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GENUS *CHOFFATELLA* (SCHLUMBERGER), 1904 (FORAMINIFERA) IN THE LOWER APTIAN (BEDOULIAN) FROM SOUTHERN DOBROGEA AND SE PART OF THE ROMANIAN PLAIN

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Abstract. Using an exceptional well preserved and rich material fossil, the paper put in discussion the type-species of the genus *Choffatella*, in the light of the nomenclatural requirements of the ICZN and describe a new species *Ch. arcana*.

Keywords: Nomenclatural considerations regarding the type species of the genus *Choffatella*

INTRODUCTION

Some systematical and nomenclatural considerations.

Benefiting by a micropaleontological material acquired from the cores coming from the drillings carried out by ISPH: Bala 1 - Oltina, on the right bank of the Danube River and F.135, Fetesti, F.134, F.133 Balta and F.1 N. Borcea in which the genus *Choffatella* has a good frequency, the authors try to put in discussion some nomenclatural problems regarding the type species *Ch. decipiens*. The population of the genus *Choffatella* with very well preserved specimens and large frequency occurs together with *Palorbitolona lenticularis*. We were also provoked to do this study and by the A. Arnaud-Vanneau's thesis (1980) and A. Cherchi and R. Schroeder article (1981) regarding the taxonomical position of the species *Ch. cruciensis* (Pictet & Renevier) 1858, vis-à-vis with *Ch. decipiens* Schlumberger 1904. The Schlumberger's remarkable skill is the matter of fact that he made thin section through the test. He succeed in carried out the wall structure of the test of this genus. He wrote: "Le paroi convexe des loges est percée de nombreux canaux qui constituent les ouvertures. La surface exterieur est couverte d'un reseau tres serré de mailles circulaires. Le test est finement arenace ", followed by the description of the new species *Ch. decipens*."

In the remarks (p.704) of this description the author totally ignore the anterior references on the subject, leaving for, probably, the opinion that if the genus is new compulsatory and the type species is also new. On such way are possible to explain and the total absence of a minimum reference.

Later on, in 1927, and 1933, J. A. Cushman in his first modern attempt to realize a foraminiferal systematic " Foraminifera, their classification and economic use" took the new genus *Choffatella* Schlumberger as a monotype genus with type species *Ch. decipiens*. Latter, on the same opinion, was expressed and by Galloway in 1933. This opinion continued to be accepted even by Loeblich and Tappan (1988), in their monumental text-book "Foraminiferal genera and their classification".

For the first time A. Arnaud-Vanneau (1980, p.510) and A. Cherci and R. Scroeder (1981), apprehended the matter of fact that in 1858 Pictet & Renevier, described and figured "*Operculina cruciensis*" from the same stratigraphical level to which Schlumberger did not do any considerations. A. Cherchi & R. Schroeder finded out and refigured the Pictet & Renevier original's of "*Operculina" cruciensis*. The material without any discussions belongs to the genus *Choffatella.* The authors, from the motives that we are not able to understand, are not doing the correction imposed by the ICZN, considering *Ch. decipiens* as a junior synonymous of *Ch. cruciensis*. In this case, is very clear that is out of any doubt that the original specimen of "*Operculina" cruciensis* is not a *nomen oblitum*. The authors above mentioned made a clear demonstration regarding this problem. After description this species was recognized and used as a good taxa (fide A. Cherchi & R. Schroeder 1981) by: Landerer (1874), Mallada (1887), Almeras (1898) and the authors concluded "Dans la meme revue et seulement quelques année plu tard Schlumberger (1904) a decrit *Choffatella decipiens*, apparennt sans connaitre l'existence *d'Operculina cruciensis*" (!?)

The conclusion of these observations is an only one: "*Operculina*" (*Choffatella*) *cruciensis* is not a *nomen oblitum*. ICZN - (1961) art.23-b shows: "A name that has remained unused as a senior synonym in the primary zoological literature for more than fifty years is to be considered a forgotten name -*nomen oblitum*- ". It is not the situation of the species "*Operculina*" (*Choffatella*) *cruciensis* which the above-mentioned authors (1981), demonstrated very conclusive, was used till the Schlumberger's taxonomical mistake. In our opinion and we belive this one have a reliable support on the ICZN, "*Operculina*" *Choffatella cruciensis* (Pictet & Renevier) 1858, is the senior synonym of *Ch. decipiens* Schlumberger 1904, and by consequence the type species of the genus *Choffatella*.

A different situation is to mentions in the species

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"*Operculina "angularis* Cornuel 1848. In his valuable paper, Cornuel, p.256, pl.2, figs.20-22, described as belonging to the genus "*Operculina*" a new species: *O. angularis* also from the Lower Aptian deposits (the clayes with ostreids from Wassy). The figuration is almost identical to those gived by Pictet & Renevier 1858, for "*Operculina" cruciensis*. Surely is the same species but in this situation without any hesitation, Cornuel's species is a typical *nomen oblitum*.

The Lower Aptian foraminiferal assemblages from the washed cores of the mentioned drillings, all from the *Palorbitolona lenticularis* level, put in evidence and the presence of the genus *Choffatella* with a particularly high frequency.

Using the external morphology of the test was possible to separate two distinct populations.

The first one gather up the specimens characterized by a very close coiled test-typical involute, flattened, with a small till punctiform umbilicus; the size of the test changes from submilimetric till supramilimetric; to the specimens with a medium till large size, well flattened, apertural face has a narrow-acute to elongate aspect with an areal aperture represented by many pores.

The second group gathers specimens with an evolute-involute coiled test with a large umbilicus and an obvious tendency to uncoiled last whorl, which can become completely uncoiled and straight. As a rule and to the specimens of this group, the test is flattened but the last uncoiled part get an elliptical aspect of the apertural face, which carried out a cribrate aperture.

In both groups the section through the test put in evidence the valability of Sigal observation (1959) regarding the existence of a holotiomorphism reproductive structures.

The first group corresponds very well the characters of the *Choffattela cruciensis* (Pictet & Renevier). The second evolute-involute group with a tendency to an uncoiled last whorl represents a distinct species. The group is presents, after Hottinger 1967, in the upper Jurassic deposits (Kimmeridgian) by *Choffatella tingitana* Hottinger, 1967.

A. Arnaud Vanneau, 1980 from the Barremian deposits, described similar specimens and doubtful assigned to *Ch. tingitana*.

SYSTEMATIC PALEONTOLOGY.

Class FORAMINIFEREA d'Orbigny, 1826
Subclass TEXTULARIIA Mikhalevich, 1980
Ord. LOFTUSIINA Kaminski, 2002
Family CYCLAMMINIDAE Marie, 1941
Subfamily **Choffatellinae** Maync, 1958

Genus ***CHOFFATELLA*** Schlumberger, 1904

Original diagnosis: Schlumberger (1904): "Plasmostracum plus ou moins discoidal. Compose de loges enroulées en spirale plane come un *Peneroplis*. Le paroi covexe des loges est percée de nombreux canaux qui constituent les ouvertures. La surface exterieur est couverte d'un reseau tres serré de mailles circulaires. Le test est finement arenace".

Cushman, 1933 (p.103): "Test planispiral compressed, composed of numerous narrow, elongate chambers, nearly completely involute, coils increasing rapidly in height; wall arenaceous with much cement, becoming labyrintic, especially on the sides and periphery of the chambers; aperture, an elongated series of small pores on the narrow apertural face"

Loeblich, A. & Helen Tappan-Loeblich, 1988 (p.102): "Test planispiral enrolled, compressed. Partially involute, whorls enlarging rapidly, chambers numerous, chamber-lumen restricted to the peripheral area of the whorl so that in section it appears evolute, although the outer wall may somewhat overlap previous whorls later chambers with a tendency to uncoil; wall exoskeleton with well developed subepidermal network, endoskeleton consists of thick and massive septa pirced by the large apertures in the median plane of the test, no pillars presents; aperture a single areal row of large openings extending up to the apertural face in the plane of colling; those of successive chambers aligned in the radial series as seen axial sections with new series of apertures intercalated between these as the spire enlarges"

In fact, this is the most complete diagnosis of the genus *Choffatella*. Concerning this one is possible to do, using ours very well preserved specimens, some supplementary data as:

-Test planispiral enroled partial involute to evolute or uncoled in the last part, compressed, whorls enlarging rapidly, chambers numerous (17-21) on the last whorl….

Aperture areal on the apertura face of the last chamber is represented by large pores located in a median depressionary grove (not only a row).

Ordinary in a large population was possible to remark the presence of the holotriomorphism. Sigal, 1959 (p.663) is the first author who carried of the presence of the holotriomorphisme to this genus illustrating this on pl.29, fig.1-8. The diplod microsphaeric schizont is represented by the largest and flattened specimens. The megalosphareric schizont have an intermediar size and a moderate flattened test. The gamont haploid megalosphaeric specimens have a small to smallest size with a *Lenticulina* aspect in the lateral apertural view.

Choffatella cruciensis
(PICTET & RENEVIER), 1858
Plate I, fig. 1-20; pl.3, figs.1-8

Operculina cruciensis PICTET & RENEVIER, 1858, p.167, pl.23, fig.4-c; 1981 A. CHERCHI & R. SCROEDER, p.137, pl.1, fig.1-2

Choffatella decipiens SCHLUMBERGER, 1904, p.763, pl.18, fig.1-6; SIGAL J.,1959, p.662, pl.29, fig.1-8, A. ARNAUD-VANNEAU, 1980, p.501, pl.12, fig.6-7, pl.49, fig.5

Operculina angularis CORNUEL, 1848, p.256, pl.2, fig.20-22 (*nomen oblitum*)

Dimensions: (figured specimens) small diameter 0,60mm, larger diameter 0,72mm (megasphaeric specimen); small diameter 1,70mm; larger diameter 2,13mm (microsphaeric specimen- microsphaeric schyzont)

Remarks: As it was presented above, the large majority of the studied specimens corresponds without any hesitation to the Pictet & Renevier 's description for *O. cruciensis* (*Coquille discoide tres aplatie, du diametre de 5 mimimetres, a tours de spire serré et ne laissant qu'un petit ombilic,celui-ci est entouré d'un bourelet assez marqué. Loges etroites, separée par des cloisons fortement arquées en avant. Sutures assez apparentes. Nous n'avons pa pu voir distinctement l'ouverture" Raports et differences: Cette espece est voisine de la O. angularis Cornuel (Mem.Soc.Geol.France 2-e serie III p.256, pl.4, fig20-22) de l'argile ostreene de Wassy, mais elle ne differe par le bourelet qui entoure l'ombilic, et surtout par sa regularité car M. Cornuel dectit a son O. angularis comme ayant ses deux faces inegales ce qui n'a pas lieu dans la notre."*

Original of the Pictet & Renevier species photographed by Cherchi & Schroeder, (1981) corresponds to the schyzontic microsphaeric generation and is identical with those presented by Schlumberger (1904) pl.18, fig.1, 3.

The distinctive character of this species is represented by the typical involute coiling with a punctiform umbilicus (especially to the schizontic specimens). From the analyses of the studied populations the presence of the three distinct reproductive generations after the size and the proloculum is a true reality.

Occurrence: ISPH drilling Bala I –Oltina –36m, 48-49m, -53m, Fl.N.Borcea fetesti –51-51,80m.

Stratigraphical distribution: Bedoulian (*Palorbitolina lenticularis* level)

Choffatella arcana n.sp.
Plate 2, fig. 1-19; pl.3, figs.9-16

Derivation of name: latin *arcanus-a-um* = mysterios, hidden, enigmatical.

Type level: Lower Aptian - Bedoulian.

Type locality: ISPH drilling Bala 1-Oltina (right bank of the Danube River)

Type specimens: holotype L.P.B.IV.11567 (pl.2, fig.13); paratypes L.P.B.IV 11568,11569 (pl.2, fig.1-12, 14-19).

Free discoidal till flattened test prevailing involut-evolut coiled but frequently the last part of the test become uncoiled, straight; arcuated and feeble depressionary sutures; wall of the test thick with the typical structure of the genus; aperture areal represented by numerous pores on the middle part of the apertural face, or on the surface of the last uncoiled chamber.

Dimensions: holotype: length 1,53mm; breadth 0,74mm; thickness 0,24mm

Paratypes: (figured specimens) length 1,29mm- 2,04mm; breadth 0,43mm- 1,20mm; thickness 0,24mm- 0,36mm.

Remarks: This species differs from *Ch. cruciensis* by the coiling aspect of the test. A. Arnaud-Vanneau, (1980) realized that in the Lower Aptian population of *Choffatella* exist more than one species (classical *Ch. decipiens*). So, the author carried out three distinct species: *Ch. decipens*, *Ch. cf. tingitana* and *Choffatela sp.*, and stand up the valability of the "*Opereculina" cruciensis*. From those *Ch. cf tingitana* Hottinger represents the uncoiled group of the *Choffatella arcana* n.sp. (in our opinion). *Choffatella arcana* represents the terminal branch of evolution started in the Upper Jurassic with Ch, tingitana. Probably *Ch. cruciensis* from the Bedoulian is the terminal branch of the second lineage of evolution represented by *Ch. pyrenaica* Peybernes & Rey from the Lowermost Cretaceous (Berriasian-Valanginian).

Stratigraphic distribution: Lower Aptian (*Palorbitolina lenticularis* level)

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PLATES

PLATE I

Figs.1-20 - *Choffatella cruciensis* (PICTET & RENEVIER), 1858 - Bedoulian ISPH drilling, Bala 1-Oltina – 48m- -49m, L.P.B.IV 11565 (1-8 macrosphaeric specimens-gamont), 9-20 microsphaeric (Al, A2) specimens.

* All figures are camera lucida drawings by Theodor NEAGU.

PLATE II

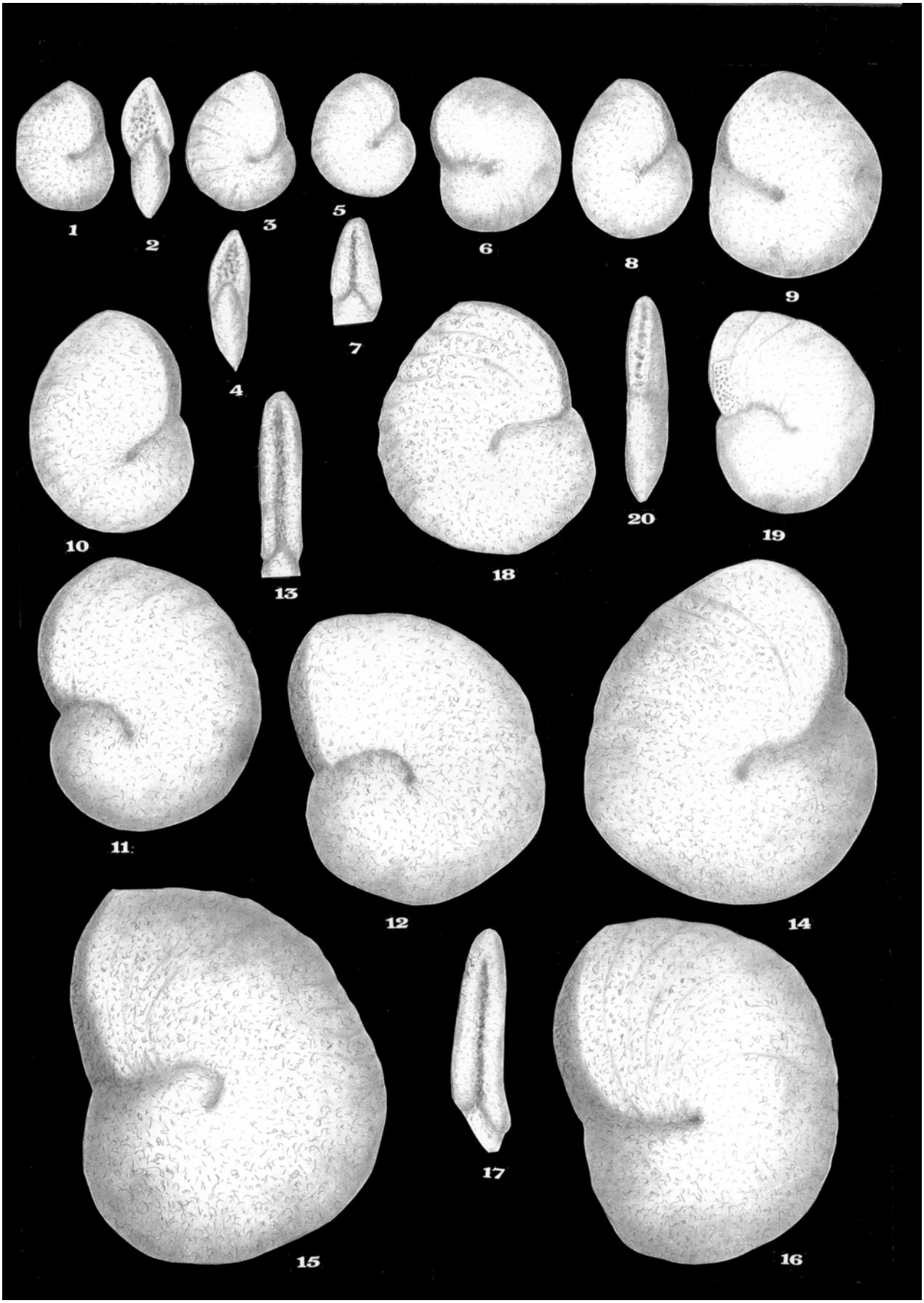
Figs. 1-19 - *Choffatella arcana* n.sp. Bedoulian ISPH drilling Bala 1- Oltina -48m—49m; holotype, fig.13, L.P.B.IV 11567, paratypes figs.1-12, 14-19, L.P.B.IV 11569.

* All figures are camera lucida drawings by Theodor NEAGU.

PLATE III

Figs.1-8 - *Choffatella cruciensis* (PICTET & RENEVIER), 1858 - Bedoulian ISPH drilling, Bala 1-Oltina – 48m- -49m, L.P.B.IV 11565

Figs.9-16 - *Choffatella arcana* n.sp. Bedoulian ISPH drilling Bala 1- Oltina -48m—49m, L.P.B. IV, 11569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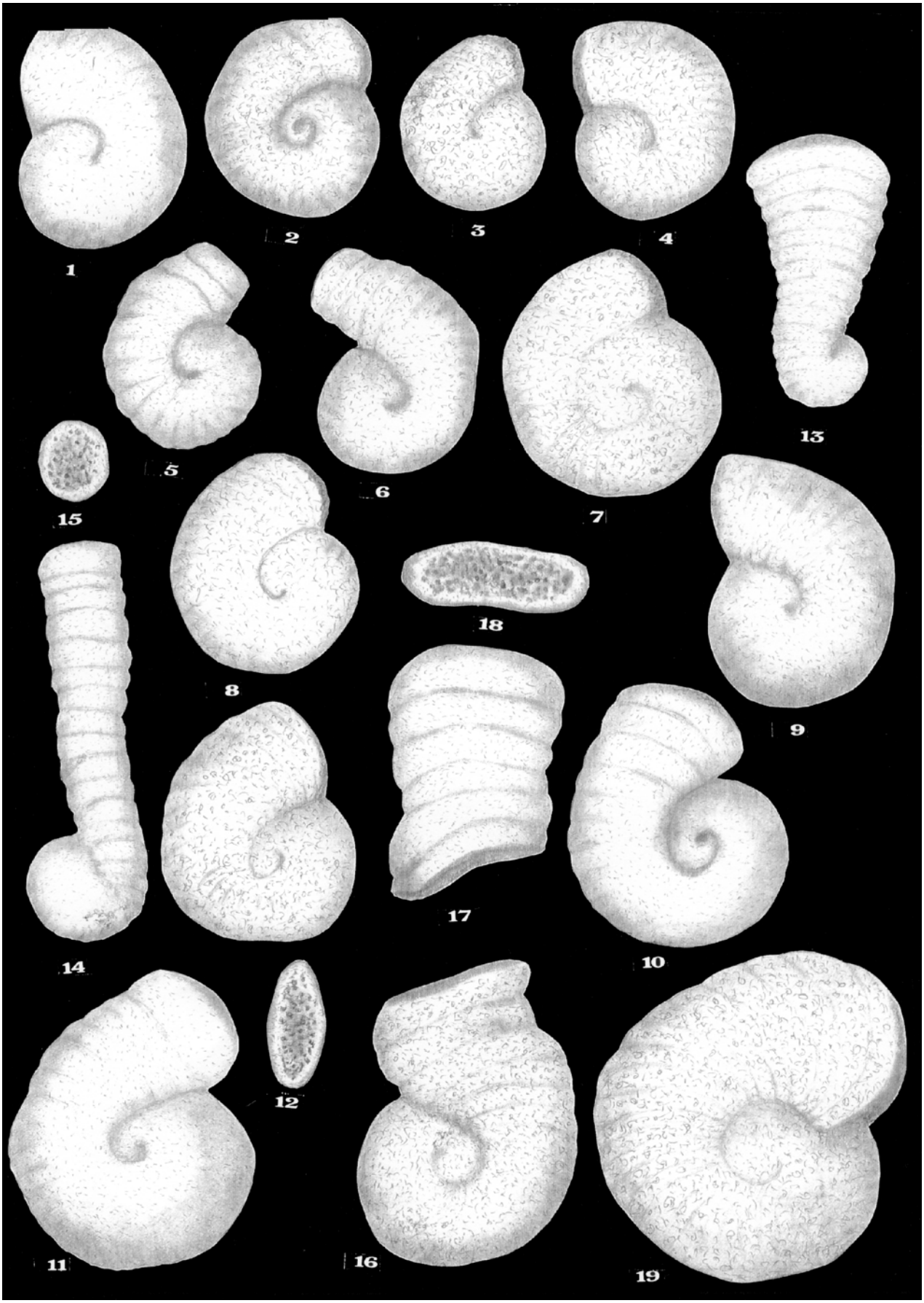
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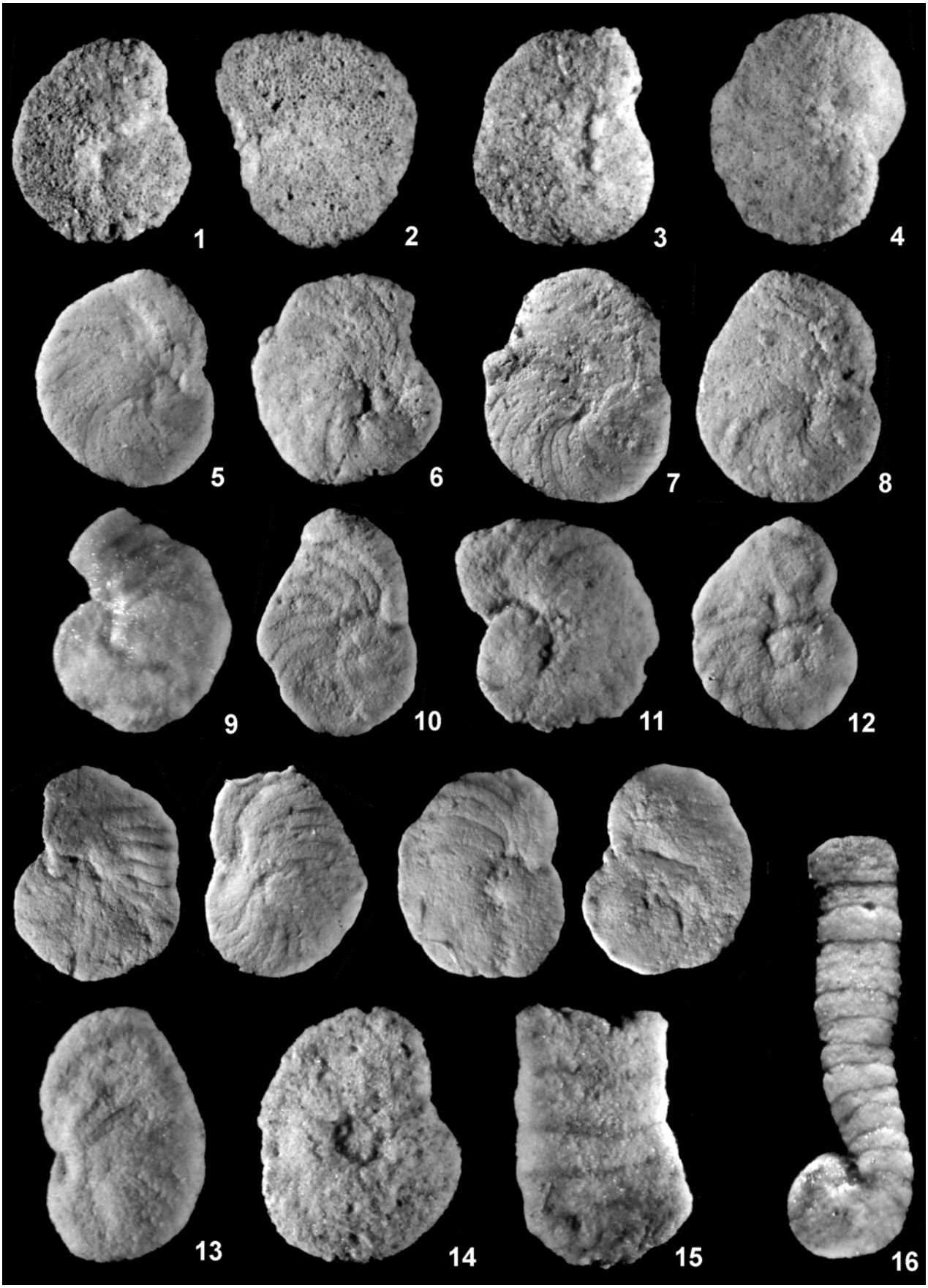
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