



The family allocation of *Dibaphimitra florida* (Gastropoda, Mitroidea, Pleioptygmatidae)

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ABSTRACT

The subfamily Pleioptygmatinae Quinn, 1989, now part of the family Mitridae, is raised to family rank based on a recent molecular study. The genus *Dibaphimitra* Cernohorsky, 1970 is newly recognized as belonging to this family.

Key words – Gastropoda, Mitridae, Pleioptygmatidae, *Dibaphimitra*, taxonomy

INTRODUCTION

Dibaphimitra Cernohorsky, 1970, originally described as a subgenus of *Mitra*, was included in the publication “The collapse of *Mitra*” by Fedosov et al. (2018). However, *Dibaphimitra florida* (A. A. Gould, 1856), its only living member, was not sequenced in this study. Fedosov et al. (2018: 325) accepted the genus *Dibaphimitra* but it was not attributed to a specific subfamily in the Mitridae, and they treated its taxonomic position as **Incertae sedis**. Cernohorsky (1970: 37) considered his new subgenus as belonging to the Mitrinae.

In MolluscaBase, the Pleioptygmatinae is treated as subfamily in the Mitridae, following Fedosov et al. (2018), although Quinn (1989: 13) originally introduced it as a family. At present the subfamily Pleioptygmatinae is represented by only one living species: *Pleioptygma helenae* (Radwin & Bibbey, 1972). Quinn based the description of his new family on the study of the anatomy of *P. helenae*. He wrote: “A new family of mitriform gastropods is proposed, comprising only the genus *Pleioptygma* Conrad, 1863, based on examination of the foregut of *P. helenae* (Radwin & Bibbey, 1972). *Pleioptygma helenae* is the only known living species of this genus, known otherwise only from species from the Neogene of the southeastern United States. The unique configuration of the foregut separates



this group from the Mitridae, Costellariidae, Volutidae, and Turridae. Features characterizing Pleioptygma-tidae include a proboscis introvert not connected to the head, presence of a proboscis bulb, buccal mass divorced from the proboscis, and hypertrophied rhachidian tooth". The exact placement of *Pleioptygma* in a family has always been very controversial and one can read about the historical proposed positions in families in Quinn (1989). He mentioned that the family contained only one living species, *P. helenae*, and did not mention *Dibaphimitra florida* (A. A. Gould, 1856) in his study. Subsequent authors, in popular shell books or in specialized studies like Fedosov et al. (2018), treated *D. florida* as a member of the Mitridae Swainson, 1831.

A recent solid molecular study of the mitochondrial genome of Mitroidea by Harasewych et al. (2025) shed light on the family placement of *Dibaphimitra florida*. In their figure 3 (Fig. 1) this species is nested between the Charitodoronidae and the Mitridae clade, closer to the Charitodoronidae than to the Mitridae clade. From this figure it can be concluded that *Dibaphimitra* neither belongs to the Charitodoronidae nor the Mitridae.

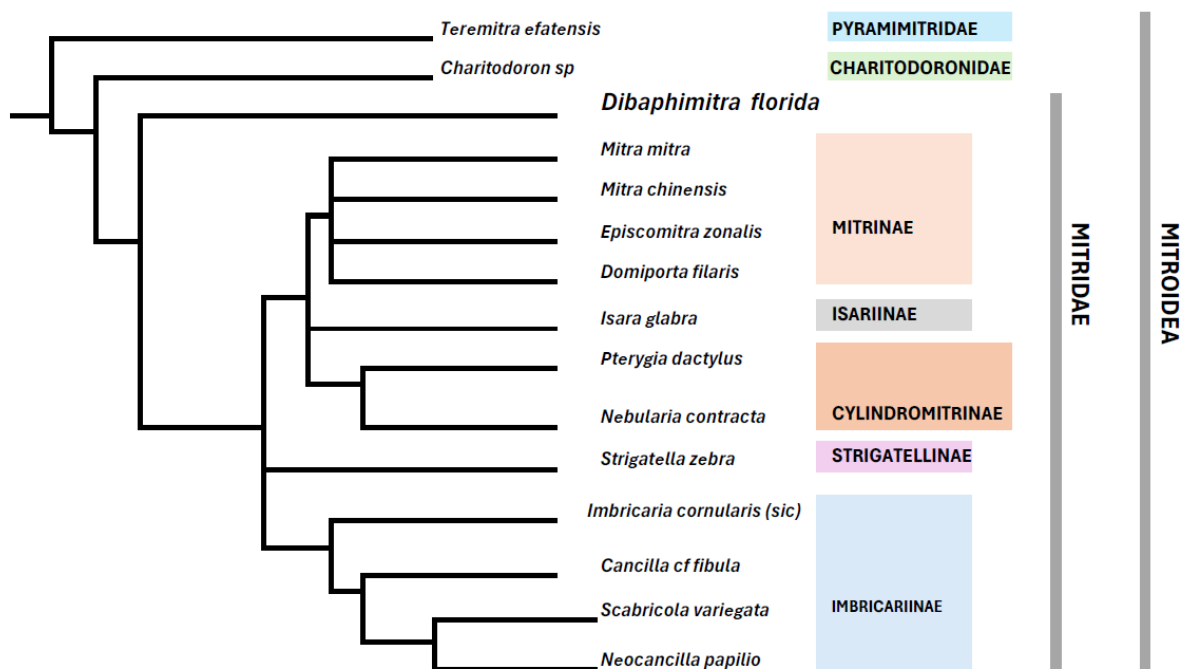


Figure 1. Phylogenetic relationships of *Dibaphimitra florida* and *Mitra chinensis* within Mitroidea based on maximum likelihood and Bayesian analyses of partial COI, 16S rRNA, and 12S rRNA sequences. Bayesian tree with branch support shown as maximum likelihood bootstrap value (when ≥ 50)/Bayesian posterior probability (when ≥ 0.7). Free after Harasewych et al. (2025: fig. 3).



Plate. 1. Fig. 1a-d. *Dibaphimitra florida* (A. A. Gould, 1856), USA, Florida, Gulf of Mexico, trawled, L 47.8 mm, AMD unnumbered, 1c detail of columella with 6 plaits (only 2 well developed), 1d detail of sculpture on body whorl.

TAXONOMY

Family Pleioptygmatidae Quinn, 1989 **revised status**

Genus *Dibaphimitra* Cernohorsky, 1970 **revised family allocation**

Type species *Mitra florida* A. A. Gould, 1856 by original designation

Included species:

***Dibaphimitra florida* (A. A. Gould, 1856)**

Original description of *Dibaphimitra*. – Cernohorsky, 1970, page 37: “Shell moderate in size, 25 – 80 mm, pterygiaeform, ovate, last whorl inflated. Teleoconch of 4 - 6 convex whorls, protoconch of $1\frac{1}{2}$ - $3\frac{1}{2}$ glassy, smooth nuclear whorls. Sculptured with fine spiral threads and spiral cords on siphonal canal. Aperture longer than spire, wide or only slightly constricted, smooth within; labial lip simple, convex or slightly angulate. Columella with 4 - 7 oblique folds (6 - 7 in type species), first posterior fold more prominent than remaining folds; anterior part of columella calloused, siphonal notch distinct.”

Discussion. – At the time of description of the genus it consisted of five species of which only one extant, and placed as subgenus of *Mitra* Lamarck, 1798. Cernohorsky (1970: 37) writes: “*Dibaphimitra* appears to be an ancestral stock of *Dibaphus*, the columellar folds are less numerous and more prominent, the aperture is wider and the shell lighter and more inflated in *Dibaphimitra*. *Dibaphimitra* possibly spread from Europe to the Indian Ocean and



the Caribbean, where one Recent species, i.e. *Mitra florida* survives". Cernohorsky made a correct observation on the old ancestral line of the genus/species, although the connection to the European and Indian Ocean *Dibaphus* R. A. Philippi, 1847 is not correct. *Dibaphus* is at present considered to be a junior synonym of *Nebularia* Swainson, 1840 (Fedosov et al., 2018), and a member of the Cylindromitrinae Cossmann, 1899 (Fig. 1). Harasewych et al. (2025: fig. 3) (Fig. 1) proved Cernohorsky's view on the older ancestral stock of *Dibaphimitra* correct. Two of the four fossil species attributed by Cernohorsky (1970:38) to his new subgenus *Dibaphimitra* are now classified in other genera (MolluscaBase). The remaining two fossil species (*Dibaphimitra clavata* (Bellardi, 1887) and *Dibaphimitra dennanti* (Tate, 1889) are not *Dibaphimitra* species either and should be included in the Mitridae, but that is beyond the scope of this article).

In the accompanying text to Gould's (1856: 15) original description of *Mitra florida* he noted the following: "Its characters are intermediate between *Mitra* and *Voluta*. It most resembles in form and coloring a small *Vol. antiquata*, but the markings are much more crowded and delicate". Although Gould described *florida* as a *Mitra*, he is not certain of its generic placement.

Petuch (1987: 70) described a second species in the genus. In his discussion he states: "*Dibaphimitra janetae* is the second known species of what was previously considered a monotypic genus. *Dibaphimitra florida* (Gould), which is only found in northern Cuba and the Florida Keys, was thought to be the only living species. The new Roatan Island endemic species differs from *D. florida* in a number of consistent ways; by being a more slender shell without an angled shoulder; in having a white base color instead of violet or pink as in *D. florida*, in having a white protoconch instead of a violet or purple one; by having a characteristic row of large, dark brown dots and dashes along the margin of the suture; and having large wine-red patches on the shell. Although lacking the beautiful violet base color, protoconch, and aperture of *D. florida*, *D. janetae* is still a much more colorful shell, especially so with its large red patches and dotted suture margin". *Dibaphimitra janetae* has only been collected in Honduras, off Roatan Island, where it is probably endemic. The combination of differences in the shells of both morphs and the not overlapping distribution is an indication we are dealing with two separate species. However, at present *D. janetae* is regarded as junior synonym of *D. florida*, based on the book by Robin & Martin (2004: 17).



Plate. 2. Fig. 1a-f. *Pleioptygma helenae* (Radwin & Bibbey, 1972). AMD unnumbered. northern Nicaragua, off shore in traps, L 97.4 mm; 1c detail of columella with 6 plaits; 1d -f details of sculpture on body whorl.

The type genus of the Pleioptygmatidae Quinn, 1989 is *Pleioptygma* Conrad, 1863. Original description (Conrad, 1863: 563) is briefly: "Subfusiform; aperture long; columella with very oblique plaits, numerous, alternated in size, or irregular, the largest being the second one from above". The type is a Miocene fossil species, *Voluta carolinensis* Conrad, 1840.

The only known extant species, *Pleioptygma helenae* (Radwin & Bibbey, 1972) was placed in Mitridae by Cernohorsky in his second volume on Mitridae (Cernohorsky, 1991: 26), ignoring the family proposed for this genus by Quinn (1989). *Mitra helenae* was described from the Cay Sal Bank, between the Florida Keys and Cuba, and assigned to the (then) subgenus *Pleioptygma* Conrad, 1863, which was previously known to contain only species of Miocene and Pliocene age. "The large size of this gastropod, its distinctive clouded color pattern and its



threaded sculpture are unique among Recent western Atlantic mitrids" (Radwin & Bibbey, 1972). Especially the sculpture consisting of moderate to sharp spiral threads or cords, irregularly spaced and becoming a bit obsolete medially on the body whorl, shell with elongate aperture and columella with around 6 irregular, moderately thin, simple folds, is largely similar to *Dibaphimitra*. This similarity supports the placement of *Dibaphimitra* in the Pleioptygmatidae. The distinct position of *Dibaphimitra* (Fig. 1) supports a placement in a family distinct from the Mitridae. The similarity of this genus to the genus *Pleioptygma* indicates that it belongs to the same family, the Pleioptygmatidae.

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