

Revision of the East Atlantic and Mediterranean Caecidae

J.J. VAN AARTSEN

Admiraal Helfrichlaan 33, Dieren, the Netherlands

A study of the Caecidae (Gastropoda Prosobranchia) from the European Atlantic coast, the Canary Islands, as well as the Mediterranean has resulted in about 26 different names for species described by various authors during the last 150 years. Difficulties encountered in identifying species of this family have been summed up recently by Moore (1968: 39): "It is at the generic and specific level that most difficulty is encountered. Some species have considerable variation, and this, combined with the three stages of growth and differences due to wear, has brought on a great deal of confusion. ... Inability to understand variation in a species resulted in some being named several times from the same small bottom sample. The varying quality of his [=De Folin's] figures also compounded the confusion".

It is with these remarks in mind that a revision of the Caecidae from the area indicated earlier was undertaken. The results as published in this paper are based on a critical literature survey on the one hand and the study of all relevant material in the collections of De Folin (Muséum National d'Histoire Naturelle, Paris), Carpenter [British Museum (Natural History, London)] and Jeffreys (National Museum of Natural History, Washington D.C., U.S.A.) and in some other collections. Acknowledgements are due to the various persons in charge of these collections for assistance during the present author's visits. Apart from the collection of Caecidae of P.P. Carpenter, the British Museum also contains some samples of Chaster, whereas the Jeffreys collection in Washington contains a number of samples which were given to Jeffreys by De Folin and Monterosato. This could be ascertained by the fact that De Folin used a special type of blue slides to mount his specimens; some of these slides were also found in the Jeffreys collection with a species name in the handwriting of De Folin. Specimens originating from Monterosato could be identified by the fact that either the label mentioned this or the original label in the characteristic handwriting of Monterosato was still present.

Below all names are shown in alphabetical order with remarks as to the validity of the species as well as the name. It is not attempted to give a complete bibliography of each name. Some species are mentioned rather frequently, while others occur only once or twice in scientific (and popular) literature. Nevertheless, it is very difficult to ascertain which species is really recorded in a specific case. This can only be done through the study of all original material (if still present). Therefore only certain classical works such as those by Jeffreys (1867), Bucquoy, Dautzenberg & Dollfus (1882-1886), Locard (1892), and some more recent publications like Priolo (1956), Nordsieck (1968) and Parenzan (1970) are being referred to. Original diagnoses of species and sometimes also figures of the species described can be found in the monograph by Carpenter (1858) and the publications by De Folin (1867-1887). The species assigned to Monterosato are mostly described in one or two sentences only or by a differential diagnosis in two publications which appeared almost simultaneously in 1884. As far as the Caecidae are concerned, the text in both publications (Monterosato, 1884a, 1884b) is exactly the same.

The species described in the last 150 years are as follows.

1. *Caecum annulatum* (Brown, 1844)

This species is mentioned by Carpenter (1858: 423) and Jeffreys (1867: 77) as a good species, but of West Indian origin. Although Nordsieck (1968: 67) mentions it as European, I am inclined to think that both Carpenter and Jeffreys were correct. Dr. D.R. Moore, one of the leading specialists in this family, writes to me (in litt., 1975): "I don't think that Brown's specimen is a native of Europe... I think it best to call it a nomen dubium...". Under these conditions I conclude that the name *C. annulatum* should not be used for specimens from the area treated in this revision.

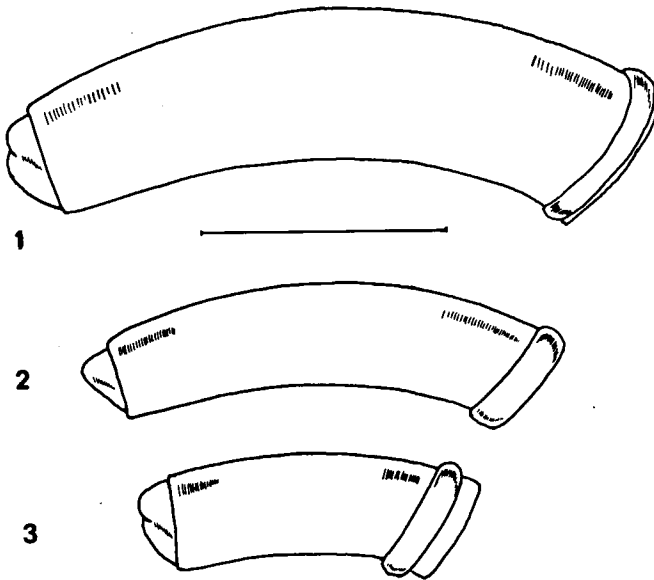
2. *Caecum armoricum* De Folin, 1869

The specimens I have been able to study, viz., the holotype in the De Folin collection in Paris and a specimen (no. 189852) in the Jeffreys collection, in my opinion show that most probably specimens under this name are only somewhat aberrant forms of *C. glabrum* (Montagu, 1803) with a much more projecting septum than is usually the case. The curve of the septum, the length and diameter of the tube and other particulars are completely the same as those of *C. glabrum*. The label on slide no. 189852 gives the name *C. armoricum* in the handwriting of De Folin as well as the locality: St. Malo (France). Somebody has written the name "*glabra* Mtg." in red ink on this same label. The specimen is a young shell and consequently rather strongly curved and tapering. Thus, I do not consider *C. armoricum* a valid species.

3. *Caecum auriculatum* De Folin, 1868 (figs. 1-3, 10-12)

This is a good and well-defined species, mentioned by Bucquoy, Dautzenberg and Dollfus (who also give a good text-figure, 1884: 231), Locard (1892: 130), Monterosato (1884a: 78), Priolo (1956: 270), Nordsieck (1968: 67), and Parenzan (1970: 101). I have examined ten syntypes in the De Folin collection.

The characteristic form of the septum, consisting of a hemispherical dome with an ear-like projection on the dextral side (see fig. 11) is only found in mature specimens. Specimens of the second growth stage show a much more pointed septum because of the



Figs. 1-3. *Caecum* specimens from Nabeul (Tunisia). 1-2. *C. auriculatum* De Folin, 1868. 3. do., monstr. *decurtatum* Mtrs., 1884.

fact that the spherical part is less developed in this stage (see fig. 12). Of course, in this stage the tube diameter is also smaller than in the adult. It is on a specimen of this second growth stage that De Folin based his *C. syriacum* (see no. 23).

4. *Caecum chiereghinianum* Brusina, 1869

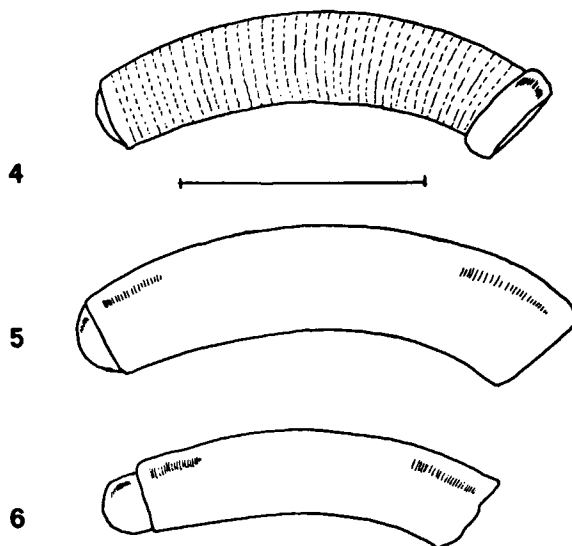
All authors agree that this is a synonym of *C. auriculatum* De Folin, 1868.

5. *Caecum clarkii* Carpenter, 1858 (figs. 16, 17)

See the separate paper on this species by Van Aartsen & Fehr-de Wal (1975).

6. *Caecum cuspidatum* Chaster, 1896 (figs. 7, 18, 19)

This species was described by Chaster (1896: 12) from specimens from the Bay of Tangier. Three specimens of this species from the Chaster collection in the British Museum (no. 96.8.6.29-31) were studied. The specimens are very much like the original figure by Chaster (1896: Plate I fig. 4). A figure of one of these specimens is depicted as my fig. 7. The septum has the form of a long and very much projecting cone (see figs. 18, 19). The above-mentioned specimens are the only ones I have been able to study, but there is no doubt that this is a good species.



Figs. 4-6. *Caedum* specimens. 4. *C. subannulatum* De Folin, 1870, Nabeul (Tunisia). 5. *C. glabrum* (Mont., 1803), Ria de Arosa (Spain). 6. *C. subannulatum* De Folin, 1870, forma cf. *incompta* Mtrs., 1884, Getares, Bay of Algeciras (Spain).

7. *Caecum decurtatum* Monterosato, 1884 (fig. 3)

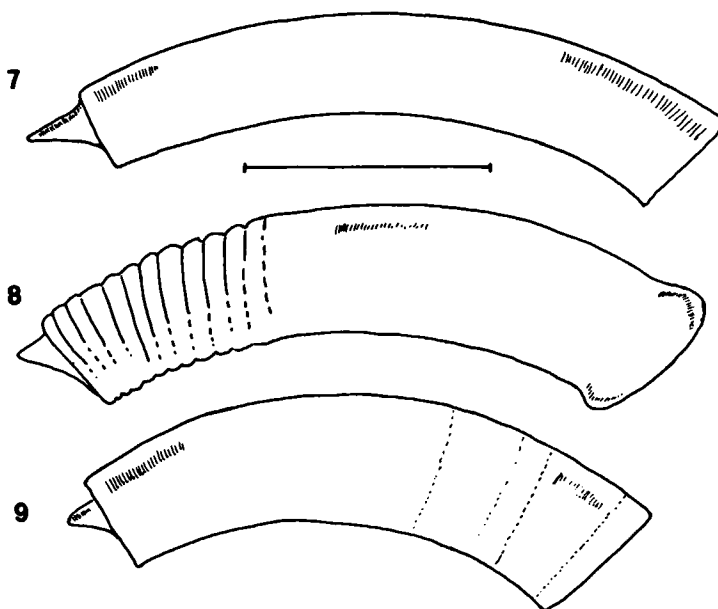
According to Pallary (1920: 48) and Priolo (1956: 270) *C. decurtatum* is a form of *C. auriculatum*, which form is shorter than usual. In fig. 3 a specimen from Nabeul (Tunisia) is shown which corresponds with this form. I do not think though, that this form is a variety: these shells should be considered monstrosities. They occur very rarely together with the typical form. None of the collections I have been able to study did contain specimens of this form.

8. *Caecum elegans* Perejaslawzewa, 1890

This form was described by Perejaslawzewa in 1890 as cited by Parenzan (1970: 102, 235), who considers it to be a variety of *C. trachea* (Montagu, 1803). The remarks made by Parenzan with respect to this form as well as his figure (pl. 50 fig. 966) have not made it clear to me, why this form should be separated from typical *C. trachea*. Although I have not seen any specimen, I think it best to consider *C. elegans* to be identical with *C. trachea*.

9. *Caecum elegantissimum* Carpenter, 1858 (fig. 24)

A good species from the Canary Islands. Described by Carpenter from material dredged by MacAndrews; specimens from MacAndrews (possibly types) are present in the British Museum. There is an unpublished figure of this very characteristic species, which



Figs. 7-9. *Caecum* specimens. 7. *C. cuspidatum* Chaster, 1896, Tangier (Morocco) (British Museum no. 96.8.6.29-31). 8. *C. trachea obsoletum* Carpenter, 1858, Nabeul (Tunisia). 9. *C. vitreum* Carpenter, 1858, Gran Canaria (Canary Islands).

figure was meant to be published by Carpenter. Through the courtesy of Dr. Donald Moore I obtained a copy of one of the plates figuring several Caecidae and reproduced here as fig. 24.

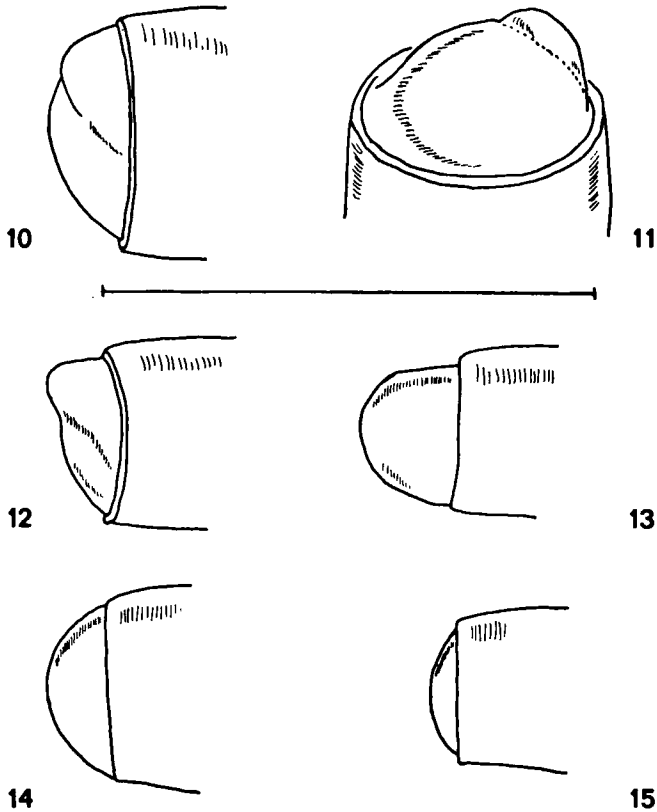
10. *Caecum fasciatum* De Folin, 1877

A study of the three syntypes in the De Folin collection has confirmed that this is most probably identical with *C. trachea obsoletum* Carpenter, 1858, which in its turn is the name to be used for the Mediterranean littoral form of *C. trachea*.

11. *Caecum glabrum* (Montagu, 1803) (figs. 5, 14)

One of the first species of the genus recognized and described from the Atlantic already by Montagu in 1803. The species does not occur in the Mediterranean although earlier writers report it from that area. All these records are erroneous, however, and should be referred to either *C. subannulatum* De Folin, 1870 or *C. auriculatum* De Folin, 1868.

Caecum glabrum does also occur in the Black Sea where it has been named *Caecum tenue* Milaschewich (see no. 24).



Figs. 10-15. Septa of *Caecum* specimens. 10-11. *C. auriculatum* De Folin, 1868, specimen of fig. 1. 12. do., specimen of fig. 2. 13. *C. subannulatum* De Folin, 1870, forma cf. *incompta* Mtrs., 1884, specimen of fig. 6. 14. *C. glabrum* (Mont., 1803), specimen of fig. 5. 15. *C. subannulatum* De Folin, 1870, specimen of fig. 4.

12. *Caecum imperforatum* (Kanmacher, 1798)

This name is sometimes used for *C. trachea* and is mentioned sub *C. imperforatum* in the well-known list of Winckworth (1932). However, Bucquoy, Dautzenberg & Dollfus (1884: 230) are very much in doubt as to the synonymy of *C. imperforatum* and *C. trachea*. Furthermore, the name *C. imperforatum* is hardly ever used in recent literature and when it is, this is apparently on the authority of Winckworth who does not give any evidence that it is really identical to *C. trachea*. Under these circumstances I prefer to regard the name *C. imperforatum* as a nomen dubium.

13. *Caecum incompta* Monterosato, 1884

According to Monterosato himself (1884a: 78) this species might be identical to *C. armoricum* De Folin, 1869, a species which I consider to be the same as *C. glabrum*. Although I have not seen any specimens labelled *C. incompta*, it seems likely that this species is described from specimens of *C. subannulatum* with a much more projecting septum than usual. Therefore it might be similar to the monstrosity of *C. glabrum* called *armoricum*. Such specimens do occur very rarely together with the typical form. An example, a specimen from Getares (Bay of Algeciras), is shown in figs. 6 and 13.

14. *Caecum laevissimum* (Cantraine, 1842)

Kisch (1959: 26) mentions the label of a sample of *C. auriculatum* De Folin, 1868, in the Norman collection in the British Museum (Natural History) from which it is clear that Dautzenberg considers this species to be identical with *C. laevissimum*. The same view is held by Locard (1892: 130) and Monterosato (1884a: 78). Bucquoy, Dautzenberg & Dollfus (1884: 232) refer *Odontidium laevissimum* Cantraine, 1842, with doubt to *C. auriculatum*, but these authors do not further comment regarding the reason for their doubts. Priolo (1956: 270) also mentions the name *C. laevissimum* with a question mark under the heading *C. auriculatum*.

However, sample no. 107563 in the Jeffreys collection in Washington from Marseilles labelled "*C. laevissimum* Cantr." and "verified by Monterosato" turned out to belong to *C. subannulatum*. As neither the Institut Royal des Sciences Naturelles de Belgique, Brussels, nor the Rijksmuseum van Natuurlijke Historie, Leiden, does contain any (syn)types of Cantraine's species, I think that *C. laevissimum* is to be treated as a nomen dubium; it may be identical to either *C. auriculatum* or *C. subannulatum*.

15. *Caecum obsoletum* Carpenter, 1858 (fig. 8)

See the remarks under no. 25, *Caecum trachea*. It is concluded that the usual littoral Mediterranean form of that species should be called *C. trachea obsoletum*.

16. *Caecum orientale* De Folin, 1868

See the article by Van Aartsen & Fehr-de Wal (1975) on *Caecum clarkii* Carpenter, 1858, where it is shown that *C. orientale* is identical to *C. clarkii*.

17. *Caecum pollicare* Carpenter, 1858

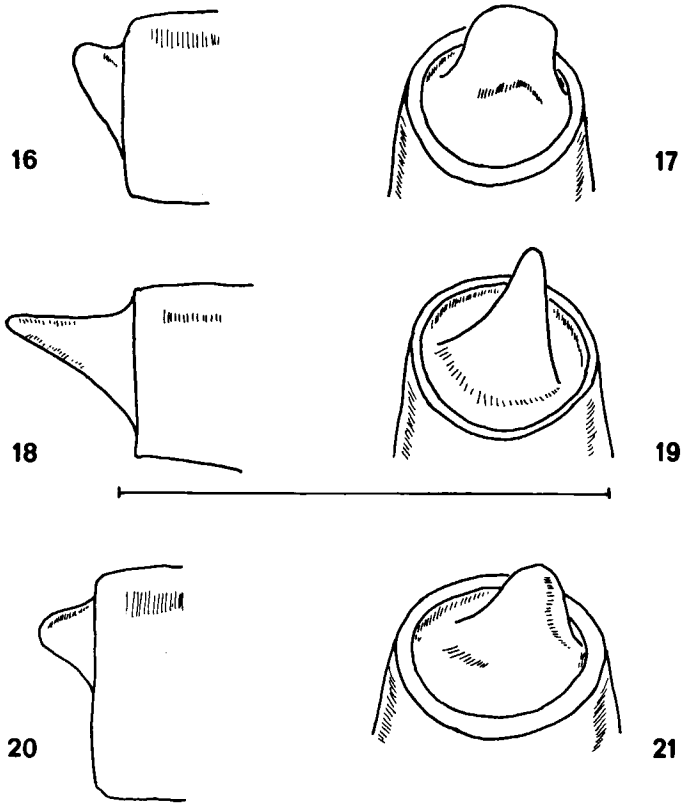
This species is also identical to *C. clarkii*. It may be, however, that more or less ringless specimens of *C. trachea obsoletum* Carpenter, 1858 have occasionally also been taken to represent *C. pollicare* as could be concluded from the discussion by De Folin (1886: 689) on the Caecidae of the Challenger Expedition.

18. *Caecum rugulosum* (Philippi, 1836)

See under no. 25, *C. trachea* (Montagu, 1803), where it is shown that *C. rugulosum* is a synonym of Montagu's species.

19. *Caecum sardinianum* De Folin, 1870

See the article by Van Aartsen & Fehr-de Wal (1975), where it is shown that this species is identical to *C. clarkii* Carpenter, 1858.



Figs. 16-21. Septa of *Caecum* specimens. 16-17. *C. clarkii* Carpenter, 1858, Lagos (Portugal). 18-19. *C. cuspidatum* Chaster, 1896, specimen of fig. 7. 20-21. *C. vitreum* Carpenter, 1858, specimen of fig. 9.

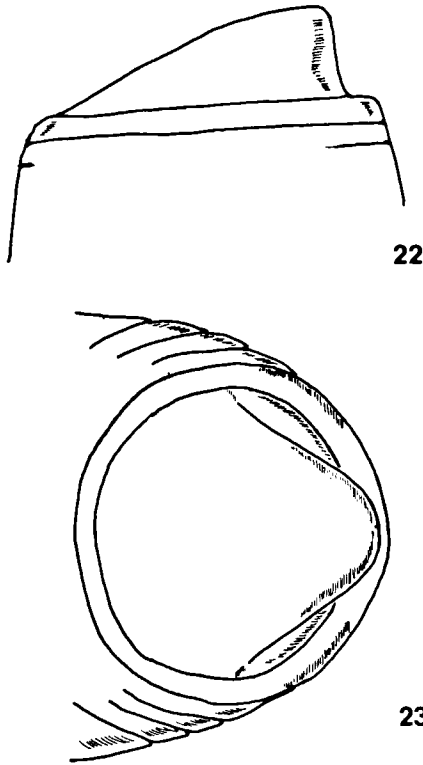
20. *Caecum semitrachea* (Brusina MS) Monterosato, 1884
This name is also a synonym of *C. clarkii* Carpenter, 1858.

21. *Caecum spinosum* De Folin, 1873

Moore (1970) concludes that this name is a synonym of *C. glabrum* (Montagu, 1803). After having studied the two syntypes in the De Folin collection in Paris I entirely agree with this conclusion.

22. *Caecum subannulatum* De Folin, 1870 (figs. 4, 15)

A good and well-known species which lives in the Mediterranean. There are eight

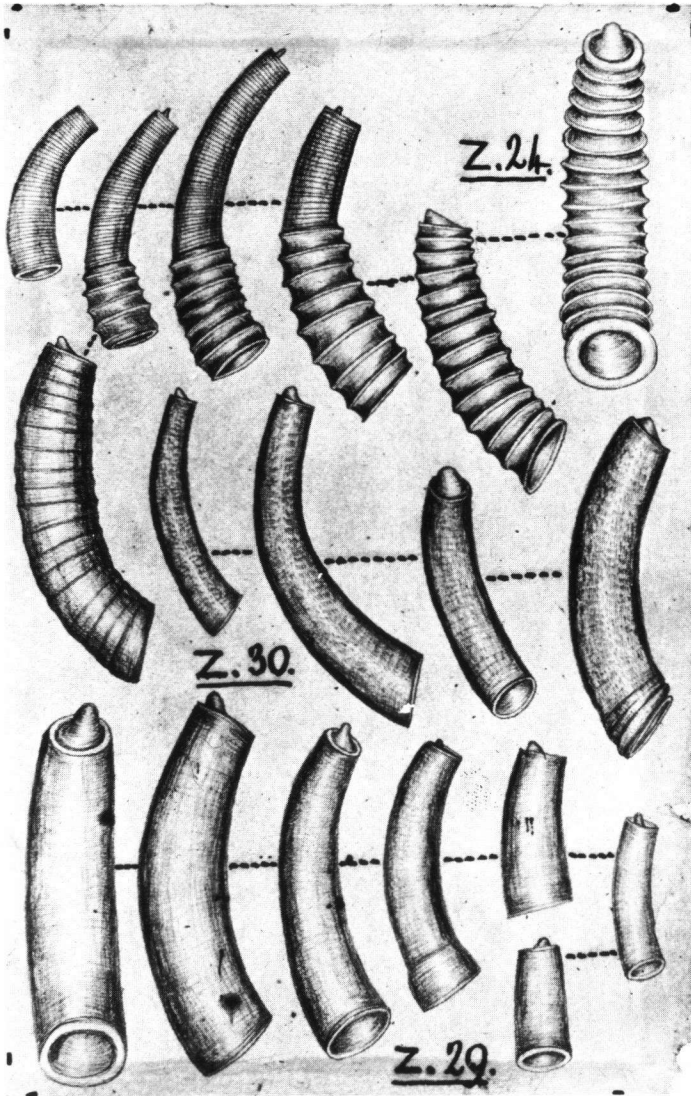


Figs. 22-23. *Caecum trachea* (Mont., 1803). Septum of a specimen from Ria de Arosa (Spain).

syntypes in the De Folin collection. The faint annulate sculpture as well as the relatively strong ring at the aperture serve to distinguish it from *C. glabrum*. The operculum is different as well. That of *C. subannulatum* is entirely flat as in *C. auriculatum*, while that of *C. glabrum* is shaped “resembling an inverted tea-cup without a handle” (Jeffreys, 1867: 78).

23. *Caecum syriacum* De Folin, 1869

After having studied the holotype of this species in the De Folin collection in Paris I am convinced that this is a second growth stage specimen of the well-known *C. auriculatum* De Folin, 1868.



Figs. 24-25. Copy of a plate intended to be published by Carpenter. 24 (= Z.24). *Caecum elegantissimum* Carp., 1858. 25 (= Z.29, only two specimens on the far left). *Caecum vitreum* Carp., 1858. Courtesy of Dr. D. Moore.

24. *Caecum tenue* Milaschewich, 1916

This species is mentioned by Parenzan (1970: 235); his figure (fig. 964) shows that this species must be identical to *C. glabrum* (Montagu, 1803), which is thus shown to also occur in the Black Sea and thus is not an exclusively Atlantic species.

25. *Caecum trachea* (Montagu, 1803) (figs. 22,23)

A well-known species, occurring both on the Atlantic coasts of Europe and throughout the Mediterranean. In the Mediterranean the specimens usually have a smaller tube diameter and the middle part of the tube does not show the characteristic annulate sculpture. These differences do not seem to be sufficient for the separation of these specimens as a species but I think that at least subspecific status is in order. According to Monterosato (1878: 315) this form lives in the littoral zone whereas the species proper also occurs, but in deeper waters. Monterosato (1884a: 79) regards this littoral Mediterranean form as a separate species and identifies it as *C. rugulosum* (Philippi, 1836). This, however, does not seem correct. The description of Philippi (1836: 102) does not mention the disappearance of the annulate sculpture on the middle part of the shell and his figure (1836: Plate VI fig. 20a) clearly shows rings completely covering the tube. Thus I regard *C. rugulosum* as a synonym of typical *C. trachea*.

The littoral Mediterranean form should be indicated by the name *obsoletum* Carpenter, 1858, which name was based on a specimen found near Salamis (Greece, Aegean Sea) by Bean. I have found this specimen in the British Museum (Natural History) and it corresponds exactly with the description of Carpenter as well as with many other specimens from different parts of the Mediterranean. A typical specimen of this subspecies is shown in fig. 8. A third species to be mentioned here is *Caecum fasciatum* De Folin, 1877. From a study of the three syntypes in the De Folin collection in Paris it seems that this species is most probably identical with *C. trachea obsoletum*. I feel a slight hesitation, however, because, on the one hand the specimens show the typical *trachea*-septum, the annulate sculpture which disappears on the middle of the tube and also the for *C. trachea* very characteristic microscopical longitudinal striae. On the other hand they differ by having a slightly greater diameter and particularly by possessing a thickened ring at the aperture. This last character is also mentioned by Monterosato (1884a: 79) for his *C. rugulosum* (= *C. trachea obsoletum*), but I have not detected it clearly in most of the samples of the littoral Mediterranean form studied. It may be, however, that this thickened ring at the aperture is only present in fully mature specimens which are expected to have a greater tube-diameter as well. In the light of this evidence I tentatively regard *C. fasciatum* to be identical with *C. trachea obsoletum*.

26. *Caecum vitreum* Carpenter, 1858 (figs. 9, 20, 21, 25)

This a good species from the Canary Islands. Specimens in the British Museum (Natural History), obtained from MacAndrews, as well as some samples from my own collection show it to be different from *C. clarkii* Carpenter, 1858. *C. vitreum* is somewhat larger, the diameter of the tube is greater than in *C. clarkii* and the septum is more pointed as can be seen from fig. 21 as compared to fig. 17.

The suggestion of some authors that *C. vitreum* and *C. sardinianum* De Folin, 1870, could be identical, is not correct as has been shown by Van Aartsen & Fehr-de Wal (1975: 82).

In conclusion it is seen that only eight of the twenty-six species of the genus *Caecum* described from the East Atlantic and Mediterranean can be considered valid species, viz.,

C. auriculatum De Folin, 1868: Mediterranean and Lusitanian.

C. clarkii Carpenter, 1858: Mediterranean, Lusitanian, Canary Islands and Azores.

C. cuspidatum Chaster, 1896: Tanger.

C. elegantissimum Carpenter, 1858: Canary Islands.

C. glabrum (Montagu, 1803): North East Atlantic and Black Sea (as *C. tenue* Mil.sensu Parenzan).

C. subannulatum De Folin, 1870: Mediterranean.

C. trachea (Montagu, 1803): North East Atlantic, Mediterranean.

C. trachea obsoletum Carpenter, 1858: Mediterranean (littoral).

C. vitreum Carpenter, 1858: Canary Islands.

These species can be distinguished with the following key which is based on well-preserved adult specimens. The scale in all figures is 1 mm.

Key to the Atlantic and Mediterranean Caecidae:

- 1a. Shell surface smooth and glossy, no annulate sculpture 2
- b. Shell surface totally or partly covered by more or less clear rings (these rings can be very difficult to detect in *C. subannulatum*) 7
- 2a. Septum consisting of a hemispherical dome with no signs of projections or appendices 3
- b. Septum otherwise 4
- 3a. No sign of annulate sculpture and no projecting ring at the aperture (see fig. 5) *C. glabrum* (Mont., 1803)
- b. A faint annulate sculpture may be detected under a certain incidence of the light and at the aperture there is a strong projecting ring (see fig. 4) *C. subannulatum* De Folin, 1870
- 4a. At the aperture a strongly projecting ring; septum more or less hemispherical and with a characteristic ear-like appendix at the side (not ventral nor dorsal!) (see figs. 1, 11) *C. auriculatum* De Folin, 1868
- b. No sign of any ring at the aperture 5
- 5a. Septum consisting of an elongate, strongly projecting and pointed cone (see figs. 7, 18) *C. cuspidatum* Chaster, 1896
- b. Septum with a more or less finger-like projection at the dorsal side of the shell 6
- 6a. Finger-like projection relatively sharply pointed; tube diameter 0.4-0.5 mm (see figs. 9, 20) *C. vitreum* Carpenter, 1858
- b. Finger-like projection blunt or even widened at the tip; tube diameter 0.3-0.35 mm (see figs. 16, 17) *C. clarkii* Carpenter, 1858

- 7a. Annulate sculpture very faint; septum hemispherical and strongly projecting ring at the aperture (see fig. 4) *C. subannulatum* De Folin, 1870
 b. Annulate sculpture clearly visible on at least the adapical part of the tube 8
 8a. Annulate sculpture present only at adapical part of tube and near aperture; middle of tube nearly smooth (there may be a projecting ring at the aperture) (see fig. 8)..... *C. trachea obsoletum* Carpenter, 1858
 b. Annulate sculpture covering the whole length of the tube 9
 9a. Rings sharp, interstices wider than rings (see fig. 24)
 *C. elegantissimum* Carpenter, 1858
 b. Rings not very sharp, rather close to each other; sometimes surface seems to be covered by very many incised lines only, a very fine longitudinal sculpture is also present..... *C. trachea* (Montagu, 1803)

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