An Upper Maestrichtian Foraminiferal Fauna from Dörfles, Lower Austria

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With 3 plates

Abstract

This paper deals with the description of Upper Maestrichtian foraminifera. The foraminifera are picked up from one sample taken from marles in crevasses and fissures of Upper Tithonian of Ernstbrunn Limestone, quarry at Dörfles. 18 species have been found in this locality which have stratigraphic value for age determination; 37 genera which have long stratigraphic range have been identified too; only those, which have characteristic morphologic features have been identified to species. Stratigraphically Dörfles sample seems to be closely related to Upper Maestrichtian of Michelstetten due to many common species in both areas.

Introduction

During my stay in Vienna from September 9, 1968 till May 21, 1969 I have restudied foraminifera of some Upper Cretaceous samples, which I have collected from different stratigraphic sections in different localities of Austria during geologic excursions. The ages of these samples range from Cenomanian to Maestrichtian. Emphasis has been laid on two samples from Michelstetten section, which belongs to the Waschberg zone, and from the Gosau beds in Salzburg; both of them have already been studied and published.

In this paper I have worked out the sample brought from an old quarry at Dörfles, Lower Austria, which belongs to Waschberg zone. No former work has been done on the foraminifera of these marles, filling crevasses and fissures of Upper Tithonian of Ernstbrunn Limestone. The purpose of this study is twofold; to find out the age of this filling, which was thought to be of Upper Tithonian, and to correlate it with one of the mentioned Upper Cretaceous Sections. I had to limit myself to study one sample, due to the short time available.

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Systematic Descriptions

Family *GLOBOTRUNCANIDAE* Brotzen, 1942

Genus *Globotruncana* Cushman, 1927

Globotruncana arca (Cushman)

(Plate 1, figure 1 a—c)

1926 *Pulvinulina arca* Cushman n. p. — Cushman, P. 32, Pl. 3, Fig. 1 a—c.
1926 *Globotruncana arca* Cushman — Herm, P. 65, Pl. 7, Fig. 3.
1966 *Globotruncana arca* Cushman — Wille-Janoschek, P. 96, Pl. 5, Fig. 1—6.

Description: Test subcircular, periphery lobate with double keels, dorsal side convex, ventral side slightly concave. Chambers forming the last whorl are six, increasing in size gradually as added. On the ventral side the umbilical margin of each chamber is with a strong lip, especially the last. Sutures an the dorsal side are oblique and curved, on the ventral side forming a loop-shape along with the umbilical lip and the ventral keel in each chamber. Almost all sutures are limbate and beaded. Aperture is not well preserved.

Dimension: Diameter 0.54 mm.; thickness 0.11 mm.
Occurrence: Common.
Range: Lower Campanian-Upper Maestrichtian.

Globotruncana mayaroensis Bolli

(Plate 1, figure 2 a—c)

1951 *Globotruncana mayaroensis* Bolli n. sp. — Bolli, P. 198, Pl. 35, Fig. 10—12.
1957 *Abathomphalus mayaroensis* (Bolli) — Loeblich & Tappan, P. 43, Pl. 11, Fig. 1 a—c.
1966 *Globotruncana mayaroensis* Bolli — Wille-Janoschek, P. 111, Pl. 6, Fig. 5, 6.

Description: Test circular with lobate periphery, slightly convex on dorsal side and concave on ventral side. Six chambers in the last whorl, they are arranged obliquely to each other. The sutures on the dorsal side are curved and coarsely beaded, especially on the peripheral part, radial on the ventral side. The periphery is truncated by two keels, ventral and dorsal, which are strongly beaded. Aperture is not preserved.

Dimension: Diameter 0.78 mm.; thickness 0.24 mm.
Occurrence: Rare.
Range: Upper part of Maestrichtian.

Globotruncana gansseri Bolli

(Plate 1, figure 3 a—c)

1951 *Globotruncana gansseri* Bolli n. sp. — Bolli, P. 196, Pl. 35, Fig. 1—3.
1963 *Globotruncana gansseri* Bolli — Van Hinte, P. 72, Pl. 3, Fig. 4.
1966 *Globotruncana gansseri gansseri* Bolli — Salaj-Samuel, P. 206, Pl. 22, Fig. 1, 2 a, b, c.

Description: Test semicircular, flat on dorsal side and inflated on ventral side. Chambers forming the last whorl are five in number surrounding the umbilicus. The sutures on the dorsal side are curved and finely beaded, ventrally radial and depressed. A very prominent beaded keel separates the flat dorsal side from the inflated ventral side. The periphery is slightly lobate. The wall of the ventral side is slightly rough and spiny. Aperture is not preserved.

Dimension: Diameter 0.27 mm.; thickness 0.100 mm.
Occurrence: Rare.
Range: Maestrichtian.

Genus *Rugoglobigerina* BRÖNNIMANN, 1952

Rugoglobigerina petaloidea petaloidea GANDOLFI

(Plate 1, figure 4 a—c)

1962 *Rugoglobigerina petaloidea petaloidea* GANDOLFI — HERM, P. 59, Pl. 2, Fig. 5.

Description: Test small, convex on dorsal side, concave ventrally with deep umbilicus. Four chambers on the final whorl, stout and compressed except the last, which is inflated to a certain extent. All chambers are covered by very fine pustules, the peripheral part is covered with fine spines. The periphery is petaloid with faint keel. Aperture is an interiomarginal low arch facing the umbilicus. This form has certain similarities with *Globotruncana citae*.

Dimension: Diameter 0.30 mm.; height 0.14 mm.
Occurrence: Rare.

Rugoglobigerina rugosa rotundata BRÖNNIMANN

(Plate 2, figure 1 a—c)

1957 *Rugoglobigerina rugosa rotundata* BRÖNNIMANN — LOEBLICH & TAPPAN, P. 43, Pl. 11, Fig. 2 a—5 c.
1962 *Rugoglobigerina rugosa rotundata* BRÖNNIMANN — HERM, P. 61, Pl. 3, Fig. 4.

Description: Test trochoidal in early stage, tending to be planispiral in later stage, subcircular, biconvex and umbilicate. In side view chambers are slighty elongate, five in the last whorl. Sutures are depressed and radial on ventral side. Periphery rounded and lobate. Wall covered by numerous papillae, which give the typical rugose appearance. Aperture is a low arch at the base of the last formed chamber facing the umbilicus.

Dimension: Diameter 0.35 mm.; thickness 0.24 mm.
Occurrence: Common.

Family *BULIMINIDAE* Jones, 1875

Genus *Reussella* Galloway, 1933

Reussella szajnochae szajnochae (Grzybowski)

(Plate 2, figure 2)

1896 *Verneuilina szajnochae* — Grzybowski, P. 287, Pl. 9, Fig. 19 a, b.
1929 *Bulimina limbata* n. sp. — White, P. 48, Pl. 5, Fig. 9.

Description: Test triangular in cross-section, has a general pyramidal shape with slightly curved edges. Chambers are clearly visible except the early ones, which are hidden by the backward projection of the later sutures, numerous and deeply excavated, due to the raised and twisted sutures. Sutures form prominent raised and twisted ridges. Aperture semilunar, situated at the base of the last formed chamber.

Dimension: Length 0.68 mm.; breadth 0.49 mm.
Occurrence: Rare.
Range: Part of Campanian and Maestrichtian.

Genus *Bulimina* d'Orbigny, 1826

Bulimina arkadelphiana Cushman & Parker

(Plate 2, figure 3)

1946 *Bulimina arkadelphiana* Cushman & Parker — Cushman, P. 124, Pl. 52, Fig. 3, 4.

Description: Test spindle shape, tapering towards the proloculus. Number of whorls five. Chambers are numerous, not visible in early stage, later chambers are distinct and inflated. Sutures are distinct and deep. Except for the last three chambers, all covered with fine ridges, which are projecting as sharp spines at the margins of the chambers, especially in the early stage. Wall finely perforated. Aperture loop-shaped, situated at the side of the last formed chamber.

Dimension: Length 0.57 mm.; diameter 0.35 mm.
Occurrence: Common.

Family *BOLIVINITIDAE* Cushman, 1927

Genus *Bolivina* d'Orbigny, 1839

Bolivina incrassata gigantea Wicher

(Plate 2, figure 5)

1962 *Bolivina incrassata gigantea* Wicher — Hiltermann & Koch in Leitfossilien der Mikropaläontologie, Pl. 312, Pl. 19, Fig. 51.

Description: Test stout, elongate, oval in outline, maximum breadth on the middle of the test, periphery is rounded. Chambers are biserial, six pairs, increasing gradually in size, slightly bending towards the proloculus.

Sutures are flush and curved. Wall smooth with fine perforations. Aperture elongate, oval with slight lip located on the side of the last formed chamber.

Dimension: Length 1.2 mm.; breadth 0.64 mm.; thickness 0.36 mm.
Occurrence: Rare.
Range: Maestrichtian.

Bolivina incrassata incrassata REUSS

(Plate 2, figue 4)

1899 *Bolivina incrassata* REUSS — EGGER, P. 45, Pl. 16, Fig. 4, 5.
1946 *Bolivina incrassata* REUSS — CUSHMAN, P. 127, Pl. 53, Fig. 8—11.
1966 *Bolivina incrassata incrassata* REUSS — SALAJ-SAMUEL, P. 138, Pl. 2, Fig. 4 a, b.

Description: Test stout, moderately compressed, increasing in breadth gradually toward the aperture so that maximum breadth is near the aperture, periphery is rounded. Chambers are biserially arranged, eight pairs, gradually increasing in size, slightly bending toward the proloculus. Sutures are flush and curved. Wall smooth with fine perforations. Aperture elongate, oval with slight lip on the side of the last formed chamber.

Dimension: Length 0.62 mm.; breadth 0.19 mm.; thickness 0.10 mm.
Occurrence: Rare.
Range: Upper Campanian and Maestrichtian.

Genus *Bolivinoides* CUSHMAN, 1927

Bolivinoides draco draco MARSSON

(Plate 2, figure 6)

1951 *Bolivinoides draco draco* MARSSON — NOTH, P. 63, Pl. 9, Fig. 10.
1957 *Bolivinoides draco* MARSSON — LOEBLICH & TAPPAN, P. 145, Pl. 33, Fig. 14—16.

Description: Test stout, rhomboidal, breadth and thickness increasing toward the aperture, periphery weakly carnated. Chambers are biserial throughout; curved toward the proloculus, increasing in size as added. Sutures are oblique and curved backward. Surface ornamentation consists of two nearly parallel median ridges, from which oblique secondary ridges branch toward the peripheral smooth surface. Aperture is a slit at the base of the last formed chamber.

Dimension: Length 0.38 mm.; maximum breadth 0.36 mm.; thickness 0.17 mm.
Occurrence: Common.
Range: Maestrichtian.

Bolivinoides peterssoni BROTZEN

(Plate 3, figure 1)

1957 *Bolivinoides peterssoni* BROTZEN — HOFKER, P. 253, Abb. 305, 312.
1962 *Bolivinoides peterssoni* BROTZEN — HILTERMANN & KOCH in Leitfossilien der Mikropaläontologie, P. 317, Pl. 50, Fig. 16.
1966 *Bolivinoides peterssoni* BROTZEN — SALAJ-SAMUEL, P. 140, Pl. 28, Fig. 1—2.

Description: Test stout, elongate, rhomboidal in outline, the thickest portion along the median line. Chambers arranged biserially, narrow and curved; the upper two or three pairs bearing spines. Sutures are curved and meet directly with the outer rim in an angle. Test covered with big sparse and overlapped nodes; very short ridges and fine granulations. The two sides of the test are straight. Aperture is loop-shaped.

Dimension: Length 0.52 mm.; maximum breadth 0.32 mm.
Occurrence: Common.
Range: Maestrichtian-Lower Danian.

Bolivinoides paleocenicus BROTZEN

(Plate 3, figure 2)

1957 *Bolivinoides paleocenica* BROTZEN — HOFKER, P. 253, Abb. 305.
1962 *Bolivinoides paleocenicus* BROTZEN — HILTERMANN & KOCH in Leitfossilien der Mikropaläontologie, P. 317, Pl. 50, Fig. 15.

Description: Test small, thin, rhomboidal in outline, almost as wide as long, the thickest portion along the median line. Sides in early stage are slightly vaulted, younger chambers are flat. Chambers are biserially arranged throughout, slightly curved, outside the periphery in the form of short spines, giving a jagged appearance of the periphery. Sutures are slightly raised and curved, they cut the periphery at an angle. Ornamentation as fine granulation throughout the test, the middle portion is covered by overlapping of very short ridges and nodes. Aperture is loop-shaped situated at the base of the last formed chamber.

Dimension: Length 0.30 mm.; breadth 0.28 mm.
Occurrence: Common.
Range: Maestrichtian-Lower Danian.

Family *ANOMALINDAE* CUSHMAN, 1927

Genus *Stensioeina* BROTZEN, 1936

Stensioeina pommerana BROTZEN

(Plate 3, figure 4 a—c)

1951 *Stensioeina pommerana* BROTZEN — NOTH, P. 71, Pl. 9, Fig. 12.
1957 *Stensioeina pommerana* BROTZEN — HOFKER, P. 353, Abb. 407.
1962 *Stensioeina pommerana* BROTZEN — HILTERMANN & KOCH in Leitfossilien der Mikropaläontologie, P. 327, Pl. 51, Fig. 11—13.

Description: Test trochoid, subcircular, plano-convex, hemispherical in shape; dorsal side flat, ventral side highly convex. Umbilicus is filled and smooth. Eight chambers in the last whorl, increasing in size, the last chamber is less ornamented than the previous ones. Sutures on ventral side are curved and flush, whereas on the dorsal side they are strongly raised and show to a certain extent some regularity with irregular short ridges in between;

they meet the periphery tangentially to form a continuous peripheral ridge. Aperture is an interiomarginal low arch.

Dimension: Maximum diameter 0.60 mm.; minimum diameter 0.48 mm.; thickness 0.32 mm.

Occurrence: Rare.

Range: Upper Campanian and Maestrichtian.

Family *NODOSARIIDAE* Ehrenberg, 1838

Genus *Neoflabellina* Bartenstein, 1948

Neoflabellina aff. numismalis (Wedekind)

(Plate 3, figure 5)

1962 *Neoflabellina* n. sp., aff. *numismalis* (Wedekind) — Hiltermann & Koch in Leitfossilien der Mikropaläontologie, P. 311, Pl. 50, Fig. 11.

1963 *Neoflabellina* aff. *numismalis* (Wedekind) — Van Hinte, P. 103, Pl. 13, Fig. 4—5.

Description: Test stout, deltoidal, flattened, periphery is truncated by two keels. Early chambers form a small planispiral portion of the test, later chambers are narrow, chevron-shaped extending backward on both sides of the proloculus. Sutures are highly limbate, curved and parallel to the periphery. Sutures along the median line of the test are divided to many parts, so that each one confines intersutural areas ranging from two to six in this sample. Ornamentation as intersutural scattered small nodes, especially near the periphery. Aperture terminal, rounded and smooth.

Dimension: Length 1.2 mm.; breadth 0.8 mm.; thickness 0.16 mm.

Occurrence: Rare.

Range: Upper Campanian-Maestrichtian.

Neoflabellina reticulata (Reuss)

(Plate 3, figure 6)

1929 *Flabellina reticulata* Reuss — White, P. 204, Pl. 28, Fig. 15.

1946 *Palmula reticulata* (Reuss) — Cushman, P. 84, Pl. 31, Fig. 1—6.

1962 *Neoflabellina reticulata* (Reuss) — Hiltermann & Koch in Leitfossilien der Mikropaläontologie, P. 309, Pl. 50, Fig. 13, 14.

Description: Test deltoidal, flattened, periphery is truncated. Early chambers form a small planispiral portion of the test, later chambers chevron-shaped, extending backward on both sides toward the proloculus. Sutures are limbate and very distinct, inbetween covered by an incomplete mesh of parallel raised ridges, which are at right angles to the sutures. Aperture is rounded a the end of a short neck.

Dimension: Length 0.91 mm.; breadth 0.57 mm.

Occurrence: Rare.

Range: Maestrichtian.

Family *HETEROHELICIDAE* CUSHMAN, 1927

Genus *Planoglobulina* CUSHMAN, 1927

Planoglobulina acervulinoides (EGGER)

(Plate 3, figure 3)

1902 *Gümbelina acervulinoides* n. sp. EGGER — EGGER, P. 36, Fig. 14, 15, 16, 17, 18, 20, 21, 22.
1946 *Planoglobulina acervulinoides* (EGGER) — CUSHMAN, P. 111, Pl. 47, Fig. 12—15.
1966 *Pseudotextularia acervulinoides* (EGGER) — WILLE-JANOSCHEK, P. 119, Pl. 8, Fig. 8.

Description: Test compressed, fan-shape and perforated. Chambers are subglobular, early stage is biserially arranged, later stages are scattered in one plane. Wall is ornamented by fine striations, they are well developed in early stage. Sutures are distinct and depressed. *Planoglobulina* is similar to *Ventilabrella*, but in *Planoglobulina* the early stage is much thicker than the early stage of *Ventilabrella*.

Dimension: Length 0.40 mm.; breadth 0.35 mm.; thickness 0.16 mm.
Occurrence: Rare.

In addition to the species described here in detail, the following genera and species were found too in the Upper Maestrichtian of Dörfles:

Ammodiscoides sp.
Ammodiscus sp.
Trifarina sp.
Asterigerinoides sp.
Allomorphina sp.
Bulimina sp.
Cibicides sp.
Cibicidoides sp.
Clavulinoides sp.
Dorothia sp.
Dentalina sp.
Eponides sp.
Eggerella sp.
Ellipsoglandulina sp.
Frondicularia sp.
Glomospira sp.
Hedbergella sp.
Gyroidina sp.
Globorotalites sp.
Gavelinella sp.
Gaudryina sp.
Lenticulina sp.
Lagena sp.
Marginulina sp.
Marssonella sp.
Nodosaria sp.
Pseudoglandulina sp.
Pleurostomella sp.
Ramulina sp.
Saracenaria sp.
Stilostomella sp.
Aragonia velascoensis CUSHMAN
Biglobigerinella barri BOLLI, LOEBLICH & TAPPAN
Marssonella oxycona REUSS

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PLATE 1

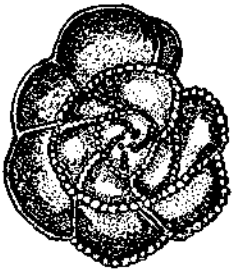
Figs. 1 a—c. *Globotruncana arca* (CUSHMAN). 1 a, Dorsal view; 1 b, side view; 1 c, ventral view.

Figs. 2 a—c. *Globotruncana mayaroensis* BOLLI. 2 a, Dorsal view; 2 b, side view; 2 c, ventral view.

Figs. 3 a—c. *Globotruncana gansseri* BOLLI. 3 a, Dorsal view; 3 b, side view; 3 c, ventral view.

Figs. 4 a—c. *Rugoglobigerina petaloidea petaloidea* GANDOLFI. 4 a, Dorsal view; 4 b, side view; 4 c, ventral view.

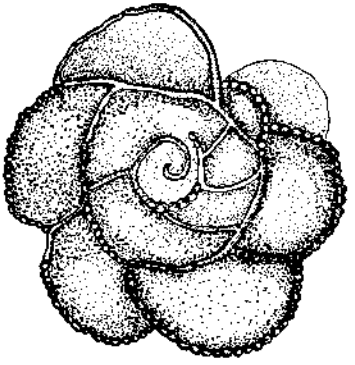
PLATE 1



1a

1b

1c



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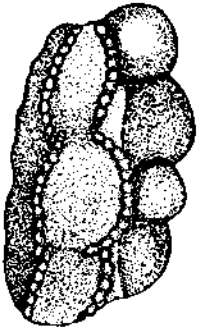

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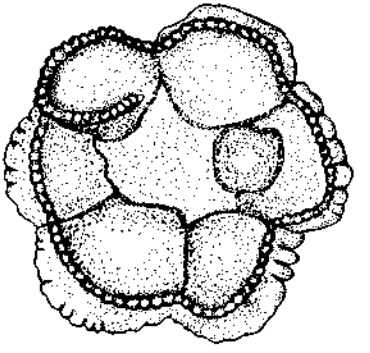


2c

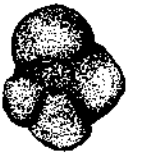
3a

3b

3c

4a

4b



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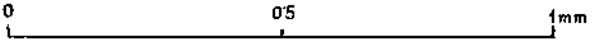
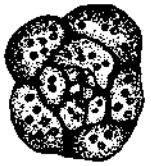


PLATE 2

Figs. 1 a—c. *Rugoglobigerina rugosa rotundata* BRÖNNIMANN. 1 a, Dorsal view; 1 b, side view; 1 c, ventral view.
Fig. 2. *Reussella szajnochae szajnochae* (GRZYBOWSKI).
Fig. 3. *Bulimina arkadelphiana* CUSHMAN & PARKER.
Fig. 4. *Bolivina incrassata incrassata* REUSS.
Fig. 5. *Bolivina incrassata gigantea* WICHER.
Fig. 6. *Bolivinoides draco draco* MARSSON.

PLATE 2



1a

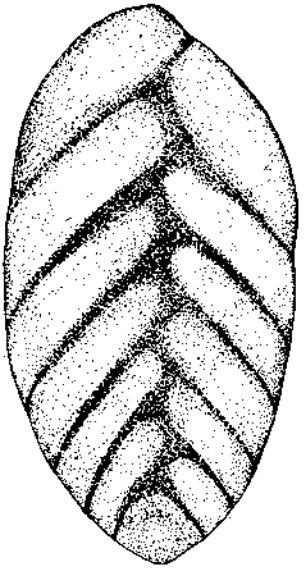
1b

1c

2

3

4



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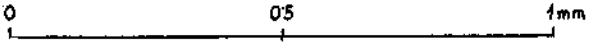


PLATE 3

Fig. 1. *Bolivinoides peterssoni* BROTZEN.
Fig. 2. *Bolivinoides paleocenicus* BROTZEN.
Fig. 3. *Planoglobulina acervulinoides* EGGER.
Fig. 4 a—c. *Stensioeina pommerana* BROTZEN. 4 a, Dorsal view; 4 b, side view; 4 c, ventral view.
Fig. 5. *Neoflabellina*, aff. *numismalis* (WEDEKIND).
Fig. 6. *Neoflabellina reticulata* (REUSS).

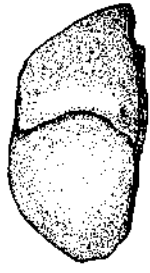
PLATE 3

1

2

3

4a



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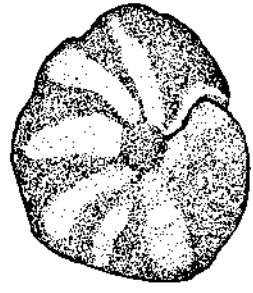
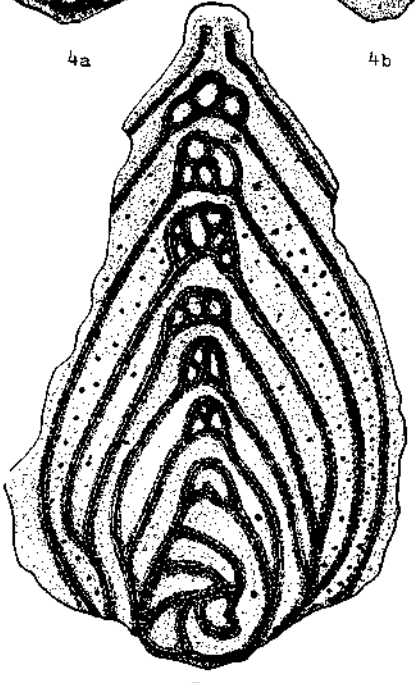
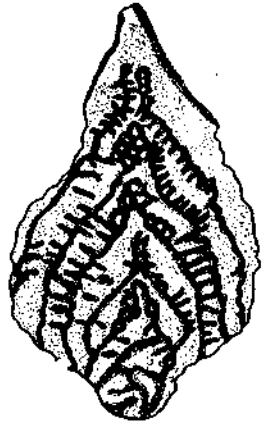


4c



5



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0 0·5 1 mm