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LOWER WENLOCK CHITINOZOA FROM THE BYKOŠ LOCALITY (SILURIAN, PRAGUE BASIN, BARRANDIAN AREA, CZECH REPUBLIC)

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Abstract. A section in the vicinity of Bykoš (Silurian, Prague Basin, Barrandian area, Czech Republic) was sampled. Twenty chitinozoans taxa were determined. Eleven species of five genera were recorded, and eight species were left in open nomenclature. Following taxa were recorded: *Ancyrochitina* sp. A, *Ancyrochitina* sp. B, *Ancyrochitina* sp. C, *Ancyrochitina* cf. pedavis, *Angochitina* sp. A, ? *Angochitina* sp., *Cingulochitina angusta*, *Cingulochitina bouniensis*, *Cingulochitina dreyenensis*, *Cingulochitina pitetensis*, *Conochitina* cf. *emmastensis*, *Conochitina proboscifera*, *Conochitina proboscifera* f. *truncata*, *Conochitina proboscifera* f. *gracilis*, *Conochitina tuba*, *Conochitina* sp. A, *Conochitina* sp. B, *Conochitina* sp. C, *Conochitina* sp. D, *Linochitina odiosa.* On the basis of correlation with coeval sections, the age of the profile is estimated to be Lower Wenlockian.

■ Silurian, Wenlockian, Chitinozoa, Barrandian area, Prague Basin, Czech Republic.

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Introduction

Wenlockian Chitinozoans from the Prague Basin (Barrandian area, Czech Republic) were first described by Eisenack (1934). However, the stratigraphic range of studied samples is not possible to determine (for details see Morávek, 2004). Dufka (1990) established 11 chitinozoan assemblages in the Lower Silurian. Several other publications dealt with Wenlock Chitinozoans: Dufka (1992, 1995) and Dufka et al. (1995).

Lower Wenlock Chitinozoan from the Hughley Brook section, Shropshire (GSSP for the base of the Wenlock Series) were described by Mullins and Aldridge (2004). Data on Wenlock Chitinozoans from other localities were published by Verniers (1981, 1982, 1999): Mehaigne area, Brabant massif, Belgium and Ithon East, Builth Wells district, Wales, UK (Verniers, 1999); Laufeld (1974): Gotland; Mullins et Aldridge (2004): Aizpute – 41 core, Latvia; Nestor (1982, 1993, 1994, 2005): Estonia and Latvia; Nestor et Nestor (2002): Estonia and Latvia; Grahn (1995): Gotland, Southern Ohio (Grahn 1985).

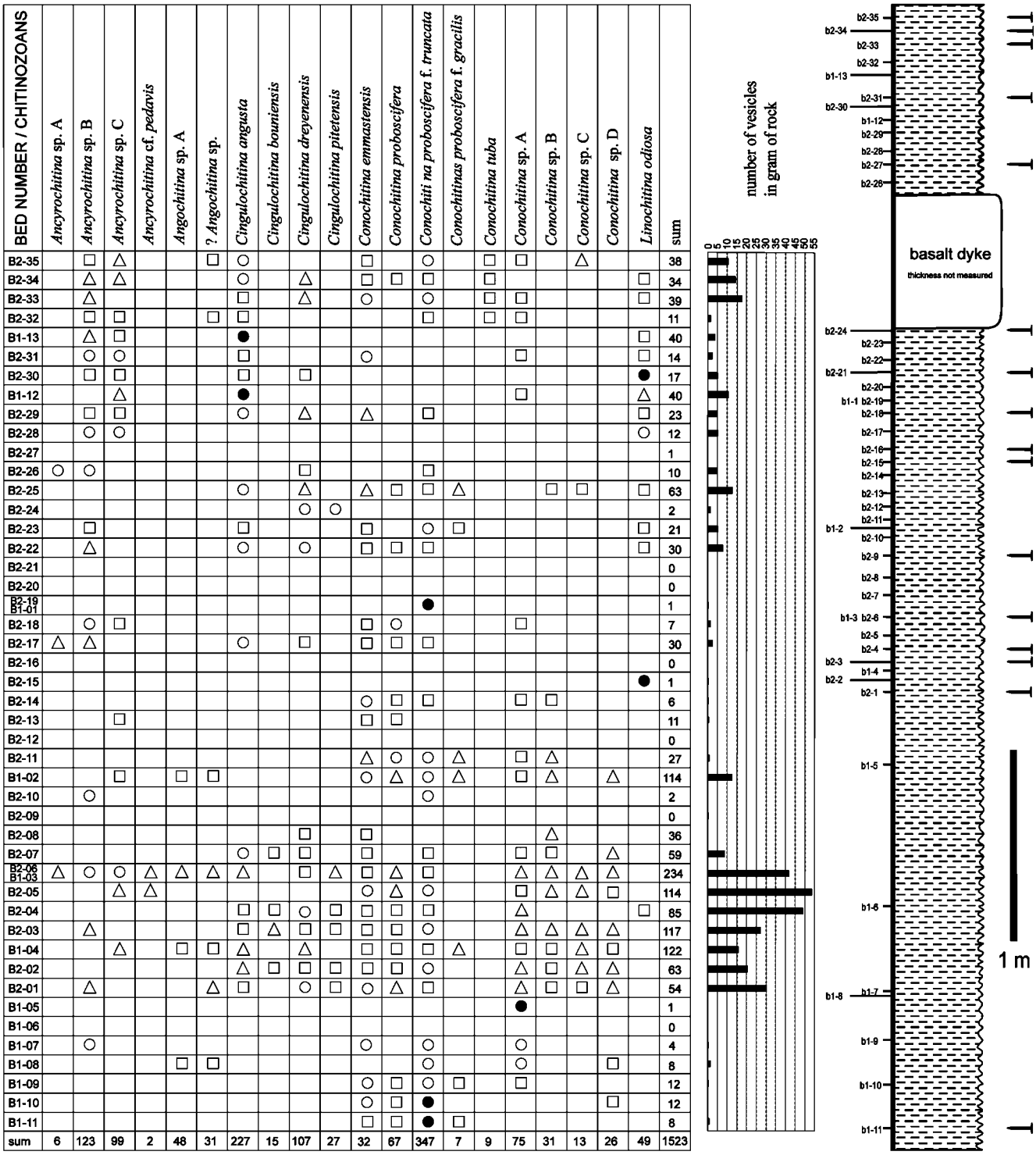
Position and geological setting

Studied section is situated WSW from the village of Bykoš (S from Beroun) on an elevation between fields (Text-fig. 1). This temporary outcrop was available for sampling twice - firstly in the year 2003 (samples designated as B1-1 to B1-13) and secondly in the year 2004 (samples designated as B2-1 to B2-35). The outcrop began 247 cm under a basalt dyke and finished 121 cm above the dyke. For a cross section see fig. 2. The GPS coordinates of the ends of the excavation under the dyke are: N 49°° 52,901 EO 14°° 4,8255 and N 49°° 52,9025 EO 14°° 4,833. The GPS coordinates of the ends of excavation above the dyke are: N 49°° 52,892 EO 14°° 4,8445 and N 49°° 52,8915 EO 14°° 4,8465. The GPS coordinates of the pear tree near the outcrop are: N 49°° 52,906 EO 14°° 4,8405. The ends of the cuts are marked with posts, and at the bottom of the cuts there is a plastic tape. Some beds of outcrop are signed by spikes (see fig. 2).

Treated samples originated from the Liteň Formation. Calcareous shales with tufitic admixture are interrupted by an altered basalt dyke. Contact metamorphose of the underlying and overlying beds extends only tens of cm from the basalt dyke. In the landscape, the basalt dyke appears as an elevation.

Text-fig. 1. Position of the Bykoš locality.

The Bykoš section



Text-fig. 2. Chitinozoan distribution in the Bykoš section, Wenlock (Silurian), Prague Basin, Czech Republic.

Several boreholes were drilled in the vicinity of Bykoš (Dufka et al., 1995), but the unprecise localization given in this paper exclude precise a correlation with the recent data.

Treatment of samples

Samples were treated using the standard palynological technique in the Palynological laboratory of the Czech Geological Survey Prague – Barrandov and at Charles University, Faculty of Science, Institute of Geology and Palaeontology.

Palynological slides were observed under Olympus BX 51 microscope (Charles University, Faculty of Science, Institute of Geology and Palaeontology) usually at magnification 400x and 1000x with Olympus immersion oil, n = 1,516. Photos were also taken using microscope too. Biometric data were measured using a special ocular.

Chitinozoans were observed by SEM in these laboratories:

- Charles University, Prague, Faculty of Science, Institute of Geology and Palaeontology, JEOL.
- Ghent University, Faculty of Sciences, Department of Geology and soil science, Research Unit Paleontology, JEOL 6400.
- Czech Geological Survey, Laboratories of Organic Geochemistry, Prague, CamScan CS 3200.

Studied palynological slides are stored at the Institute of Geology and Palaeontology, Faculty of Science, Charles University, Prague.

All recovered specimen were compressed; a correction factor of 0.8 (Paris, 1981) was used to calculate the uncompressed dimensions of the specimens.

The following abbreviations are used in the taxonomic section:

n	number of measured vesicles
L	total length of the vesicle
D_a	diameter of the aperture
D_m	maximal diameter of the vesicle
L_{ch}	length of the chamber
D_{bn}	diameter of the base of neck
L_{prcn}	length of the processes on the neck
L_{prcb}	length of the processes on the base

Abundance of chitinozoa

Each sample was weighted. All vesicles of Chitinozoa were selected from the sample. If the case of rich samples, only one fifth to half were selected. The number of vesicles in a gram of rock was calculated (Text-fig. 2). The average number of vesicles in a gram of rock is 8.

Systematic part

Incertae sedis group **Chitinozoa Eisenack, 1931**

Order **Operculatifera Eisenack, 1972**

Family **Desmochitinidae Eisenack, 1931 emend. Paris, 1981**

Subfamily **Margachitininae Paris, 1981**

Genus ***Linochitina* Eisenack, 1968 restrict. Paris, 1981**

Type species: *Desmochitina erratica* Eisenack, 1931

***Linochitina odiosa* Laufeld, 1974**

Pl. 3, figs. 1-6; pl. 7, figs. 14-17.

1974 *Linochitina odiosa* Laufeld, p. 100-102, figs. 61A-C.
1990 *Linochitina* cf. *odiosa* Laufeld, Dufka, p. 58-59, pl. 41, figs. 1-5.
2004 *Linochitina odiosa* Laufeld, Mullins et Aldridge, pl. 5, figs. 15-17.

D e s c r i p t i o n : Vesicles are tubular to conical. The basal edge is rounded and the base is extremely convex. Flanks are straight to convex. Shoulders and flexure were not developed. Twins are very common. A cingulum is not visible.

D i s c u s s i o n : *Linochitina odiosa* is very similar to the *Cingulochitina angusta*. It differs by not having a well-developed cingulum. The absence of cingulum is verified by SEM observation. In comparision with data obtained by Dufka (1990), *L. odiosa* from the Bykoš locality are narrower. The length is the same. Vesicles are longer than those of specimens originating from Gotland (cf. Laufeld, 1974). In comparision with the *L. odiosa* from Gotland (Laufeld, 1974) the neck flares less.

O c c u r r e n c e : Lower Silurian of the Prague Basin (Dufka, 1990): Homerian (zone: *C. lundgreni*). Hughley Brook section, Hughley, Shropshire (GSSP for base of the Wenlock; Mullins et Aldridge, 2004), UK: samples 25/44 and 25/45 from this section.

Gotland (Laufeld, 1974): From the *Conchidium tenuistriatum* Beds through Slite Beds to the Mulde Beds (Midlle Sheinwoodian to the upper Homerian).

Table 1. Dimensions of *Linochitina odiosa* Laufeld, 1974

µm	L	D_a	D_m	D_m/L
minimum	120	18	31	0,18
maximum	215	40	56	0,45
average	159	28	46	0,29
median	159	29	45	0,29
n	49	49	49	49

Subfamily **Pterochitininae Paris, 1981**

Genus ***Cingulochitina* Paris, 1981**

Type species: *Desmochitina cingulata* Eisenack, 1937

R e m a r k s : The membranous carina is often eroded in the *Cingulochitina* species. The carina often appears as a folding or thickening.

***Cingulochitina angusta* Verniers, 1999**

Pl. 1, figs. 1-7; pl. 7, figs. 1-4.

1981 *Linochitina* sp. A; Verniers, pl. 2, fig. 30.
1982 *Cingulochitina* sp. A; Verniers, p. 23, pl. 7, figs. 138-142.
cf. 1995 *Cingulochitina* sp. A; Dufka, p. 139-141, pl. 1, fig. 10, 11.
1999 *Cingulochitina angusta* Verniers, p. 370-371.

D e s c r i p t i o n : Shape of the vesicle is claviform. Maximal width of the vesicle is above the cingulum. The shoulders and flanks are indistinct. The collarette is flared. The basal edge is rounded and the base is extremely convex. A short cingulum appears on the basal edge. The cingulum is developed as a ridge or as a folding or thickening of the chamber wall. A copula is present. Some of described vesicles are translucent or semitransparent. In this situation a connection between the copula and operculum is then visible. The surface is smooth. Specimens are often found as chains of two, three or more vesicles.

D i s c u s s i o n : Measurements made on *Cingulochitina angusta* are very similar to the data presented by Verniers (1999) from the Mehaigne area.

In comparision with *Cingulochitina* sp. A described by Dufka (1995), *C. angusta* is shorter and narrower but the overall vesicle shape is very similar.

O c c u r r e n c e : Mehaigne area, Brabant massif, Belgium (Verniers; 1981, 1982, 1999): late Llandovery to early Wenlock, members MB3D to basal MB4A

Ithon East, Builth Wells district, Wales, UK (Verniers, 1999): late lower Wenlock (graptolite biozone *M. riccartonensis*).

Table 2. Dimensions of *Cingulochitina angusta* VERNIERS, 1999

µm	L	D_a	D_m	D_m/L
minimum	118	19	37	0,22
maximum	192	52	62	0,43
average	153	32	47	0,31
median	153	32	48	0,32
n	186	186	186	186

Cingulochitina bouniensis VERNIERS, 1999

Pl. 1, fig. 9, 9a; pl. 7, fig. 5.

1979 *Linochitina* sp. B; Verniers et Rickards, p. 157, pl. 1, figs. 9-10.
1981 *Linochitina* sp. B; Verniers, p. 171, pl. 2, fig. 24.
1982 *Cingulochitina* sp. B, Verniers, p. 23-24, pl. 7, figs. 143-147, 150-156.
1999 *Cingulochitina bouniensis* VERNIERS, p. 370-371.
2004 *Cingulochitina bouniensis* VERNIERS, Mullins et Aldridge, pl. 5, figs. 4-6, 8-12.

D e s c r i p t i o n : Cono-ovoid *Cingulochitina* with a very short tapering neck. The shoulders are indistinct, the flanks are straight or convex. A ridge-like carina or folding occurs beneath the maximal width of the vesicle. The carina is visible within the chain of the vesicles. The surface is smooth. No ornamentation was observed. All specimens found were in a chain.

Cingulochitina bouniensis is shorter and wider than *C. angusta*. The ratio of the D_m/L is distinctly different than by the in *C. angusta*.

D i s c u s s i o n : Specimens described here differ from those decribed by Verniers (1981, 1982 and 1999) in the absence of the longitudinal foldings. Some foldings occur but are randomly distributed and not parallel to the longitudal axis.

O c c u r r e n c e : Mehaigne area, Brabant massif, Belgium (Verniers; 1981, 1982, 1999): late Llandovery to early Wenlock, Member MB3 to MB4.

Ithon East and Trecoed, Builth Wells district, Wales, UK: late lower Wenlock (graptolite biozone *C. murchisoni* and *M. riccartonensis* VERNIERS, 1999).

Hughley Brook section, Hughley, Shropshire (GSSP for base of the Wenlock; Mullins et Aldridge, 2004), UK: *C. murchisoni* graptolite biozone.

Aizpute-41 core, Latvia (Mullins et Aldridge, 2004): upper part of the *C. murchisoni* graptolite biozone.

Table 3. Dimensions of *Cingulochitina bouniensis* VERNIERS, 1999

µm	L	D_a	D_m	D_m/L
minimum	88	29	49	0,42
maximum	126	45	62	0,7
average	102	37	54	0,51
median	106	37	54	0,52
n	14	14	14	14

Cingulochitina dreyenensis VERNIERS, 1999

Pl. 2, figs. 2-4, 7; pl. 7, figs. 6-9.

1979 *Linochitina* sp. C; Verniers et Rickards, p. 157, pl. 1, figs. 11-12.
1979 *Linochitina* sp. D; Verniers et Rickards, p. 157, pl. 1, figs. 13-14.
1981 *Linochitina* sp. C; Verniers, p. 171, pl. 2, fig. 20.
1981 *Linochitina* sp. D; Verniers, p. 171, pl. 2, fig. 25.
1982 *Linochitina* sp. C; Verniers, p. 24-25, pl. 6, fig. 125; pl. 7, figs. 170-182.
1982 *Linochitina* sp. D; Verniers, p. 25-26, pl. 6, fig. 123; pl. 7, figs. 183-190.
1992 *Belonechitina*? sp.; Dufka, p. 119, pl. 3, fig. 4.
1995 *Cingulochitina* sp. C; Grahn, fig. 6K.
cf. 1995 *Cingulochitina* sp. B; Dufka, p. 142, pl. 1, fig. 6.
1999 *Cingulochitina dreyenensis* VERNIERS, p. 372, pl. 1, fig. 7.

D e s c r i p t i o n : *Cingulochitina* with trapezoid or ovoid shaped chamber. The neck is short and tapering. The flanks are straight to convex, rarely concave. The shoulders are indistinct. The maximal diameter of the vesicle is on or in vicinity of the basal edge. The basal edge is sharp to round. The base is flat to convex. A short mucron is present. The cingulum does not change the curvature of the basal edge, it is developed as a ridge, folding or thickening of the wall. The surface is smooth. Vesicles twins are often observed.

D i s c u s s i o n : *Cingulochitina dreyenensis* is very closely related to *C. pitetensis*. It is not possible to distinguish these two species by biometry. *C. pitetensis* posseses a flared neck, more pronounced shoulders and flexure. The

maximal width of vesicle is greater than in *C. dreyenensis*.

Cingulochitina sp. B described by Dufka (1995) is longer and wider than *C. dreyenensis*. But the shape of vesicle is similar.

O c c u r r e n c e : Mehaigne area, Brabant massif, Belgium (Verniers; 1981, 1982, 1999): late Llandovery to early Wenlock, Member MB3C to MB4.

Ithon East, Ithon West and Trecoed, Builth Wells district, Wales, UK (Verniers, 1999): lower Wenlock to middle Wenlock (graptolite biozone *C. centrifugus* and *M. dubius*).

Table 4. Dimensions of *Cingulochitina dreyenensis* Verniers, 1999

µm	L	D_a	D_m	D_m/L
minimum	105	17	35	0,23
maximum	196	58	61	0,52
average	138	32	50	0,37
median	136	32	50	0,37
n	107	107	107	107

Cingulochitina pitetensis Verniers, 1999

Pl. 2, figs. 1, 5, 5a, 6, 8; pl. 7, figs. 10-13.

1979 *Linochitina* aff. *cingulata* Martin et Rickards, p. 194, pl. 1, fig. 7.
1981 *Linochitina* sp. E; Verniers, p. 171, pl. 2, fig. 28.
1982 *Cingulochitina* sp. E; Verniers, p. 26-27, pl. 6, figs. 133-137.
1999 *Cingulochitina pitetensis* Verniers, p. 374.

D e s c r i p t i o n : *Cingulochitina* with ovoid to conical chamber. The tubular neck is often flared. The maximal width of the vesicle is at one third of the length of the chamber. Shoulders and flexure are well developed. A ridge-like cingulum does not change the curvature of the bluntly rounded basal edge. A short narrow mucron is observed if the vesicles are not connected. Vesicle twins are common.

D i s c u s s i o n : For discussion see *Cingulochitina dreyenensis*.

O c c u r r e n c e : Mehaigne area, Brabant massif, Belgium (Verniers; 1981, 1982, 1999): late Llandovery to early Wenlock, Member MB3C to base of MB4.

Table 5. Dimensions of *Cingulochitina pitetensis* Verniers, 1999

µm	L	D_a	D_m	D_m/L
minimum	105	28	44	0,29
maximum	169	48	59	0,46
average	137	35	51	0,37
median	139	35	51	0,37
n	26	26	26	26

Ithon East and Trecoed, Builth Wells district, Wales, UK (Verniers, 1999): late lower Wenlock (middle part of the graptolite biozone *riccartonensis*).

Order **Prosomatifera Eisenack, 1972**
Family **Conochitinidae Eisenack, 1931 emend. Paris, 1981**
Subfamily **Conochitininae Paris, 1981**

Genus ***Conochitina* Eisenack, 1931 emend. Paris, Grahn, Nestor et Lakova, 1999**

Type species: *Conochitina claviformis* Eisenack, 1931

***Conochitina* cf. *emmastensis* Nestor, 1982**

Pl. 4, figs. 1-5; pl. 9, figs. 11-14.

cf. 1982 *Conochitina emmastensis* Nestor, p. 108, pl. 1, figs. 1-3, text-fig. 1.
cf. 1990 *Conochitina emmastensis* Nestor, Dufka, p. 65, pl. 36, figs. 1-5.
cf. 1993 *Conochitina emmastensis* Nestor, Nestor, pl. 2, figs. 3-4.
cf. 1994 *Conochitina emmastensis* Nestor, Nestor p. 28-29, pl. 13, figs. 1-4.
cf. 1995 *Conochitina emmastensis* Nestor, Grahn, fig. 7A.
cf. 2005 *Conochitina emmastensis* Nestor, Nestor, pl. 2, fig. 2.

D e s c r i p t i o n : The chamber constitutes two thirds of the total length of the vesicle, it is conical, with straight or convex flanks. The maximal diameter of the vesicle is above the basal edge. The neck is tubular with a short colarette. A wide mucron occurs on the flate base. The basal edge is rounded.

D i s c u s s i o n : *C. emmastensis* is longer, with a narrower neck, which can hardly be distinguished from the chamber.

O c c u r r e n c e : Lower Silurian of the Prague Basin (Dufka, 1990): upper Aeronian to the lower Sheinwoodian (zones: *M. sedgwickii*, ? *M. riccartonensis*).

Estonia (Nestor, 1982): Adavere Formation to the Jaani Formation (*M. sedgwickii* to *C. murchisoni*), Aeronian to Sheinwoodian.

Jaagarahu Core, Estonia (Nestor, 1993): Velisa Formation of the Adavere Stage (Llandovery) to the lower part of Mustjala Member of the Jaani Stage (Wenlock).

Estonia and North Latvia (Nestor, 1994): Raikküla Stage to the Jaani Stage, chitinozoan biozones 7-10 (middle Aeronian to middle Telychian) and 12 (lower Sheinwoodian).

Subsurface of Gotland (Grahn, 1995): from the Aeronian (zone *M. sedgwickii*) to the lower Sheinwoodian (zone *C. centrifugus*).

Southwestern Estonia and northernmost Latvia (Nestor et Nestor, 2002): Staicele drill core (Latvia): upper part of the Rumba Formation (Adavere stage), chitinozoan biozone number 2; Ikla (Estonia) drill core: from Rumba Formation to the Tõlla Member, chitinozoan biozones number 1-4.

West Estonian drill cores – *Margachitina margaritana* Biozone (Nestor, 2005): In Viki core and Kaugatuma core

C. emmastensis appears in the Velise Formation (Llandovery), in Ohesaare core and Ruhnu core *C. emmastensis* was found in the Velise and Riga Formation close to the Llandovery – Wenlock boundary (the precise boundary is not known).

Table 6. Dimensions of *Conochitina* cf. *emmastensis* Nestor, 1982

µm	L	D_a	D_m	D_m/L
minimum	111	25	41	1,83
maximum	370	78	107	4,31
average	213	48	71	3,07
median	215	49	72	3
n	214	214	214	214

Conochitina proboscifera Eisenack, 1937

Pl. 5, figs. 8-11; pl. 9, figs. 5-7, 15.

1937 *Conochitina proboscifera* Eisenack, p. 225, pl. 15, figs. 4-5.
1974 *Conochitina proboscifera* Eisenack, Laufeld, p. 70-72, fig. 32 A-D.
1982 *Conochitina proboscifera* Eisenack, Verniers, p. 35-36, pl. 1, figs. 1-17.
1985 *Conochitina proboscifera* Eisenack Grahn, p. 160, pl. 1, figs. 12-13.
1990 *Conochitina proboscifera* Eisenack, Dufka, p. 68, pl. 39, figs. 8-16.
1993 *Conochitina proboscifera* Eisenack, Nestor, pl. 2, fig. 13-14.
1994 *Conochitina proboscifera* Eisenack, Nestor, p. 36, pl. 18, figs. 1-3.
1995 *Conochitina proboscifera* Eisenack, Grahn, figs. 7 C-D.
2002 *Conochitina proboscifera* Eisenack, Nestor et Nestor, pl. 1, fig. 12
2004 *Conochitina proboscifera* Eisenack, Mullins et Aldridge, p. 758-762, pl. 3, fig. 13, pl. 6, figs. 3-14, pl. 7, figs. 10-12, pl. 8, figs. 1-2, 5, 7, 12.
2005 *Conochitina proboscifera* Eisenack, Nestor, pl. 1, figs. 8-9.

D e s c r i p t i o n : Tubular vesicle with a hardly distinguishable neck. The neck is tubular or flared at the apertural pole. The chamber may be conical. The flanks are straight or slightly convex. The basal edge is rounded and the base is flat to convex with a tiny mucron. The mucron can be sunken and is then invisible. Ratio of maximal diamater to the length of vesicle is greater than 1:5 but less than 1:9.

D i s c u s s i o n : The shape of *Conochitina proboscifera* sometimes resembles *C. proboscifera* f. *truncata*. The differentiation is made on the basis of the ratio of diameter and length of the vesicle.

O c c u r r e n c e : Lower Silurian of the Prague Basin (Dufka, 1990): Sheinwoodian (zones: *C. murchisoni*, *M. riccartonensis* and *C. rigidus*).

Hughley Brook section, Hughley, Shropshire (GSSP for the base of the Wenlock; Mullins et Aldridge, 2004), UK: *C. proboscifera* is distributed throughout unit G of the Buildways Formation.

Gotland (Laufeld, 1974): From the lower Visby Beds to the top of the Högklint Beds (upper Telychian to the middle Sheinwoodian).

Mehaigne area (Brabant Massif, Belgium; Verniers, 1981, 1982): From the Formation MB2A to the Formation MB5, Llandovery to early Wenlock.

Southern Ohio (Grahn, 1985): Estill Shale (zones: *M. crenulata* to *C. centrifugus*).

Jaagarahu Core, Estonia (Nestor, 1993): Velisa Formation of the Adavere Stage (Llandovery) to the Mustjala Member of the Jaani Stage (Wenlock).

Estonia and North Latvia (Nestor, 1994): Adavere Stage to the Jaani stage, chitinozoan biozone 10 (middle Telychian), 12 and 13 (lower Sheinwoodian).

Subsurface of Gotland (Grahn, 1995): from the Aeronian (zone *M. sedgwickii*) to the lower Sheinwoodian (zone *C. murchisoni*).

Southwestern Estonia (Nestor et Nestor, 2002): Staicele (Estonia) drill core: middle part of Tõlla Member, chitinozoan biozone number 4.

West Estonian drill cores – *Margachitina margaritana* Biozone (Nestor, 2005): *C. proboscifera* appears in all four sampled cores through the Llandovery-Wenlock boundary.

Table 7. Dimensions of *Conochitina proboscifera* Eisenack, 1937

µm	L	D_a	D_m	D_m/L
minimum	205	24	31	5,42
maximum	585	91	88	8,49
average	394	50	62	6,38
median	402	49	62	6,56
n	67	67	67	67

Conochitina proboscifera Eisenack, 1937 forma *truncata* Laufeld, 1974

Pl. 5, figs. 1-7; pl. 9, figs. 1-4.

1974 *Conochitina proboscifera* Eisenack forma *truncata* Laufeld, p. 72, figs. 34D - E.
1981 *Conochitina proboscifera* Eisenack forma *truncata* Laufeld, Paris, p. 184-185, pl. 19, figs. 4, 7.
1982 *Conochitina proboscifera* Eisenack forma *truncata* Laufeld, Verniers, p. 35, pl. 1, figs. 3-9.
1990 *Conochitina proboscifera* Eisenack forma *truncata* Laufeld, Dufka, p. 70, pl. 40, figs. 3-4.
1995 *Conochitina proboscifera* Eisenack forma *truncata* Laufeld, Grahn, fig. 7F.

D e s c r i p t i o n : Tubular to subtubular vesicle. The neck is tubular, sometimes tapering in the apertural pole. Flexure inconspicuous. The flanks are straight and parallel or convex. The shoulders can be well developed. Flat to convex base and with basal edge bluntly rounded. The mucron is wide. Ratio of the maximal diamater to length is from 1:4 to 1:5.

D i s c u s s i o n : Vesicles from the Bykoš locality are very similar to the specimens depicted in Laufeld (1974).

Occurrence: Lower Silurian of the Prague Basin (Dufka, 1990): Sheinwoodian (zones: ? *C. murchisoni* and *C. riccartonensis*).

Gotland (Laufeld, 1974): From the upper Visby Beds to the top of the Slite Marl (lower to the middle Sheinwoodian).

Coupé du Rocher and coupé de la Lande-Murée, France (Paris, 1981): zone *M. turriculatus* (upper Llandovery).

Mehaigne area (Brabant Massif, Belgium; Verniers, 1981, 1982): see occurence of *C. proboscifera*.

Subsurface of Gotland (Grahn, 1995): from the upper Telychian (zone *M. spiralis*) to the Sheinwoodian (zone *M. belophorus*).

Table 8. Dimensions of *Conochitina proboscifera* Eisenack, 1937 forma *truncata* Laufeld, 1974

µm	L	D_a	D_m	D_m/L
minimum	127	20	34	2,75
maximum	532	74	116	5,83
average	284	49	69	4,11
median	294	49	70	4,21
n	347	347	346	346

Conochitina proboscifera Eisenack, 1937 forma *gracilis* Laufeld, 1974

Pl. 9, figs. 8-10.

1974 *Conochitina proboscifera* Eisenack forma *gracilis* Laufeld, p. 72, figs. 34 A-C.
1990 *Conochitina proboscifera* forma *gracilis* Eisenack forma *gracilis* Laufeld, Dufka, p. 71, pl. 40, figs. 5-9.
1995 *Conochitina proboscifera* Eisenack forma *gracilis* Laufeld, Grahn, fig. 7E.

Description: Very rarely found specimens with extreme ratio of maximal width to length of vesicles – more than 1:8. Tubular to subtubular vesicle. The neck is not diferentiated from the chamber and is tapering in the apertural pole. The base is convex and the basal edge is rounded. The mucron is wide if at all visible.

Discussion: This species can be differentiated from *C. proboscifera* by its greater length to diameter ratio.

Occurrence: Lower Silurian of the Prague Basin (Dufka, 1990): Upper Sheinwoodian (zones: *C. perneri* and *C. ramosus*).

Gotland (Laufeld, 1974): From the upper Visby Beds to the lowermost Högklint Beds (lower Sheinwoodian).

Table 9. Dimensions of *Conochitina proboscifera* Eisenack, 1937 forma *gracilis* Laufeld, 1974

µm	L	D_a	D_m	D_m/L
minimum	423	28	45	7,54
maximum	798	79	106	10,85
average	528	50	53	9,09
median	534	51	60	9,11
n	7	7	7	7

Mehaigne area (Brabant Massif, Belgium; Verniers, 1981, 1982): see occurence of *C. proboscifera.*

Subsurface of Gotland (Grahn, 1995): from the upper Telychian (zone *M. spiralis*) to the Sheinwoodian (*M. riccartonensis*).

Conochitina tuba Eisenack, 1932

Pl. 6, figs. 4-7.

1932 *Conochitina tuba* Eisenack, p. 271, pl. 12, figs. 8-10.
1974 *Conochitina tuba* Eisenack, Laufeld, p. 72-73, fig. 36.
1982 *Conochitina tuba* Eisenack, Verniers, p. 37, pl. 3, figs. 51-54.
1990 *Conochitina tuba* Eisenack, Dufka, p. 72, pl. 42, figs. 1-3.
1994 *Conochitina tuba* Eisenack, Nestor, p. 39, pl. 19, figs. 1-4.
2002 *Conochitina tuba* Eisenack, Nestor et Nestor, pl. 2, fig. 1.

Description: *Conochitina* with tubular vesicle. The flexure is inconspicious, flanks are straight to convex. Base is flat to convex and the basal edge is rounded. The mucron is sunken. The neck is tubular and clearly diferentiated from the chamber.

Discussion: *C. tuba* differs from *C. proboscifera* f. *truncata* by a clearly differentiated neck and a lower ratio of length to width of the vesicle. However, these ratios can be excceded. *C. tuba* occurs in the upper part of the profile only.

Occurrence: Lower Silurian of the Prague Basin (Dufka, 1990): Homerian (zone: *C. lundgreni*).

Gotland (Laufeld, 1974): From the Slite Beds to the Hemse beds (upper Sheinwoodian to the Ludfordian).

Mehaigne area (Brabant Massif, Belgium; Verniers, 1981, 1982): From the formation MB7 to the formation MB8, middle to late Wenlock.

Estonia and North Latvia (Nestor, 1994): Jaani stage to the Rootsiküla stage, chitinozoan biozone 15 to 22; middle Sheinwoodian to upper Homerian.

Southwestern Estonia and northernmost Latvia (Nestor et Nestor, 2002): Staicele (Estonia) drill core: upper part of the Tõlla Member to the Sõrve Formation, chitinozoan biozone numbers 5-11; Ikla (Estonia) drill core: from the Paramaja Member to the Jamaja Formation, chitinozoan biozone numbers 5-8.

Table 10. Dimensions of *Conochitina tuba* Eisenack, 1932

µm	L	D_a	D_m	D_m/L
minimum	195	36	54	3,13
maximum	386	59	85	4,88
average	246	47	70	3,47
median	256	48	70	3,63
n	9	9	9	9

Conochitina sp. A

Pl. 4, figs. 6, 8, 9; pl. 6, figs.8-10.

Description: Tubular vesicle with straight to convex flanks. It is not possible to distinguish the neck. The basal edge is very rounded to rounded and the base is con-

vex or very convex. The shoulders are not clearly developed. The neck is tapering in the apertural pole. A wide mucron is developed.

Table 11. Dimensions of *Conochitina* sp. A

µm	L	D_a	D_m	D_m/L
minimum	157	20	37	2,54
maximum	386	64	94	6,47
average	231	48	72	3,33
median	241	47	70	3,52
n	75	75	75	75

Conochitina sp. B

Pl. 4, figs. 7, 10; pl. 8, figs. 1-5.

Description: Tubular vesicles with parallel flanks. The neck is not distinguishable. The flanks are straight or slightly convex. The basal edge is rounded to sharp. The mucron occurs on the flat base. The outline of the vesicle is rectangular.

Discussion: The rectangular shape of vesicle clearly distinguishes these specimens from others.

Table 12. Dimensions of *Conochitina* sp. B

µm	L	D_a	D_m	D_m/L
minimum	112	37	47	1,92
maximum	456	70	87	6,72
average	239	51	61	3,47
median	239	51	64	3,79
n	31	31	31	31

Conochitina sp. C

Pl. 6, figs. 1-3; pl. 8, figs. 6-9.

Description: *Conochitina* with flat or concave base, rounded basal edge. Straight to convex flanks. Maximal width is near to the middle of the vesicle's length. The neck is short and it is usually widened in the apertural direction.

Table 13. Dimensions of *Conochitina* sp. C

µm	L	D_a	D_m	D_m/L
minimum	169	35	49	2,61
maximum	270	52	81	5,44
average	211	47	61	3,12
median	213	44	63	3,48
n	13	13	13	13

Discussion: This species differs from *Conochitina* sp. B in the location of the maximal diameter of the vesicle and by the widening of the neck.

Conochitina sp. D

Pl. 10, figs. 1-5.

Description: Tubular vesicles with cylindrical neck. The shoulders are well developed and flanks are convex. The chamber constitutes half or more of the total length of the vesicle. The basal edge is rounded and the base is flat to convex. The mucron is visible.

Discussion: Specimens resemble *Conochitina armilata* ? described by Verniers (1982, p. 29) in their shapes and sizes. Range of *Conochitina armilata* ? in the Brabant massif is from MB7 to MB8 (Midlle to Late Wenlock).

Table 14. Dimensions of *Conochitina* sp. D

µm	L	D_a	D_m	D_m/L
minimum	156	31	49	2,76
maximum	289	71	85	3,51
average	213	49	69	3,16
median	216	48	69	3,15
n	25	25	25	25

Family **Lagenochitinidae Eisenack, 1931 emend. Paris, 1981**

Subfamily **Angochitininae Paris, 1981**

Genus ***Angochitina* Eisenack, 1931**

Type species: *Angochitina echinata* Eisenack, 1931

Angochitina sp. A

Pl. 10, figs. 11-13.

Description: Vesicles of this species are poorly preserved. Spherical to ovoid chamber. Sphericity of the chamber (maximal diameter of the vesicle divided by length of the chamber) is between 0.53 and 0.72 (average is 0.71). The chamber constitutes half to three quarters of the vesicle length. Spines are observed very rarely and are sparsely distributed over the whole surface of the chitinozoa. The neck is tubular.

Table 15. Dimensions of *Angochitina* sp. A

µm	L	D_a	D_m	L_{ch}	D_m/L_{ch}	D_m/L	D_{bn}
minimum	115	20	46	63	0,53	0,32	21
maximum	179	38	69	106	0,92	0,54	37
average	140	28	58	80	0,71	0,39	29
median	143	28	57	80	0,72	0,4	29
n	48	48	48	48	48	48	45

? *Angochitina* sp.

Pl. 10, figs. 14-15.

D e s c r i p t i o n : The outline of the vesicle corresponds with *Angochitina* sp. A, but no spines were observed.

D i s c u s s i o n : If the absence of spines is assumed, the possesion of processes could be possible. In this case these vesicles could be described as *Ancyrochitina* sp. C. Glabrous vesicles with a spherical chamber could be determined as *Sphaerochitina* sp. Sphericity of the vesicles (the ratio of the maximal diameter of the vesicle to the length of the chamber) ranges from 0.45 to 0.85 (average 0.67). The assignement to the species *Angochitina* is tentative.

Table 16. Dimensions of ? *Angochitina* sp.

µm	L	D_a	D_m	L_{ch}	D_m/L_{ch}	D_m/L	D_{bn}
minimum	126	19	47	67	0,45	0,33	22
maximum	173	37	69	115	0,89	0,48	36
average	143	28	57	84	0,67	0,38	28
median	146	28	57	86	0,67	0,39	28
n	31	31	31	31	31	31	30

Subfamily **Ancyrochitininae Paris, 1981**

Genus *Ancyrochitina* Eisenack, 1955

Type species: *Conochitina ancyrea* Eisenack, 1931

N o t e s : The vesicles from the lowest part of the profile were poorly preserved. Processes were often destroyed. The ramification of processes is rarely preserved. For this reason, the majority of the *Ancyrochitina* can be divided into three morphotypes only.

Ancyrochitina sp. A

Pl. 6, figs. 13, 14.

D e s c r i p t i o n : Chitinozoa with lenticular shaped chamber. The chamber constitutes one third to half of the vesicle length. The neck is tubular, slightly flaring. Only remnants of the spines are observed on the neck. The broadly rounded basal edge bears processes, sometimes very long.

Table 17. Dimensions of *Angochitina* sp. A

µm	L	D_a	D_m	D_m/L	L_{ch}	L_{prcb}	L_{prcn}	D_{bn}
minimum	90	21	50	0,42	49	10	4	24
maximum	143	34	74	0,67	76	36	34	32
average	110	29	62	0,55	55	16		30
median	114	29	63	0,56	58	20		29
n	6	6	6	6	6	9	2	5

D i s c u s s i o n : Some specimens of *Ancyrochitina* sp. B can resemble *Ancyrochitina* sp. A. There is a slight difference between the lenticular shape of vesicle and conical shape of vesicle with convex flanks and convex base. Specimens of these two species could not be to distinguished by the size variation.

Ancyrochitina sp. B

Pl. 3, figs. 7, 8, pl. 8, figs. 10-13.

D e s c r i p t i o n : *Ancyrochitina* with a conical chamber. Flanks of the chamber are sometimes convex. The neck is tubular, in some cases widened in an apertural direction. The base is flat to convex. Processes are on the basal edge. Processes can be present on the neck. The chamber constitutes one third to more than half of the length of the vesicle. The basal edge is rounded to sharp. The wall of the vesicle is very thin at the apertural pole, hence often broken.

Table 18. Dimensions of *Angochitina* sp. B

µm	L	D_a	D_m	D_m/L	L_{ch}	L_{prcb}	L_{prcn}	D_{bn}
minimum	88	17	22	0,15	47	3,7	6,3	14
maximum	184	54	80	0,63	98	35,6	24,9	56
average	135	28	60	0,46	68	18,1	9	27
median	136	29	60	0,45	70	19,4	10,8	27
n	114	115	115	114	111	88	32	109

Ancyrochitina sp. C

Pl. 3, fig. 9; pl. 10, figs. 6-10.

D e s c r i p t i o n : *Ancyrochitina* with spherical to ovoid chamber. The neck is tubular and constitutes half or less than half of the total length of the vesicle. Processes are present on the chamber, and sometimes on the neck.

Table 19. Dimensions of *Angochitina* sp. C

µm	L	D_a	D_m	D_m/L	L_{ch}	L_{prcb}	L_{prcn}	D_{bn}
minimum	96	13	28	0,22	51	4	2	16
maximum	186	127	132	0,83	103	38	25	62
average	137	26	55	0,41	74	15	9	26
median	137	28	56	0,42	75	16	10	27
n	97	97	97	97	95	77	38	91

Ancyrochitina cf. *pedavis* Laufeld, 1974

Pl. 6, figs. 11-12.

D e s c r i p t i o n : *Ancyrochitina* with typical ramified processess on the base of the chamber. The ramified processes are parallel to the longitudinal axis of the vesicles. The chamber is conical, with a tubular, slightly flaring neck. The chamber constitutes more than half of the total length. The basal edge is broadly rounded to rounded.

D i s c u s s i o n : Only two specimes were found. The observations were not verified by SEM.

Table 20. Dimensions of *Angochitina* cf. *pedavis*

µm	L	D_a	D_m	D_m/L	L_{ch}	L_{prcb}	L_{prcn}	D_{bn}
minimum	130	26	52	0,34	67	11	3	23
maximum	154	27	52	0,4	86	22	3	24
average						16		
median						16		
n	2	2	2	2	2	4	1	2

Correlation with other sections

Although Sheinwoodian Chitinozoan were treated neither *M. margaritana* nor *C. cingulata* (global Chitinozoans biozones, Verniers et al., 1995) were determined in this section. However, correlation with the coeval section in Prague Basin is possible. The lower part of the section described by Dufka (1995) resembles the assemblage from the Bykoš locality. *Conochitina proboscifera* f. *gracilis*, *Cingulochitina* sp. A (cf. *C. angusta*), *Cingulochitina* sp. B (cf. *C. dreyenensis*) and *Conochitina tuba* are common to both sections.

The Chitinozoan assemblage from the Bykoš locality could be correlated with Dufka's Chitinozoan assemblages F, G, H, I and J.

Builth Wells district (VERNIERS, 1999): *Cingulochitina* species (*angusta*, *dreyenensis*, *bouniensis*, *pitetensis*) allow to be correlated this section with the Bykoš locality. The occurrence of *Cingulochitina bouniensis* ranges in tens of meters. The profile thickness in the Bykoš locality is 6.5 m and the range of *C. bouniensis* is restricted to less than 1 m.

Cingulochitina species (*angusta*, *dreyenensis*, *bouniensis*, *pitetensis*), *C. emmastensis* and forms of *Conochitina proboscifera* are restricted to the Telychian and Sheinwoodian (for references see "occurrence" in taxonomic section).

Conochitina tuba appears later, from Sheinwoodian to Homerian (for references see occurrence of *C. tuba* in the taxonomic part).

Conclusions

The number of Chitinozoan *per* gram of rock fluctuates between 0.03 and 54 (precise quantities are given in fig. 2). Only three samples were barren: B2-20, B2-16 and B1-06. There were more than 20 Chitinozoan per gram in bed numbers: B-05, B2-04, B2-03, B2-02 and B2-01.

The state of preservation of Chitinozoa ranges from bad to medium. Thin walled specimens of *Ancyrochitina* were very often damaged and processes broken. Hence the determination is limited. Most of the *Ancyrochitina* species are left in open nomenclature. Only two vesicles could be determined as *Ancyrochitina* cf. *pedavis*. The others were split into three morphotypes.

Angochitina sp. A and ? *Angochitina* sp. were found in the lower part of the profile. The determination of ?*Angochitina* sp. is tentative, on the basis of outline vesicle similarity.

Cingulochitina angusta, *C. dreyenensis*, *C. pitetensis* and *C. bouniensis* are reported from the Prague basin for the first time. Their cingulum is developed as a ridge, a folding or thickening.

Conochitina species create half of the total number of Chitinozoa. *Conochitina proboscifera* f. *truncata* is the most widespread species; more than 340 vesicles were determined. Seven specimens of *C. proboscifera* f. *gracilis* were ascertained. Four groups of *Conochitina* were left in open nomenclature.

49 specimens of *Linochitina odiosa* were determined in the section (for chitinozoan distribution in the Bykoš section see fig. 2).

List of taxa

Ancyrochitina sp. A
Ancyrochitina sp. B
Ancyrochitina sp. C
Ancyrochitina cf. *pedavis*
Angochitina sp. A
? *Angochitina* sp.
Cingulochitina angusta
Cingulochitina bouniensis
Cingulochitina dreyenensis
Cingulochitina pitetensis
Conochitina cf. *emmastensis*
Conochitina proboscifera
Conochitina proboscifera f. *truncata*
Conochitinas proboscifera f. *gracilis*
Conochitina tuba
Conochitina sp. A
Conochitina sp. B
Conochitina sp. C
Conochitina sp. D
Linochitina odiosa

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Explanation to the plates

Plate 1

1. *Cingulochitina angusta* VERNIERS, 1999. Specimen from the bed number B1-04. Scale bar 10 μm.
2. *Cingulochitina angusta* VERNIERS, 1999. Specimen from the bed number B2-25. Scale bar 10 μm.

2a. Detail of the specimen from the figure 2. Scale bar 5 μm.

3. *Cingulochitina angusta* VERNIERS, 1999. Specimen from the bed number B2-04. Scale bar 50 μm.

3a. *Cingulochitina angusta* VERNIERS, 1999. Detail of antiapertural pole of the lower vesicle from figure 3. Scale bar 10 μm.

3b. *Cingulochitina angusta* VERNIERS, 1999. Detail of the specimen from the figure 3. Scale bar 10 μm.

4. *Cingulochitina angusta* VERNIERS, 1999. Specimen from the bed number B2-22. Scale bar 50 μm.

4b. *Cingulochitina angusta* VERNIERS, 1999. Detail of antiapertural pole of the lower vesicle from the figure 4. Scale bar 20 μm.

4c. *Cingulochitina angusta* VERNIERS, 1999. Detail of the lower vesicle from the figure 4. Scale bar 50 μm.

5. *Cingulochitina angusta* VERNIERS, 1999. Specimen from the bed number B2-33. Scale bar 20 μm.
6. *Cingulochitina angusta* VERNIERS, 1999. Specimen from the bed number B2-22. Scale bar 20 μm.

6a. Detail of cingulum of lower vesicle from the figure 6. Scale bar 5 μm.

7. *Cingulochitina angusta* VERNIERS, 1999. Specimen from the bed number B2-35. Scale bar 20 μm.

Plate 2

1. *Cingulochitina pitetensis* VERNIERS, 1999. Lower vesicle from the figure 6. Specimen from the bed number B2-03. Scale bar 10 μm.
2. *Cingulochitina dreyenensis* VERNIERS, 1999. Specimen from the bed number B2-02. Scale bar 20 μm.
3. *Cingulochitina dreyenensis* VERNIERS, 1999. Specimen from the bed number B2-02. Scale bar 20 μm.

3a. Detail of antiapertural pole of the vesicle from the figure 3. Scale bar 10 μm.
4. *Cingulochitina dreyenensis* VERNIERS, 1999. Specimen from the bed number B2-07. Scale bar 50 μm.
5. *Cingulochitina pitetensis* VERNIERS, 1999. Specimen from the bed number B2-29. Scale bar 50 μm.
5a. Upper vesicle from the figure number 5. Scale bar 20 μm.
6. *Cingulochitina pitetensis* VERNIERS, 1999. Specimen from the bed number B2-03. Scale bar 50 μm.
7. *Cingulochitina dreyenensis* VERNIERS, 1999. Specimen from the bed number B2-03. Scale bar 50 μm.
8. *Cingulochitina pitetensis* VERNIERS, 1999. Specimen from the bed number B2-04. Scale bar 20 μm.
9. *Cingulochitina bouniensis* VERNIERS, 1999. Specimen from the bed number B2-07. Scale bar 50 μm.
9a. *Cingulochitina bouniensis* VERNIERS, 1999. Detail of the connection between uppermost and middle vesicle from the figure number 9. Scale bar 10μm.

Plate 3

1. *Linochitina odiosa* LAUFELD, 1974. Specimen from the bed number B2-04. Scale bar 20 μm.
1a. *Linochitina odiosa* LAUFELD, 1974. Detail of the antiapertural pole of the vesicle on the figure 1. Scale bar 10 μm.
2. *Linochitina odiosa* LAUFELD, 1974. Specimen from the bed number B2-25. Scale bar 20 μm.
2a. *Linochitina odiosa* LAUFELD, 1974. Detail of the the neck surface of vesicle on figure 2. Scale bar 10 μm.
3. *Linochitina odiosa* LAUFELD, 1974. Specimen from the bed number B2-04. Scale bar 100 μm.
4. *Linochitina odiosa* LAUFELD, 1974. Specimen from the bed number B2-25. Scale bar 20 μm.
5. *Linochitina odiosa* LAUFELD, 1974. Specimen from the bed number B1-13. Scale bar 50 μm.
5a. Detail of the antiapertural pole of the vesicle from the figure number 5. Scale bar 10 μm.
6. *Linochitina odiosa* LAUFELD, 1974. Specimen from the bed number B2-22. Scale bar 20 μm.
6a. *Linochitina odiosa* LAUFELD, 1974. Detail of the antiapertural pole of the vesicle from the figure number 6. Scale bar 10 μm.
7. *Ancyrochitina* sp. B. Specimen from the bed number B2-06. Scale bar 20 μm.
8. *Ancyrochitina* sp. B. Specimen from the bed number B2-06. Scale bar 40 μm.
9. *Ancyrochitina* sp. C. Specimen from the bed number B2-06. Scale bar 20 μm.

Plate 4

1. *Conochitina emmastensis* NESTOR, 1982. Specimen from the bed number B2-04. Scale bar 50 μm.
2. *Conochitina emmastensis* NESTOR, 1982. Specimen from the bed number B1-09. Scale bar 50 μm.
3. *Conochitina emmastensis* NESTOR, 1982. Specimen from the bed number B2-08. Scale bar 50 μm.
4. *Conochitina emmastensis* NESTOR, 1982. Specimen from the bed number B2-08. Scale bar 50 μm.
5. *Conochitina emmastensis* NESTOR, 1982. Specimen from the bed number B2-06. Scale bar 25 μm.
6. *Conochitina* sp. A. Specimen from the bed number B2-03. Scale bar 100 μm.
7. *Conochitina* sp. B. Specimen from the bed number B2-03. Scale bar 100 μm.
8. *Conochitina* sp. A. Specimen from the bed number B2-25. Scale bar 50 μm.
9. *Conochitina* sp. A. Specimen from the bed number B2-03. Scale bar 50 μm.
10. *Conochitina* sp. B. Specimen from the bed number B1-04. Scale bar 100 μm.
10a. *Conochitina* sp. B. Specimen from the bed number B1-04. Scale bar 20 μm.

Plate 5

1. *Conochitina proboscifera* EISENACK, 1937 forma *truncata* LAUFELD, 1974. Specimen from the bed number B2-08. Scale bar 50 μm.
2. *Conochitina proboscifera* EISENACK, 1937 forma *truncata* LAUFELD, 1974. Specimen from the bed number B2-04. Scale bar 100 μm.
3. *Conochitina proboscifera* EISENACK, 1937 forma *truncata* LAUFELD, 1974. Specimen from the bed number B1-04. Scale bar 50 μm.
4. *Conochitina proboscifera* EISENACK, 1937 forma *truncata* LAUFELD, 1974. Specimen from the bed number B2-04. Scale bar 100 μm.
4a. *Conochitina proboscifera* EISENACK, 1937 forma *truncata* LAUFELD, 1974. Detail of the antiapertural pole from the figure 4. Scale bar 40 μm.
5. *Conochitina proboscifera* EISENACK, 1937 forma *truncata* LAUFELD, 1974. Specimen from the bed number B1-04. Scale bar 75 μm.
6. *Conochitina proboscifera* EISENACK, 1937 forma *truncata* LAUFELD, 1974. Specimen from the bed number B1-10. Scale bar 100 μm.
6a. Detail of the antiapertural pole from the figure 6. Scale bar 20 μm.
7. *Conochitina proboscifera* EISENACK, 1937 forma *truncata* LAUFELD, 1974. Specimen from the bed number B2-03. Scale bar 50 μm.
7a. *Conochitina proboscifera* EISENACK, 1937 forma *truncata* LAUFELD, 1974. Detail of the antiapertural pole from the figure 7. Scale bar 25 μm.
8. *Conochitina proboscifera* EISENACK, 1937. Specimen from the bed number B2-02. Scale bar 100 μm.
9. *Conochitina proboscifera* EISENACK, 1937. Specimen from the bed number B2-02. Scale bar 100 μm.
10. *Conochitina proboscifera* EISENACK, 1937. Specimen from the bed number B2-02. Scale bar 100 μm.
11. *Conochitina proboscifera* EISENACK, 1937. Specimen from the bed number B2-04. Scale bar 100 μm.

Plate 6

1. *Conochitina* sp. C. Specimen from the bed number B2-35. Scale bar 50 μm.
2. *Conochitina* sp. C. Specimen from the bed number B2-35. Scale bar 50 μm.
3. *Conochitina* sp. C. Specimen from the bed number B2-06. Scale bar 50 μm.
4. *Conochitina tuba* EISENACK, 1932. Specimen from the bed number B2-34. Scale bar 50 μm.

5. *Conochitina tuba* EISENACK, 1932. Specimen from the bed number B2-32. Scale bar 50 µm.
6. *Conochitina tuba* EISENACK, 1932. Specimen from the bed number B2-34. Scale bar 50 µm.
7. *Conochitina tuba* EISENACK, 1932. Specimen from the bed number B2-35. Scale bar 50 µm.
8. *Conochitina* sp. A. Specimen from the bed number B2-05. Scale bar 50 µm.
9. *Conochitina* sp. A. Specimen from the bed number B1-04. Scale bar 50 µm.
10. *Conochitina* sp. A. Specimen from the bed number B2-05. Scale bar 50 µm.
11. *Ancyrochitina* cf. *pedavis*. Specimen from the bed number B1-03. Scale bar 50 µm.
12. *Ancyrochitina* cf. *pedavis*. Specimen from the bed number B1-03. Scale bar 50 µm.
13. *Ancyrochitina* sp. A. Specimen from the bed number B2-06. Scale bar 50 µm.
14. *Ancyrochitina* sp. A. Specimen from the bed number B1-03. Scale bar 50 µm.

Plate 7

1. *Cingulochitina angusta* VERNIERS, 1999. Specimen from the bed number B2-06. Scale bar 50 µm.
2. *Cingulochitina angusta* VERNIERS, 1999. Specimen from the bed number B2-07. Scale bar 50 µm.
3. *Cingulochitina angusta* VERNIERS, 1999. Specimen from the bed number B1-12. Scale bar 50 µm.
4. *Cingulochitina angusta* VERNIERS, 1999. Specimen from the bed number B2-17. Scale bar 50 µm.
5. *Cingulochitina bouniensis* VERNIERS, 1999. Specimen from the bed number B2-04. Scale bar 50 µm.
6. *Cingulochitina dreyenensis* VERNIERS, 1999. Specimen from the bed number B2-29. Scale bar 50 µm.
7. *Cingulochitina dreyenensis* VERNIERS, 1999. Specimen from the bed number B2-25. Scale bar 50 µm.
8. *Cingulochitina dreyenensis* Verniers, 1999. Specimen from the bed number B2-04. Scale bar 50 µm.
9. *Cingulochitina dreyenensis* VERNIERS, 1999. Specimen from the bed number B2-02. Scale bar 50 µm.
10. *Cingulochitina pitetensis* VERNIERS, 1999. Specimen from the bed number B2-06. Scale bar 50 µm.
11. *Cingulochitina pitetensis* VERNIERS, 1999. Specimen from the bed number B2-04. Scale bar 50 µm.
12. *Cingulochitina pitetensis* VERNIERS, 1999. Specimen from the bed number B2-03. Scale bar 50 µm.
13. *Cingulochitina pitetensis* VERNIERS, 1999. Specimen from the bed number B2-04. Scale bar 50 µm.
14. *Linochitina odiosa* LAUFELD, 1974. Specimen from the bed number B2-22. Scale bar 50 µm.
15. *Linochitina odiosa* LAUFELD, 1974. Specimen from the bed number B2-25. Scale bar 50 µm.
16. *Linochitina odiosa* LAUFELD, 1974. Specimen from the bed number B2-22. Scale bar 50 µm.
17. *Linochitina odiosa* LAUFELD, 1974. Specimen from the bed number B2-30. Scale bar 50 µm.

Plate 8

1. *Conochitina* sp. B. Specimen from the bed number B2-25. Scale bar 50 µm.
2. *Conochitina* sp. B. Specimen from the bed number B2-25. Scale bar 50 µm.
3. *Conochitina* sp. B. Specimen from the bed number B1-25. Scale bar 50 µm.
4. *Conochitina* sp. B. Specimen from the bed number B1-04. Scale bar 50 µm.
5. *Conochitina* sp. B. Specimen from the bed number B1-04. Scale bar 50 µm.
6. *Conochitina* sp. C. Specimen from the bed number B2-01. Scale bar 50 µm.
7. *Conochitina* sp. C. Specimen from the bed number B2-05. Scale bar 50 µm.
8. *Conochitina* sp. C. Specimen from the bed number B1-04. Scale bar 50 µm.
9. *Conochitina* sp. C. Specimen from the bed number B1-02. Scale bar 50 µm.
10. *Ancyrochitina* sp. B. Specimen from the bed number B2-06. Scale bar 50 µm.
11. *Ancyrochitina* sp. B. Specimen from the bed number B2-05 Scale bar 50 µm.
12. *Ancyrochitina* sp. B. Specimen from the bed number B2-06. Scale bar 50 µm.
13. *Ancyrochitina* sp. B. Specimen from the bed number B2-06. Scale bar 50 µm.

Plate 9

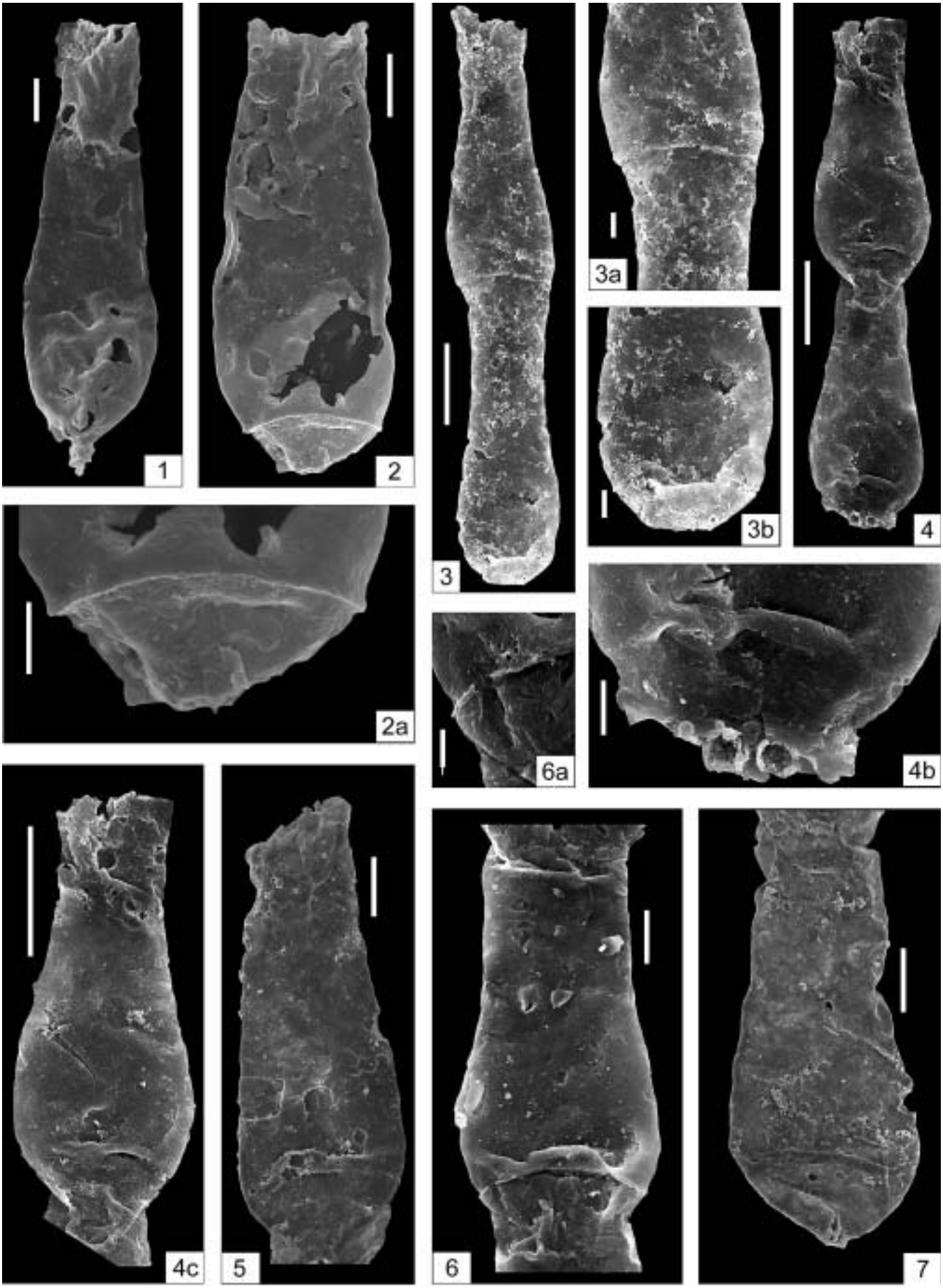
1. *Conochitina proboscifera* EISENACK, 1937 forma *truncata* Laufeld, 1974. Specimen from the bed number B2-05. Scale bar 100 µm.
2. *Conochitina proboscifera* EISENACK, 1937 forma *truncata* Laufeld, 1974. Specimen from the bed number B2-05. Scale bar 100 µm.
3. *Conochitina proboscifera* EISENACK, 1937 forma *truncata* Laufeld, 1974. Specimen from the bed number B2-07. Scale bar 100 µm.
4. *Conochitina proboscifera* EISENACK, 1937 forma *truncata* Laufeld, 1974. Specimen from the bed number B2-02. Scale bar 100 µm.
5. *Conochitina proboscifera* EISENACK, 1937. Specimen from the bed number B2-17. Scale bar 100 µm.
6. *Conochitina proboscifera* EISENACK, 1937. Specimen from the bed number B2-18. Scale bar 100 µm.
7. *Conochitina proboscifera* EISENACK, 1937. Specimen from the bed number B2-25. Scale bar 100 µm.
8. *Conochitina proboscifera* EISENACK, 1937 forma *gracilis* Laufeld, 1974. Specimen from the bed number B1-11. Scale bar 100 µm.
9. *Conochitina proboscifera* EISENACK, 1937 forma *gracilis* Laufeld, 1974. Specimen from the bed number B1-02. Scale bar 100 µm.
10. *Conochitina proboscifera* EISENACK, 1937 forma *gracilis* Laufeld, 1974. Specimen from the bed number B2-11. Scale bar 100 µm.
11. *Conochitina emmastensis* NESTOR, 1982. Specimen from the bed number B2-05. Scale bar 100 µm.
12. *Conochitina emmastensis* NESTOR, 1982. Specimen from the bed number B1-04. Scale bar 100 µm.
13. *Conochitina emmastensis* NESTOR, 1982. Specimen from the bed number B1-04. Scale bar 100 µm.
14. *Conochitina emmastensis* NESTOR, 1982. Specimen from the bed number B1-04. Scale bar 100 µm.

15. *Conochitina proboscifera* EISENACK, 1937. Specimen from the bed number B2-17. Scale bar 100 µm.

Plate 10

1. *Conochitina* sp. D. Specimen from the bed number B2-05. Scale bar 50 µm.
2. *Conochitina* sp. D. Specimen from the bed number B2-05. Scale bar 50 µm.
3. *Conochitina* sp. D. Specimen from the bed number B2-05. Scale bar 50 µm.
4. *Conochitina* sp. D. Specimen from the bed number B1-04. Scale bar 50 µm.
5. *Conochitina* sp. D. Specimen from the bed number B1-04. Scale bar 50 µm.
6. *Ancyrochitina* sp. C. Specimen from the bed number B1-03. Scale bar 50 µm.
7. *Ancyrochitina* sp. C. Specimen from the bed number B1-03. Scale bar 50 µm.
8. *Ancyrochitina* sp. C. Specimen from the bed number B1-03. Scale bar 50 µm.
9. *Ancyrochitina* sp. C. Specimen from the bed number B2-05. Scale bar 50 µm.
10. *Ancyrochitina* sp. C. Specimen from the bed number B1-02. Scale bar 50 µm.
11. *Angochitina* sp. Specimen from the bed number B1-02. Scale bar 50 µm.
12. *Angochitina* sp. Specimen from the bed number B1-02. Scale bar 50 µm.
13. *Angochitina* sp. Specimen from the bed number B1-04. Scale bar 50 µm.
14. ? *Angochitina* sp. Specimen from the bed number B1-02. Scale bar 50 µm.
15. *? Angochitina* sp. Specimen from the bed number B1-04. Scale bar 50 µm.

PLATE 1



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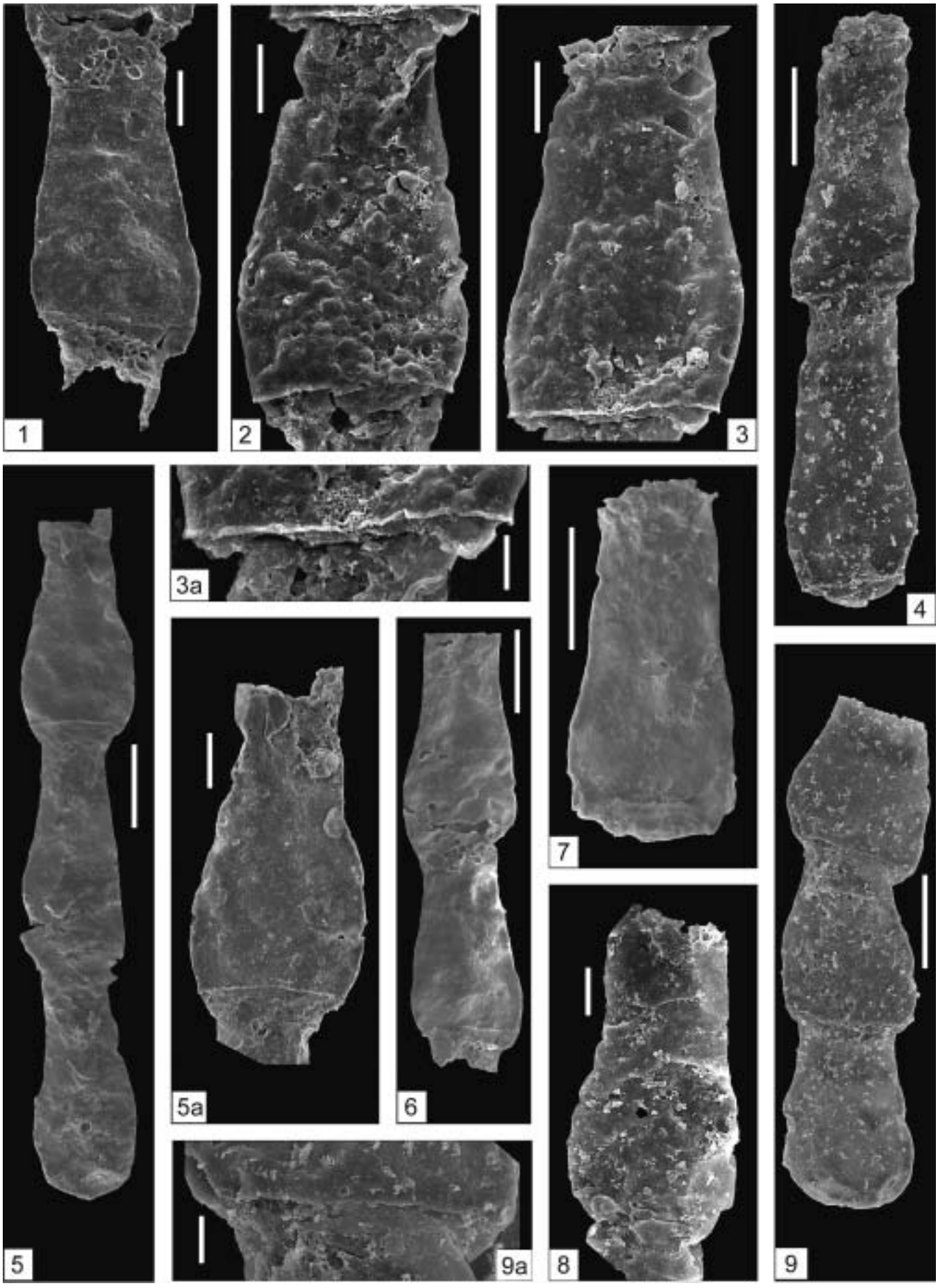

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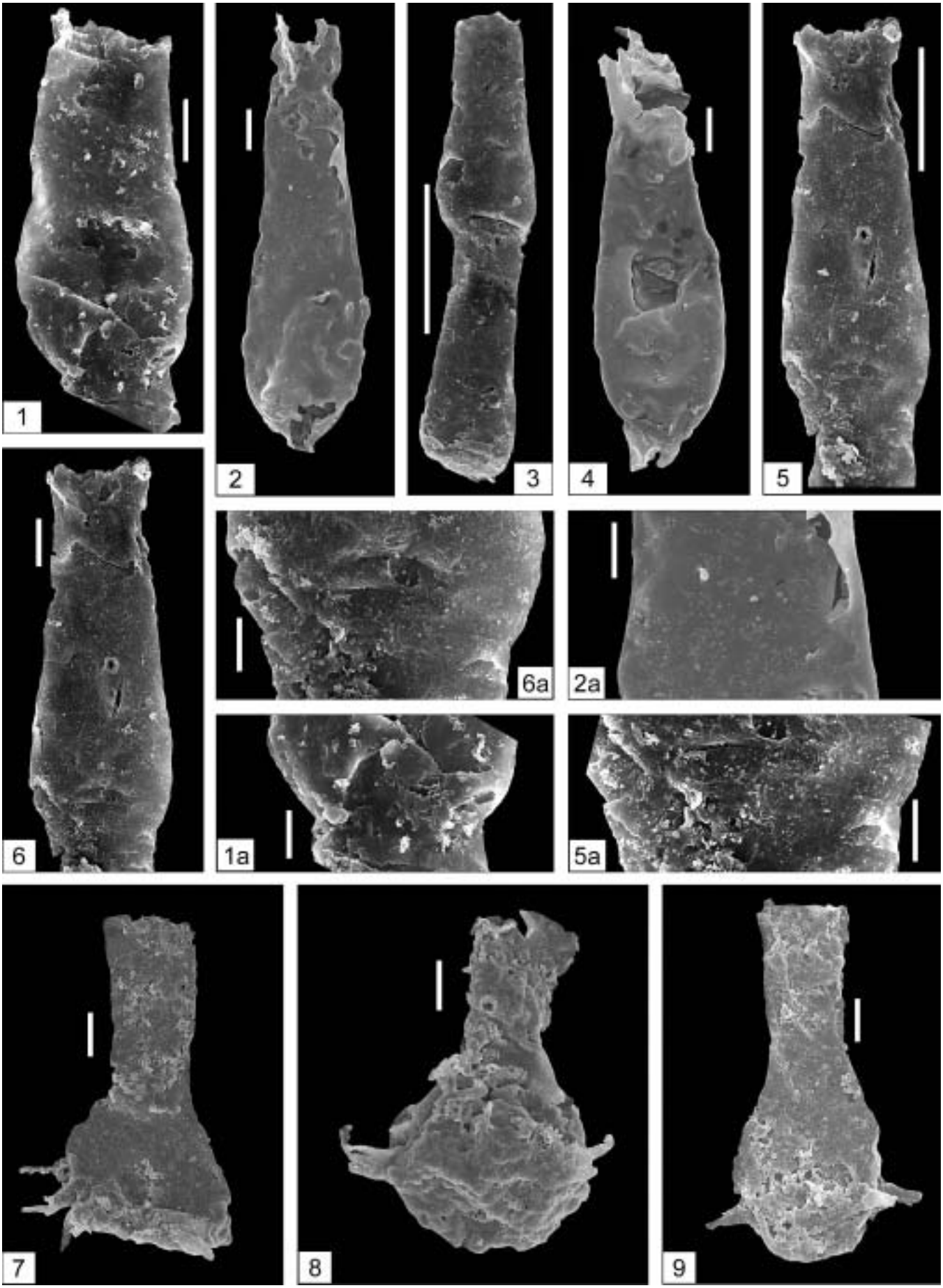

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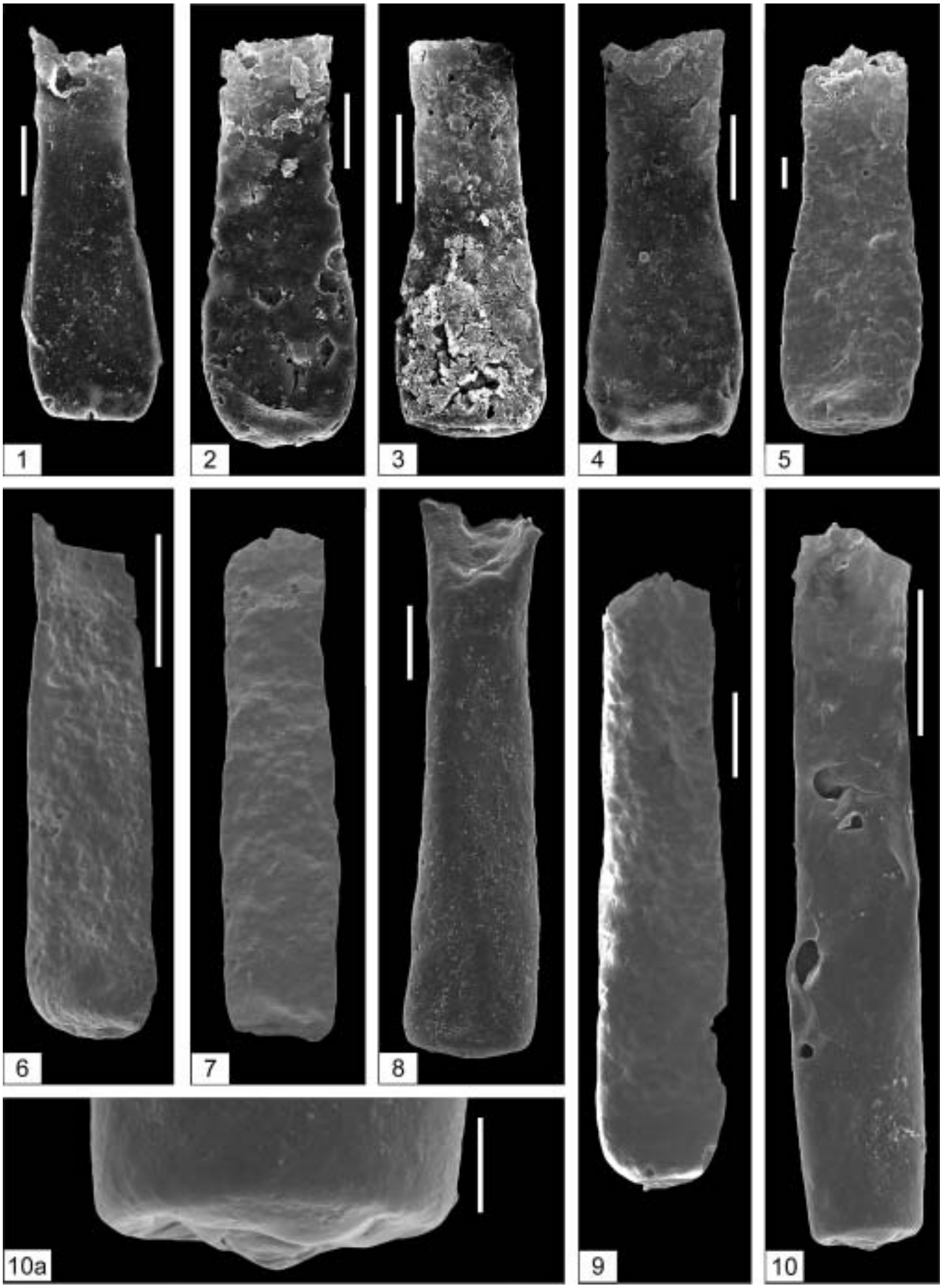

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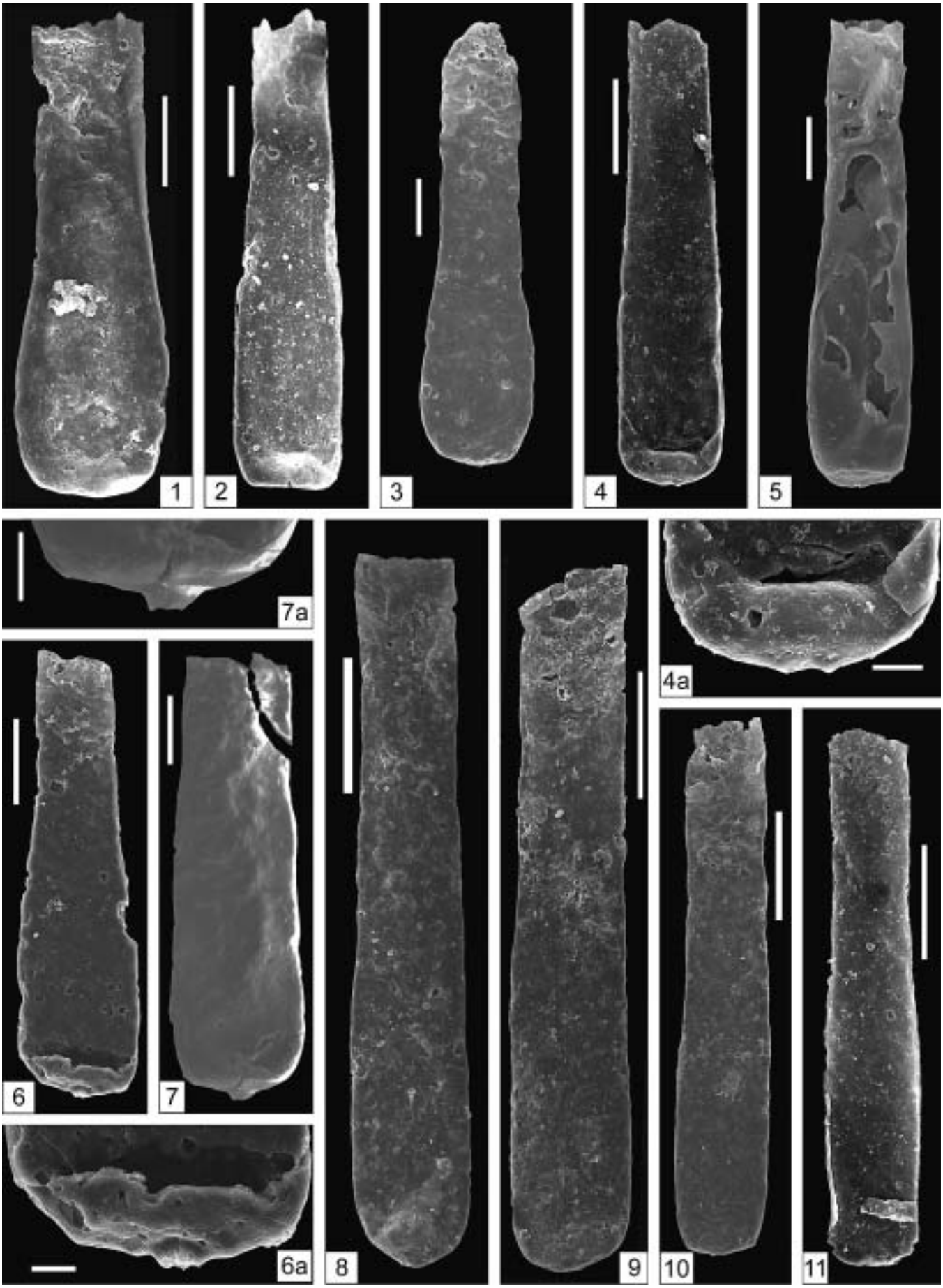

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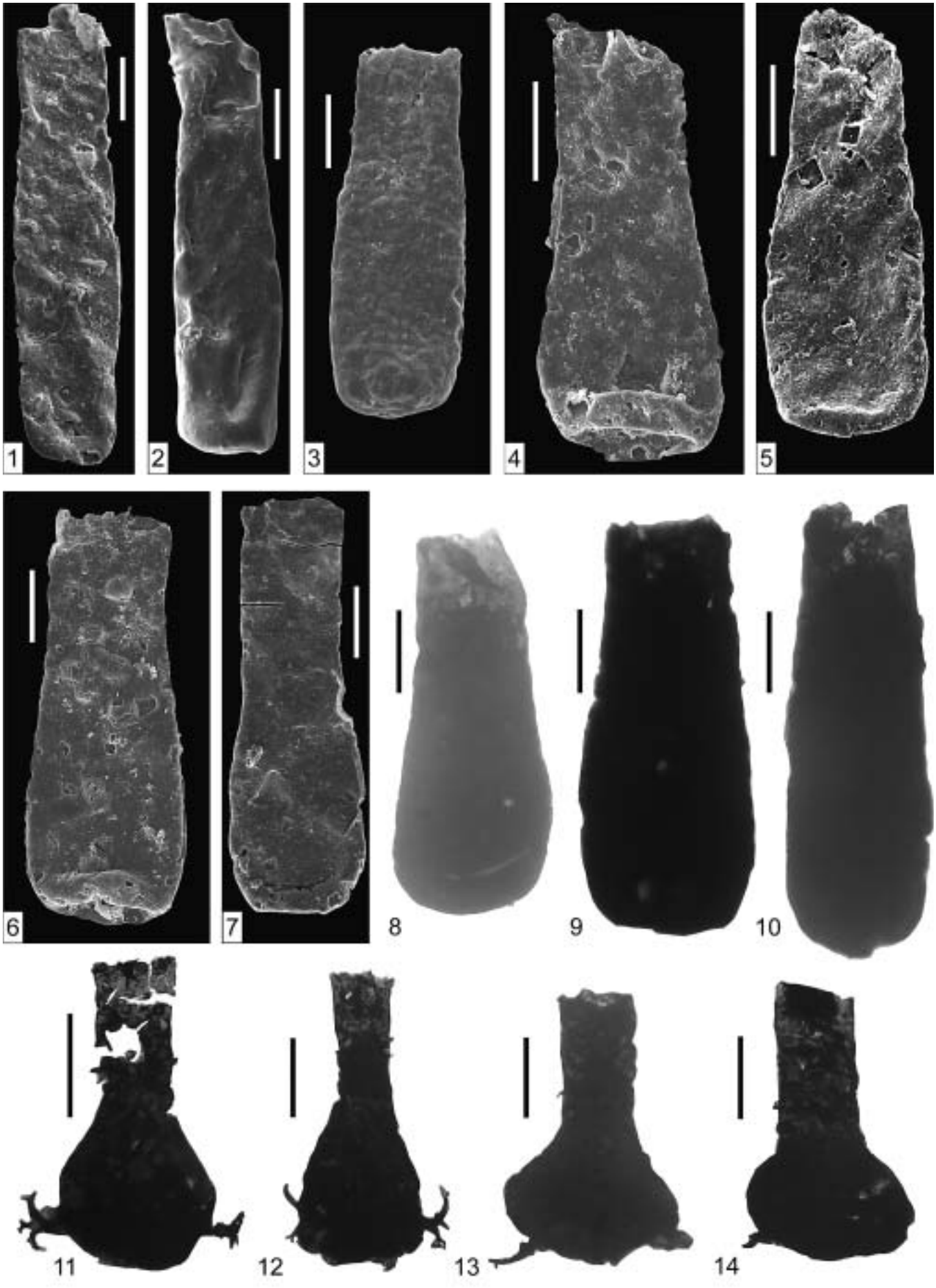

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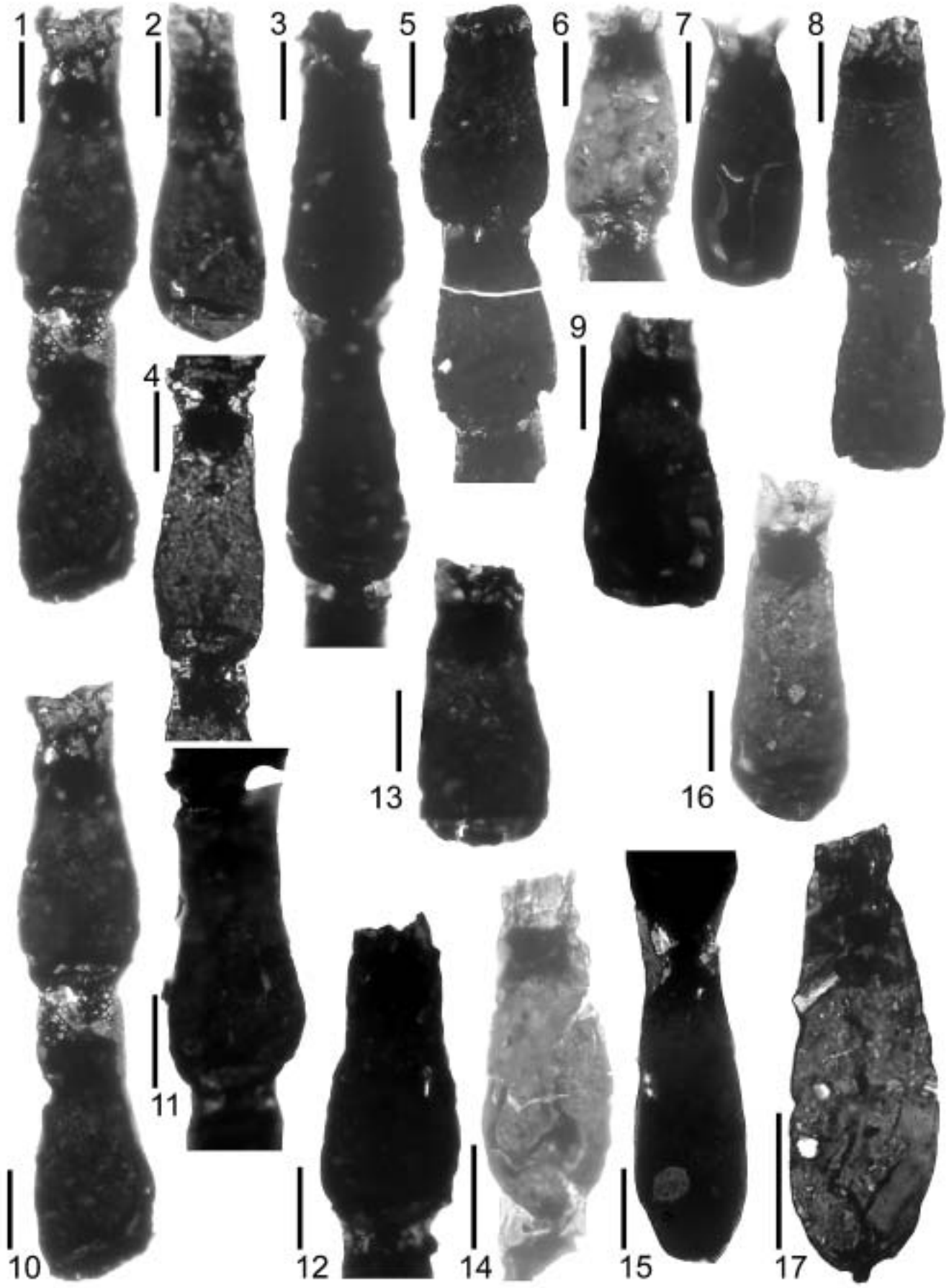

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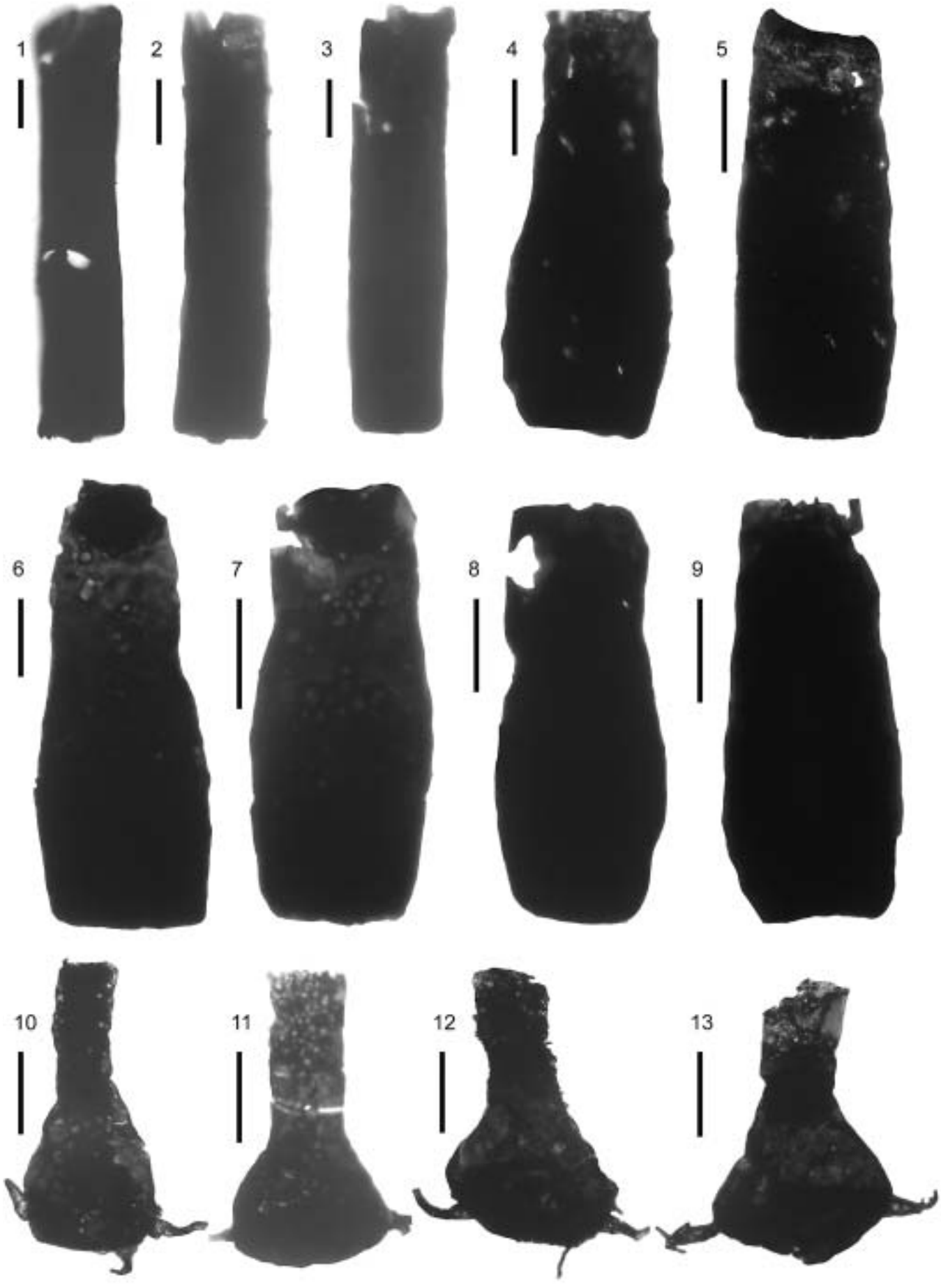

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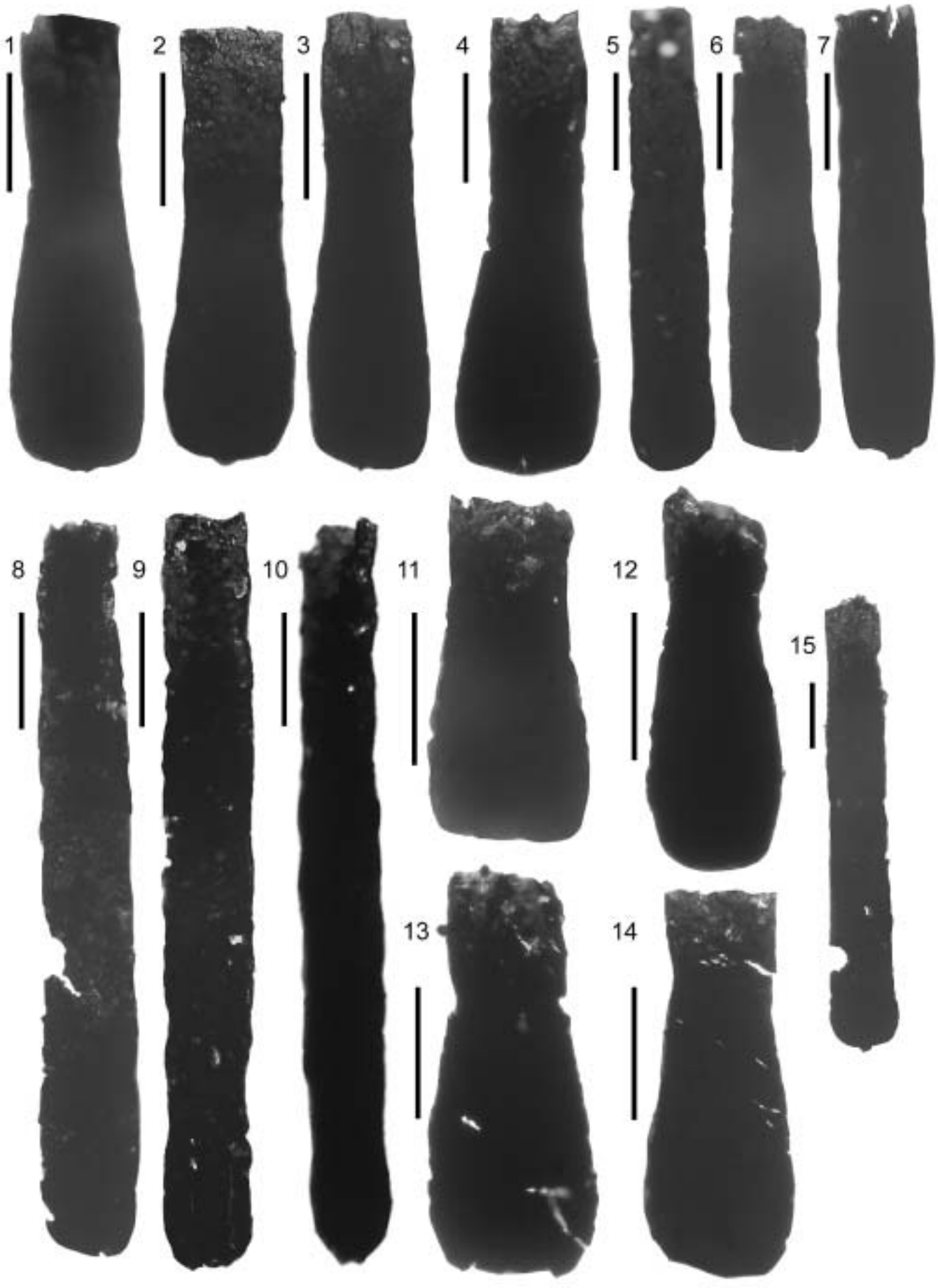

PLATE 10