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FANWORM GENUS *PSEUDOFABRICIA* CANTONE, 1972
(POLYCHAETA: SABELLIDAE: FABRICIINAE)

KIRK FITZHUGH



NATURAL HISTORY MUSEUM OF LOS ANGELES COUNTY

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ADDITIONS TO THE DESCRIPTION OF THE FANWORM GENUS *PSEUDOFABRICIA* CANTONE, 1972 (POLYCHAETA: SABELLIDAE: FABRICIINAE)

KIRK FITZHUGH¹

ABSTRACT. The monotypic genus *Pseudofabricia* Cantone, 1972, with type species *P. aberrans*, was originally described from two specimens, both of which lacked branchial crowns. Neither of these specimens was, however, formally designated as a type. Only one of these specimens is extant. That specimen is redescribed and designated as the lectotype and is compared to some of the complete specimens used by Giangrande and Cantone (1990) in their redescription of the taxon. These latter specimens have nonvascularized ventral filamentous appendages in the branchial crown, which appear to be homologous to those in *Fabriciola* Friedrich, yet differ in that they are only slightly longer than the dorsal lips. Contrary to what was described by Giangrande and Cantone, the manubria of abdominal uncini in *P. aberrans* are about the same length as the dentate region. Based on the present redescription, the cladistic relationships of *Pseudofabricia* to other fabriciin taxa are discussed.

INTRODUCTION

The monotypic genus *Pseudofabricia* Cantone, 1972, with type species *P. aberrans*, was recently redescribed from complete specimens by Giangrande and Cantone (1990), substantially increasing knowledge of this taxon. Cantone's (1972) original description was based on two living specimens, both lacking the branchial crown. These specimens were collected near Siracusa, Sicily, from among the rhizomes of the sea grass *Posidonia oceanica* at a depth of about 2 m. Giangrande and Cantone (1990) based their redescription on specimens collected from similar habitats at two localities: off the island of Ponza, northwest of Naples, and from near the city of Brindisi in the Adriatic Sea. Unfortunately, no direct comparisons were made with the original specimens.

Prior to Giangrande and Cantone's (1990) redescription, Cantone's (1972: figs. 1-2, pl. 1) illustrations of setal forms and the anterior end of the body were too limited to fully assess the relationship of the genus to other fabriciin taxa (e.g., Fitzhugh, 1989, 1991, 1992). Giangrande and Cantone (1990) established the position of *Pseudofabricia* in the Fabriciinae (*sensu* Fitzhugh, 1989, 1991) and suggested that the genus is most closely related to *Fabricia* Blainville and *Novafabricia* Fitzhugh. Based on Giangrande and Cantone's description, I

was able to analyze the cladistic relationships of *P. aberrans* to other fabriciin taxa (Fitzhugh, 1993). The result of that analysis supported the continued monophyly of all nonmonotypic genera and allowed for the recognition of *Pseudofabricia* (Fig. 1) as part of a clade comprising *Fabricia*, *Augeneriella* Banse, *Parafabricia* Fitzhugh, *Fabricinuda* Fitzhugh, *Novafabricia* Fitzhugh, and *Pseudofabriciola* Fitzhugh.

I recently had the opportunity to examine several of the specimens used in Giangrande and Cantone's (1990) redescription and discovered an attribute that allows for a more precise definition of the genus. As well, I have obtained from Dr. Cantone the only remaining specimen of *Pseudofabricia aberrans* upon which she based her original description. Unfortunately, Cantone (1972) neither designated nor specifically referred to either of the original specimens as types and made no mention of the final disposition. With the growing awareness over the past several years of the diversity and distribution of fabriciins in the Mediterranean Sea (Giangrande and Castelli, 1986; Martin and Giangrande, 1991; Simboursa, 1990; Fitzhugh *et al.*, 1994; Fitzhugh and Simboursa, 1995), the need to minimize ambiguity in the identification of small-bodied sabellids from this region has become more acute. I will in the present paper designate Cantone's original specimen as the lectotype of *P. aberrans* as well as compare this specimen with some of the nontype material. All specimens examined have been deposited in the Allan Hancock Foundation Polychaete Collection of the Los Angeles County Museum of Natural History (LACM-AHF).

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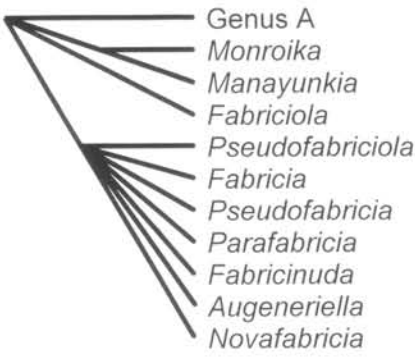


Figure 1. Strict consensus cladogram, modified from Fitzhugh (1993: fig. 3), indicating the relationship of *Pseudofabricia* to other Fabriciinae genera.

SYSTEMATICS

Pseudofabricia aberrans

Cantone, 1972, emended

Figures 2–4

Pseudofabricia aberrans Cantone, 1972: 4, figs. 1–2, pl. 1; Giangrande and Cantone, 1990: 363, figs. 1–3.

MATERIALS EXAMINED. Lectotype (LACM-AHF 1708, slide mount), designated herein; Mediterranean Sea, Island of Sicily, near Siracusa, *Posidonia oceanica* grass bed, depth about 2 m. Nine nontype specimens (three complete, six lacking branchial crown, LACM-AHF 1709), Tyrrhenian Sea, Island of Ponza, near Lazio, among rhizomes of *Posidonia oceanica*, depth 1 m, 1989.

DESCRIPTION OF LECTOTYPE. Specimen in

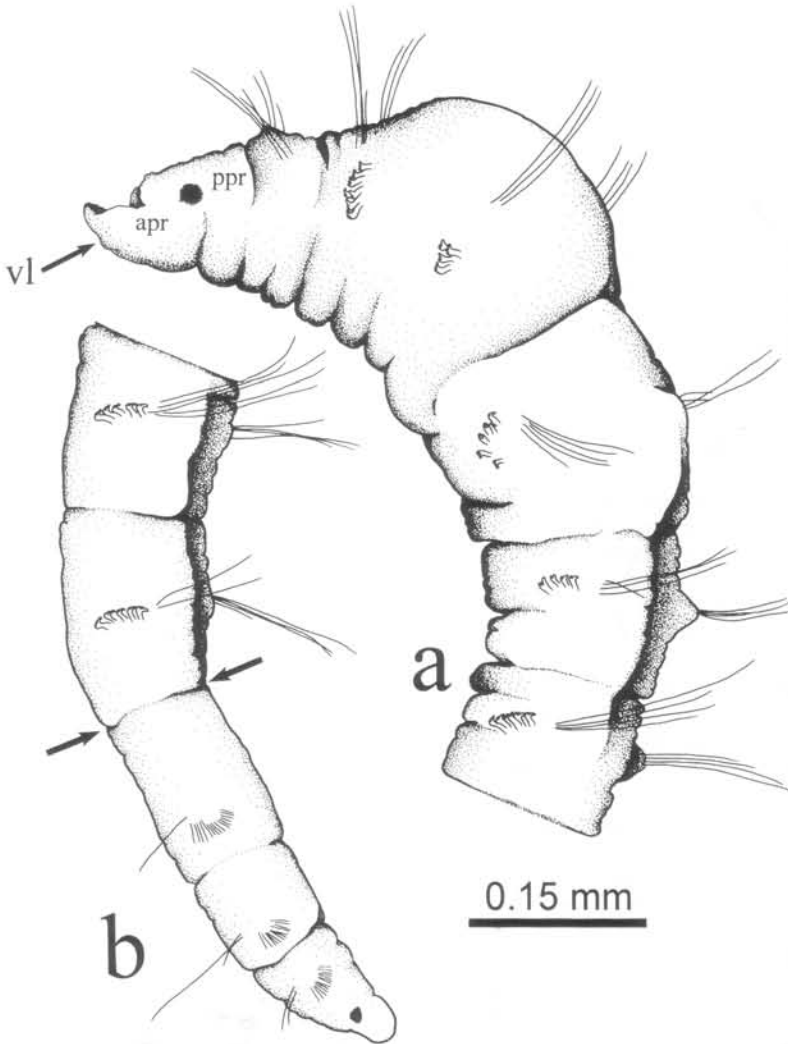


Figure 2. Lectotype of *Pseudofabricia aberrans* (LACM-AHF 1708), left side, entire specimen (figure split between setigers 6 and 7). a, anterior half of body. b, posterior half of body; arrows indicate thorax–abdomen boundary. Abbreviations: apr, anterior peristomial ring; ppr, posterior peristomial ring; vl, ventral lobe of anterior peristomial ring.

poor condition, mounted on slide, somewhat laterally flattened (Fig. 2). Body with 8 thoracic and 3 abdominal setigers, branchial crown absent. Total body length 1.30 mm, maximum width 0.25 mm at setiger 3. Ventral margin of anterior peristomial ring developed as broad lobe, about same length as remainder of ring. Posterior peristomial ring slightly shorter than anterior ring (exclusive of ventral lobe). Annulation between anterior and posterior rings only visible ventrally. Setigers 1-2 each slightly longer than posterior peristomial ring. Ventrums of setiger 3 about same length as setiger 2, dorsum of setiger 3 distinctly inflated, about 2 times longer than ventrum. Setiger 4 about 2.5 times longer than setiger 1. Setigers 5-8 each about same length as setiger 4 or slightly shorter. Anterior and posterior regions of thorax slightly tapered. Abdominal setigers of equal width, only slightly narrower than posterior thoracic region. Setiger 9 slightly shorter than setiger 8, setiger 10 about one-half length of setiger 9, setiger 11 and pygidium each about one-half length of setiger 10. Posterior margin of pygidium rounded. Anterior peristomial ring and pygidium each with pair of dark brown eyes. Superior thoracic notosetae elongate, narrowly hooded; 3-5 per fascicle. Inferior thoracic notosetae in setigers 2-8 short forms of elongate, narrowly hooded form; 1-2 per fascicle. Abdominal neurosetae modified, elongate, narrowly hooded; 1-3 per fascicle. Thoracic uncini acicular, in single row of 4-7 per fascicle; large tooth above main fang followed by series of smaller teeth. Abdominal uncini with 10-11 rows of teeth, 3-5 teeth per row; manubrium about same length as dentate region; uncini not viewed in profile. Body pigmentation absent.

REMARKS ON LECTOTYPE. In comparison with Cantone's (1972: fig. 1, pl. 1; Fig. 3) illustrations of this species while still alive, the lectotype is considerably contracted, the slide preparation probably causing additional distortion by lateral compression. The poorly preserved and incomplete condition of the lectotype makes comparisons difficult with specimens described by Giangrande and Cantone (1990). Comparing the lectotype and Ponza specimens, the latter being described below, with Cantone's (1972) original description points to a misinterpretation of the anterior end. For instance, Cantone's (1972: fig. 1; Fig. 3) illustrations of the whole animal, which were made from the two original specimens while they were still alive, show the anterior end with the ventral lobe of the anterior peristomial ring distinctly demarcated by a very deep gap from a large dorsal lobe (Fig. 3b). This dorsal lobe probably represents at least a portion of the narrow, median ridge situated just above the mouth, which is present in most fabriciins (e.g., Fig. 4a). In all specimens examined, this ridge is not nearly as pronounced as indicated by Cantone, and the deep gap between the ridge and the ventral lobe is an artifact. It is not uncommon to find the ventral lobe curved over the anterior end when the branchial

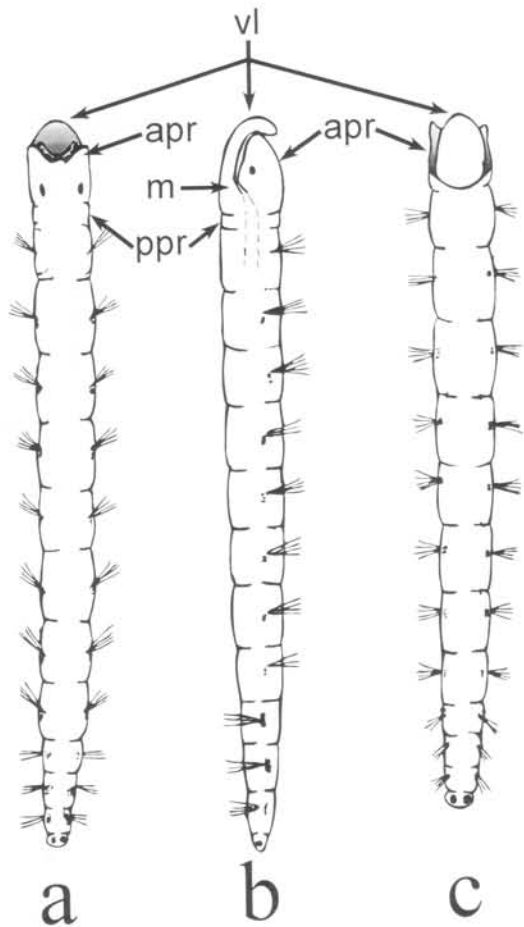


Figure 3. *Pseudofabricia aberrans*, modified from Cantone (1972: fig. 1). Abbreviations: apr, anterior peristomial ring; m, mouth; ppr, posterior peristomial ring; vl, ventral lobe of anterior peristomial ring.

crown is missing (e.g., Cantone, 1972: figs. 1-2, pl. 1; Giangrande and Cantone, 1990: fig. 1B), which at first sight can give the impression that the peristomial margin is incised just above the lobe. This interpretation of the anterior peristomial ring is also seen in the illustrations of Giangrande and Cantone (1990: figs. 1B, 2B-D), discussed below.

ADDITIONS TO DESCRIPTION BASED ON PONZA SPECIMENS. Inner margin of each branchial lobe with a low, triangular dorsal lip (Fig. 3a, b). One pair of nonvascularized ventral filamentous appendages present just ventral to each dorsal lip; appendages slightly longer than dorsal lips to up to 1.5 times longer than lips; surface of appendages ranges from smooth (Fig. 4a) to wrinkled (Fig. 4b); width relatively uniform except for slight widening at base; distal end rounded. Ventral margin of anterior peristomial ring as a broad, flattened lobe; proximal margin distinctly continuous with remainder of anterior ring (Fig. 4a). Anterior peristo-

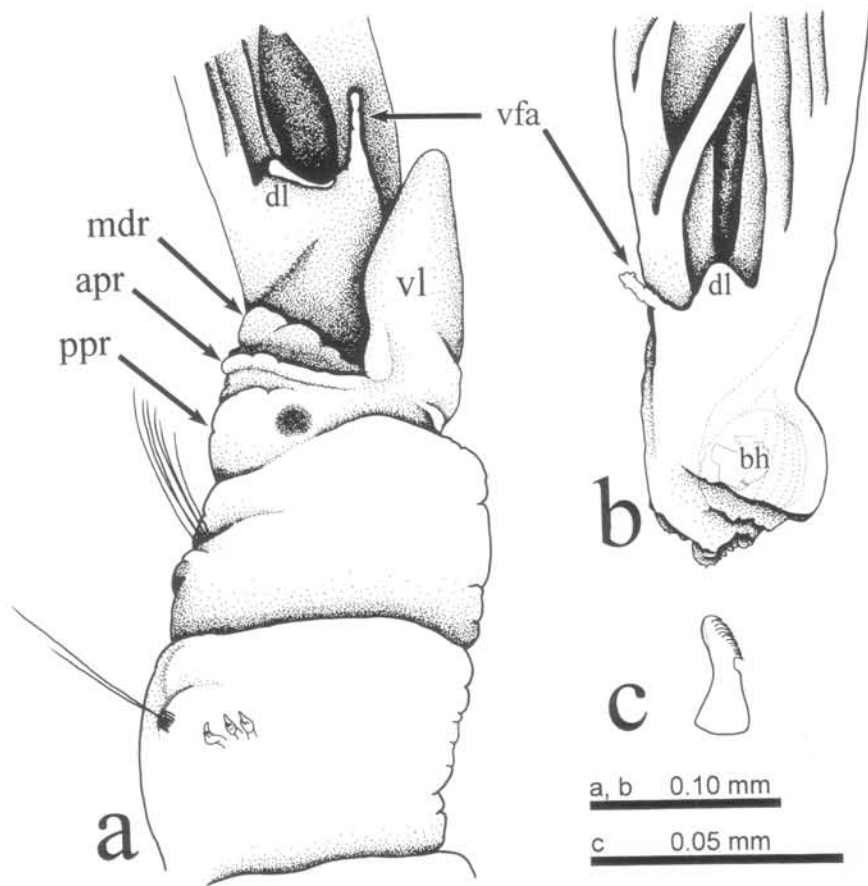


Figure 4. *Pseudofabricia aberrans* from Ponza Island, Italy (LACM-AHF 1709). **a**, anterior end, right side (right half of branchial crown removed, distal end of dorsal lip is folded over). **b**, inner margin of right half of branchial crown. **c**, abdominal uncinus from setiger 9. Abbreviations: apr, anterior peristomial ring; bh, branchial heart; dl, dorsal lip; mdr, middorsal ridge; ppr, posterior peristomial ring; vfa, ventral filamentous appendage; vl, ventral lobe of anterior peristomial ring.

mial ring about one-half length of posterior ring. Annulation between anterior and posterior rings distinct dorsolaterally and ventrally. Abdominal uncini with 10–11 rows of teeth (Fig. 4c), 3–5 teeth per row; manubrium slightly constricted distally and about same length as dentate region.

REMARKS ON PONZA SPECIMENS. There are two notable features presented here that differ from those described by Giangrande and Cantone (1990). First, ventral filamentous appendages were overlooked in the redescription (e.g., Giangrande and Cantone, 1990: fig. 2D). These structures are extremely difficult to see without first completely separating the branchial lobes and examining the inner margin of a lobe with a compound microscope. In terms of their position and structure relative to the dorsal lips, these appendages show a striking resemblance to the nonvascularized ventral filamentous appendages seen in all species of *Fabriciolo* Friedrich (see Fitzhugh, 1990; Rouse, 1993). The difference, however, is that the appendages in

Fabriciolo are considerably longer, usually terminating near the distal end of the crown.

Second, Giangrande and Cantone (1990: figs. 1, 2B–D) illustrated the ventral lobe of the anterior peristomial ring as though it were distinctly separated from the remainder of the ring, almost appearing to originate from the posterior peristomial ring, a condition similar to what Cantone (1972: fig. 1; Fig. 3c) illustrated. Giangrande and Cantone stated, however, that the ventral lobe was a continuation of the anterior margin of the anterior ring. It is likely that they mistook folding of the body wall in the area of the ventral lobe to indicate the lobe's proximal boundary. Shown here in Figure 4a, the placement of the ventral lobe is identical to what is seen in other fabriciins with this structure (e.g., *Fabricia*, *Parafabricia*, *Novafabricia*).

Giangrande and Cantone (1990: 364, fig. 3E) stated that the manubria of abdominal uncini were "about twice as long as the dentate region," which is not in agreement with what they illustrated. In

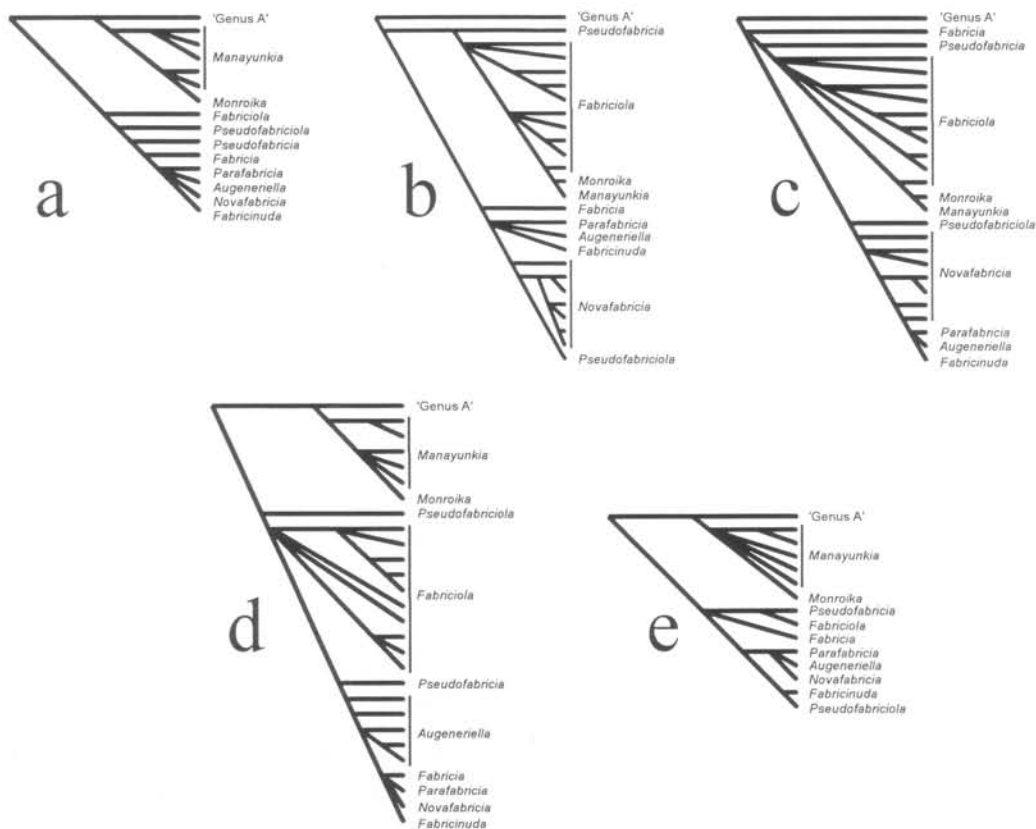


Figure 5. Selected cladograms indicating topological variation among fabriciini genera. *Pseudofabricia* was coded with nonvascularized ventral filamentous appendages present and homologous to those in *Fabriciola*. Analyses were performed with all available species in each genus, but only genera are indicated here if monophyletic. Paraphyletic genera, and included species, are delimited by a bar.

most instances, the manubrium is about the same length as the dentate region. (Fig. 4c), though I have seen some uncini with a slightly longer manubrium. In no instance have I found manubria twice as long as the dentate region.

I commented earlier (Fitzhugh, 1993: 10) on the fact that *Pseudofabricia* is characterized by plesiomorphic characters. While this does not technically affect the integrity of the genus at this time, as it is monotypic, the presence of very short, non-vascularized ventral filamentous appendages easily suffices as a synapomorphy in the event additional *Pseudofabricia* species are described.

DISCUSSION

Relative to other fabriciini sabellids, *Pseudofabricia aberrans* possesses an unusual combination of character states, certainly pointing to the need for a reassessment of the relationship of this taxon to other fabriciini genera. My earlier inclusion of *Pseudofabricia* in a cladistic analysis of fabriciini genera and species (Fitzhugh, 1993) placed the genus in a clade including *Pseudofabriciola*, *Parafabricia*, *Fabricia*, *Novafabricia*, *Augeneriella*, and *Fabrici-*

nuda (Fig. 1), this clade being defined by the presence of a large tooth above the main fang in thoracic uncini. There was certainly nothing remarkable about the placement of *Pseudofabricia*, especially given the dentition pattern in thoracic uncini, coupled with the presence of the ventral lobe on the anterior peristomial ring, both of which are common to most of these genera. In a subsequent series of unpublished cladistic analyses I have performed with fabriciini genera and species, in which nonvascularized ventral filamentous appendages are coded as present in *Pseudofabricia* (homologous to *Fabriciola* appendages), a substantially greater number of tree topologies exist and far greater instability occurs with regard to relationships among genera. While some topologies are consistent with those obtained in previous analyses (e.g., Fig. 5a), I have observed two notable topological arrangements that have not been observed previously: (1) *Fabriciola*, *Novafabricia*, and *Augeneriella* are capable of being paraphyletic (e.g., Fig. 5b-d), and (2) *Pseudofabricia* can be the sister group to *Fabriciola* by the presence of nonvascularized filamentous appendages in both genera (e.g., Fig. 5b, c, e).

The marked effects on tree topology and monophyly due to the inclusion of filamentous appendages in *Pseudofabricia* readily precludes a straightforward reassessment of relationships among genera at this time. The extreme sensitivity of tree topologies to even minor modifications in character data is a clear indication of the lack of sufficient data relative to the ever increasing number of taxa being described. The very small body sizes of fabriciini sabellids present distinct limits on the availability of gross morphological characters typically used in sabellid systematics. This increasing disparity between the number of characters and taxa simply heightens the level of homoplasy, the principal result being the more tenuous recognition of genera. A suite of very promising characters is being developed by Rouse (e.g., 1992, 1993, 1995; Rouse and Fitzhugh, 1994), centering on reproductive and developmental features. Indeed, based on his survey of reproductive characters in *Fabriciolo*, Rouse (1993: 250) suggested that, once these characters are taken into consideration cladistically, *Fabriciolo* might be paraphyletic. Such a view is supported by some of the topologies presented here (Fig. 5b-d). The further integration of Rouse's reproductive data with characters currently available will likely afford greater resolution to relationships among fabriciini taxa.

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