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MESOMPHIX VULGATUS AND ITS ALLIES

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The examination of a large amount of anatomical material of *Mesomphix vulgatus* and the species of *Mesomphix*, sensu stricto, closely related to it, has shown that these species cannot be distinguished by the shells with any degree of certainty. However, there are very good specific differences in the genitalia. In order to place the identification of the species of this group on a more secure basis, the author has prepared descriptions of the genitalia of all the species which were not described adequately by Pilsbry (Land Moll. N. Amer. II, pp. 319-317, figs. 162, 164.), as well as those of two new species. The distributions given are based on anatomical identifications.

MESOMPHIX VULGATUS H. B. Baker

Plate 1, A; fig. 1, A.

Shell depressed with low spire, buffy-olive above, ecru-olive below, dull, opaque. Whorls about 5, rapidly increasing, well rounded, sutures moderately impressed. Embryonic whorls with fine radial striae, becoming stronger on later whorls, upper surface of last whorl with distinct radial striae which continue onto the sides, becoming obsolete on the lower surface. Upper and lower surfaces of last whorl covered with close, minutely papillose, spiral threads. Umbilicus very small, sealed with hardened slime. Aperture a little wider than high, lunate, with a white lining. Peristome somewhat oblique, sharp, slightly reflected over the umbilicus.

Height 11.9 mm. Diameter 21.0 mm. Spire width 11.0 mm. Aperture width 11.0 mm. Aperture height 9.6 mm. Topotype.

Penis rather short, club shaped, without an appendix, of uniform texture throughout its length. Interior of penis with two pilasters which extend the entire length of the penis. Penial retractor muscle short wide and thick, attached at the end of the penis. Epiphallus rather stout with an enlargement in the lower third, about three times as long as the penis, entering the penis near the middle. Spermatheca large, a flattened sphere or ovoid, duct short. Free oviduct about four times as long as the penis. Vagina about a third as long as the penis. Atrium very short, only reaching through the integument. In some

specimens there is a yellow glandular ring around the base of the vagina.

Penis 7 mm. Epiphallus 21 mm. Vagina 2.5 mm. Spermatheca duct 4 mm. Free oviduct 27 mm. Topotype.

Distribution.—*Indiana*: Harrison Co.: 0.5 mile northeast of White Cloud. *Kentucky*: Meade Co.: Ohio River bluff, 5 miles east of Brandenburg. Anderson Co.: Kentucky River bluff, just north of Tyrone. Mercer Co.: Kentucky River bluff, near Brooklyn Bridge. Jessamine Co.: cedar woods, Camp Nelson. Lincoln Co.: hillside, 5 miles south of Stanford. Edmonson Co.: near Mammoth Dome Sink, near Mammoth Cave, Mammoth Cave National Park (Plate , A). Warren Co.: Barren River bluff, at Ky.-101, south of Three Forks. Metcalfe Co.: ravine, near Piercy Cave, 2.5 miles south of Summer Shade; low woods, 1 mile west of Beaumont. Cumberland Co.: hillside, 1 mile northeast of Dubre; Cumberland River bluff, 1.8 miles southeast of Burksville. *Tennessee*: Sumner Co.: near creek, 1.5 miles north of Bransford; hillside, 1.7 miles south of Bransford. Macon Co.: ravine, 5 miles southeast of Lafayette.

Mesomphix vulgatus is found to be a species of rather limited range. The above localities are only those for which anatomical material was available. The real range is probably a little greater, particularly on the northern and western sides. It probably extends into southwestern Ohio and southeastern Illinois.

Mesomphix vulgatus is based on a shell collected in Kentucky by Rafinesque. The type locality is here restricted to the vicinity of Mammoth Cave, Edmonson Co., Kentucky, a locality which Rafinesque is known to have visited.

MESOMPHIX ANURUS, new species.

Pl. 1 C; fig. 1, E.

Shell depressed with low spire, pale brownish-yellow, glossy, translucent. Whorls about 5, rapidly increasing, well rounded, sutures well impressed. Embryonic whorls with fine radial striae, becoming stronger on later whorls; upper surface of last whorl with irregular radial striae which continue onto the sides, overlaid with close, minutely papillose spiral threads. The lower surface is nearly smooth. Umbilicus very small, sealed with hardened slime. Aperture a little wider than high, lunate, with a white lining. Peristome somewhat oblique, sharp, slightly reflected over the umbilicus.

Height 11.8 mm. Diameter 20.3 mm. Spire width 11 mm. Aperture width 10.7 mm. Aperture height 9 mm. Holotype.

Penis rather short, fusiform, without an appendix, of uniform texture throughout its length, interior uniformly papillose, without pilasters. Penial retractor muscle long, slender, attached at

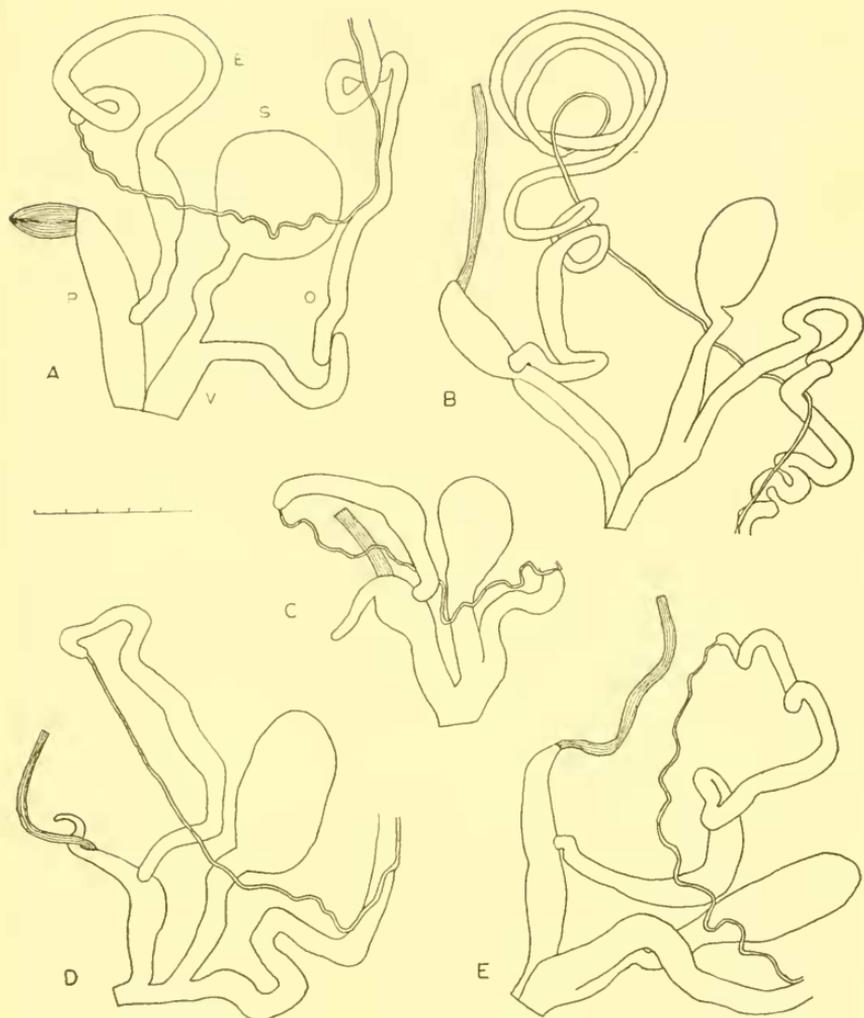


Fig.1. A., *Mesomphix vulgatus* H. B. Baker, topotype. B., *Mesomphix derochetus* Hubricht, holotype. C., *Mesomphix ruidus* Hubricht, paratype. D., *Mesomphix globosus* (MacMillan), topotype. E., *Mesomphix anurus* Hubricht, holotype. e. epiphallus. o. free oviduct. p. penis. s. spermatheca. v. vagina. Scale line 5 mm.

the end of the penis. Epiphallus entering the penis near the middle, about 3 times as long as the penis, the lower third much enlarged, being larger than the penis. Spermatheca large, ovoid, duct short. Free oviduct about as long as the penis. Vagina very short, about as long as wide. Atrium very short, only reaching through the integument.

Penis 9 mm. Epiphallus 24 mm. Spermatheca duct 4.3 mm. Vagina 1.5 mm. Free oviduct 9.3 mm. Holotype.

Distribution.—*Kentucky*: Warren Co.: Barren River bluff, 2 miles northeast of Bowling Green. *Tennessee*: Montgomery Co.: near Coleman Cave, 5 miles, southwest of Woodlawn. Sumner Co.: hillside, 1.7 miles south of Bransford. Macon Co.: ravine, 4 miles southwest of Lafayette; hillside, above Ann White Cave, 6 miles west of Lafayette, holotype 111660 and paratypes 111661, Chicago Natural History Museum, other paratypes 18296, collection of the author. Smith Co.: Cumberland River bluff, 1 mile southeast of Carthage. DeKalb Co.: Caney Fork River bluff, Sligo Landing, dry hillside, 0.8 mile southeast of Dowelltown. Grundy Co.: Big Mouth Cave Sink, 4 miles northeast of Pelham; side of Cumberland Mtn., 1.5 miles north of Monteagle. Marion Co.: hillside above spring, Martin Springs; hillside above spring, 2 miles south of Martin Springs. *Alabama*: Madison Co.: Monte Sano State Park, east of Huntsville. Jackson Co.: side of Keel Mtn., Paint Rock.

The shell of *Mesomphix anurus* differs from that of *M. vulgatus* in being yellow and more glossy, with more slender, more loosely coiled whorls and deeper sutures. Anatomically it differs in the longer, more slender penial retractor muscle, in the more enlarged basal third of the epiphallus, and in the shorter free oviduct.

MESOMPHIX DEROCHETUS, new species.

Pl. 1, B; fig. 1, B.

Shell depressed with low spire; pale brownish-yellow above and below, dull and opaque. Whorls about 5, rapidly increasing, well rounded, sutures moderately impressed. Embryonic whorls with distinct radial striae, not increasing much in later whorls, base nearly smooth. Last two whorls covered with close, minutely papillose spiral threads. Umbilicus very small, sealed with hardened slime. Aperture a little wider than high, lunate, with a white lining. Peristome somewhat oblique, sharp, slightly reflected over the umbilicus.

Height 12.1 mm. Diameter 23.2 mm. Spire width 12 mm. Aperture width 12 mm. Aperture height 10.1 mm. Holotype.

Penis rather short, club shaped, projecting slightly beyond the insertion of the penial retractor muscle; above the insertion of the epiphallus it is thick and rigid, below it is somewhat flattened and flexible; within there is a single pilaster which extends the entire length of the penis. Penial retractor muscle long and slender. Epiphallus very long, about 5 times the length of the penis, somewhat enlarged above its junction with the penis, the rest rather slender, joining the penis near the middle. Spermatheca

large, ovoid, duct short, somewhat enlarged basally. Free oviduct from 2 to 3 times as long as the penis. Vagina about $\frac{1}{3}$ as long as the penis. Atrium very short, only reaching through the integument.

Penis 10 mm. Epiphallus 47 mm. Vagina 3.7 mm. Spermatheca duct 5 mm. Free oviduct 23 mm. Holotype.

Type locality.—*Kentucky*: Mercer Co.: Kentucky River bluff, 1 mile northeast of Shakertown, holotype 111658 and paratypes 111659, C.N.H.M., other paratypes 13394, collection of the author.

The shell of *Mesomphix derochetus* differs from that of *M. vulgatus* in having the striae on the last whorl finer and the papillose spiral threads coarser. The real differences are in the anatomy. The very long epiphallus, equal in length to twice the diameter of the shell, will distinguish it from any other described species. The penis is clearly divisible into an upper and a lower section, and the longer and more slender penial retractor muscle is attached to the penis a little below the end.

MESOMPHIX PERLAEVIS (Pilsbry).

The range of this species was found to be much greater than was previously believed. It ranges from northern Georgia through western North Carolina, eastern Tennessee, eastern Kentucky, West Virginia, western Maryland, to southwestern Pennsylvania.

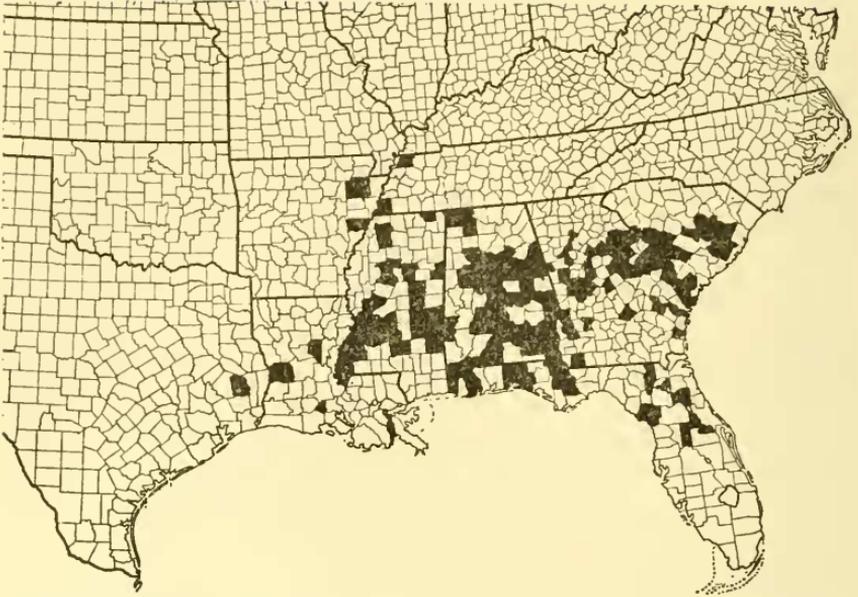
Pilsbry (Land Moll. N. Amer. II, p. 321.) refers to the penial appendix in this species as being lateral. However, it is terminal. The base of the penial retractor muscle is much expanded and in fully mature animals is not always clearly differentiated from the penis, and appears as an extension of the penis. The appendix is not always present. When it is absent, the species can be readily distinguished by the very broad terminal portion of the penis, the broad base of the retractor muscle, and the short epiphallus.

MESOMPHIX LATIOR (Pilsbry).

Mesomphix latior monticola Pilsbry, 1946, Land Mollusca of North America (North of Mexico). Acad. Nat. Sci. Phila. Monogr. 3, vol. 2 (1): 322-323, fig. 163d-e, 164, 165.

The penis of *M. latior* is very similar to that of *M. ruidus* but the appendix is shorter and the retractor muscle is heavier.

The difference in the shells between *Mesomphix latior* and *M. l. monticola* is no greater than is to be found in other species of *Mesomphix*.



Map 1. Distribution of *Mesomphix globosus* (MacMillan), as represented by specimens in my collection.

Mesomphix latior ranges from the mountains of northeastern Alabama to southwestern Virginia.

MESOMPHIX GLOBOSUS (MacMillan). Pl. 1, D & E; fig. 1, D.

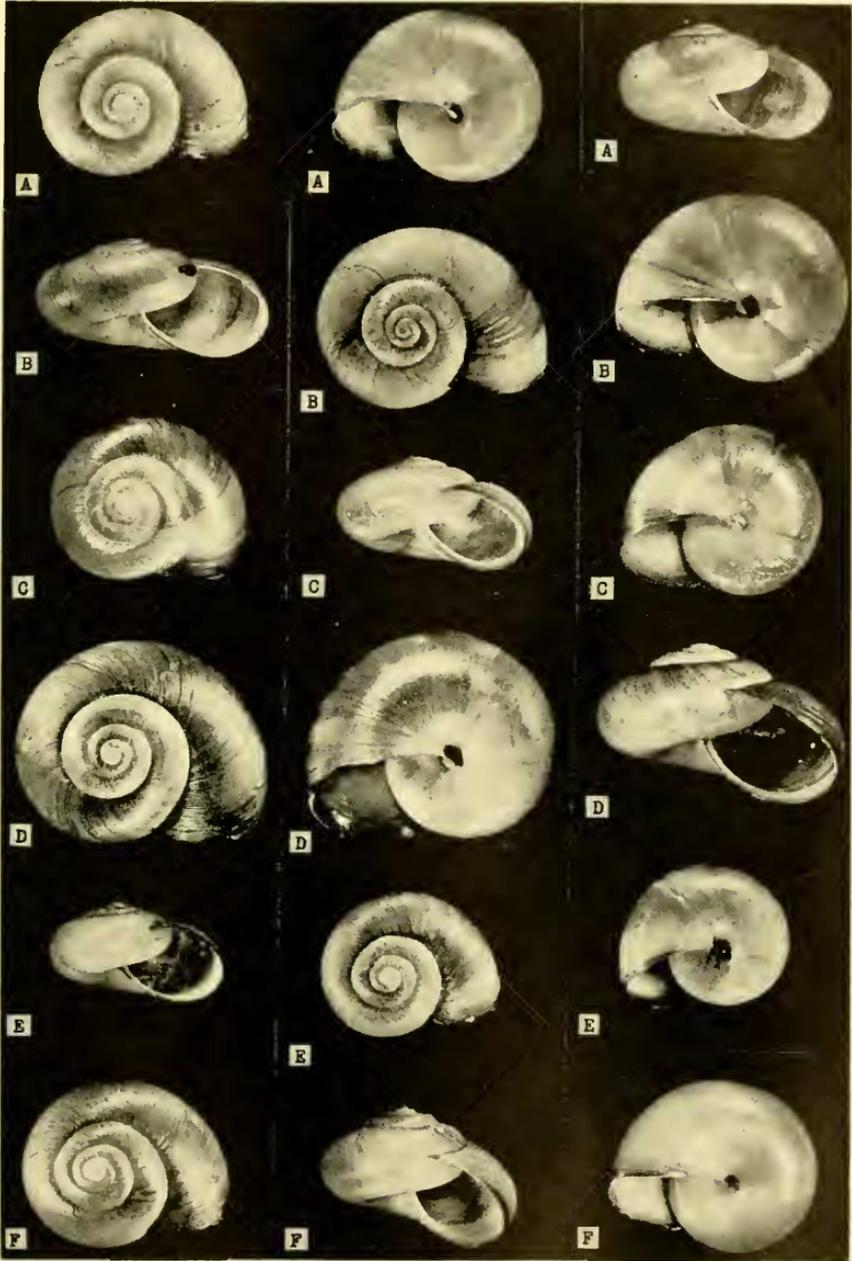
Omphalina pilsbryi globosus MacMillan, 1940. Amer. Midl. Nat. 23: 732, fig. 1.

Mesomphix pilsbryi globosus (MacMillan), Pilsbry, 1946, Land Moll. N. Amer. II, p. 343, fig. 177e-f.

Mesomphix vulgatus form *hartwrighti* Pilsbry, 1946, Land Moll. N. Amer. II, p. 326. figs. 166c, 167f.

A study of the anatomy of topotypes of *M. globosus* shows that it is not related to *M. pilsbryi* (Clapp), but to *M. ruidus* Hubricht. The following anatomical description is based on specimens collected near the Santee Canal, 2.5 miles northeast of Moncks Corner, Berkeley Co., South Carolina.

Penis rather short, fusiform, with a distinct appendix, which varies from $\frac{1}{4}$ to $\frac{1}{2}$ as long as the penis. Interior of penis uniformly papillose without pilasters. Penial retractor muscle long and slender. Epiphallus from $2\frac{1}{2}$ to 3 times as long as the penis, somewhat expanded in the middle; entering the penis near the middle. Spermatheca large, ovoid; duct short, rather thick. Free oviduct about 3 times as long as the penis. Vagina very short. Atrium short.



A, *Mesomphix vulgatus* H. B. Baker. B, *M. derochetus* Hubricht, holotype. C, *M. anurus* Hubricht, holotype. D, E, *M. globosus* (MacMillan). F, *M. ruidus* Hubricht, paratype. Photographs by Chicago Natural History Museum.