

Contribution to the knowledge of the family Caecidae. 2.
***Caecum auriculatum* de Folin, 1868**
(Caenogastropoda: Rissoidae) (*)

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ABSTRACT. The complex of forms related to *Caecum auriculatum* de Folin are reviewed. The synonymy of *C. auriculatum* is discussed after examination of types and large additional material. The status of the taxon *Brochina decurtata* Monterosato is discussed, with consideration on the biological implications. Two forms of this complex are additionally considered.

INTRODUCTION

The European species of the family Caecidae Gray M.E., 1850 have been the object of many important works during recent years, mainly by Dutch authors (e.g. VAN AARTSEN & FEHR-DE WAL, 1975; VAN AARTSEN, 1977; VAN AARTSEN & HOENSELAAR, 1984; VAN DER LINDEN, 1986; HOEKSEMA & SEGERS, 1993). Despite such an array of studies, we consider it useful to deal with an allegedly well-known Mediterranean species, such as *Caecum auriculatum* de Folin, 1868 and related forms. The aim is to provide a new insight, with new data based on the large amount of material we have examined.

SYSTEMATICS

Superfamily RISSOIDEA

Gray J.E., 1847

Family CAECIDAE Gray M.E., 1850

Genus *Caecum* Fleming, 1813

Caecum auriculatum de Folin, 1868

Figs. 1-17

= ? *Odontidium laevissimum* Cantraine, 1842

= *Brochina chiereghiniana* Brusina, 1869

= *Caecum syriacum* de Folin, 1869

= *Brochina decurtata* Monterosato, 1884

= *Caecum vitreum* sensu Vaissière, 1930 not Carpenter, 1858

= *Caecum saavedrae* Beltran, 1965

= *Dentalium glabrum* sensu authors not (Montagu, 1803)

Original description (DE FOLIN, 1868: 95).

"Testa irregulariter elevata, interdum lata, cylindrica, paulo arcuata; subdiaphana, nitida, minutissime transversim striata; aperturam versus annulo parum expresso, lato, planato, tumescente; apertura vix declivi, haud

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contracta, subacuta. Septo mamillato, seu hemispherico, prominente; apice dextrorso lato, auriculato; margine laterali et dorsali in uno, convexo, semi-circulari; operculo ? Long.: 0,0023; diam.: 0,0006."

Material examined

Type material - *C. auriculatum*: holotype (MNHN, Paris). A plastic box containing two glass vials is stored in the MNHN (Paris) :

Vial 1 - One partly broken shell (1.85 mm, Fig. 1), cracked, with the surface eroded and with traces of glue. The accompanying label reads: "*Caecum auriculatum* de Folin 1868. HOLOTYPE figuré probable F. M. I pl.XI f. 2 - 3". This is very likely to be the holotype, and has been identified by Virginie Heros (MNHN) who wrote the label (S. Gofas pers. comm.). In fact, de Folin states he has received a single specimen ("Notre type est ..."), from Palermo. Three original (by de Folin hand) labels have been kept in the box (Figs. 2-4): two of them report the name of the species with the notation "lisses" by which the author indicated the group of smooth (no sculpture) *Caecum* (Figs. 2, 3). The third label bears only the indication "Palerme. Carlo-forte." (Fig. 4).

Vial 2 - Eight shells with traces of glue, labelled simply "ex. auteur.". They can not be considered as types, since they are not mentioned in the original description, and are likely to originate from the second locality of the third label (namely Carlo Forte, S. Pietro Is., Sardinia, Italy). Anyway, they fit exactly *C. auriculatum* as commonly known.

C. syriacum: holotype (MNHN, Paris: Figs. 7-9). *Brochina decurtata*: lectotype (here selected; GAGLINI, 1991: 132, fig. 122) and paralectotype, from Palermo (MZR, Rome).

Additional material - Some thousands specimens and shells from all over the species range. Particularly, of the form *decurtatum* Monts. (see below) we have examined the following material:

SINGLE-RING FORM - Civitavecchia (Rome, Italy), sediment in a glass bottle, -3 m, 1 shell; Capriccioli (SS, Italy), -1.5 m, 2 shells; Is. La Maddalena (SS, Italy), -4 m, 1 shell; Piccolo Romazzino (SS, Italy), -3/4 m, 1 shell; Capo Palinuro (SA, Italy), "Occhi" cave, -9 m, 5 shells; Isola delle Correnti (SR, Italy), -1.5 m, 8 shells; Punta de Nana (Granada, Spain), -17 m, 2 shells; Cerro Gardo (Granada, Spain), -21 m, 1 shell; Umago (Istria), beached, 1 shell; Zakynthos Is. (Greece), 1 shell.

DOUBLE-RING FORM - Civitavecchia (Rome, Italy), sediment in a glass bottle, -3 m, 1 shell; Santa Marinella (Rome, Italy), beached, 1 shell;

Isola delle Correnti (SR, Italy), -1.5 m, 1 shell; Cala Calandra (Lampedusa Is., Italy: URANIA'91 Expedition), -30 m, 30.IV.1991, 1 shell; Punta de Nana (Granada, Spain), -17 m, 1 shell; Kash (Southern Turkey; AKDENIZ'92 Expedition stn. AKD 92.15), -28 m, 1 shell.

Type locality

Palermo (Italy), by original designation.

Distribution

All over the Mediterranean Sea, very common; it has been recorded in the Atlantic waters (Linden, 1986). Living specimens have been collected in soft bottoms (fine to coarse sediment) from a very few meters to 50 m depth. Ruggieri (1994) reported for the first time material of this lineage from the Pliocene and Pleistocene of Sicily.

Subsequent description

Adult stage: shell small, white, transparent in beached specimens, with a light brownish periostracum; such ephemeral periostracum has sometimes very weak longitudinal wrinkles, slightly undulated. They are visible only at high magnification and recall the encrusting tubes of some polychaetes.

The tube is regularly cylindrical, moderately arched (*); surface smooth, with no longitudinal sculpture, with only very weak growth lines. Septum hemispheric, more or less protruding, with hear-like mucro, right orientated (Fig. 14).

Latero-dorsal margin convex, semicircular. Ventral margin concave. Aperture circular, ringed, bent toward the ventral margin.

Dimensions: maximum length is ca 2 mm (adult stage).

Growth stages: all stages have been identified, with the exception of the larval one. For the latter, we have been unable to score unequivocal characters for the identification (such as the microsculpture used by HOENSELAAR & HOENSELAAR (1990) for *C. trachea*). The characters of the species are identifiable also in the juveniles, that are slightly different: (i.e.) the septum is more nail-shaped, and recalls that of *C. trachea*, the apertural ring is lacking, and the general silhouette (nearly cylindrical in the adult) is slightly conical (Fig. 6).

(* *Caecum auriculatum* has a tube less curved than *C. lightfootae* Pizzini, Nofroni & Oliverio, contrary to what erroneously written in PIZZINI *et al.* (1994: 80).

Operculum: perfectly circular, corneous, light brownish, with concentric ridges on the outer side, and numerous radial zigzag lines on the inner side (Figs. 15-17).

Besides CARPENTER (1859) on the one side, who lapidary described the opercula of some species in the frame of a simple scheme, and BARTSCH (1920) on the other side, who used it as a fundamental character in his key, the operculum has been largely disregarded by most of the authors. For example, DE FOLIN (1868-1869: 260) contested the validity of the degree of convexity of the operculum as a good character, as used by Carpenter and Bartsch.

In *C. auriculatum*, the operculum is very peculiar. At our knowledge, within the Mediterranean Caecidae, it is the only case of an operculum sculptured on both sides.

Animal: PANETTA (1980) examined the soft parts of *C. auriculatum* and found them to be similar to those of *C. glabrum* (see GÖTZE, 1938).

Remarks

The holotype (Fig. 1) has a septum with a particularly protruding mucro, a character exceptional in *Caecum auriculatum*. All other features fit well with the description of *C. auriculatum* and we believe this is a somehow anomalous specimen, certainly belonging to the present species, as currently known.

C. auriculatum differs from *C. armoricum*, lacking any microsculpture on the tube, having a less projecting septum, and a ringed aperture (the latter is a character valid only for the full grown adult stage).

C. subannulatum has a more slender profile, a normally smaller size and the septum always perfectly hemispheric, without any appendage, even in juveniles.

Nearly all modern authors agree considering *Brochina decurtata* Monterosato, 1884 as a synonym of *C. auriculatum*. We completely adhere to this interpretation, and present here further support to it. Based on Lower Pleistocene material from M. Serro (Trapani, Sicily, Italy), RUGGIERI (1994), excludes the possibility that injuries caused the 'shortening' of the shells, a position that we share; rather, he proposes to explain the existence of the 'monstrosity' *decurtatum* with events of autotomy by the very snails. According to our material, we consider very unlikely this explanation. Besides many 'short' shells (see Material examined: Fig. 13), we have found six adult shells of *C. auriculatum* with two rings (Fig. 12): the first varix at the middle of the shell length (corresponding to the

apertural varix of the 'short' shells; in one shell the first varix was more close to the septum), and the second at the aperture. This phenomenon can be explained if we consider that a varix is normally formed in gastropods when sexual maturity is reached or when gonads are mature (FRETTER & GRAHAM, 1962; see GOSTAN, 1958 for an example in risssoideans). Probably, some individuals (form '*decurtatum*') reach maturity earlier than others, and only after that some of them start newly to grow. This possibility is somehow also considered by PALAZZI (1979: 62). The tube formed after the first varix has often a subconical (not cylindrical) shape (Figs. 10-12). The septum of the form '*decurtatum*', supposed to be more protruding and rounded according to the original description, is not a diagnostic character as suggested (GAGLINI, 1991). According to our material (we select here the specimen figured by GAGLINI, 1991: 132 fig. 122 as lectotype of *B. decurtata*) and to RUGGIERI (1994), there is a wide variation well within the range of 'normal' *C. auriculatum*.

According to the original description and illustration (BELTRAN, 1965), *C. saavedrae* is a junior synonym of *Brochina decurtata* Monterosato, 1884 (and therefore of *C. auriculatum*). Several other taxa (e.g. *C. brevede Folin*, 1867 from the West Atlantic, and *C. abnormale* (Carpenter, 1857) from the Panamic Province), are very likely to be based on short forms of other known species (studies are in progress by the first author, M.P.), a possibility already suggested by CARPENTER (1957) himself, and LIGHTFOOT (1993).

The holotype of *C. syriacum* de Folin, 1869 (MNHN, Paris), has been already figured by PANETTA (1980). This specimen (Fig. 7) is a juvenile at the third stage. *C. syriacum* is a synonym of *C. auriculatum*, as already suggested by PANETTA (1980) and VAN AARTSEN (1977).

In his first works, Monterosato used the name *Odontidium laevissimum* Cantraine, 1842 as a senior synonym of *C. auriculatum*; subsequently, he started using the name *auriculatum*. VAN AARTSEN (1977) regards *O. laevissimum* as a nomen dubium, since the taxon is not recognizable and the whereabouts of the original material is unknown.

With the sole exception of SCHIRÒ *et al.* (1976: 17) who adopted a subgeneric classification for the Mediterranean species, all modern European authors use a simplified classification of Caecidae, with the sole genera *Caecum* and *Parastrophia*. On the other hand,

the American authors usually employ a more articulated (sub)generic subdivision. Lacking sufficient information on the anatomy and relationships within the family, we refrain from using an articulated (sub)generic system, and prefer a more conservative position. Anyway, it should be noted that *Caecum auriculatum* has been classified by some past authors in the supraspecific taxon *Brochina*, together with some extramediterranean species.

***Caecum* sp. A**

Figs. 18-21

Material examined:

Capo Palinuro (Salerno, Italy), sediment inside 'Occhi' cave, -6 m, 2 shells; Pantelleria Is. (Agrigento, Italy: URANIA'91 Expedition), -31 m, 1 shell; Sardinia (Italy), beached, 2 shells, G. Zanardi leg.; Agropoli (Salerno, Italy), beached, 1 shell, K. Nicolay leg.

Remarks

We have sorted out specimens of a *Caecum* similar to *C. auriculatum* in the septum, mucro, tube and apertural ring (Figs. 18-20). These specimens are characterised by a peculiar sculpture of longitudinal, parallel and equidistant series of pits (Fig. 21). We refrain from describing a new species based only on such a character, waiting for more material to define its value.

***Caecum* sp. B**

Material examined:

Salvore (Croazia), several specimens, beached material, D. Di Massa leg.

Remarks

This entity is nearly identical to *C. auriculatum* in all features, but the size. All examined specimens are ca one third to half the size of 'normal' *C. auriculatum*. The adult features of such specimens (e.g. cylindrical tube) would prevent us to consider them as juveniles. Their status is currently being investigated by the authors.

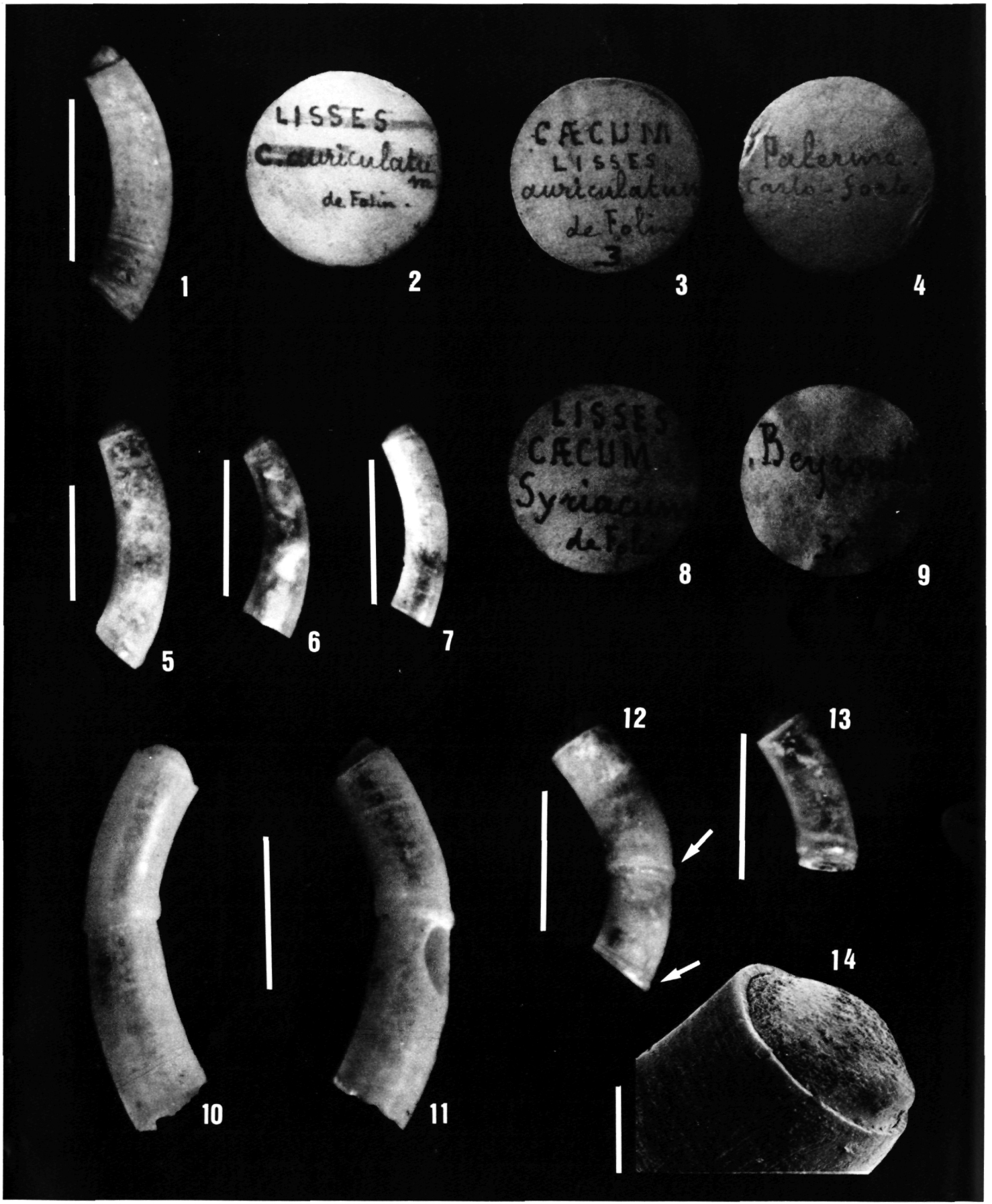
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Figs. 1-14. (opposite page)

1. Holotype of *C. auriculatum* (MNHN, Paris), Palermo, Italy.
- 2-4. Labels accompanying the specimen of figure 1.
5. Porto Palo di Siracusa (Sicily, Italy), beached, VIII.1978.
6. Juvenile at the III stage, Salto di Fondi (Latina, Italy), beached.
7. Holotype of *C. syriacum* (MNHN, Paris).
- 8, 9. Labels accompanying the specimen of figure 7.
- 10, 11. Single-ring form, Cala Calandra (Lampedusa Is., Italy), -30 m, 30.IV.1991.
12. Double-ring form, Civitavecchia (Rome, Italy), -3 m, sediment in a glass bottle.
13. Civitavecchia (Rome, Italy), -3 m, sediment in a glass bottle.
14. Septum of *C. auriculatum*, Pantelleria Is. (AG, Italy), -31 m.

Scale bars: 1 mm (1, 5-7, 10-13) and 200 μ m (14).



Figs. 15-21. (opposite page)

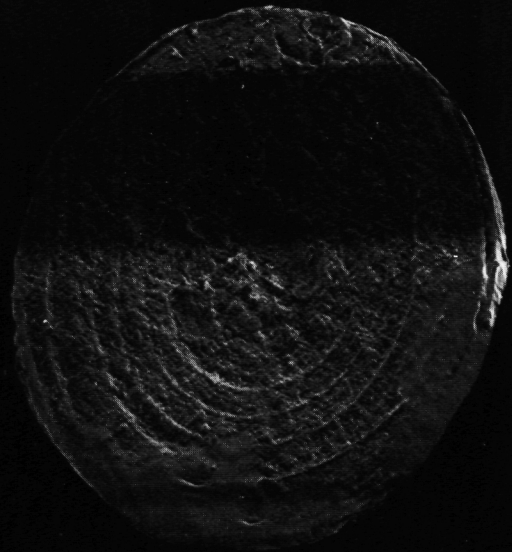
15-17. Operculum (15: inner side; 16: outer side; 17: lateral view) of *C. auriculatum*, Capo Palinuro (Italy).

18-21. *Caecum* sp. A (18: shell; 19: septum; 20: apertural ring; 21: particular of the pitted sculpture), Pantelleria Is. (AG, Italy), -31 m.

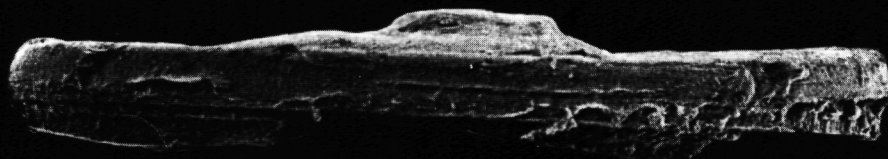
Scale bars: 200 μ m (15-17, 19, 20), 50 μ m (21), 1 mm (18).



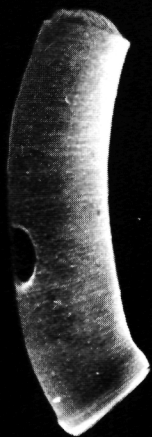
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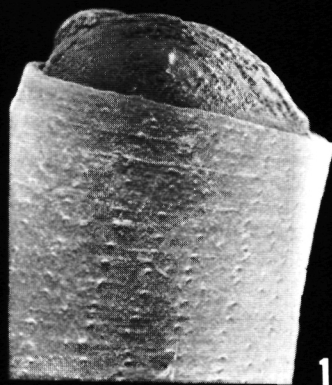
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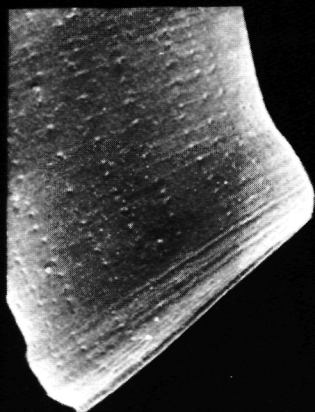
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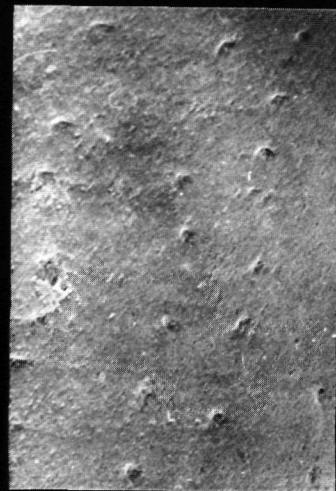
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