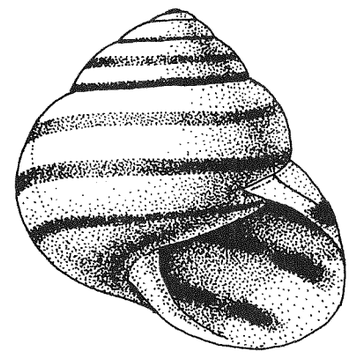
A. A. Schileyko

TREATISE ON RECENT TERRESTRIAL PULMONATE MOLLUSCS

Part 12

Bradybaenidae, Monadeniidae, Xanthonychidae, Epiphragmophoridae, Helminthoglyptidae, Elonidae, Humboldtianidae, Sphincterochilidae, Cochlicellidae



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XANTHONYCHOIDEA
Pfeffer in Strebel et Pfeffer, 1880

Strebel & Pfeffer, 1880: 25 (pro fam.).

Shell mostly helicoid or hygromioid, of various size and shape, sometimes reduced to various extent.

Accessory organs of female section represented by 1-4 stylophores accompanied by alveolar or tubular mucus glands situated on stylophore on vagina; duct(s) of mucus glands may enter stylophore through additional sac. In some American groups upper sections of mucus glands transformed into a peculiar envelope (sheath) on which 1-2 additional glands may be inserted. Sometimes atrium expands to form so-called neophore; in this case stylophore sits on summit of neophore. There are numerous secondary modifications of this scheme including reduction of some or all accessory organs down to complete disappearance.

DISTRIBUTION. Mediterranean countries, Asia and America.

BRADYBAENIDAE Pilsbry, 1939

Pilsbry, 1939: 15.

— Eulotidae Moellendorff, 1898: 97.

— Fruticicolidae Lindholm, 1927: 120.

Shell generally helicoid, rarely lens-shaped or turreted, of various size, shape and color. Embryonic whorls smooth, radially wrinkled or with pustulae. Most common feature is presence of distinct spiral grooves on postapical whorls, but they sometimes vague or, rarely, absent. Hairs on postapical whorls may be present.

Sole smooth.

Jaw odontognathous.

Flagellum and penial verge initially present, but in many cases secondary missing. Stylophore 1, containing 1 or (in a single case) 2 darts; sometimes absent. Mucus glands 1 or 2, compact, branched or grouped into 2 bundles and enter stylophore often through an additional sac. Spermathecal stalk without diverticle, cylindrical, with more or less swollen base. Reservoir small, globular, "fastened" to pericardial area by connective-tissued ligament.

DISTRIBUTION. Maximal diversity at the generic level in SE and E Asia including China; besides, the family is represented in the Philippines, Indonesia, Hindustan Peninsula including Ceylon, Japan, Russian Far East and Siberia, Central Asia, NW America; 1 sp. in Europe.

AEGISTINAE Kuroda et Habe, 1949

Kuroda & Habe, 1949: 62.

— ? Euhadrinae Habe, Okutani et Nishiwaki, 1994: 81; Minato, 1988: 174 (nom. nud.).

Shell lacks specific characters, mostly more or less flattened, uniformly brown to light-corneous, with simple aperture and narrow to very broad umbilicus.

Flagellum and (usually) verge present. Penis sometimes with conic caecum. Accessory sacs of stylophore 2, 1, or 0. Mucus glands several to 1, in former case they may be branched. In some genera all vaginal appendages missing. Spermathecal stalk cylindrical throughout or with swollen base.

DISTRIBUTION. Japan, China, Taiwan, Korea, Philippines, Indonesia.

Nesiohelix Kuroda et Emura, 1943
Fig. 2099

Kuroda & Emura, 1943: 19.

— ? *Takasagohadra* Kuroda, 1941: 148 (t.-sp. *Takasagohadra multifasciata* Kuroda, 1941; OD).

TYPE SPECIES — *Helix swinhoei* L. Pfeiffer, 1865; OD.

Shell semiglobose to turbinate-depressed, moderately solid, dull or silky glossy, of 5-6 flattened to moderately convex whorls. Last whorl somewhat descending, with obtuse cord-like peripheral keel. Color yellowish to chestnut or pinkish, sometimes with light circumumbilical zone and narrow light band on keel; besides, sometimes there are darker radial streaks or a series of narrow indistinct bands, mainly on basal surface. Embryonic whorls smooth, polished. Later whorls with fine to coarse radial striation and (very) close, distinct spiral grooves. Aperture broadly ovate, quite oblique, with slightly thickened, reflexed margins. Umbilicus not wide, sometimes semicovered. Height 21-36, diam. 36-58 mm (35.2 × 56.4 mm).

Flagellum long, slender. Epiphallus long, its diameter just a little exceeds that of flagellum. Penis more or less cylindrical or fusiform. Penial retractor inserted on distal section of epiphallus. Stylophore rather

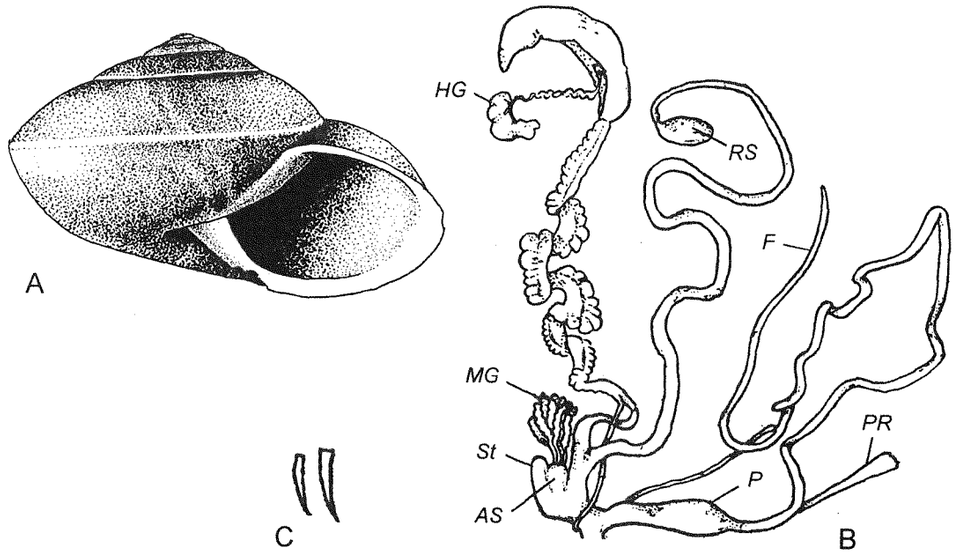


Fig. 2099. ***Nesiohelix swinhoei*** (L. Pfeiffer, 1865).
A — shell: "Formose" [Taiwan]. **Paris**. B — reproductive tract. C — pair of darts from stylophore. After Kuroda & Emura, 1943.

small, containing 2 (!) simple, conic darts one of which longer than the other. 2 bundles of tubular mucus glands enter well developed accessory sac. Vagina short to moderately long. Basal swelling of very long spermathecal shaft developed to various degree.

DISTRIBUTION. China (Zhejiang, Hunan, Guangxi, Taiwan), S Japan (Ryukyu Islands), Korea. 7-9 spp. & subspp.

REMARK. I include the name *Takasagohadra* Kuroda, 1941 in the synonymy of *Nesiohelix* with serious doubts. Kuroda did not give any description but presented photographs of the shell of *T. multifasciata* Kuroda, 1941 (pl. 4, figs. 59-61); judging by the photos, it differs from all known Taiwanian species mainly by the presence of many dark, narrow bands and strongly descending last whorl. Anatomy of this species is unknown.

Plectotropis Martens, 1860
Fig. 2100

Martens in Albers, 1860: 121 (nom. nov. pro *Thea* Albers, 1850; *Helix* subg.

— *Thea* Albers, 1850: 118 [nom. praeocc., non Mulsant, 1846 (Coleoptera); *Helix* subg.; t.-sp. *Helix pretiosa* Albers, 1850; SD Herrmannsen, 1852].

TYPE SPECIES — *Helix elegantissima* L. Pfeiffer, 1849 (OD).

Shell lens-shaped, thin to moderately solid, of 5-8 slightly convex whorls. Last whorl nearly straight, with sharp, smooth or more or less crenulated keel. Color uniformly greenish-grey to brown. Embryonic whorls practically smooth. Later whorls with irregular radial wrinkles and weak spiral striation; short, numerous hairs may be present on surface of fresh shells. Aperture angulate-lunar, oblique; margins narrowly expanded, reflexed below and on columellar side. Umbilicus moderately broad. Height 6-20, diam. 9-30 mm (16.2 × 24.1 mm).

Vas deferens demarcates flagellum/epiphallus junction, entering it at right angle. Flagellum well developed, finger-shaped, with complex inner structure. Epiphallus somewhat shorter than penis; both divisions rather slender, cylindrical. Stylophore rather small; mucus glands, a bundle of a few corrugated tubules entering lower part of stylophore through well developed accessory sac. Lower section of vagina extremely short (practically absent), upper section of moderate length.

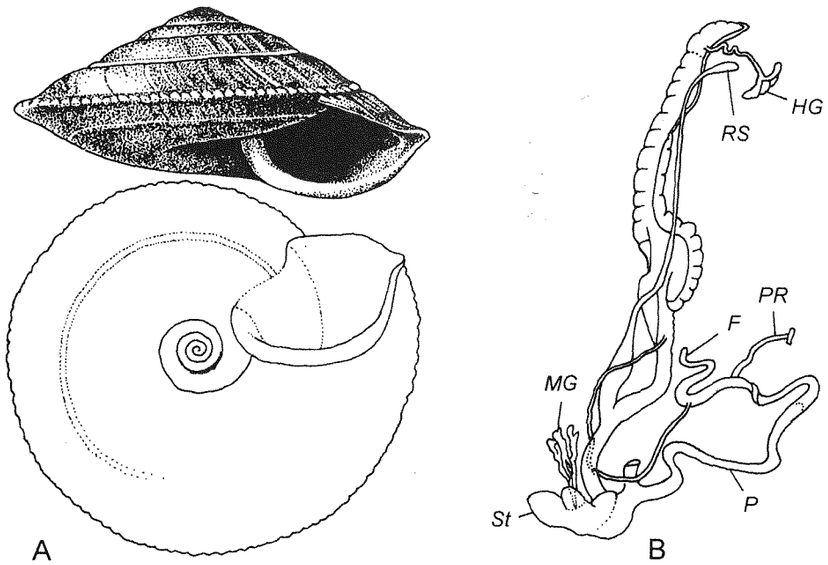


Fig. 2100. ***Plectotropis elegantissimus*** (L. Pfeiffer, 1849).
A — shell: Yaeyama Island, Loo Choo [Okinawa] Islands, Japan. **Phil**. No. 49588. B — reproductive tract. After Azuma, 1982.

DISTRIBUTION. Japan, China and adjacent islands; south to Sumatra. About 45 spp. with numerous forms.

Neoaegista Azuma, 1955
Fig. 2101

Azuma, 1955: 1.

TYPE SPECIES — *Helix* (*Plectotropis*) *trochula* A. Adams, 1868; OD.

Shell obesely lenticular, moderately thin, of 6-6.5 slightly convex whorls. Last whorl scarcely descending in front, with cord-like peripheral keel. Color yellow to corneous. Embryonic whorls smooth; sculpture of later whorls of distinct spiral incised lines, radial wrinkles, and thin, periostracal, widely and irregularly spaced wrinklets bearing sharp scales which become triangular on peripheral keel. Umbilicus rather broadly open. Height 9.5-15.5, diam. 15.0-18.5 mm (9.9 × 15.5 mm).

Vas deferens relatively short, entering epiphallus at right angle. Flagellum well developed, with regular circular thickenings and complex inner structure. Epiphallus cylindrical, stout, rather long. Penis small, swollen. Penial retractor attached to upper half of epiphallus. Stylophore or mucus glands wanting. Free oviduct very short. Vagina cylindrical, quite long. Basal thickening of spermathecal shaft well expressed and clearly demarcated; reservoir small, attending albumen gland.

DISTRIBUTION. Japan (Nagasaki). 1 sp.

Miyakoia Minato, 1980
Fig. 2102

Minato, 1980: 90 (*Camaena* subg.).

TYPE SPECIES — *Satsuma* (*Coniglobus*) *sakishimana* Kuroda, 1960; OD.

Shell lens-shaped, of about 5 flattened whorls. Last whorl nearly straight, with sharp peripheral angle. Color light-corneous, with dark peripheral band. Aperture rather narrow, semilunate, slightly oblique, with thin, shortly reflexed margins. Umbilicus moderately wide, open. Height 12.4, diam. 24.0 mm.

Talon small, exposed, drop-like. Vas def-

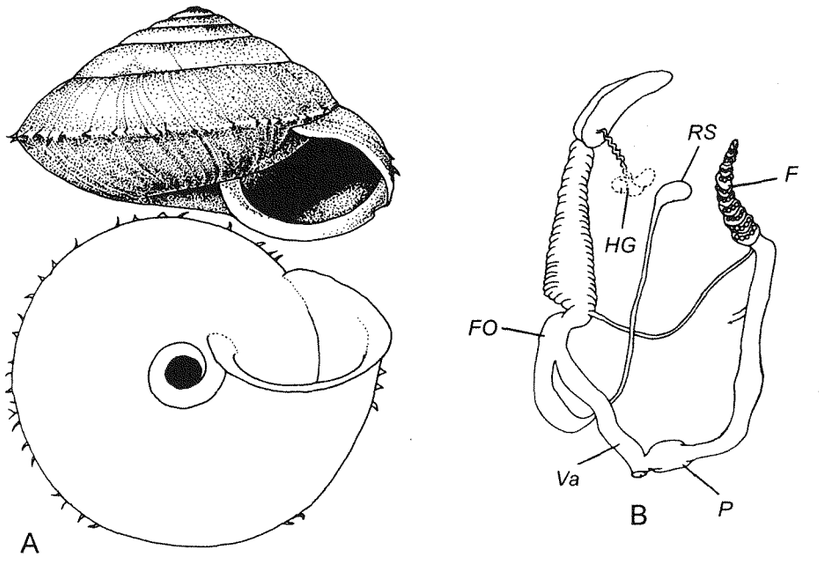


Fig. 2101. ***Neoaegista trochula*** (A. Adams, 1868).
A — shell: Tsushima Islands, Japan. **Paris**. B — reproductive tract. After Azuma, 1995.

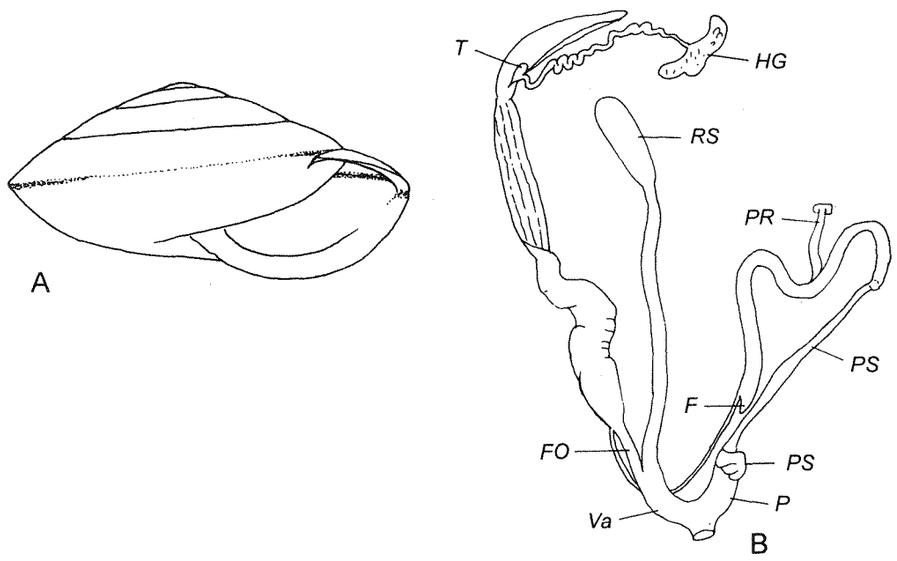


Fig. 2102. ***Miyakoia sakishimana*** (Kuroda, 1960).
A — shell. B — reproductive tract. After Minato, 1980.

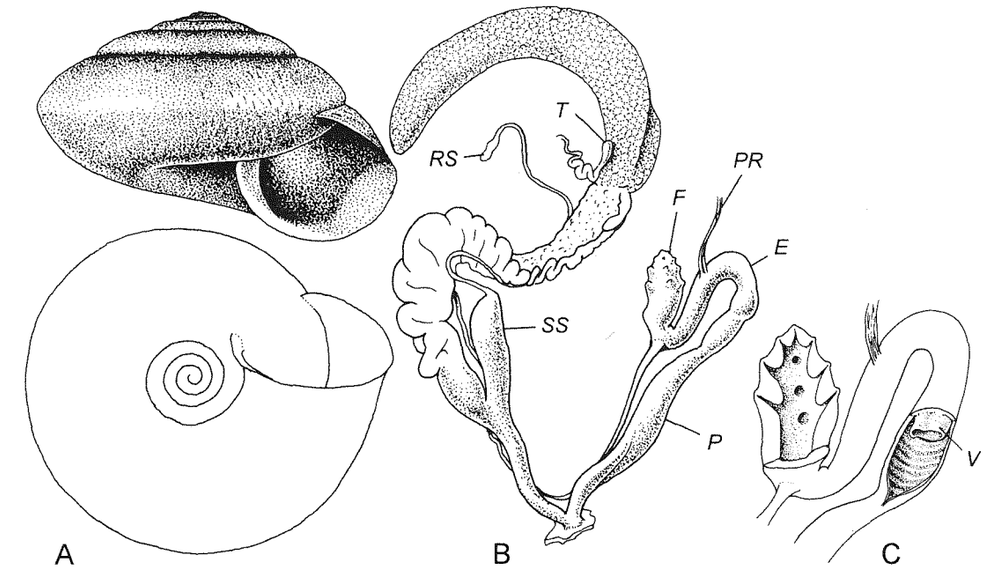


Fig. 2103. A — ***Landouria huttoni*** (L. Pfeiffer, 1842).
Shell: Kathmandu valley: 5.8 km NW of Kathmandu, Nagarjun Royal Forest, at 1550 m above sea level. **Moscow** No. Lc-25669. B, C — ! ***Landouria dhaulagirica*** Schileyko et Kuznetsov, 1998. B — reproductive tract. C — interior of penis and flagellum. Holotype. **Moscow** No. Lc-22977. After Schileyko & Kuznetsov, 1998.

erens relatively short. Flagellum rudimentary, conic. Epiphallus long, consisting of somewhat thickened proximal and thin, thread-like distal parts. Penis short, without appendix. Penial retractor attached to middle of proximal section of epiphallus. Free oviduct rather short, vagina markedly longer. Stylophore or mucus glands missing. Spermathecal stalk long, cylindrical; elongated reservoir (nearly) reaching albumen gland.

DISTRIBUTION. Miyako Islands (Japan), Taiwan. 1 sp.

Landouria Godwin-Austen, 1918
Fig. 2103

Godwin-Austen, 1918: 604. Schileyko & Kuznetsov, 1998: 43.

TYPE SPECIES — *Helix huttoni* L. Pfeiffer, 1842; OD.

Shell somewhat depressed, thin, dull, of 5-6 moderately convex whorls. Last whorl a little deflected, evenly rounded to obtusely angulated at periphery. Color corneous to reddish-brown. Embryonic whorls with chequerwise elongated granules ("scars"), radial and spiral striae. Postnuclear sculpture of dense, fine radial wrinklets and scars, often with short periostracal scales. Aperture rounded, oblique, with a little reflexed, thin margins; columellar margin more or less reflexed. Umbilicus moderately broad, deep. Height 5-7, diam. 8.3-13.0 mm (6.3 × 9.3 mm).

Talon, a short, ovate, exposed thickening of hermaphroditic duct. Vas deferens entering epiphallus at some angle. Flagellum short, stout, more or less ovate, with series of distinct tubercles on its surface. Internally flagellum with axial channel from which secondary smaller channels branched off; these secondary channels end in superficial tubercles. Epiphallus rather thick, moderately long. Penis distinctly subdivided into 2 portions: upper one short, more or less swollen, containing a minute tubular verge with thin, somewhat corrugated walls and very spacious lumen; lower (distal) portion internally with longitudinal sinuous folds. Penial retractor inserted on middle of epiphallus. Vagina lacks additional organs, longer than free oviduct. Spermathecal stalk greatly swollen basally,

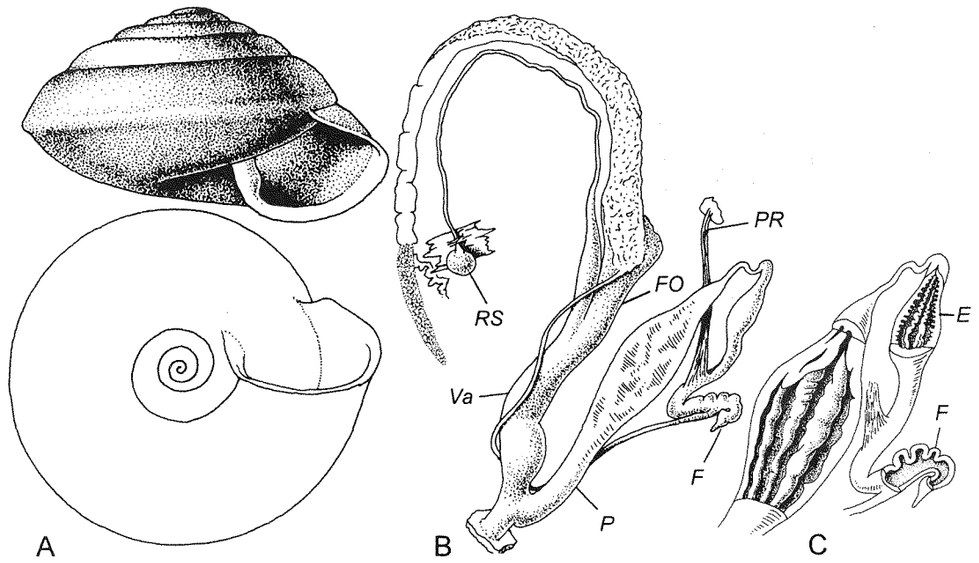


Fig. 2104. ***Thaitropis goniochila*** (L. Pfeiffer, 1862).
A — shell: "Siam" (Thailand). **Geneva**. B, C — Kao Pra Put, Lop Buri Prov., Thailand, October 24, 1966. B — reproductive tract. C — interior of epiphallus and penis. **Chicago** No. 155087.

its rest part very slender; reservoir small, reaching albumen gland.

DISTRIBUTION. N India, Nepal, N Myanmar (Burma), Ceylon, ? Indonesia. About 15 spp.

Thaitropis Schileyko, gen. nov.
Fig. 2104

ETYMOLOGY: the name is a combination of *Thai*[land] and [Plecto]*tropis*.

Gender: feminine.

TYPE SPECIES — *Helix goniochila* L. Pfeiffer, 1862.

Shell obesely lentiform, rather thin, more or less translucent, of about 6 moderately convex whorls. Last whorl scarcely deflected, with rounded, cord-like peripheral keel. Color light-corneous to whitish. Embryonic whorls with exceptionally delicate spiral striae. Later whorls finely, irregularly, radially striated above; striae more or less distinctly divided into minute granules; base with coarse, wavy spiral grooves and weak radial striae; on slopes of umbilicus granulation visible. Aperture irregularly ovate, moderately oblique, with thin, shortly reflexed margins; small, smoothed columellar nodule may be present. Umbilicus broad, shallow. Height 7-8, diam. 11-13 mm (7.2 × 12.5 mm).

Talon not located. Vas deferens long, thin, entering epiphallus at acute angle. Flagellum short, hook-shaped, with distinct incisions on convex surface; internally with slit-like pockets located in swellings between incisions. Epiphallus thin-walled, internally with longitudinal, corrugated pilasters. Epiphallus connected with penis by very thin intercalar section. Penis fusiform, with stout, muscular walls; internally with rather thick, rounded pilasters; verge absent. Penial retractor attached to proximal part of epiphallus. Free oviduct short. Vagina long, stout. Stylophore or mucus glands missing. Spermathecal stalk long, somewhat swollen basally; reservoir small, globular, attending albumen gland.

DISTRIBUTION. Thailand. 2 spp.

REMARK. *Thaitropis* is probably related to *Landouria*, differing from the latter in the presence of keel, absence of periostracal scales as well as the absence of verge. The main diagnostic character of *Thaitropis* is the presence of a sharp narrowing between epiphallus and penis.

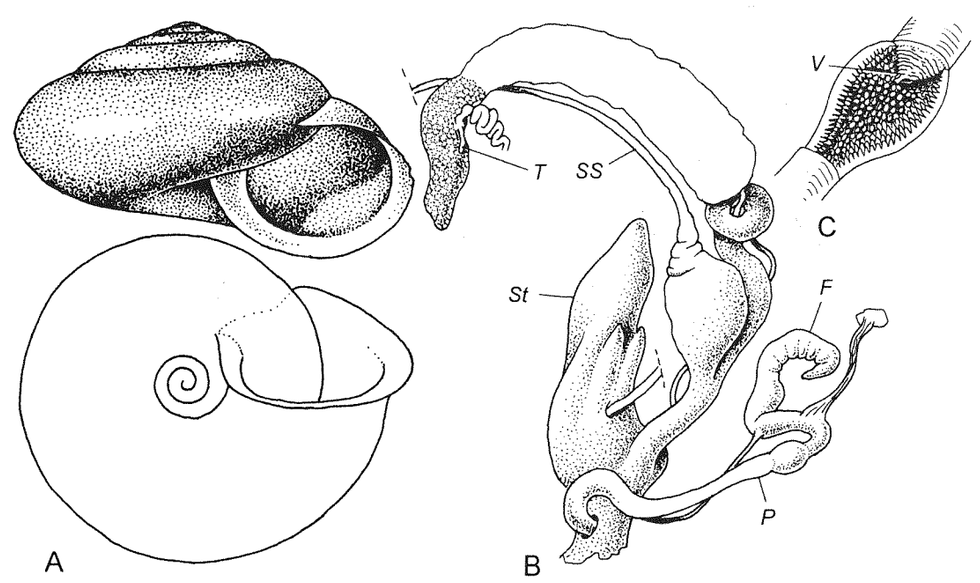


Fig. 2105. ***Trishoplita pallens*** Jacobi, 1898.
A — shell: Sagawa, Tosa, Japan. **StB**. No. 12759. B, C — Kochi, Japan. B — reproductive tract. C — interior of penis. **Phil**. A-16696.

Trishoplita Jacobi, 1898
Fig. 2105

Jacobi, 1898: 65.

TYPE SPECIES — *Trishoplita pallens* Jacobi, 1898; SD Zilch, 1960.

Shell trochoid, more or less depressed, thin, translucent, of 4.25-6 moderately convex whorls. Last whorl rounded or scarcely angulated, gradually descending in front. Color whitish to light-corneous, monochromatic or with brown peripheral band. Embryonic whorls smooth. Postnuclear sculpture of fine irregular radial striation and distinct spiral grooves. Aperture (broadly) elliptic, moderately oblique, with thin, slightly reflexed margins. Umbilicus moderately wide, perspective. Height 5.0-14.5, diam. 7.5-21 mm (9.3 × 16.0 mm).

Flagellum enormously developed, conic, sometimes more or less coiled, with tapering tip; through its walls complicated inner structure is visible. Epiphallus short, cylindrical. Penis consisting of long, cylindrical basal portion and small swollen chamber above; internally chamber with numerous, close set, minute papillae and very short, conic, transversely wrinkled verge. Penial retractor attached to middle of epiphallus. Stylophore consists of distal and proximal chambers. Mucus glands of alveolar or tubular structure, entering stylophore through 2 small additional sacs independently from each other. Basal swelling of spermathecal stalk very well developed, reservoir rather small, reaching albumen gland.

DISTRIBUTION. Japan, Korea. 20-25 spp.

Coelorus Pilsbry, 1900
Fig. 2106

Pilsbry, 1900b: 528 (*Eulota* subg.).

TYPE SPECIES — *Eulota* (*Coelorus*) *cavicollis* Pilsbry, 1900; OD.

Shell dome-shaped, moderately thin, of 6-7.5 weakly convex whorls. Last whorl scarcely angulated, abruptly and very deeply deflected, constricted behind aperture. Color uniformly corneous or brownish-grey. Embryonic whorls smooth. Rest surface covered with crowded, not very regular radial wrinkles. Aperture broadly ovate, very oblique (subhorizontal), with

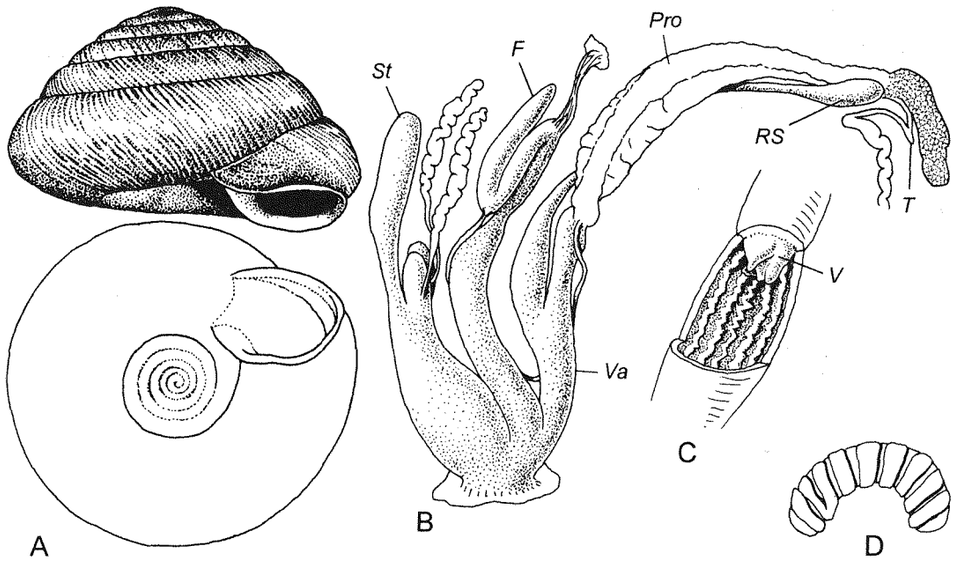


Fig. 2106. ***Coelorus cavicollis*** (Pilsbry, 1900).
A — shell: Kyoto, Japan. Holotype. **Phil**. No. 76280. B, C, D — Kyoto Prefecture, Honshu, March 1908. B — reproductive tract. C — interior of penis. D — jaw. **Phil**. No. A-9502-E.

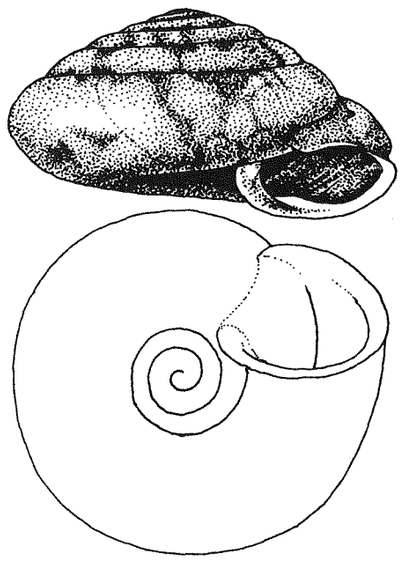


Fig. 2107. ***Pseudaspasita binodata*** (Moellendorff, 1886).
Feng-shui, Cheking, China. **Phil**. No. 168787.

thin, shortly reflexed margins; upper margin somewhat straightened or sinuous. Umbilicus broad, quite perspective. Height 3.8-4.3, diam. 4.0-10.5 mm (4.7 × 6.7 mm).

Jaw with wide, flat ribs which are wider than intervals between them.

Talon, a simple curvature of hermaphroditic duct. Flagellum conic, tapering. Epiphallus short. Penis long, cylindrical, internally with corrugated axial pilasters and short to elongate verge with opening surrounded by 2-3 short lobes. Penial retractor inserted to middle of epiphallus. Stylophore elongate, with swollen basal section. Mucus glands 2, not branched, alveolar and convoluted at upper section, tubular below, each of them enters its own accessory sac laterally. Free oviduct and vagina moderately long. Spermathecal stalk long, swollen basally; reservoir reaching albumen gland.

DISTRIBUTION. Japan. 4 spp.

Pseudaspasita Moellendorff, 1891
Fig. 2107

Moellendorff, 1901: 308 (*Plectotropis* subg.).

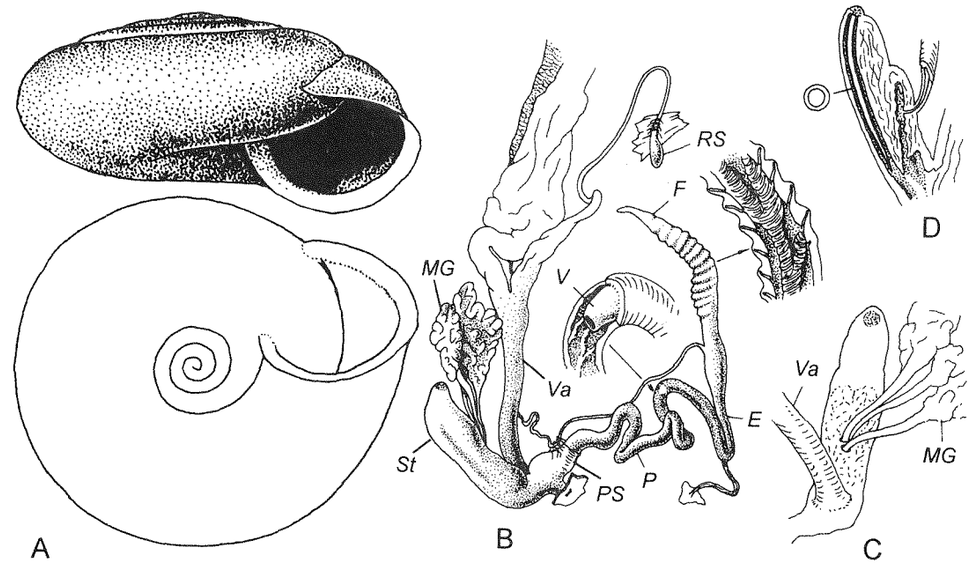


Fig. 2108. A — ***Aegista chinensis*** (Philippi, 1845).
Shell: Se-Cu-San, China. **Paris**. B, C, D — ! ***Aegista subchinensis*** (Moellendorff, 1884). SW of Yeh-liu, Taipei Co., Taiwan, May 14, 1988. B — reproductive tract, interior of penis and flagellum. C — stylophore from other side. D — interior of stylophore and cross-section through dart. **Moscow** No. Lc-20838 (gift of C. Coney).

TYPE SPECIES — *Helix* (*Gonostoma*) *binodata* Moellendorff, 1886; SD Zilch, 1960.

Shell dome-shaped, depressed-conic, thin, of about 6 moderately convex whorls. Body whorl scarcely angulated, markedly deflected. Color (pale) corneous. Embryonic whorls smooth. Postapical sculpture of delicate radial ridgelets. Aperture broadly ovate, quite oblique, with shortly reflexed margins; upper palatal margin sinuous. Basal lip sometimes with variously developed 1 or 2 teeth or thickenings. Umbilicus broad, perspective. Height 3-5, diam. 6-9 mm (3.0 × 6.0 mm).

DISTRIBUTION. China. 4-6 spp.

Aegista Albers, 1850
Fig. 2108

Albers, 1850: 91 (*Helix* subg.).

TYPE SPECIES — *Helix chinensis* Philippi, 1845; monotypy.

Shell much flattened to almost flat, rather solid, of 5-6.5 slightly convex whorls. Last whorl well descending in front, rounded or more or less angulated at periphery. Color grey to chestnut, sometimes with light peripheral band. Embryonic whorls smooth. Postembryonic sculpture of irregular, radial, fine, closely spaced wrinkles. Aperture broadly ovate to subcircular, oblique, with thin or somewhat thickened, reflexed margins. Umbilicus moderately to very wide, perspective. Height 5.5-17.0, diam. 11-32 mm (10.2 × 20.3 mm).

Vas deferens entering epiphallus laterally. Flagellum tapering, with transversal thickenings; each thickening contains a slit-like cavity. Epiphallus moderately long. Penis long, cylindrical, convoluted, containing small elongate verge that has wide internal channel; inner surface of penis with irregular relief of branched folds. Penial retractor attached to middle portion of epiphallus. Stylophore long, with long, thin dart and additional sac poorly visible externally. Mucus glands alveolar, of 2-3 separated bundles entering middle of additional sac through very short common duct. Base of spermathecal stalk markedly enlarged.

DISTRIBUTION. Japan, China, Taiwan. About 40 spp. & subspp.

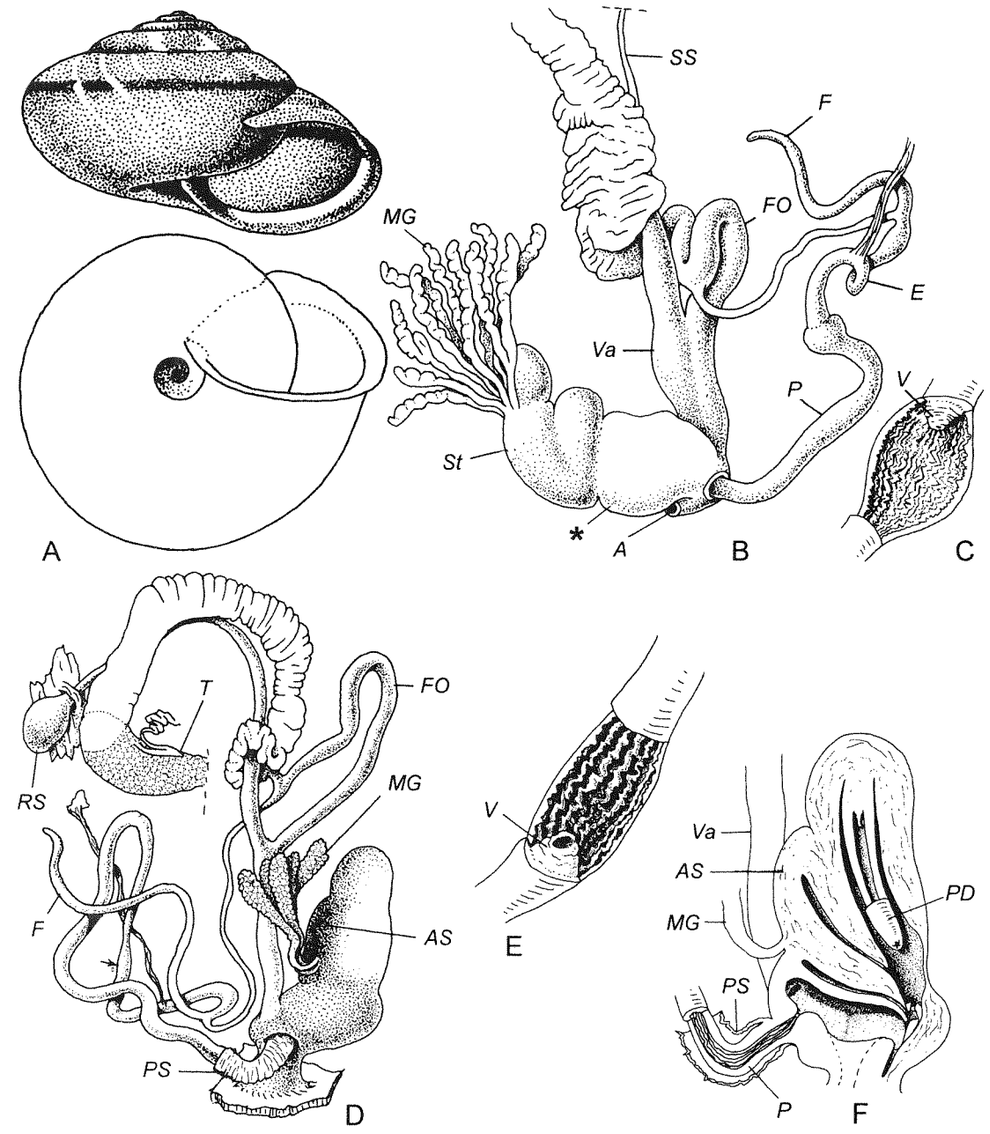


Fig. 2109. A — ! ***Euhadra hiconis*** (Kobelt, 1879).
Shell: Okayama city, Honsu Island, Japan. **Moscow** No. Lc-25653 (gift of H. Minato). B, C — ***Euhadra peliomphala*** (L. Pfeiffer, 1850). Kyoto Prefecture, Honshu, Japan. B — reproductive tract. C — interior of penis. **Phil.** No. A-9502-F. D, E, F — ! ***Euhadra quaesita*** (Deshayes, 1850). Japan. D — reproductive tract. E — interior of stylophore. **Paris**. ***Asterisk*** — supraatrial bladder. ***Arrow*** on "D" indicates place where verge situated.

Euhadra Pilsbry, 1890
Fig. 2109

Pilsbry, 1890 (1890-1891): 94, 95, 304 (*Helix*, supersect. *Hadra*; sect.).

TYPE SPECIES — *Helix peliomphala* L. Pfeiffer, 1850; OD.

Shell dextral or sinistral, depressed-conic, rather thin to solid, of 5-7 moderately convex whorls. Last whorl rounded,

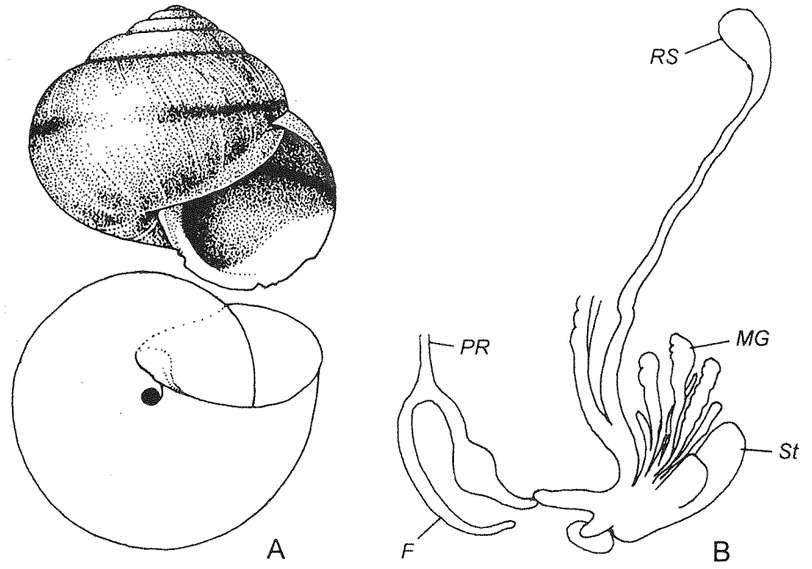


Fig. 2110. ***Mastigeulota kiangsinensis*** (Martens, 1875).
A — shell: Kwanhsien, W China. **Moscow** No. Lc-21370 (**Phil.**). B — reproductive tract. After Pilsbry, 1895 (1894-1895).

abruptly descending in front. Color yellowish and pinkish to blackish, uniform or (rarely) with 1-3 dark bands; sometimes with marble pattern or light radial markings. Embryonic whorls smooth. Later whorls with fine radial striation and regular spiral grooves. Aperture lunar or widely ovate, oblique, margins expanded and reflexed throughout, with light lip. Umbilicus moderately narrow but perspective. Height 11.3-38.0, diam. 20.5-57.0 mm (21.8 × 44.7 mm).

Talon exposed, a simple curvature of hermaphroditic duct. Flagellum long, tapering, vermiform. Epiphallus varies in length (as a rule, rather long), cylindrical, coiled, with or without distinct demarcation with penis. Latter more or less cylindrical, sometimes enlarged near atrium, internally with many thin, corrugated or zigzagged folds and very short verge. Penial retractor inserting approximately to middle of epiphallus. Stylophore large, often pigmented. Mucus gland consists of tubular, straight or convoluted, or clavate branches of alveolar structure entering well developed accessory sac either by common duct or independently. I did not find lumen of duct(s) in thick, fibrous, loose tissue of additional sac: it seems that secret of mucus gland directed into minute cavities and lacunas of walls. Stylophore thick-walled, containing a large papilla with internal lumen; on roof of lumen I found a small blind process (evidently, dart formed around this process). Atrium and base of stylophore surrounded by white, thin but very dense, supraatrial bladder. Basal swelling of spermathecal stalk not strongly expressed.

DISTRIBUTION. China, Taiwan, Japan. Over 60 spp. & subspp.

REMARK. In the lumen of dart papilla in *E. quaesita* I found something what reminds small fragments of dart; the date on the label is absent but the material was in alcohol for at least several tens years, and perhaps, the dart has been dissolved.

Mastigeulota Pilsbry, 1895
Fig. 2110

Pilsbry, 1895 (1893-1895): 211 (*Eulota* sect.).

TYPE SPECIES — *Helix kiangsinensis* Martens, 1875; OD.

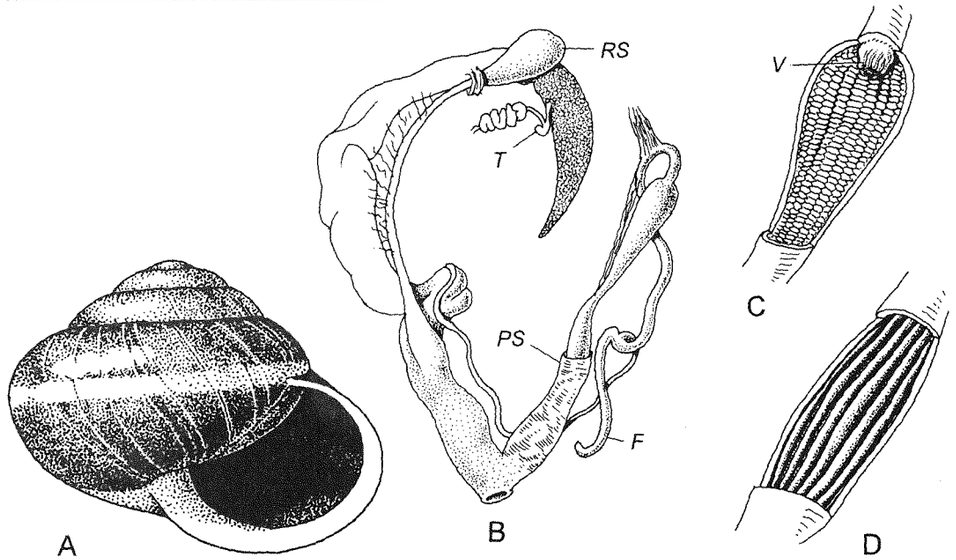


Fig. 2111. ***Mandarina mandarina*** (Gray, 1839).
A — shell: Chichi-Shima, Bonin Islands, at high altitude. **Moscow** No. Lc-21353 (**Phil.** No. 192159). B, C, D — Hahajima Island, Ogasawara (Bonin) Islands, Tokyo Prefecture, Japan. Reproductive tract and interior of 2 sections of penis. **Phil.** No. A-16695.

Shell globose, rather thin, dull, of about 6 moderately convex whorls. Last whorl widely rounded, practically straight. Spire conic. Color yellowish-straw, with brown peripheral band seen inside aperture. Embryonic whorls vaguely microgranulated (nearly smooth). Sculpture of rest surface composed of delicate, irregular radial striation and wavy spiral grooves. Aperture large, semicircular, margins thin, reflexed over umbilicus and basally. Umbilicus narrow, cylindrical. Height 20-33, diam. 29.5-40.0 mm (27.1 × 29.5 mm).

Flagellum long, slender. Epiphallus short. Penis dilated above into hollow, thin-walled bulb. Penial retractor inserted to flagellum/epiphallus junction. Stylophore capacious, elongated. Mucus gland consisting of numerous sacculated armed branches bound together and to accessory sac. Vagina extremely short, free oviduct a little longer. Basal swelling of spermathecal duct poorly developed.

DISTRIBUTION. Central and W China (Valley of Yangtze River, Zhejiang). Probably 1 variable sp.

REMARK. Nordsieck (2002: 41) states: "*Mastigeulota* was separated [by Pilsbry — A. Sch.] because its male end ducts should bear a flagellum but the respective figure (pl. 66, fig. 26) shows instead of a flagellum a vas deferens cut off in preparation". However Pilsbry [1895 (1893-1895: 363, 3rd line from bottom)] indicated: "(vas deferens omitted by lithographer)". So the question on the presence of flagellum in *Mastigeulota kiangsinensis* remains open.

Mandarina Pilsbry, 1895
Fig. 2111

Pilsbry, 1895 (1893-1895): 214 (*Eulota* sect.).

— *Boninia* Pilsbry, 1901a: 4 (for *Helix pallasiana* L. Pfeiffer, 1850 and *Nanina ruschenbergeri* Pilsbry, 1890).

TYPE SPECIES — *Helix mandarina* Gray, 1839; monotypy and tautonymy.

Shell globose to depressed, solid, opaque, of 4.5-5.5 moderately convex whorls. Last whorl straight. Apex rounded. Color pale-yellowish to reddish or reddish-brown, uniform or with light peripheral band (rarely with 2 bands — above and below periphery) and vague radial strips. Embryonic whorls nearly smooth, postapical

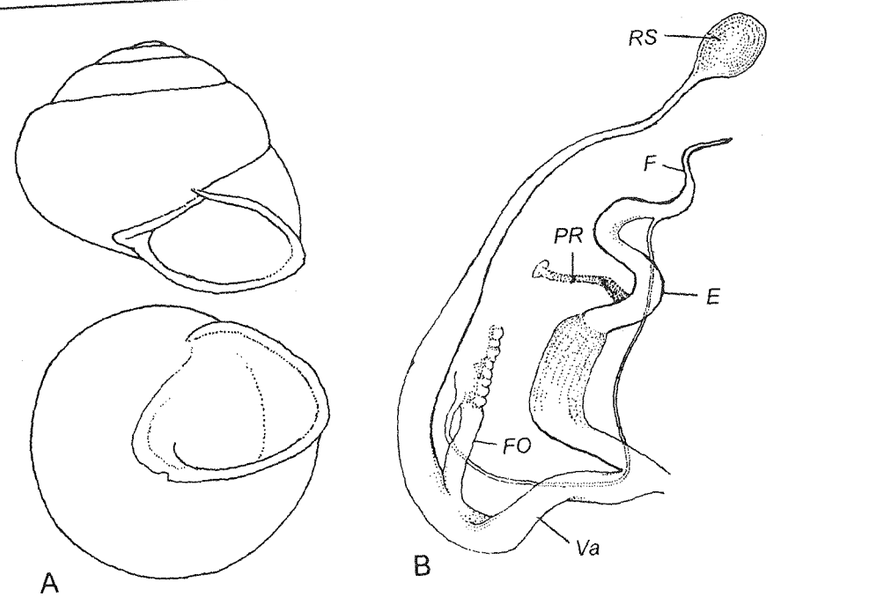


Fig. 2112. ***Neochloritis tomiyamai*** Minato, 1982.
A — shell. B — reproductive tract. After Minato, 1982.

sculpture of fine irregular radial wrinkles; besides, on early postembryonic whorls there is a distinct sculpture of rather crowded spiral grooves which becomes weaker toward body whorl. Aperture rounded, with slightly thickened, somewhat reflexed margins. Columellar margin much reflexed. Umbilicus closed or narrowly open. Height 20-23, diam. 23-29 mm (22.1 × 28.0 mm).

Talon exposed, small, drop-like. Vas deferens long, enters epiphallus laterally leaving a long flagellum. Epiphallus long, subcylindrical. Penis also long, consisting of 2 chambers separated by a narrowing; internally basal chamber with many high, rather thin axial pilasters which in upper chamber turn into rows of prismatic tubercles. Verge small, longitudinally grooved, with broad lumen. Free oviduct long, sinuous and somewhat twisted. Vagina a little shorter, expanded, internally with many strong longitudinal folds. Spermathecal shaft long, swollen basally; reservoir attending lower margin of albumen gland.

DISTRIBUTION. S Japan [Bonin (= Ogasawara) Islands]. 3 spp.

Neochloritis Minato, 1982
Fig. 2112

Minato, 1982: 130 (in Camaenidae).

TYPE SPECIES — *Neochloritis tomiyamai* Minato, 1982; OD.

Shell globose-conic, solid, of 5 moderately convex whorls. Body whorl inflated, rounded, distinctly deflected. Color reddish-brown, with darker peripheral band bordered on both sides by pale-yellowish zones. Surface with close set short hairs usually arranged in oblique lines; in adult specimens often only traces of hairs remain. Aperture roundly semilunate, quite oblique, with firm, reflexed margins. Parietal callus smooth, thickened. Umbilicus closed. Height 14.4-17.4, diam. 19.0-21.6 mm.

Vas deferens long. Flagellum rather short, tapering. Epiphallus moderately long, distinctly separated from somewhat swollen penis. Penial retractor attached to distal half of epiphallus. Free oviduct about 2 times shorter than vagina. Spermathecal stalk long, swollen in basal half; reservoir subglobular.

DISTRIBUTION. S Kyushu, Japan. 1 sp.

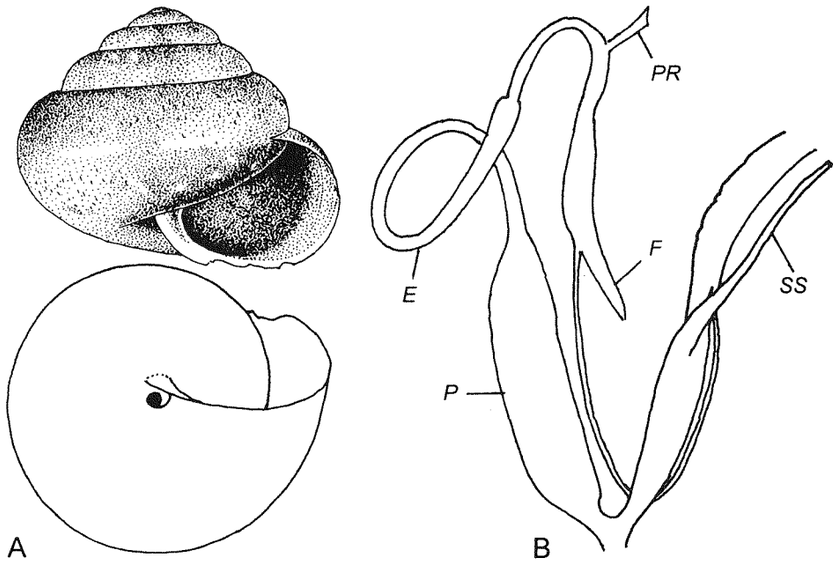


Fig. 2113. ***Lepidopisum verrucosum*** (Reinhardt, 1877).
A — shell: Sumusa, Japan. **Vienna**. B — reproductive tract. After Habe, 1958.

Lepidopisum Kuroda et Habe, 1958
Fig. 2113

Kuroda et Habe in Habe, 1958: 167 (*Aegista* subg.).

TYPE SPECIES — *Helix verrucosa* Reinhardt, 1877; OD.

Shell globose-trochoid, rather thin, of 5.25-5.5 somewhat convex whorls. Last whorl rounded to obtusely angulated, not descending in front. Color uniformly greyish-brown or yellowish-corneous. Embryonic whorls smooth, rest surface finely radial-obliquely striate, covered with thick, scaly periostracum. Aperture broadly ovate, slightly oblique, with thin, acute, simple margins. Umbilicus very narrow. Height 4-6, diam. 5-7 mm (4.3 × 5.1 mm).

Flagellum conic, rather short. Epiphallus vaguely subdivided into fusiform proximal, slender cylindrical intercalar, and slightly enlarged distal parts; penial retractor inserts to upper portion of cylindrical part. Penis massive, elongated. Stylophore and mucus glands missing. Free oviduct short, vagina about 2 times longer. Base of spermathecal stalk only slightly swollen.

DISTRIBUTION. S Japan (Ryukyu Islands). 1 sp.

Torobaena Haas, 1935
Fig. 2114

Haas, 1935: 45 (*Bradybaena* subg.).

TYPE SPECIES — *Helix rostrella* L. Pfeiffer, 1862; OD.

Shell globose-trochiform, thin but rather solid, silky glossy, of about 5 a little convex whorls. Last whorl slightly descending in front, with smoothed keel running along or a little above midline. Spire conoid, apex rather acute. Color tawny-corneous, sometimes with darker radial streaks. Embryonic whorls smooth, polished. Later whorls with fine, irregular radial striae and traces of spiral striation. Aperture broadly ovate, moderately oblique, margins somewhat reflexed, columellar margin expanded. Umbilicus rather narrow. Height 10-15, diam. 17-23 mm (14.6 × 22.6 mm).

DISTRIBUTION. Laos, Cambodia. 2-3 spp.

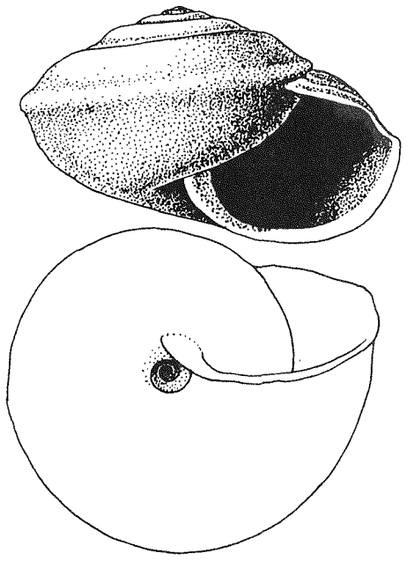


Fig. 2114. ***Torobaena rostrella*** (L. Pfeiffer, 1862).
Luang-Prabang, Laos. **Senck**. No. 22731.

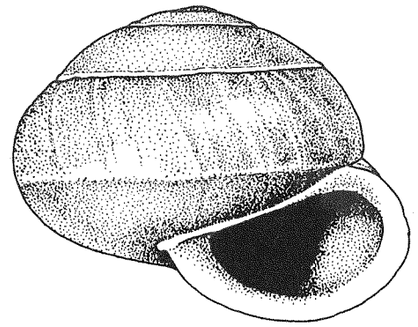


Fig. 2115. ***Plecteulota goniostoma*** (Moellendorff, 1892).
Tenimber Island, Indonesia. **Cardiff**.

? *Plecteulota* Moellendorff, 1892
Fig. 2115

Moellendorff, 1892: 90, 92 (*Eulota* sect.).

TYPE SPECIES — *Eulota goniostoma* Moellendorff, 1892; OD.

Shell semiglobose, solid, shining, of 4.5 flattened whorls. Last whorl straight, with thread-like peripheral keel. Color yellowish-corneous. Embryonic whorls with very weak radial wrinkles, same sculpture retained on later whorls, but there extremely fine spiral striation added. Aperture lunate-ovate, moderately oblique, margins thickened but not reflexed. Parietal callus thick. Umbilicus narrow, semicovered. Height 12-14, diam. 15-19 mm (12.3 × 15.8 mm).

DISTRIBUTION. Indonesia (Tenimber Island). 2-3 spp.

REMARK. Perhaps, this genus should be assigned to Camaenidae, mainly for geographical reasons.

Dolicheulota Pilsbry, 1901
Fig. 2116

Pilsbry, 1901 (1901-1902): 18.

TYPE SPECIES — *Bulimus* (*Amphidromus*) *formosensis* H. Adams, 1866; OD.

Shell elongate, bulimoid, solid, of 5.5-7.5 slightly convex whorls. Last whorl straight, widely rounded. Apex somewhat acuminate. Color yellowish to chestnut, often with irregularly alternating lighter and darker radial streaks. Embryonic whorls smooth. Postapical sculpture consists of rather sharp irregular striae and finer spiral wavy grooves. Aperture elongate ovate, slightly oblique, bluish inside; margins reddish-brown, slightly thickened, reflexed. Umbilicus very narrow, cylindrical. Height 35-58, diam. 15-27 mm (49.3 × 25.9 mm).

Vas deferens slender. Flagellum vermiform, tapering, with narrow lumen. Inner surface of epiphallus covered with scattered short folds, arranged in more or less concentric pattern around pore of vas deferens. This pore opens into bottom of grooved duct running from vas deferens pore throughout entire length of epiphallus to penis. Boundary between epiphallus and penis quite clear. Penis more or less cylindrical, its lower part coated by thin sheath. Inner surface of penis furnished with a few longitudinal rows of sharp transversal folds;

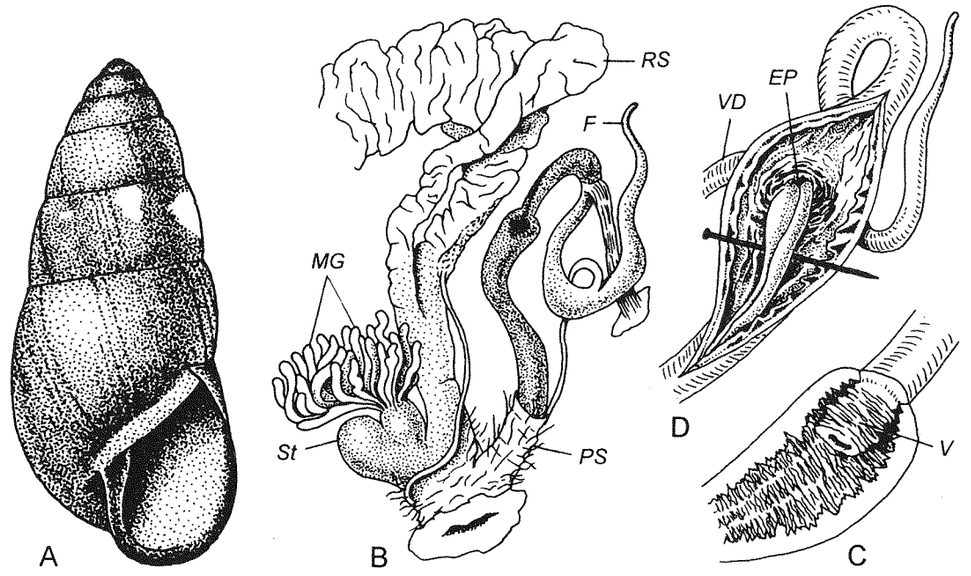


Fig. 2116. ***Dolicheulota formosensis*** (H. Adams, 1866).
"Kan Kan, Formosa" [= Taiwan]. A — shell. B — reproductive tract. C — interior of penis. D — interior of epiphallus. **Vienna** No. 51.553.

uppermost chamber occupied by a short blunt verge. Stylophore globular, sitting on very base of vagina (practically on atrium). Mucus gland, a bundle of many tubular branches entering tip of spherical accessory sac. Spermathecal stalk stout, folded, without a defined basal thickening; there is no distinct boundary between duct and voluminous reservoir which not attends albumen gland.

DISTRIBUTION. Taiwan. 2 spp.

Satsuma A. Adams, 1868

Adams A., 1868: 463 (*Helix* sect.).

— *Fruticotrochus* Kobelt, 1879: 48 (unavailable nom. nov. pro *Satsuma* A. Adams, 1868 because Kobelt named it "nomen barbarum").

TYPE SPECIES — *Helix japonica* L. Pfeiffer, 1847; SD Kuroda & Habe, 1949.

Shell dextral or sinistral, subglobose to high-conic, rather thin, of 5.5-7 slightly to moderately convex whorls. Last whorl rounded, straight. Color white to corneous, monochromatic or with 1-3 brown or reddish bands. Embryonic whorls smooth or microscopically granulated. In sculpture of postapical whorls spiral lines present. Aperture broadly ovate or subcircular, moderately oblique, with shortly reflexed margins. Umbilicus very narrow, semicovered.

Vas deferens long, thin throughout or thickened in its distal part. Flagellum (rather) long, tapering. Epiphallus moderately to very long. Penis with conic caecum that marks boundary between penis and epiphallus. Penial retractor attached to distal half of epiphallus. Free oviduct short, vagina much longer, without any accessory organs. Spermathecal stalk rather long, swollen basally.

DISTRIBUTION. Japan.

REMARK. It is generally believed that the genus *Satsuma* contains 3 subgenera: *Luchuhadra* (11 spp.), *Satsuma* s. str. (about 30 spp. & subspp.) and *Coniglobus* (about 15 spp. & subspp.). Taking into consideration the considerable conchological variability within this taxonomic unit and remarkable stability in anatomical characters, I cannot understand why Japanese authors almost unanimously treat these subgenera as valid. Unfortunately I had a chance to dissect only one representative of this group

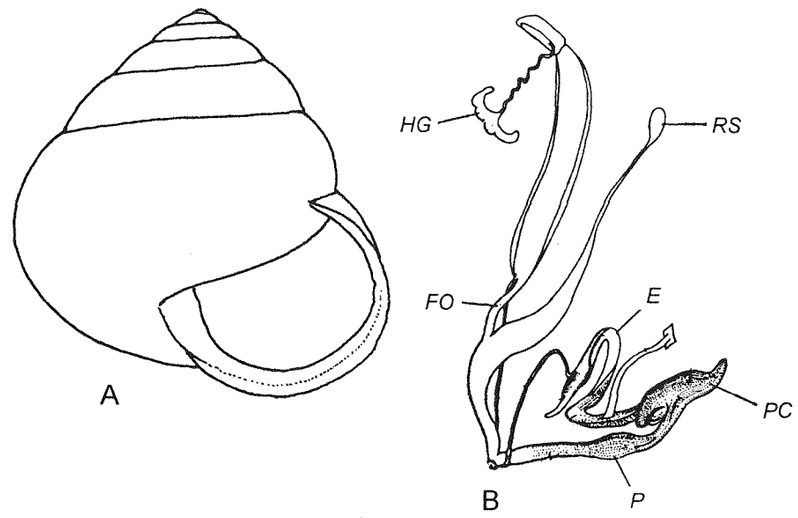


Fig. 2117. ***Satsuma* (*Luchuhadra*) *largillierti*** (L. Pfeiffer, 1849).
A — shell. After Pilsbry, 1887. B — reproductive tract. After Azuma, 1995.

and can judge on anatomical differences among them only from illustrations and English translations of species descriptions. Therefore, the descriptions of the subgenera are mainly based on type species only.

Satsuma (Luchuhadra Kuroda et Habe, 1949) Fig. 2117

Kuroda & Habe, 1949: 59. Minato, 1984: 33.

TYPE SPECIES — *Helix largillierti* L. Pfeiffer, 1849; OD.

Shell subglobular-conic to flat, thin, translucent, of 5-6.5 slightly convex whorls. Last whorl nearly straight, rounded to sharply angulated. Color white, yellowish or corneous, sometimes with 1-2 chestnut bands; when bands 2, a light zone between them may be present. Embryonic whorls smooth. Later whorls smoothish, with weak radial striae and variously developed hairs. Aperture subcircular or broadly ovate, moderately oblique, with reflexed margins, basal margin may be somewhat thickened. Height 17-27, diam. 21-29 mm.

DISTRIBUTION. Japan (Central Ryukyu Islands). 11 spp.

Satsuma (*Satsuma* s. str.) Fig. 2118

Shell high-conic, thin, translucent to semitransparent, glossy above and dull on base, of 5.5-6.5 moderately convex whorls. Last whorl almost straight, with blunt peripheral angle. Color yellow to pale-brown. Embryonic whorls smooth, polished, shining. Later whorls slightly radially striated, with narrowly spaced, wavy spiral grooves. Aperture irregularly rounded, moderately oblique, with thin, reflexed margins. Umbilicus narrow, mostly semicovered. Height 11.6-40.0, diam. 14.4-50.0 mm (20.7 × 20.9 mm).

Vas deferens entering epiphallus laterally leaving a long flagellum. Epiphallus joins penis at sharp angle. On junction between penis and epiphallus there is a conic caecum. Penis cylindrical, subequal to epiphallus in length. Penial retractor attached to distal half of epiphallus. Free oviduct short. Vagina long. Spermathecal stalk

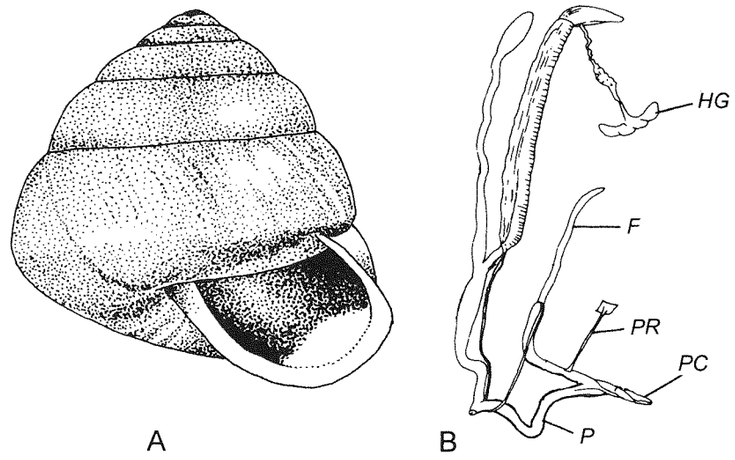


Fig. 2118. ***Satsuma*** (***Satsuma***) ***japonica*** (L. Pfeiffer, 1847).
A — shell: Kyoto, Japan. **Vienna** No. 5112. B — reproductive tract. After Azuma, 1995.

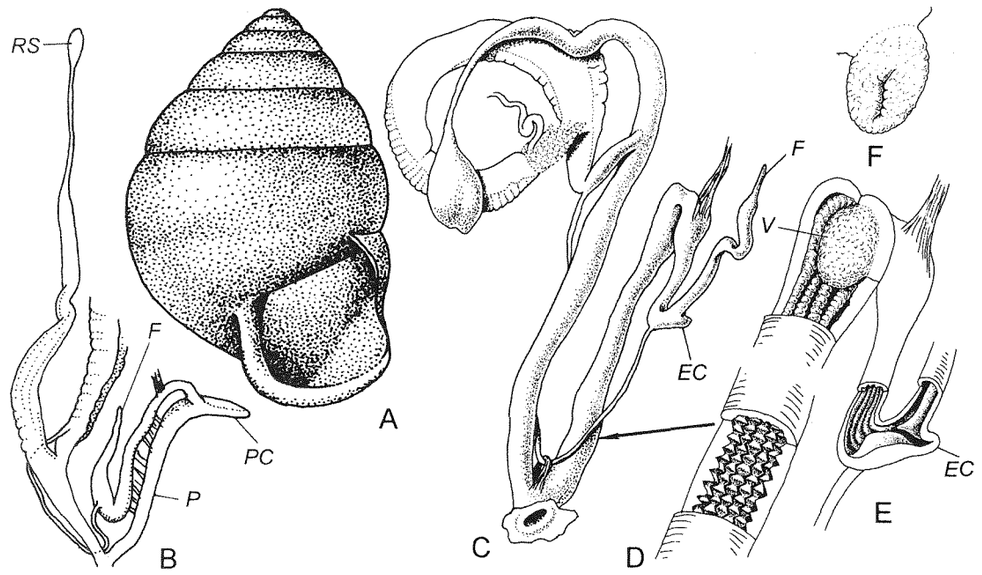


Fig. 2119. A, B — ***Satsuma*** (***Coniglobus***) ***sphaeroconus*** (L. Pfeiffer, 1865).
A — shell: Suganiikei, Taiwan. **Phil**. No. 90003. B — reproductive tract. After Minato, 1975. C, D, E, F — ! ***Satsuma*** (? ***Coniglobus***) ***arisana takkiriensus*** (Kuroda, 1941). Headquarters of Taroko Nat. Park, Taiwan, August 2000. C — reproductive tract. D — interior of basal part of penis. E — interior of upper part of penis and caecum. F — verge from other side. **Paris**.

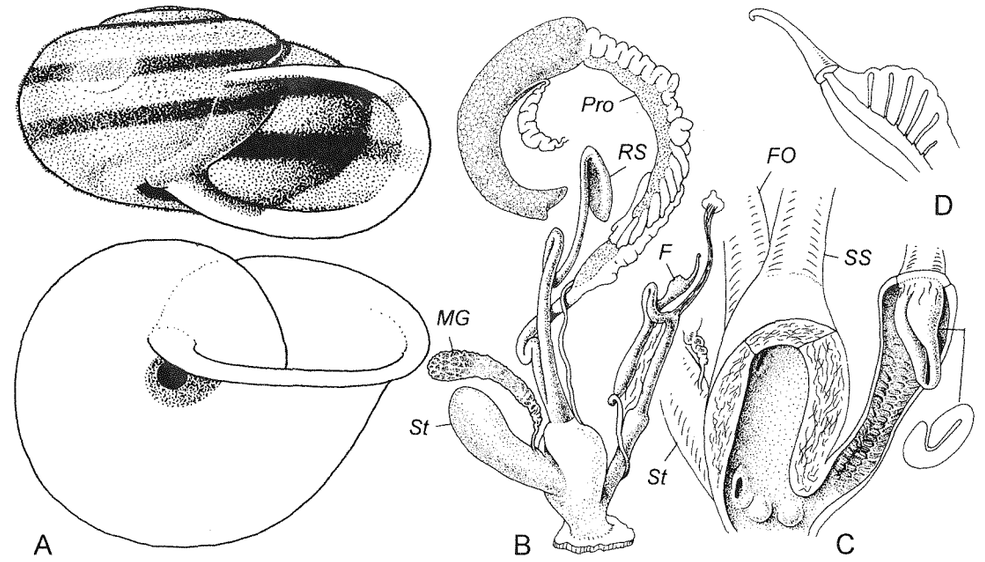


Fig. 2120. ***Guamampa tuba*** (Albers, 1854).
Gua Mampu, SW Sulawesi, north of Bone (Matampone). A — shell. B — reproductive tract. C — interior of penis and vagina. D — interior of flagellum. **Moscow** No. Lc-23802 (**Paris**). After Schileyko, 1996.

scarcely thickened basally; reservoir attending albumen gland.

DISTRIBUTION. Japan, Taiwan. About 30 spp. & subspp.

Satsuma (*Coniglobus* Pilsbry et Hirase, 1906)
Fig. 2119

Pilsbry & Hirase, 1906: 735 (*Eulota* subg.).

TYPE SPECIES — *Bulimus sphaeroconus* L. Pfeiffer, 1865; OD.

Shell dextral or sinistral, depressed-turbinate to pointed-ovoid, rather thin, of 6-7 moderately convex whorls. Last whorl straight, rounded. Color generally corneous, often with darker peripheral band. Embryonic whorls with fine, distinct granulation. Postapical whorls delicately granulated above, fine spiral striae on later whorls. Aperture subcircular to ovate, moderately oblique, with thin, reflexed margins. Umbilicus narrow, semicovered. Height 12.5-30.5, diam. 13-43 mm (27.0 × 13.1 mm).

Flagellum long, with more or less attenuated tip; its lumen obstructed by strong axial pilaster. Epiphallus rather short, internally with strong, dense axial folds and fleshy pad just below caecum. Penis long, subcylindrical, internally with very distinct relief of large prismatic tubercles arranged in axial rows; in upper part relief turns in series of pilasters having transversal grooves. Epiphallus opens through fleshy verge that has tubercular surface and slit-like pore occupying lateral position. Penial retractor attached to distal part of epiphallus. Free oviduct short, enters quite long vagina laterally. Spermathecal stalk is a continuation of vagina, more or less swollen basally; reservoir attending albumen gland.

DISTRIBUTION. Japan, Taiwan. About 15 spp. & subspp.

Guamampa Schileyko, 1996
Fig. 2120

Schileyko, 1996: 108.

TYPE SPECIES — *Helix tuba* Albers, 1854; OD.

Shell helicoid, depressed, rather thin but solid, somewhat translucent, of about 4.5 moderately convex whorls; last whorl evenly rounded at periphery, slightly descending in

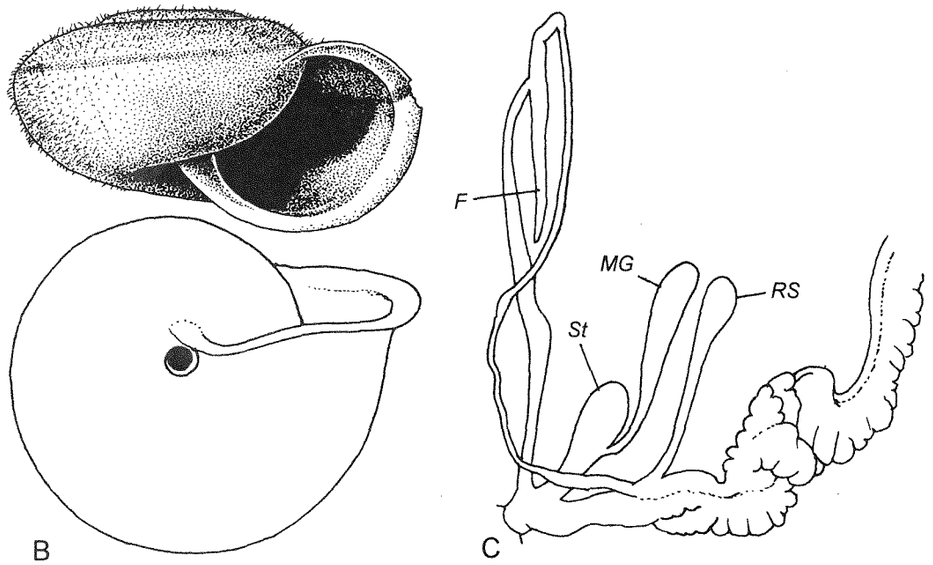


Fig. 2121. ***Tricheulota spinosissima*** (Semper, 1870).
A — shell: Mindanao, San Juan de Surigao. **Vienna**. B — reproductive tract. After Semper, 1870.

front. Basic coloration consisting of yellow background with 2 brown or reddish bands above and below periphery; umbilicus encircled by area of same dark color; in addition, usually there are 2 ill-defined bands, darker than background, one between adapical band and suture, the other between abapical band and circumumbilical area. Band width varies from reduced to hypertrophied. Initial part (0.3-0.4 whorl) of embryonic whorls smooth, polished, subsequently regularly radially wrinkled. Postnuclear surface nearly smooth, densely covered with very short golden hairs arranged in oblique series. Aperture wide, with broadly expanded and reflexed whitish or pinkish lip. Umbilicus open, rather narrow. Height 17-20, diam. 30-36 mm (18.7 × 34.4 mm).

Talon, a small vesicle on a long slender duct, lying on albumen gland. Vas deferens consisting of 2 parts: a long, slender duct arising from prostate and a distal, enlarged, club-shaped portion. Junction of epiphallus and penis marked by flagellum of peculiar shape, somewhat resembling a human fist with extended forefinger. Internally flagellum containing a series of narrow cavities entering principal lumen of duct at right angle, or nearly so. Penial retractor attached to middle section of epiphallus. Apical part of penis more or less bulbous, containing a verge in form of longitudinally folded fleshy plate, i.e. it is not closed, but grooved. Inner surface of distal part of penis covered with rows of prismatic tubercles. Stylophore voluminous, single tubercular-alveolar mucus gland entering its lower part via very thin duct; accessory sac absent. Vagina enlarged, with white dense external layer and thick walls filled with loose fibrous tissue. Spermathecal shaft nearly cylindrical, reservoir lying *in situ* on surface of upper half of spermoviduct.

DISTRIBUTION. Indonesia. 6-7 spp.

Tricheulota Pilsbry, 1895
Fig. 2121

Pilsbry, 1895 (1893-1895): 212 (*Eulota* sect.).

TYPE SPECIES — *Helix spinosissima* Semper, 1870; OD.

Shell depressed, thin, translucent, of 5-5.5 a little convex whorls. Last whorl scarcely descending in front. Apex flat or even slightly sunken. Color reddish, reddish-chestnut, or yellowish with darker peripheral band margined by variously developed lighter zones. Embryonic whorls practically smooth or with very weak chequerwise pustules. Later whorls with irregular major radial wrinkles and microsculpture of crowded, radial, anastomosing wrinklets; above all, there are numerous, straight, rather stout, dark-brown or black bristles; after they lost, distinct tubercles remain. Aperture subcircular, oblique, with thin, reflexed margins. Umbilicus narrowly open. Height 15-21, diam. 29-36 mm (17.7 × 32.7 mm).

Stylophore and mucus gland as in preceding genus. Spermathecal stalk short.

DISTRIBUTION. Mindanao Island (Philippines). 2 spp.

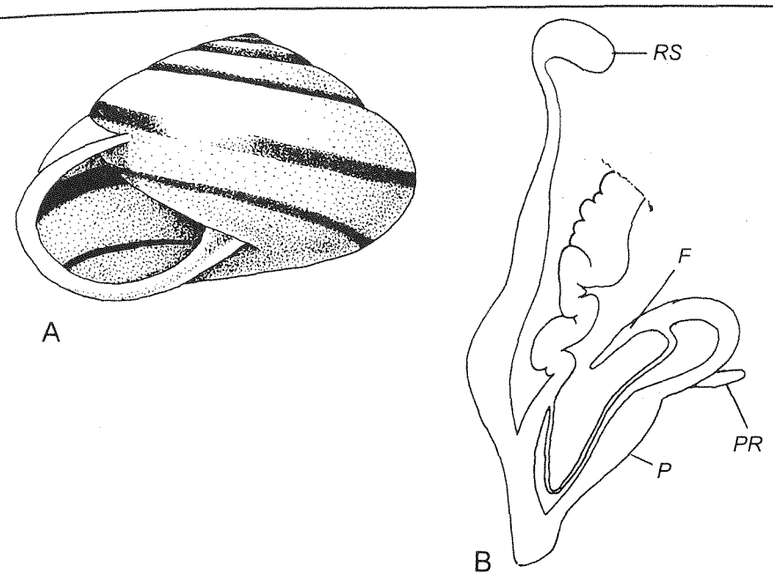


Fig. 2122. ! ***Pancala batanica bolteobagoensis*** Kuroda, 1932.
A — shell: Taiwan, Orchid Island, ex coll. Philippe Saunier. **Moscow** No. Lc-25680 (**Bern** No. 1701.101). B — ***Pancala batanica pancala*** (Schmacker et Boettger, 1891). Reproductive tract. After Kuroda & Habe, 1949.

Pancala Kuroda et Habe, 1949
Fig. 2122

Kuroda & Habe, 1949: 53 (*Camaena* subg.).

TYPE SPECIES — *Helix* (*Hadra*) *pancala* Schmacker et Boettger, 1891 (= *batanica pancala*); OD.

Shell dextral or sinistral, depressedly-conic, rather solid, shining, of 5-6 moderately convex whorls. Last whorl only slightly and gradually descending near aperture. Color milky-white, pale-yellow or light-chestnut, uniform or (more frequently) with 1-3 narrow, brown or reddish bands. Embryonic whorls smooth, polished. Later whorls with very weak, irregular radial wrinklets and microscopical, crowded, wavy spiral lines on basal surface. Aperture rounded, moderately oblique, with shortly reflexed margins. Umbilicus narrow, partly covered. Height 14-22, diam. 20-26 mm (14.3 × 21.1 mm).

Vas deferens moderately long, enters epiphallus laterally. Flagellum not long, conic. Epiphallus subcylindrical. Penis more or less fusiform. Penial retractor inserted on distal half of epiphallus. Free oviduct somewhat shorter than vagina. Dart apparatus missing. Spermathecal stalk long, markedly expanded except for most proximal part.

DISTRIBUTION. Taiwan. 5 spp. & forms.

Yakuchloritis Habe, 1955
Fig. 2123

Habe, 1955: 224 (*Trichochloritis* subg.).

TYPE SPECIES — *Chloritis alholabris* Pilsbry et Hirase, 1902; OD.

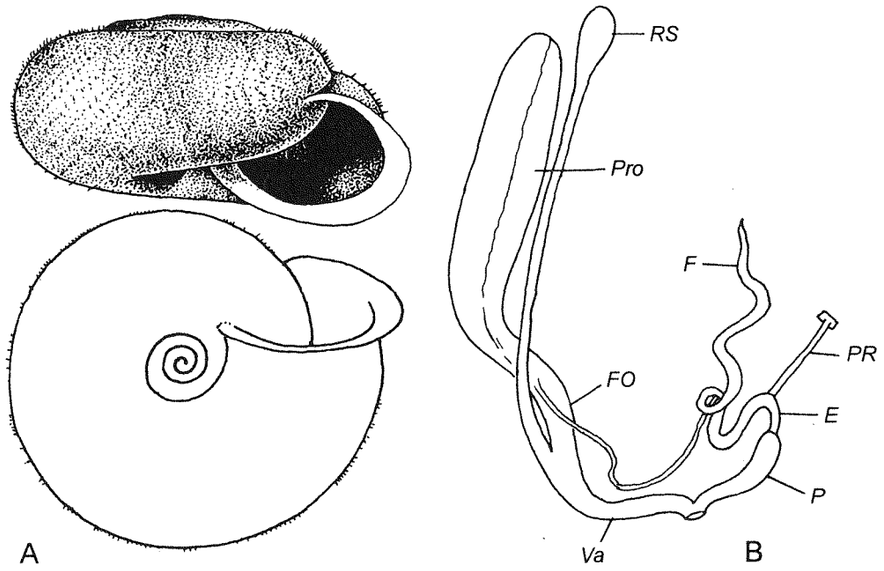


Fig. 2123. ***Yakuchloritis albolabris*** (Pilsbry et Hirase, 1902).
A — shell: Jokiyina, Osomi. **Vienna**. B — reproductive tract. After Azuma, 1995.

Shell much depressed, thin, translucent, of 4.75-5 moderately convex whorls. Body whorl rounded, somewhat deflected in front. Color yellow, peristome white. Embryonic whorls with chequerwise pustules. Postapical whorls with weak, smoothed radial wrinkles and short, stiff, corneous setae. Aperture broadly ovate, not strongly oblique, with thin, reflexed margins. Umbilicus open, perspective, rather broad. Height 9.5-9.6, diam. 18.0-18.2 mm (9.6 × 18.2 mm).

Vas deferens rather short, entering epiphallus laterally leaving quite long flagellum; epiphallus a little shorter. Penis not long, clavate. Penial retractor inserted on lower part of epiphallus. Free oviduct rather short, vagina somewhat longer. Dart apparatus absent. Spermathecal stalk long, cylindrical; reservoir ovate.

DISTRIBUTION. Japan. 1 or 2 spp.

Nipponochloritis Habe, 1955
Fig. 2124

Habe, 1955: 226.

TYPE SPECIES — *Chloritis fragilis* Gude, 1900; OD.

Shell much depressed, inflated, thin, very fragile, translucent, of 4-5 rather convex whorls. Last whorl ample, rounded, straight. Apex flat or slightly sunken. Color pale-corneous to brown. Embryonic whorls finely but distinctly granulated. Postapical whorls microgranulated, with weak, smoothed radial wrinklets and very short hairs. Aperture ample, widely lunate to subcircular, slightly oblique, with thin, simple margins; columellar margin slightly dilated above. Umbilicus dot-like to moderately wide. Height 8.5-16.0, diam. 13.0-21.0 mm (10.0 × 14.4 mm).

Vas deferens comparatively short. Flagellum moderately long to rudimentary. Epiphallus subcylindrical, quite long; penis somewhat shorter, also almost cylindrical. Boundary between penis and epiphallus marked by well developed, conic caecum. Penial retractor attached to distal half of epiphallus. Free oviduct about 2 times shorter than vagina. Dart apparatus wanting. Spermathecal stalk expanded in lower part; reservoir attending albumen gland.

DISTRIBUTION. Japan. 16 spp. & subspp.

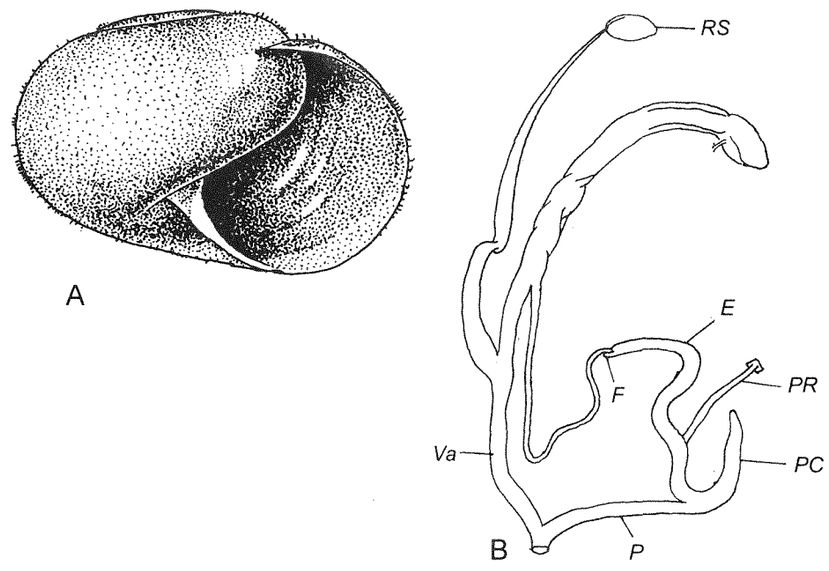


Fig. 2124. ***Nipponochloritis fragilis*** (Gude, 1900).
A — shell: Kyoto, Japan. **Vienna**. B — reproductive tract. After Azuma, 1995.

HELICOSTYLINAE Inering, 1909

Ihering, 1909: 430 (Helicidae subf.).

— Cochlostylidae Moellendorff, 1890: 226 (see Remark).

— Pfeifferiana Gray, 1855: 155 (pro tribe; nom. dubium).

Shell large, ranging from globose to lens-shaped, fusiform or high-conic, often brightly colored and/or banded, weakly sculptured. Aperture toothless or with a single tubercle on columellar margin. Umbilicus absent (very rarely in form of a small perforation).

Flagellum mostly absent; when present, never long. Penis lacks caecum, contains a verge of various structure. Accessory sac of stylophore variously developed, sometimes wanting. 1 ovoid or (rarely) aciniform, never branched, mucus gland of alveolar structure opens through a short duct into stylophore — apically or into its base. Sometimes all vaginal appendages missing. Spermathecal stalk cylindrical, without diverticle.

DISTRIBUTION. Philippines and Moluccas; 1 sp. in Taiwan.

REMARK. Nordsieck (2002: 41, footnote) states: "The older name Cochlostylidae Möllendorff, 1890, a synonym of Helicostylidae Ihering, 1909, which was rejected for this family by nearly all authors (cf. H. Baker, 1959) threatens stability and universality and is in accordance with Art. 23.9.3 ICZN proposed for suppression by the Commission (Art. 81 ICZN)".

Orustia Mörch, 1852
Fig. 2125

Mörch, 1852: 15.

TYPE SPECIES — *Helix monticola* Sowerby, 1841; SD Pilsbry, 1894 (1893-1895).

Shell turbinate-globose, rather thin, with broadly rounded spire and quite obtuse apex, of 5 slightly convex whorls. Last whorl straight, rounded. Hydrophanous periostracum on fresh shells rich yellow and cream-colored to almost orange; there is a narrow dark-brown subperipheral band; base green. Embryonic whorls smooth. Postnuclear surface slightly, obliquely, irregularly striatulate. Aperture oblique, broadly ovate, white within, faintly showing brown band; margins very narrowly subreflexed, columellar margin deeply inserted,

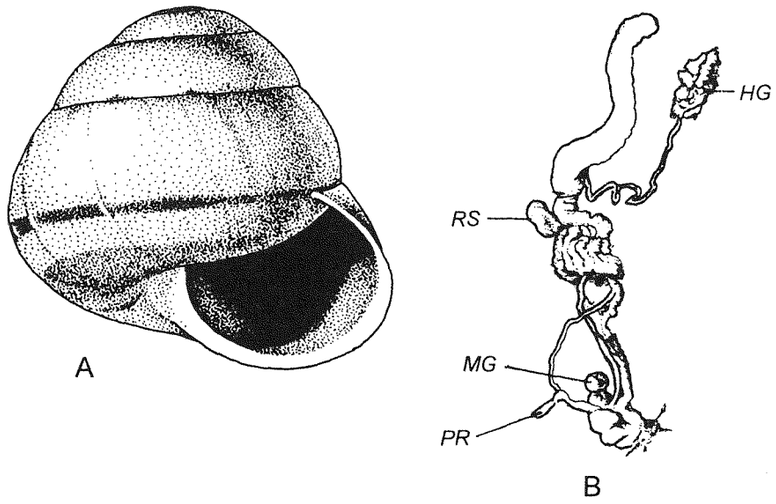


Fig. 2125. ***Orustia monticola*** (Sowerby, 1841).
A — shell: "Philippines". **Phil**. No. 1594. B — reproductive tract. After Semper, 1870.

dilated over umbilical depression that covered with a light concave callus. Height 14.5-20.0, diam. 16.0-22.0 mm (20.2 × 22.1 mm).

Vas deferens moderately long, enters short epiphallus apically. Flagellum absent. Penis small, sac-like. Free oviduct long, vagina practically absent. Stylophore small, mucus gland globular, nearly sedentary. Spermathecal stalk slender, reservoir attending albumen gland.

DISTRIBUTION. Philippines (N Luzon). 1 sp.

Helicostyla Férussac, 1821

Férussac, 1821: 50.

TYPE SPECIES — *Helix mirabilis* Férussac, 1821; SD Martens in Albers, 1860.

Shell generally globose, thin to rather solid, of 4-5 moderately convex whorls. Last whorl rounded. Color highly variable. Embryonic whorls smooth. Later whorls with weak radial wrinkles and mostly with very fine spiral striae. Umbilicus closed.

Flagellum absent. Vas deferens rather short. Epiphallus and penis long; on boundary between them there is a short, very thin-walled section containing lobate stimulator of very complex form. Penial retractor inserted on proximal part of epiphallus. Stylophore with accessory sac and sessile, subglobular mucus gland. Spermathecal stalk long, straight; reservoir attending lower edge of albumen gland.

DISTRIBUTION. Philippines.

Helicostyla (*Helicostyla* s. str.) Fig. 2126

Shell ovate-globose, solid, with broad dome-shaped spire, of about 5 whorls. Last whorl nearly straight or slightly and gradually descending in front. Color corneous to white, with 1-3 narrow brown bands, one of which lies below suture. Postembryonic whorls nearly smooth, in places with weak spiral striae. Aperture ample, oblique, with thickened and expanded margins, columellar margin sometimes with a weak swelling. Height 38-42, diam. 38-40 mm (39.1 × 40.1 mm).

Penis internally consists of 3 sections.

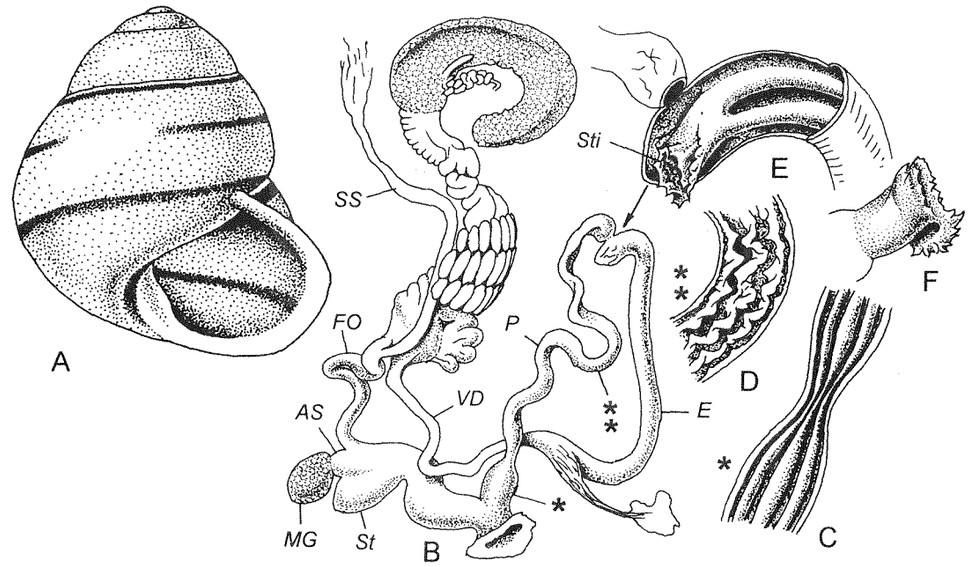


Fig. 2126. ***Helicostyla* (*Helicostyla*) *mirabilis*** (Férussac, 1821).
A — shell: Albai (Maion) Volcano, Luzon Island [Philippines]. **SPb**. B, C, D, E, F — "de Manille. 1837". B — reproductive tract. C, D — interior of 2 sections of penis marked by 1 and 2 asterisks. E — interior of distalmost, thin-walled end of epiphallus. F — stimulator, view from opposite side. **Paris**.

Basal section with a few strong, smooth axial pilasters; further pilasters become higher, lamellar, with undulating edges; uppermost section contains 2 very strong pilasters uniting before entering penis and ending in stimulator. Latter bears a number of short, pointed processes (papillae) along its upper edges; stimulator located inside a small, conic, subtransparent pocket. Free oviduct longer than vagina.

DISTRIBUTION. Philippines; 1 sp. in Taiwan. About 10 spp. & forms.

Helicostyla (*Opalliostyla* Pilsbry, 1896) Fig. 2127

Pilsbry, 1896: 108 (nom. nov. pro *Eudoxus* Martens, 1860).

— *Eudoxus* Martens in Albers, 1860: 179 [nom. praeocc., non Kirby, 1837 (Coleoptera); *Cochlostyla* subg.; t.-sp. *Helix effusa* L. Pfeiffer, 1842; OD].

TYPE SPECIES — *Helix effusa* L. Pfeiffer, 1842; OD.

Shell ovate to ovate-conic, solid, shining, of about 5 moderately convex whorls. Last whorl evenly rounded, practically straight.

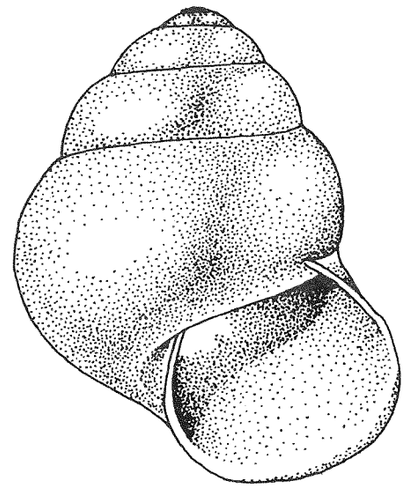


Fig. 2127. ***Helicostyla* (*Opalliostyla*) *effusa*** (L. Pfeiffer, 1842).
Romblon Island [Philippines]. **Leiden**.

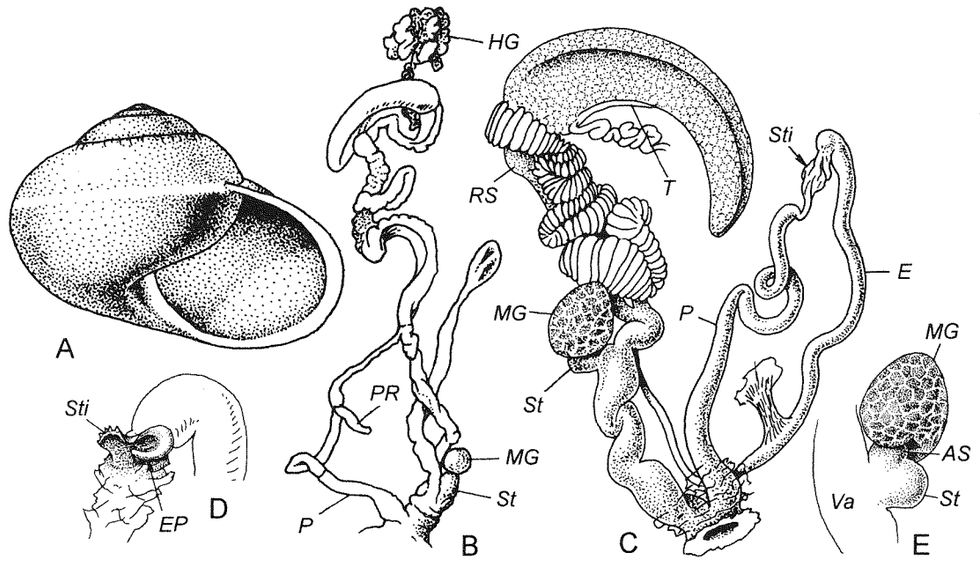


Fig. 2128. A, B — ***Helicostyla* (*Calocochlia*) *pulcherrima*** (Sowerby, 1841).
A — shell: Philippines. **Moscow** No. Lc-15563. B — reproductive tract. After Semper, 1870. C, D, E — ! ***Helicostyla* (*Calocochlia*) *dubiosa*** (L. Pfeiffer, 1846). "Philippines. 1882". C — reproductive tract. D — stimulator. E — stylophore and mucus gland from other side. **Paris**.

Color uniformly grey, yellowish or pinkish to reddish-brown, sometimes with 1-5 dark bands. Postembryonic whorls scarcely sculptured with very vague radial wrinkles and exceptionally slight spiral grooves developed to various degree (sometimes nearly absent). Aperture broadly ovate, moderately oblique, with somewhat thickened and reflexed margins; columellar margin narrow, sometimes slightly flattened. Height 14-60, diam. 14-55 mm (39.2 × 34.0 mm).

DISTRIBUTION. Philippines (Marinduque, Luzon, Romblon and Burias Islands). About 20 spp.

Helicostyla (*Calocochlea* Hartmann, 1843) Fig. 2128

Hartmann, 1843: 163.

— *Calocochlia* Hartmann, 1840: unnumbered page next to XX (nom. nud.).

— *Callicochlias* Agassiz, 1846: 58 (nom. nov. pro *Calocochlea* Hartmann, 1840).

— *Callocochlias* Mörch, 1857: 5 (t.-sp. *Helix pulcherrima* Sowerby, 1841; designated here).

— ? *Halocochlea* Bartsch, 1932b: 336 [*Cochlostyla* subg.; t.-sp. *Cochlostyla* (*Halocochlea*) *lillianae* Bartsch, 1932; monotypy].

TYPE SPECIES — *Helix pulcherrima* Sowerby, 1841; OD.

Shell mostly depressed-globose, thin to rather solid, of about 5 moderately convex whorls. Last whorl nearly straight, but due to development of peristome reflection an impression arises that very end of the whorl slightly elevated. Upper whorls usually pinkish, color of rest whorls yellow to brown and reddish, frequently with a light spiral band on or slightly above periphery; above this band some narrower bands may be present, sometimes bands broken into rows of spots. Postnuclear sculpture of very weak, vague, radial wrinkles and elements of spiral striation, predominantly on upper whorls and on basal surface. Aperture ample, subcircular, margins reflexed and moderately expanded; columellar margin flattened. Height 6-45, diam. 24-60 mm (30.7 × 40.0 mm).

Penis similar to that of *Helicostyla* s. str. (see Fig. 2126) but its inner relief not so strongly developed. Stimulator consists of 2 lobes, one of them horse-shoe-liked, with smooth upper edge, the other lamellar, with edge supplied with short, conic, pointed tubercles (papillae). Stimulator located inside semitransparent section of penis without forming a pocket. Free oviduct varies in length.

DISTRIBUTION. Philippines. About 70 spp., subspp. & forms.

Helicostyla (*Chromatosphaera* Pilsbry, 1892) Fig. 2129

Pilsbry, 1891a: 169 (*Cochlostyla* sect.).

TYPE SPECIES — *Helix aurata* Sowerby, 1841; OD.

Shell depressed-globose, rather solid, of 4-5 slightly to moderately convex whorls. Last whorl rounded, straight or scarcely descending in front. Color pattern consists of yellow background and 1-2 spiral, brown or violet bands; upper spire usually blackish or violet. Hydrophanous periostracum lacking. Postembryonic sculpture of scattered, weak radial wrinkles; elements of malleate sculpture may be present on body whorl. Aperture ample, broadly ovate, margins blunt, usually very narrowly reflexed throughout. Columellar margin subvertical, deeply inserted, umbilico-columellar area covered with a concave white callus. Height 22-26, diam. 30-35 mm (24.0 × 32.0 mm).

DISTRIBUTION. Philippines (Luzon). 5-6 spp.

Chloraea Albers, 1850 Fig. 2130

Albers, 1850: 113 (*Helix* subg.).

TYPE SPECIES — *Helix sirena* Beck in L. Pfeiffer, 1842; SD Martens in Albers, 1860.

Shell depressed-globose to lens-shaped, relatively thin to rather solid, more or less translucent. Whorls 4-5, flattened to nearly flat, rapidly increasing. Last whorl descending or straight, with variously developed peripheral angle or keel. Color generally milky-white or yellow to greenish, monochromatic or with a narrow supraperipheral band. Embryonic whorl finely wrinkled to almost smooth. Postapical sculpture of vague radial wrinkles and regular, quite clear, crowded spiral grooves; no hydrophanous patches on periostracum. Aperture

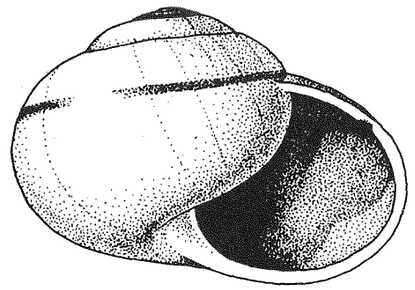
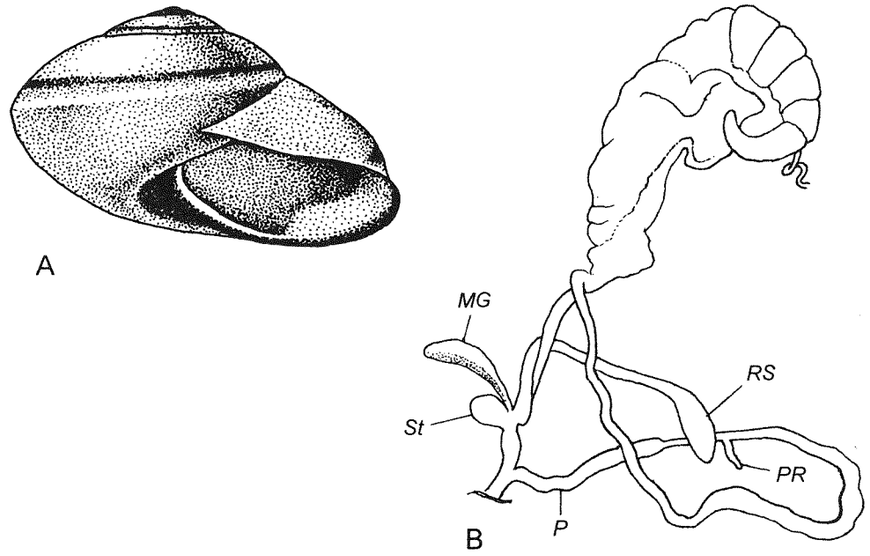


Fig. 2129. ***Helicostyla* (*Chromatosphaera*) *aurata*** (Sowerby, 1841).
"Ins. Manilla". Syntype. **Phil**. No. 32623.

lunar, very oblique, margins thin, shortly reflexed. Umbilicus closed. Height 9-18, diam. 16-32 mm (*sirena*: 17.0 × 27.0 mm; *thersites*: 16.4 × 36,1 mm).

Talon, a simple curvature of hermaphroditic duct. Vas deferens comparatively long. There is a short conic flagellum. Epiphallus contains 2 strong, smooth pilasters. Penis bulky, its basal section internally with a few uneven, corrugated pilasters; inner walls of upper chamber have a complex relief of numerous, sharp, short, transversal folds. Lamellar, fleshy stimulator occupies nearly entire lumen of penial chamber; relief of stimulator surface precisely corresponds to that of chamber inner surface. Stylophore voluminous, enters vagina through a short papilla. Additional sac missing; simple mucus gland acinous, not globular, enters basal section of stylophore and opens to vagina independently from channel of stylophore. Vagina rather long, internally with numerous prismatic tubercles arranged in axial rows. Spermathecal stalk long, reservoir nearly attending albumen gland.

DISTRIBUTION. Philippines. Over 20 spp. & forms.



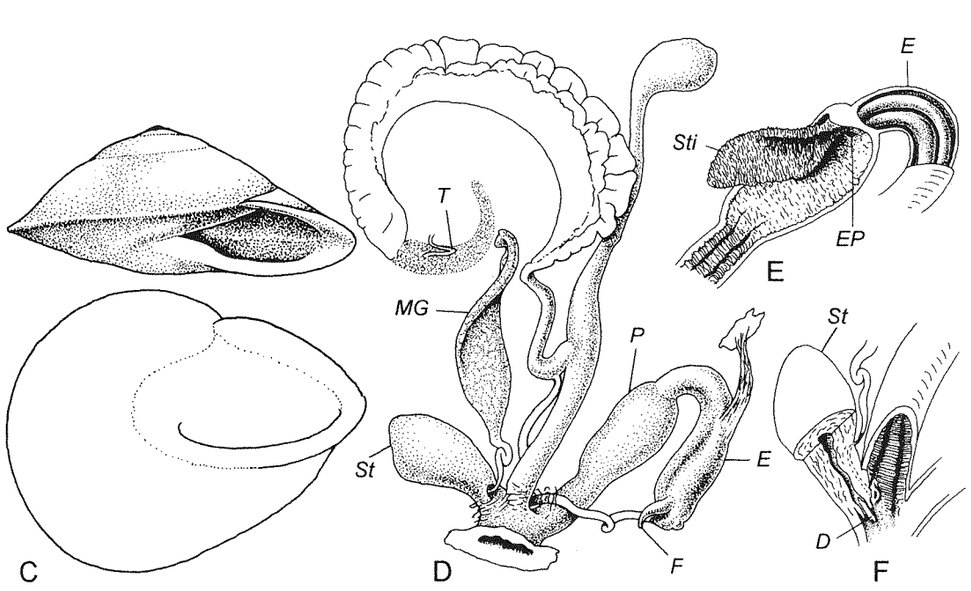


Fig. 2130. A — ***Chloraea sirena*** (Beck, 1842). Guimaras Island, Philippines. **SPb**.
B — ! ***Chloraea benguetensis*** (Semper, 1877). Reproductive tract. After Semper, 1877. C, D, E, F — ! ***Chloraea thersites*** (Broderip, 1841). "Philippines: Mindoro Oriental; Pente Est du Mont Halcon, 400-600 m. Decembre 1980". C — shell. D — reproductive tract. E — interior of epiphallus and penis. F — interior of vagina and stylophore. **Paris**. ***D*** — dart.

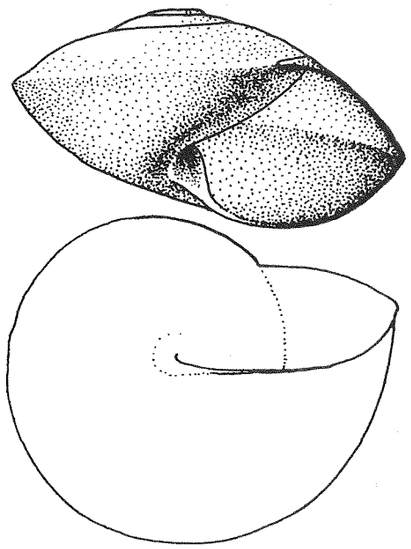


Fig. 2131. ***Corasia virgo*** (Broderip, 1841). Cebu Island, Philippines. **Moscow** No. Lc-25714.

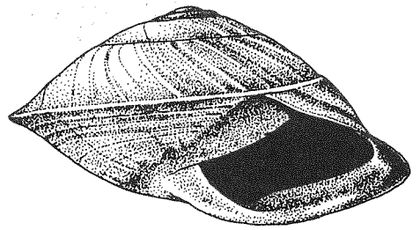


Fig. 2132. ***Anixa zebuensis*** (Broderip, 1841). Cebu Island, Philippines. Syntype. **Phil**. No. 32416.

Corasia Albers, 1850
Fig. 2131

Albers, 1850: 111 (*Helix* subg.).

TYPE SPECIES — *Carocolla virgo* Broderip, 1841; SD Martens in Albers, 1860.

Shell depressed-globose, thin, translucent, of 3.5-5 almost flat, rapidly increasing whorls. Body whorl often carinated, straight or scarcely descending in front. Color white or pale-straw; aperture edge sometimes brown. No opaque or hydrophanous markings. Embryonic whorls smooth, polished. Later whorls with silky radial striation; in places (especially at suture) there are elements of fine spiral striation. Aperture roundly heart-shaped, margins slightly expanded or narrowly reflexed. Height 15-38, diam. 24-63 mm (20.2 × 34.6 mm).

DISTRIBUTION. Philippines except Palawan Island. More than 30 spp. & forms.

Anixa Pilsbry, 1894
Fig. 2132

Pilsbry, 1894 (1893-1895): 223 (nom. nov. pro *Axina* Albers, 1850).

— *Axina* Albers, 1850: 113 [nom. praeocc., non Kirby, 1817 (Coleoptera); *Helix* subg.; t.-sp. *Helix zebuensis* Broderip, 1841; SD Martens in Albers, 1860].

TYPE SPECIES — *Helix zebuensis* Broderip, 1841; OD.

Shell globose-turbinate to lens-shaped, solid, dull, of 4.5-6 flattened to flat whorls. Last whorl not descending in front, with variously developed, usually sharp peripheral angle or keel. Color mostly dark, brown to chestnut, almost uniform or with scattered patches. Embryonic whorls glossy, later whorls radially wrinkled, in angulate forms these wrinkles usually bear periostracal ridges near peripheral angle; elements of malleation may be present on body whorl; fine reticulation may be between neighboring ridges. Spiral striation absent. Aperture rounded to angled, oblique, margins narrowly expanded above, narrowly reflexed beneath. Columellar margin obliquely sloping, nearly straight, sometimes more or less obviously toothed below. Height 16-32, diam. 25-72 mm (19.5 × 35.5 mm).

DISTRIBUTION. Philippines (Luzon, Cebu, Siquijor Islands). About 15 spp. & forms.

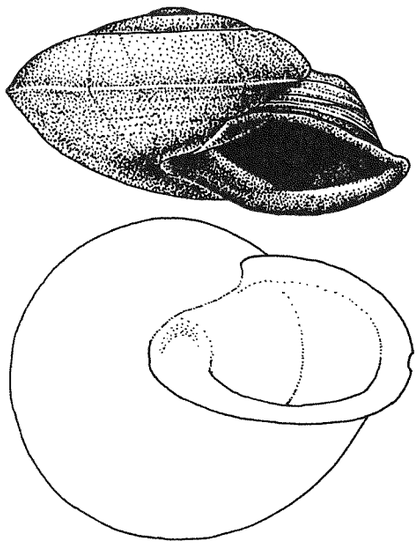


Fig. 2133. ***Pyrochilus lampas*** (Müller, 1774). No data. **Leiden**.

Pyrochilus Pilsbry, 1893
Fig. 2133

Pilsbry, 1893: 391 (nom. nov. pro *Phania* Martens in Albers, 1860).

— *Phania* Martens in Albers, 1860: 157 [nom. praeocc., non Meigen, 1824 (Insecta); *Helix* subg.; t.-sp. *Helix lampas* Müller, 1774; OD].

TYPE SPECIES — *Helix lampas* Müller, 1774; OD.

Shell obesely lenticular, solid, of 4-5 much flattened whorls. Last whorl angulated or keeled, notably descending in front. Color dark-chestnut to brown or corneous-yellowish, nearly uniform. Embryonic whorls smooth. Later whorls with spiral malleation expressed to various degree and with weak, irregular radial wrinkles. Aperture oblique, angulated, margins expanded, bright colored within; columellar margin widened into a flat plate, its inner edge blade-like. Height 24-35, diam. 50-66 mm (27.5 × 55.0 mm).

DISTRIBUTION. Moluccas (Halmahera and Batjan Islands). 4 spp. & few forms.

Trachystyla Pilsbry, 1892
Fig. 2134

Pilsbry, 1892 (1891-1892): 166 (*Cochlostyla*, sect. *Calocochlia*; subsect.)

TYPE SPECIES — *Helix cryptica* Broderip, 1841; OD.

Shell capacious, depressed-globose, solid, of 3-4.5 moderately convex whorls. Last whorl rounded, nearly straight or slightly descending in front. Color dark-brown or purple-brown, with hydrophanous periostracum. Embryonic whorls glabrous, rest surface with low, widely spaced spiral cords, and close, obliquely forward-descending wrinkles; sometimes there are elements of malleation on body whorl. Aperture very large, oblique, livid or silvery-bluish inside; margins usually light, reflected; columellar margin much expanded. Height 32-55, diam. 56-70 mm (53.2 × 63.0 mm).

Vas deferens very short, entering epiphallus apically. Boundary between epiphallus and penis externally not visible. Internally penis with a long conic verge. Lower part of vagina practically absent: small stylophore occupies nearly atrial position. Additional sac well developed. Mucus gland ovoid, with short duct. United duct of stylophore and mucus gland protrudes into lumen of vagina by a short conic process. Upper part of vagina long. Spermathecal duct enlarged, reservoir rather small, not reaching albumen gland.

DISTRIBUTION. Philippines (Samar, Suringao, Mindanao, Bohol, Leyte, Luzon Islands). 6-8 spp., subspp. & forms.

Cochlodryas Martens, 1860
Fig. 2135

Martens in Albers, 1860: 176 (*Cochlostyla* subg.).

— *Poecilus* L. Pfeiffer, 1879 (1878-1881): 206 [nom. praeocc., non Bonelli, 1813 (Coleoptera); in syn. of *Cochlodryas*: "Albers mss."].

TYPE SPECIES — *Helix polychroa* Sowerby, 1841 (= *Helix viridostriata* Lea, 1840); OD.

Shell elongated-globose, rather solid, glossy, of 5-6 moderately convex whorls. Body whorl rounded, scarcely deflected. Hydrophanous periostracum lacking. Ground color emerald-green to olive, having a very narrow white band just below suture, and often some brown bands, of which one below white line, one at columella, and 2

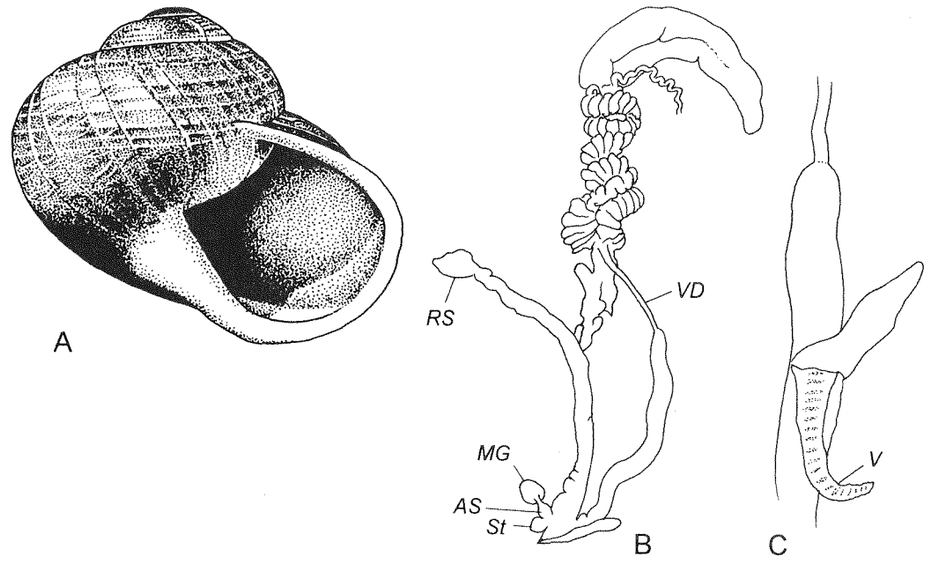


Fig. 2134. A — ***Trachystyla cryptica*** (Broderip, 1841). A — shell: Surigao Island, Philippines. **Phil**. No. 95099. B, C — ! ***Trachystyla dattaensis*** (Semper, 1866). B — reproductive tract. C — interior of penis. After Semper, 1877.

encircle body whorl above and below periphery. Some or all of these brown bands may be missing. Embryonic whorls vaguely microgranulated. Postapical whorls with smoothed irregular radial wrinkles; on 2 first postembryonic whorls there are spiral grooves, disappearing toward body whorl. Aperture subcircular, its margins somewhat thickened, moderately reflexed, white; columellar margin expanded. Height 20-43, diam. 24-34 mm (36.6 × 36.7 mm).

DISTRIBUTION. Philippines (Mindoro, Tablas, Romblon and Temple Islands). About 15 spp., subspp. & forms.

Mesanella Clench et Turner, 1952
Fig. 2136

Clench & Turner, 1952: 32 (in Camaenidae).

TYPE SPECIES — *Helix trailli* L. Pfeiffer, 1855; OD.

Shell globose-conic, moderately thin to solid, glossy, of 4.5-5 slightly convex whorls. Last whorl somewhat inflated, rounded, scarcely deflected. Color almost uniformly brown or with 2-3 variously developed, dark bands. Later whorls closely,

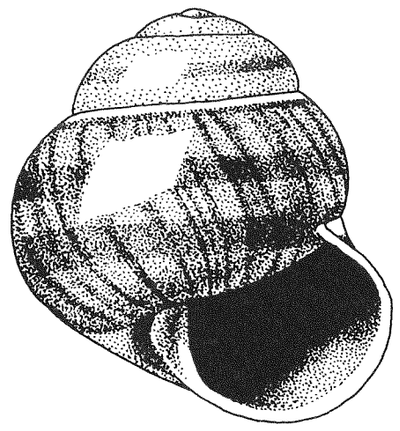


Fig. 2135. ***Cochlodryas viridostriata*** (Lea, 1840). Philippines. **Moscow** No. L-1509.

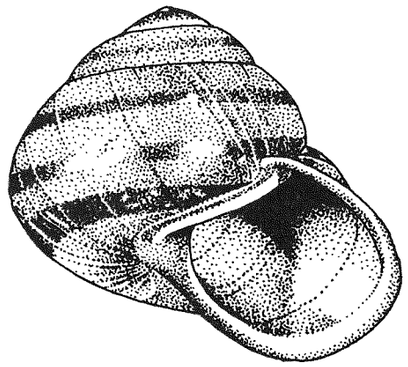


Fig. 2136. ***Mesanella trailli*** (L. Pfeiffer, 1855). Philippines. **Leiden**.

strongly rib-striated above, less distinctly so beneath. Aperture rounded or rounded-subquadrangular, with more or less thickened, reflexed margins. Umbilicus narrow, semicovered. Height 40-55, diam. 48-60 mm (48.2 × 55.2 mm).

DISTRIBUTION. Philippines (Palawan and Balabac Islands). 3-5 spp.

Helicobulinus Broderip, 1841
Fig. 2137

Broderip, 1841: 123 (*Helix* subg.).

— *Chromococlea* Hartmann, 1842: 137 [for *Helix turbinoides* Broderip, 1841 and *Helix mindorana* "Sowerby" Hartmann, 1842 (nom. err. pro *Helix mindanaensis* Sowerby in sched. Cuming, L. Pfeiffer, 1842)].

— *Chromatocochlias* Agassiz, 1846: 84 (nom. nov. pro *Chromococlea* Hartmann, 1842).

— *Coenobita* Gistel, 1848: VIII [nom. praeocc., non Latreille, 1829 (Crustacea); t.-sp. *Helix turbinoides* Broderip, 1841; monotypy].

— *Helicobulimus* Moellendorff, 1890: 241 (*Cochlostyla* sect.; t.-sp. *Helix sarcinosa* Férussac, 1821; monotypy).

TYPE SPECIES — *Helix sarcinosa* Férussac, 1821; OD.

Shell turbinate-globose, capacious, solid, opaque, of 5.25-6.5 relatively convex whorls. Last whorl straight, sometimes obtusely angulated at periphery. Spire conic. Color variegated with green or brown; there is variously patterned hydrophanous periostracum; aperture blue-white or white inside. Both embryonic and later whorls smooth, with no traces of spiral sculpture; postapical surface with irregular radial wrinkles. Aperture large, oblique, with narrowly reflexed margins, columellar margin more or less folded (in adult shells). Height 43-74, diam. 45-70 mm (74.2 × 63.0 mm).

Vas deferens relatively long, rather wide, entering epiphallus terminally; flagellum missing. Penis voluminous, shortly fusiform, thin-walled, inner surface lacks distinct relief; verge (stimulator) in form of fleshy folded plate, bent longitudinally; "wings" of verge fused at tip to form a narrow internal channel. Penial retractor attached to upper end of epiphallus. Stylophore small, dart not found. Mucus gland globular, consisting of numerous slender acini, enters a large accessory sac. United duct of stylophore and of additional sac fused and protrudes in lumen of vagina through a short papilla. Lower section of vagina unusually long, internally with thin, regular, crowded, longitudinal pilasters. Spermathecal stalk enlarged, reservoir fusiform.

DISTRIBUTION. Philippines. 8-10 spp.

Steatodryas Pilsbry, 1932
Fig. 2138

Pilsbry, 1932: 72 (nom. nov. pro *Hypoptychus* Pilsbry, 1892).

— *Ptychostylus* Moellendorff, 1888: 74 [nom. praeocc., non Sandberger, 1870 (Trochidae); *Cochlostyla* sect.; t.-sp. *Helix cepoides* Lea, 1841; OD].

— *Hypoptychus* Pilsbry, 1893: 395 [nom. praeocc., non Steindachner, 1880 (Pisces); nom. nov. pro *Ptychostylus* Moellendorff, 1888].

TYPE SPECIES — *Helix cepoides* Lea, 1841; OD.

Shell globose-turbinate, solid, of 6.5-7 narrow, tightly coiled, rather convex whorls. Spire shortly conoid. Ground color brown above, yellowish beneath; hydrophanous periostracum may form a series of creamy

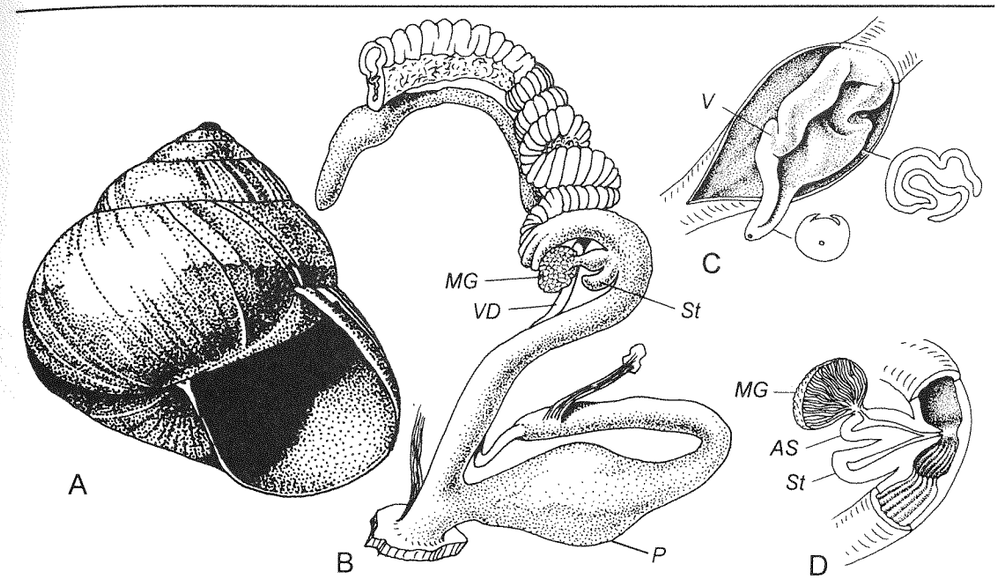


Fig. 2137. A — ***Helicobulinus sarcinosus*** (Férussac, 1821). Shell: Philippines. **Leiden**.
B, C, D — ! ***Helicobulinus turbinoides*** (Broderip, 1840). 8.5 km W of Gimoto, Catanduanes Id., Catanduanes Prov., Philippines, January 20, 1988. B — reproductive tract. C — interior of penis and cross-sections through verge. D — interior of vagina. **Chicago** No. 223556.

blotches below suture, and narrow band at or just below periphery. Embryonic whorls polished, later whorls covered with conspicuous sculpture in form of fine shagreen and with irregular light radial wrinkles. Aperture oblique, narrowly lunar, margins somewhat expanded, thickened within; columellar margin very short, vertical, with a strong tooth-like fold. Height 40-45, diam. 44-51 mm (45.0 × 51.0 mm).

DISTRIBUTION. Philippines (Luban Island). 1 sp.

Dryocochlias Moellendorff, 1898
Fig. 2139

Moellendorff, 1898: 124 (*Cochlostyla* sect.).

TYPE SPECIES — *Helix metaformis* Férussac, 1819; OD.

Shell high-turbinoid, solid, shining, of about 5 slightly convex whorls. Last whorl widely rounded, almost straight. Color bright, olive-green, brown or yellow; monochromatic or with dark band(s). Embryonic whorls smooth. Postapical whorls finely spirally striated. Aperture irregularly subcircu-

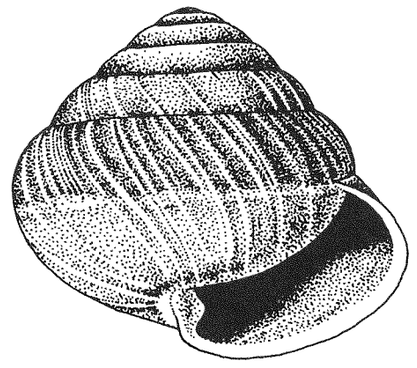


Fig. 2138. ***Steatodryas cepoides*** (Lea, 1841). "Philippines". **Leiden**.

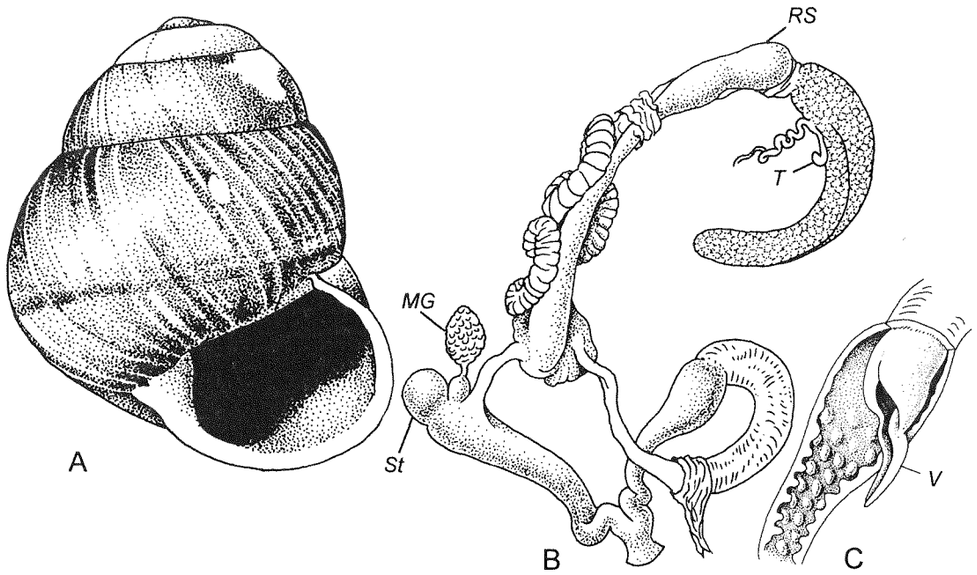


Fig. 2139. ***Dryocochlias metaformis*** (Férussac, 1819).
Manille, Mt. Baro. A — shell. B — reproductive tract. C — interior of penis. **Paris**.

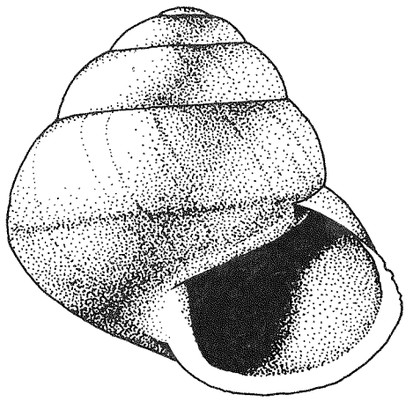


Fig. 2140. ***Rhymbocochlias turbo*** (L. Pfeiffer, 1845).
No data. **Phil**. No. 31733.

lar, quite oblique, with more or less thickened margins; columellar margin broadly dilated. Umbilicus absent. Height 27-70, diam. 22-60 mm (27.2 × 22.2 mm).

Talon exposed, curved. Vas deferens stout and short. Epiphallus swollen, with thick, strongly muscularized walls. Penis clavate, internally with large, rounded tubercles in lower section and conspicuous verge that has a wide lumen and conic process grooved on inner surface. Base of penial retractor coats vas deferens/epiphallus junction. Free oviduct thin, rather short. Vagina much longer, expanded, with muscular walls. Stylophore small, subglobular; compact, alveolar mucus gland enters well expressed accessory sac through short duct. Spermathecal stalk long, stout; reservoir poorly defined, attending base of albumen gland.

DISTRIBUTION. Philippines. About 10 spp.

Rhymbocochlias Moellendorff, 1895
Fig. 2140

Moellendorff in Quadras & Moellendorff, 1895: 116 (*Cochlostyla* sect.).

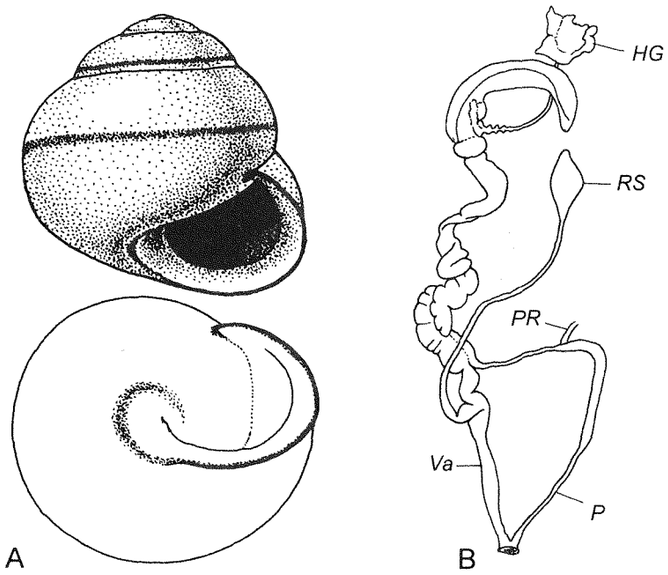


Fig. 2141. ***Pachysphaera sphaerica*** (Sowerby, 1841).
A — shell: Luzon, Philippines. **Moscow** No. Lc-15566. B — reproductive tract. After Semper, 1870.

TYPE SPECIES — *Helix turbo* L. Pfeiffer, 1845; OD.

Shell globose-turbinate, rather thin to solid, of 5-5.5 a little convex whorls, last whorl a mere trifle descending in front. Apex obtuse. Color mostly straw, with 1 or 2 dark spiral bands; basal area sometimes blackish. Surface practically smooth throughout. Aperture round-lunar, white or tinted within, margins more or less expanded, white or chestnut. Columellar margin subvertical. Height 35-46, diam. 35-47 mm (37.0 × 38.0 mm).

DISTRIBUTION. Philippines (Luzon, Tablas, Romblon Islands). 5-7 spp.

Pachysphaera Pilsbry, 1891
Fig. 2141

Pilsbry, 1891a: 172 (*Cochlostyla*, sect. *Helicostyla*; subsect.).

TYPE SPECIES — *Helix sphaerica* Sowerby, 1841; OD.

Shell globose, rather solid, only slightly translucent, of 4-5 moderately convex whorls. Last whorl markedly but gradually descending in front. Color white or yellow, usually with 1 or 2 narrow brown bands; one of them lies above suture on penultimate whorl, on body whorl it occupies periphery; 2nd band lies on basal surface and continues on peristome. Embryonic whorls vaguely microgranulated. Postapical sculpture of weak radial wrinkles and also weak, well spaced spiral grooves, that usually expressed better on penultimate whorl. Aperture subcircular, oblique, white inside; its margins strongly but shortly reflexed; elevated lip lies at very margin. Columellar margin somewhat enlarged, sometimes with light thickening at upper part. Height 19-31, diam. 17-25 mm (20.9 × 24.0 mm).

Vas deferens very short, entering epiphallus terminally. Epiphallus somewhat enlarged, passes into thread-like penis; judging by external appearance, verge must be absent. Penial retractor attached to very upper end of epiphallus. Stylophore or mucus gland wanting. Vagina long, spermathecal stalk slender, just a little expanded basally.

DISTRIBUTION. Philippines (N Luzon). 4-6 spp.

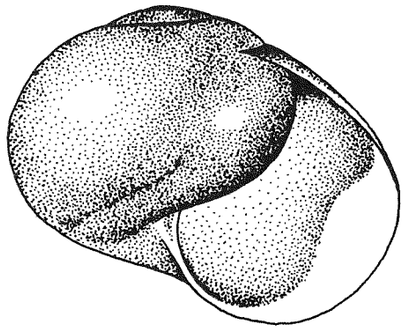


Fig. 2142. ***Pfeifferia micans*** (L. Pfeiffer, 1845). Luzon Island. **Phil**. No. 1621.

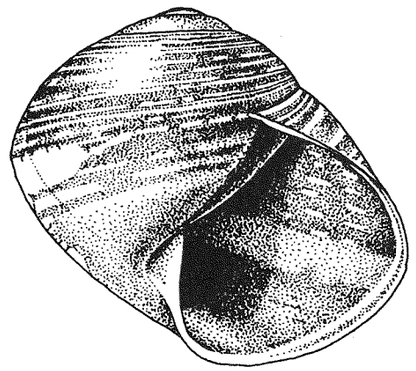


Fig. 2143. ***Leytia fragilis*** (Sowerby, 1841). "nr. Luzon". **Phil**. No. 129512.

Pfeifferia J. Gray, 1853
Fig. 2142

Gray J., 1853: 110.

TYPE SPECIES — *Helix micans* L. Pfeiffer, 1845; OD.

Shell globose, thin, brittle, translucent, of 4 flattened whorls. Last whorl capacious, evenly rounded, not descending in front. Color whitish, sometimes with an opaque white band below suture. Embryonic whorls smooth, surface of postnuclear whorls weakly obliquely striatulate and obsoletely, finely spirally striated. Aperture broadly lunar, only slightly oblique, margins thin, fragile, acute, upper part of palatal margin curving forward; columellar margin subvertical, deeply inserted in base. Umbilicus absent. Height 21-22, diam. 26 mm (21.1 × 26.0 mm).

Vas deferens wide and passes gradually into simple penis, which lacks all accessories. Penial retractor short and thick. Stylophore globular, fat, with accessory sac; mucus gland short. Spermathecal shaft long. Right ocular retractor passes through penioviducal angle. [The above anatomical description is given according to Semper (1880), who did not figure the reproductive tract].

DISTRIBUTION. Philippines (N Luzon). 5 spp.

Leytia Pilsbry, 1892
Fig. 2143

Pilsbry, 1892 (1891-1892): 129 (*Cochlostyla* sect.).

TYPE SPECIES — *Helix fragilis* Sowerby, 1841; monotypy.

Shell bubble-like, thin, translucent, of 4 nearly flat whorls. Last whorl inflated, bluntly angulated at periphery, a little descending in front. Color blue-green above periphery, becoming pinkish-white on spire; on body whorl there are numerous narrow, interrupted, hydrophanous, cream-white bands; below periphery dark-green, with 2-3 straw zones and sometimes with numerous narrow, interrupted whitish lines. Embryonic whorls smooth. Rest surface with well spaced, fine spiral grooves and irregular radial striae. Aperture very large, oblique,

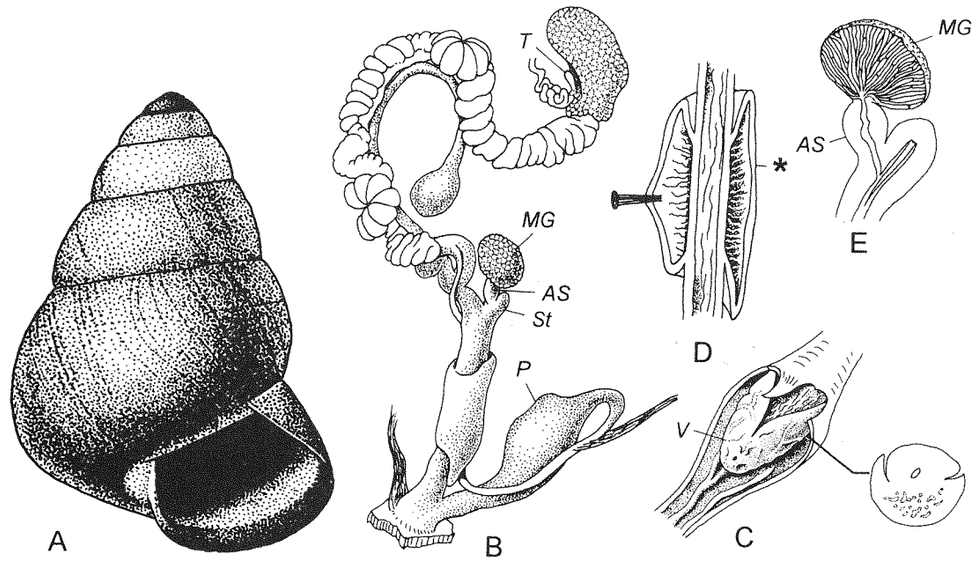


Fig. 2144. ***Cochlostyla pithogaster*** (Férussac, 1821). Terogo, Caramoan Municipality, Camarines Sur Prov., Luzon, Philippines, October 1982. A — shell. B — reproductive tract. C — interior of penis and cross-section through verge. D — interior of vagina. E — longitudinal section through stylophore and mucus gland. **Gain**. No. UF-193562. ***Asterisk*** — vaginal bladder.

margins simple, white, a little expanded below; columellar margin vertical, thin. Height 21-27, diam. 26-32 mm (27.0 × 32.0 mm).

DISTRIBUTION. Philippines (Tanauan, Leyte Island). 1 sp.

Cochlostyla Férussac, 1821
Fig. 2144

Férussac, 1821: 47.

— *Orthostylus* Beck, 1837: 49 [*Bulimus* subg.; t.-sp. *Helix pithogastra* Férussac, 1821; SD Martens in Albers, 1860.

— *Pithohelix* Swainson, 1840: 166 (*Geotrochus* subg.; t.-sp. *Helix castanea* Swainson, 1840; OD).

— *Pythohelix* Swainson, 1840: 332 (nom. err. pro *Pithohelix*).

TYPE SPECIES — *Helix pithogastra* Férussac, 1821; SD Pilsbry, 1894 (1893-1895).

Shell ovate-conic to oblong-conic and pyramidal, quite solid, of 6-7 moderately convex whorls. Last whorl almost straight, rounded. Color generally dark: chestnut, brown or greenish, monochromate or with radial lighter stripes; sometimes there are 1-3 creamy spiral bands; upper spire usually lighter. Embryonic shell nearly smooth. Later whorls with weak, irregular radial wrinkles and sometimes with fine traces of spiral striation. Aperture rounded, oblique, milky-white inside, often with bluish hue; aperture margins somewhat reflexed, thin, dark colored. Columellar margin not enlarged, sometimes pinkish. Height 42-76, diam. 27-58 mm (60.2 × 40.2 mm).

Vas deferens comparatively long; there is no visible boundary between it and epiphallus. Latter enters bulky penis apically. Internal surface of penis bears a few irregular longitudinal pilasters; capacious blunt verge has narrow channel and 2 "wings" coating basal portion of the organ. Thick walls of verge filled with fibrous tissue containing many lacunes. Stylophore rather small, with a simple dart. Mucus gland globular, entering stylophore through accessory sac. Long vagina embraced by peculiar bladder having thin, non-glandular walls; within bladder there are numerous connective-tissued fibers, connecting inner surface of bladder with vagina walls. Sper-

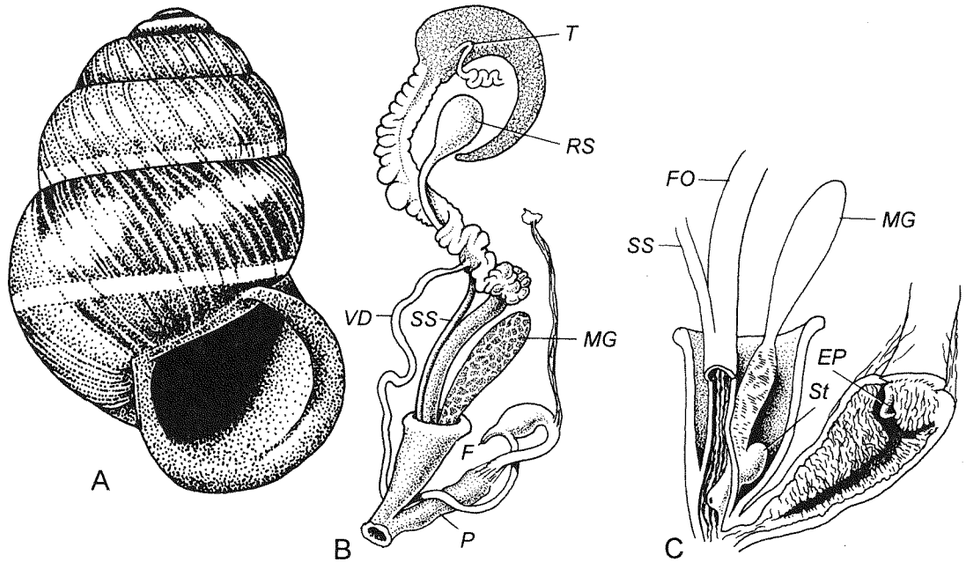


Fig. 2145. ! ***Phoenicobius aratus*** (Sowerby, 1841).
A — shell: Tablas Island, Philippines. **Leiden**. B, C — "Peute Est du Mont Halcon, 400-600 m, Mindoro oriental, Philippines", December 1980. B — reproductive tract. C — interior of penis and vagina. **Moscow** No. Lc-25726 (**Paris**).

mathecal stalk cylindrical, reservoir globular.

DISTRIBUTION. Philippines (Luzon, Alabat, Masbate, Marinduque, Siquijor, Cebu, Bohol, Magtan, Camotes, Ticao, Negros, Polillo, Romblon Islands). Over 20 spp. & subspp.

Phoenicobius Mörch, 1852
Fig. 2145

Mörch, 1852: 32.

TYPE SPECIES — *Helix brachyodon* Sowerby, 1841; SD Martens in Albers, 1860.

Shell generally pupiform, elevated, (moderately) solid (rarely thin), of 4-6 rather convex whorls. Last whorl rounded, somewhat descending in front. Color yellowish (rare) to rich-chestnut, mostly with a light narrow peripheral band on body whorl which seen above suture on penultimate whorl. Embryonic sculpture absent. Postapical whorls nearly smooth to possessing distinct, well spaced radial rib-wrinkles. Aperture generally subcircular, margins expanded and reflexed, white to blackish, columellar margin subvertical, sometimes vaguely folded; on basal margin a small tubercle may be present. Height 24-46, diam. 18-34 mm (44.5 × 25.3 mm).

Vas deferens comparatively very long, slender to rather stout, entering epiphallus subterminally leaving small, slender, finger-shaped flagellum. Epiphallus short, generally clavate, swollen in proximal part, subcylindrical in distal part. Penis more or less cylindrical, internally with 2 strongly corrugated axial pilasters and wide, wrinkled verge which has 2 unequal in size lobes. Penial retractor attached to penis/epiphallus junction. Free oviduct long, cylindrical. Vagina very short. Stylophore small, spherical; single mucus gland relatively voluminous, with well developed, strongly muscular duct fused with accessory sac. Duct of mucus gland along with duct of stylophore enters vagina through common pore situated on tip of small papilla. Stylophore, accessory sac + duct of mucus gland, basal sections of free oviduct and spermathecal stalk surrounded by muscular collar. Spermathecal shaft long, more or less cylindrical throughout; reservoir subglobular.

DISTRIBUTION. Philippines (Tablas,

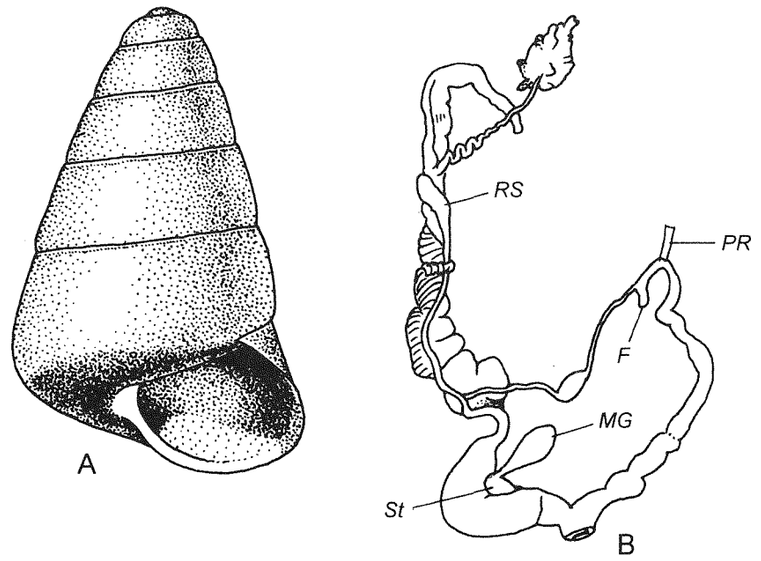


Fig. 2146. ***Phengus opalina*** (Sowerby, 1841).
A — shell: Philippines. **Moscow** No. L-1755. B — reproductive tract. After Semper, 1870.

Mindoro, Luban, Busuanga, Palawan Islands). About 6 spp.

Phengus Albers, 1850
Fig. 2146

Albers, 1850: 137 (*Bulimus* subg.).

TYPE SPECIES — *Helix opalina* Sowerby, 1841; SD Martens in Albers, 1860.

Shell high-conic or pyramidal, thin, somewhat translucent, of 6-6.5 flat whorls. Last whorl straight, bluntly angulated below midline. Color white, grey, yellowish or blue-green, without spiral bands. Embryonic whorls microgranulated. Postapical whorls weakly radially striated; on basal surface elements of spiral sculpture may be present. Aperture rounded, white inside, with thin, shortly reflexed margins; columellar margin enlarged above. Height 26-34, diam. 17-21 mm (32.3 × 19.0 mm).

Vas deferens long, slender, with notable swelling in midway. There is a short, finger-shaped flagellum. Epiphallus rather long. Penis somewhat swollen, shorter than epiphallus. Penial retractor attached to upper part of epiphallus close to flagellum. Stylophore small, mucus gland lanceolate, with short duct; accessory sac seemingly absent. Judging by Semper's (1870) drawing, vagina much enlarged; perhaps species of the genus also possess a sort of bladder, which is characteristic for *Cochlostyla*. Spermathecal stalk cylindrical, slender.

DISTRIBUTION. Philippines (Luzon, ? Mindoro). About 10 spp. & forms.

Chrysallis Albers, 1850
Fig. 2147

Albers, 1850: 140 (*Bulimus* subg.).

TYPE SPECIES — *Helix chrysalidiformis* Sowerby, 1833; SD Martens in Albers, 1860.

Shell elongated, ovate-conic, solid, opaque, of 5.5-7.5 more or less flattened whorls. Last whorl widely rounded, straight. Color pattern consists of straw background and irregular, well developed, brown stripes; besides, often there is brown sutural band spotted with white. Embryonic whorls smooth. Rest surface rather coarsely and ir-

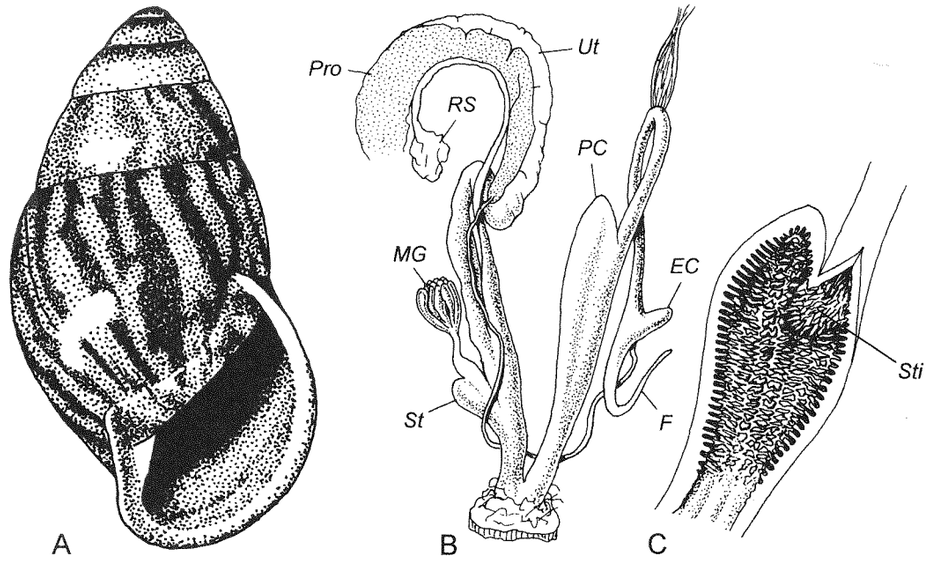


Fig. 2147. ***Chrysallis chrysalidiformis*** (Sowerby, 1833).
A — shell: Philippines. **Leiden**. B, C – "Peute Est du Mont Halcon, 400-600 m, Mindoro oriental, Philippines", December 1980. B — reproductive tract. C — interior of penis. **Moscow** No. Lc-25672 (**Paris**).

regularly radially wrinkled. Spiral sculpture totally absent. Aperture broadly lunar, margins well expanded; columellar margin dilated and reflexed. Umbilicus absent or slit-like. Height 50-82, diam. 20-28 mm (51.0 × 21.2 mm).

Vas deferens long, slender. Flagellum moderately long, tapering. Epiphallus long, narrow, with a short caecum on proximal-most end. Penis large, supplied with a conic chamber (caecum) in upper part. Internally distal part of penis with broad, smoothed axial folds; proximal part with numerous, crowded, high tubercles of irregular shape; at epiphallic pore there is a sort of stimulator in form of pad covered with same tubercles. Penial retractor inserts on distal half of epiphallus. Free oviduct long, vagina shorter. Stylophore small, elongated. Mucus gland not alveolar, consisting of many short tubules, entering accessory sac by a single duct. Spermathecal stalk slightly expanded basally, rather long; thin-walled reservoir (nearly) attending base of albumen gland.

DISTRIBUTION. Philippines (Mindoro Island). 4-5 spp.

Hypselostyla Martens, 1868
Fig. 2148

Martens in L. Pfeiffer, 1868: 7.

TYPE SPECIES — *Bulimus nympha* L. Pfeiffer, 1842; monotypy.

Shell elongated-conic or oblong-turreted, usually rather firm but not thick-walled, of 6-7 slightly convex whorls. Last whorl often more or less angled or even keeled at periphery, generally not or a little descending in front. Color pattern widely varies; in type species surface straw or creamy to brown, with whitish streaks; suture sometimes with dark border; spire flesh-colored or purplish above. Embryonic whorls glossy. On rest surface fine spiral striation visible. Aperture subcircular, oblique, margins more or less expanded but not broad; columellar margin vertical, somewhat widened. Height 29-92, diam. 19-37 mm (52.1 × 25.2 mm).

Talon exposed, rod-like, long. Vas deferens short, stout, demarcated from epiphallus by a small bulb containing sphincter. Inner surface of epiphallus with 2 strong pilasters divided into a number of sections by deep,

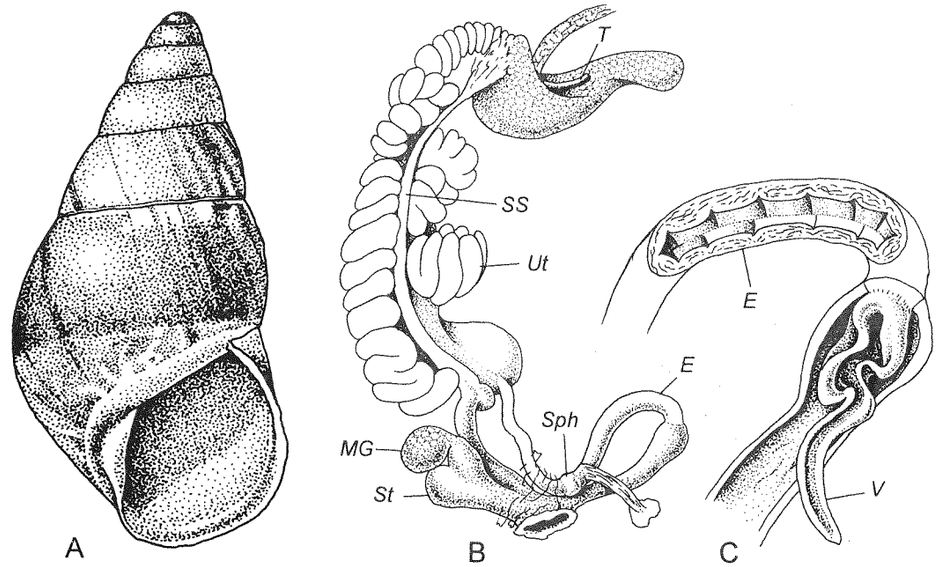


Fig. 2148. A — ***Hypselostyla nympha*** (L. Pfeiffer, 1842).
Shell: Camaraines, Philippines. **Phil**. No. 95299. B, C — ! ***Hypselostyla carinata*** (Lea, 1840). "Philippines. 1882". B — reproductive tract. C — interior of epiphallus and penis. **Paris**.

narrow transversal furrows; such a structure permits to suppose that spermatophores might be formed in epiphallus. Penis clavate, containing a long verge in form of tapering, longitudinally folded plate (like in *Helicobulinus* — compare figs. 2137 & 2148); epiphallic pore situated near base of verge. Inner surface of penis without regular relief. Penial retractor inserted on proximal end of epiphallus, under mentioned bulb. Stylophore sits very low — in essence on atrium and enters by a simple pore, without forming a papilla. Mucus gland nearly sessile, accessory sac well developed. Spermathecal stalk long, reservoir in dissected specimen poorly preserved but evidently reaching base of albumen gland.

DISTRIBUTION. Central Philippines (Romblon, Temple, Burias, Luban, Marinduque, Luzon, Tayabas, Negros, Panay, Siquijor, Albay, Catanduanes, Cebu, Camotes, Bohol, Maribojoc, Cuyo, Tablas, Busuanga Islands). About 20 spp.

Dolichostyla Pilsbry, 1896
Fig. 2149

Pilsbry, 1896: 108 (nom. nov. pro *Prochilus* Martens in Albers, 1860).

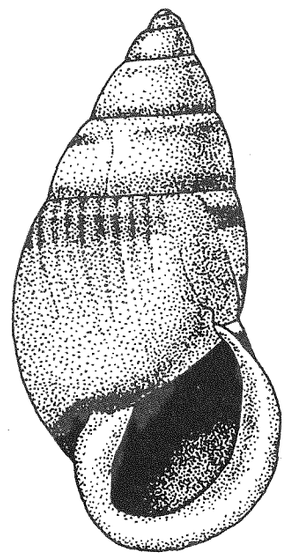


Fig. 2149. ***Dolichostyla virgata*** (Jay, 1839).
Philippines. **Moscow** No. L-1276.

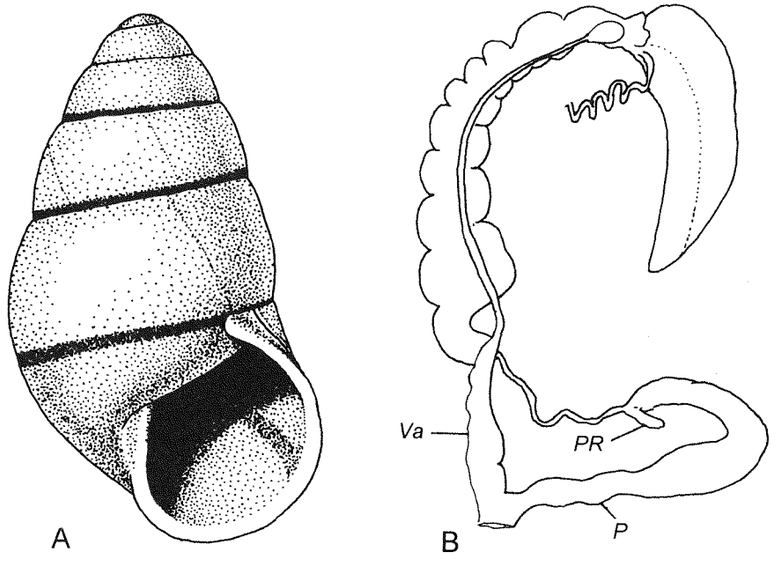


Fig. 2150. A — ***Canistrum ovoideum*** (Bruguière, 1789). Shell: Masbate Island, Philippines. **Vienna** No. 8742. B — ! ***Canistrum stabilis*** (Sowerby, 1841). Reproductive tract. After Semper, 1870.

— *Prochilus* Martens in Albers, 1860: 179 [nom. praeocc., non Illinger, 1811 (Mammalia); *Cochlostyla* subg.; t.-sp. *Helix virgata* Jay, 1839; OD].

TYPE SPECIES — *Helix virgata* Jay, 1839; OD.

Shell bulimoid, elongated ovate-pyramidal, solid, glossy, slightly translucent, of 5.5-7 flattened or moderately convex whorls. Body whorl rounded, not descending in front. Color very light, mostly uniform, sometimes with 2 dark bands, occupying upper and lower parts of whorls. Embryonic whorls vaguely microgranulated. Sculpture of later whorls of weak, smoothed radial wrinkles and feeble spiral grooves; actually surface looks like quite glabrous. Aperture relatively small, ovate, oblique; margins broadly reflexed and expanded; columellar margin vertical. Umbilicus very narrow or closed. Height 30-52, diam. 15-25 mm (41.0 × 20.2 mm).

DISTRIBUTION. Philippines (Mindoro, Cuyo, Tablas Islands). 8-10 spp. & forms.

Canistrum Mörch, 1852
Fig. 2150

Mörch, 1852: 31.

TYPE SPECIES — *Bulimus luzonicum* Sowerby, 1833 (= *Bulimus ovoideum* Bruguiére, 1789); SD Martens in Albers, 1860.

Shell ovate-conic or oblong, rather solid, glossy, moderately translucent, of 5-6 more or less convex whorls. Last whorl rounded, straight. Color white or ivory, with 1-4 brown and yellow bands; in some species there are alternating lighter and darker sinuous or zigzagged streaks. Embryonic whorls smooth. Rest surface microscopically spirally striated; elements of radial sculpture weak and highly irregular. Aperture subcircular, weakly oblique, margins well expanded; columellar margin subvertical. Height 26-43, diam. 18-25 mm (33.8 × 20.2 mm).

Vas deferens of moderate length, cylindrical, entering epiphallus apically. There is no visible boundary between penis and epiphallus. Penial retractor attached to vas deferens/epiphallus junction. Vagina relatively long. All accessory organs of reproductive apparatus missing. Spermathecal shaft slender, cylindrical; reservoir small.

DISTRIBUTION. Philippines (Luzon, Masbate, Ticao, Mindoro, Burias, Romblon Islands). 8 spp. & several forms.

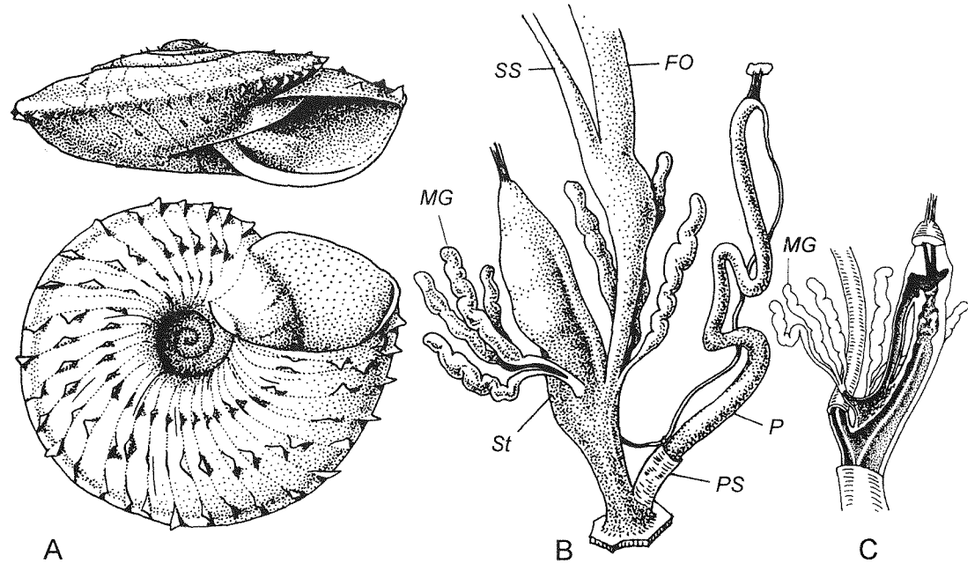


Fig. 2151. ***Ponsadenia*** (***Tarbagataja***) ***hirsuta*** (Matiokin, 1966). Dzhailiau Syrt, Terskey Ridge, July 27, 1976. A — shell. B — reproductive tract. C — interior of stylophore. **Moscow** Lc-19426.

BRADYBAENINAE Pilsbry, 1939

Pilsbry, 1939: 15.

— Buliminopsinae Hoffmann, 1928: 1239 (in Eulotidae).

Shell generally helicoid, rarely turreted or flat, highly variable in size, shape and sculpture. Aperture mostly simple, rarely with 1-5 tubercular teeth.

Flagellum or verge missing, although a secondary verge may arise due to immersion of lower end of epiphallus into lumen of penis. Penis lacks caecum. Accessory sac of stylophore present or absent. Mucus glands 2 to many, alveolar or branched. Various secondary complexities in structure of atrium and dart apparatus may be present.

DISTRIBUTION. Eurasia including Japan; ? Indonesia (Tenimber Islands).

Ponsadenia Schileyko, 1978

Schileyko, 1978: 119.

TYPE SPECIES — *Helix semenovi* Martens, 1864; OD.

Shell of 4 types: 1 — globose, usually banded, with ample aperture and very narrow semicovered umbilicus; 2 — much depressed, dark, unicolor, with peripheral keel, and widely umbilicated; there are periostracal scales on radial wrinkles; 3 — depressed, with rounded periphery, light, unicolored, finely sculptured, with subcircular aperture and round, open, cylindrical umbilicus; 4 — flattened, uniformly yellow or whitish, with vague fulvous radial streaks, weakly sculptured, with strongly oblique aperture and rather broad but not perspective cylindrical umbilicus.

Mucus glands enter either through paired reservoirs adjoining atrium and connected with apical part of stylophore by a peculiar "bridge", or they enter bridge close to its middle. Reservoirs sometimes modified into supraatrial bladder.

DISTRIBUTION. Central Asia (Tien-Shan, Dzungar Ridge and Tarbagatai Mts.).

Ponsadenia (*Tarbagataja* Schileyko, 1978)
Fig. 2151

Schileyko, 1978: 119.

TYPE SPECIES — *Bradybaena hirsuta* Matiokin, 1966; OD.

Shell small, flattened, lenticular, moderately thin, of 4.5-6 slightly convex whorls. Last whorl descending in front, strongly

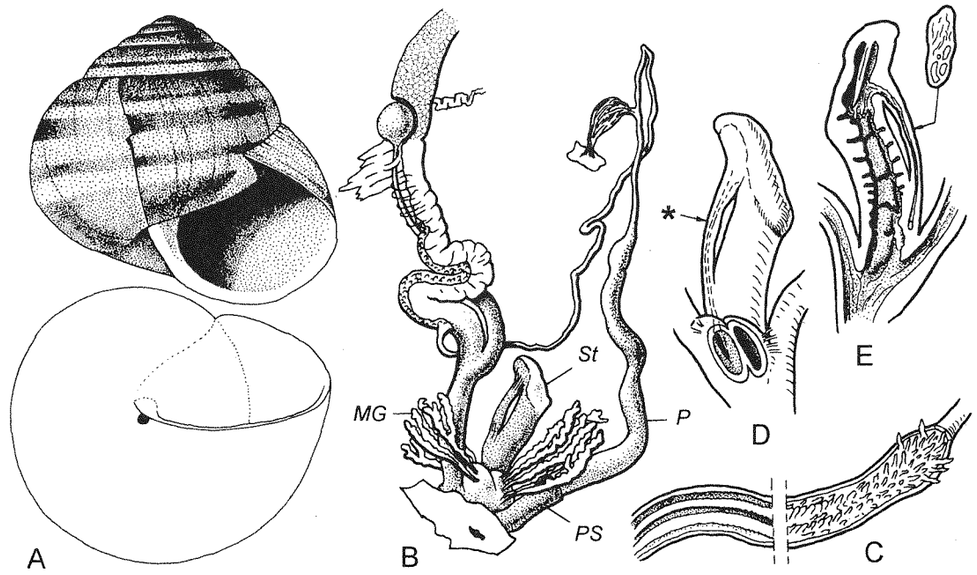


Fig. 2152. ***Ponsadenia* (*Mesasiata*) *duplocincta*** (Martens, 1879).
South shore of Issyk-kul Lake, Tien-Shan Mts., August 12, 1970. A — shell. B — reproductive tract. C — interior of epiphallus and penis. D, E — interior of stylophore and supraatrial bladder. **Moscow** No. Lc-18842.

keeled. Spire scarcely elevated. Color nearly uniformly corneous. Surface of embryonic whorls minutely papillose, with numerous traces of hairs attachment. Postnuclear sculpture of radial elements of 2 sorts: delicate radial striation and rows of thin periostracal round-triangular scales, size of which increasing from suture towards periphery. Aperture rather narrow, strongly oblique, columellar and baso-palatal margins below peripheral angle slightly reflexed; lip absent. Umbilicus moderately broad, perspective. Height 4.5-5.2, diam. 10.6-11.5 mm (5.0 × 11.1 mm).

Penis without caecum. Small mucus glands situated on lower end of "bridge"; this end incorporated into tissue of stylophore base.

DISTRIBUTION. Central Asia (Tarbagatai, Dzungar and Terskey Ridges). 1 sp.

Ponsadenia (*Mesasiata* Schileyko, 1978)
Fig. 2152

Schileyko, 1978: 120.

TYPE SPECIES — *Helix duplocincta* Martens, 1879; OD.

Shell large, globose or nearly so, rather solid, of 6 moderately convex whorls. Last whorl rounded, slightly deflected. Spire shortly conic to dome-shaped. Color pattern generally composed of yellow or corneous background and a few brown bands, which sometimes fused; rarely without bands. Embryonic whorls nearly smooth. Rest surface with irregular radial wrinkles and distinct spiral grooves. Aperture large, rounded, slightly oblique, its margins somewhat thickened. Columellar margin subvertical, well dilated. Umbilicus very narrow, semicovered. Height 19-26, diam. 22-27 mm (25.2 × 26.0 mm).

Penis without caecum. Reservoir of mucus glands lies on surface of atrial region and connected by bridge with stylophore summit. Mucus glands enter each of 2 parts of reservoir by several independent branches.

DISTRIBUTION. NE regions of Central Asia including NW China. Probably 1 variable sp.

Ponsadenia (*Ponsadenia* s. str.)
Fig. 2153

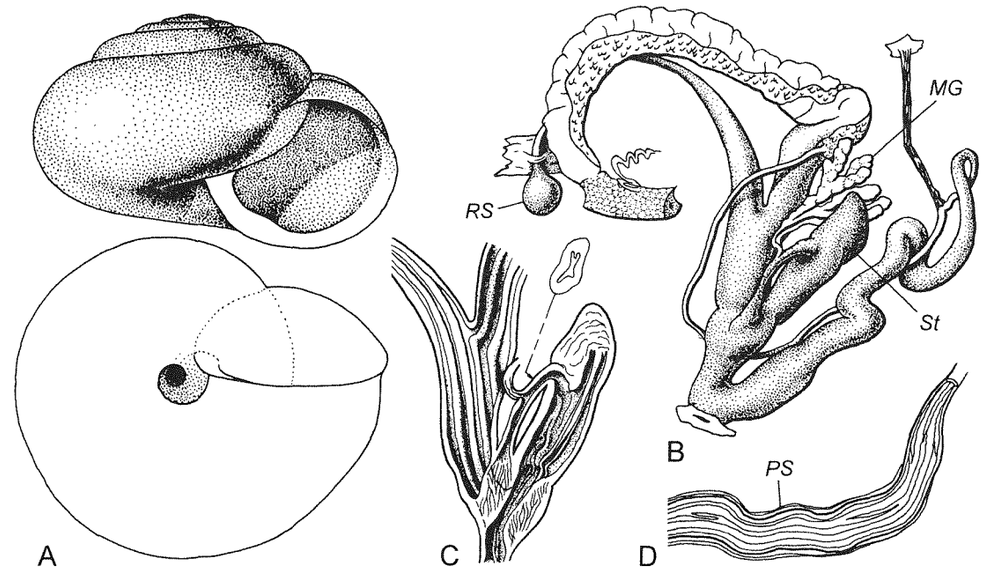


Fig. 2153. ***Ponsadenia* (*Ponsadenia*) *semenovi*** (Martens, 1864).
Naryn River valley upstream of Toktogul [Tien-Shan Mts.], May 31, 1972. A — shell. B — reproductive tract. C — interior of stylophore and vagina. D — interior of penis. **Moscow** No. Lc-18844.

Shell depressed, moderately solid, of 5-5.5 strongly convex whorls, last whorl gradually and slightly descending in front. Spire dome-shaped, apex a little protruding. Color grey, brownish-pink or bluish-grey, nearly monochromatic; just basal surface a little lighter. Embryonic whorls smooth or with chequer-wise microscopic granules, postapical sculpture a fine radial striation; indistinct spiral grooves are visible in places on body whorl. Aperture subcircular, slightly oblique, margins simple, columellar somewhat reflexed. Sometimes baso-columellar tubercle may be present. Umbilicus narrow, not perspective. Height 4-10, diam. 6-15 mm (8.3 × 12.8 mm).

Penis without caecum. Reservoirs of mucus glands as such not expressed; mucus glands entering middle of bridge connecting atrial area with stylophore summit.

DISTRIBUTION. Tien-Shan. 2 spp.

Ponsadenia (*Dzungaria* Schileyko, subg. nov.)
Fig. 2154

ETYMOLOGY: after the name of Dzungar Ridge.

Gender: feminine.

TYPE SPECIES — *Bradybaena pseudoferghanica* Schileyko, 1978.

Shell nearly flat to depressed, moderately solid, of 5-6 almost flat whorls. Last whorl strongly but gradually descending, with bluntly angulated periphery. Apex protruding. Color uniformly yellow to whitish, with vague, diffuse radial markings. Embryonic whorls very finely microgranulated, postnuclear sculpture of irregular radial wrinkles and delicate spiral lines. Aperture ovate, oblique, margins sharply reflexed, peristome insertions approached. Umbilicus moderately broad, open, perspective. Height 9-12, diam. 18-22 mm (9.3 × 18.7 mm).

Penis with a short caecum. Reservoirs of mucus glands fused to each other and modified into supraatrial bladder connected with stylophore apex by a bridge that tightly connected with walls of stylophore. Each of 2 mucus glands enters supraatrial bladder independently, their ducts sit side-by-side.

DISTRIBUTION. Central Asia (Tarbagatai, Dzungar, Zailijsky and Kyrgyz Ridges). 1 sp.

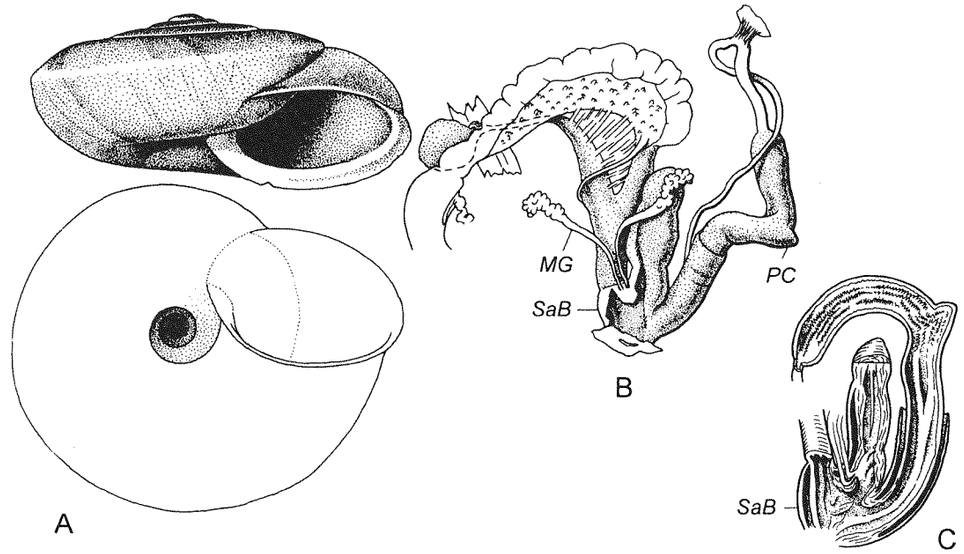


Fig. 2154. ***Ponsadenia* (*Dzungaria*) *pseudoferghanica*** (Schileyko, 1978).
A — shell: Dzungar Ridge. Holotype. **SPb**. B, C — upper part of Charsa-chai River valley, Dzungar Ridge, June 12-15, 1969. B — reproductive tract. C — interior of penis and stylophore. Paratype. **Moscow** No. Lc-18943. ***SaB*** — supraatrial bladder.

Ezohelix Kuroda et Emura, 1938
Fig. 2155

Kuroda & Emura, 1938: 176.

TYPE SPECIES — *Eulota gainesi* Pilsbry, 1900; OD.

Shell semiglobose, capacious, thin, somewhat translucent, of 4.75-5.25 convex whorls. Last whorl rounded, a little descending in front. Color yellowish-corneous, with or without brown supraperipheral band. Embryonic whorls vaguely granulated. Later whorls with thin radial striation and wavy spiral grooves; elements of malleation on body whorl usually present. Aperture ample, rounded, with thin, shortly reflexed margins. Umbilicus narrow. Height 26-31, diam. 30-39 mm (27.4 × 35.0 mm).

Epiphallus very short, not differing from vas deferens; boundary between these ducts marked by attachment of penial retractor. Penis elongate-clavate, internally with many thin, high axial folds and pad-like stimulator near epiphallic pore; surface of stimulator covered with numerous minute papillae. Stylophore elongated, sometimes twisted basally. Mucus glands of tubular structure, gathered in 2 bundles which united in common duct within large accessory sac. Base of spermathecal stalk distinctly swollen.

DISTRIBUTION. Japan. 2 spp.

Paraegista Kuroda et Azuma, 1951
Fig. 2156

Kuroda & Azuma, 1951: 75.

TYPE SPECIES — *Paraegista takahidei* Kuroda et Azuma, 1951; OD.

Shell depressedly trochoid, rather thin, of 5 moderately convex whorls. Last whorl rounded, somewhat descending in front. Color straw, nearly uniform. Embryonic whorls smooth, rest surface densely covered with very short, stiff setae. Aperture oblique, widely ovate, with thin, moderately reflexed margins. On baso-columellar margin there is entering plica corresponding to groove on basal surface. Umbilicus rather wide, quite perspective. Height 7-10, diam. 12-15 mm.

Epiphallus short, only slightly wider than vas deferens; penial retractor attached to junction between these ducts. Penis cylindrical-clavate, long. Stylophore relatively small, with swollen base. Mucus gland compact, alveolar, of 2 lobes, entering well de-

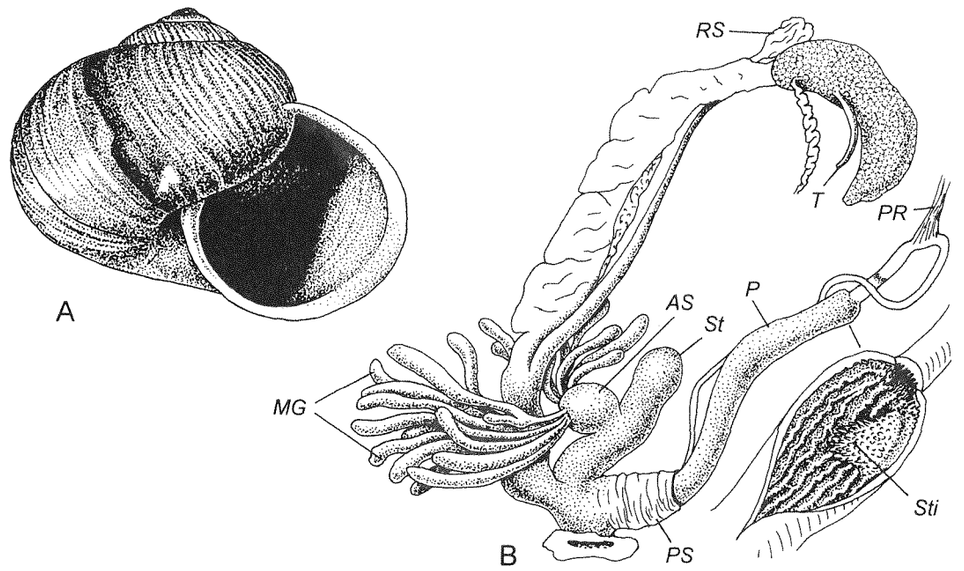


Fig. 2155. ***Ezohelix gainesi*** (Pilsbry, 1900).
A — shell: Ushika, Teshio, Japan. Holotype. **Phil**. No. 76277. B — reproductive tract and interior of penis. Hokkaido Prefecture, Hokkaido Island. **Phil**. No. A-9503.

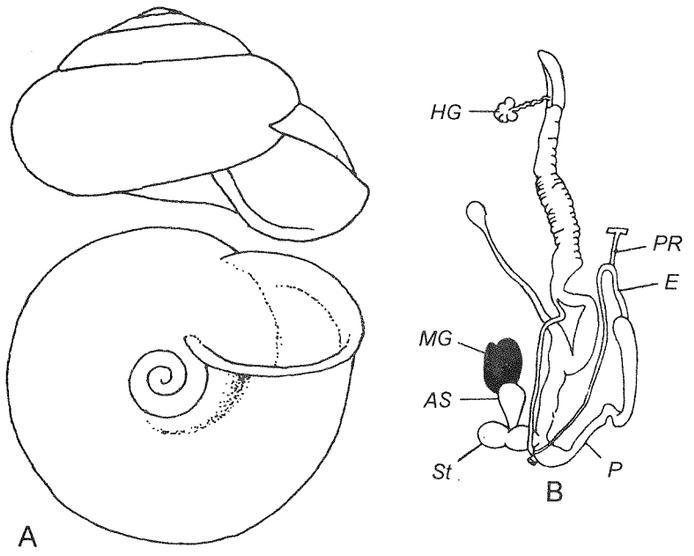


Fig. 2156. ***Paraegista takahidei*** Kuroda et Azuma, 1951.
A — shell. B — reproductive tract. After Azuma, 1995.

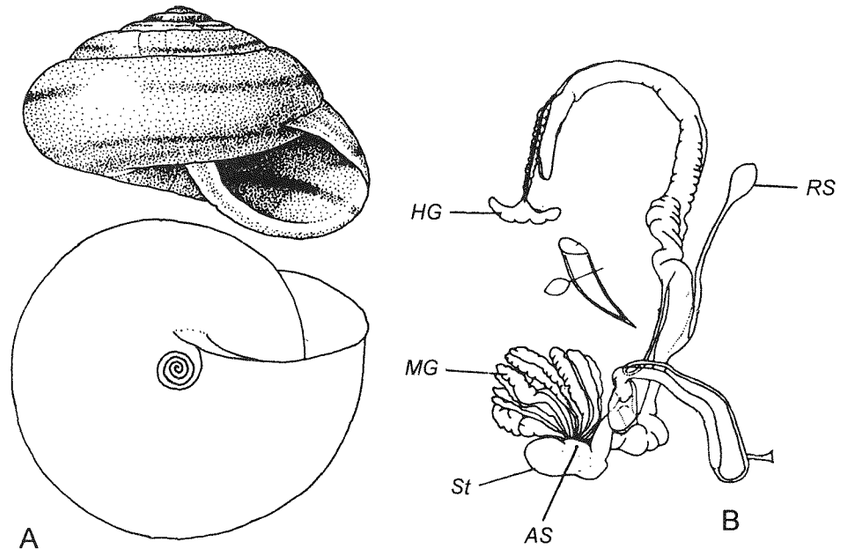


Fig. 2157. ***Ainohelix editha*** (A. Adams, 1868).
A — shell: near Sapporo [Hokkaido Island, Japan]. **Phil**. No. 85103. B — reproductive tract and dart enlarged. After Azuma, 1995.

veloped, capacious accessory sac. Vagina rather short. Basal swelling of spermathecal stalk markedly expressed.

DISTRIBUTION. Japan. 2 spp.

Ainohelix Kuroda et Taki, 1933
Fig. 2157

Kuroda & Taki, 1933: 323 (*Fruticicola* subg.).

TYPE SPECIES — *Helix editha* A. Adams, 1868; SD Minato, 1988.

Shell depressed-conic, rather thin, translucent, of 5.5-6 convex whorls. Body whorl rounded, practically straight or slightly deflected. Color whitish-yellow, with 2 brown spiral bands — above and under periphery. Embryonic whorls pitted. Later whorls weakly sculptured with very fine radial and spiral striae. Aperture broadly ovate, somewhat oblique, margins thin, baso-columellar margin reflexed. Umbilicus rather narrow. Height 11-16, diam. 19-30 mm (15.5 × 25.0 mm).

Epiphallus very short, externally not distinguished from slender vas deferens, boundary between these ducts marked by penial retractor attachment. Penis of moderate length, cylindrical. Stylophore large, mucus gland composed of numerous tubular branches, entering accessory sac without visible fusion of basal ends of branches. Vagina rather long. Basal swelling of spermathecal stalk poorly expressed.

DISTRIBUTION. Japan. 1 sp.

Phaeohelix Kuroda et Habe, 1949
Fig. 2158

Kuroda & Habe, 1949: 63 (*Bradybaena* subg.).

TYPE SPECIES — *Bradybaena submandarina* Pilsbry, 1890; OD.

Shell depressedly trochoid to subglobose, moderately thin, of 5.5-6.25 slightly convex whorls. Body whorl widely rounded, a little deflected. Spire nearly conic to dome-shaped. Color whitish to chestnut, with or without a narrow reddish or brown peripheral band. Embryonic whorls smooth, later whorls with fine radial striation and spiral wavy grooves. Aperture broadly ovate, slightly oblique, margins reflexed throughout. Umbilicus narrow, open or partly covered. Height 12-25, diam. 22-27 mm (21.4 × 23.6 mm).

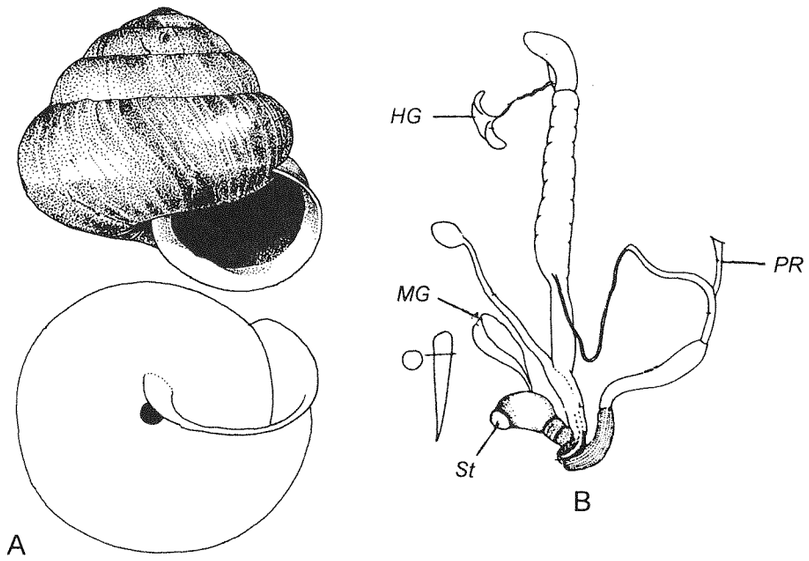


Fig. 2158. ***Phaeohelix submandarina*** (Pilsbry, 1890).
A — shell: Tanegashima Island, Japan. **Paris**. B — reproductive tract and dart enlarged. After Kuroda & Habe, 1949.

Vas deferens very thin, gradually and slightly enlarged into cylindrical epiphallus. Penis rather long, separated from epiphallus by well expressed enlargement. Stylophore proper rather small, accessory sac enormously developed. Mucus gland alveolar, compact, composed of 1-3 lobes, entering accessory sac by common duct. Vagina short. Basal swelling of spermathecal shaft weakly developed.

DISTRIBUTION. Japan. 4 spp. & subspp.

Trichobradybaena Wu et Guo, 2003
Fig. 2159

Wu & Guo, 2003: 241.

TYPE SPECIES — *Helix submissa* Deshayes, 1873; OD.

Shell depressed, thin but rather firm, dull to slightly shining, mostly semitransparent, of 5-6.5 convex whorls. Last whorl rounded to sharply keeled, straight or moderately deflected. Color uniformly whitish, corneous-brown, yellowish-brown, or brown. Embryonic whorls finely granulated. Postapical whorls practically smooth to granulated, with minute periostracal scales or short hairs. Aperture ovate to roundly rhombic, more or less oblique, toothless, with thin or thickened basally margins. Parietal callus indistinct. Umbilicus broad, perspective. Height 5.9-9.4, diam. 11.8-20.9 mm (6.8 × 12.9 mm).

Jaw with 6 to 9 ribs dentating concave margin.

Vas deferens long, slender. Penis short and swollen to rather long and slender, with simple caecum near junction of penis and vas deferens. Internally penis with numerous thin, corrugated, locally anastomosing pilasters. Penis sheath short to long. Penial retractor terminal. Stylophore and vagina distally surrounded by a membranous sac. Stylophore somewhat elongated, containing straight or slightly curved dart; distal part of dart in cross-section two-bladed. Accessory sac small. In sagittal section stylophore internally with 4 valvules. Mucus glands with 2 ducts. Spermathecal stalk moderately long, more or less swollen basally; reservoir adhering to upper half of spermoviduct.

DISTRIBUTION. Central China (valley of Yangtze River and region between Yellow River and Yangtze River). 3 spp.

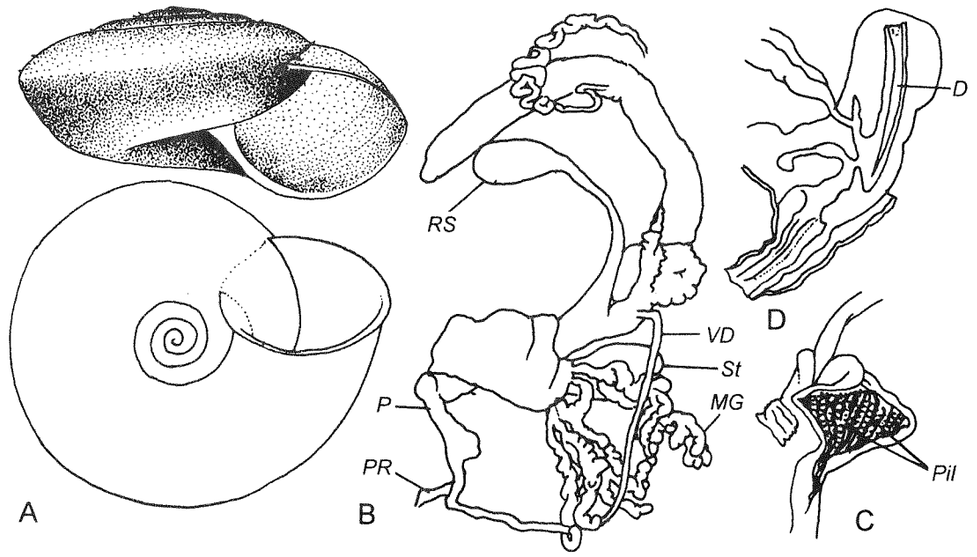


Fig. 2159. ***Trichobradybaena submissa*** (Deshayes, 1873).
A — shell: Elasy Mts., Sichuan Prov., China. **Moscow** No. Lc-27119. B — reproductive tract. C — interior of penis. D — sagittal section of stylophore. *D* — dart. After Wu & Guo, 2003.

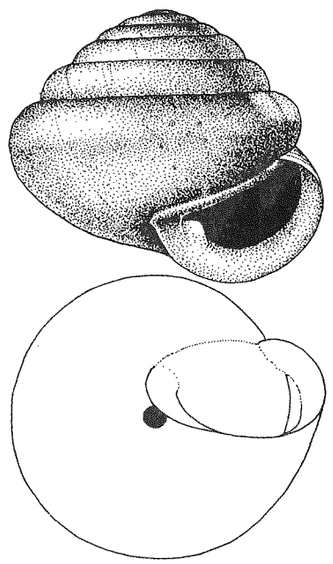


Fig. 2160. ***Semibuliminus beresowskii*** (Moellendorff, 1899).
Gansu, China. **SPb**.

Semibuliminus Moellendorff, 1899
Fig. 2160

Moellendorff, 1899: 133 (*Buliminopsis* sect.).

TYPE SPECIES — *Buliminopsis beresowskii* Moellendorff, 1899; monotypy.

Shell globose, solid, opaque, silky glossy, of 7-7.5 tightly coiled, convex, shouldered whorls. Body whorl distinctly deflected shortly behind aperture. Color light-corneous, whitish around umbilicus. Embryonic whorls smooth. Later whorls with weak, irregular radial wrinkles and numerous, easily deciduous hairs; when hairs absent, scars of them well visible. Aperture rounded-triangular, margins shortly reflexed, with heavy lip inside. Parietal callus well developed. Baso-columellar margin occupied by short lamellar tubercle. Umbilicus narrow, cylindrical. Height 6.9-7.5, diam. 7.5-8.0 mm (6.9 × 7.6 mm).

DISTRIBUTION. China (Gansu Prov.). 1 sp.

Metodontia Moellendorff, 1886
Fig. 2161

Moellendorff, 1886: 191 (*Helix* sect.).

— *Tetrodontina* Ancey, 1887: 64 (for *Helix yantaiensis, tetrodon* and *houaiensis*).

TYPE SPECIES — *Helix* (*Metodontia*) *hemipleuris* Moellendorff, 1885; monotypy.

Shell globose-turbinate to moderately depressed, moderately solid to rather thin, of 5-7.5 tightly coiled whorls. Last whorl rounded or subangulated, not descending in front. Color whitish to yellowish, sometimes with 1 (peripheral) or 2 (peripheral and wider subsutural) bands. Embryonic whorls glabrous. Later whorls delicately radially striated or plicated. Aperture broadly ovate to lunar, slightly oblique, margins a little reflexed. Parietal wall with 2 approximating tuberculous teeth; 2 similar teeth situated on thick internal remote lip; on columellar margin 1 smaller tooth may be present. Umbilicus narrow, often nearly covered. Height 8-11, diam. 6.5-14.0 mm (7.9 × 9.5 mm).

DISTRIBUTION. N China. 3-4 spp.

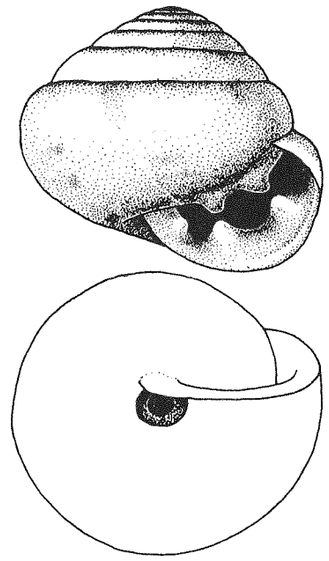


Fig. 2161. ***Metodontia hemipleuris*** (Moellendorff, 1885).
"Tsi-shan, Shensi, China". Lectotype. **Senck**. No. 9030.

Karaftohelix Pilsbry, 1927
Fig. 2162

Pilsbry, 1927b: 13 (*Eulota* subg.).

TYPE SPECIES — *Eulota fiscina* Fulton, 1905; OD.

Shell somewhat depressed to depressedly globose, rather thin, of 6-6.5 weakly convex whorls. Body whorl rounded, slightly descending in front. Spire almost conic to dome-shaped. Color uniformly yellow or (more often) with 1 or 3 brown bands; in latter case 1st band lies under suture, 2nd on periphery, 3rd on basal surface. Embryonic whorls smooth, postnuclear surface with crowded radial wrinkles and distinct spiral grooves. Aperture rounded, oblique, with wide lip inside. Aperture margins sharp, reflexed, sometimes brownish. Umbilicus rather narrow, semicovered. Height 5.5-38.0, diam. 7-38 mm (27.8 × 32.8 mm).

Basal part of long cylindrical penis surrounded by a thin sheath. Internally penis with longitudinal pilasters becoming more vague toward vas deferens; upper section of penis contains an elongated, short, tubercular stimulator. Stylophore clavate, with narrowed basal section. Alveolar mucus gland composed of several elongate branches which enter well developed globular accessory sac very close to each other. Vagina short, its lower portion coated by conspicuous collar having narrow lumen of complex configuration. Basal swelling of spermathecal duct not strongly expressed.

DISTRIBUTION. Russian Far East including Sakhalin and S Kurile Islands; N Japan. 15-20 spp. with numerous forms or subspp.

Acusta Martens, 1860
Fig. 2163

Martens in Albers, 1860: 56 (*Helix* subg.).

- ? *Manchurohelix* Taki, 1939: 132, 196 (*Bradybaena* subg.; t.-sp *Eulota lavrushini* Cockerell, 1926; OD).

TYPE SPECIES — *Helix ravida* Benson, 1842; OD.

Shell subglobose, inflated, thin, fragile, translucent, of 5-6 convex whorls. Last whorl widely rounded, straight. Color yellowish, olive-greenish, corneous, or brown; a brown supraperipheral band sometimes present (rarely there are 3 bands). Embryonic whorls smooth, rest surface with more or less regular radial striation and deeply incised spiral grooves. Aperture large, rounded, slightly oblique, with sharp, simple margins, upper part of columellar margin more or less expanded. Umbilicus dot-

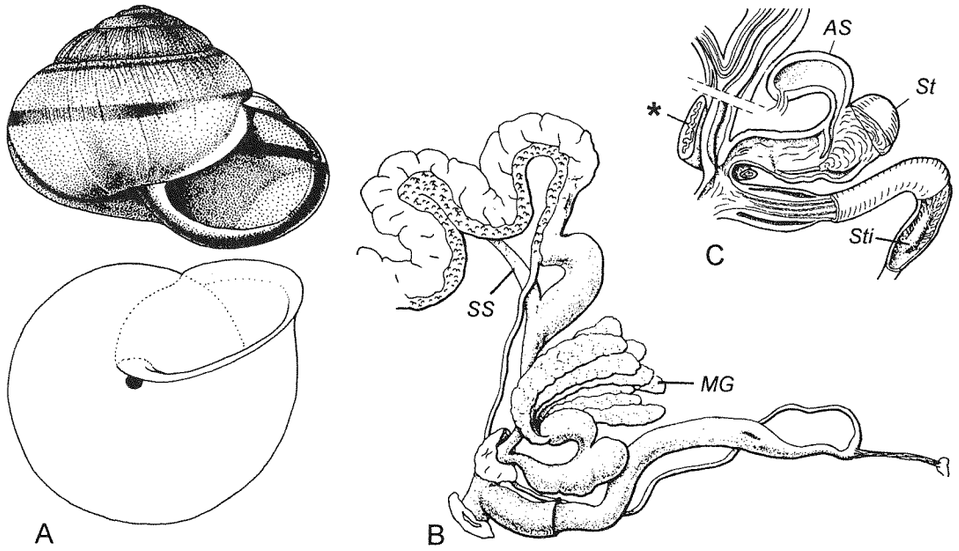


Fig. 2162. ! ***Karaftohelix weyrichi*** (Schrenck, 1867).
Suburbs of Yuzhno-Sakhalinsk, S Sakhalin, August 24, 1971. A — shell. B — reproductive tract. C — interior of distal parts of genitalia. **Moscow** No. Lc-16323. ***Asterisk*** — vaginal collar. After Schileyko, 1978.

like. Height 15-30, diam. 20-35 mm (26.2 × 33.0 mm).

Vas deferens slender, continuing into very short epiphallus; boundary between these duct marked by penial retractor attachment. Penis elongated, its distal portion embraced by a short sheath. Internally penis with weak relief, its upper part may contain a small elongated stimulator. Stylophore clavate. Large mucus glands (in type species) composed of 2-4 branches with alveolar upper and tubular basal parts, entering independently but very tightly to each other clavate accessory sac and united within it. Vagina of moderate length, its lower portion coated by collar (like in *Karaftohelix*). Basal swelling of spermathecal stalk well expressed.

DISTRIBUTION. Russian Far East, E China, Korean Peninsula, S Kurile Islands, Japan. 10-12 spp. & subspp.

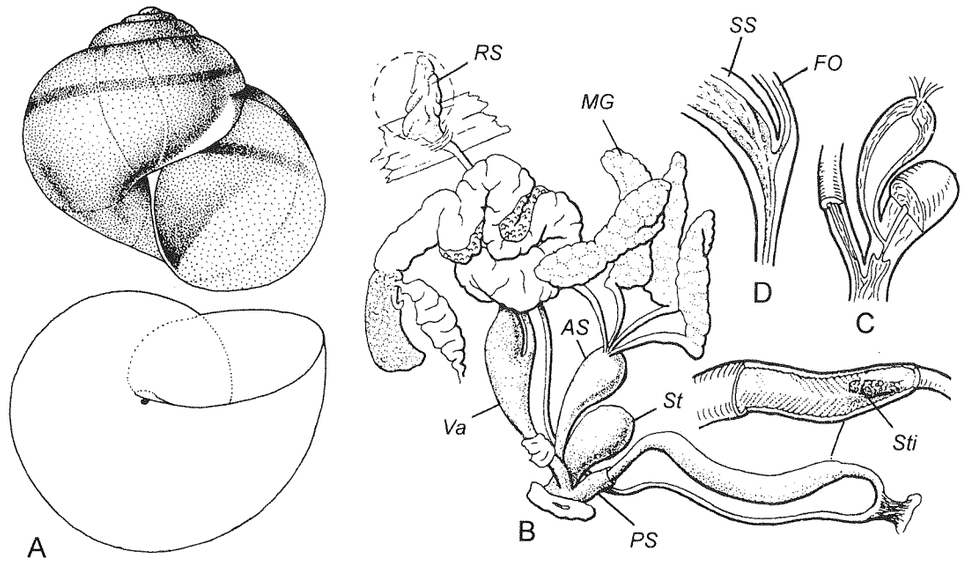
REMARK. Taki (1939) described the subgenus *Manchurohelix* which has the shell very similar to that of *Acusta* but differs mainly by the absence of additional sac of stylophore and somewhat reduced in size mucus glands. In this connection I would like to notice that reduction of some parts of reproductive tract is a rather common phenomenon among helicoids (Schileyko, 1978). On the other hand, as I had no possibility to dissect any species of *Manchurohelix*, I can assume that this taxon does exist. Therefore, I add the drawings of shell and reproductive tract of *"Bradybaena (Manchurochelix)" lavrushini* (Cockerell, 1926).

Coccoglypta Pilsbry, 1895
Fig. 2164

Pilsbry, 1895 (1893-1895): 211 (*Eulota* sect.).

TYPE SPECIES — *Helix dimidiata* Heude, 1888; OD.

Shell depressed-conoidal, rather solid, dull, of 5-6 slightly convex whorls. Last whorl inconspicuously angled at periphery, rather strongly descending in front near aperture. Spire low, nearly conic. Color uniformly light-corneous to brown. Embryonic whorls practically smooth, just with very indistinct radial wrinkles. 1st postapical whorl with weak radial wrinkles, on 2nd whorl spiral striation added, on later whorls there is a beautiful, quite clear granulation; on basal surface a fine spiral striation is visible. Aperture rounded, oblique, its upper margin



straight, rest moderately reflexed. Umbilicus broad, funnel-shaped. Height 9-16, diam. 14-30 mm (15.2 × 30.0 mm).

Vas deferens slender; its is unclear if there is an epiphallus, or penial retractor inserted directly to upper end of penis. Retractor very short and stout. Penis more or less cylindrical, internally with fine longitudinal pilasters. Stylophore of moderate size, accessory sac of about same size and shape. Each of 2 alveolar, capacious mucus glands enters accessory sac independently. Spermathecal stalk enormously long, strongly coiled and twisted; its base practically not swollen; a little higher an elongated mass of spermia with no spermatophore has been found in figured specimen.

DISTRIBUTION. China. 2 Recent spp.

? *Mikiria* Godwin-Austen, 1918
Fig. 2165

Godwin-Austen, 1918: 611.

TYPE SPECIES — *Mikiria diyungensis* Godwin-Austen, 1918; OD.

Shell depressed-conic, somewhat lentiform, of about 6 slightly convex, a little shouldered whorls. Last whorl with cord-like keel, a little descending in front. Color corneous or pale-ochraceous. Embryonic whorls vaguely, microscopically granulated.

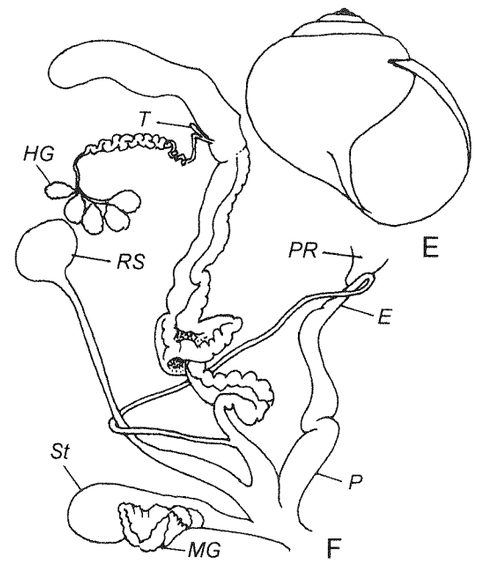


Fig. 2163. A, B, C, D - ***Acusta ravida*** (Benson, 1842).
A — shell: Putyatin Island, Peter The Great Bay. **SPb**. B, C, D — Peishula village near Vladivostok, Primorye, July 3, 1971. B — reproductive tract and interior of penis. C — interior of stylophore and accessory sac. D — interior of free oviduct/spermathecal stalk junction. After Schileyko, 1978. E, F — ***"Bradybaena (Manchurohelix)" lavrushini*** (Cockerell, 1926). E — shell. F — reproductive tract. After Taki, 1939.

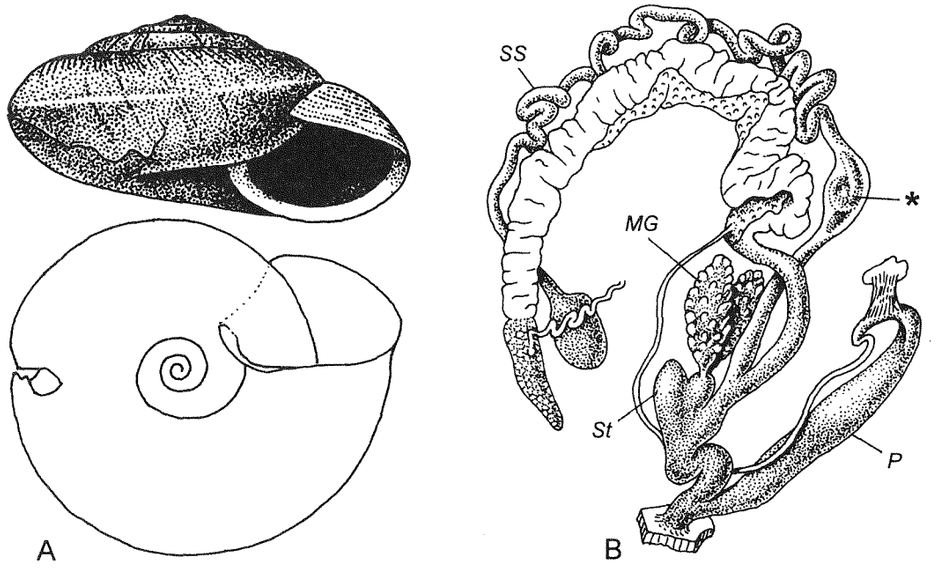


Fig. 2164. ! ***Coccoglypta pinchoiana*** (Heude, 1886). Emei Shan, Sichuan Prov., China, June 22, 1955. A — shell. B — reproductive tract. **SPb**. ***Asterisk*** — sperm mass in spermathecal stalk.

Postapical sculpture of very fine radial wrinkles and indistinct granulation. Aperture subcircular, well oblique, with thin, shortly reflexed margins. Umbilicus moderately broad, quite perspective. Height 7.0-9.2, diam. 11.5-18.0 mm (9.2 × 16.3 mm).

Jaw with about 16-18 ribs.

Vas deferens moderately short, entering epiphallus with a slight sinuosity. Epiphallus long, slender, only slightly wider than vas deferens. Penis also long, subcylindrical. Penial retractor attached to proximal part of epiphallus. Free oviduct rather short. Vagina long, without any accessory organs. Spermatheca almost sessile.

DISTRIBUTION. N India (Assam). 3 spp.

REMARK. Taxonomic position of *Mikiria* is unclear because the original anatomical description and illustration are not sufficient enough. It might be placed in Camaenidae.

? *Neseulota* Ehrmann, 1912
Fig. 2166

Ehrmann, 1912: 61 (*Plectotropis* subg.).

TYPE SPECIES — *Eulota hemisphaerica* Moellendorff, 1892; OD.

Shell depressedly conic, thin, translucent, dull, of 4-4.25 whorls. Last whorl straight, with peripheral keel. Color light-grey, keel lighter. Embryonic whorls with microscopic radial wrinkles, later whorls nearly smooth, with extremely fine spiral incised lines; on base spirals somewhat coarser. Aperture oblique, columellar and basal margins slightly reflexed. Umbilicus narrowly open. Height 7.8-8.6. diam. 12.5-13.6 mm (8.6 × 13.6 mm).

DISTRIBUTION. Indonesia (Tenimber [= Kepulauan Tanimbar] and Dammer Islands). 2 spp.

REMARK. Perhaps, the genus *Neseulota* belongs to Camaenidae (anatomy unknown).

Armandiella Ancey, 1901
Fig. 2167

Ancey, 1901: 144 (nom. nov. pro *Armandia* Ancey, 1883).

— *Armandia* Ancey, 1883: 143 [nom. praeocc., non Philippi, 1881 (Lepidoptera); t.-sp. *Helix davidi* Deshayes, 1870; OD].

TYPE SPECIES — *Helix davidi* Deshayes, 1870; OD.

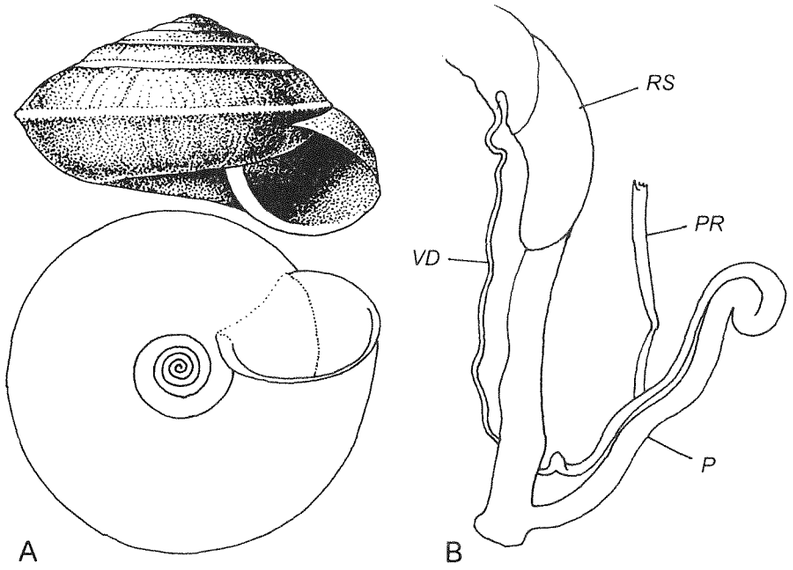


Fig. 2165. ***Mikiria diyungensis*** Godwin-Austen, 1918.
A — shell: Singpho Hills, Diyung Valley [N India]. "Type". **London** No. 1995073. B — reproductive tract. After Godwin-Austen, 1918.

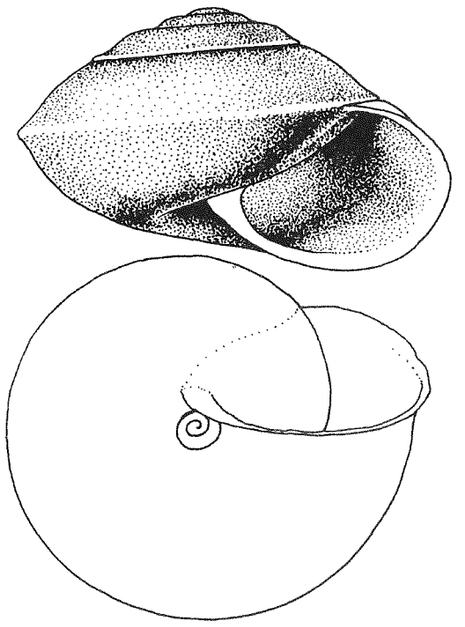


Fig. 2166. ***Neseulota hemisphaerica*** (Moellendorff, 1892).
Sjerah, Tenimber Island [Indonesia]. "Typus". **Senck**. No. 8859.

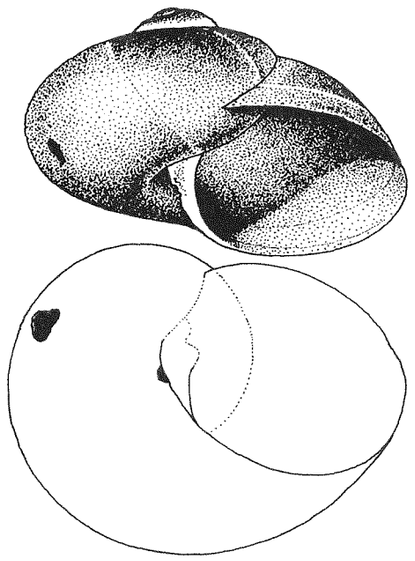


Fig. 2167. ***Armandiella davidi*** (Deshayes, 1870).
Moupin [Mou-p'ing, China]. Syntype. **Paris**.

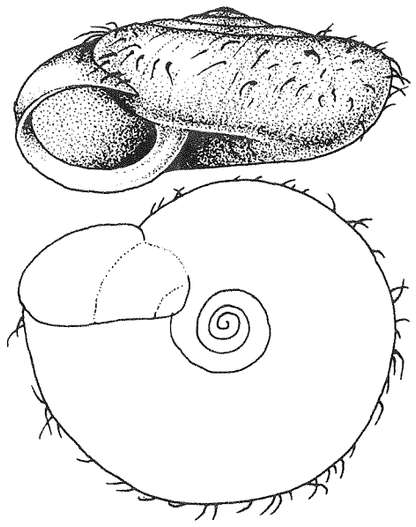


Fig. 2168. ***Trichocathaica lyonsae*** Gude, 1919. Min Valley, China. "Type". **London** No. 1922.8.29.86.

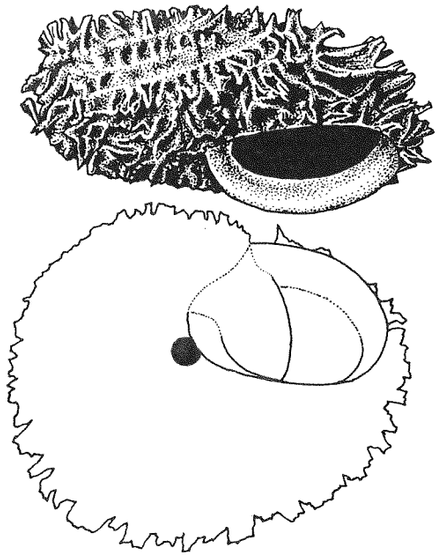


Fig. 2169. ***Grabauia tsishanensis*** Yen, 1935. China, mountains near Tsishan, South of Shanxi Province. ? syntype. **Moscow** No. Lc-24783 (**Paris**).

Shell trochoid, thin, subtranslucent, dull, of about 3.5 convex whorls. Last whorl rounded, slightly descending in front. Color whitish-corneous. Embryonic shell smooth. Rest surface with fine, irregular, radial, crowded wrinkles, at first glance looks nearly glabrous. Aperture wide, strongly oblique, margins thin, straight. Umbilicus narrow, semicovered. Height 7-8, diam. 8-12 mm (7.5 × 10.0 mm).

DISTRIBUTION. Tibet and adjacent territory of China. 4-5 spp.

Trichocathaica Gude, 1919
Fig. 2168

Gude, 1919: 119 (*Cathaica* subg.).

TYPE SPECIES — *Trichocathaica lyonsae* Gude, 1919; OD.

Shell sinistral, depressed-conoid, thin, of 6 quite convex whorls which increase slowly at first, then rather suddenly. Last whorl rounded, not sharply descending in front, subangulated above middle line and around umbilicus. Color corneous, whitish on base. Embryonic whorls minutely pustulate. Postnuclear sculpture of small elongated tubercles that more or less regularly arranged in radial rows; there are long hairs, when they lost small scares retain. Aperture subcircular, well oblique, with smoothed, white inner lip; edges of upper palatal margin straight, basal and columellar margins much reflexed. Umbilicus wide and deep. Height 8-9, diam. 18-20 mm (9.0 × 17.8 mm).

DISTRIBUTION. China (Sichuan, Yunnan). 1 sp.

? *Grabauia* Yen, 1935
Fig. 2169

Yen, 1935: 14.

TYPE SPECIES — *Grabauia tsishanensis* Yen, 1935; OD.

Shell inflated, orbicular, rather solid, of 5.25-5.5 rather convex whorls. Body whorl ventricose, rounded, moderately deflected near aperture. Color of very thick periostracum grey. Embryonic sculpture of dense granulation. Postapical whorls with oblique-spiral series of extraordinary developed, hairy periostracal lamellae. Periostracum deciduous. Aperture widely lunate, quite oblique, porcellaneous within, with strong, rounded, white lip; peristome insertions somewhat approached. Umbilicus narrowly

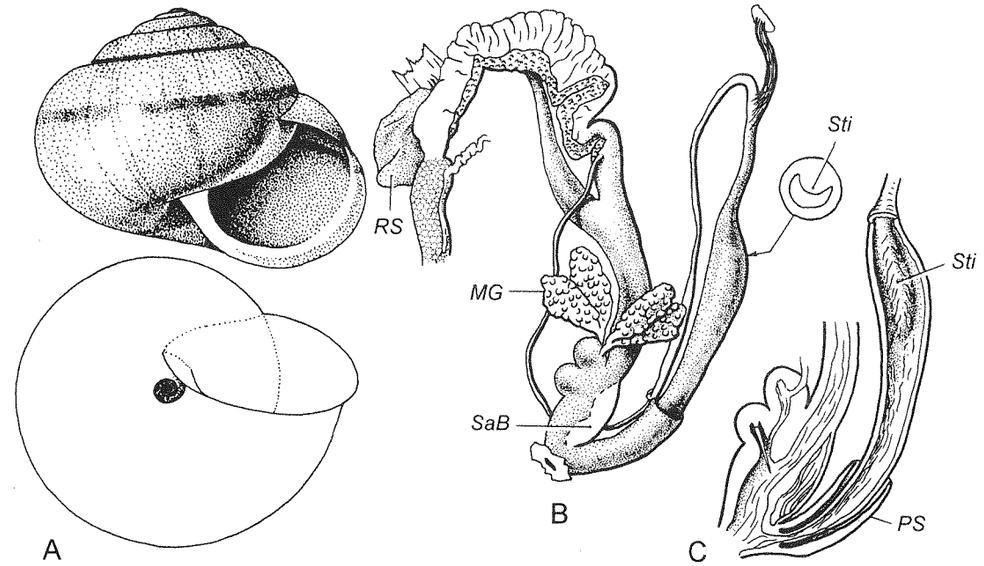


Fig. 2170. ***Fruticicola fruticum*** (Müller, 1774). Romashkovo near Moscow [Russia], May 5, 1958. A — shell. B — reproductive tract. C — interior of penis and vagina. After Schileyko, 1978.

open, partially covered. Height 7.6-9.5 diam. 12.5-15.0 mm (7.6 × 13.5 mm).

DISTRIBUTION. E China (Shanxi Province). 1 sp.

REMARK. The very peculiar genus *Grabauia* may belong to either Bradybaenidae or Camaenidae. The taxonomic decision should be postponed until anatomy of *G. tsishanensis* is known.

Fruticicola Held, 1837
Fig. 2170

Held, 1837: 914.

— *Eulota* Hartmann, 1843: 179 (t.-sp. *Helix fruticum* Müller, 1774; monotypy).

— *Campylocathaica* Andreae, 1900: 5 (*Cathaica* subg.; t.-sp. *Helix przewalskii* Martens, 1882; OD).

— *Kaznakoviella* Lindholm, 1922: 312 (*Cathaica* subg.; t.-sp. *Helix perlucens* Rosen, 1901; OD).

— *Virginihelix* Kuroda et Habe, 1949: 64 [*Bradybaena* subg.; t.-sp. *Ganesella virgo* Pilsbry, 1926 (= *Helix arcasiana* Crosse et Debeaux, 1863); OD].

— *Koreanohadra* Kuroda et Habe, 1949: 65 (*Fruticicola* subg.; t.-sp. *Eulota kurodana* Pilsbry, 1926; OD).

Schileyko, 1978: 123 (as *Bradybaena*).

TYPE SPECIES — *Helix fruticum* Müller, 1774; SD Herrmannsen, 1847.

Shell highly variable — from globular to lens-shaped, thin to moderately solid, of 4.5-6.5 moderately convex to flattened whorls. Last whorl evenly rounded to sharply keeled. Color white to corneous or chestnut, often with darker peripheral band; sometimes speckled with dark markings. Surface of embryonic whorls ranged from smooth to granulated. Later whorls nearly smooth to radially ribbed; spiral incised lines mostly present. Aperture, according to shell shape, subcircular to narrow, angulated, moderately to strongly oblique, with variously developed lip. Umbilicus narrow to rather broad, never closed. Height 5-22, diam. 11-27 mm (15.6 × 19.7 mm).

Vas deferens long, enters poorly defined epiphallus terminally. Penis long, internally with straight or zigzagged folds of either longitudinal or obliquely-transversal arrangement; in latter case they convergent along one shallow groove. In proximal part

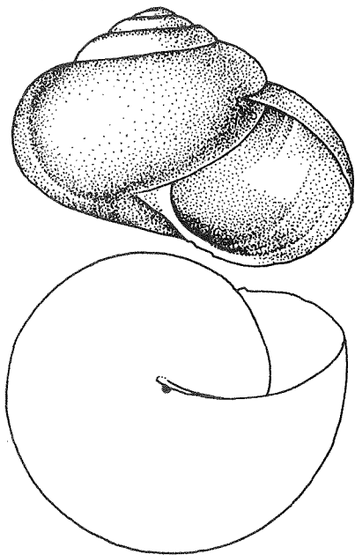


Fig. 2171. ***Chosenelix problematica*** (Pilsbry, 1926).
"Pukhan-san, nr. Seoul" [S Korea]. Holotype. **Phil**. No 99969.

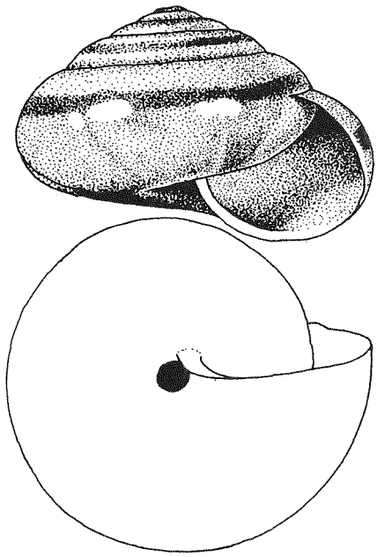


Fig. 2172. ***Chalepotaxis infantilis*** (Gredler, 1881).
"Tonkin" [N Vietnam]. **Paris**.

of penis a small ridge-like stimulator may be present. Base of penis surrounded by a thin sheath. Penial retractor attached to epiphallus. Vagina with ovate or elongated stylophore containing a short, conic dart. Additional sac variously developed but always present. Mucus glands alveolar to tubular, 2 to many in number. Supraatrial bladder sometimes present, at least in some Central Asian species. Basal swelling of spermathecal shaft generally well expressed; reservoir straight, reaching albumen gland.

DISTRIBUTION. Central Asia, Russian Far East, Siberia, China, Japan; 2 spp. in Europe. More than 80 spp. & forms.

REMARK. In the current geological time, a very intensive process of evolution takes place in the malacofauna of China and Central Asia. This process primarily concerns shell, while anatomical characters retain relative morphological stability (a similar phenomenon is observed in Asian Enidae). Formally one could select a number of subgenera, but in reality, so far as I can judge at the moment, there is a continuum, and I was unable to give differential diagnoses for these taxonomic "unities" (Schileyko, 1978). That is why I prefer to place *tentatively* all the species in one large genus.

Chosenelix Pilsbry, 1927
Fig. 2171

Pilsbry, 1927: 462 (*Chloritis* subg.).

TYPE SPECIES — *Chloritis* (*Chosenelix*) *problematica* Pilsbry, 1927; OD.

Shell conic, thin, very fragile, translucent, of about 5 moderately convex whorls. Last whorl straight, rounded. Color uniformly whitish. Embryonic whorls smooth. Later whorls with very weak radial striae and silky, regular spiral lines. Aperture subcircular, moderately oblique, with thin, simple margins; columellar margin dilated above. Umbilicus minutely open. Height 12-13, diam. 15-17 mm (12.0 × 15.5 mm).

DISTRIBUTION. S Korea. 1 sp.

Chalepotaxis Ancey, 1887
Fig. 2172

Ancey, 1887: 22.

TYPE SPECIES — *Nanina* (?) *infantilis* Gredler, 1881; OD.

Shell depressed-conic, thin, translucent, shining, of about 6 moderately convex whorls. Last whorl straight, evenly rounded. Color whitish, with reddish supraperipheral

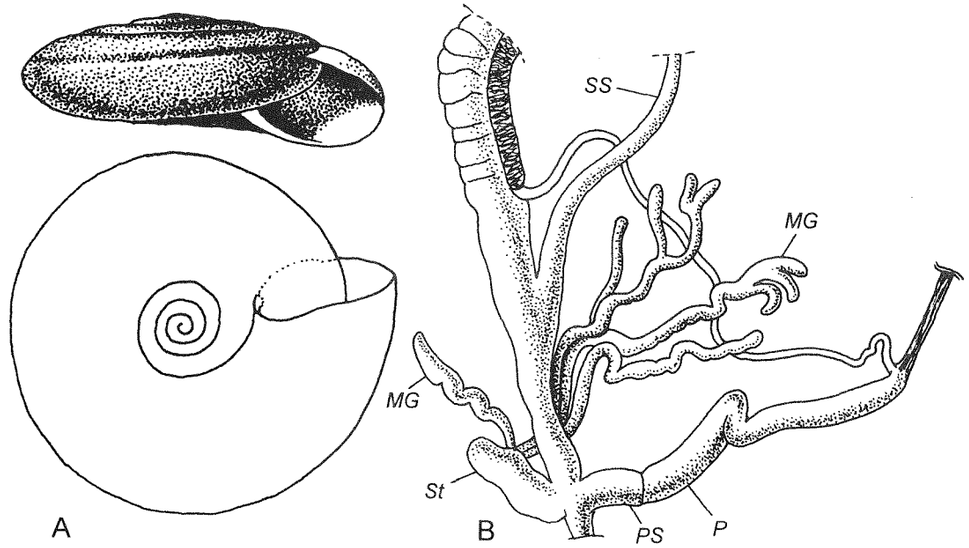


Fig. 2173. ***Stilpnodiscus vernicinus*** Moellendorff, 1899.
A — shell: China. **SPb**. B — reproductive tract. After Wiegmann, 1900.

band. Embryonic whorls polished. Sculpture of later whorls very weak, consisting of vague, much smoothed radial wrinkles. Aperture subvertical, rounded to lunate, with thin, simple margins, columellar margin somewhat reflexed. Umbilicus narrowly open. Height 4-5, diam. 6-7 mm (4.3 × 6.9 mm).

DISTRIBUTION. China, Taiwan, N Vietnam. 2 spp.

Stilpnodiscus Moellendorff, 1899
Fig. 2173

Moellendorff, 1899: 65.

TYPE SPECIES — *Stilpnodiscus vernicinus* Moellendorff, 1899; OD.

Shell much flattened to completely flat, thin to rather solid, glossy, of 5.5-7 flattened or slightly convex whorls. Body whorl not deflected, rounded or with blunt angle above middle line. Color generally yellowish-corneous, uniform or with narrow supraperipheral dark band. Embryonic whorls smooth, rest surface radially striatulate. Aperture elliptic to lunar, somewhat oblique, margins thin or slightly thickened, straight or weakly reflexed. Umbilicus very broad and shallow. Height 5-8, diam. 16.0-19.5 mm (7.4 × 19.2 mm).

Epiphallus missing. Penis long, more or less cylindrical, its lower end surrounded by sheath. Penial retractor inserted to boundary between vas deferens and penis. Stylophore elongated. Mucus gland, a bundle of very long, tubular, simple and branched arms, entering poorly expressed accessory sac. Lower part of vagina absent, upper rather long. Base of spermathecal stalk only slightly expanded.

DISTRIBUTION. Central regions of N China (S Gansu, N Sichuan). 3 spp.

Laeocathaica Moellendorff, 1899
Fig. 2174

Moellendorff, 1899: 86.

TYPE SPECIES — *Laeocathaica christinae* H. Adams, 1870; OD.

Shell sinistral, depressedly conic to much flattened, moderately solid, of 6-8 almost flat whorls. Last whorl abruptly descending in front, angulated to strongly keeled; rarely rounded. Coloration consists of whitish, corneous or chestnut background and mostly with 1-2 dark sub-

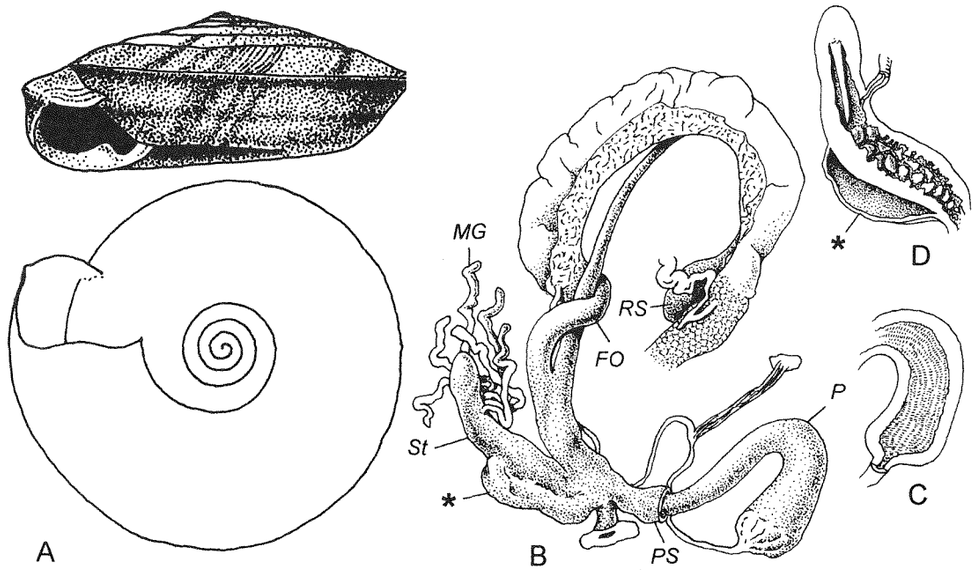


Fig. 2174. A — ! ***Laeocathaica pewzowi*** Moellendorff, 1899.
Shell: Wen-hsien, W China. B, C, D — ! ***Laeocathaica polytyla*** Moellendorff, 1899. Nanping, W China. B — reproductive tract. C — interior of penis. D — interior of stylophore. **SPb**. ***Asterisk*** — bladder on lower part of stylophore.

peripheral bands; besides, usually there are several fulvous, diffuse radial streaks. Embryonic whorls smooth, glossy; sculpture of later whorls varies from fine, silky radial striation to rather strong ribbing; on basal surface below keel or angle this sculpture becomes much weaker. Aperture rounded to slit-like, oblique, margins usually more or less reflexed. Teeth absent or there is 1 tuberculiform basal tooth and sometimes another one on palatal wall. During postembryogenesis several sets of teeth are forming, and juvenile teeth may be drastically different from adult in shape and number. Umbilicus moderately to very wide. Height 5-14, diam. 10.0-29.5 mm (6.2 × 15.4 mm).

Slender vas deferens enters more or less enlarged upper end of penis apically or subapically. Penis generally clavate, rarely subcylindrical, internally with fine, corrugated, irregular, anastomosing in places, longitudinal pilasters. Penis sheath surrounds basal section of penis. Penial retractor attached to vas deferens at some distance from penis. Stylophore long, slender, more or less cylindrical. Accessory sac absent; tubular mucus glands entering above middle of stylophore separately, they united into common duct within wall of stylophore. Lower section of stylophore supplied with thin-walled bladder. Lower part of vagina practically absent, upper part rather short. Spermathecal shaft subcylindrical throughout.

DISTRIBUTION. China (Gansu, Hubei, Shaanxi, Sichuan). About 20 spp. & subspp.

Platypetasus Pilsbry, 1895
Fig. 2175

Pilsbry, 1895 (1893-1895): 207 (*Eulota* sect.).

TYPE SPECIES — *Helix innominata* Heude, 1885; OD.

Shell lens-shaped, thin, of 4.5-5 flattened whorls. Last whorl acutely keeled, gradually and slightly descending in front. Color uniformly light-corneous. Both embryonic and later whorls covered with fine granulation. Aperture ovate, oblique, adnate. Aperture margins approaching and connected across parietal wall, shortly reflexed below; columellar margin expanded. Umbilicus rather narrow but quite perspective. Height 5-11, diam. 12.0-24.0 mm (6.8 × 14.5 mm).

DISTRIBUTION. China. About 10 spp. & subspp.

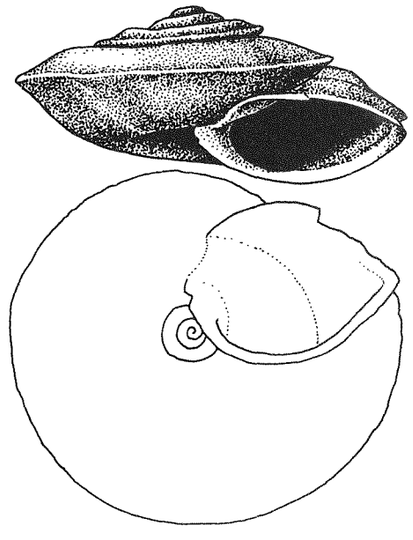


Fig. 2175. ***Platypetasus innominatus*** (Heude, 1885).
China. **Phil**. No. 33411.

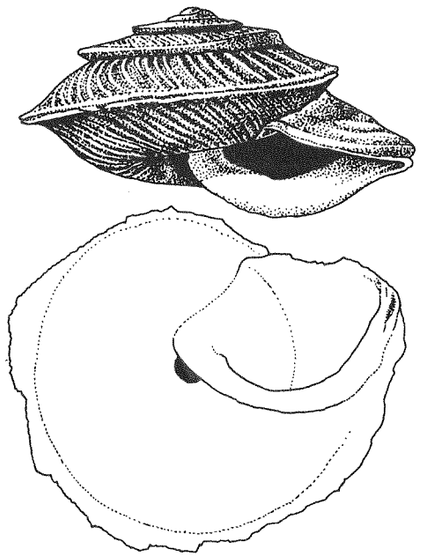


Fig. 2176. ***Pseudiberus tectumsinense*** (Martens, 1873).
China. **Phil**. No. 64168.

Pseudiberus Ancey, 1887
Fig. 2176

Ancey, 1887: 76.

TYPE SPECIES — *Helix tectumsinense* Martens, 1873; SD Pilsbry, 1895 (1893-1895).

Shell depressed-pagodiform, strongly and unevenly keeled, solid, of about 5 very flattened whorls. Last whorl strongly descending in front. Color corneous to cretaceous and whitish. Embryonic whorls smooth. Rest surface rudely striated to ribbed. Spiral striation absent. Aperture roughly rhombic, very oblique, upper margin straight, other margins expanded and much thickened within. Umbilicus narrow, semicovered. Height 5-12, diam. 10-20 mm (11.0 × 17.0 mm).

DISTRIBUTION. China. 2-3 spp.

REMARK. Some additional species of *Pseudiberus* have been described from Central Asia, but actually they belong to *Fruticicola* (Schileyko, 1978, as *Bradybaena*). On the other hand, since anatomy of Chinese species is still unknown, it is quite possible that the name *Pseudiberus* is also a synonym of *Fruticicola* (in the currently adopted sense).

Pseudobuliminus Gredler, 1887
Fig. 2177

Gredler, 1887: 7 (*Helix* sect.).

— *Buliminopsis* Heude, 1890: 146 (t.-sp. "*H.*" *buliminus* Heude, 1890; OD).

TYPE SPECIES — *Helix pseudobuliminus* Heude, 1882; tautonymy.

Shell turreted or elevated-conic, shining, of 7-9 flattened whorls. Last whorl straight. Color corneous. Embryonic whorls smooth, postembryonic ones weakly radially striated; on last whorl light elements of malleation may be present. Aperture irregularly rounded or ovoid, quite oblique, with thin, reflexed margins. Umbilicus, a minute perforation. Height 7-23, diam. 4.5-10.0 mm (11.2 × 6.2 mm).

DISTRIBUTION. China including Taiwan. 6-7 spp.

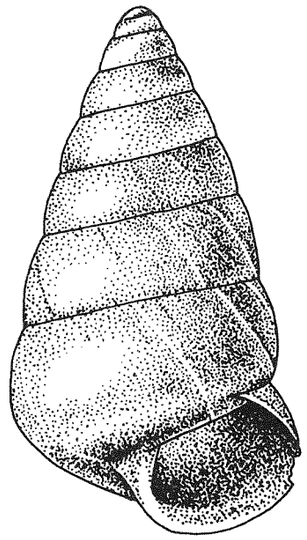


Fig. 2177. ! ***Pseudobuliminus buliminoides*** (Heude, 1882).
China. Syntype. **Senck.** No. 33427.

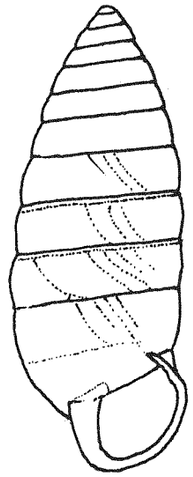


Fig. 2178. ***Rudens rudens*** Heude, 1890.
After Heude, 1890.

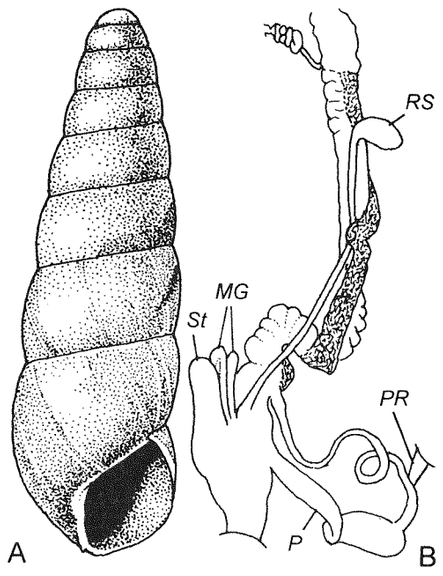


Fig. 2179. ***Secusana cerasina*** (Gredler, 1894).
A — shell: China. **Cardiff.** B — reproductive tract. After Wiegmann, 1900.

Rudens Heude, 1890
Fig. 2178

Heude, 1890: 148.

TYPE SPECIES — *Funiculus rudens* Heude, 1890; OD.

Shell bullet-shaped, moderately solid, of 12-13 narrow, much flattened convex whorls. Last whorl straight, rounded. Postapical whorls radially wrinkled. Aperture rounded, slightly oblique, with thickened, shortly reflexed margins. Umbilicus slit-like. Height 18, diam. 8 mm.

DISTRIBUTION. China. 1 sp.

Secusana Gredler, 1894
Fig. 2179

Gredler, 1894: 422 (*Buliminopsis* subg.).

TYPE SPECIES — *Buliminopsis cerasinus* Gredler, 1894; OD.

Shell slender, high-turreted, solid, of 9 weakly convex whorls. Last whorl straight, rounded. Color uniformly yellowish. Embryonic shell smooth. Later whorls finely, irregularly, radially wrinkled. Aperture small, irregularly ovate, well oblique, with nearly straight, slightly thickened margins.

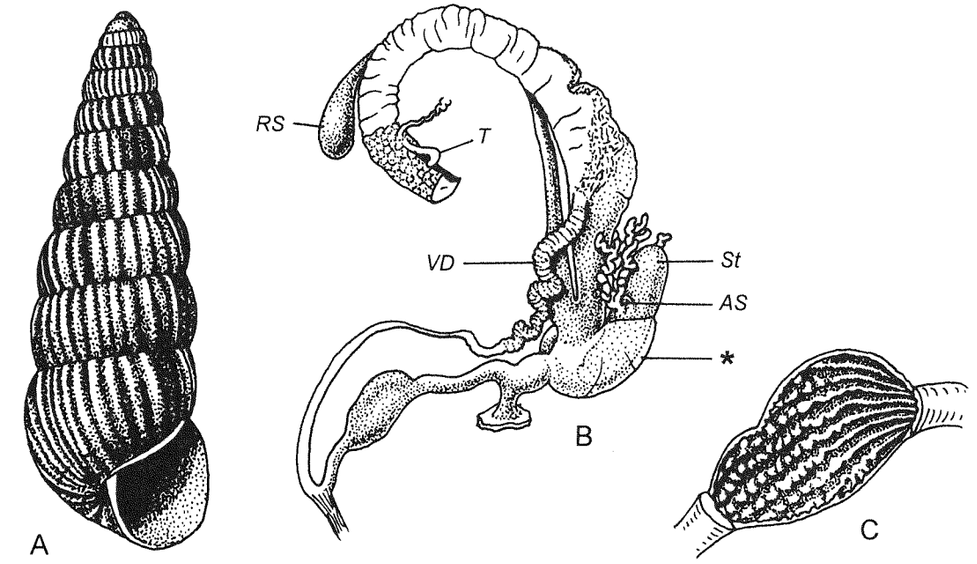


Fig. 2180. ***Stenogyropsis potanini*** (Moellendorff, 1899).
Gansu Prov., China. Syntype. **Moscow** Lc-20944. A — shell. B — reproductive tract. C — interior of penis. **SPb.** ***Asterisk*** — bladder surrounding stylophore base.

Umbilicus absent. Height 30-40, diam. 9.5-11.0 mm (31.6 × 9.8 mm).

Epiphallus very short, scarcely wider than vas deferens. Penis consists of bulky proximal and subcylindrical distal sections. Penial retractor attached to epiphallus. Stylophore elongated, arising from atrium below level of penis base. Mucus gland composed of 2 short, simple tubules; accessory sac not located. Vagina practically absent. Spermathecal stalk cylindrical.

DISTRIBUTION. China (Hupei, Hunan). 1-3 spp. (?).

Stenogyropsis Moellendorff, 1899
Fig. 2180

Moellendorff, 1899: 139 (*Buliminopsis* sect.).

TYPE SPECIES — *Buliminopsis potanini* Moellendorff, 1899; OD.

Shell high-conic, solid, slightly translucent, of 11-12 convex whorls. Last whorl evenly rounded, straight. Color white, with dark, diffuse radial stripes and spots. Embryonic shell practically smooth (vaguely microgranulated). Postapical sculpture of strong, smoothed radial ribs and weak spiral lines which can be observed locally. Aperture ovoid, small, subvertical, margins remote, sharp, straight except for slightly dilated columellar one. Umbilicus round, minute. Height 21.0-22.5, diam. 7.25-7.75 mm (22.0 × 7.5 mm).

Proximal section of vas deferens thickened and folded, then narrowing; after that duct widened again. Vas deferens entering expanded upper portion of penis; lower portion of penis cylindrical. Swollen part of penis thin-walled, internally with thin longitudinal pilasters, that broken into rows of tubercles toward pore of vas deferens. Penial retractor inserted on vas deferens at short distance from penis. Stylophore elongated, its basal part coated by thin-walled bladder. Mucus gland composed of 2 bundles of branched, somewhat coiled tubules, each bundle enters independently middle section of stylophore above mentioned bladder; additional sac apparently absent. Vagina short. Diameter of spermathecal stalk gradually increases from reservoir to base.

DISTRIBUTION. W China. 1 sp.

Buliminidius Heude, 1890
Fig. 2181

Heude, 1890: 146.

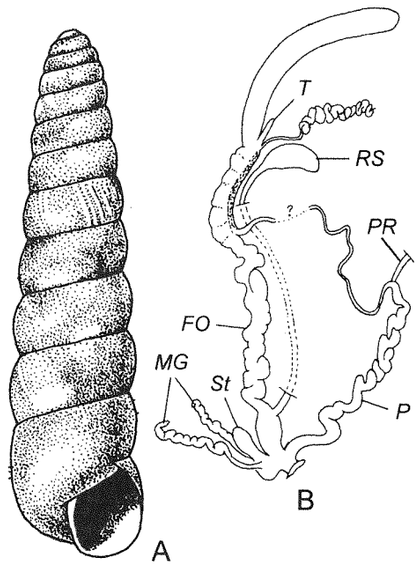


Fig. 2181. ! ***Buliminidius hirsutus*** (Moellendorff, 1899).
A — shell: Nanping, Kansu, China. **London** No. 1901.10.3.43. B — reproductive tract. After Wiegmann, 1900.

— *Funiculus* Heude, 1888: 241 [nom. praeocc., non Scudder, 1882 (fide Zilch, 1960); t.-sp. *Buliminus delavayanus* Heude, 1888; OD].

TYPE SPECIES — *Buliminus squamosulus* Heude, 1890; OD.

Shell tower-shaped, comparatively solid, of 12-13 rather convex whorls. Last whorl not deflected, rounded. Color corneous or yellowish-corneous. Embryonic whorls smooth, polished. Subsequent whorls have peculiar sculpture of short irregular radial wrinklets and dot-like scars of hairs or scales, which in places arranged in obliquely-radial rows; on lowest whorls elements of malleate sculpture may be present. Aperture comparatively small, rounded, moderately oblique, with slightly thickened margins; parietal callus white, usually well-developed. Umbilicus slit-like. Height 18-28, diam. 4.5-7.0 mm (20.0 × 4.8 mm).

Epiphallus absent. Penis exceptionally long, twisted and coiled. Attachment of penial retractor demarcates boundary between vas deferens and penis. Penial sheath seems to be absent. Stylophore elongated. Mucus gland, a couple of convoluted, unbranched tubules entering separately directly basal portion of stylophore, so accessory sac missing. Lower section of vagina absent, upper of approximately same length as stylophore. Free oviduct, similarly to penis, very long and strongly coiled. Basal swelling of spermathecal duct not expressed.

DISTRIBUTION. China. 3-4 spp.

Cathaica Moellendorff, 1884

Moellendorff, 1884: 339 (*Helix* "Gruppe").

— *Eucathaica* Andreae, 1900: 3 (*Cathaica* subg.; t.-sp. *Helix fasciola* Draparnaud, 1801; OD).

TYPE SPECIES — *Helix pyrrhozona* Philippi, 1845 (= *Helix fasciola* Draparnaud, 1801); OD.

Shell much flattened to depressed-conoidal, moderately solid to rather thin, sometimes with silky luster, of 5-6 moderately convex whorls. Last whorl straight to deflected, evenly rounded at periphery. Color white to grey or pale-corneous, sometimes with diffuse radial streaks, often with 1-2 dark bands. Embryonic whorls smooth or with variously developed chequerwise tubercles. Postembryonic whorls almost smooth to finely radially ribbed. Spiral striation absent or very weak. Aperture elliptic, sometimes slightly angulated, a little oblique, with thin or scarcely thickened, more ot less reflexed margins and thin white lip. 1-3 former lips may be seen through shell wall. Umbilicus semicovered, dot-like or moderately broad.

Epiphallus absent. Penis long, cylindrical, internally with thin longitudinal pilasters. Lower third of penis coated by thin sheath. Stylophore massive, elongated. Mucus glands composed of 2 bundles of tubular branches, entering scarcely developed accessory sac by 2 ducts. Free oviduct and vagina rather short. Spermathecal stalk cylindrical throughout; reservoir lying on upper half of spermoviduct.

DISTRIBUTION. China (region north of Yangtze River, Yunnan).

Cathaica (*Cathaica* s.str.)
Fig. 2182

Shell rather solid, with conic outlines of spire. Whorls 5-6. Color white, with 1-2 dark, narrow bands. Embryonic whorls with variously developed chequerwise tubercles. Postembryonic sculpture of fine, irregular,

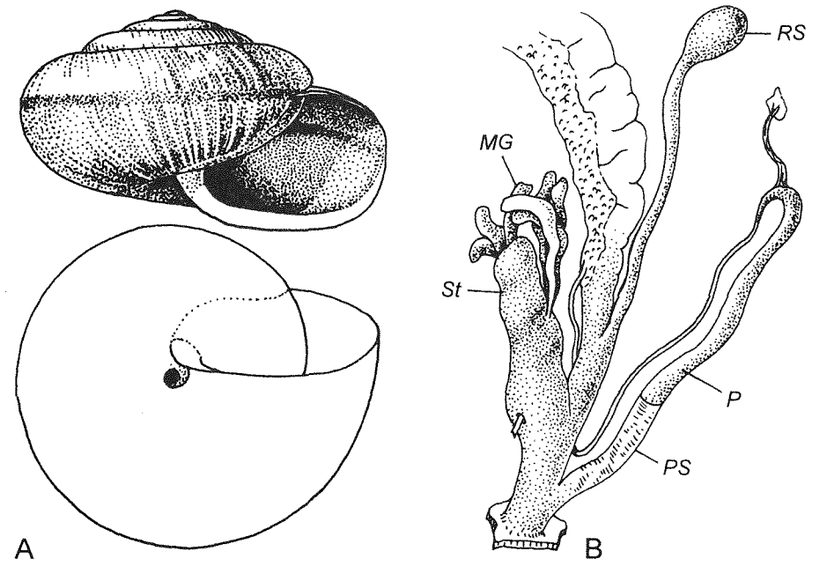


Fig. 2182. ***Cathaica*** (***Cathaica***) ***fasciola*** (Draparnaud, 1801).
A — shell: Shanxy Prov., China. B — reproductive tract. Huan-sian, China. **SPb**.

radial ribs. Aperture ovate-quadrangular, with moderately developed lip. Umbilicus dot-like. Height 8-12, diam. 11-24 mm (9.6 × 16.6 mm).

DISTRIBUTION. China. 4-5 spp.

Cathaica (*Pliocathaica* Andreae, 1900)
Fig. 2183

Andreae, 1900: 3.

TYPE SPECIES — *Helix pulveratrix* Martens, 1882; OD.

Shell quite solid, with conic spire. Whorls about 5. Color light-corneous to whitish, with 1-2 dark, mostly more or less diffuse bands. Embryonic whorls smooth. Postapical whorls bear vague, well spaced, irregular radial lines and fine, crowded spiral striae. Aperture broadly ovate, oblique, margins moderate reflexed throughout and much thickened. Umbilicus, a narrow slit. Height 5-10, diam.8-22 mm (11.0 × 16.1 mm).

DISTRIBUTION. China. About 10 spp.

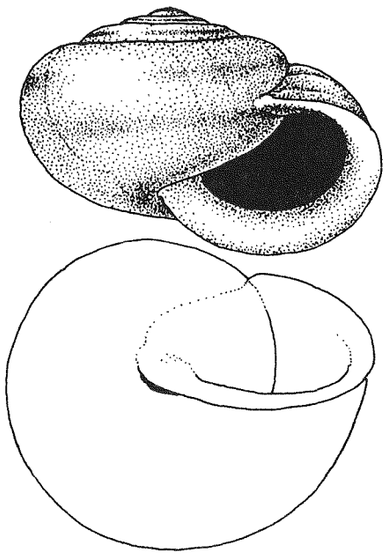


Fig. 2183. ***Cathaica*** (***Pliocathaica***) ***pulveratrix*** (Martens, 1882).
China. **Phil**. No. 45622.

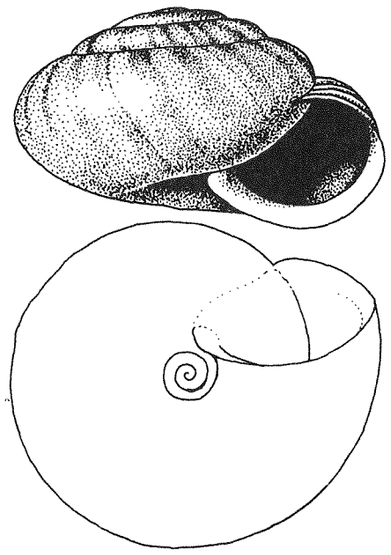


Fig. 2184. ***Cathaica*** **(*Xerocathaica*)** ***kreitneri*** (Hilber, 1882).
Batang, E Tibet. **Phil**. No. 263821.

Cathaica (*Xerocathaica* Andreae, 1900)
Fig. 2184

Andreae, 1900: 4.

TYPE SPECIES — *Helix kreitneri* Hilber, 1882; OD.

Shell moderately solid, with dome-shaped spire. Whorls 5-5.5. Color corneous, with 1-2 weak bands (may be absent) and mostly with radial streaks. Embryonic whorls smooth. Postnuclear surface with fine irregular radial striation. Aperture ovate, margins weakly reflexed and somewhat thickened. Umbilicus open, moderately wide, perspective. Height 6-7, diam. 8-13 mm (6.8 × 11.4 mm).

DISTRIBUTION. W China. 5-6 spp.

Bradybaena Beck, 1837
Fig. 2185

Beck, 1837: 18.

—*Eulotella* Martens, 1891: 236 (*Helix* subg.; t.-sp. *Helix similaris* Férussac, 1822; OD).

TYPE SPECIES — *Helix* (*Helicella*) *similaris* Férussac, 1822 (nom. nud.; = *Helix similaris* Rang, 1831); SD J. Gray, 1847b.

Shell globular to more or less depressed, moderately solid, of 4-6 somewhat convex whorls. Last whorl rounded or slightly angled, usually more or less descending in front. Color variable, often with peripheral band. Embryonic whorls smooth to finely granulated. Rest surface nearly glabrous to ribbed; characteristic feature is presence of distinct wavy spiral grooves (rarely absent). Aperture slightly to strongly oblique, of various outline, toothless, with reflexed margins. Umbilicus broad to narrow. Height 5-15, diam. 8-24 mm (8.6 × 12.0 mm).

Talon thin, exposed, rod-like. Vas deferens long, thin, entering epiphallus at sharp angle. Epiphallus consists of thin, cylindrical proximal and somewhat expanded distal parts. Penis not long, internally with many thin, corrugated axial plicae. Penis sheath surrounds basal portion of penis. Free oviduct rather long, stout. Vagina absent since stylophore sits on atrium. Base of stylophore expanded, with rather thick walls; stylophore proper enters this basal part by a short papilla. A pair of mucus glands tubular, branched, entering lower portion of stylophore proper by 2 very thin ducts. Spermathecal stalk long, more or less swollen basally; reservoir attending base of albumen gland.

DISTRIBUTION. SE Asia, Japan, ? Philippines; type species introduced in coastal areas of many tropical countries. It is impossible to say how many species this genus includes until a thorough revision. Approximately 15-25 spp.

? ***Apatetes*** Gude, 1914
Fig. 2186

Gude, 1914: 193.

TYPE SPECIES — *Corasia bourdilloni* Theobald, 1876; monotypy.

Shell shortly conic, thin, shining, translucent, of 5 nearly flat whorls. Last whorl straight, carinated, flat above, and a little inflated around umbilicus. Apex mamillate. Color whitish, with pale-straw periostracum; apical whorls pink. Embryonic whorls smooth; next 1 whorl with radial wrinkles below suture; later whorls with distinct, crowded, wavy spiral grooves; on base grooves somewhat finer and more crowded.

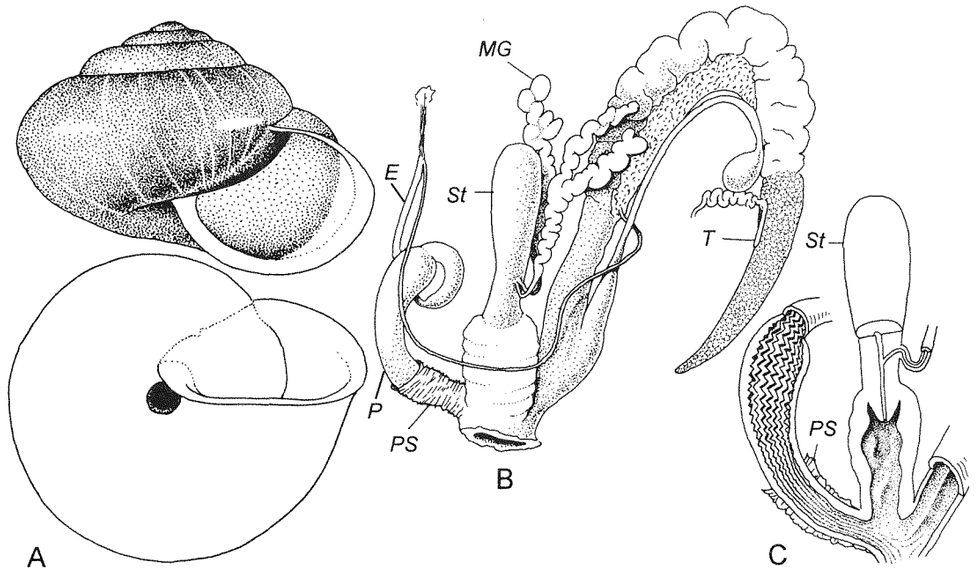


Fig. 2185. ***Bradybaena similaris*** (Rang, 1831).
Tani-Keli islet near Nosi-Be Island, NW coast of Madagascar, April 14, 1983. A — shell. B — reproductive tract. C — interior of penis and stylophore. **Moscow** No. Lc-12954.

Aperture large, irregularly quadrangular, rather oblique, with thin, simple margins joined by a very thin callus. Umbilicus tiny, semicovered. Height 21.0, diam. 25.4 mm.

DISTRIBUTION. India (Trevandrum, Travancore Prov.). 1 sp.

REMARK. Pilsbry [1891 (1891-1892): 127) writes: "Judging from the sharp lip, as well as the locality, this is no *Corasia*. It may prove to be a *Nanina*." Gude (1914: 193) adds: "Its position is very uncertain, and it is not at all improbable that the thin, sharp, peristome is an indication that the specimens are not full-grown". I suppose *Apatetes* may be a representative of Bradybaenidae or Ariophantidae.

MONADENIIDAE Nordsieck, 1987

Nordsieck, 1987: 19 (Xanthonychidae subfam.).
Schileyko, 1996: 407.

Shell semiglobose to much depressed, moderately solid to rather thin. Last whorl rounded to carinated, slightly to moderately deflected. Color usually (pale) corneous or

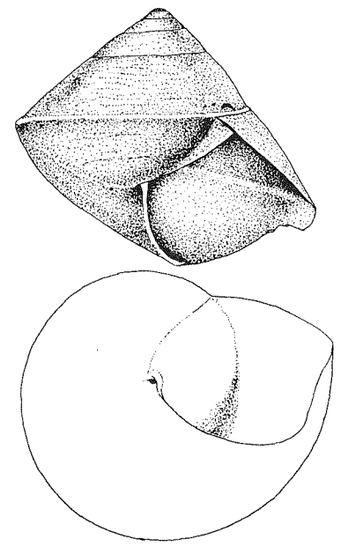


Fig. 2186. ***Apatetes bourdilloni*** (Theobald, 1876).
"Travankor, India". "Type". **London**, No. 1888.12.4.1455.

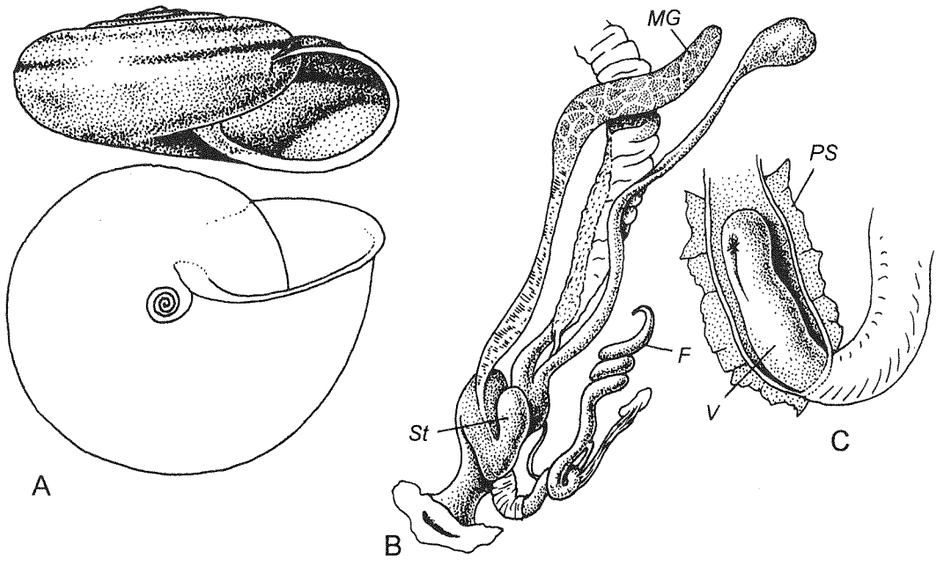


Fig. 2187. ***Monadenia* (*Shastelix*) *troglodytes troglodytes*** Hanna et Smith, 1933.
A — shell: near mouth of Samwel Cave, Shasta Co., California. **Moscow** No. Lc-25678 (**StB** No. 75187) B, C — Slope below Samwel Cave, Shasta Co., California, March 11, 1978. B — reproductive tract. C — interior of penis. **Moscow** No. Lc-21403.

brown, with a dark supraperipheral band bordered with pale zones above and below; sometimes uniformly yellowish, blackish or chestnut. Embryonic whorls densely granulose. Postapical whorls with fine radial striae and, often, spiral lines; rarely surface hirsute; sometimes granulose. Aperture broadly ovate, well oblique, peristome slightly or not expanded above, basal margin narrowly reflexed. Umbilicus narrowly open.

Sole smooth.

Jaw with strong ribs.

Flagellum and epiphallus rather thick, with large cavity. Penis very short, stout, with solid walls, containing fleshy verge. Penial retractor inserted at middle of epiphallus. Stylophore sits on lengthened atrium, contains a two-bladed dart. Additional sac or sheath of stylophore absent. A single, tubular mucus gland inserted on stylophore or on boundary between stylophore and vagina. Gland lies in haemocoele freely, stretching alongside vagina. Spermathecal stalk without diverticle.

DISTRIBUTION. NW and W North America (Alaska to San Francisco Bay; in California inland from Shasta County south to Mariposa County).

Monadenia Pilsbry, 1895

Pilsbry, 1895 (1893-1895): 198.

—*Aglaia* Martens in Albers, 1860: 122 (in part.).

TYPE SPECIES — *Helix fidelis* Gray, 1834; OD.

Characters and distribution as in family.

Monadenia (Shastelix Roth, 1981)
Fig. 2187

Roth, 1981: 381.

TYPE SPECIES — *Monadenia troglodytes troglodytes* Hanna et Smith, 1933; OD.

Shell much flattened, thin, transparent. Last whorl only slightly descending. Embryonic sculpture of minute, somewhat confluent granules, tending to align in diagonal series. Postapical whorls smooth or granulose. Height 10.1-11.6, diam. 21.6-27.5 mm (11.5 × 25.0 mm).

Flagellum coiled, substantially longer than penis + epiphallus. Penis with subcylindrical verge which has lateral pore. Mucus gland much longer than stylophore, distinctly subdivided into gland proper and its duct.

DISTRIBUTION. California. 1 or 2 spp. with a few subsp.

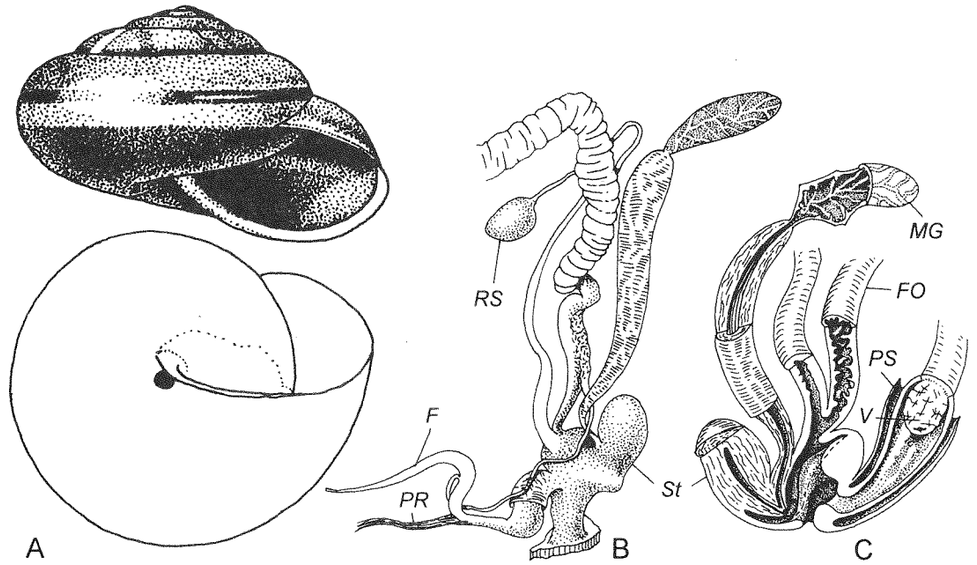


Fig. 2188. ***Monadenia* (*Monadenia*) *fidelis*** (Gray, 1834).
A — shell: Triangle Lake, Lane Co., Oregon. **Chicago** No. 62473. B, C — north facing slope, Middle Sisters Rock, Oregon. April 27, 1960. B — reproductive tract. C — interior of distal genitalia. **Chicago**.

Monadenia (Monadenia s. str.)
Fig. 2188

Shell semiglobose to depressed-conic. Last whorl moderately descending. Embryonic whorls densely granulose. Later whorls unevenly radially striated, sometimes with spiral lines or granulose; short hairs may be present. Height 11.3-27.4, diam. 20-40 mm (23.2 × 32.6 mm).

Flagellum not coiled, not longer than penis + epiphallus. Penis with ovoid verge which has apical pore. Mucus gland much longer than stylophore, distinctly subdivided into gland proper and its duct.

DISTRIBUTION. As in genus. About 15 spp., subspp. & color forms.

Monadenia (Corynadenia Berry, 1940)
Fig. 2189

Berry, 1940: 204.

TYPE SPECIES — *Helix hillebrandi* Newcomb, 1864; OD.

Shell flattened, comparatively solid, of 5.5-6 slightly convex whorls. Last whorl strongly, abruptly descending in front, with rounded peripheral angle. Embryonic whorls densely papillose. Later whorls densely granular and minutely radially wrinkled, with short hairs. Height 10.2-13.0, diam. 23.2-27.0 mm (12.0 × 24.0 mm).

Flagellum not coiled, much longer than penis + epiphallus. Penis with ovate verge having apical pore. Mucus gland short, club-shaped, showing no evident external division into gland proper and its duct.

DISTRIBUTION. Western USA (west side of Sierra Nevada). 1 sp. with 2 subspp.

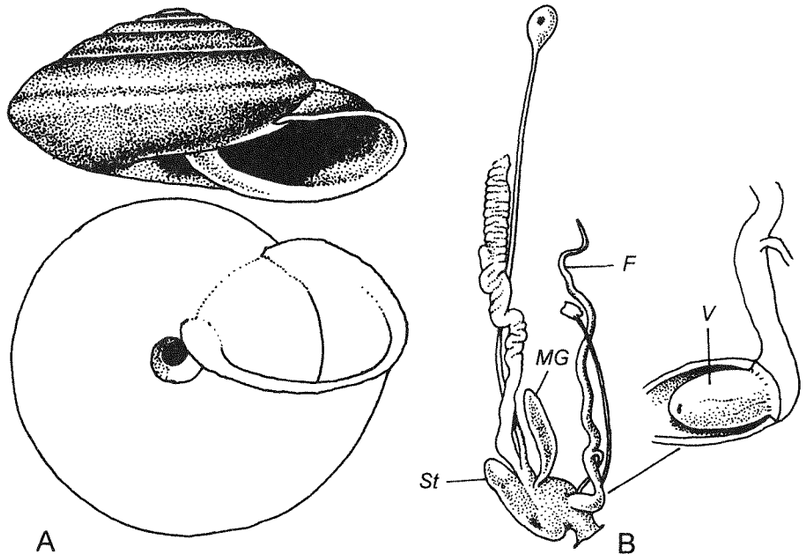


Fig. 2189. ***Monadenia* (*Corynadenia*) *hillebrandi*** (Newcomb, 1864).
A — shell: Mariposa, California. **Phil**. No. 10634. B — Bagby, Mariposa Co., California, June 4-6, 1969. Reproductive tract and interior of penis. **StB**, slide No. 5146.

XANTHONYCHIDAE
Pfeffer in Strebel et Pfeffer, 1880

Strebel & Pfeffer, 1880: 25 (as Xanthonycidae).

Shell subglobular to reduced.
Sole smooth.
Jaw strongly ribbed.
Flagellum well developed to absent. Penial verge mostly present. Stylophore sits on vagina or atrium. Accessory sac missing. There are 2 or (rarely) 1 mucus gland. Both glands are of same structure and position or one of them adheres to base of penis; glands open independently into stylophore or vagina at base of stylophore. Each gland possesses thickened apical part and thin duct, or both glands fusiform-cylindrical. Sheath of stylophore absent. Sometimes (Sonorellinae) appendages of female division totally absent. Spermathecal stalk cylindrical, its base not expanded; diverticle present or wanting.
DISTRIBUTION. Central and N America, north of S America.

XANTHONYCHINAE
Pfeffer in Strebel et Pfeffer, 1880

Strebel & Pfeffer, 1880: 25.

Shell flattened, vitrinoid or much reduced, (rather) thin. Embryonic whorls smooth, finely granulate or with very delicate radial threads.
Flagellum well developed. Mucus glands similar topographically, lie in hemocoele freely, ducts of glands stretched along vagina or glands coiled.
DISTRIBUTION. Central America including Mexico and north of S America.

Trichodiscinini Nordsieck, 1987

Nordsieck, 1987: 21 (in Epiphragmophorinae).

Shell normally developed.
Flagellum long. Mucus glands open into stylophore base. Diverticle of spermatheca very strongly developed, thicker than stalk, situated very low.
DISTRIBUTION. Central America with SW Mexico.

Trichodiscina Martens, 1892
Fig. 2190

Martens, 1892: 133 (nom. nov. pro *Trichodiscus* Strebel et Pfeffer, 1880).

— *Trichodiscus* Strebel & Pfeffer, 1880: 32 [nom. praeocc., non Ehrenberg, 1830 (Infusoria); t.-sp. *Helix coactiliata* Férussac, 1838; SD Pilsbry, 1895 (1893-1895)].

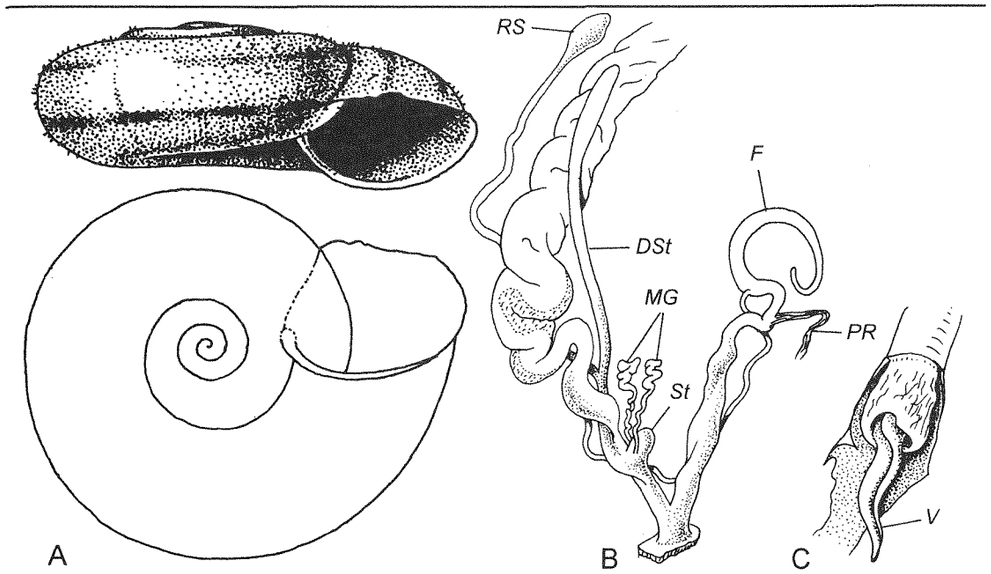


Fig. 2190. ***Trichodiscina coactiliata*** (Férussac, 1838).
A — shell: between Cupido and Maratakka, district Nickerie, Suriname. **Leiden**. B, C — Peten Tikal, Guatemala, August 6, 1976. B — reproductive tract. C — interior of penis. **Chicago** No. 192826.

TYPE SPECIES — *Helix coactiliata* Férussac, 1838; SD Pilsbry, 1895 (1893-1895).
Shell nearly flat, thin, fragile, of about 4 moderately convex whorls; last whorl markedly descending in front. Color whitish or pale-corneous, usually with supra- and subperipheral dark bands. Embryonic whorls smooth, subsequent whorls with beautiful, very fine granulation and short, stiff hairs. Aperture subcircular, much oblique, with thin, slightly reflexed margins. Umbilicus very wide. Height 5-9, diam. 10-28 mm (5.2 × 12.8 mm).
Vas deferens long, entering epiphallus laterally. Epiphallus rather short. Penis irregularly cylindrical, with thin, semitransparent walls, its inner surface without special relief. Verge slender, pointed, with superficial groove; base of verge surrounded by a fleshy collar. Free oviduct short. Vagina moderately long. Stylophore small, with 2 tubular, convoluted mucus glands independently entering base of stylophore. Spermathecal stalk long, subcylindrical, with shorter diverticle; neck short; reservoir small, (nearly) attending albumen gland.
DISTRIBUTION. Central America with SW Mexico and north of S America. 2-3 spp.

Miraverellini Schileyko, 1991

Schileyko, 1991: 222.

Shell well developed.
Flagellum very long. Mucus glands open into paired, short outpocketings near summit of stylophore. Diverticle of spermathecal stalk moderately developed, not thicker than duct, situated low.
DISTRIBUTION. Mexico, Costa Rica.

Miraverellia H. Baker, 1922
Fig. 2191

Baker H., 1922: 58 (*Averellia* subg.).

TYPE SPECIES — *Helix sumichrasti* Crosse et Fischer, 1872; OD.
Shell depressed, rather thin, of 3.5-5.5 quite convex whorls. Suture very deep. Last whorl sharply descending near aperture, bluntly subangulated peripherally. Color dark-brown or chocolate. Embryonic whorls almost smooth or with very delicate, irregular radial threadlets; rugosities on these threadlets appear as fine, conic tubercles. Later whorls bear thin, periostracal, radial wrinkles and short, elongated squamulae; behind aperture squamulae especially strong; on base tiny hairs may be present.

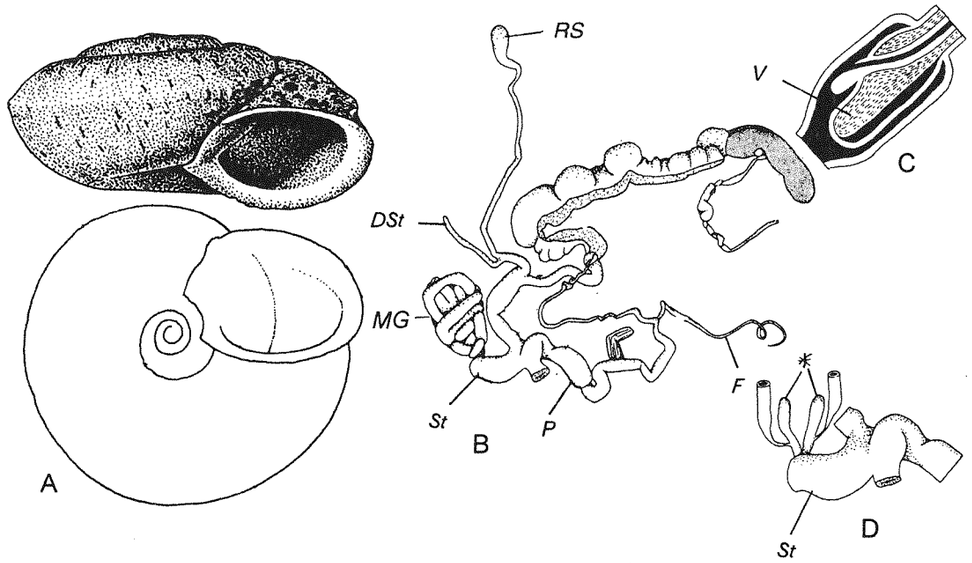


Fig. 2191. A — ***Miraverellia sumichrasti*** (Crosse et Fischer, 1872).
Shell: "La Huallaga, Mexique". Holotype. **Paris**. B, C, D — ! ***Miraverellia inflata*** Thompson, 1959. B — reproductive tract. C — diagramatic reconstruction of penis. D — penial-vaginal complex enlarged. After Thompson, 1959.

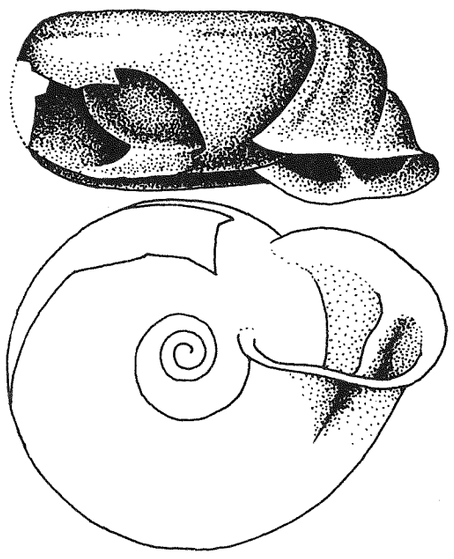


Fig. 2192. ***Averellia macneili*** (Crosse, 1873).
Costa Rica. **Chicago** No. 39842.

Aperture ovate, moderately oblique, with thin, simple margins. Parietal callus strongly developed. Umbilicus moderately wide, profound. Height 5-12, diam. 9.5-21.5 mm (8.1 × 16.4 mm).

Sole tripartite.

Talon exposed, small, ovoid. Vas deferens rather long. Flagellum long, slender. Epiphallus somewhat shorter, internally with strong axial folds which fill most of lumen of the organ; epiphallus surrounded by glandular tissue. Penis cylindrical, internally with a large, bifurcated verge; one lobe being shorter and more compressed than the other. Tubular center of epiphallus continues into proximal half of verge and then protrudes through side of that structure as shorter appendage of bifurcated tip. Pore of verge occupies lateral position. On side of verge opposite to extrusion of epiphallic tube lies another lumen which continues with length of verge, extends from base of verge to tip of larger terminal appendage, and separates on side of verge from its internal pillar of glandular tissue. Penial retractor attached to middle of epiphallus. Free oviduct and vagina about equal in length. Stylophore ("bulbous vestibule", after Thompson, 1959) rudimentary, lacks

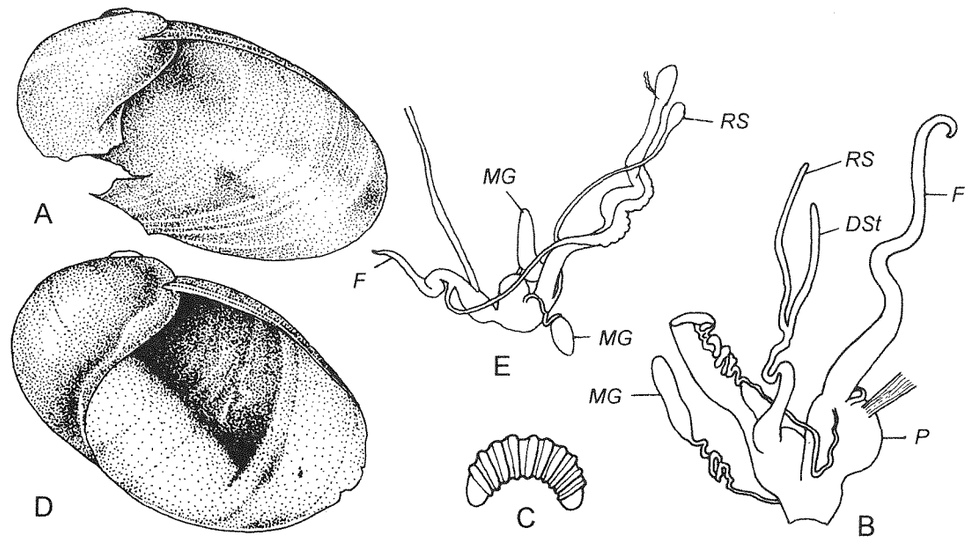


Fig. 2193. A, B, C — ***Xanthonyx sumichrasti*** (Brot, 1867).
A — shell: Mexico. Holotype. **Geneva** No. 993/213. B — reproductive tract. C — jaw. After P. Fischer, 1867. D, E — ! ***Xanthonyx salleanus*** (L. Pfeiffer, 1856). D — shell: "Texolo, V[era] C[ruz], Mexico". **Phil**. No. 77206. E — reproductive tract. After Pilsbry, 1900a.

dart. A pair of club-shaped mucus glands open into stylophore by separate ducts. Each gland bears in turn a very long tubular diverticle which shows no signs of glands; they are highly convoluted and interwoven to form of a jumbled mass on top of stylophore. Spermathecal stalk slender, with a short diverticle in lower part; reservoir lies against base of albumen gland.

DISTRIBUTION. Mexico. 3 spp.

Averellia Ancey, 1887
Fig. 2192

Ancey, 1887: 54 (nom. nov. pro *Coelospira* Ancey,1886).

— *Coelospira* Ancey, 1886: 20 [nom. praeocc., non Hall, 1858 (Brachiopoda); t.-sp. *Helix macneili* Crosse, 1873; OD].

TYPE SPECIES — *Helix Mac-Neili* Crosse, 1873; OD.

Shell flat, puck-shaped, with sunken summit, moderately solid, weakly translucent, of 4.5 rather convex whorls. Body whorl rounded, strongly descending in front. Color uniformly chestnut; aperture margins white. Embryonic whorls smooth. Rest surface finely, irregularly granulated. Aperture rounded-triangular, very oblique, margins shortly reflexed; peristome insertions slightly approached. Basal and palatal walls with long longitūdinal folds having thickened ridges; impressions behind aperture correspond to these folds. Umbilicus wide. Height 6.0-6.5, diam. 13-15 mm (6.5 × 15.0 mm); holotype ("Chiriqua Lagoon, Nicaragua", **Paris**): 6.0 × 14.4 mm.

DISTRIBUTION. Costa Rica, Nicaragua. 1 sp.

Xanthonychini
Pfeffer in Strebel et Pfeffer, 1880

Strebel & Pfeffer, 1880: 25 (pro fam.).

Shell reduced, vitrinoid; semislugs.

Flagellum long. Mucus glands open into stylophore base. Diverticle of spermatheca moderately developed or absent; when present it situated closer to reservoir than in representatives of Miraverellini and Trichodiscinini.

DISTRIBUTION. Mexico.

Xanthonyx Crosse et Fischer, 1867
Fig. 2193

Crosse & Fischer, 1867: 223.

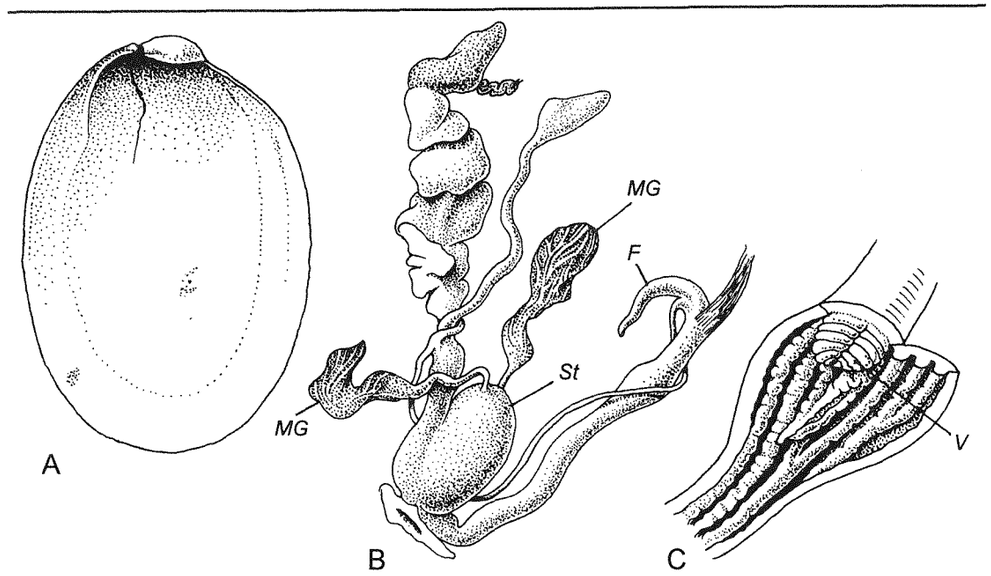


Fig. 2194. ***Metostracon mima*** Pilsbry, 1900.
A — shell: Morelia, Michoacan, Mexico. Holotype. **Phil**. No. 77245; B, C — same locality. B — reproductive tract. C — interior of penis. **Phil**. No. A-9636.

— *Leptonyx* Crosse et Fischer, 1867: Pl. X (nom. err. pro *Xanthonyx* Crosse et Fischer, 1867).

TYPE SPECIES — *Vitrina sumichrasti* Brot, 1867; SD Zilch, 1960.

Shell *Vitrina*-like, very thin, fragile, semitransparent, shining, of about 2.5 whorls. Color yellowish. Embryonic whorls finely granulate, later whorls gently radially plicate, locally with short, irregular spiral grooves. Umbilicus closed. Height 10-12, diam. 12-15 mm (10.5 × 12.3 mm).

Jaw flatly ribbed.

Sole undivided.

Hermaphroditic gland of several groups of short acini. Vas deferens moderately long, entering epiphallus or penis laterally. Flagellum stout, (rather) long, conic. Epiphallus short or missing. Penis swollen, with a large verge. Penial retractor inserted on epiphallus or penis at vas deferens entrance. Small stylophore inserted on atrium; where it joins atrium, on each side, slender ducts of 2 large, oblong mucus glands inserted. Vagina short, expanded. Spermathecal stalk long, with or without diverticle.

DISTRIBUTION. Mexico. 2 spp.

REMARK. Illustrations and descriptions of reproductive tract of *Xanthonyx sumichrasti* given by P. Fischer (1867) and *X. salleanus* by Pilsbry (1900a) markedly differ (compare figs. 2193 B and E) in number of mucus glands (1 or 2) and in presence or absence of spermathecal stalk diverticle. Pilsbry (op. cit.: 28) suggested that "... Fischer's preparations of the genitalia was mutilated, and part of the structures wrongly interpreted".

Metostracini Nordsieck, 1987

Nordsieck, 1987: 22.

Slugs; shell internal.

Flagellum rather short. Mucus glands open directly into stylophore summit. Diverticle of spermathecal stalk absent.

DISTRIBUTION. Mexico, Costa Rica.

Metostracon Pilsbry, 1900
Fig. 2194

Pilsbry, 1900a: 24.

TYPE SPECIES — *Metostracon mima* Pilsbry, 1900; monotypy.

Shell reduced to convex ovate plate with subcentral apex. Color pale-yellow. Sculpture in form of rather rough concentric wrinkles. Max. diam. up to 11.4, min. diam. up to 7.5 mm.

Sole with 1 longitudinal groove.

Talon externally not visible. Vas deferens twisted around vagina and enters epiphallus leaving a short, conic, tapering flagellum. Epiphallus very short. Penis composed of long cylindrical basal and short swollen upper portions. Latter contains rather small two-lobed verge; one lobe short, rounded, with sharp circular folds; the other longer, attenuated, pointed at tip, with a few longitudinal folds. Inner surface of cylindrical portion with coarse, strong, corrugated pilasters and a deep longitudinal groove. Penial retractor attached to upper part of epiphallus opposite to vas deferens entrance. Free oviduct short, vagina 2-3 times longer. Stylophore very large, fleshy, with 2 clavate mucus glands. Inner surface of glands with numerous, longitudinal, anastomosing folds. Spermathecal shaft rather long, reservoir reaching albumen gland.

DISTRIBUTION. Mexico. 1 sp.

Cryptostrakon Binney, 1879
Fig. 2195

Binney, 1879: 258.

— *Cryptostracon* Kobelt, 1880: 874 (nom. err. pro *Cryptostrakon* Binney, 1879).

TYPE SPECIES — *Cryptostrakon gabbi* Binney, 1879; OD.

Shell covered by mantle, flat, ear-shaped, thin, of about 2.5 whorls, with resorbed base. Color of thick periostracum yellowish or olivaceous. Sculpture of rather regular growth lines. Max. diam. 13.1, min. diam. 9.4 mm.

Jaw with 3-8 strong ribs.

DISTRIBUTION. Costa Rica. 1 sp.

MICRARIONTINAE Schileyko, 1991

Schileyko, 1991: 223.

Shell depressed to subglobose, thin to solid. Embryonic whorls either nearly smooth, or with delicate radial wrinkles, or with minute scales.

Flagellum well developed. Apical part of one of mucus glands fused together with vagina above stylophore, apical part of the other gland fused with atrial area.

DISTRIBUTION. Pacific coast of California, Channel Islands and Lower California.

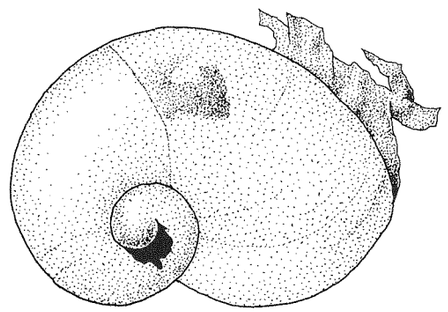


Fig. 2195. ***Cryptostrakon gabbi*** Binney, 1879. Costa Rica. Holotype. **Phil**. No. 246310a.

Micrarionta Ancey, 1880

Ancey, 1880: 334 (*Helix* subg.).

TYPE SPECIES — *Helix facta* Newcomb, 1864; monotypy.

Shell rather small, subglobose to depressed, composed of 3.5-5 whorls. Body whorl rounded or subangulated. Embryonic whorls with radial wrinklets or minute scales.

Flagellum short to long. Penis moderately large, containing short verge or none. Penial retractor attached to epiphallus. Vagina long, bearing stylophore near its middle; 1 or 2 mucus glands expanded, flattened and spread upon stylophore, vagina or base of penis, or sometimes free, club-shaped; excreting through separate slender ducts inserted in crotch between stylophore and vagina. Spermathecal stalk long, without diverticle.

DISTRIBUTION. Channel Islands, California.

Micrarionta (*Micrarionta* s. str.)
Fig. 2196

Shell orbicular, very solid, shining, of about 5 slightly convex whorls. Last whorl rounded, well deflected. Embryonic sculp-

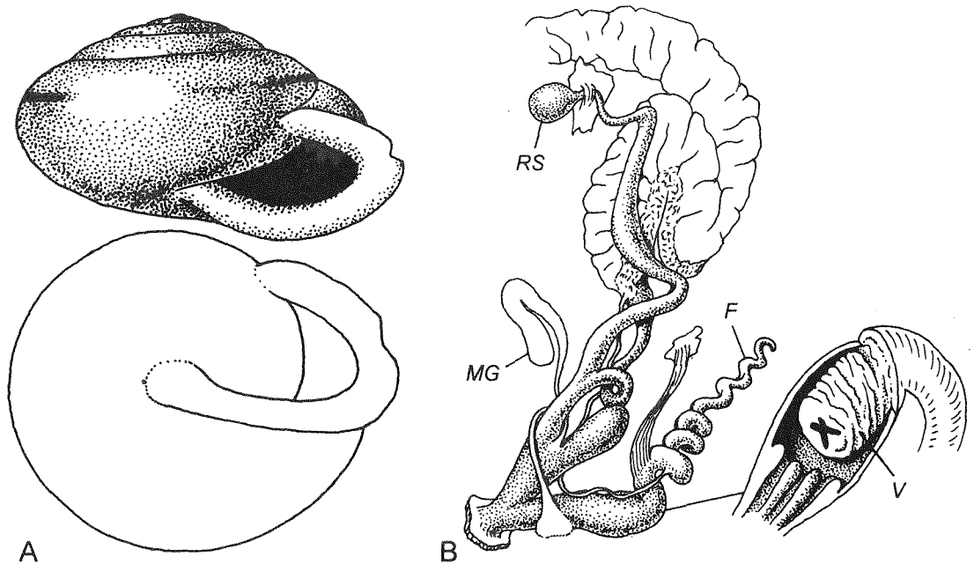


Fig. 2196. ! ***Micrarionta*** (***Micrarionta***) ***beatula*** (Newcomb, 1864).
Near Avalon, Santa Catalina Island, California, April 18, 1984. A — shell. B — reproductive tract and interior of penis. **Moscow** No. Lc-20434.

ture of microscopic radial wrinkles. Postapical whorls with fine, smoothed, irregular radial ridgelets and spiral striae. Aperture rather narrow, ovate, with thickened margins. Umbilicus closed or nearly so. Height 5.3-15.5, diam. 7.7-23.2 mm (5.6 × 9.5 mm).

Flagellum long, spirally coiled. Epiphallus exceptionally short. Penis bulky, its lower section internally with rather strong axial pilasters; upper section contains a large, thick-walled verge with X-shaped pore. Penial retractor inserted opposite to entrance of vas deferens. Stylophore clavate. Mucus glands 2, one of them extended upward, the other adheres basal part of penis.

DISTRIBUTION. Channel Islands, California. 7 spp. & subspp. with many forms.

Micrarionta (*Nicolenea* Roth, 1996)
Fig. 2197

Roth, 1996: 41.

TYPE SPECIES — *Micrarionta opuntia* Roth, 1975; OD.

Shell depressed-conic, moderately solid, of about 5 slightly convex whorls. Last whorl rounded, scarcely deflected. Color yellowish, with 2 corneous bands — above and below periphery; lip white. Embryonic whorls with fine radial wrinkles. Postapical sculpture of extensive papillation. Aperture subcircular, with somewhat thickened margins, moderately oblique. Umbilicus narrowly open. Height 6-8, diam. 8-11 mm (6.7 × 9.8 mm).

Flagellum long, slender, not coiled. Epiphallus also long. Penis rather small, internally smooth, contain ovate verge that has an apical pore. Penial retractor attached to distal part of epiphallus. Free oviduct long; vagina somewhat shorter. Stylophore or descending mucus glands absent; there is a thin-walled, non-branching gland which spreads upward. Spermathecal stalk very long, loosely convoluted, slightly expanded basally; reservoir attending base of albumen gland.

DISTRIBUTION. California (Channel Islands). 2-4 spp.

Micrarionta (*Chamaearionta* Berry, 1930)
Fig. 2198

Berry, 1930: 75.

TYPE SPECIES — *Micrarionta aquae-albae* Berry, 1922; OD.

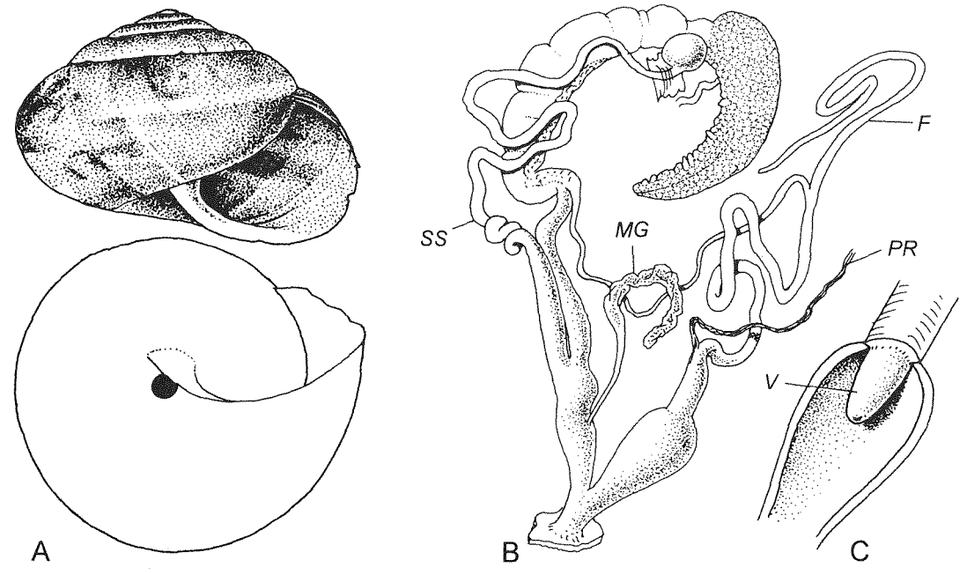


Fig. 2197. ***Micrarionta*** (***Nicolenea***) ***opuntia*** Roth, 1975.
A — shell: San Nicolas Island, California. Paratype (not fully mature specimen). **Phil.** No. 335700. B, C — San Nicolas Island, terrace near mouth of Mineral Canyon, February 28, 1984. B — reproductive tract. C — interior of penis. **Moscow** No. Lc-25666 (gift of Walter Miller).

Shell depressed-conic, thin, translucent, of 3.5-4 rather convex whorls. Suture deeply channelled. Body whorl subangulated, straight. Color corneous or brown, slightly lighter below, with a narrow, very obscure sepia band just above periphery. Embryonic whorls with minute scales. Postapical whorls with heavily shagreened periostracum and short, rigid hairs. Aperture broadly ovate, strongly oblique, with thin margins and very weak inner lip. Umbilicus moderately wide, profound. Height 3.5-4.7, diam. 6.5-8.1 mm (4.7 × 8.1 mm).

Flagellum short, slender. Epiphallus longer than flagellum or penis. Penial retractor attached to junction of epiphallus and penis. Structure of dart apparatus differs from that of *Micrarionta* s. str. mainly by sole feature: both mucus glands descend.

DISTRIBUTION. S California. 1 sp.

Plesarionta Pilsbry, 1939
Fig. 2199

Pilsbry, 1939: 212 (*Micrarionta* subg.).

TYPE SPECIES — *Helix stearnsiana* Gabb, 1867; OD.

Shell subglobose-conic, thin, glossy, of 5-5.5 slightly convex whorls. Last whorl rounded, gently deflected. Color generally buff or corneous, with brown peripheral band and some lighter mottling. Embryonic whorls with wavy, sometimes interrupted radial striae. Postapical sculpture of fine, irregular radial ridgelets and more or less shallow pits. Aperture widely ovate, oblique, with thin, shortly reflexed margins. Umbilicus, a narrow perforation. Height 15.5-24.5, diam. 20.8-30.7 mm (21.4 × 26.8 mm).

Flagellum comparatively short. Penis very long, internally with 4 strong pilasters and a short, blunt verge, above which epiphallus wide, with thick walls and a narrow lumen. Penial retractor very short and broad; beyond it epiphallus becomes smaller and thin-walled. Vagina very long, thrown into folds above stylophore. Ascending mucus gland applied to upper part of vagina, descending gland — to basal part of penis. Spermathecal stalk with or without rudimentary diverticle.

DISTRIBUTION. Channel Islands and Lower California. 2 spp.

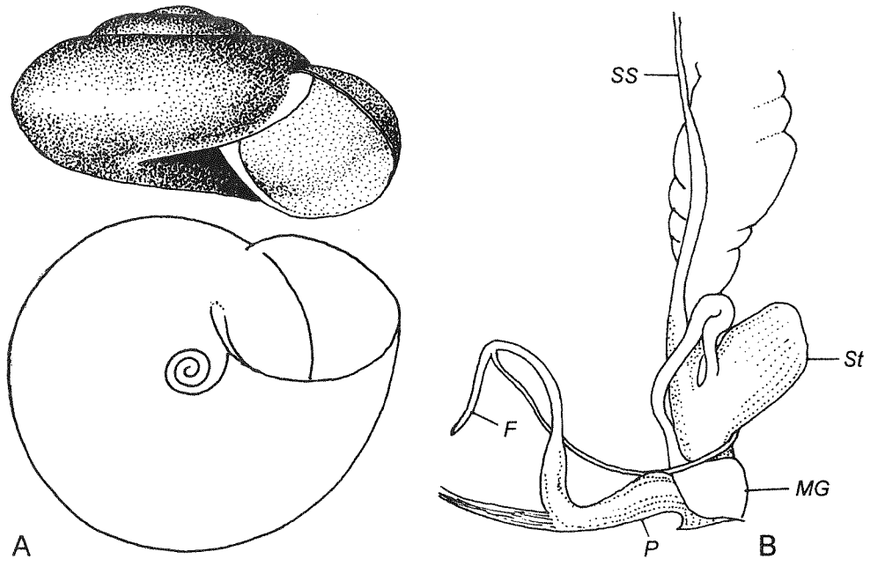


Fig. 2198. ***Micrarionta*** (***Chamaearionta***) ***aquaealbae*** Berry, 1922.
A — shell: E side of Whitewater Canyon, Riverside Co., California. **Moscow** No. Lc-25670 (**StB** No. 76035). B — reproductive tract. After Pilsbry, 1939.

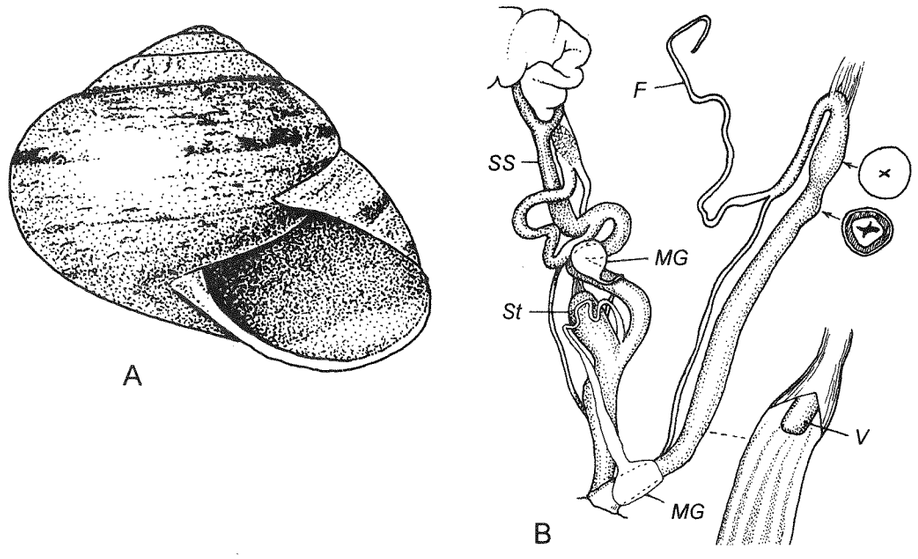


Fig. 2199. ***Plesarionta stearnsiana*** (Gabb, 1867).
A — shell: Fish Camp, Punta Bandu, Ensenada, Lower California. **Moscow** No. Lc-25664 (**StB** No. 27746). B — reproductive tract and interior of penis. After Pilsbry, 1939.

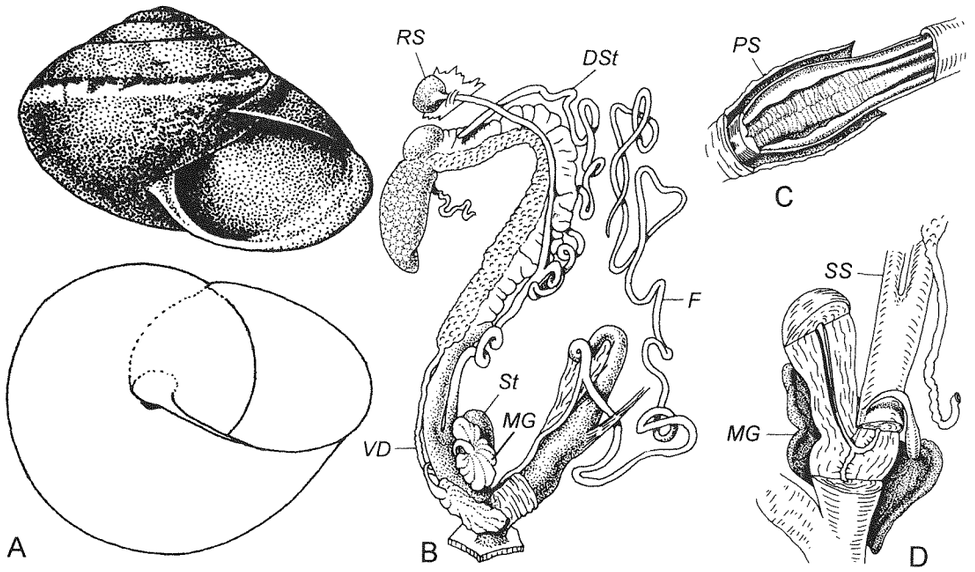


Fig. 2200. ! ***Xerarionta kelleti*** (Forbes, 1850).
Santa Catalina Island, California, December 3, 1978. A — shell. B — reproductive tract. C — interior of penis. D — interior of vagina and stylophore. **Moscow** No. Lc-20836 (gift of Eric Hochberg).

Xerarionta Pilsbry, 1913
Fig. 2200

Pilsbry, 1913: 382 (*Micrarionta* subg.).

TYPE SPECIES — *Arionta veitchii* "Newcomb" Tryon, 1866 (= *Helix canescens* Adams et Reeve, 1848); OD.

Shell globose to depressed-globose, capacious, thin, translucent, of 4.5-6 slightly convex whorls. Color copiously variegated or sometimes white, usually with dark supraperipheral band bordered from below by lighter zone; sometimes speckled with brownish markings. Embryonic whorls 1.5, with straight or wavy radial wrinklets or nearly smooth. Postapical sculpture of rather weak radial wrinkles and elements of malleation; traces of spiral striation may be present. Aperture large, broadly ovate, with moderately to scarcely expanded margins; columellar margin shortly dilated. Umbilicus very narrow, wholly or almost covered. Height 13.4-25.5, diam. 18.0-30.7 mm (19.0 × 26.6 mm).

Flagellum very long. Penis ample, rather thin-walled, tapering posteriorly into epiphallus, which has rather thick walls and 4 strong, axial pilasters inside. Junction of epiphallus and penis marked internally by abrupt flattening of pilasters; verge absent. Basal section of penis surrounded by sheath. Vagina long, bears stylophore. 2 mucus glands enter by slender ducts in crotch between stylophore and vagina. 1 gland descends and spreads over basal part of penis, the other — over stylophore and adjacent section of vagina. Spermathecal stalk with very long, convoluted and twisted diverticle.

DISTRIBUTION. Pacific coast of California, Channel Islands and Lower California. 9 spp.& subspp.

SONORELLINAE Pilsbry, 1939

Pilsbry, 1939: 25, 267.

Shell depressed, (moderately) thin. Embryonic whorls with minute sculpture of radial wrinkles and usually forwardly de-

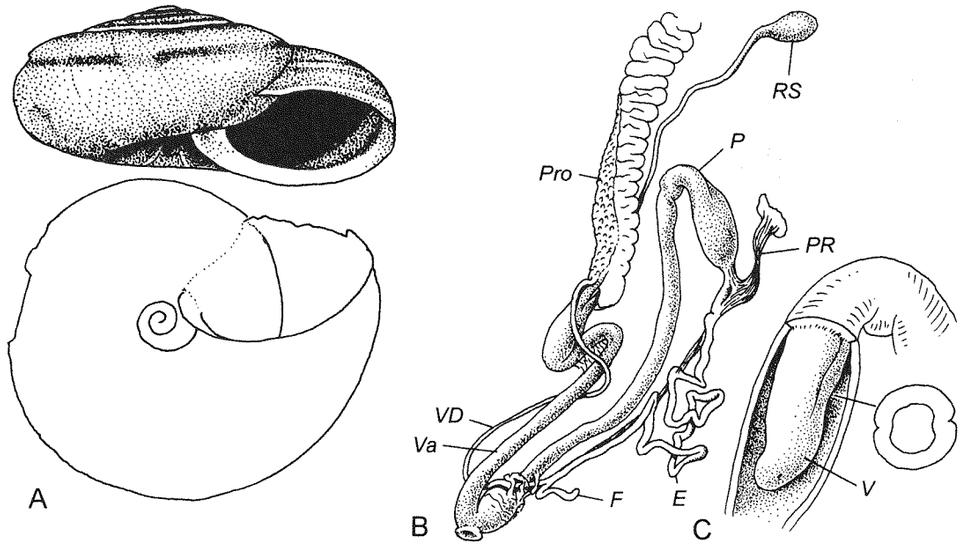


Fig. 2201. ***Sonoranax dalli*** (Bartsch, 1904).
A — shell: "Tanner's Canyon, Huachuca Mts., Arizona". Holotype. **Phil**. No. 89228. B, C — Garden Canyon near Sierra Vista, Huachuca Mts., Arizona, April 17, 1993. Topotype. B — reproductive tract. C — interior of penis. **Moscow** No. Lc-21354.

scending threads or spirally lengthened granules.

Flagellum much reduced or absent. Dart apparatus missing.

DISTRIBUTION. Arid SW of USA, N Mexico, Lower California.

Sonoranax Pilsbry, 1939
Fig. 2201

Pilsbry, 1939: 273, 391 (*Sonorella* subg.).

TYPE SPECIES — *Sonorella dalli* Bartsch, 1904; OD.

Shell much depressed, thin, somewhat translucent, of 4.5-5 weakly convex whorls. Last whorl abruptly deflected behind aperture. Color corneous, with darker band above periphery. Embryonic whorls with very fine granulation. Postapical surface with delicate, irregular radial wrinkles and variously developed spiral, incised regular lines, predominantly on body whorl. Aperture ovate, oblique; columellar margin reflexed partly over umbilicus but elsewhere only slightly or not expanded. Umbilicus rather wide, perspective. Height 12-13, diam. 20.4-28.0 mm (12.0 × 25.6 mm).

Vas deferens moderately long. Epiphallus very long, thin, convoluted and twisted. Flagellum small, somewhat vestigial. Penis long, much exceeds shell diameter, subcylindrical; its inner surface without special relief. Verge short, with broad inner canal and minute subapical pore. Penial retractor attached by its widened base to very distal section of epiphallus and gives an additional arm to proximal end of epiphallus. Free oviduct extremely short; vagina, on the contrary, very long, bent. Spermathecal stalk long, slender throughout; small reservoir attending albumen gland.

DISTRIBUTION. Arizona [Huachuca Mts., Garden (former Tanner) Canyon]. 1 sp.

Mohavelix Berry, 1943
Fig. 2202

Berry, 1943: 6 (*Sonorella* subg.). W. Miller, 1968: 50-51.

TYPE SPECIES — *Micrarionta* (*Eremarionta*) *micrometalleus* Berry, 1930; OD.

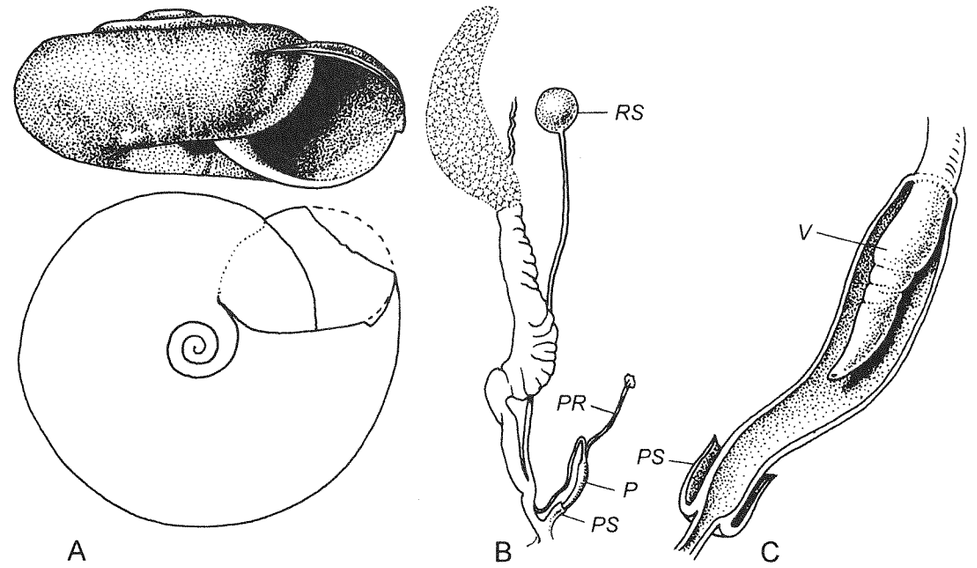


Fig. 2202. ***Mohavelix micrometalleus*** (S. Berry, 1930).
A — shell: Mesquite Canyon near Garlock, Kern Co., El Paso Mts., Mohave Desert, Arizona. **Moscow** No. Lc-25660. B, C — same label, March 15, 1969. B — reproductive tract. C — interior of penis. **StB**, W. Miller's slide No. 5107-B.

Shell much flattened, thin, fragile, dull, of 4-4.5 quite convex whorls. Last whorl moderately descending, somewhat shouldered, rounded. Color corneous, with a narrow, indistinct, more or less interrupted, darker band. Both embryonic and later whorls finely squamulose. Spiral sculpture wanting. Aperture subcircular, moderately to rather strongly oblique, with thin, scarcely reflexed margins; columellar margin only slightly dilated. Umbilicus rather broad. Height 4.0-5.4, diam. 9.0-10.2 mm (4.1 × 9.0 mm).

Talon hidden. Vas deferens comparatively short. Epiphallus not expressed. Penis small, slender, clavate, with smooth inner surface; verge slender, more or less conic, with terminal pore. Penis sheath with free upper margin, surrounds base of penis. Penial retractor attached to distal part of vas deferens. Free oviduct considerably longer than vagina. Spermathecal stalk long, slender, without diverticle; reservoir attending lower half of albumen gland.

DISTRIBUTION. Arizona. 1 sp.

Sonorella Pilsbry, 1900
Fig. 2203

Pilsbry, 1900c: 556.

TYPE SPECIES — *Epiphragmophora hachitana* Dall, 1895; OD.

Shell depressed, thin, of 4.5-5 rounded whorls. Color light with brown band above periphery. Embryonic whorls with minute sculpture of radial impressions and usually forwardly descending threads or spirally lengthened granules. Rest surface without clear sculpture. Aperture oblique, wide; its margins scarcely thickened. Columellar margin dilated. Height 7.0-17.0, diam. 13.6-30.5 mm (12.2 × 22.7 mm).

Talon very short, simple, buried in albumen gland. Penis contains moderately to very long, slender verge. Epiphallus rather long, terminating in minute, vestigial flagellum which sometimes obsolete. Penis sheath short, thin, with free upper edge, surrounds very base of penis. Penial retractor inserted on epiphallus. Reservoir of spermatheca small, on long, unbranched stalk.

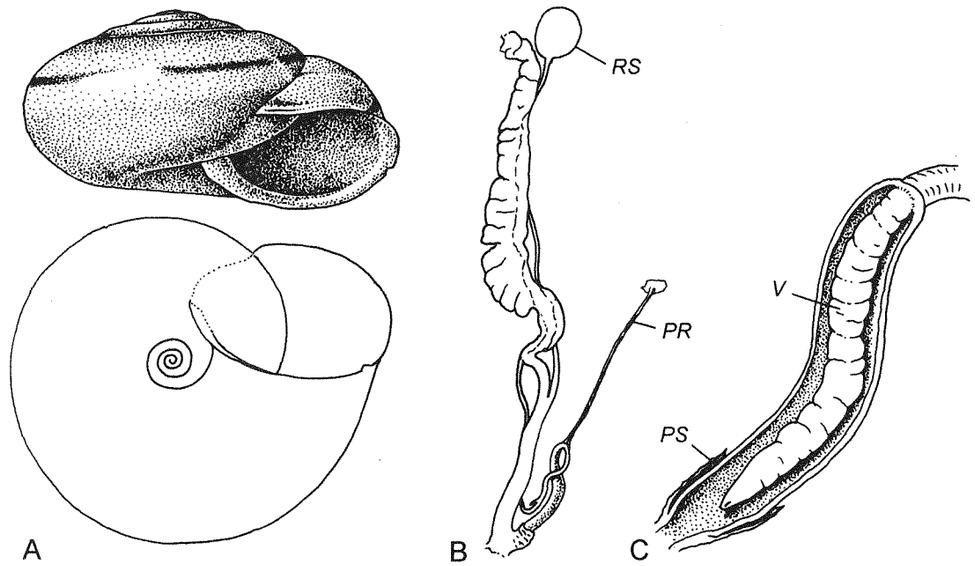


Fig. 2203. ***Sonorella hachitana*** (Dall, 1895).
SE flank of Big Hatchet Peak, Big Hatchet Mt., Hidalgo Co., New Mexico, April 8, 1966. A — shell. B — reproductive tract. C — interior of penis. A — **Moscow** Lc-21401 (**StB** No. 74877). B, C — **StB**, W. Miller's slide No. 4877-C.

DISTRIBUTION. Arizona, southern New Mexico and western Texas, southward to northwestern Chihuahua and northeastern Sonora. At least 80 spp. & subspp.

Maricopella Roth, 1996
Fig. 2204

Roth, 1996: 41.

TYPE SPECIES — *Sonorella allynsmithi* Gregg et W. Miller, 1969; OD.

Shell depressed-globose, rather thin, glossy, of about 4 moderately convex whorls. Last whorl rounded, descends steeply and abruptly. Color white or creamy-ivory, with a tinge of brownish-grey, with a narrow, light-brown supraperipheral band. Embryonic whorls with a very small, silky-smooth area at very apex, followed by closely spaced radial wrinkles over which are faint remnants of superimposed spiral, hyphen-like papillae which occasionally anastomose into forwardly descending and ascending threads. Later whorls with irregular, light radial wrinklets, early whorls with occasional pit scars of worn-off periostracal projections. Aperture rounded, well oblique, with thin, moderately reflexed margins. Umbilicus relatively narrow, subcylindrical. Height 7-8, diam. 12.0-15.7 mm (7.8 × 13.4 mm).

Flagellum rudimentary. Epiphallus long, slender. Penis thin, with a minute verge that has lateral pore. Penis sheath thick, envelops most of penis. Penial retractor inserted on about middle of epiphallus. Free oviduct relatively long. Vagina short. Spermathecal stalk long, slender throughout.

DISTRIBUTION. Arizona. 2-3 spp.

Masculus Pilsbry, 1939
Fig. 2205

Pilsbry, 1939: 273, 377 (*Sonorella* subg.)

TYPE SPECIES — *Sonorella virilis* Pilsbry, 1905; OD.

Shell depressed, rather thin, slightly translucent, of 4.5-5 moderately convex whorls. Body whorl rounded, slightly inclined in front. Spire conic. Color pale-brown to whitish, with dark band. Embryonic whorls with radially elongated minute

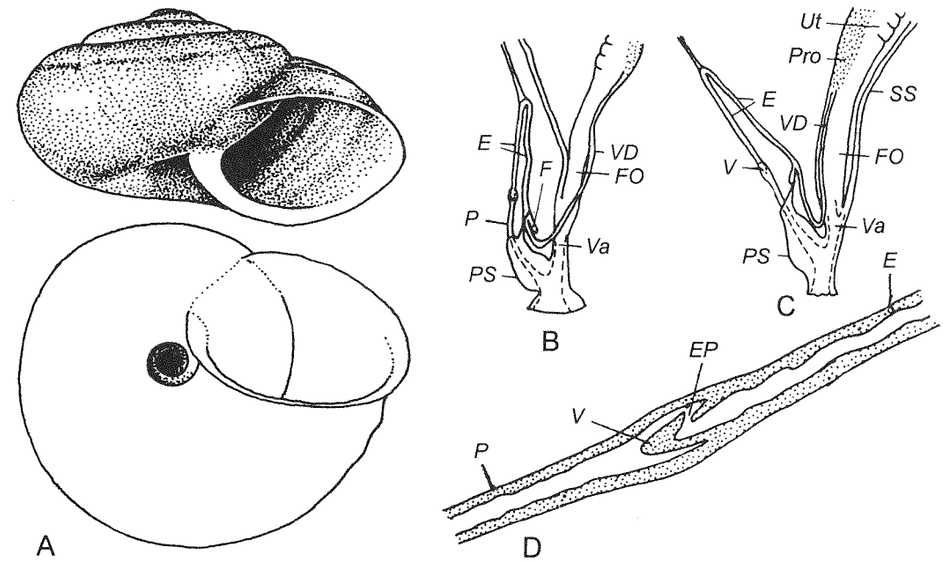


Fig. 2204. ***Maricopella allynsmithi*** (Gregg et W. Miller, 1969).
A — shell: 1500 ft Squaw Peak Rd., Phoenix Mts., Maricopa Co., Arizona. Holotype. **Phil.** No. 314853. B, C — reproductive tract of holotype (B) and paratype (C). D — details of verge. After Gregg & W. Miller, 1969.

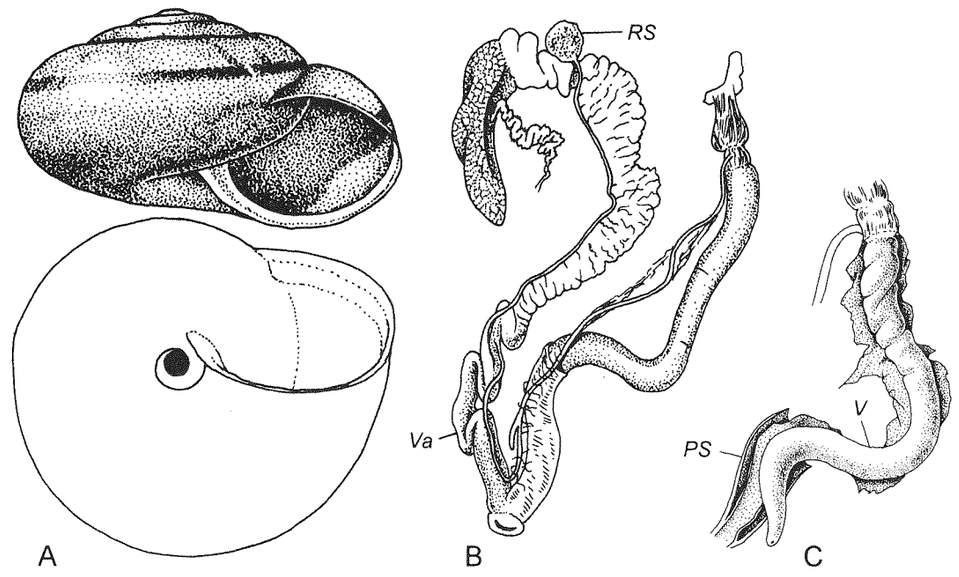


Fig. 2205. ***Masculus virilis*** (Pilsbry, 1905).
Cave Creek Canyon near Portal, Chiricahua Mts., Arizona, April 16, 1993 (type locality). A — shell. B — reproductive tract. C — interior of penis. **Moscow** No. Lc-21399 (dry shells); Lc-21405 (soft parts).

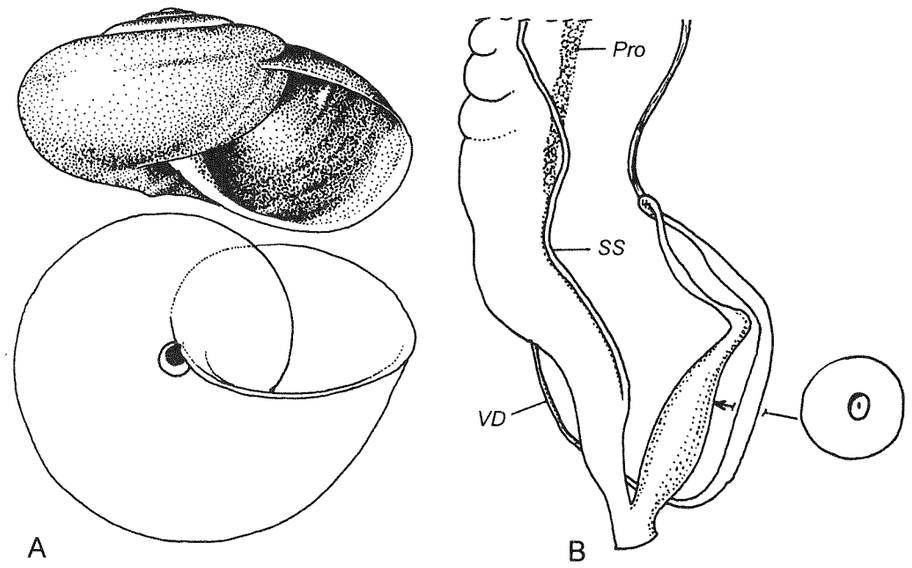


Fig. 2206. ***Myotophallus fragilis*** (Pilsbry, 1939).
A — shell: Cliff ruins, Roosevelt Lake, Arizona. Holotype. **Phil**. No. 166733. B — reproductive tract and cross-section through penis. After Pilsbry, 1939.

granules. Rest surface with fine radial striation and scars of hairs which present on juvenile shells, but usually lost in adults. Aperture rounded, oblique, with thin, narrowly expanded at columellar and basal regions margins. Umbilicus rather narrow, cylindrical. Height 7.8-16.0, diam. 14.0-26.5 mm (11.0 × 18.4 mm).

Talon exposed, small. Flagellum vestigial. Epiphallus rather long, of about same diameter as vas deferens. Penis enormously developed, its length exceeds shell diameter. Verge long, occupying most of penis lenght, with minute channel. Penis sheath free at upper end, surrounds basal 1/3 of penis. Penial retractor strong, attached to penis apically. Free oviduct very short. Vagina long, convoluted. Spermathecal stalk long, scarcely expanded basally, without diverticle; globular reservoir almost reaching albumen gland.

DISTRIBUTION. SE Arizona from Chiricahua Mts. west to Santa Ritas, and from Rincons south to Huachuca Mts. 7 spp.& subspp.

REMARK. It is hard to say is there epiphallus in *Masculus virilis* or not. If we suppose that the small appendix on vas deferens is a flagellum, the section of the duct above the appendix is vas deferens proper, and the section below is an epiphallus; at the same time diameters of these sections are equal.

Myotophallus Pilsbry, 1939
Fig. 2206

Pilsbry, 1939: 273, 393 (*Sonorella* subg.).

TYPE SPECIES — *Sonorella fragilis* Pilsbry, 1939; OD.

Shell moderately depressed, very thin and fragile, of 4-4.5 moderately convex whorls. Suture rather deep. Body whorl very wide, scarcely descending in front. Color light pinkish-cinnamon, with narrow supraperipheral dark band. Embryonic whorls with very small smooth area at very apex, followed by some coarse, unequal radial wrinkles, after which it becomes granulose near upper suture, later whorls with rather widely spaced, forwardly descending and ascending threads, and very weak radial wrinkles between them. Part of 1st postembryonic whorl has inconspicuous papillae in oblique series. Rest surface rather glossy, with light wrinkles. Aperture ample, with thin, narrowly expanded margins, dilated at columellar insertion. Umbilicus rather narrow, subcircular. Height 9.4-11.8, diam. 17.2-18.5 mm (11.5 × 18.4 mm).

"The inner tube of the penis is slender, but it is enveloped in an extremely thick muscular sheath, tapering posteriorly, length of the whole about one-fifth the diameter of shell or less. Epiphallus long. Flagellum minute, bound with vas deferens. Vagina very short." (Pilsbry, 1939: 393).

DISTRIBUTION. Central Arizona, Roosevelt Lake. 1 sp.

EPIPHRAGMOPHORIDAE
Hoffmann, 1928

Hoffmann, 1928: 1239 (Helicidae subf.).

Shell depressedly helicoid to subglobose, usually rather thin. Last whorl rounded or bluntly angulated.

Sole smooth.

Jaw with flat, broad ribs.

Flagellum not long. Epiphallus well expressed. Penis with solid walls, lacks verge. Stylophore sits on base of vagina, contains a simple, conic dart. Accessory sac, when present, large, elongated, with vast cavity. Sheath of stylophore absent. Mucus glands 2 (rarely 1), sac-like, open into base of accessory sac or one of them to stylophore at its base, the other — to vagina. Spermathecal stalk short, cylindrical or with swollen base; diverticle absent.

DISTRIBUTION. South America.

Epiphragmophora Döring, 1875
Fig. 2207

Döring, 1875: 446 (*Aglaja* "grupo").

TYPE SPECIES — *Epiphragmophora hieronymi* Döring, 1875; SD Pilsbry, 1895 (1893-1895).

Shell depressed, moderately solid, shining, of 4.5-5 more or less convex whorls. Last whorl evenly rounded at periphery, straight or scarcely descending in front. Spire rounded. Color light-chestnut to corneous and straw, basal surface lighter; dark peripheral band mostly present. Embryonic whorls smooth, rest surface with fine irregular wrinkles (looks smooth at first glance) and, in places, with spiral touches; on last whorl elements of malleate sculpture may be present. Aperture widely ovate, moderately oblique, places of its attachment only slightly approached. Aperture margins thin, slightly reflexed, usually with light lip inside. Umbilicus broadly open. Height 7-19, diam. 15-60 mm (9.5 × 22.2 mm).

Vas deferens entering penis at some angle near boundary with flagellum. Latter conic, tapering, well developed. Penis cylindrical or consisting of slender distal and swollen proximal portions, internally with 2-3 longitudinal pilasters; verge absent. Penial retractor attached to upper portion of penis. Stylophore fusiform, with large, thick-walled additional sac. A pair of voluminous, alveolar mucus glands with narrow ducts entering base of additional sac side-by-side. This sac opens by a short papilla in stylophore cavity. Dart short, curved, conic, with 1 lateral longitudinal blade. Lumen of stylophore proper opens by minute pore situated on tip of rather long fleshy papilla. Upper section of vagina long, free oviduct and lower section of vagina short. Spermathecal shaft short, reservoir small, subglobular.

DISTRIBUTION. South America. At least 30 spp.

Doeringina Ihering, 1929
Fig. 2208

Ihering, 1929: 44 (*Eurycampta* subg.).

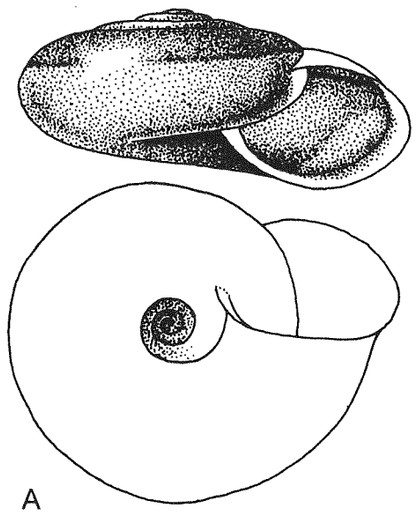
TYPE SPECIES — *Helix trenquelleonis* Grateloup, 1851; OD.

Shell depressedly conic, rather thin, translucent, shining, of 4-4.5 slightly convex whorls. Last whorl rounded or (rarely) angulated at periphery, gradually and quite markedly descending in front. Spire low-conic. Color yellowish, uniform or with dark narrow band above periphery; often with lighter radial strikes. Embryonic whorls smooth, postnuclear with vague irregular radial wrinkles and sometimes with spiral touches. Aperture very oblique, margins thin, shortly reflexed. Umbilicus relatively narrow, partially covered. Height 12-17, diam. 21-28 mm (15.0 × 26.9 mm).

Vas deferens entering penis at some an-

gle. Flagellum tapering, moderately long. Penis slender, cylindrical. Stylophore long, rather thin. Mucus glands enter base of stylophore by short ducts. Free oviduct extremely short, upper vagina moderately long, lower practically absent. Spermathecal shaft very short, reservoir voluminous.

DISTRIBUTION. Argentina. 1 sp.



Pilsbrya Ancey, 1887
Fig. 2209

Ancey, 1887: 54 (nom. nov. pro *Poecilostola* Ancey, 1886.

— *Poecilostola* Ancey, 1886: 20 [nom. praeocc., non Stöl, 1870 (Hemiptera); *Helix* subg.; t.-sp. *Helix farrisi* L. Pfeiffer, 1859; OD].

TYPE SPECIES — *Helix farrisi* L. Pfeiffer, 1859; OD.

Shell depressedly globose, thin, of about 4.5 rather convex whorls. Last whorl rounded, distinctly descending in front. Spire convex, rounded. Color yellowish-brown, with 3-5 dark bands; sometimes with zigzagged lighter markings. Embryonic whorls smooth. Later whorls with irregular spiral striation and coarse elements of malleate sculpture. Aperture ovate, well oblique, with thin or somewhat thickened, shortly expanded margins. Umbilicus narrow slit-like to closed. Height 16-23, diam. 23-40 mm (20.5 × 33.2 mm).

DISTRIBUTION. South America. 2-3 spp.

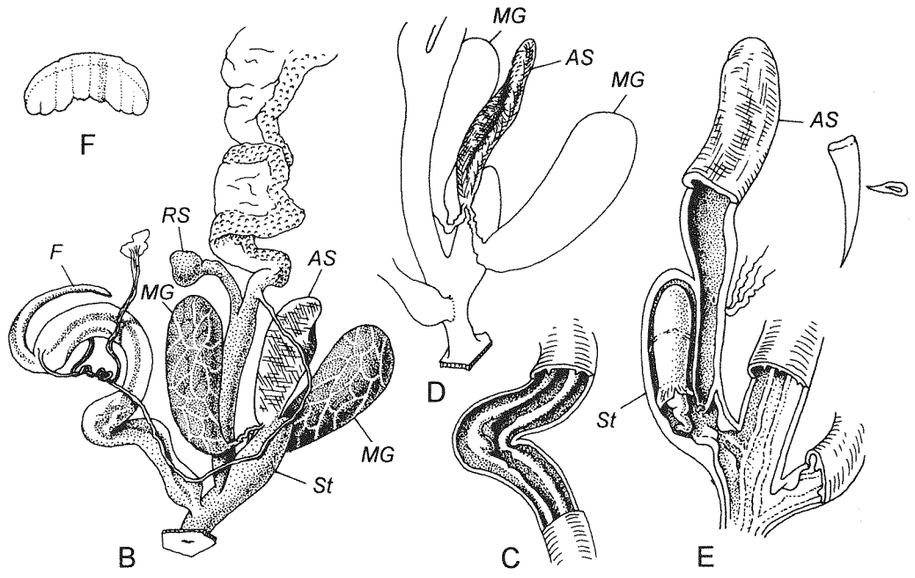


Fig. 2207. A — ***Epiphragmophora hieronymi*** Döring, 1875.
Shell: La Cuesta de la Púerta, 900 m, between Pirquitos & La Púerta, prov. Catamarca, Argentina. **Chicago** No. 216702. B, C, D, E, F — ! ***Epiphragmophora claromphalos*** (Deville et Hupé, 1850). Valle Urubamba, Sahuayaco, Peru. B — reproductive tract. C — interior of penis. D — vagina with accessory organs. E — interior of stylophore, dart and its cross-section. F — jaw. **Phil**. No. A-5783.

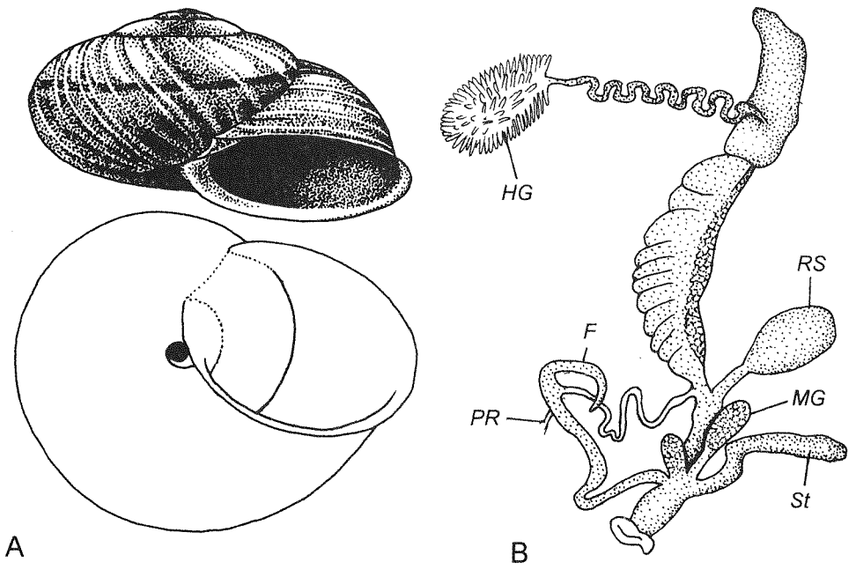


Fig. 2208. ***Doeringina trenquelleonis*** (Grateloup, 1851).
A — shell: Cordoba, Argentina. **Leiden**. B — reproductive tract. After Fernandez & Rumi, 1984.

Karlschmidtia Haas, 1955
Fig. 2210

Haas, 1955: 327.

TYPE SPECIES — *Karlschmidtia lentiformis* Haas, 1955; OD.

Shell lens-shaped, solid, slightly translucent, of 5 moderately convex whorls. Last whorl slightly descending in front, with sharp peripheral angle. Spire depressedly dome-shaped. Color yellowish-corneous, uniform or with very weak darker bands above and below peripheral angle. Embryonic whorl smooth. Later whorls with widely spaced, irregular, not sharp radial ribs, which usually lighter than background. Aperture very oblique, margins thin, widely reflexed, with low, white lip within. Umbilicus rather broad, cylindrical. Height 10-12, diam. 26-32 mm (12.1 × 29.2 mm).

DISTRIBUTION. Peru. 2 spp.

Dinotropis Pilsbry et Cockerell, 1937
Fig. 2211

Pilsbry & Cockerell, 1937: 24.

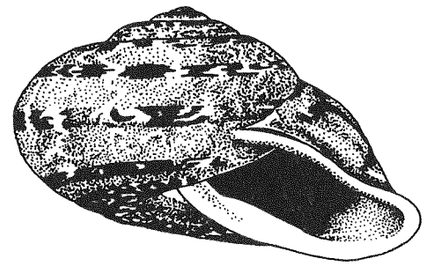


Fig. 2209. ***Pilsbrya farrisi*** (L. Pfeiffer, 1859).
Leymebamba, Peru. **Phil**. No. 159907.

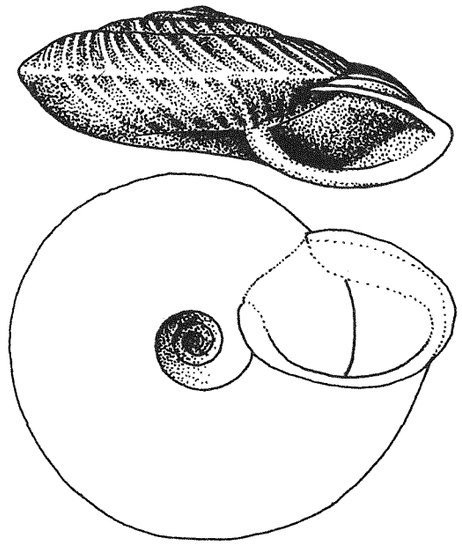


Fig. 2210. ***Karlschmidtia lentiformis*** Haas, 1955.
Hacienda Mozobamba, Ongoy, Andahuaylas, Apurimae, Peru. Paratype. **Chicago** No. 51272.

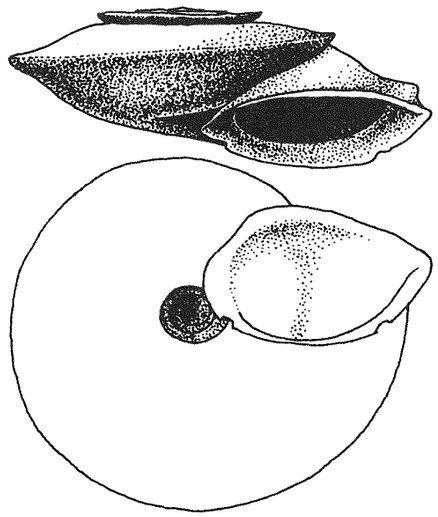


Fig. 2211. ***Dinotropis harringtoni*** Pilsbry et Cockerell, 1937.
Rio Iguembe, above Rio Ingre, Bolivia. "Paratype". **Chicago** No. 125896.

TYPE SPECIES — *Dinotropis harringtoni* Pilsbry et Cockerell, 1937; OD.

Shell lens-shaped, rather thin, of 4.5 flattened whorls. Last whorl slowly and strongly descending, with sharp keel, which usually can be traced on earlier whorls. Spire only slightly convex. Color (dead shell) light-buff, with very faint indication of brownish band above keel. Embryonic whorls smooth. Postnuclear surface very closely granulose, granules pustuliform, indistinctly arranged along light radial lines, but locally forming short oblique trends. Aperture very strongly oblique, adnate, peristome well expanded and reflexed. Umbilicus moderately broad. Height 8-9, diam. 26-28 mm (8.0 × 28.0 mm).

DISTRIBUTION. Bolivia. 1 sp.

REMARK. The species has been described from a single shell with damaged basal margin of the aperture. However in Chicago there is a specimen in excellent condition, designated as "paratype"; probably Harrington collected several specimens, but sent to Pilsbry only one of them; the label of the "paratype" coincides completely with those given in the original description. If Pisbry really has not seen the Chicago specimen, then it does not belong to the type series even if it originated from the same sample as the holotype.

Angrandiella Ancey, 1886
Fig. 2212

Ancey, 1886: 20 (*Helix* subg.).

TYPE SPECIES — *Helix angrandi* Morelet, 1863; OD.

Shell lens-shaped, moderately solid, of about 4.5 flattened whorls. Last whorl slightly descending in front, bluntly angulated at periphery. Spire slightly elevated. Color corneous, with darker supraperipheral band. Embryonic whorls smooth, rest surface vaguely radially wrinkled. Aperture strongly oblique, margins slightly reflexed; there is basal tooth, to which deep depression on external surface corresponds. Umbilicus rather wide. Height 7-8, diam. 20-25 mm [about 7 (estimated) × 20.6 mm].

DISTRIBUTION. Andes in Peru. 1 sp.

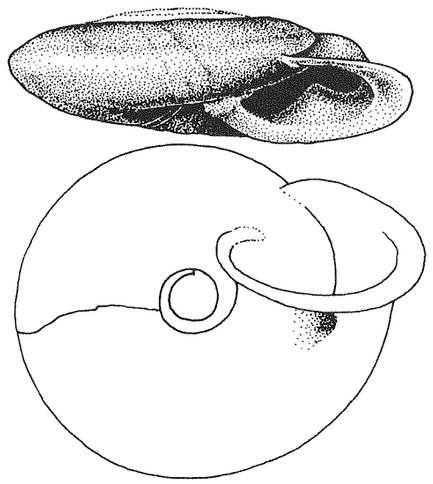


Fig. 2212. ***Angrandiella angrandi*** (Morelet, 1863).
"Vallée de l'Apurim, Peru". **London** No. 1893.2.4.454.

nae), being surrounded by a thin, transparent sheath; in this case there are 2 additional mucus glands inserting on lower part of mentioned sheath. Spermathecal stalk cylindrical, with or without diverticle.

DISTRIBUTION. SW and SE (Florida) N America, Caribbean Islands.

REMARK. Dr. Barry Roth (1996: 41), based on his cladograms, introduced 11 new suprageneric "phylogenetic" taxa in Helminthoglyptidae without proper definitions or indications of their taxonomic rank. As an example of mode of description of these taxa I am citing the description of the 1st taxon:

"Chamaeariontales, new taxon, consists of *Chamaearionta aquaealba* and all taxa that share a more recent common ancestor with it than with Helminthoglyptales".

Since I do not know what should I do with these names, I am just listing them: Chamaeariontales, Eremariontaphim, Helminthoglyptaina, Helminthoglyptales, Helminthoglyptamorpha, Helminthoglyptaniki, Helminthoglyptaphim, Helminthoglyptotes, Sonorellales, Sonorellamorpha, Xerariontales.

HELMINTHOGLYPTIDAE Pilsbry, 1939

Pilsbry, 1939: 24.

Shell globose to depressed, generally rather thin, never reduced.

Sole smooth.

Jaw either with a few strong ribs or nearly smooth, with a low median projection.

Flagellum long to absent. Epiphallus sometimes much reduced. Penis with solid or double walls. Verge present or lacking; in latter case walls of penis double. There is 1 or 2 mucus glands. If there are 2 glands they open either separately or via 1 common duct into stylophore, their apical parts being directed to atrial area and forming a transparent sheath around neophore. Near place of opening into stylophore there are more or less clearly expressed swellings on ducts; if glands open by 1 duct, swellings well-developed and situated near fusion of ducts. If mucus gland 1, it is small, rounded, opens into stylophore through short duct, almost apically. Neophore may be present (Cepoli-

EREMARIONTINAE Schileyko, 1991

Schileyko, 1991: 223.

Shell generally depressed, mostly with a supraperipheral dark band. Teeth in aperture absent. Umbilicus always open, rather narrow.

Jaw ribbed.

Penis with verge which may be very short, sphincter-like. Penial walls one-layered, although walls of epiphallus and verge may contain circular slit-like cavities. Stylophore sits on lower section of vagina, so neophore absent. Initially there are 2 mucus glands, with small muscular swellings of their ducts; these ducts open into stylophore separately. Apical sections of glands adjoining atrial area without forming thin-walled sheath. Accessory glands of stylophore sheath absent. However in 5 (of 7) genera I refer to Eremariontinae dart apparatus totally missing.

DISTRIBUTION. California (Death Valley region, Mohave and Colorado Deserts and bordering mountains), Arizona (Yuma County), NW Sonora, NW Mexico (Lower California).

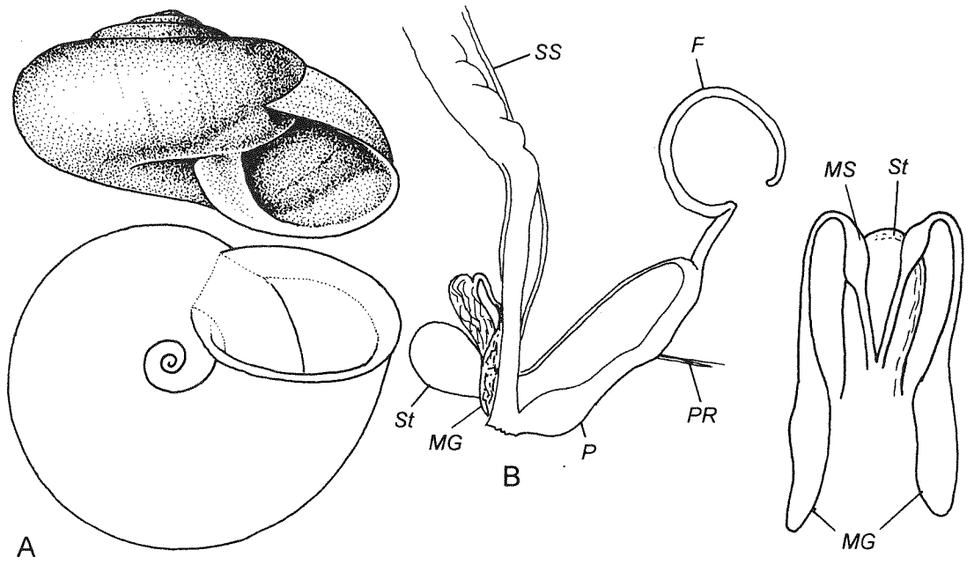


Fig. 2213. ***Eremarionta desertorum*** (Pilsbry et Ferriss, 1908).
A — shell: 12 miles south from Parker, Yuma Co., Arizona. Lectotype. **Phil**. No. 94783. B — reproductive tract. C — dart sac and mucus glands. After Pilsbry, 1939. ***MS*** — muscular swelling on mucus gland ducts.

Eremarionta Pilsbry, 1913
Fig. 2213

Pilsbry, 1913: 382 (*Micrarionta* sect.).

TYPE SPECIES — *Micrarionta desertorum* Pilsbry et Ferriss, 1908; OD.

Shell depressed, thin, shining, of 4-5 moderately convex, rounded whorls. Last whorl rounded, more or less deflected. Color yellowish to pale-corneous, usually with dark supraperipheral band. Embryonic whorls with lengthened papillae arranged in spiral and oblique series; sometimes papillae united into short threads or partly netted together. Postapical whorls nearly smooth. Aperture subcircular, well oblique, its margins scarcely to distinctly expanded. Umbilicus moderately narrow to dot-like. Height 6.3-15.5, diam. 9.5-23.5 mm (7.25 × 12.92 mm).

Flagellum (moderately) long. Epiphallus short (about 2 times shorter than penis). Penis swollen near base. Penial retractor slender, marks boundary between penis and epiphallus. Free oviduct long. Vagina very short. Stylophore large; near its base, on inner side 2 mucus glands inserted close together. Mucus glands descend, their enlarged ends lie near base of stylophore. On each of gland ducts there is a muscular swelling (propulsatory organ). Spermathecal stalk very long, slender; reservoir globular. Diverticle of spermathecal shaft absent, except for 1 species.

DISTRIBUTION. California (Death Valley region, Mohave and Colorado Deserts and bordering mountains), Arizona (Yuma County), NW Sonora. About 25 spp. & subspp.

Cahillus Roth, 1996
Fig. 2214

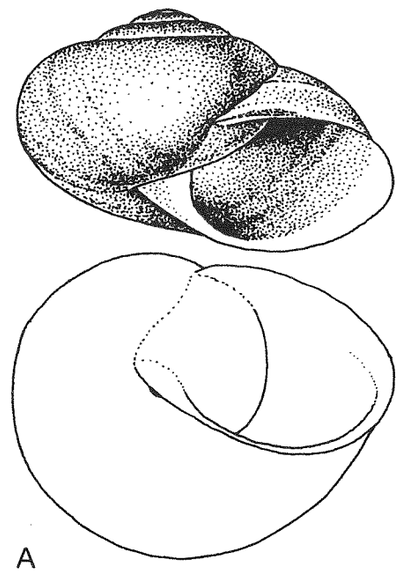
Roth, 1996: 40.

TYPE SPECIES — *Sonorella wolcottiana* Bartsch, 1903; OD.

Shell depressed-conic to flattened, thin, somewhat translucent, of 4-5 slightly convex whorls. Last whorl rounded, gradually but markedly descending in front. Color whitish to corneous, uniform or (more often) with supraperipheral brown or reddish band margined by light zones. Embryonic whorls distinctly granulose. Postapical sculpture of very fine, irregular radial wrinkles. Aperture widely ovate to subcircular, well oblique, with straight, sharp margins. Umbilicus moderately broad to dot-like, more or less covered. Height 6-16, diam. 11-24 mm (*wolcottiana*: 15.0 × 23.1 mm; *greggi*: 7.3 × 13.5 mm).

Talon not located. Flagellum rather short. Epiphallus very short, less than 0.4 time as long as penis. Penis capacious or slender, internally smooth, with ovate verge; walls of verge contains narrow circular cavity extending to basal part of epiphallus walls. Penial retractor attached to penis/epiphallus junction. Free oviduct short, vagina 2-3 times longer. Stylophore rather small, ovate, containing a small, simple, conic dart. Both mucus glands descending, with muscular swelling on each duct.

DISTRIBUTION. California. At least 5 spp.



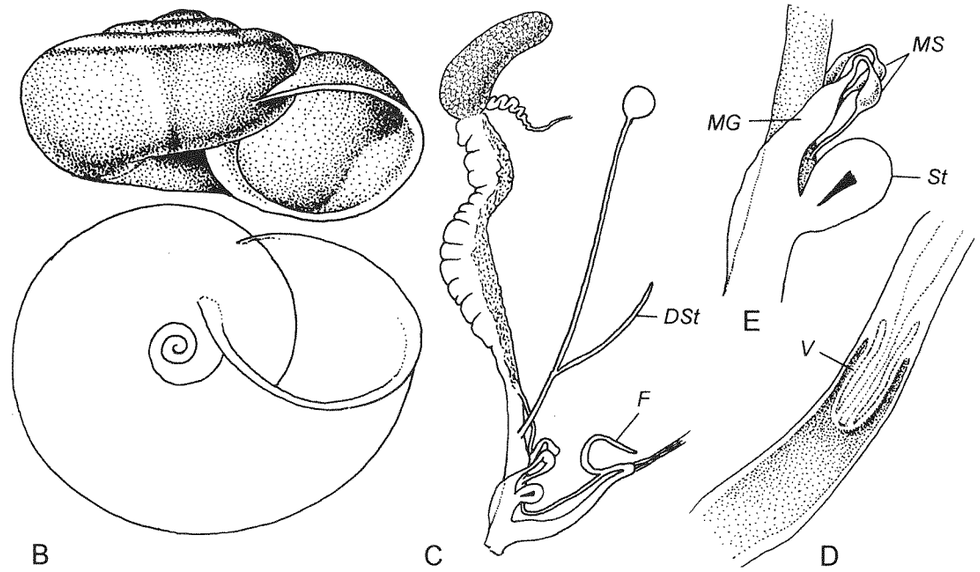


Fig. 2214. A — ***Cahillus wolcottiana*** (Bartsch, 1903).
Palm Springs, Los Angeles Co., California. Topotype. **Phil**. No. 85001. B, C, D, E — ! ***Cahillus greggi*** (W. Miller, 1981). Johnson Canyon, Death Valley, California, May 18-19, 1972. B — shell. Paratype. **Moscow** No. Lc-24785 (**StB** No. 5897). C — reproductive tract. D — interior of penis. E — stylophore and mucus glands. **StB** No. 5897, W. Miller's slide. ***MS*** — muscular swellings on mucus gland ducts.

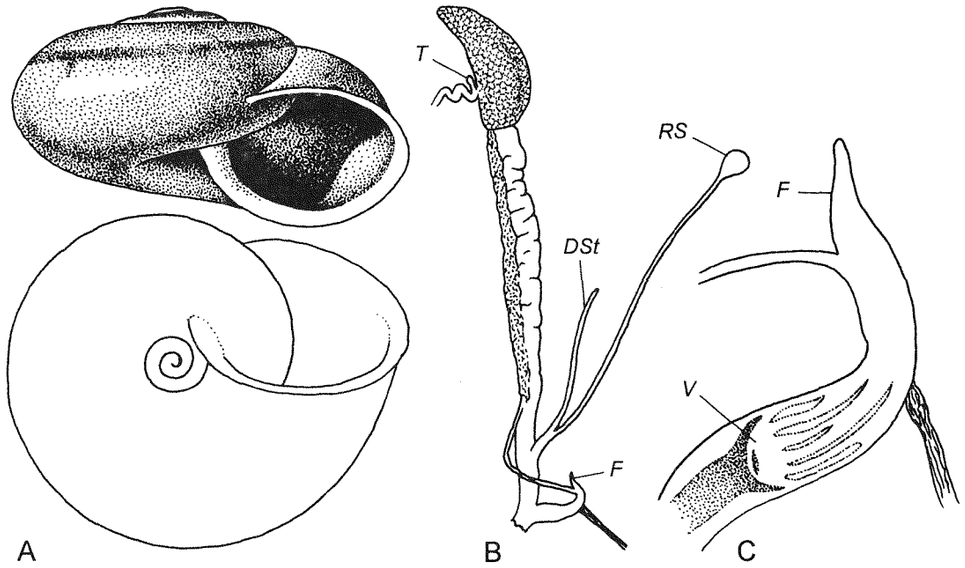


Fig. 2215. ***Eremariantoides argus*** (Edson, 1912).
A — shell: N-facing rock-slide, Revenue Canyon, Argus Mts., Inyo Co., California. **Moscow** Lc-21355. B, C — the same locality, January 19 — February 18, 1959. B — reproductive tract. C — optical longitudinal section of penis and epiphallus. **StB**, W. Miller's slide No. 7765-C.

Eremariontoides W. Miller, 1981
Fig. 2215

Miller W., 1981: 439.

TYPE SPECIES — *Sonorella argus* Edson, 1912; OD.

Shell depressed, rather thin, slightly shining, translucent, of 3.5-4 a little convex whorls. Last whorl rounded, distinctly descending in front. Spire conic. Color light-corneous, with darker band encircling body whorl a little above periphery. Embryonic whorls with fine granulation. Later whorls with fine, irregular radial wrinklets. Aperture ovate, oblique, with thin, narrowly expanded margins; their insertions somewhat converging, so thin, transparent parietal callus rather short. Umbilicus not wide, funnel-shaped or subcylindrical. Height 6-7, diam. 11-13 mm (6.8 × 12.5 mm).

Talon minute, exposed. Flagellum reduced to minute tip at end of epiphallus. Epiphallus short, contains 3-4 longitudinal, anastomosing, thick pilasters which can protrude only slightly to form minute verge, into short, saccular penial chamber. Walls of epiphallus contain a few very narrow, slit-like cavities. Stylophore and mucus glands completely absent. Spermathecal stalk long, diverticle much shorter; neck very short; reservoir attending albumen gland.

DISTRIBUTION. California (Argus Mts., Revenue Canyon). 1 sp.

Greggelix W. Miller, 1972
Fig. 2216

Miller W., 1972: 130.

TYPE SPECIES — *Helix indigena* Mabille, 1895; OD.

Shell much depressed, thin, slightly translucent, of about 4-5 rather convex whorls. Last whorl well deflected, rounded. Color white, with brown supraperipheral band. Embryonic and early postembryonic whorls with smoothed radial wrinkles and small, distinct pustules. Later whorls weakly, irregularly, radially wrinkled. Aperture broadly ovate, quite oblique, with

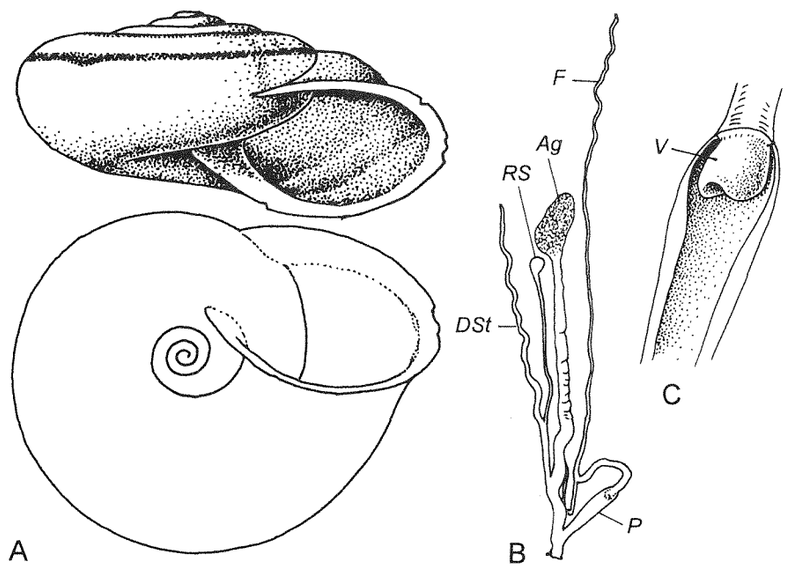


Fig. 2216. ***Greggelix indigena*** (Mabille, 1895).
San Jose Comondu, Baja California Sur, Mexico, December 20, 1970. A — shell. **Moscow** No. Lc-25676 (**StB** No. 75304). B — reproductive tract. C — interior of penis. **StB**, W. Miller's slide No. 75309.

thin, widely reflexed margins. Umbilicus moderately wide, perspective. Height 8-10, diam. 16-22 mm (9.5 × 20.3 mm).

Vas deferens comparatively short. Flagellum extraordinary long. Epiphallus rather short. Penis small, rather thick-walled, its inner surface without regular sculpture. Verge small, subglobular, with wide channel. Free oviduct short, vagina somewhat longer. Dart apparatus absent. Spermathecal stalk long, with longer diverticle and short neck; reservoir small, reaching albumen gland.

DISTRIBUTION. Lower California (Mexico). 3 spp.

Martirelix W. Miller, 1982
Fig. 2217

Miller W., 1982: 345 (*Greggelix* subg.).

TYPE SPECIES — *Greggelix* (*Martirelix*) *babrakzaii* W. Miller, 1982; OD.

Shell depressed, thin, somewhat shining, of about 5 moderately convex whorls. Last whorl well descending in front, evenly rounded. Spire slightly elevated, broadly-conic. Color white, with brown supraperipheral band. Embryonic whorls with microscopic radial wrinklets and vague granulation. Later whorls with very smoothed, crowded radial wrinkles. Aperture ovate, quite oblique, with thin, moderately reflexed margins. Umbilicus relatively narrow. Height 9.7-13.1, diam. 16.7-21.5 mm (11.0 × 19.3 mm).

Vas deferens of moderate length. Flagellum very long. Epiphallus rather short. Penis clavate, very thin-walled, its inner surface with rows of V-shaped folds; verge conic, with terminal pore. Penial retractor inserted on middle of epiphallus. Free oviduct and vagina moderately long, subequal in length. Dart apparatus missing. Spermathecal stalk long, nearly cylindrical, scarcely expanded basally; reservoir attending albumen gland. Diverticle of spermathecal stalk long, neck short.

DISTRIBUTION. Lower California (Mexico). 2 spp.

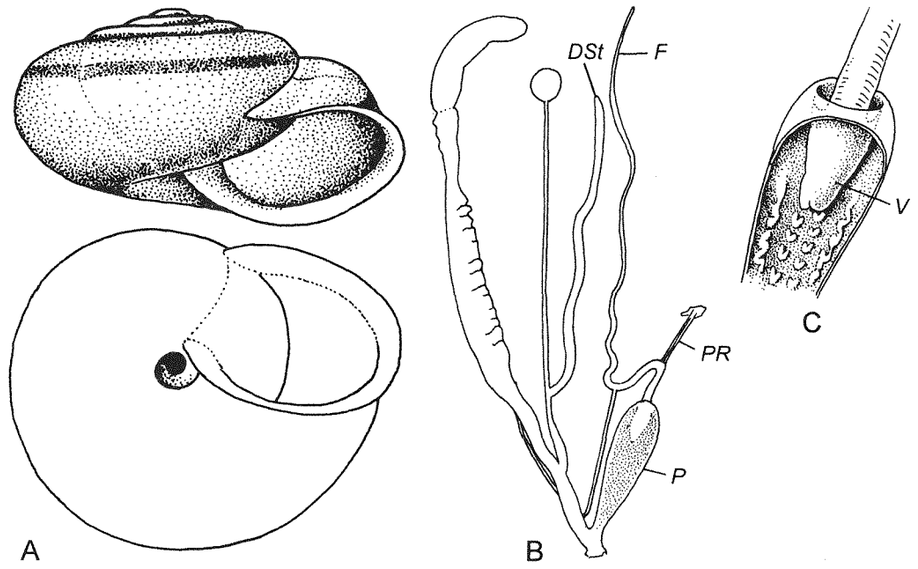


Fig. 2217. ***Martirelix babrakzaii*** (W. Miller, 1982).
A — shell: E slope of Sierra San Pedro Martir, Canyon Diablito, Baja California, Mexico. Paratype. **Moscow** No. Lc-24790 (**StB** No. 7162). B, C — Sierra San Pedro Martir, Canyon de Diablo, Baja California, Mexico, March 17, 1981. B — reproductive tract. C — interior of penis. **StB**, W. Miller's slide No. 7163-C.

Herpeteros Berry, 1947
Fig. 2218

Berry, 1947: 11 (*Sonorelix* subg.).

TYPE SPECIES — *Micrarionta* (*Eremarionta*) *inglesiana* Berry, 1928; OD.

Shell depressed-globular to low-conic, thin, rather fragile, of 5-5.5 rather convex whorls. Last whorl somewhat inflated, rounded at periphery, slightly descending in front. Color uniformly brownish to cinnamon. Sculpture of embryonic whorls of strong, rather indefinitely aligned papillae superimposed upon more finely wrinkly-papillose surface. On early postapical surface papillae become much smaller and closer together; toward 2 next whorls they gradually become obsolete, and penultimate and body whorls nearly smooth. Aperture semicircular, well oblique, with reflexed margins; columellar margin expanded. Umbilicus narrowly open, almost cylindrical. Height 11-16, diam. 19-25 mm (13.4 × 21.5 mm).

Vas deferens comparatively short. Flagellum vestigial. Epiphallus short and very slender, its diameter approximately equal to that of vas deferens. Penis capacious, obesely fusiform; its large cavity nearly filled by enormous muscular verge that has a wide lateral orifice. Penial retractor inserted directly upon upper end of penis. Free oviduct extremely short (nearly absent). Vagina quite long, lacking dart apparatus. Spermathecal stalk long; diverticle about 2.5 times shorter; neck moderately short.

DISTRIBUTION. Lower California. 5-6 spp.

Sonorelix Berry, 1943
Fig. 2219

Berry, 1943: 8.

TYPE SPECIES — *Micrarionta* (*Eremarionta*) *borregoensis* Berry, 1929; OD.

Shell depressed, rather thin, of 4.5-5 slightly convex whorls. Last whorl rounded, well deflected. Color white, with dark supraperipheral band. Sculpture of embryonic whorls reticulate. Postapical whorls with very smoothed, irregular radial wrin-

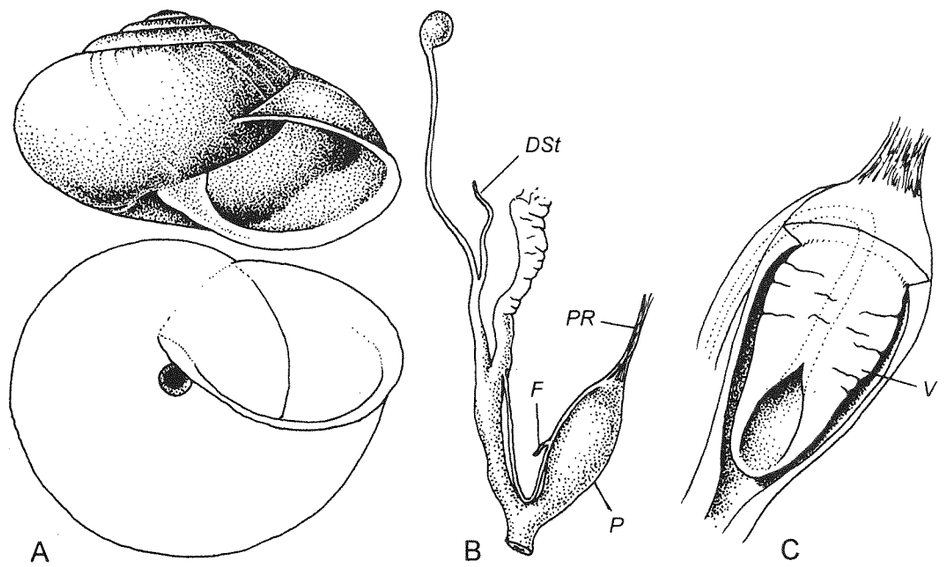


Fig. 2218. ***Herpeteros inglesiana*** (Berry, 1928).
A — shell: N slope of Red Rock near Hamilton Rancho below Santo Domingo, Lower California. Paratype. **Phil**. No. 146094. B, C — Hamilton Ranch, Lower California, November 5, 1973. B — reproductive tract. C — interior of penis. **StB**, Miller's slide No. 76310.

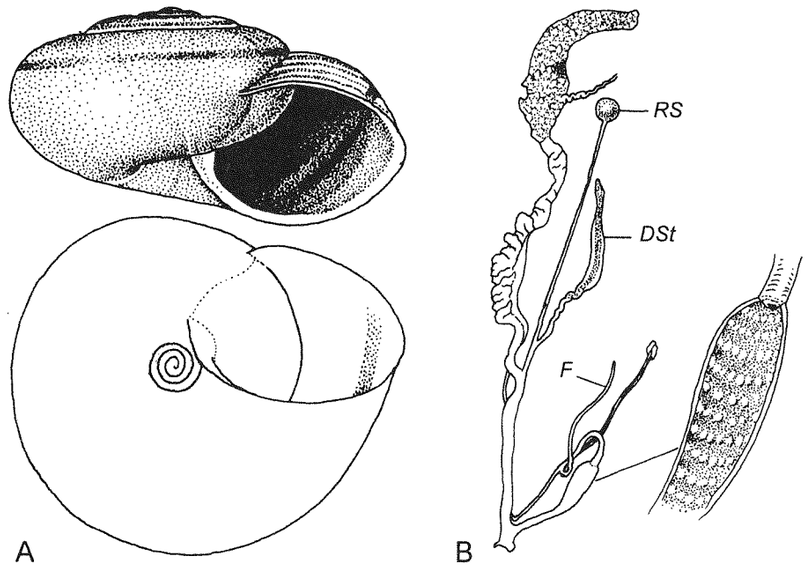


Fig. 2219. ***Sonorelix borregoensis*** (Berry, 1929).
A — shell: Palm Canyon, Borrego Valley, San Diego Co., California. Syntype. **Phil**. No. 150059. B — the same locality, November 23, 1972. Reproductive tract and interior of penis. **StB**, W. Miller's slide No. 6031-A.

kles. Aperture broadly ovate, with thin, slightly reflexed margins. Umbilicus not wide but perspective. Height 8-13, diam. 14-23 (11.4 × 21.7 mm).

Talon hidden. Vas deferens moderately long. Flagellum not long, slender; epiphallus a little shorter. Penis clavate, thin-walled, internally with transversal rows of rounded tubercles; verge extremely short; in essence, it is a mere sphincter. Penial retractor inserted on proximal part of epiphallus. Free oviduct very short, vagina much longer. Spermathecal stalk slender, reservoir attending albumen gland; diverticle shorter than stalk; within diverticle I found residue of spermatophore; neck short.

DISTRIBUTION. S California. 1 sp.

HELMINTHOGLYPTINAE
Pilsbry, 1939

Pilsbry, 1939: 25, 31.

Shell depressed to globose, usually with dark band above periphery, bordered by pale zones. Shell of some xerophilous species many-banded and variegated. Teeth in aperture absent. Umbilicus narrow, sometimes more or less covered.

Jaw strongly ribbed.

Penis lacking verge (in subgenus *Coyote* secondary verge is formed). Penial walls may contain slit-like circular cavity, i.e. consists of 2 layers. Stylophore sits on neophore (derivative of atrium). There are 2 mucus glands, muscular swellings of their ducts well developed. Ducts fuse before opening into stylophore; distal portions of glands thin and transformed into thin-walled sheath surrounding stylophore, neophore and lower sections of gland ducts. There are no accessory glands of stylophore sheath.

DISTRIBUTION. California and NW Mexico (Lower California).

Helminthoglypta Ancey, 1887

Ancey, 1887: 76. Pilsbry, 1939: 63.

TYPE SPECIES — *Helix tudiculata* Binney, 1843; OD.

Shell globose to depressed-conic, generally (rather) thin, often more or less shining, of 5-7.5 rather convex whorls. Last whorl rounded, not strongly descending. Color generally ochraceous, yellow, greenish-olive, or chestnut, with dark supraperipheral band (sometimes absent). Embryonic whorls smooth at very tip, then a few radial ripples come, then sculpture of close, microscopic, waved, radial wrinkles, over which there are papillae in forwardly descending trends (often indistinct or practically absent); sometimes there is fine granulation. Postnuclear sculpture of simple radial ridgelets or with spiral lines, malleation, papillae or granulation also. Aperture circular to ovate, moderately to well oblique, with shortly reflexed, thin margins. Umbilicus moderately narrow to covered.

Vas deferens passes around stylophore. Epiphallus and flagellum well developed. Penis slender, with very narrow cavity, nearly filled by 3-4 longitudinal pilasters. Spermatophore thread-like, blunt at anterior end and tapering to a fine point posteriorly; in cross-section, spermatophore ranges from roughly circular to shield-shaped. 1-2 round pilasters extend for most of its length, and between them a thin, vertical lamina with its free edge either simple or serrated; points of serration directed toward posterior end.

DISTRIBUTION. California and NW Mexico (Lower California).

Helminthoglypta (*Helminthoglypta* s.str.)
Fig. 2220

Conchological characters as in genus. Height 9.2-30.0, diam. 18.0-42.6 mm (25.2 × 31.0 mm).

Penis lies freely inside sheath, its cavity very narrow, complex in cross-section. Neophore long. Common duct of mucus glands very short.

DISTRIBUTION. California and Lower California. About 70 spp., subspp. & forms.

Helminthoglypta (*Charodotes* Pilsbry, 1939)
Fig. 2221

Pilsbry, 1939: 170.

TYPE SPECIES — *Helix traskii* Newcomb, 1861; OD.

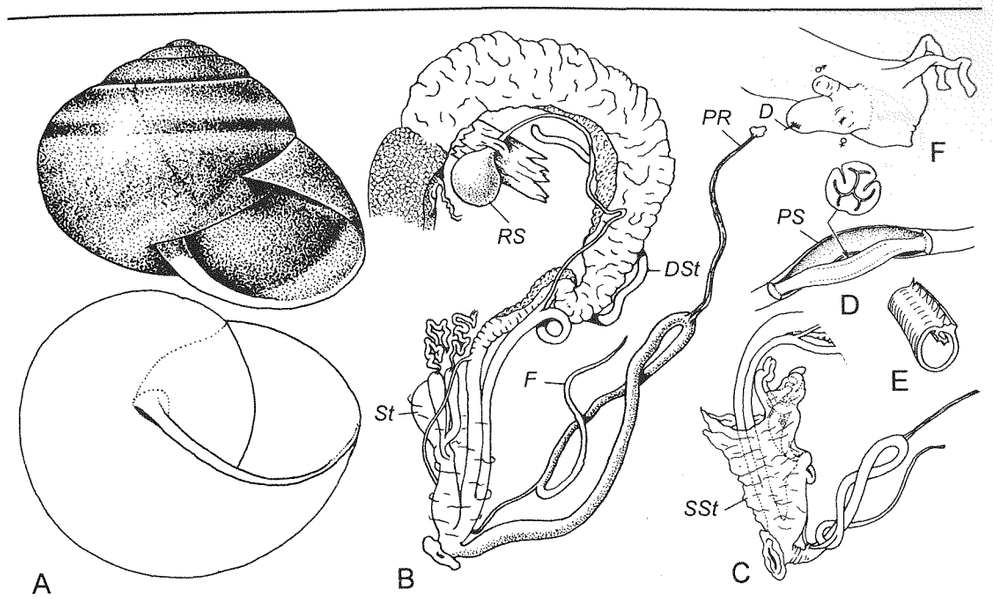


Fig. 2220. A — ***Helminthoglypta* (*Helminthoglypta*) *tudiculata*** (Binney, 1843). Shell: Oceanside, San Diego Co., California. **Moscow** No. Lc-25711 (**StB** No. 2677). B, C, D, E, F — ! ***Helminthoglypta* (*Helminthoglypta*) *nickliniana*** (Lea, 1838). San Mateo Co., California, November 5, 1963. B — reproductive tract. C — distal part of another specimen, sheath of mucus glands in intact condition. D — penis and cross-section through it. E — fragment of spermatophore. F — anterior part of preserved specimen with everted distal parts of genitalia. **Moscow** No. Lc-25657. ***D*** — dart. ***SSt*** — sheath of stylophore.

Shell moderately or rather strongly depressed, thin, translucent, shining, of 5-6 moderately convex whorls. Last whorl rounded, slightly deflected. Color yellowish or light-corneous to reddish, with narrow brown supraperipheral band that often indistinctly margined above and below by narrow light zones. Embryonic whorls nearly smooth or with smoothed, irregular radial wrinkles. Postapical whorls (at least, body whorl) usually with incised spiral lines (but these may be faint or practically absent) and with more or less expressed papillation. Umbilicus rather narrow, open or partly covered. Height 9.2-20.7, diam. 17.1-31.6 mm (13.0 × 22.2 mm).

Penis slender, has a small 4-ribbed cavity and a single, thick muscular walls. Neophore long. Common duct of mucus glands about as long as stylophore or shorter.

DISTRIBUTION. S California and Lower California (Mexico). About 25 spp. & subspp.

Helminthoglypta (*Rothelix* W. Miller, 1985)
Fig. 2222

Miller W., 1985: 96.

TYPE SPECIES — *Epiphragmophora cuyamacensis lowei* Bartsch, 1918; OD.

Shell depressed-conic, thin, translucent, of about 5 moderately convex whorls. Suture deeply channeled. Last whorl rounded, only slightly descending in front. Color dark-yellow or straw, with narrow brown supraperipheral band. Embryonic whorls indistinctly granulated. Later whorls with fine, smoothed, irregular radial wrinkles and microscopical granules. Aperture ovate, well oblique, with thin, a little reflexed margins. Umbilicus narrowly open, subcylindrical. Height 9-18, diam. 16-28 mm (17.2 × 27.5 mm).

Anatomically differs from *Helminthoglypta* s. str. by presence of long, sausage-shaped, lower chamber of penis and by va-

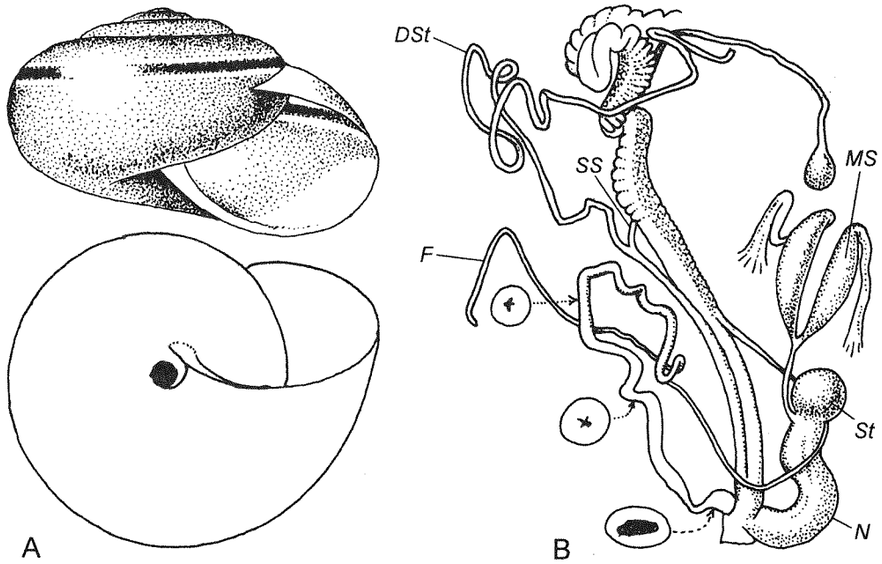


Fig. 2221. ***Helminthoglypta*** (***Charodotes***) ***traskii*** (Newcomb, 1861).
A — shell: Los Angeles, California. **Moscow** No. Lc-25641 (**StB** No. 51587). B — reproductive tract. After Pilsbry, 1939.

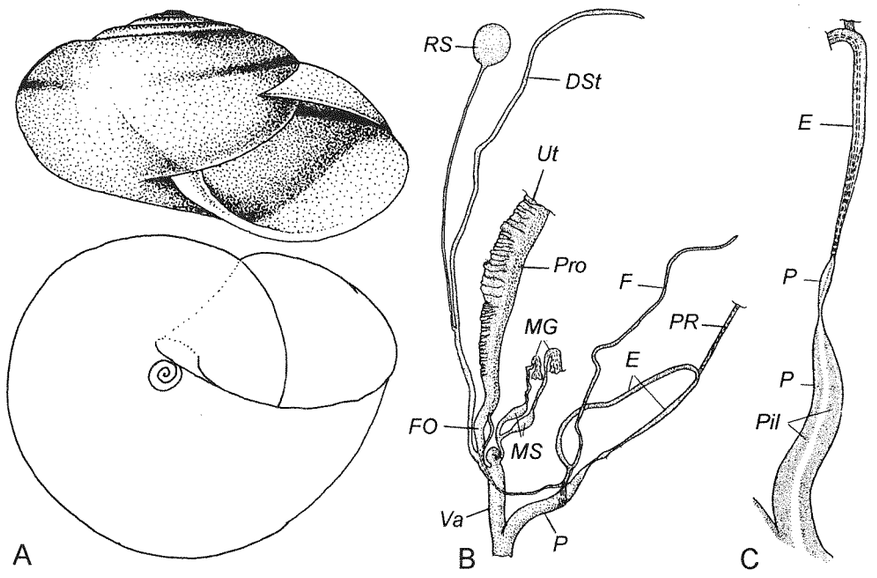


Fig. 2222. ***Helminthoglypta*** (***Rothelix***) ***lowei*** (Bartsch, 1918).
A — shell: Near sawmill on highway on south face Palomar Mt., San Diego Co., California, April 7, 1928. **Moscow** No. Lc-25675 (**StB** No. 6548). A — shell. B — reproductive tract. C — structure of penis. After W. Miller, 1985. ***MS*** — muscular swelling on mucus gland ducts.

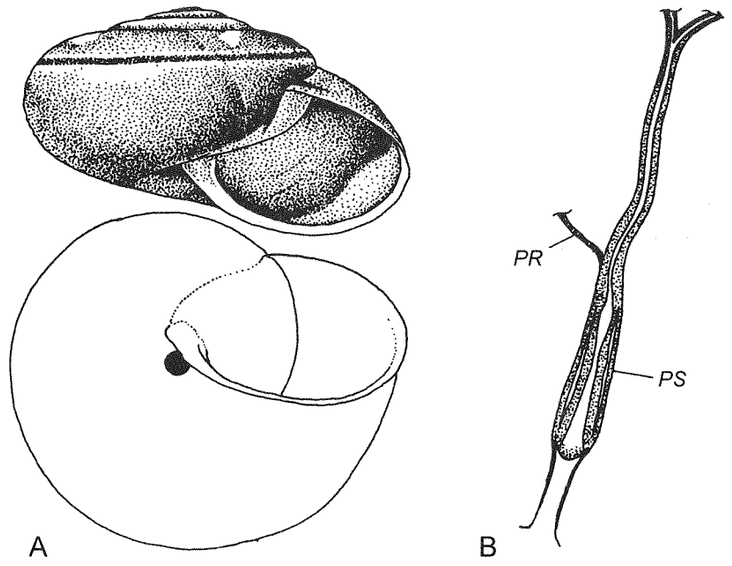


Fig. 2223. ***Helminthoglypta*** (***Coyote***) ***taylori*** Reeder et Roth, 1988.
Along small creek at base of Silverwood Dam, San Bernardino Co., California, April 28, 1993. A — shell. **Moscow** No. Lc-21402. B — interior of penis. After Reeder & Roth, 1988.

gina which enters atrial sac at its apex, next to stylophore; neophore fused with vagina so that it looks like to be nearly absent.

DISTRIBUTION. S California. 4 spp.

Helminthoglypta (***Coyote*** Reeder et Roth, 1988) Fig. 2223

Reeder & Roth, 1988: 253.

TYPE SPECIES — *Helminthoglypta* (*Coyote*) *taylori* Reeder et Roth, 1988; OD.

Shell depressed-conoid, thin, somewhat translucent, weakly shining, of about 5 non convex whorls. Last whorl slightly declined towards aperture. Color greenish-olive, with narrow brown band above periphery. Embryonic sculpture of fine granulation, later whorls covered with thin irregular radial striation and punctation. Aperture ovate, its margins not thickened and slightly reflexed; parietal callus weak, whitish. Umbilicus relatively narrow. Height 8-14, diam. 15-24 mm (11.6 × 20.4 mm).

Penis with double-tubed chamber. In distal section of this chamber there is a prominent bulge.

DISTRIBUTION. S California. 15 spp. & subspp.

Helminthoglypta (***Noyo*** Roth, 1996) Fig. 2224

Roth, 1996: 41 (pro genus).

TYPE SPECIES — *Helminthoglypta intersessa* Roth, 1987; OD.

Shell depressed-conic, rather thin, somewhat shining, of 5.5-6 slightly convex whorls. Last whorl rounded, gently descending in front. Color yellowish, with narrow brown supraperipheral band. Embryonic whorls with very weak radial wrinkles. Postapical sculpture of dense radial wrinkles and widely spaced spiral lines that cut radial elements giving granular effect. Aperture subcircular, moderately oblique, with thin, quite reflexed margins. Parietal callus moderately thick, with granular surface. Umbilicus narrowly open. Height up to 18.3, diam. 21.1-25.5 mm (17.5 × 22.7 mm).

Vas deferens enters summit of epiphal-

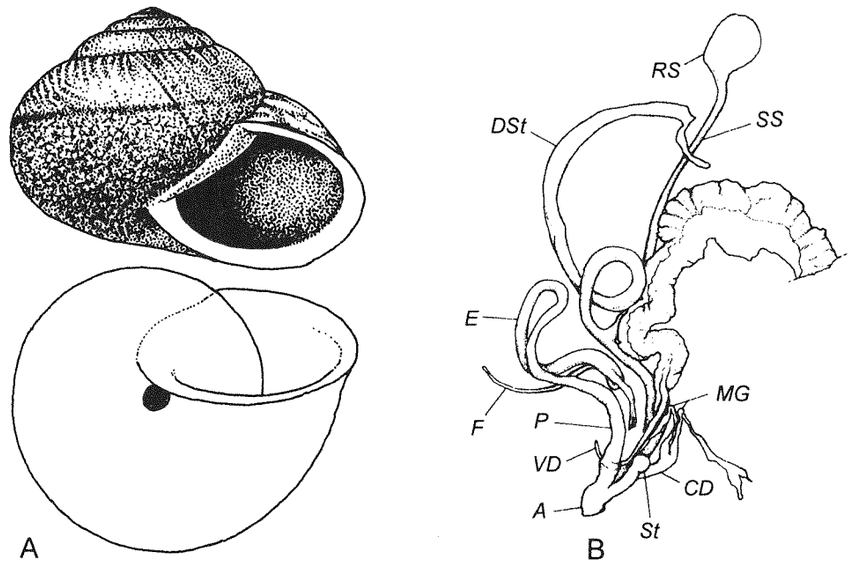


Fig. 2224. ***Noyo intersessa*** (Roth, 1987).
A — shell: Coastal bluffs immediately north of Pudding Creek, Fort Bragg, Mendacino Co., California. Paratype. **Phil**. No. 373461. B — reproductive tract. After Roth, 1987. ***CD*** — common duct of mucus glands.

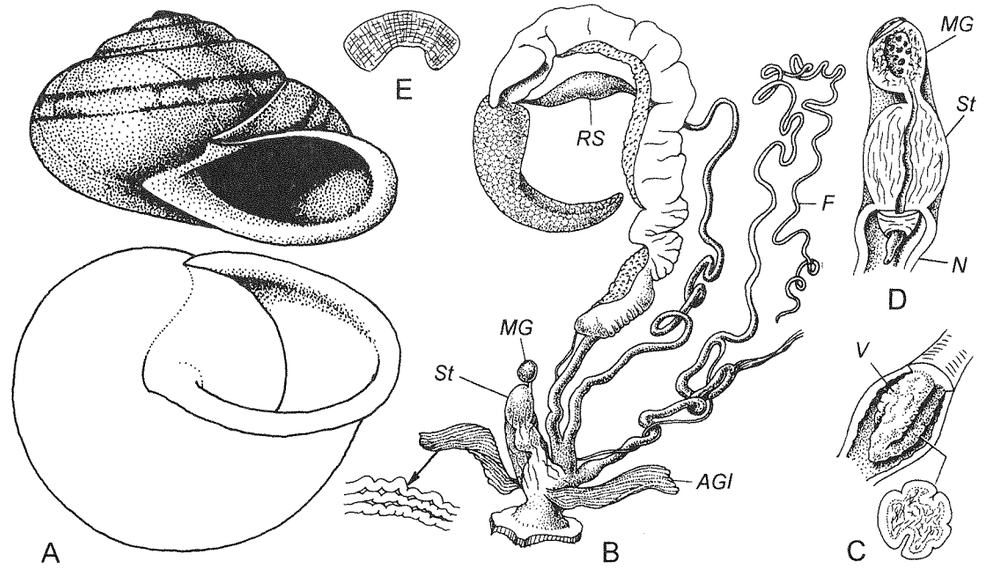


Fig. 2225. ***Eurycampta bonplandi*** (Lamarck, 1822).
A — shell: Pinar del Rio Province, Cuba. **Moscow** No. Lc-25716. B, C, D, E — Stone walls along road to Managua, Habana Province, Cuba, August 1938. B — reproductive tract. C — interior of penis and cross-section of verge. D — longitudinal section through stylophore. E — jaw. **Phil**. No. A-13280. ***AGl*** — accessory glands.

lus excentrically. Flagellum rather long. Mucus glands tubular, not convoluted, supplied by bulbs, with Y-shaped, heavily muscularized common duct, and bent downward so that they lie along inboard surface of vagina.

DISTRIBUTION. California. Probably 1 Recent sp.

CEPOLINAE Ihering, 1909

Ihering, 1909: 429 (Helicidae subf.).

Shell shows a great variety in size, shape, coloration and sculpture. 1-2 teeth or a short plica in aperture may be present. Umbilicus narrowly open to closed.

Jaw without ribs, finely vertically and longitudinally striated (exception: *Setipellis* has ribbed jaw).

Penis with minute verge. Penial walls simple. Stylophore sits on neophore. There is a single globular mucus gland (product of fusion of muscular swellings of ducts of Helminthoglyptinae) situated on summit of stylophore. Stylophore enters neophore through a short papilla. Transparent, very thin sheath of dart apparatus supplied with 1 or 2 accessory glands of peculiar tubular structure which enter sheath at level of lower section of neophore.

DISTRIBUTION. Florida, Greater Antilles, Bahamas.

Eurycampta Martens, 1860
Fig. 2225

Martens in Albers, 1860: 127 (*Helix* subg.).

TYPE SPECIES — *Helix bonplandi* Lamarck, 1822; OD.

Shell depressedly-conic, thin, moderately translucent. Spire nearly conic. Whorls 4.5-5, rather convex. Last whorl rounded, strongly and gradually descending in front. Color light-corneous, with 2 narrow brown bands above and below periphery. Embryonic whorls practically smooth; sculpture of postnuclear whorls in form of radial irregular wrinkles and clear spiral grooves. On body whorl these sculpture elements become more chaotic, and malleate areas appear. Aperture ovate, places of its insertion slightly converging. Aperture margins thin or slightly thickened and reflexed; lip practically absent. Umbilicus closed or nearly so. Height 9-24, diam. 15-35 mm (17.9 × 26.4 mm).

Vas deferens thin, moderately long. Flagellum extraordinary long, slender, convoluted and twisted; epiphallus markedly shorter and just a little thicker. Penis small, with comparatively large verge which bears axial grooved on its surface; epiphallic pore situated at base of verge. Free oviduct long, vagina much shorter. Stylophore thick-walled, enters neophore through a muscular papilla. A pair of additional glands consisting of many sinuous, tightly adjoining to each other tubules, sit on enlarged atrium. Spermathecal stalk very long (longer than spermoviduct), twisted and convoluted; reservoir with apical ligament, attending albumen gland.

DISTRIBUTION. Cuba, Bahamas, Martinique. About 10 spp. & forms.

Hemitrochus Swainson, 1840
Fig. 2226

Swainson, 1840: 165, 330.

— *Phaedra* Albers, 1850: 100 [nom. praeocc., non Horsfield, 1829 (Lepidoptera); *Helix* subg.; t.-sp. *Helix varians* Menke, 1829; designated here].

— *Polytaenia* Martens in Albers, 1860: 129 (*Helix* subg.; t.-sp. *Helix multifasciata* Weinland et Martens, 1859; monotypy).

TYPE SPECIES — *Hemitrochus haemastomus* Swainson, 1840 (= *Helix varians* Menke, 1829); OD.

Shell subglobose, moderately solid, weakly translucent, apex somewhat pointed. Whorls 5-5.5, slightly convex. Last whorl capacious, evenly rounded, descending in front. Color white, apex pinkish; 1-3 dark spiral bands may be present; columellar and parietal margins of aperture often pink. Embryonic whorls smooth. Postnuclear sculpture of very fine irregular wrinkleness. Aperture oblique, rounded,

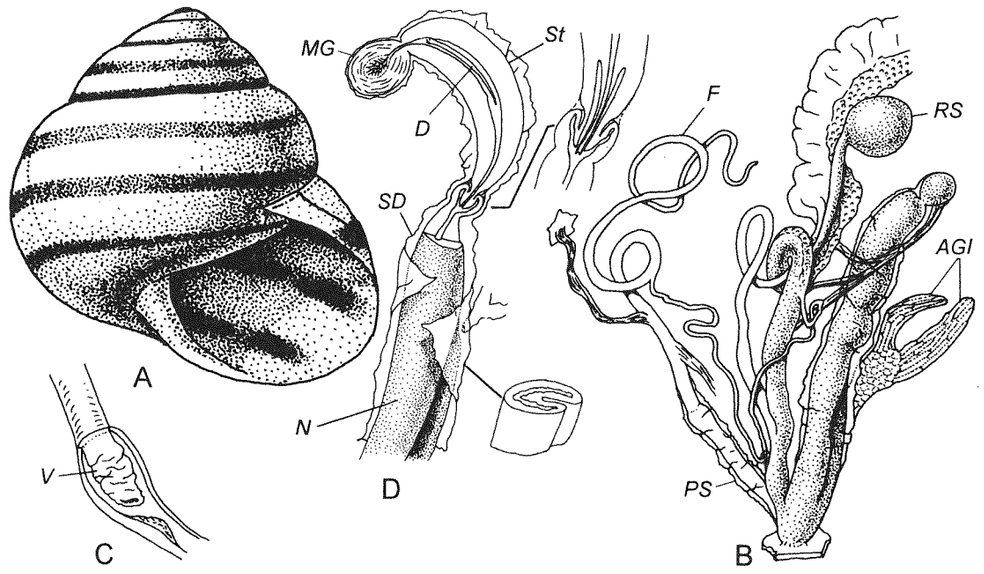


Fig. 2226. ***Hemitrochus varians*** (Menke, 1829).
Coral Gables near Miami, Florida, September 1989. A — shell. B — reproductive tract. C — interior of penis. D — interior of stylophore. **Moscow** No. Lc-20949 (dry shells); Lc-25704 (soft parts) (gift of Glenn Long). ***AGl*** — accessory glands. ***D*** — dart. ***SD*** — sheath of dart apparatus.

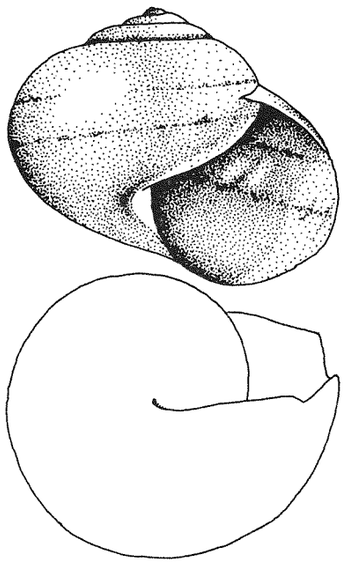


Fig. 2227. ***Cysticopsis cubensis*** (L. Pfeiffer, 1840).
Zona Franca, Matanzas, Cuba. **Leiden**.

columellar and parietal margins slightly thickened, not reflexed; columellar margin much reflexed and covers umbilicus. Height 12.2-18.5, diam. 14.0-16.2 mm (15.2 × 14.4 mm).

Jaw with a low median projection, almost smooth, just with slight horizontal wrinklets and exceptionally fine vertical striation.

Vas deferens long, slender. Flagellum long, vermiform; epiphallus shorter. Penis rather small, subcylindrical, internally with folded verge and a small pad covered with tiny tubercles. Penis sheath thin, transparent. Penial retractor attached to middle of epiphallus. Free oviduct rather long; vagina much shorter. Small mucus gland sits on summit of elongated stylophore which enters neophore through a minute papilla. Additional glands of tubular structure, united at their base, enter sheath of neophore at level of middle of its lower portion. Spermathecal stalk long.

DISTRIBUTION. S Florida and Bahamas. Probably 1 variable sp.

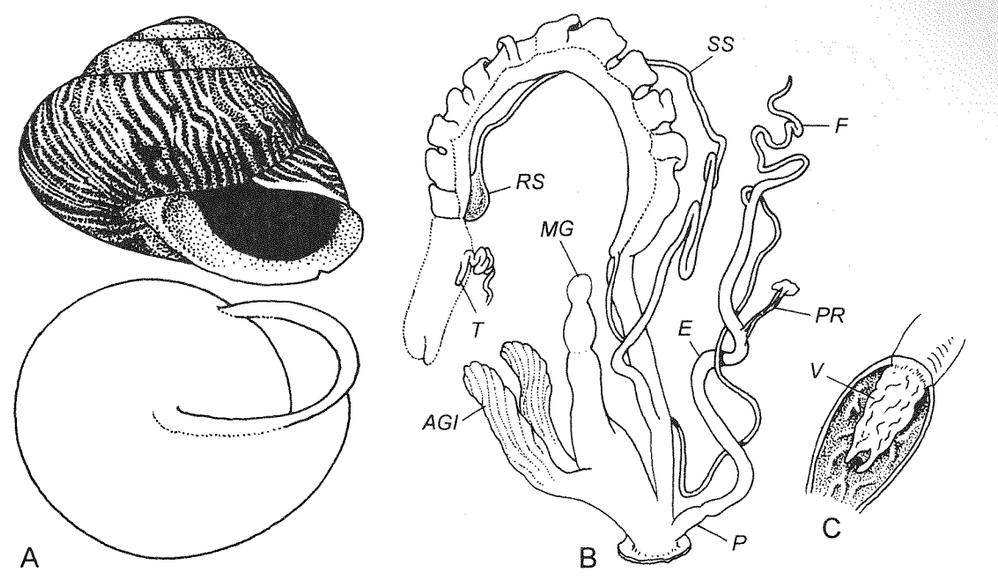


Fig. 2228. ***Coryda alauda*** (Férussac, 1821).
A — shell: Baraco, Cuba. **Moscow** No. Lc-20942. B, C — Cuba. B — reproductive tract. C — interior of penis. **Phil**. No. A-13292. ***AGl*** — accessory glands.

Cysticopsis Mörch, 1852
Fig. 2227

Mörch, 1852: 2.

TYPE SPECIES — *Helix cubensis* L. Pfeiffer, 1840; monotypy.

Shell subglobular-conic, thin, fragile, subtransparent, of about 5 moderately convex whorls. Last whorl inflated, rounded, (almost) straight. Color whitish or yellowish, either uniform or with narrow dark bands, or dotted. Both embryonic and later whorls lack regular sculpture. Aperture subcircular, only slightly oblique, with simple, thin margins; columellar margin dilated. Umbilicus minute or closed. Height 7-16, diam. 8-19 mm (10.5 × 12.5 mm).

DISTRIBUTION. Cuba including Isla de la Juventud (= Isla de Pinos). About 10 spp. & forms.

Coryda Albers, 1850
Fig. 2228

Albers, 1850: 100 (*Helix* subg.).

— *Histrio* L. Pfeiffer, 1854: 185 (t.-sp. *Helix dennisoni* L. Pfeiffer, 1853; monotypy).

TYPE SPECIES — *Helix alauda* Férussac, 1821; SD Martens in Albers, 1860.

Shell depressedly conic or turbinoid, solid, weakly translucent. Spire dome-shaped, apex smoothed. Whorls 5, weakly convex. Last whorl strongly descending in front. Color brown to chestnut, upper whorls lighter; body whorl with numerous light irregular streaks. Embryonic whorls glabrous. Postapical whorls also nearly smooth, just with fine, vague, irregular radial wrinkles. Aperture very oblique, rounded, parietal callus weak, margins shortly reflexed; there is rather strong lip at short distance from edge. Umbilicus absent. Height 8-17, diam. 13-23 mm (16.1 × 22.2 mm).

Talon small, exposed. Flagellum moderately long. Epiphallus long, cylindrical. Penis small, internally with many minute, scattered folds and verge which has wrinkled surface and pore margined by 2 tiny lobes. Dart apparatus typical for subfamily.

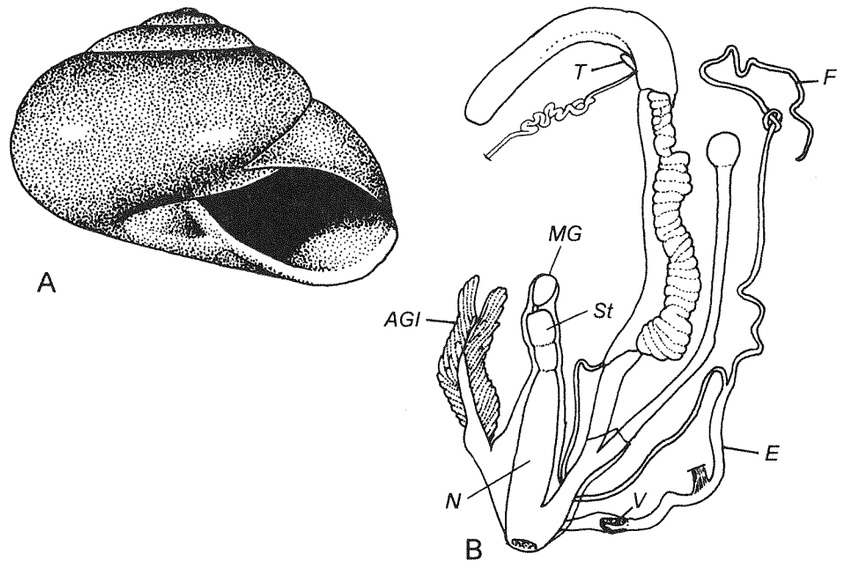


Fig. 2229. ***Levicepolis boriquenae*** (H. Baker, 1943).
A — shell: Loiza, Puerto Rico. Holotype. **Phil**. No. 28335. B — reproductive tract. After H. Baker, 1943. ***AGl*** — accessory glands.

Ducts of accessory glands united just before entering sheath of neophore. Spermathecal stalk very long, convoluted and folded.

DISTRIBUTION. E Cuba, W Hispaniola. About 6 spp.

Levicepolis H. Baker, 1943
Fig. 2229

Baker H., 1943: 88 (*Cepolis* subg.).

TYPE SPECIES — *Cepolis* (*Plagioptycha*) *boriquenae* H. Baker, 1940; monotypy.

Shell depressed-conic, rather thin, shining, of 4.5 moderately convex whorls. Last whorl well descending in front, evenly rounded. Color whitish to straw. Both embryonic and later whorls lacking regular sculpture. Aperture rounded, well oblique, with thin, shortly reflexed margins. Umbilicus absent, umbilical depression profound. Height 9.9, diam. 14.0 mm (9.9 × 14.0 mm).

Talon small, drop-like, exposed. Vas deferens moderately long. Flagellum very long, twisted. Epiphallus shorter than flagellum. Penis small, containing subconic verge with basal pore and a sulcus on opposite side. Penial retractor inserted on middle of epiphallus. Free oviduct and vagina subequal in length. Stylophore and neophore typical for subfamily. Common duct of accessory glands undivided.

DISTRIBUTION. Puerto Rico. 1 sp.

Euclastaria Pilsbry, 1926
Fig. 2230

Pilsbry, 1926: 112 (nom. nov. pro *Euclasta* Martens, 1877).

— *Euclasta* Martens, 1877: 347 [nom. praeocc., non Lederer, 1855 (Lepidoptera); *Helix* subg.; t.-sp. *Helix musicola* Shuttleworth, 1854; monotypy].

TYPE SPECIES — *Helix musicola* Shuttleworth, 1854; OD.

Shell low-conic, thin, somewhat shining, slightly translucent. Apex narrowly rounded. Whorls 4-5, moderately convex. Last whorl straight, rounded. Color yellowish, monochromate or banded at or above periphery. Embryonic whorls smooth. Postnuclear surface microscopically subgranose and radially wrinkled or ribbed. Aperture rounded, oblique, its margins sharp, simple; columellar margin reflexed. Umbilicus narrowly open, cylindrical. Height 6.0-6.5, diam. 9-10 mm (6.1 × 9.0 mm).

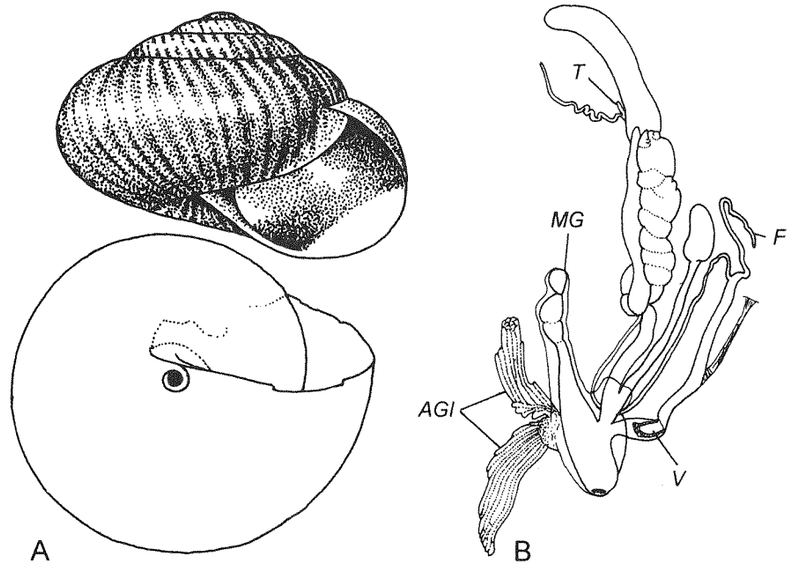


Fig. 2230. ***Euclastaria musicola*** (Shuttleworth, 1854).
A — shell: Puerto Rico. **Chicago** No. 45569. B — reproductive tract. After H. Baker, 1943. ***AGl*** — accessory glands.

Hermaphroditic gland of 4-5 fans of acini. Talon short, mainly buried, or a slender thread, expanded into 2 discs at apex. Flagellum comparatively short. Penis contains verge with pore (hidden) near base and with spatulate apex. Stylophore with dart gradually expanding toward base. Neophore contains a swollen basally papilla. Accessory glands confluent only where tubules, mostly long, discharge. Spermathecal stalk comparatively short, reservoir reaching 0.7 up short spermoviduct.

DISTRIBUTION. Virgin Islands, Puerto Rico, Cuba. 2-3 spp.

Jeanneretia L. Pfeiffer, 1877
Fig. 2231

Pfeiffer L., 1877: 7 (*Helix* sect.).

TYPE SPECIES — *Helix multistriata* Deshayes, 1832; SD Pilsbry, 1895 (1893-1895).

Shell low-conic, solid, slightly translucent, of about 6 rather convex whorls. Apex narrowly rounded, spire somewhat dome-shaped. Last whorl scarcely angulated, deflected toward aperture. Color uniformly yellow to yellowish-corneous; rarely with vague dark band above periphery. Embryonic whorls smooth. Later whorls with spiral cords, those on body whorl expressed better; peripheral cord strongest. Aperture very oblique, places of its insertion slightly convergent; margins somewhat thickened and sharply reflexed, white; baso-columellar margin bears weak thickening. Umbilicus very narrow, partly or completely covered by reflection of columellar margin. Height 10-18, diam. 14-23 mm (17.8 × 22.5 mm).

Hermaphroditic gland of 5 clusters of acini. Talon minute, rod-like. Vas deferens moderately long. Flagellum very long, slender; epiphallus much shorter. Penis small, internally with dome-shaped, minute verge which excised near base by a pore. Free oviduct not long; vagina shorter. Stylophore and neophore typical. Accessory glands comparatively small, confluent just before entering sheath of dart apparatus. Spermathecal stalk long; reservoir attend-

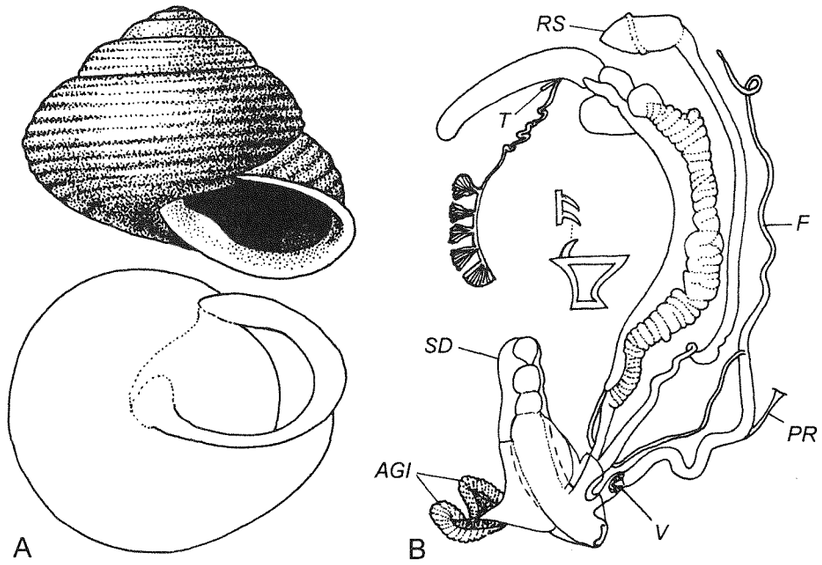


Fig. 2231. A — ***Jeanneretia multistriata*** (Deshayes, 1832).
Shell: Sta. 2, San Vincente de los Banos, Pinar del Rio, Cuba. **Chicago** No. 170218. B — ! ***Jeanneretia dermatina*** (Shuttleworth, 1854). Reproductive tract and cross-section through spermatophore. After H. Baker, 1943. ***AGI*** — accessory glands. ***SD*** — sheath of dart apparatus.

ing lower half of albumen gland. Spermatophore with 3-sided epiphallic body, bearing, along one angle, a row of hooks, which curve sideward and away from tail.

DISTRIBUTION. Cuba, Puerto Rico. About 10 spp.

Bellacepolis Pilsbry, 1943
Fig. 2232

Pilsbry in Baker, 1943: 86 (*Cepolis* subg.).

TYPE SPECIES — *Helix squamosa* Férussac, 1819; OD.

Shell depressed-conic, rather thin, lusterless, of about 4.5 moderately convex, somewhat shouldered whorls. Last whorl bluntly angulated, sharply descending in front. Color yellowish to brownish-yellow, irregularly and rather sparsely speckled with small, elongated, chestnut-brown spots. Postembryonic whorls with spiral rows of large tubercles; on peripheral angle tubercles turned to short, low, deciduous scales. Aperture broadly ovate, very oblique; basal tooth absent but basal margin markedly thickened. Umbilicus absent. Height 9-10, diam. 16-17 mm (9.0 × 16.1 mm).

Hermaphroditic gland of 4 clusters of acini. Talon clavate, exposed. Flagellum quite long. Epiphallus opening near base of flattened verge. Free oviduct about 2 times as long as vagina. Stylophore ovoid, thick-walled, opening through a short papilla. Accessory glands roughly semicircular in cross-section; flat side with duct, from which numerous, short to moderately long, mucus tubules radiate, so that only ends visible on convex side. Cavity of dart apparatus sheath where accessory glands attached, has vertical partition. Spermathecal shaft long, convoluted; voluminous reservoir attending albumen gland. Body of spermatophore with 4 axial, sometimes splitted ribs, its tail part coiled longitudinally.

DISTRIBUTION. Puerto Rico. 1 sp.

Plagioptycha L. Pfeiffer, 1855
Fig. 2233

Pfeiffer L., 1855: 135 (*Helix* subg.).

— *Monodonta* Bartsch, 1932: 8 [t.-sp. *Plagioptycha* (*Monodonta*) *beatensis* Bartsch, 1932; monotypy].

TYPE SPECIES — *Helix loxodon* L. Pfeiffer, 1850; SD Martens in Albers, 1860.

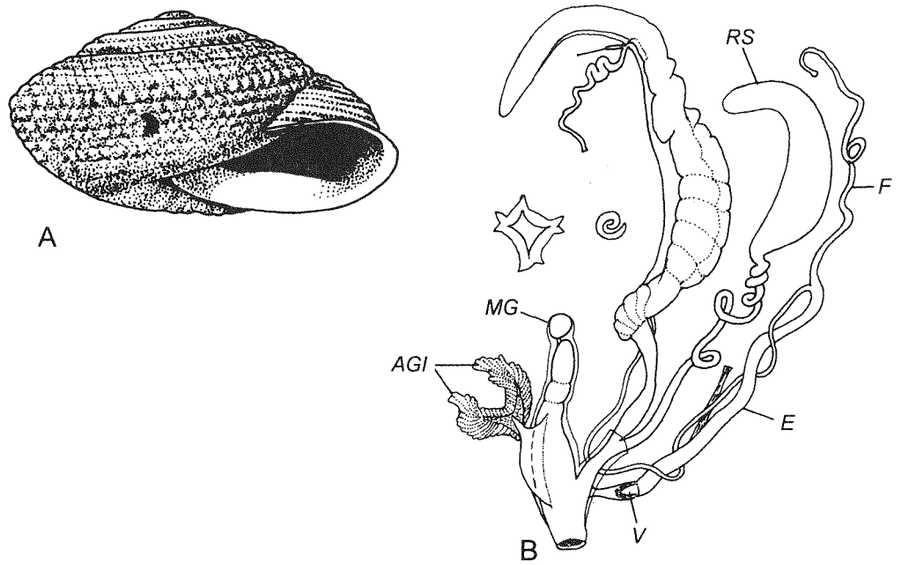


Fig. 2232. ***Bellacepolis squamosa*** (Férussac, 1819).
A — shell: W Rio Arecibo, Puerto Rico. **Phil.** No. 256412. B — reproductive tract and cross-sections of spermatophore. After Baker, 1943. ***AGI*** — accessory glands.

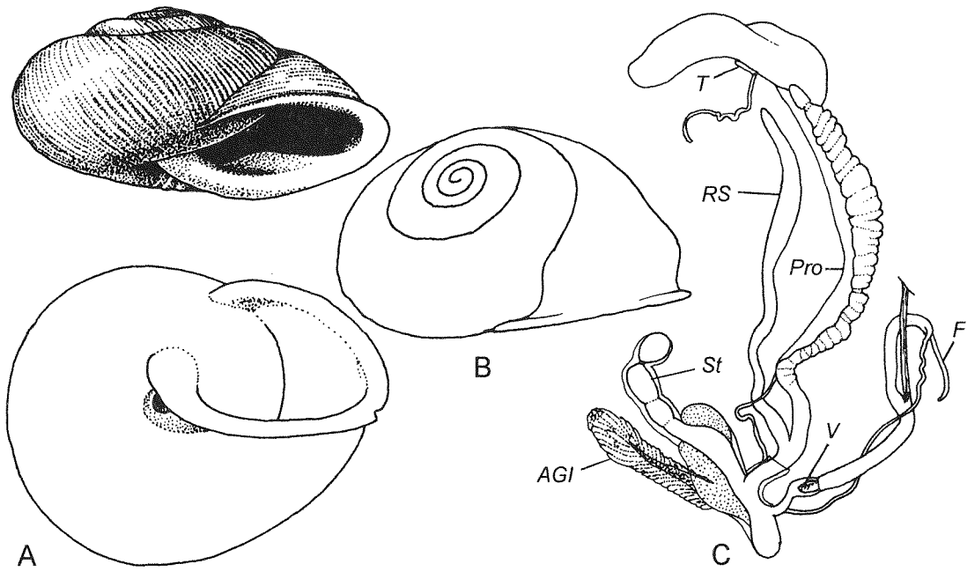


Fig. 2233. A — ***Plagioptycha loxodon*** (L. Pfeiffer, 1850).
Shell: "Haiti". **Chicago** No. 39834. B, C — ! ***Plagioptycha indistincta*** (Férussac, 1821). B — shell. C — reproductive tract. After H. Baker, 1943. ***AGI*** — accessory gland.

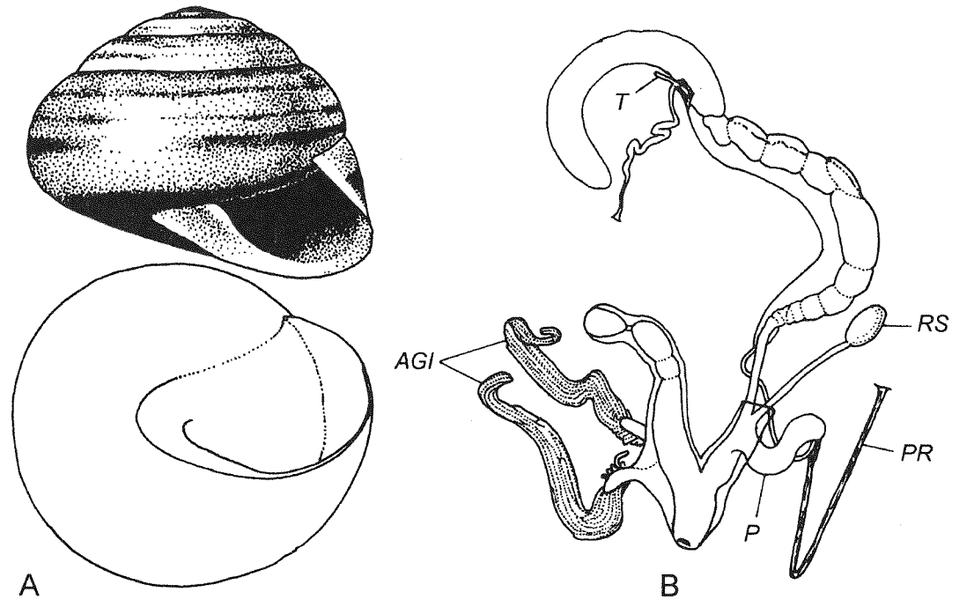


Fig. 2234. ***Dialeuca nemoraloides*** (C. Adams, 1845).
A — shell: Jamaica. **Leiden**. B — reproductive tract. After Baker, 1943. ***AGl*** — accessory glands.

Shell much depressed, rather thin, silky glossy, translucent, of 4.5-5 somewhat convex whorls. Last whorl rounded, strongly and abruptly deflected. Color uniformly pale-yellow to yellowish-corneous. Embryonic whorls smooth throughout or delicately ribbed in distal part. Postapical sculpture of fine, regular ribbing. Aperture broadly ovate, oblique; peristome insertions approached. Margins of aperture reflexed; there is a basal thickening which lies not exactly in plane of aperture but its left end directed a little inside. Umbilicus narrowly open to closed, encircled by a blunt ridge. Height 5-12, diam. 9-21 mm (7.0 × 14.0 mm).

Hermaphroditic gland of 2 clumps of acini. Flagellum comparatively very short. Small penis with "verge which little more than a ring with teat-shaped papilla on one side" (Baker, 1943: 86). Free oviduct and vagina about equal in length. There is only 1 accessory gland. Cavity of sheath of dart apparatus with heavy, broad partition.

DISTRIBUTION. Hispaniola, Bahamas. About 20 spp.

Dialeuca Albers, 1850
Fig. 2234

Albers, 1850: 114 (*Helix* subg.).

— *Leptoloma* Martens in Albers, 1860: 167 (*Helix* subg.; t.-sp. *Helix fuscocincta* C. Adams, 1850; OD).

TYPE SPECIES — *Helix nemoraloides* C. Adams, 1845; monotypy.

Shell generally depressed-conic, rather thin, of 5.5-6 slightly convex whorls. Last whorl rounded, slightly and gradually descending. Spire mostly dome-shaped. Color white, usually with 2-4 dark bands. Embryonic and later whorls with fine shagreen sculpture. Aperture ovate-subtriangular, moderately oblique, with thin, only slightly reflexed margins except considerably widened columellar. Umbilicus closed. Height 10-23, diam. 16-24 mm (12.5 × 16.1 mm).

Hermaphroditic gland of 7 groups of acini. Talon small, rod-like. Vas deferens short, entering near apex of penis between vergic folds. Flagellum or epiphallus absent. Penis internally with strong pilasters basally; apical half pebbled, with 2 principal pilasters bifurcating to form high vergic loops. Penial retractor attached to vas deferens entrance. Free oviduct moderately long; vagina shorter. Dart apparatus typical for subfamily. Accessory glands 2, quite long, enter sheath of dart apparatus independently. Spermathecal stalk short; reservoir lies on distal part of spermoviduct.

DISTRIBUTION. Jamaica, Navassa, Cayman Islands. 12-14 spp. & forms.

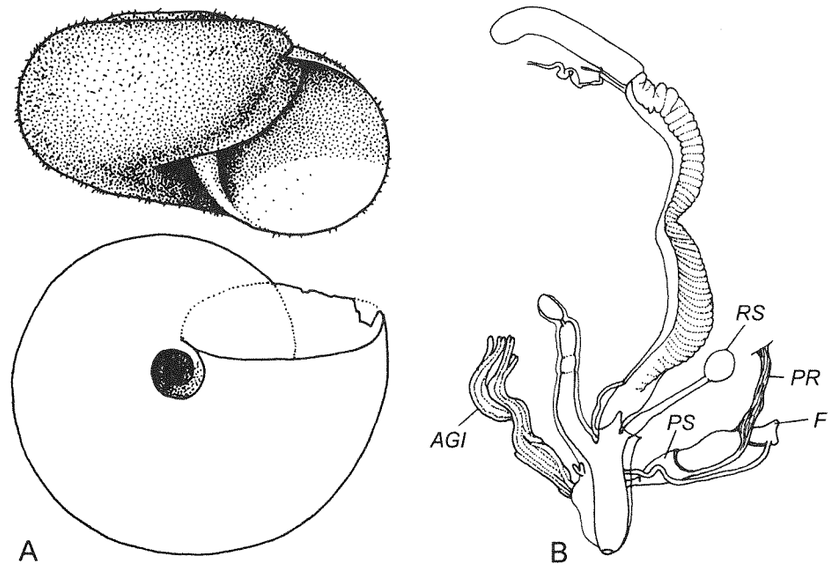


Fig. 2235. ***Setipellis stigmatica*** (L. Pfeiffer, 1841).
A — shell: Escaleros de Jaruco near Habana, Cuba. **Moscow** No. Lc-20923. B — reproductive tract. After H. Baker, 1943. ***AGl*** — accessory gland.

Setipellis Pilsbry, 1926
Fig. 2235

Pilsbry, 1926: 111 (*Suavitas* sect.).

TYPE SPECIES — *Helix stigmatica* L. Pfeiffer, 1841; OD.

Shell nearly puck-shaped, very thin, with hardly elevated spire and flattened summit. Whorls 4, weakly convex. Last whorl straight, evenly rounded. Color uniformly light-corneous. Embryonic whorls smooth. Postapical whorls finely radially wrinkled and shortly setose; setae stiff, transparent, straight, arranged in oblique rows. Aperture subcircular, only slightly oblique, with thin, sharp, fragile margins. Umbilicus open, comparatively wide, nearly cylindrical. Height 9, diam. 16-17 mm (9.0 × 16.1 mm).

Jaw with 5 ribs, of which median strong and outermost very weak.

Talon exposed, rod-like, extremely slender basally. Vas deferens rather short. Flagellum vestigial, blunt. Epiphallus very short. Penis comparatively large, internally with rather strong axial folds and conic verge which has lateral slit-like pore. There is penis sheath surrounding basal 1/3 of penis. Penial retractor attached to penis/epiphallus junction and sends branches to upper edge of penis sheath. Free oviduct short, vagina shorter. Stylophore and neophore typical. 1 accessory gland with almost no duct and about 9 long tubules; other gland vestigial or absent; both attached below neophore. Spermathecal stalk comparatively short, scarcely swollen basally; reservoir not attending middle of spermoviduct.

DISTRIBUTION. W Cuba. 1 sp.

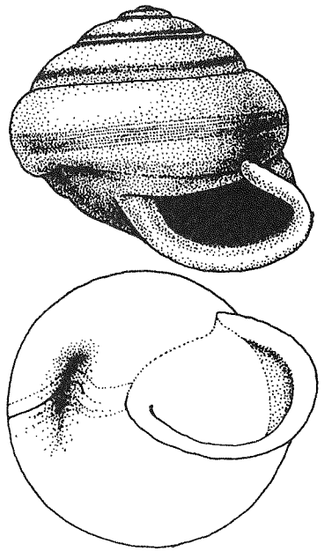


Fig. 2236. ***Guladentia subtussulcata*** (L. Pfeiffer, 1863).
Pinar del Rio, Cuba. **Moscow** No. Lc-17716.

Guladentia Clench et Aguayo, 1951
Fig. 2236

Clench & Aguayo, 1951: 87 (*Jeanneretia* subg.).

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

Shell globular, moderately solid, slightly translucent, of 6 moderately convex whorls. Last whorl strongly descending in front. Spire dome-shaped. Color light-corneous or yellowish to nearly white, with 2 or 3 brown bands: one of them below suture, 2nd on periphery and 3rd on basal surface (may be absent). Embryonic whorls glossy, covered with both radial and spiral fine striation. On postnuclear whorls same sculpture becomes stronger. On basal surface there is a deep curved scar or trench, producing an elongated fold or tooth inside body whorl. Aperture rounded-lunar, very oblique; margins reflexed, thickened, sometimes with small longitudinal thickening on columellar margin. Peristome insertions slightly converging, connected by well developed callus. Umbilicus absent. Height 16-31, diam. 21-31 mm (25.6 × 30.2 mm).

DISTRIBUTION. Cuba. 1-2 spp.

Cepolis Montfort, 1810
Fig. 2237

Montfort, 1810: 150.

— *Cepolum* Montfort, 1810: 151 (nom. err. pro *Cepolis*).

TYPE SPECIES — *Cepolis nicolsinianum* Montfort, 1810 (= *Helix cepa* Müller, 1774); OD.

Shell depressed-globose, solid, more or less glossy, of 4.5-5 weakly to strongly convex whorls. Last whorl strongly descending in front. Color chestnut, porcelain white or yellow, monochromate or with 1-3 bands. Embryonic whorls with smoothed irregular radial wrinkles or granules. Postapical sculpture of variously developed radial striae. Aperture irregularly subquadrangular or oblong-lunate, quite oblique, usually with tubercular tooth on columellar margin and elongated palatal plica. Umbilicus narrowly open, slit-like or closed. Height 10-25, diam. 16-45 mm (21.2 × 39.0 mm).

Vas deferens long, somewhat coiled around epiphallus and penial retractor. Flagellum very long. Epiphallus superficially not demarcated from penis. Penis internally with axial folds and very short verge which has wide lumen. Free oviduct long, vagina very short. Stylophore and neophore of usual structure. Sheath of dart apparatus reduced. Single accessory gland has alveolar rather than tubular structure, sits on atrium. Spermathecal stalk long, somewhat convoluted; reservoir large, reaching albumen gland. Spermatophore on ventral side bears lamina coiled along its length; on dorsal side there are 3 longitudinal sharp ribs having minute hooks; lateral ribs with smooth ridges.

DISTRIBUTION. Greater Antilles, Bahamas. About 10 spp., subspp. & forms.

Polymita Beck, 1837

Beck, 1837: 44.

TYPE SPECIES — *Helix picta* Born, 1780; SD Gray, 1847.

Shell subglobular to oblong-conic, rather thin but firm, glossy, of 4-5 slightly to moderately convex whorls. Last whorl evenly rounded, slightly and gradually descending. Color brilliant, highly variable. Both embryonic and postembryonic whorls lack a special sculpture. Aperture rounded, slightly lunate, with margins simple, not expanded or reflexed except at columella, where it more or less dilated and adnate over umbilicus. Umbilicus closed.

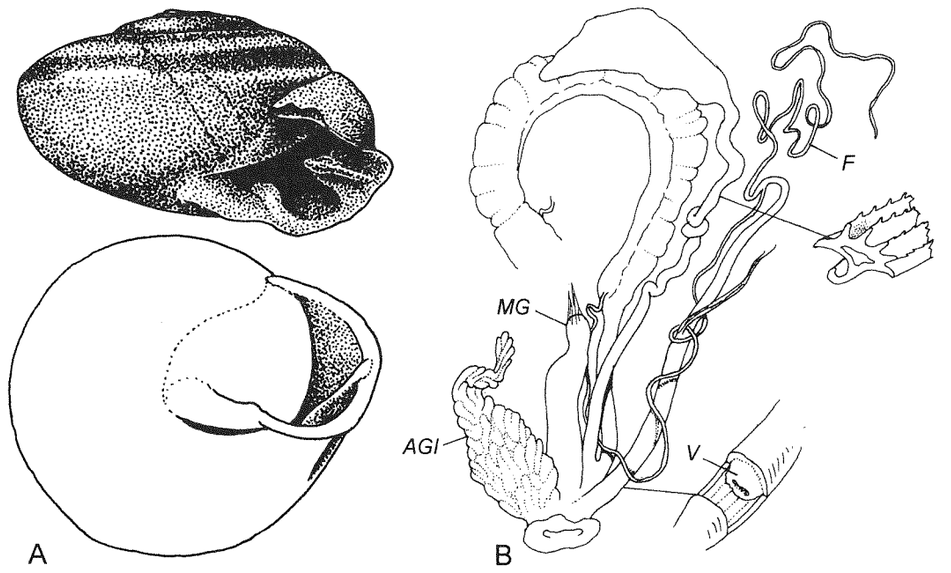


Fig. 2237. A — ***Cepolis cepa*** (Müller, 1774).
Shell: Santo Domingo [Hispaniola]. **SPb**. B — ! ***Cepolis definita*** (Fulton, 1908). 19th km on Alcoa, road from Cabo Rojo to Bauxiti Mines, Prov. Pedernales, Dominican Republic, Hispanola, March 20, 1997. B — reproductive tract, interior of penis and cross-section through spermatophore. **Moscow** No. Lc-25730. ***AGl*** — accessory gland.

Talon exposed, drop-like. Flagellum of moderate length. Epiphallus rather short to moderately long. Penis internally with reticulate relief or nearly smooth; verge minute, conic, with apical pore. Penial retractor inserted above middle of epiphallus. Mucus gland, stylophore and neophore typical. Accessory glands fan-like, not attending mucus gland, enter sheath of dart apparatus separately. Free oviduct markedly longer than vagina. Spermathecal stalk moderately long, reservoir lies on upper half of spermoviduct.

DISTRIBUTION. E Cuba.

REMARK. Two genera in the genus *Polymita* differ mainly by conchological characters while the anatomy of their type species looks very similar. But, since I have not dissected representatives of *Oligomita*, I tentatively retain these subgenera.

Polymita (*Oligomita* Torre, 1950)
Fig. 2238

Torre, 1950: 18.

TYPE SPECIES — *Helix versicolor* Born, 1870; OD.

Shell globose to oblong-conic, of 4.5-5 moderately to rather convex whorls. Coloration consists of many bands, all or part of which broken into spots or markings; no radial varix-like lines. Height 22-28, diam. 15-28 mm (25.7 × 27.1 mm).

DISTRIBUTION. E Cuba, Oriente Province. 2 spp. with numerous color forms.

Polymita (Polymita s. str.)
Fig. 2239

Shell globose to turbinate, of 3.5-4 flattened whorls. Color uniform or with a few non-broken bands or dark spots and dark radial varix-like lines mostly followed by lighter lines. Height 17-30, diam. 17-33 mm (20.5 × 27.0 mm).

DISTRIBUTION. E Cuba. 2 spp. with numerous color forms.

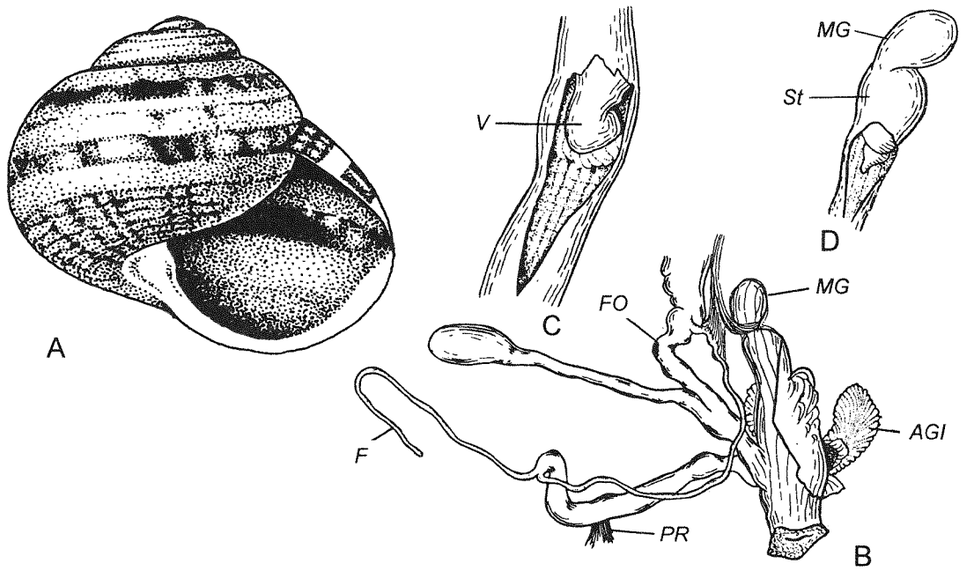


Fig. 2238. ***Polymita* (*Oligomita*) *versicolor*** (Born, 1870).
A — shell: Rio las Canas near Cajobabo, E Cuba. **Phil**. No. 341903. B — reproductive tract. C — interior of penis. D — interior of neophore. After Moreno, 1950.

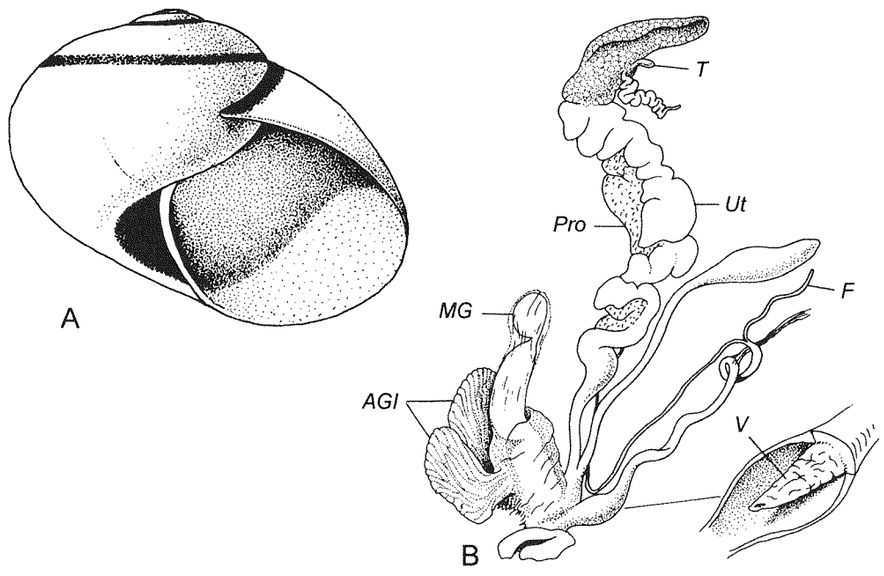


Fig. 2239. ***Polymita* (*Polymita*) *picta*** (Born, 1780).
A — shell: Cuba. Syntype. **Vienna** (Born collection). B — Monte Cupey, Holguin, Cuba, June 4, 1989. Reproductive tract and interior of penis. **Paris**.

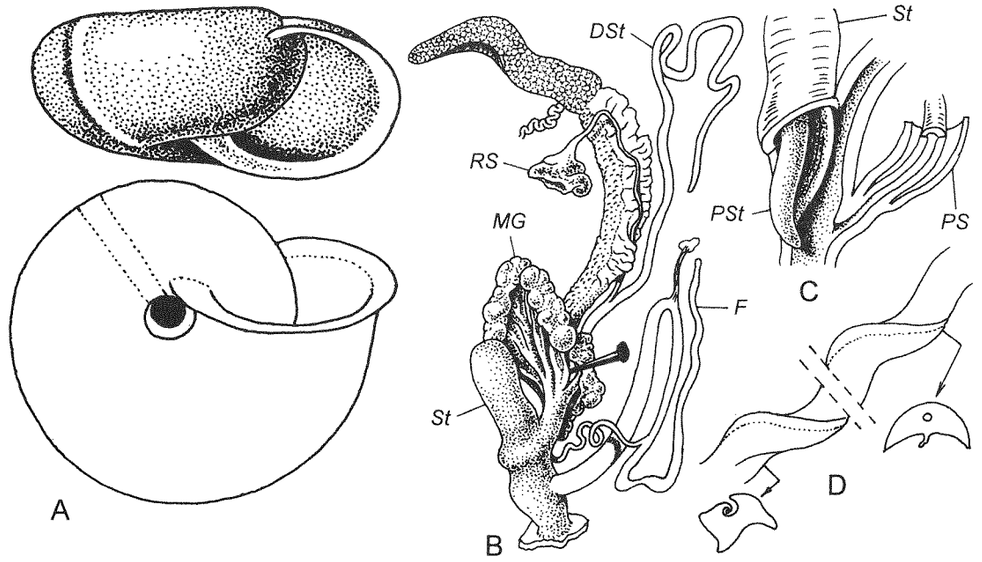


Fig. 2240. ***Elona quimperiana*** (Férussac, 1821).
Mondoòedo, prov. Lugo, Spain, November 1, 1974. A — shell. B — reproductive tract. C — interior of atrium, penis and distal portion of vagina. D — fragment and cross-sections of spermatophore. **Leiden**.

ELONIDAE Gittenberger, 1979

Gittenberger, 1979: 139.

Shell much depressed to flat, thin, translucent. Last whorl rounded. There are 1-4 light, followed by darker, radial lines. Umbilicus open, moderately broad, cylindrical.

Sole smooth.

Jaw odontognathous.

Flagellum long, longer than epiphallus. Penis, a long tube, coiled and folded within penis sheath, internally with axial folds and fine papillae, lacking verge. Stylophore opens into vagina. Neophore absent. Mucus glands 2, club-shaped, alveolar in appearance, enter vagina above stylophore. Spermathecal stalk with a long diverticle.

DISTRIBUTION. NE Spain, W France.

Elona H. Adams et A. Adams, 1855
Fig. 2240

Adams H. & Adams A., 1855: 211 (nom. nov. pro *Sterna* Albers, 1850).

— *Sterna* Albers, 1850: 93 [nom. praeocc., non Linnaeus, 1758 (Aves); t.-sp. *Helix quimperiana* Férussac, 1821; monotypy].

TYPE SPECIES — *Helix quimperiana* Férussac, 1821; OD.

Shell flat, thin, with a little sunken apex, of 5-6 convex whorls. Last whorl not descending. Color pale yellowish-brown. Embryonic whorls with elongated papillae arranged in spiral series; papillae formed by calcareous part and accentuated by periostracal scales (frequently deciduous). Early postapical whorls with comparatively big, widely spaced, round calcareous papillae, forming bases of thick periostracal hairs; besides, there are many very fine periostracal pustules on this part; later whorls with weak, irregular radial wrinkles and very fine, somewhat obsolete spiral striae. Aperture subcircular, a little flattened below, slightly oblique, with well reflexed margins. Height 10-12, diam. 20-30 mm (10.8 × 26.5 mm).

Flagellum moderately long. Stylophore with a long, slender dart, opens into atrium through grooved papilla. Ducts of mucus glands rather long. Spermatophore thread-like, spirally twisted, with longitudinal lam-

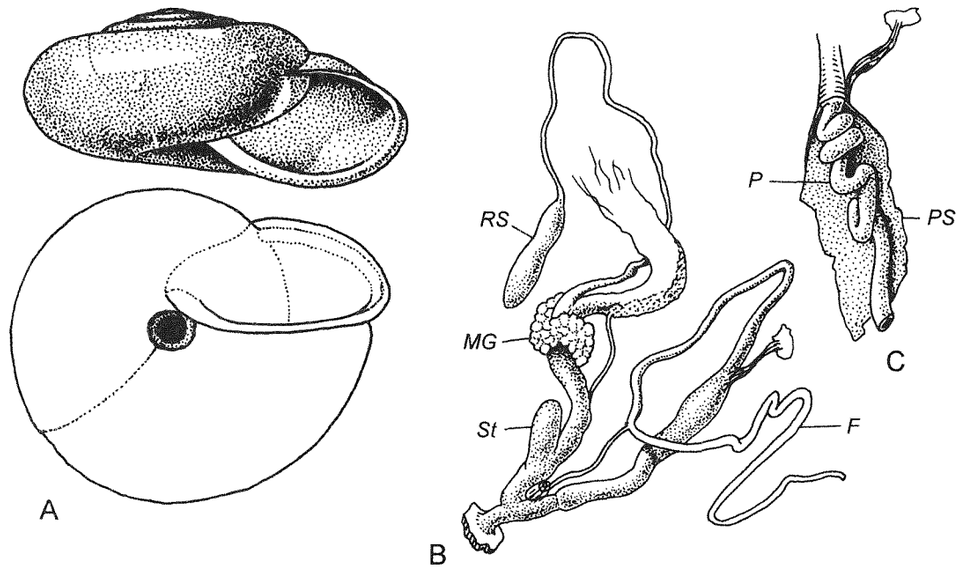


Fig. 2241. ***Norelona pyrenaica*** (Draparnaud, 1805).
Villefranche-de-Conflent, dept. Pyrénées Orientales, France, August 21, 1954. A — shell. B — reproductive tract. C — penis, sheath dissected. **Leiden**.

ina which toward tail end coiled longitudinally.

DISTRIBUTION. Spain (N Pyrenees), France (Brittany). 1 sp.

Norelona Nordsieck, 1986
Fig. 2241

Nordsieck, 1986: 118.

TYPE SPECIES — *Helix pyrenaica* Draparnaud, 1805; OD.

Shell depressed, moderately thin, of 4.5-5 rather convex whorls. Last whorl markedly descending. Color yellowish, pale corneous, sometimes with olivaceous tint. Embryonic whorls with distinct beautiful sculpture of chequerwise arranged pustules. Later whorls nearly smooth, just with vague spiral striae and, in places, separate granules. Aperture broadly ovate, moderately oblique, with shortly reflexed margins. Height 11-12, diam. 19-24 mm (11.5 × 24.0 mm).

Flagellum very long. Stylophore with a very short, broad-based dart, opens into atrium by a simple pore, without papilla. Ducts of mucus glands very short.

DISTRIBUTION. Pyrenees. 1 sp.

REMARK. I have not found the diverticle of spermathecal stalk in the specimen I dissected. Seemingly, it has been thrown out incidentally.

HUMBOLDTIANIDAE Pilsbry, 1939

Pilsbry, 1939: 26, 395 (Helminthoglyptidae subf.).

Shell variable in size and shape, sometimes reduced.

Sole smooth; serrated keel may be present on posterior end of cephalopodium.

Jaw smooth or ribbed.

Flagellum long (exception: in *Tryonigens* reduced). Epiphallus long to short. Penis with variously developed verge. Stylophore number 4, 3, 2, or 1 [absent in *Humboldtiana* (*Oreades*) and *Tryonigens*], each contains 2 darts. Mucus glands without ducts, or ducts very short; compact, lumpy,

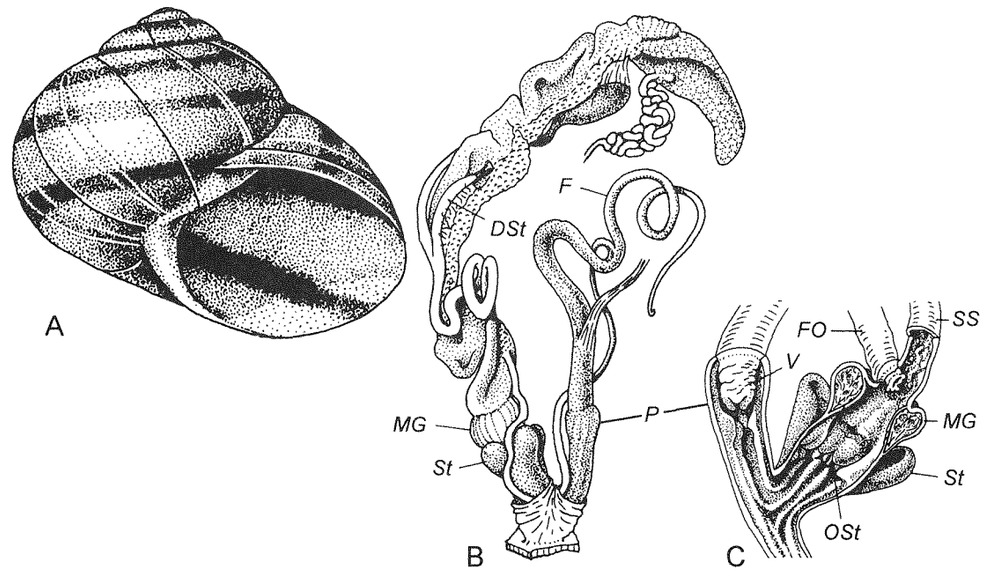


Fig. 2242. ***Humboldtiana*** (***Humboldtiana***) ex gr. ***humboldtiana*** (L. Pfeiffer, 1847).
Buenaventura, ca. 14 km SW of village of Buenaventura, Sierra de la Catarina, near Cuesta las Emes, Texas, March 25, 1989. A — shell. B — reproductive tract. C — interior of distal genitalia. **Moscow** No. Lc-25703. (gift of A. Metcalf). ***OSt*** — opening of stylophore.

rarely tubular, open into vagina. Spermathecal stalk with or without diverticle.

DISTRIBUTION. Central America with Mexico and south of USA (Texas).

HUMBOLDTIANINAE Pilsbry, 1939

Shell globose to nearly discoid, large (diam. 21-43 mm), of 4-5 slightly to strongly convex whorls, typically with 3 dark spiral bands. Embryonic whorls smooth to vaguely micromalleated. Aperture strongly oblique, with (nearly) unexpanded margins. Umbilicus (very) narrow.

Cephalopodium lacks a caudal keel or serration.

Jaw varies from strongly to very weakly ribbed.

Penis contains a variously developed verge. Stylophores 4, each with 2 darts, their number may decrease to 1 within one genus. Neophore absent. Mucus glands compact, only slightly separated from walls of vagina and have no ducts of their own. Spermathecal stalk with diverticle. In one subgenus (*Oreades*) dart apparatus, verge or diverticle of spermatheca wanting.

DISTRIBUTION. N Mexico and Texas.

Humboldtiana Ihering, 1892

Ihering, 1892: 472. Pilsbry, 1939: 395.

TYPE SPECIES — *Helix humboldtiana* L. Pfeiffer, 1847; monotypy.

Characters of subfamily.

DISTRIBUTION. Mountains of the plateau of Mexico south to Mexico City; Texas.

Humboldtiana (*Humboldtiana* s. str.)
Fig. 2242

Shell globose to somewhat depressed, rather thin to moderately solid, of 4-4.5 convex whorls. Color pattern 3-banded. Sculpture variable, smooth to coarsely wrinkled; granules, when present, aligned parallel to radial striae. Height 19-41, diam. 21-43 mm (28.8 × 33.1 mm).

Flagellum moderately long. Penis symmetrical with rather small verge. Vagina

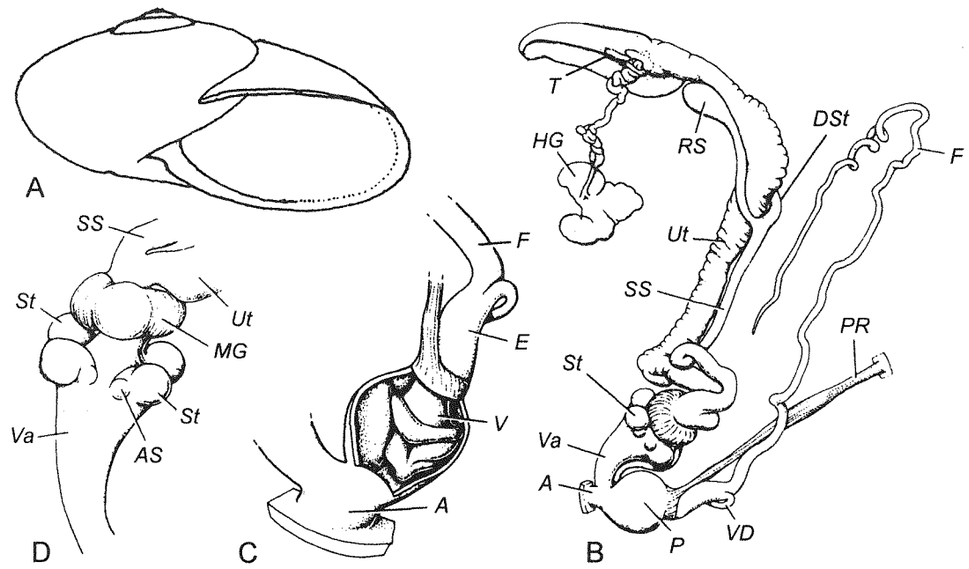


Fig. 2243. ***Humboldtiana* (*Polyomphala*) *oreina*** Thompson et Brewer, 2000.
A — shell. B — reproductive tract. C — interior of penis. After Thompson & Brewer, 2000.

with mucus glands, 4 stylophores and 2 small bulbs on each side of stylophores. Dart bulbs embedded in wall of vagina and not apparent externally. Spermathecal stalk long, slender, with variously developed diverticle.

DISTRIBUTION. From the Guadalupe Mountains in Texas south to Puebla and Veracruz in Mexico. About 20 spp. & subspp.

Humboldtiana (*Polyomphala* Thompson et Brewer, 2000) Fig. 2243

Thompson & Brewer, 2000: 71.

TYPE SPECIES — *Humboldtiana oreina* Thompson et Brewer, 2000; OD.

Shell much depressed, moderately thin, of 4 or a little more slightly convex whorls. Color pattern 3-banded, obscured by a diaphanous wash in periostracum. Sculpture of sparse, large, nodular tubercles that arranged in short segments aligned transversely to radial striations. Height 20.0-24.2, diam. 36.0-42.5 mm.

Flagellum very long. Penis asymmetrical, containing a large verge of complex shape. Vagina with 4 mucus glands, 4 stylophores, and 2 exposed bulbs on each side of stylophores. Spermathecal stalk slender, longer than combined length of uterus+vagina. Diverticle of spermathecal stalk present.

DISTRIBUTION. N Mexico, northern Coahuila (Sierra Encantada and adjacent Sierra Santa Rosa). 2 spp.

Humboldtiana (*Oreades* Thompson et Brewer, 2000) Fig. 2244

Thompson & Brewer, 2000: 66.

TYPE SPECIES — *Humboldtiana porterae* Thompson et Brewer, 2000; OD.

Shell subglobose, thin and fragile compared to other subgenera, of 4-4.3 rather convex whorls. Color pattern 3-banded. Postapical sculpture of coarse radial wrinkles and elongate granules aligned parallel

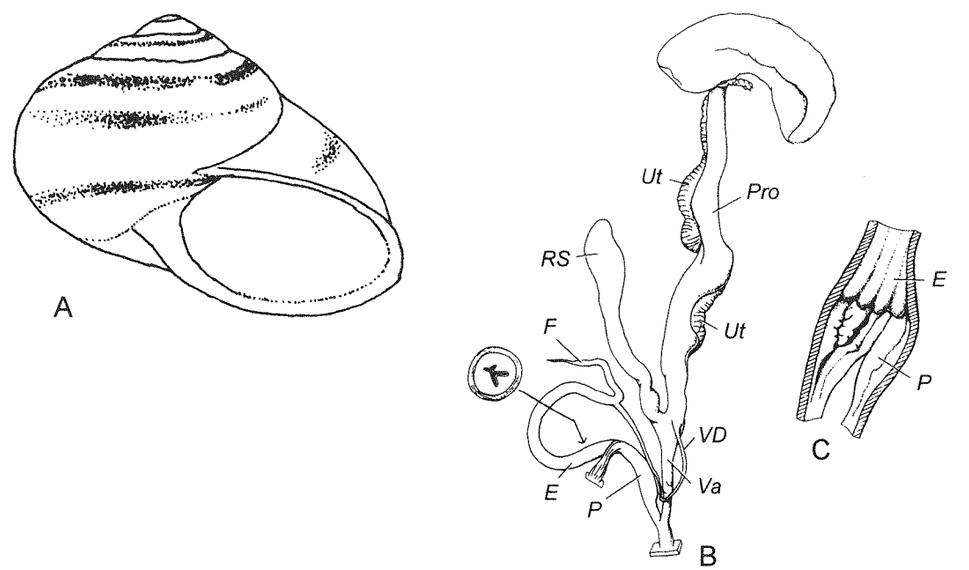


Fig. 2244. ***Humboldtiana* (*Oreades*) *porterae*** Thompson et Brewer, 2000.
A — shell. B — reproductive tract. C — interior of penis. After Thompson & Brewer, 2000.

to wrinkles. Height 31.0-33.5, diam. 38.1-41.0 mm.

Flagellum rather short. Penis symmetrical, lacking verge. Stylophores, mucus glands or bulbs missing. Spermathecal stalk comparatively short, without diverticle.

DISTRIBUTION. N Mexico, Nuevo Leon (Canyon de Garcia). 1 sp.

BUNNYINAE Nordsieck, 1987

Nordsieck, 1987: 23 (pro trib.).

Shell reduced, vitrinoid, medium-sized (diam. 12-19 mm); whorls count no more than 3. Color uniform.

Cephalopodium lacks caudal keel but has a horn-like process.

Jaw ribbed.

Penis with or without a verge. Stylophores 3, each contains a pair of darts. Neophore absent. Mucus glands rounded, sac-like, separated from walls of vagina, each with a short duct.

DISTRIBUTION. Mexico.

Bunnya H. Baker, 1942 Fig. 2245

Baker H., 1942: 37.

TYPE SPECIES — *Bunnya bernadinae* H. Baker, 1942; OD.

Shell vitrinoid, thin, translucent, slightly glossy, of about 2.5 whorls. Color brownish-buff. Embryonic whorls (1.5) with first quarter whorl sunken, soon assuming quite sharp and regular but low, closely spaced radial wrinkles crossed by microscopic spiral ones. Later whorls with more widely spaced but much more irregular radial wrinkles; spiral sculpture very weak. Aperture large, ovate, quite oblique, with thin, simple margins. Umbilicus absent. Height up to 10, diam. up to 19 mm.

Jaw with 10 flat ribs or plaits, of which only outer edges sharply marked.

Flagellum rather short. Epiphallus internally with 4 large pilasters. Penis too small to contain large, externally wrinkled and papillate verge; verge cylindrical, with opening between 3 flattened papillae at tip. Stylophores 3, each basally with 2 fusi-

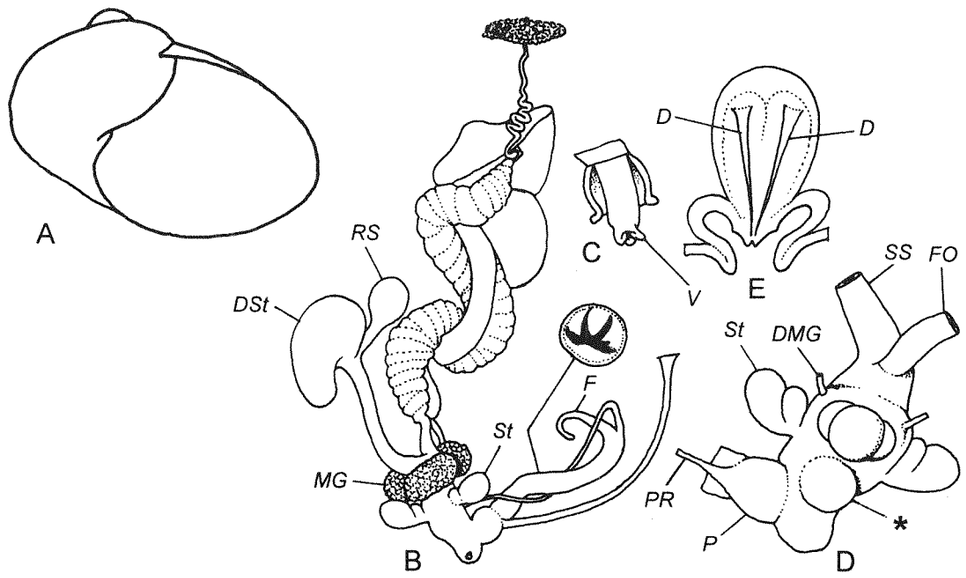


Fig. 2245. ***Bunnya bernadinae*** H. Baker, 1942.
A — shell. B — reproductive tract. C — interior of penis. D — vagina. E — interior of stylophore. After H. Baker, 1942. ***Asterisk*** — vaginal diverticle.

form muscular bulbs, which open either side of dart papilla. Each stylophore contains 2 darts and supplied with 1 short papilla. Mucus glands 3, alveolar, with short ducts running in vaginal wall to between openings of stylophores. Vagina below dart apparatus bears a short diverticle which contained (in the specimen dissected by H. Baker) a shed dart. Spermathecal stalk short, with large, short, clavate diverticle just below reservoir.

DISTRIBUTION. Mexico. 2 spp.

LYSINOEINAE Hoffmann, 1928

Hoffmann, 1928: 1239 (Eulotidae subf.).

Shell depressed, large (diam. up to 65 mm), of 4.5-5.5 whorls, with 2-3 bands.

Cephalopodium with serrated caudal keel.

Jaw strongly ribbed.

Penis with a rather small, grooved verge. Stylophores 2, each with a dart. Neophore absent. Mucus glands 3, clavate, one of them simple, the other biramous.

DISTRIBUTION. Central America.

Lysinoe H. Adams et A. Adams, 1855
Fig. 2246

Adams H. & Adams A., 1855: 203 (*Macrocyclis* subg.).

— *Aglaja* Albers, 1850: 107 [nom. praeocc., non Eschscholtz, 1825 (Coelenterata); t.-sp. *Helix ghisbreghti* Nyst, 1841; monotypy).

— *Odontura* P. Fischer et Crosse, 1870: 211, 242 [nom. praeocc., non Rambur, 1838 (Orthoptera); *Helix* sect.; t.-sp. *Helix ghisbrechtia* Nyst, 1841; SD Pilsbry, 1927c)].

— *Priodontura* H. Fischer, 1899: 304 (nom. nov. pro *Odontura* P. Fischer et Crosse, 1870; t.-sp. *Helix ghisbrechtia* Nyst, 1841; SD Pilsbry, 1927c).

TYPE SPECIES — *Helix ghisbreghti* Nyst, 1841; SD Martens in Albers, 1860.

Shell depressed-orbicular, solid, of 4.5-5.5 rather convex to somewhat flattened whorls. Last whorl rounded, gradually descending toward aperture. Color brown,

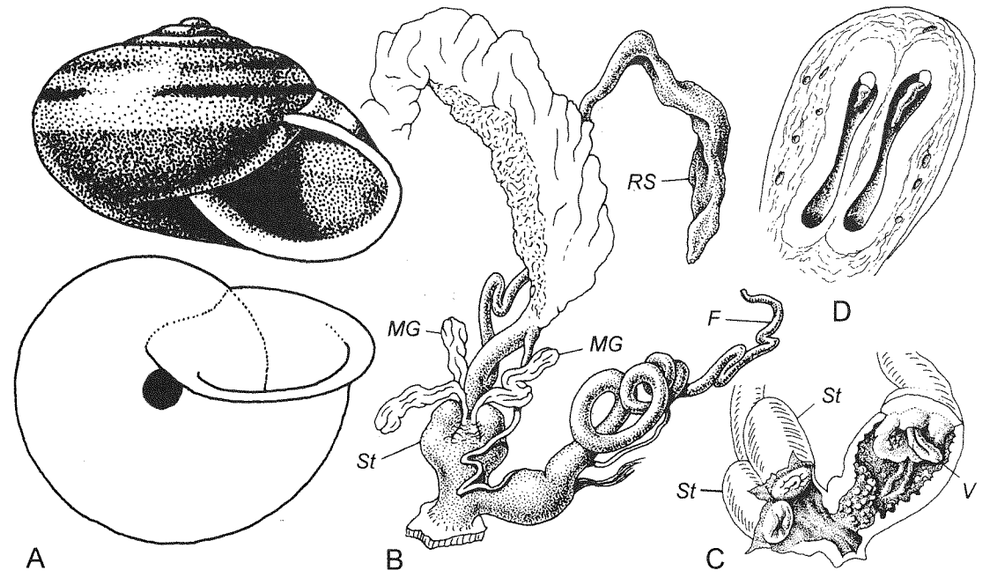


Fig. 2246. ***Lysinoe ghisbreghti*** (Nyst, 1841).
A — shell: Guatemala. **Vienna** No. 29.250. B, C — 1 km SW of Esquipulas Palo Gorda, San Marcos, Guatemala, July 28, 1980. B — reproductive tract. C — interior of penis and vagina. **Chicago** No. 206294. D — Vera Paz [Guatemala]. Longitudinal section through one stylophore. **Paris**.

with variously developed 2-3 yellow bands; when bands intensively developed, coloration, on the contrary, turns to be consisting of yellow background with dark bands; peristome white. Embryonic whorls smooth. Postapical sculpture of fine radial wrinkles and short, easily deciduous, periostracal hairs. Aperture broadly ovate, with expanded, shortly reflexed, somewhat approaching margins. Umbilicus rather narrow, profound. Height 23-46, diam. 37-65 mm (45.2 × 61.2 mm).

Vas deferens enters epiphallus laterally leaving a long flagellum. Epiphallus long, coiled. Penis short, swollen, internally with a few axial folds and tubercles; at expanded base of a short, grooved verge there is a wide stimulatory velum. Penial retractor attached to penis/epiphallus junction. Stylophores at first glance 2, equal, symmetrically placed on vagina, with highly muscular walls, entering vagina by slit-like pores; however on longitudinal section it is seen that each stylophore is a result of fusion of 2 stylophores; I did not find darts (material spent in alcohol more than 100 years) but there were 2 lumens which contained a pair of unequal papillae – bases of darts. Mucus glands 3, irregularly clavate, enter vagina at level of stylophore summits. Spermathecal stalk very long, more or less convoluted; reservoir attending albumen gland.

DISTRIBUTION. Central America (Chiapas in Mexico, Guatemala, Honduras). 2-3 spp. with a number of color forms.

LEPTARIONTINAE Nordsieck, 1987

Nordsieck, 1987: 22 (pro trib.).

Shell depressed, low-conic, rather large (diam. 20-30 mm), of 3.5-4.5 whorls, with a dark peripheral band.

Cephalopodium with crenulated caudal keel.

Jaw almost smooth.

Penis with a small verge. Stylophore 1. Neophore absent. Mucus glands 2, with very short common duct.

DISTRIBUTION. Mexico.

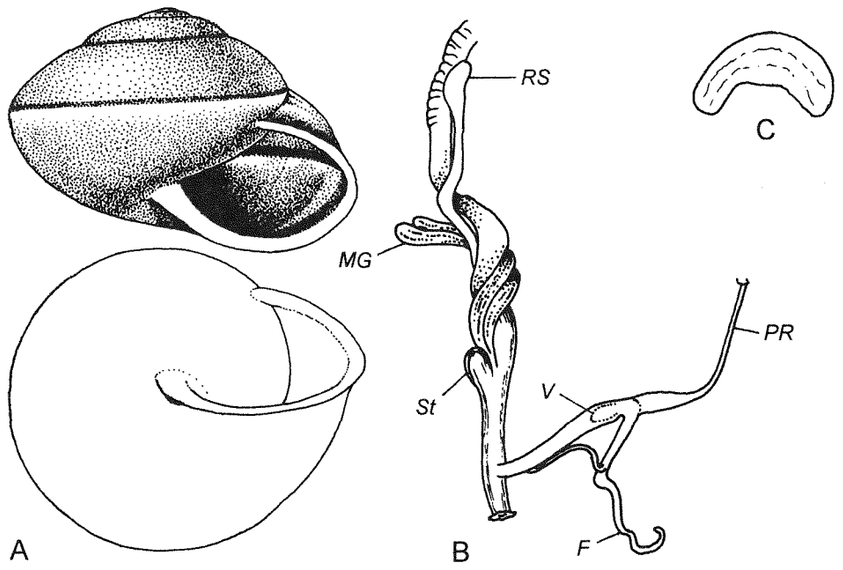


Fig. 2247. A — ***Leptarionta bicincta*** (L. Pfeiffer, 1841).
Shell: Mexico. **Phil**. No. 33344. B, C — ! ***Leptarionta guillarmodi*** (Shuttleworth, 1852). B — reproductive tract. C — jaw. After Pilsbry, 1927c.

Leptarionta Fischer et Crosse, 1872
Fig. 2247

Fischer & Crosse, 1872 (1870-1902): 224, 253 (*Helix* sect.).

TYPE SPECIES — *Helix bicincta* L. Pfeiffer, 1841; SD Pilsbry, 1927c.

Shell thin, translucent, shining, of 3.5-4.5 slightly convex whorls. Last whorl mostly with blunt, rounded peripheral angle, almost straight to moderately deflected. Color chestnut to light greyish-yellowish, often with 2 narrow bands, upper one chestnut, lower milk-white; peristome may be encircled by dark zone. Embryonic whorls smooth. Later whorls with fine radial wrinkles, sometimes whorls indented by little pits. Aperture ovate, well oblique, with thin, slightly reflexed margins. Umbilicus narrow, more or less covered. Height 10-22, diam. 16-30 mm (11.0 × 16.0 mm).

Jaw smooth, without ribs, with a very weak median projection.

Kidney long, rather narrow. Distal 2/3 of secondary ureter appear to be open.

Vas deferens comparatively short, entering epiphallus laterally. Flagellum moderately long; epiphallus shorter. Penis subcylindrical, quite long, internally plicate; verge short. Penial retractor inserted on distal part of epiphallus. Long vagina bears short, oval stylophore protruding into cavity of vagina by a slender papilla; dart(s) not found. 2 long, irregularly club-shaped mucus glands united near their insertion on vagina, close to base of stylophore. Spermathecal stalk comparatively short, reservoir not attending albumen gland.

DISTRIBUTION. Central America [S Mexico (Oaxaca & Vera Cruz States), Guatemala, Honduras, Costa Rica, Panama]. About 10 spp. & forms.

TRYONIGENINAE Schileyko, 1991

Schileyko, 1991: 219.

Shell depressed, low-conic, medium-sized (diam. 17 mm), of about 4 whorls, with 1 dark, narrow band.

Cephalopodium with crenulated caudal keel.

Penis contains a large verge. Vagina without any appendages.

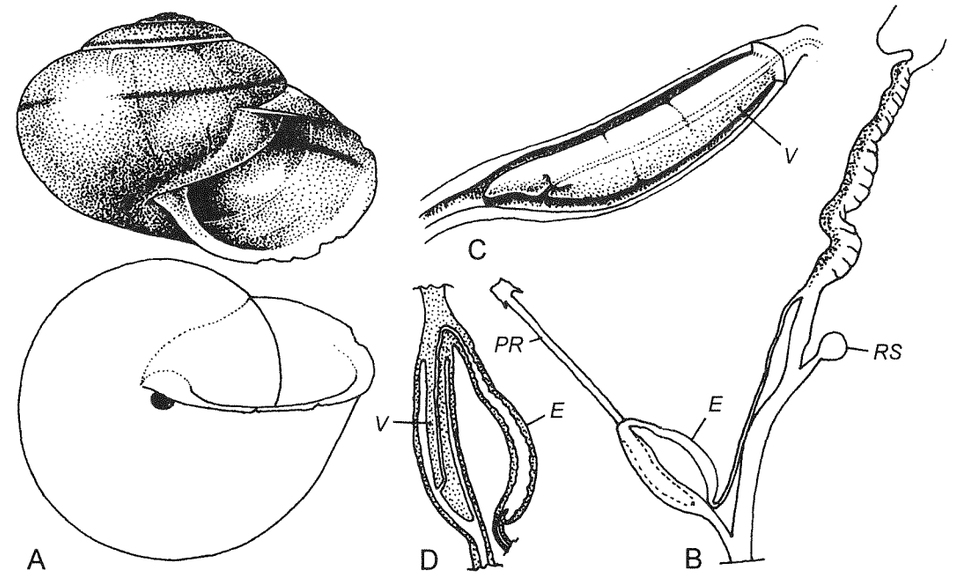


Fig. 2248. ***Tryonigens remondi*** (Tryon, 1863).
A — shell: Guasaremos, Rio Mayo, Chihuahua, Mexico. **Moscow** No. Lc-25673 (**Phil.**). B, C, D — Sinaloa, Mexico. B — reproductive tract. C — interior of penis. D — optical longitudinal section of penis and epiphallus. **StB** No. 74556.

DISTRIBUTION. Mexico.

Trionigens Pilsbry, 1927
Fig. 2248

Pilsbry, 1927c: 189.

TYPE SPECIES — *Helix remondi* Tryon, 1863; OD.

Shell turbinately-subglobose, thin, glossy, translucent, of about 4 slightly convex whorls. Last whorl rounded, just a little deflected. Color (pale) corneous, with a narrow, brown or reddish supraperipheral band. Embryonic whorls smooth, polished. Later whorls with weak, irregular radial wrinkles and microscopic tubercles. Aperture widely ovate, moderately oblique, with thin, slightly reflexed margins. Umbilicus narrowly open, partly covered. Height 11.7-12.0, diam. 17 mm (11.7 × 17.0 mm).

Vas deferens comparatively short. Flagellum absent. Epiphallus fusiform. Penis subcylindrical, thin-walled, with a long verge that has lateral pore. Penial retractor attached to penis/epiphallus junction. Free oviduct about 2 times shorter than vagina. Vagina with complexly folded internal surface. Spermathecal stalk very short; reservoir not attending lower end of spermoviduct.

DISTRIBUTION. N Mexico (Chihuahua State). 1 sp.

SEMICONCHULINAE
Schileyko, subfam. nov.

Type genus — *Semiconchula* Naranjo-Garcia et Polaco, 2000.

Shell vitrinoid, poorly calcified, covered with mantle.

Cephalopodium lacks keel.

Jaw with 2 strong ribs.

Penis contains a short verge. Stylophore 1, sits on neophore and contains 2 darts. 2 unequal mucus glands united before entering upper section of neophore.

DISTRIBUTION. S Mexico (Chiapas State).

REMARK. Taxonomic position of *Semiconchula* is arbitrary. I erect a new subfamily for this genus because of combination of at least 3 quite peculiar features: membranous, internal shell; the presence of 2

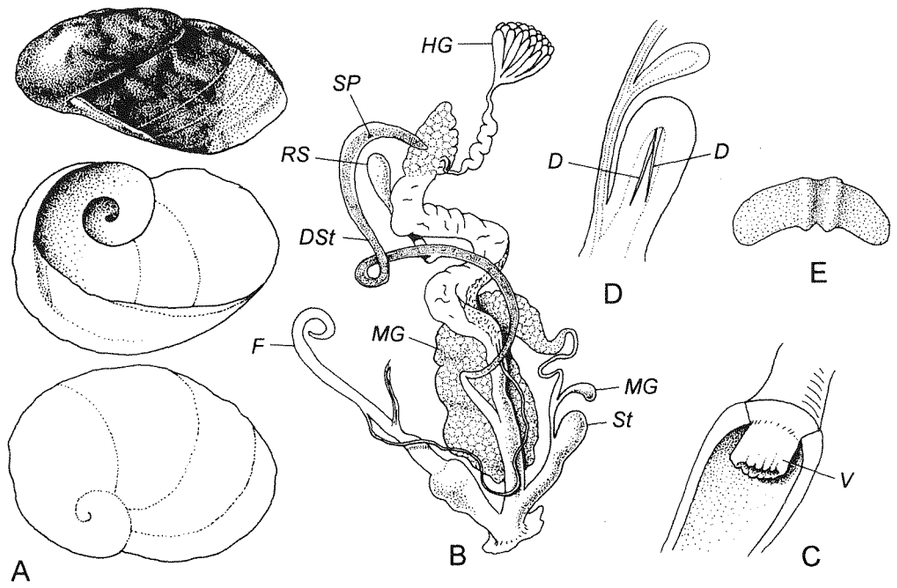


Fig. 2249. ***Semiconchula custepecana*** Naranjo-Garcia, Polaco et Pearce, 2000.
Along dirt road Custepec — La Independencia, ca 4 km N of Custepec, Chiapas, Mexico, August 28, 1990. Paratype. A — shell. B — reproductive tract. C — interior of penis. D — optical section through stylophore to show 2 darts. E — jaw. **Moscow** No. Lc-24793 (gift of Walter Miller). (D — **StB**, W. Miller's slide No. 7953). ***D*** — dart.

unequal mucus glands; the presence of neophore. Naranjo-Garcia & Polaco (2000) referred the genus to Xanthonychidae; perhaps, they are right (the presence of neophore and 2 unequal mucus glands, one of which adheres free oviduct and vagina); however I suggest that the presence of 2 darts in one stylophore is an important plesiomorphic character which is retained only in Humboldtianidae among American helicoids. That is why I, with some doubts, assign Semiconchulinae to Humboldtianidae rather than to Xanthonychidae.

Semiconchula
Naranjo-Garcia et Polaco, 2000
Fig. 2249

Naranjo-Garcia & Polaco in Naranjo-Garcia et al., 2000: 156.

Type-species — *Semiconchula custepecana* Naranjo-Garcia, Polaco et Pearce, 2000; OD.

Shell vitrinoid, very thin, much reduced, membranaceous above, slightly calcified below, of 2-3 whorls. Color uniformly greenish. Embryonic sculpture of fine spiral lines. Height up to 4.1, diam. up to 11.1 mm (ˆ × ˆ mm).

Vas deferens entering epiphallus laterally. Flagellum moderately long. Epiphallus cylindrical, shorter than flagellum. Penis short, swollen above, internally lacking special relief, with a small verge that has broad opening surrounded by somewhat corrugated edges. Penial retractor inserted on upper half of epiphallus. Vagina and free oviduct subequal in length. At very base of vagina, just above atrium, there is a long neophore, on tip of which a small, ovoid stylophore situated. Inside stylophore there are 2 needle-like darts. 2 mucus glands united before entering base of stylophore; one gland very large, alveolar, adhering free oviduct and vagina, the other rudimentary and free. Spermathecal stalk long, with well developed diverticle; reservoir reaching albumen gland. In the specimen dissected by me there was a thread-like spermatophore within diverticle; in another specimen housed in **StB** (W. Miller's slide No. 7953) I found a *pair of darts in lower part of diverticle* of spermatheca.

DISTRIBUTION. Mexico (Chiapas). 2 spp.

SPHINCTEROCHILIDAE
Zilch, 1960

Zilch, 1960: 663 (Helicidae subf.).

— Leucochroidae Westerlund, 1886, title-page (based on preoccupied name).

— Calcarinidae Pallary, 1909: 12 (based on preoccupied name).

— Albeidae Pallary, 1909: 178.

Forcart, 1972: 161 (as Sphincterochilacea).

Shell more or less globular to nearly lens-shaped, thick, opaque, chalky-white, calcareous, (rather) weakly sculptured (exception: species of subgenus *Rima* have coarse malleate sculpture). Embryonic whorls smooth. Umbilicus moderately wide to closed.

Sole tripartite. Keel on cephalopodium absent.

Jaw smooth, oxygnathous, with variously developed median projection.

Flagellum (rather) long, slender. Penis often swollen distally, internally with folds or pilasters, lacking verge. Atrium or vagina with an appendix (seemingly highly modified stylophore) which consists of a muscular stalk and minute process on its summit. A single alveolar, ovate or elongated mucus gland enters between stalk and mentioned process. Dart absent. Internally atrium sometimes contains a fleshy stimulator.

DISTRIBUTION. Mediterranean countries.

REMARK. The name Albeidae has formal priority over the name Sphincterochilidae. Dr. Philippe Bouchet has sent a proposal to the Comission to conserve the name Sphincterochilidae.

Sphincterochila Ancey, 1887

Ancey, 1887: 23.

— *Mima* Westerlund, 1886: 88 [nom. praeocc., non Meigen, 1820 (Diptera); *Leucochroa* subg.; for *Helix filia* Mousson, 1861 and *Helix boissieri* Charpentier, 1847].

TYPE SPECIES — *Helix boissieri* Charpentier, 1847; SD Pilsbry, 1895 (1893-1895).

Spermatophore with smooth surface, consists of long, slender apical part (ampula) and shorter thread-like tail. Other characters and distribution as in family.

Sphincterochila (*Cariosula*
Pallary, 1910)
Fig. 2250

Pallary, 1910: 102 (*Calcarina* subg.). Forcart, 1974: 63. Alonso & Ibáñez, 1979: 1.

TYPE SPECIES — *Helix cariosula* Michaud, 1833; OD.

Shell semiglobose, white, with widely rounded spire. Whorls 4-4.75, upper flattened, lower moderately convex. Body whorl with variously developed angle or thread-like keel. Last whorl abruptly descends just behind aperture. Suture mostly somewhat crenulated. Upper surface of postembryonic whorls with obliquely-radial wavy wrinkles and widely spaced spiral lines; base almost smooth. Height 6.6-16.0, diam. 12.9-23.0 mm (14.6 × 19.0 mm).

Retractor of right ommatophore passes through peni-oviducal angle.

Talon not located. Flagellum and epiphallus approximately equal in length or epiphallus somewhat longer. Penis internally longitudinally plicate. Neophore long, with thick, muscular walls; stylophore minute. Mucus gland large, elongated rather than ovate, with very short duct, attachment of which marks boundary between neophore and stylophore.

DISTRIBUTION. NW Africa, Balearic Islands, S coast of Iberian Peninsula. 1 sp. with 2 subspp.

Sphincterochila (*Zilchena*
Forcart, 1972)
Fig. 2251

Forcart, 1972: 163.

TYPE SPECIES — *Zonites piestius* Bourguignat, 1859; OD.

Shell obesely lentiform, of 4.5-5 whorls. Last whorl more or less descending, with peripheral angle or keel. Later whorls finely, irregularly wrinkled. Aperture broadly ovate to subcircular, well oblique. Umbilicus comparatively broad but par-

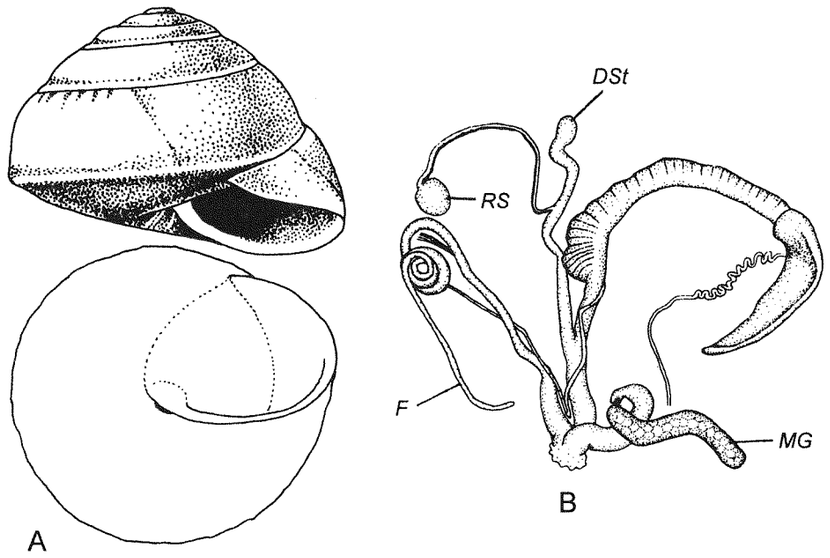


Fig. 2250. ***Sphincterochila*** (***Cariosula***) ***cariosula*** (Michaud, 1833).
A — shell: Oran, Algeria. **Leiden**. B — reproductive tract. After Alonso & Ibáñez, 1979.

tially covered. Height 10-13, diam. 18-24 mm (12.3 × 22.0 mm).

Talon not located. Flagellum rather short, epiphallus markedly longer. Penis with side pocket. Stylophore shifted toward base of a small, poorly developed neophore. Mucus gland ovate, entering base of stylophore.

DISTRIBUTION. Algeria. Probably 1 sp.

Sphincterochila (*Rima* Pallary, 1910)
Fig. 2252

Pallary, 1910: 102

TYPE SPECIES — *Helix cariosa* Olivier, 1804; OD.

Shell obesely lens-shaped, of about 5 whorls. Last whorl with blunt peripheral keel, only slightly descending in front. Suture crenulated. Postnuclear whorls with coarse malleate sculpture. Aperture not contracted, ovate to subquadrangular, strongly oblique. Umbilicus widely open, sometimes a little covered, surrounded by a cord-like ridge. Height 9-15, diam. 16-23 mm (9.3 × 16.7 mm).

DISTRIBUTION. E Mediterranean (S Syria and N Israel). Probably 1 sp.

Sphincterochila (*Albea* Pallary, 1909)
Fig. 2253

Pallary, 1909: 178 (nom. nov. pro *Calcarina* Moquin-Tandon, 1848).

— *Calcarina* Moquin-Tandon, 1848: 375 [nom. praeocc., non d'Orbigny, 1821 (Foraminifera); *Zonites* sect.; t.-sp. *Helix candidissima* Draparnaud, 1801; monotypy].

— *Leucochroa* Martens in Albers, 1860: 78 (nom. praeocc., non Beck, 1837; t.-sp. *Helix candidissima* Draparnaud, 1801; OD).

— *Candidissima* Pallary, 1910: 102 (*Calcarina* subg.; t.-sp. *Helix candidissima* Draparnaud, 1801; tautonymy).

TYPE SPECIES — *Helix candidissima* Draparnaud, 1801; OD.

Shell a little depressed to subglobose. Last whorl rounded to slightly angulate, markedly descending in front. Suture not crenulated. Postembryonic sculpture of delicate, crowded, uneven, locally wavy radial wrinkles. Aperture not contracted, broadly ovate, well oblique. Umbilicus

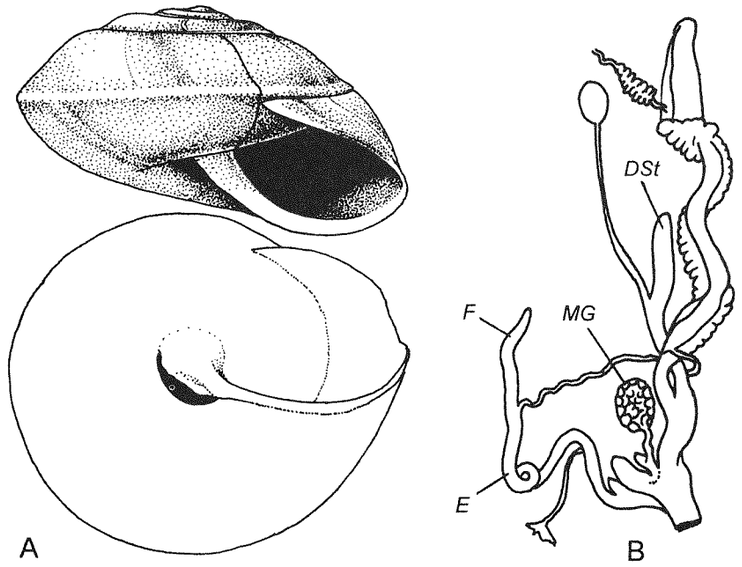


Fig. 2251. ***Sphincterochila*** (***Zilchena***) ***piestia*** (Bourguignat, 1859).
A — shell: Bougie, Algeria. **Paris**. B — reproductive tract. After Hesse, 1931.

closed or at most slit-like. Height 7—21, diam. 10-26 mm (14.5 × 18.0 mm).

Talon exposed, small, rod-like. Vas deferens enters epiphallus laterally. Flagellum moderately long. Epiphallus slender. Penis considerably swollen, forms a sort of pocket on one side, internally with a few axial pilasters; inside pocket 3-4 corrugated small folds branched off from one of pilasters. Penial retractor inserted on lower half of epiphallus. Free oviduct long, vagina very short, lacking special internal structures. Stylophore small, neophore somewhat longer, its canal continues in fleshy stimulator that located in atrium and directed toward opening of spermathecal duct. Mucus gland ovate, with comparatively long duct. Neck of spermathecal stalk long.

DISTRIBUTION. Mediterranean countries. 1 or 2 highly variable spp.

Sphincterochila (*Cerigottella* Gittenberger, 1993)
Fig. 2254

Gittenberger, 1993: 530.

TYPE SPECIES — *Leucochroa candidissima*

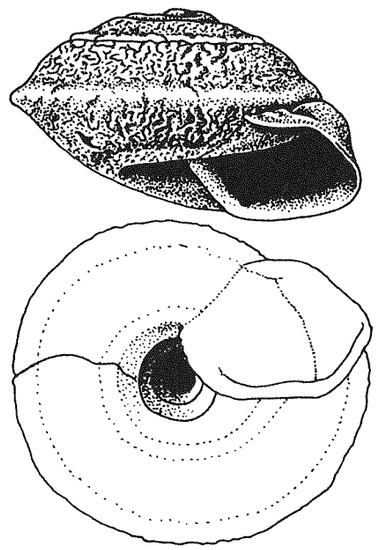


Fig. 2252. ***Sphincterochila*** (***Rima***) ***cariosa*** (Olivier, 1804).
Rosh Hanikra, W Galilee [Israel]. **Leiden**.

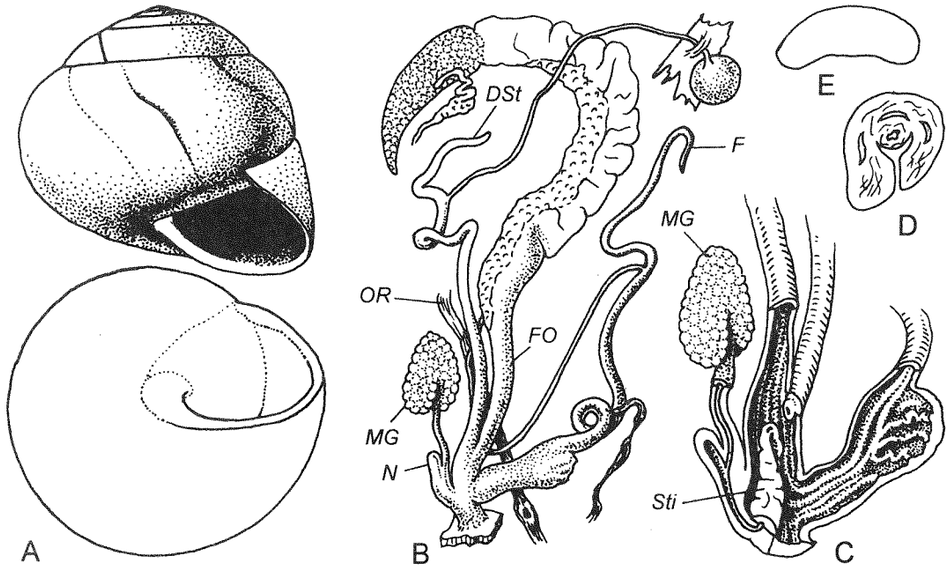


Fig. 2253. ***Sphincterochila*** (***Albea***) ***candidissima*** (Draparnaud, 1801).
Arles, France, August 1971. A — shell. B — reproductive tract. C — interior of distal part of reproductive tract. D — cross-section through atrial stimulator. E — jaw. **Moscow** No. Lc-20586.

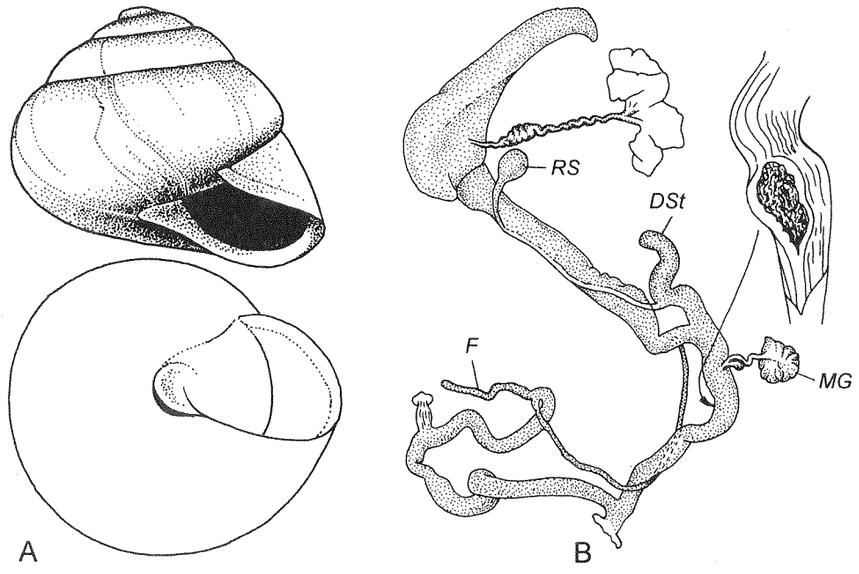


Fig. 2254. ***Sphincterochila*** (***Cerigotella***) ***insularis*** (O. Boettger, 1894).
A — shell: SW of Potamos, Andikithira Island, Greece. **Moscow** No. Lc-25719 (**Leiden**).
B — reproductive tract and interior of vagina. After Gittenberger, 1993.

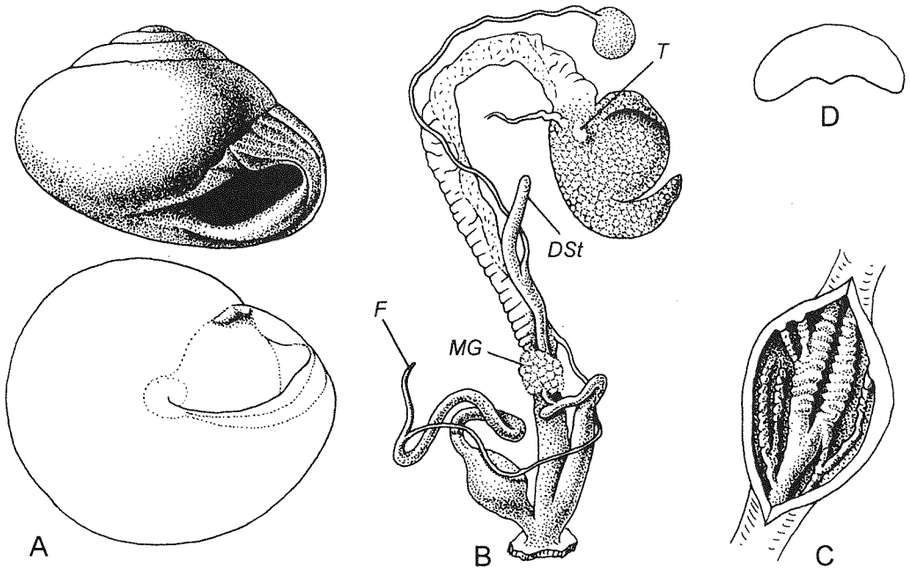


Fig. 2255. ***Sphincterochila*** (***Sphincterochila***) ***boissieri*** (Charpentier, 1847).
"Totus Meer" [Israel]. A — shell. B — reproductive tract. C — interior of penis. D — jaw. **Vienna**.

var. *insularis* O. Boettger, 1894; OD [as *Sphincterochila* (*Cerigottella*) *insularis* (O. Boettger, 1894)].

Shell conic-globose, moderately solid, not shining, of 4.5-5 slightly convex whorls. Last whorl markedly descending in front, evenly rounded at periphery. Postapical sculpture of very fine radial wrinklets. Aperture ovate, well oblique, with somewhat thickened margins. Umbilicus, a narrow lateral crack. Height 10.0-10.5, diam. 12.5-15.5 mm (10.2 × 12.9 mm).

Talon not located. Flagellum moderately long. Epiphallus and penis lack any peculiar characters. "Dart apparatus" relatively simple, consisting of a spherical gland and a duct provided with an apical process only (without neophore), inserts unusually high — on upper half of vagina. At and distal of this insertion, lumen of vagina has a conspicuously wrinkled wall-segment, bordered by 2 ridges. Neck of spermathecal stalk very short and stout, as well as diverticle.

DISTRIBUTION. Greek island Andikithira and Libya. 3 spp.

Sphincterochila (***Sphincterochila*** s. str.) Fig. 2255

Shell globular. Last whorl deeply deflected, rounded. Suture smooth. Postapical whorls without special sculpture. Aperture contracted, very oblique, with upper palatal margin strongly plicated. Umbilicus closed. Height 10-17, diam. 16-25 mm (14.5 × 21.4 mm).

Retractor of right ommatophore free from peni-oviducal angle.

Talon exposed, small, ovate. Albumen gland bilobed. Flagellum comparatively short. Epiphallus long, entering penis through a simple pore. Penis considerably swollen, internally with 2 principal pilasters fusing in distal section, and a number of minor branched pilasters; all pilasters somewhat corrugated. Penial retractor not located. Stylophore long, slender, tapering. Compact mucus gland enters stylophore at very short distance from its apex through a very short duct. Neck of spermathecal duct rather short, diverticle stout, also short.

DISTRIBUTION. Middle East. 1 or 2 spp.

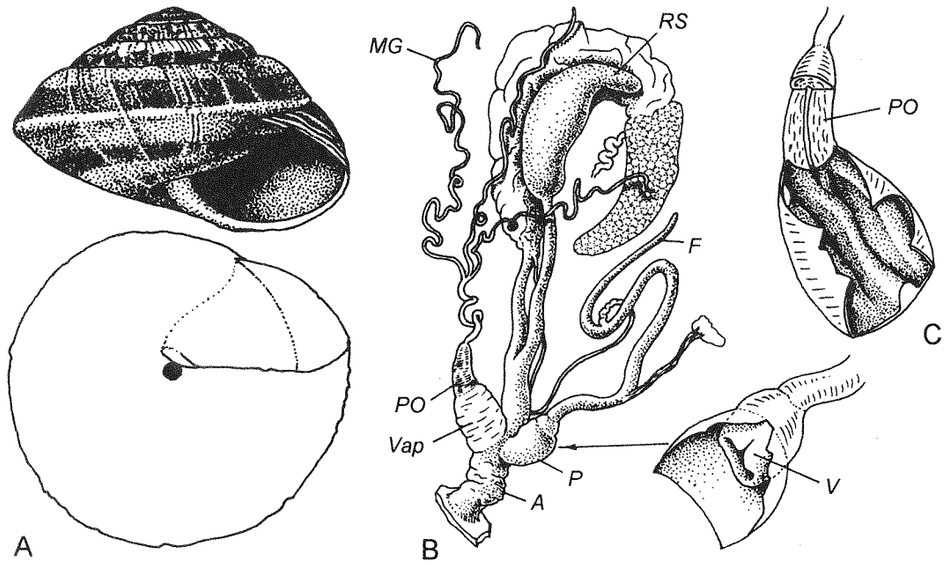


Fig. 2256. ***Monilearia phalerata*** (Webb et Berthelot, 1833).
Grand Canary, 2 km S of Fataga [Canary Islands], April 6, 1988. A — shell. B — reproductive tract and interior of penis. C — inner structure of vaginal appendix. After Schileyko & Menkhorst, 1997. ***PO*** — propulsatory organ. ***VAp*** — vaginal appendix.

COCHLICELLIDAE Schileyko, 1972

Schileyko, 1972: 39 (Helicidae subf.).

— Stenelicidae Locard, 1894: 238 (part.; nom. inv. because based upon non-existent generic name "*Stenelix*").

Shell moderately depressed to high-conic. Margins of aperture, except columellar, thin, simple. Umbilicus narrowly open to closed.

Sole smooth. Cephalopodium without keel.

Jaw odontognathous.

Flagellum of various length but always present. Penis contains tubular or partially open verge; in latter case verge consists of proximal and distal parts and coated by calcareous stimulatory envelope. Similar to Sphincterochilidae, atrium or vagina with an appendix (probably highly modified stylophore) which consists of stalk and thickening on its summit. Dart absent. In apex of appendix 1-3 tubular, simple or biramous mucus glands open.

DISTRIBUTION. Mediterranean including NW Africa and Canary Islands, Atlantic coast of Ireland, Britain, France, Belgium.

Monilearia Mousson, 1872
Fig. 2256

Mousson, 1872: 39 (*Helix* sect.). Schileyko & Menkhorst, 1997: 53.

TYPE SPECIES — *Helix phalerata* Webb et Berthelot, 1833; SD Pilsbry, 1895 (1893-1895).

Shell depressed to trochoid, thin, of 5-7 moderately convex whorls. Last whorl more or less angulated, slightly descending. Coloration usually consists of light-corneous or yellowish background and 2 dark bands — narrower on base and wider above peripheral angle. Embryonic whorls smooth. Postnuclear sculpture of rather fine radial wrinkles; basal surface with delicate, wavy spiral striae. Aperture ovoid, quite oblique, with thin, simple margins. Umbilicus minutely open to nearly closed. Height 4-10, diam. 6-12 mm (6.2 × 9.0 mm).

Talon simple, buried in albumen gland. Vas deferens long, slender. Flagellum rather long, epiphallus markedly longer.

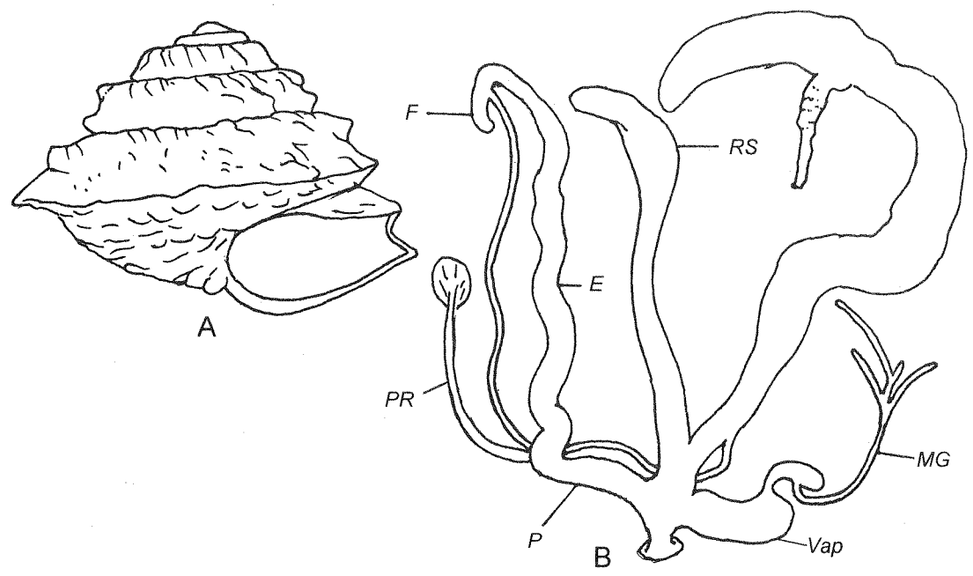


Fig. 2257. ***Obelus despreauxii*** (d'Orbigny, 1839).
A — shell. B – reproductive tract. After Ibáñez et al., 2003. *Vap* — vaginal appendix.

Penis small, subglobose, internally without regular relief, contains a short, ovate verge that has a wide inner channel and lacks calcareous envelope. In very distal end of vagina, opposite to penis, there is an appendix (seemingly, highly modified stylophore) consisting of thin-walled stalk which ends by muscular thickening (propulsatory organ). Lower end of this thickening sometimes lengthened in papilla; long, slender, tubular, trilobate gland opens on top of propulsatory organ. Atrium long. Spermathecal stalk not forms swelling; reservoir large.

DISTRIBUTION. Canary Islands. 10 spp.

Obelus Harmann, 1842
Fig. 2257

Hartmann, 1842: 158. Ibáñez et al., 2003: 162.

TYPE SPECIES — *Helix despreauxii* d'Orbigny, 1839; SD Herrmannsen, 1847.

Shell trochoid to pagodiform, rather solid, of 5-6 rather convex whorls. Last whorl straight to slightly deflected, angulated to sharply keeled. Color white to creamy, sometimes with dark basal and suprapreripheral bands. Embryonic whorls smooth. Postapical sculpture mostly of coarse obliquely-radial ribs that give serrate appearance to peripheral keel. Aperture ovate to narrowly semilunar, moderately to strongly oblique, with simple margins; columellar and basal margins shortly reflexed. Umbilicus narrowly open. Height 3.9-8.2, diam. 6.70-11.15 mm.

Talon not located. Vas deferens enters epiphallus laterally, leaving short flagellum. Penis much shorter than epiphallus, boundary between these portions marked by penial retractor attachment. Penis internally with a short verge. Vagina with appendix (? modified stylophore) consisting of rather long stalk and apical bulb lacking papilla. Mucus gland, atrium and spermatheca similar to that of *Monilearia*.

Disribution. NW Africa, Canary Islands. 6-7 spp.

Prietocella
Schileyko et Menkhorst, 1997
Fig. 2258

Schileyko & Menkhorst, 1997: 54.

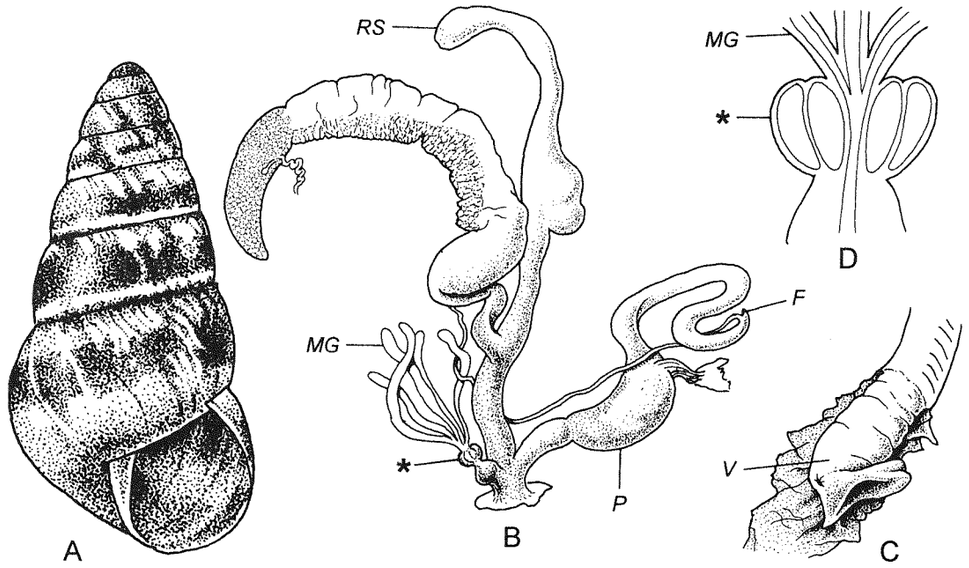


Fig. 2258. ***Prietocella barbara*** (Linnaeus, 1758).
A — shell: Nice. **Paris**. B, C, D – "Torrente de Farinera bei Capdepera und Canyamel (7 km oberhalb der Einmündung bei Canyamel), Wiese am Ufer des Torrente, Mallorca, 26.3.2004". B — reproductive tract. C – interior of penis. D – sagittal section through basal part of mucus gland and upper part of vaginal appendix (somewhat schematized). **Moscow** No. Lc-25706 (gift of Dr. Karl-Heinz Beckmann). ***Asterisk*** – bubbles at base of mucus gland.

— *Acalcchlicella* Prieto, 1986: 231, 234 [unavailable name according to Art. 8 (d) (II), (III) and Art 9 (3) of ICZN; t.-sp. "*Acalcchlicella barbara* (Draparnaud, 1801)"; OD].

TYPE SPECIES — *Helix barbara* Linnaeus, 1758; OD.

Shell conic, of 7-8 strongly flattened whorls. Height 8-12 mm, diam. 5-8 mm (10.2 × 5.1 mm).

Talon globular, minute. Vas deferens enters epiphallus laterally, leaving a tiny rudimentary flagellum. Epiphallus moderately long. Penis voluminous, bulky, with very thin, transparent walls, containing rather long verge of irregular, variable shape; calcareous envelope absent. Stalk of vaginal appendix short, with thick, muscular walls; on its summit there are 2-4 small thin-walled widenings or bubbles. Mucus gland with 2-3 arms, some of them could be biramous; arms united just before entering terminal widening of vaginal appendix and common duct of mucus glands, as far as I could trace, passes between mentioned bubbles and has no connection with cavities of bubbles. Atrium rather short. Spermathecal stalk swollen in its middle; reservoir small.

DISTRIBUTION. Mediterranean. 2-4 spp. with many forms.

Cochlicella Férussac, 1821
Fig. 2259

Férussac, 1821: 56 (ICZN Opinion 335).

— *Longaeva* Megerle von Mühlfeld in Menke, 1828: 15 [in syn. of *Bulimus acutus*: "(*Longaeva turrita*, Mhlfld.)"].

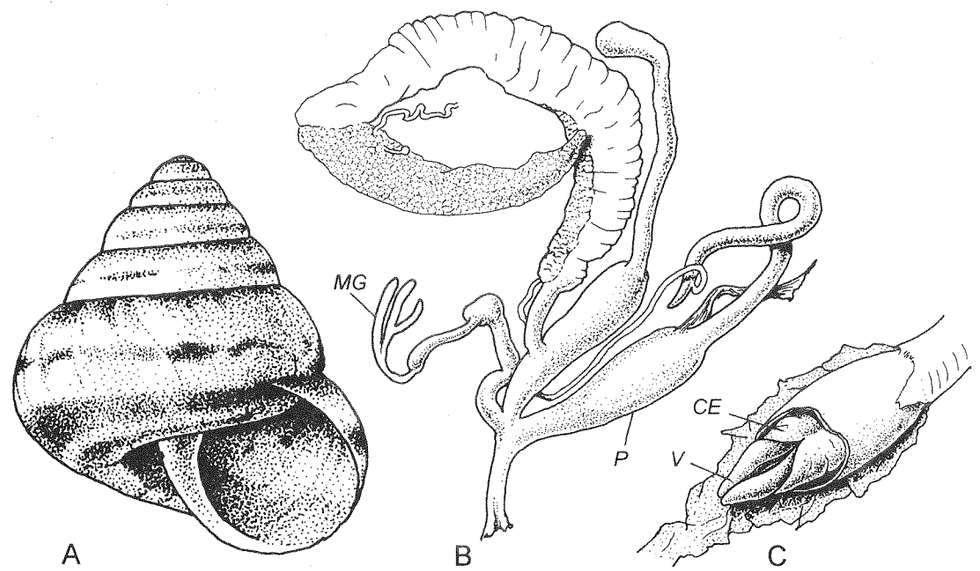
— *Elisma* Leach in Turton, 1831: 84 (as *Elisma fasciata* in syn. of *Bulimus fasciatus* Leach MSS = *Bulimus acutus* "Draparnaud, 1801").

— *Cochlicellus* Beck, 1837: 62 (*Bulimus* subg.; nom. err. pro *Cochlicella* Férussac, 1821).

— *Xeroacuta* Monterosato, 1892: 25 (for *Helix acuta* Müller, 1774 and *Bulimus ventricosus* Draparnaud, 1801).

Schileyko & Menkhorst, 1997: 54. Puente Martínez, 1994: 130, 135.

TYPE SPECIES — *Helix conoidea* Draparnaud, 1801; SD J. Gray, 1847a.



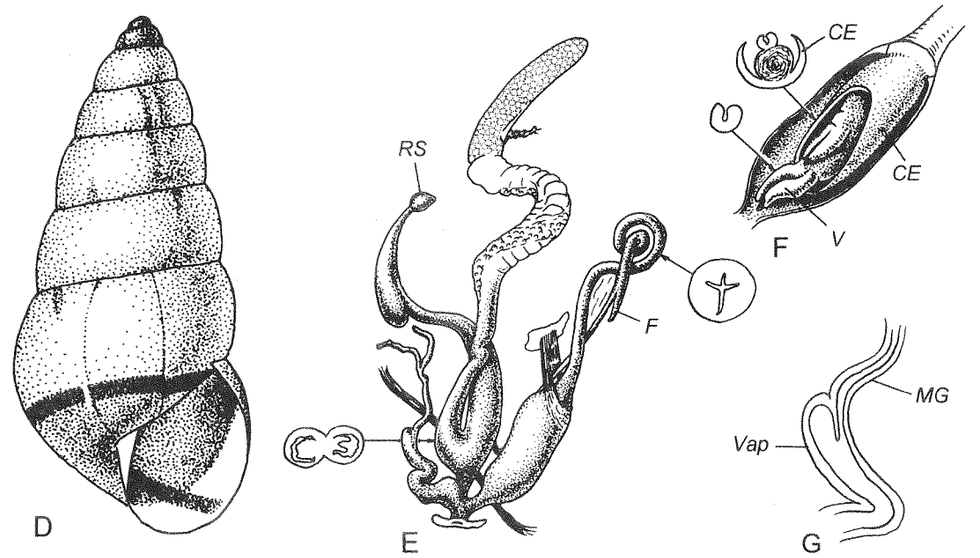


Fig. 2259. A, B, C — ***Cochlicella conoidea*** (Draparnaud, 1801).
A — shell: "dunes à 10 km au SO de Sète [France]". **Paris**. B, C – "Mallorca, km 24.5 Strasse can Picafort nach Alcudia; Dunengelände, March 23, 2004". B – reproductive tract. C – interior of penis. **Moscow** No. Lc-25707 (gift of Dr. Karl-Heinz Beckmann). D, E, F, G — ***Cochlicella acuta*** (Müller, 1774). Environs of Montpellier [France], August 1971. D — shell. E — reproductive tract and cross-section through spermathecal stalk/free oviduct junction. F — interior of penis. G — longitudinal section of vaginal appendix. After Schileyko & Menkhorst, 1997. ***CE*** — calcareous envelope of verge. ***VAp*** — vaginal appendix.

Shell turbinoid to high-conic, of 5.5-10 slightly to quite convex whorls. Height 6-30 mm, diam. 4-8 mm (*conoidea*: 7.0 × 6.3 mm; *acuta*: 15.7 × 5.4 mm).

Talon thin, partially buried. Vas deferens rather long, enters epiphallus at acute angle; flagellum somewhat longer than in *Prietocella*. Epiphallus quite long. Penis swollen. Verge consists of distal and proximal portions, with superficial groove; verge partly surrounded by calcareous envelope. Stalk of vaginal appendix rather long, thick-walled, without apical propulsatory organ. Atrium very short. Spermathecal stalk swollen in its middle; reservoir small. Spermatophore long, oval in cross-section, with an elevated, closely serrate edge.

DISTRIBUTION. Mediterranean and Atlantic coasts of Ireland, Britain, France and Belgium. 3 or 4 spp.

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