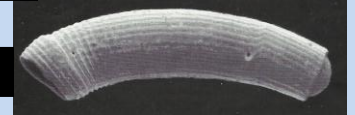
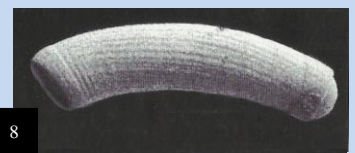
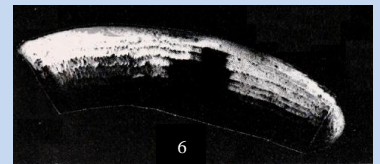
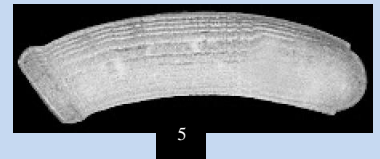
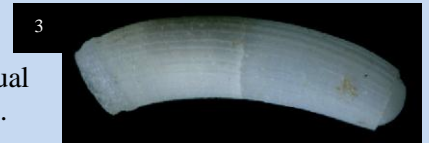
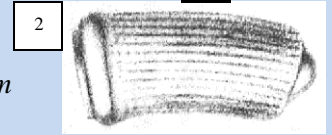
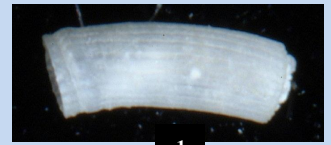


## A new perspective on *Caecum breve* and *C. debile* by Harry G. Lee

Its collector, David Kirsh of Durham, NC, and I were quite excited when we laid eyes on a shell he culled from grunge he retrieved from a 70 foot SCUBA dive off Boynton Beach, Palm Beach Co., Florida in late April, 2005. The specimen (**Fig. 1**) was only the third of its species ever reported from the waters of continental America (Lightfoot, 1992b: 27), and, at one mm, a midget among pygmies. In the western Atlantic easily the shortest, chubbiest and straightest of the family, which species are typically curved tubes resembling macaroni, it has an oddly truncated appearance. We had determined that the shell was the elusive and puzzling *Caecum breve* de Folin (1867a: 53 pl. 3, fig 5 **Fig. 2** here; see bibliography for URLs to the original description and figure of this and other species treated herein). For years the image was posted on the jaxshells website, but only recently did it strike me that a congener taken in that same grunge haul and arguably its equal in rarity (**Fig. 3**) in some respects bore a haunting resemblance to the midget. The shells of each were actually on the same webpage! We had tentatively identified this second species as *C. debile* A.E. Verrill and Bush, 1900, described from Bermuda, but at the time of the web posting otherwise known only from the ABC Islands (de Jong and Coomans, 1988; see **Fig. 4**).

Despite having another specimen of *C. debile*, from Nevis, in my collection, owing to the facts that (a) at the time of the web posting there were no other reports of this species and (b) Absalão and Gomes (1998) had synonymized the nominal taxon with the common and relatively ubiquitous *C. multicostratum*, we allowed the discussion to lapse into equivocation and atony. However, rather recently Colin Redfern reported *C. debile* having been taken by his colleague Jack Worsfold from the off-, and inshore waters of Grand Bahama Is. in the early 1980's (**Fig. 5**). Thus it appeared that there was an emerging consensus on the identity of *C. debile*, but, to be certain, a scrutiny of the actual shell on which the authors based the description would be essential. This quest was challenged by the lack of a figure accompanying the original description (Verrill and Bush, 1900: 538). Fortunately Richard Johnson (1989: 33; pl. 17, fig. 7; photo by Robert Moolenbeek) located the holotype (Yale Peabody Museum 15667), and, despite the loss of quality in two electronic transfers (hardcopy to www to here), we present the venial grandchild as **Fig. 6**.

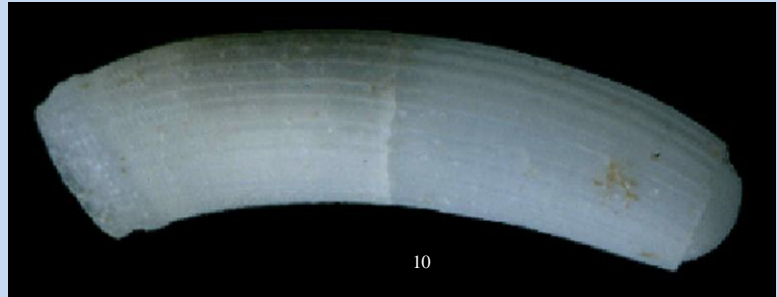
Before returning to this report's topical species, an analysis of a third congener, *Caecum multicostratum* de Folin, 1867b (32, 33; pl. 3, fig. 4; here **Fig. 7**), with which species Absalão and Gomes (1998) placed *C. debile* in synonymy, is in order. These authors later (Absalão and Gomes, 2001) designated a lectotype of *C. multicostratum* (**Fig. 8** here), which made it apparent that de Folin's drawing accompanying the original description had exaggerated the sculpture of the anterior portion of the shell. The authors went on to unite *C. heladum* Olsson and Harbison, 1953 (syntype our **Fig. 9**) and *C. johnsoni* Winkley, 1908 with *C. multicostratum* but did not include *C. debile* in the synonymy. Perhaps the authors had tacitly recanted their earlier assertion.



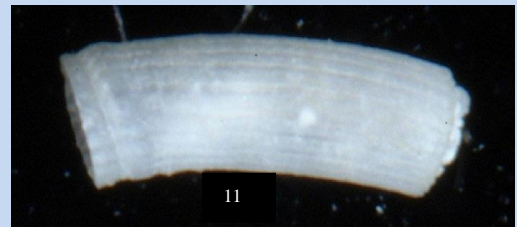
The comparison of material referred to *C. debile* and *C. multicostratum* above impels me to conclude they are separate species based on the latter's

- coarser sculpture throughout
- anterior end formed by fusion of closely approximated strong rings (vs. a varicose swelling preceded and followed by constricted segments)
- narrower tube

Having built a case for the distinction of *Caecum debile*, I must now return to David's other rara avis, *C. breve*. Here are the two again, now enlarged, as **Figs. 10 and 11** respectively. Note the distinct suture-like interface at the mid-portion of the larger *C. debile*, right where the aperture (or septum) of the *C. breve* would be stationed.



The two shells share the now familiar preapertural varix behind the apertural constriction, and their delicate sculpture of flattish longitudinal ribs crossed by very fine and densely placed circumferential rings is virtually identical. The partially decorticate blistered septum of the *C. breve* specimen reveals the usually inapparent or very subtle mucro near the convex side of the beginning of the tube. Such



dehiscence, probably involving elements of intritacalx, has been reported in *C. multicostratum* (Lee, 2009: 72). It is now apparent that **Figs 10 and 11 represent only one species!**

The unusual saltatory shell growth of the majority of caecids was discussed by Lightfoot (1992a: 172). Each of the three or more ontogenetic stages appears to adhere to a pre-programmed pattern of growth stoppage, formation of a new septum, then resumption, generally with shedding of the preceding stage. It appears that the final stage of typological *Caecum breve* has a precocious maturation setting, typical *C. debile* exhibiting a more conventional growth regimen. In some populations, e.g., Water Is. U.S. Virgin Is. (Mitchell-Tapping, 1979), the precocious morph may be the exclusive phenotype, in others, e.g., Grand Bahama Is. (Redfern, *loc. cit.*) the opposite may be the case. It is not unlikely both environmental and genetic factors play roles in phenotypic expression of this most remarkable species. As exemplified by the shells in **Figs. 1, 11 vs. 3, 10**, metamorphosis from the precocious (*breve*) to the elongate (*debile*) form may occur, but it seems to be infrequent. In such instances, it appears that a bit of conchological remodeling occurs at the point of growth reinitiation. As David pointed out, the question then arises: in individuals such as **Fig. 10**, is the potential for shedding of the posterior half persistent? If so, and abscission were to occur at the point of the mid-shell scar, **two** typological *C. breve*, one abandoned shell, one surviving snail, would be generated – a conchological two-fer. All this notwithstanding, since these two nominal taxa are here considered synonymous, there is **only one valid name applicable to these morphs, *C. breve* de Folin, 1867.**

Although it appears David must relinquish one species on his Boynton biodiversity inventory as well as his new Florida records tally, originally 47 species (Kirsh, 2006), he might find solace in having collected a pair of microshells that excited some heterodoxy in the annals of *Caecum* taxonomy.

### **Acknowledgments:**

I commend David Kirsh for his diligence in field work, curation, and microphotography and thank him for sharing the fruits of his labor. Colin Redfern and Ricardo Absalão kindly each allowed use of their shell images. Bill Frank provided technical and image-editing services. David and Colin provided comments on an earlier version of this report.

### **Literature cited:**

- Absalão, R.S. and R.S. Gomes, 1998. *Caecum debile* Verrill and Bush, 1900 as a synonym of *C. multcostatum* Folin, 1867 (Gastropoda: Caecidae). *Abstracts of the World Congress of Malacology, Washington, DC 25-30 July 1998*. Chicago, 1998.  
<[http://www.sigma.ufrj.br/UFRJ/SIGMA/producoes/consulta/relatorio.stm?app=PRODUCOES&id\\_producao=52262&buscas\\_cruzadas=ON](http://www.sigma.ufrj.br/UFRJ/SIGMA/producoes/consulta/relatorio.stm?app=PRODUCOES&id_producao=52262&buscas_cruzadas=ON)>. Not seen; title only.
- Absalão, R. S. and R. S. Gomes, 2001. The species usually reported in the subgenus *Brochina* (*Caecum*, Caecidae, Caenogastropoda) from Brazil and some relevant type specimen from the western Atlantic. *Bolletino Malacologico* 37(1-4): 9-22
- De Jong, K.M. and H.E. Coomans, 1988. Marine gastropods from Curaçao, Aruba and Bonaire. *Studies on the Fauna of Curaçao and other Caribbean Islands* 69: 1-261 + 47 pls.
- Folin, L. de, 1867a. Descriptions d'espèces nouvelles de Caecidae. *Journal de Conchyliologie 3ème série* 7; *Tome VIIe* 15: 44-58 + pls. 2, 3.  
< <http://www.biodiversitylibrary.org/item/52768#page/48/mode/1up>>  
Specifically see <<http://www.biodiversitylibrary.org/item/52768#page/57/mode/1up>> and  
<<http://www.biodiversitylibrary.org/item/52768#page/493/mode/1up>>
- Folin, L. de. 1867b. Rade de la Guayra. *Les Fonds de la Mer* 1: 30-33, pls. 3-4 Savy, Paris.  
<<http://www.biodiversitylibrary.org/item/108784#page/43/mode/1up>>  
Specifically see <<http://www.biodiversitylibrary.org/item/108784#page/45/mode/1up>> and  
<<http://www.biodiversitylibrary.org/item/108784#page/335/mode/1up>>
- Johnson, R.I., 1989. Molluscan taxa of Addison Emery Verrill and Katharine Jeannette Bush, including those introduced by Sanderson Smith and Alpheus Hyatt Verrill. *Occasional Papers on Mollusks* 5(67): 1-143. 30 Aug.  
<<http://www.biodiversitylibrary.org/item/25416#page/5/mode/1up>>
- Kirsh, D., 2006. New shell records for Florida. *American Conchologist* 34(3): 17-19. "Sept."
- Lee, H.G., 2009. *Marine Shells of Northeast Florida*. Jacksonville Shell Club, Inc., Jacksonville, FL. 204 pp. + 19 color plates. 28 May.
- Lightfoot, J., 1992a. Caecidae of the western Atlantic [Part 1 of 2]. *Of Sea and Shore* 14(4): 171-185. Winter. <[http://www.ofseaandshore.com/publications/magazine/pdf/vol14\\_4.pdf](http://www.ofseaandshore.com/publications/magazine/pdf/vol14_4.pdf)>
- Lightfoot, J., 1992b. Caecidae of the western Atlantic Part 2 [of 2]. *Of Sea and Shore* 15(1): 23-32. Spring. <[http://www.ofseaandshore.com/publications/magazine/pdf/vol15\\_1.pdf](http://www.ofseaandshore.com/publications/magazine/pdf/vol15_1.pdf)>
- Mitchell-Tapping, H.J., 1979. The Caecidae (Gastropoda: Rissoacea) of Water Island, U.S. Virgin Islands, with a new species. *The Nautilus* 93(2-3): 103-105. 23 April.  
<<http://www.biodiversitylibrary.org/item/34226#page/121/mode/1up>>

Olsson, A.A. and A. Harbison, 1953. Pliocene Mollusca of Southern Florida, with special reference to those from North Saint Petersburg. *Monographs of the Academy of Natural Sciences of Philadelphia* 8: vii + 459, 65 pls. 6 Nov.

Redfern, C., 2012. Bahamian Seashells. Last visited 25 November.

<<http://www.bahamianseashells.com/>>

Specifically see <<http://www.bahamianseashells.com/addrecords.html>>; and scroll down.

Verrill, A.E. and K.J. Bush, 1900. Additions to the marine Mollusca of the Bermudas.

*Transactions of the Connecticut Academy of Arts and Sciences* 10: 513-544, pls. 63-66. Sept.

<<http://www.biodiversitylibrary.org/item/48107#page/543/mode/1up> >

Specifically see <<http://www.biodiversitylibrary.org/item/48107#page/568/mode/1up>>