-Austen, 1888; OD.

Slugs. Externally similar to *Mariaella*.

Flagellum internally with axial thread and numerous cryptae in walls; filled with milky-white fluid. Epiphallus sharply bent, penial retractor attached to its flexure. Penis internally with thick-walled verge which attached to penis wall by one side, only its tip free. Basal section of penis surrounded by sheath which is free at upper end. Sarcobelum long, with apical retractor, containing fleshy papilla. Free oviduct moderately long, vagina very short. Spermatheca large, scarcely divided into stalk and reservoir. Spermatophore consists of long apical thread, large ampulla and slender tail; there are two areas bearing branched spines: one area situated at place of junction of ampulla and tail, in this area spines comparatively short and stout; the other area located on end of tail, there spines much thinner, longer and more intensively branched.

DISTRIBUTION. Hindustan Peninsula, Ceylon. 1 sp.

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