

**Revision of the micro-coprolite *Palaxius ? triasicus* (Elliott),
1962, and description of a new Triassic thalassinid anomuran
(Crustacea, Decapoda) coprolite from France, Austria and Libya.**

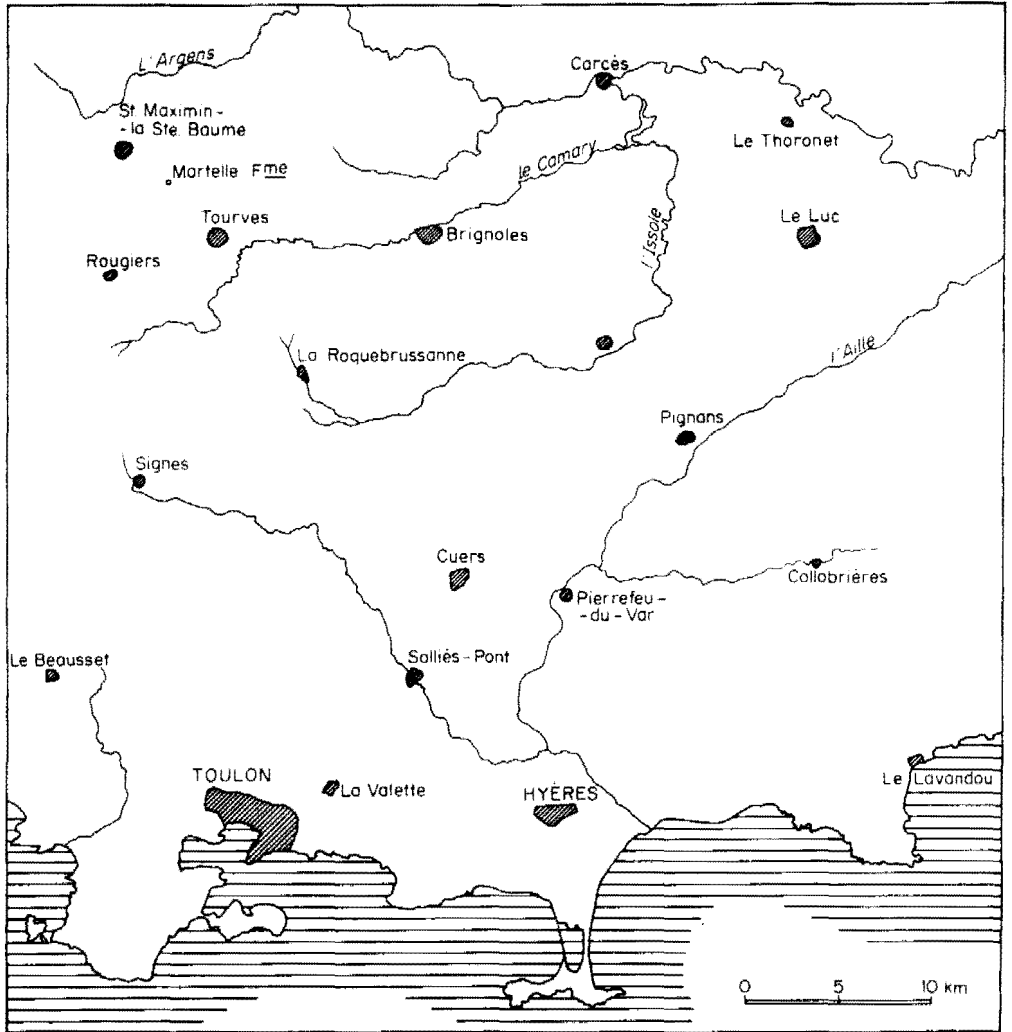
by

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Text-figure 1

Map showing the geographic situation of „La Martelle Ferme“ near St-Maximin, Provence, southern France.

Summary

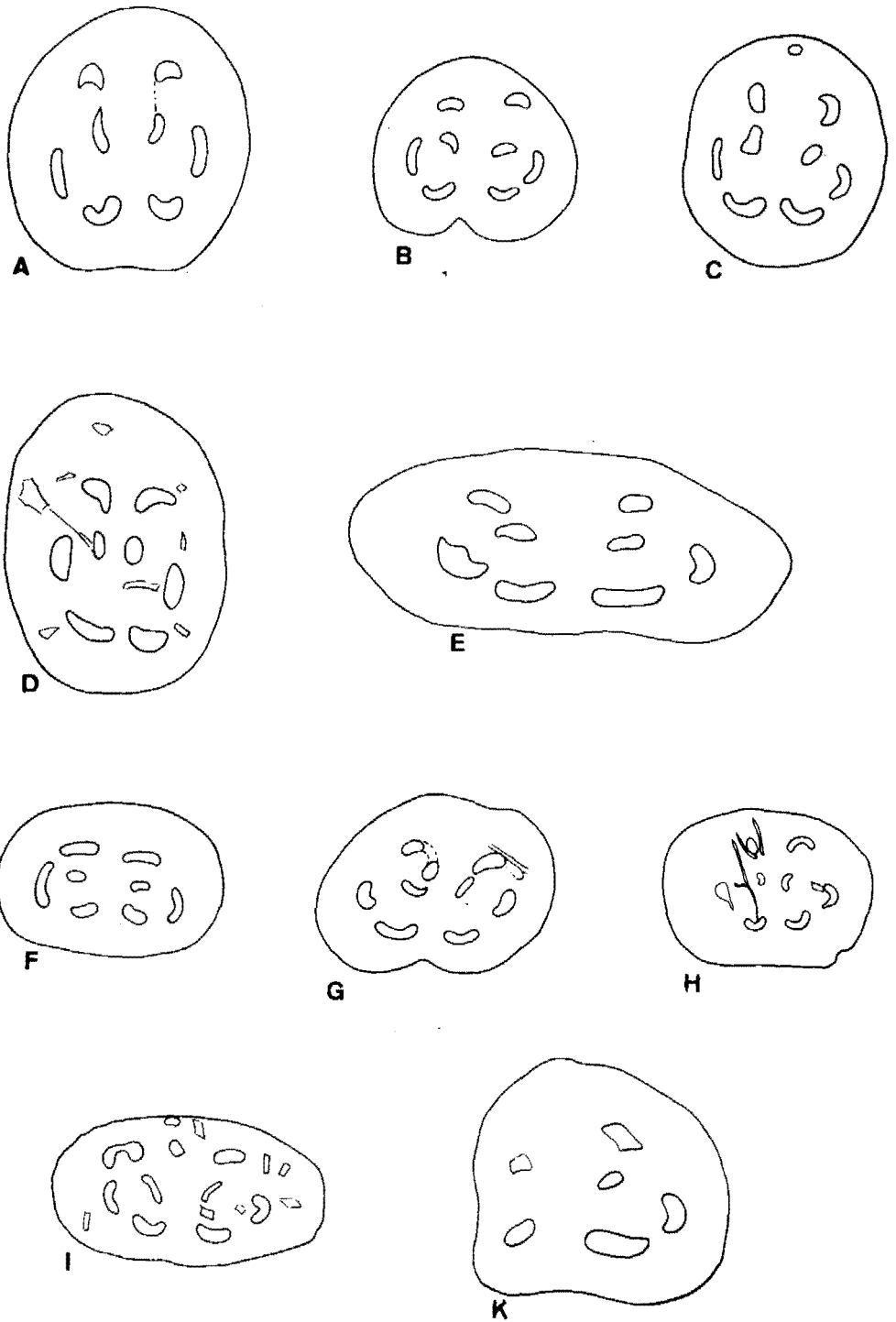
Favreina triasica Elliott, 1962, from the Middle Triassic of northeast Iraq is referred with reservation to *Palaxius* Brönnemann and Norton, 1960, and a lectotype is designated from Elliott's syntypic series. *Favreina martellensis*, n. sp., with a total of 6 favreine longitudinal canals is described from the „Upper Muschelkalk“ of Provence, southern France. This favreine coprolite form-species has also been recorded in the Anisian of the Préalpes médianes rigides of Haute-Savoie, France, in the Norian „Hauptdolomit“ of Austria, and in the Upper Ladinian to Carnian Azizia formation of Libya.

1. Revision of *Palaxius* ? *triasicus* (Elliott), 1962

In 1962 Elliott described a new anomuran coprolite from the Middle Triassic Upper Geli Khana formation, Sirwan, Sulemania Liwa, northeast Iraq, under the name of *Favreina triasica*. The synstypic series of this micro-coprolite form-species as defined by Elliott's pl. 2, fig. 1, 2, are composed of several more or less obliquely cut cross sections and longitudinal sections of an apparently palaxine fecal pellet. The rod-like pellet is pierced by a total of 8 longitudinal canals in 2 bilaterally symmetric groups of 4 canals each. As shown by Elliott's text-figures the 4 longitudinal canals of each group are in an asymmetric relationship. The 3 peripheral canals seem to be clearly palaxine with the convex portion of the crescents directed inward. The single central canal however seems to be of rounded or of indistinct palaxine cross section.

The British Museum (Natural History) most obligingly let us examine the thin sections Z. 917 and Z. 918 illustrated in part by Elliott. The lumina of the longitudinal canals as seen in cross sections are strongly recrystallized. This tends to mask or even obliterate their original shape. Dolomite rhombohedrons and patches of clear crystals occur at random in the fine-grained dark matrix of most cross sections of the coprolites. The careful analysis of the cross sections of the longitudinal canals reveals that the 3 peripheral canals are in fact more or less distinctly palaxine with the concave sides directed toward the center of each group of canals. The crescents are rather short, without peripheral tips, very similar to those described in the Miocene *Palaxius sirticus* Brönnemann and Norton, 1960. The cross sections of the unique central canal are smaller than those of the peripheral ones and also seem to be of palaxine type as shown by our pl. 1 and text-fig. 2.

The central canal, however, is generally very strongly recrystallized and our description is based on indistinct outlines hence clearly interpretative. In some cases a palaxine cross section seems to be present (pl. 1, fig. 1-15, 18, text-fig. 2) and in others we were unable to make out the original outlines of the cross sections because they are replaced by irregularly rounded-elongate patches of clear crystals. Although we are not absolutely certain that the original outline of the cross section of the individual central longitudinal canal is palaxine we tend to believe that it is in fact a short crescent. Hence we refer *Favreina triasica* with some doubt to *Palaxius* Brönnemann and Norton, 1960. According to Elliott (1962, p. 32) the cross sections of the longitudinal canals of this coprolite are



Text-figure 2

Fig. A-K *Palaxius? triasicus* (Elliott), 1962

Fig. A, B, F, G British Museum thin section Z. 918.

Fig. C-E, H-K British Museum thin section Z. 917.

All approx. 320 X.

The outlines of the longitudinal canals as seen in the transverse sections are in part interpreted.

throughout crescentic in outline. Should in better preserved material the individual central canal turn out to be of rounded favreine type then we would be in presence of a new form-genus of thalassinid anomuran coprolites characterized by a combination of palaxine and favreine longitudinal canals.

Class Crustacea (Anomura)

Order Decapoda

Tribe Thalassinidea

Genus *Palaxius* Brönnemann and Norton, 1960.

Palaxius ? triasicus (Elliott), 1962

Pl. 1, Fig. 1–15, 18. Text-fig. 2 A–K.

Synonymy:

1962. *Favreina triasica*. Elliott, p. 32, pl. 2, fig. 1, 2 (syntypic series).

1967. (Non) *Favreina* cf. *F. triassica* (sic). Lehmann, Rozeboom, Waller and Conley, pl. 6, fig. 1.

Definition of lectotype:

We are designating as the lectotype of *Palaxius ? triasicus* (Elliott) the cross section of a specimen in the thin section with the British Museum registration number Z. 918. This thin section is partially illustrated by pl. 2, fig. 2 of Elliott's paper (1962). The lectotype is in the right upper corner of Elliott's fig. 2. The cross section is virtually perpendicular to the longitudinal axis of the pellet. It shows a homogeneous micritic to finely granular texture with some dolomite rhombohedrons. It is 184 μ high in the plane of bilateral symmetry and 230 μ wide perpendicular to this plane. It is „ventrally“ flattened to faintly grooved and „dorsally“ gently convex. The longitudinal canals are arranged in 2 bilaterally symmetric groups of 4 canals each. The 3 peripheral canals are larger than the individual central canal and in this specimen the canals seem to be all of palaxine type with the concave sides of the crescent directed toward the interior of the group. A typical crescent is about 20 to 30 μ wide. The right side group of canals is about 60 μ wide and 105 μ high. Both groups are 20 to 25 μ apart.

The lectotype is here illustrated by pl. 1, fig. 2.

Remarks:

To present a good idea on the morphology and also on the difficulties regarding the analysis of the cross sections of the longitudinal canals we are illustrating by photographs

and interpretative camera lucida drawings many other cross sections of *Palaxius* ? *triasicus* (Elliott) from the thin sections Z. 917 and Z. 918 which are both partially illustrated by Elliott.

The maximum height of the cross sections perpendicular to the longitudinal axes range from about 150 to 280 μ . The maximum width varies from about 200 to 240 μ . A longitudinal section measures about 500 μ in length and about 160 μ in width. Some of the cross sections are „ventrally“ more or less grooved, others are „dorsally“ and „ventrally“ well rounded. The absence of the central „ventral“ groove in some individuals may be due to secondary abrasion of the pellets. The fecal pellets are numerous in both thin sections and accompanied by rare and smaller specimens of a new palaxine form-species with a total of 6 longitudinal canals arranged in 2 groups of 3 canals each. This form-species has only been encountered in 2 cross sections of thin section Z. 918. For the time no new formal name is proposed for thin coprolite.

Stratigraphic occurrence:

Middle Triassic.

2. Description of *Favreina martellensis*, n. sp.

Mr. J.-P. Caron, Département des Sciences de la Terre, Université d'Aix-Marseille I, St-Jérôme-Marseille, France, most kindly sent us 4 thin sections from an outcrop of Upper Muschelkalk at „La Martelle“ near St-Maximin, Provence, France, containing a new favreine coprolite which is here described.

Genus *Favreina* Brönnimann, 1955

Favreina martellensis Brönnimann and Zaninetti, n. sp.

Pl. 2, Fig. 1–7. Text-fig. A–L.

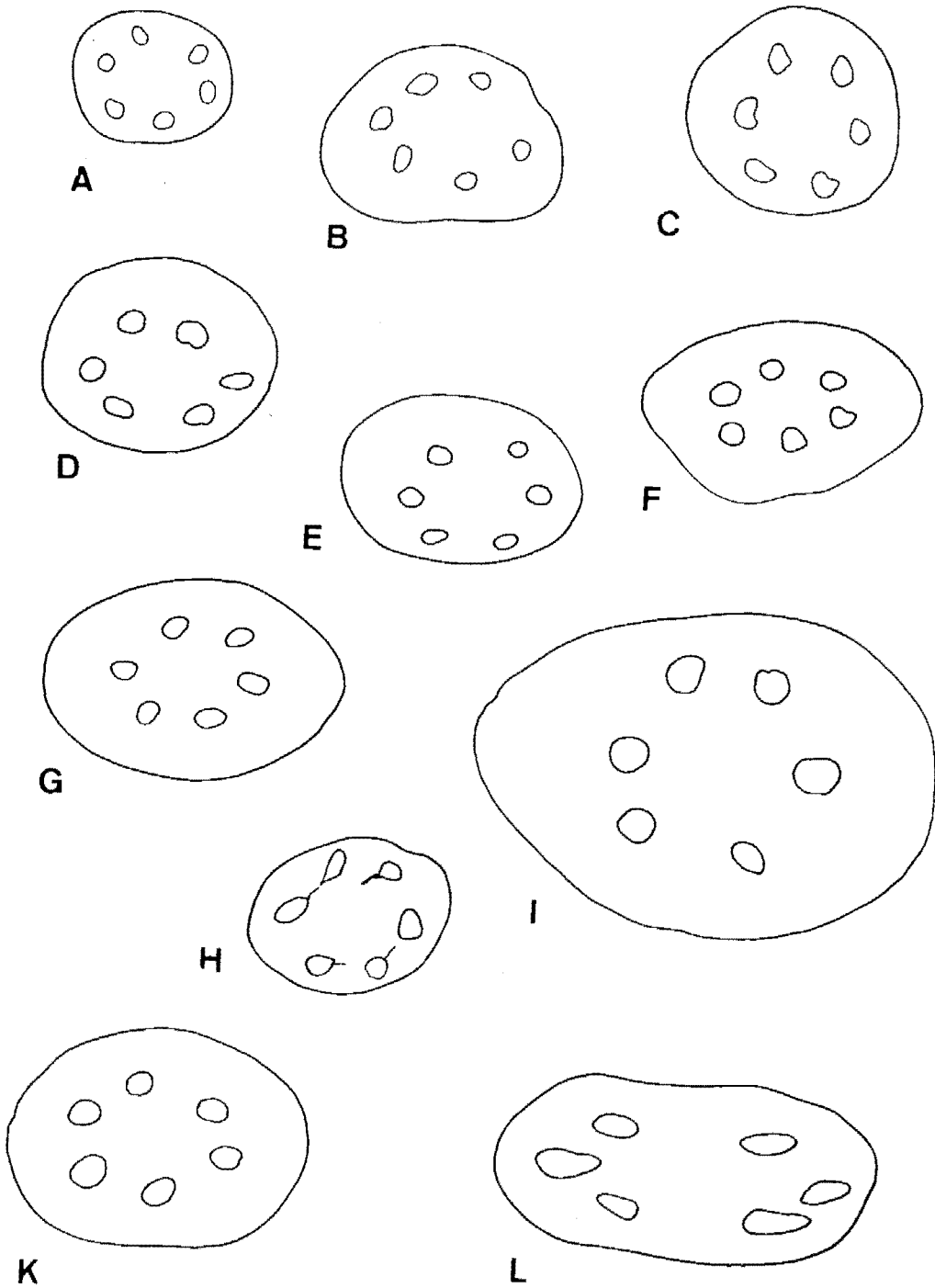
Synonymy:

1967. *Favreina* cf. *F. triassica* (sic) Lehmann, Rozeboom, Waller and Conley, pl. 6, fig. 1.
1970. Koprolithen. Müller-Jungbluth, pl. IV, fig. 9, (center left).

Description of holotype:

The holotype of *Favreina martellensis*, n. sp., is the specimen illustrated by the slightly obliquely cut cross section pl. 2, fig. 6 and text-fig. 3 G. The specimen is from Caron sample MI 11-10.68, Upper Muschelkalk, outcrop at „La Martelle“ near St-Maximin, Provence, France (text-fig. 1). The maximum height of the transverse section as seen in the thin section is about 120 μ and its maximum width 160 μ . The overall outline of the coprolite is subcircular to oval and the pellet itself is of ellipsoid shape. It is of homogeneous texture and pierced by a total of 6 favreine canals. They are arranged in 2 somewhat separated bilaterally symmetric groups of 3 canals each which can be subdivided in 2 median canals on a line parallel to the plane of bilateral symmetry and a single peripheral canal. In the holotype the maximum diameter of the canals is about 15 μ and that of a group of canals about 80 μ .

The 2 bilaterally symmetric groups are about 30 μ apart.



Text-figure 3

Fig. A-L *Favreina martellensis* Brönnimann and Zaninetti, n. sp.
 Fig. A, B, D, E, F, G, H, L Caron sample MB 11-10.68.
 Fig. K, C, I Caron sample MI 11-10.68.
 Holotype: Fig. G.
 All approx. 320 X.

Remarks:

The diameter of *Favreina martellensis*, n. sp., varies from about 100 μ to 320 μ . The number of longitudinal canals is the same in small and large specimens, only the diameters of the canals increase with increasing size of the pellet. In the transverse cut illustrated by text-fig. 3 H, some of the longitudinal canals extend into fissural spaces which are probably the result of the action of the pointed and flexible tips of the intestinal processes which produced the longitudinal canals. Such extensions of the longitudinal canals are occasionally seen to interconnect neighboring canals. They have been observed in many thalassinid and galatheid pellets and do not seem to be taxonomically significant. *Favreina martellensis*, n. sp., differs from all other favreine coprolites by the number and arrangement of the longitudinal canals. In our thin sections, the coprolite bodies almost merge with the surrounding sediment. The textures of coprolite and matrix are virtually identical.

Lehmann, Rozeboom, Waller and Conley (1967, pl. 6, fig. 1) illustrated a typical representative of *F. martellensis*, n. sp., from the Azizia formation, a dolomite-limestone sequence outcropping near Azizia a locality in the eastern part of Gebel Nefusa about 38 km SSW of Tripoli, Libya. The age of the Azizia formation is given by the authors as Upper Ladinian to Carnian that is late Middle to early Upper Triassic. They arrived at this age by considering faunal content and lithostratigraphic relationship of the Azizia formation with overlying and underlying units. The authors described the type of environment in which the *Favreina martellensis*, n. sp., producing crustaceans lived as a relatively quiet water inner shelf milieu. An oblique cut of *Favreina martellensis*, n. sp., was also illustrated by Müller-Jungbluth (1970, pl. IV, fig. 9). It is from the Upper Hauptdolomite of Norian age, Salvesental, eastern Lechtaler Alpen, Tirol, Austria.

It occurs in a pellet type sediment with other coprolites, pellets of algae, and aphanitic pellets and lumps („Bioarenoaphanit“) which is referred by Müller-Jungbluth to the supra-tidal to subtidal region of deposition in a very shallow-water sea with strong tidal action. A typical specimen of *F. martellensis*, n. sp., has also been recorded in Baud sample EN 103001 from his Middle? to Upper Anisian sequence IV, Préalpes médianes rigides, outcropping at Eperon du Nant, Val d'Abondance, Chablais, Haute-Savoie, France (Brönnimann, Zaninetti and Baud, 1972).

Bibliography

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- BRÖNNIMANN, P., ZANINETTI, L. and BAUD, A., 1972 – New thalassinid anomuran (Crustacea, Decapoda) coprolites from the Anisian of the Préalpes médianes rigides of Switzerland and France (Chablais). (This volume)

Explanation to Plate 1

- Fig. 1–5, 17?, 18 *Palaxius ? triasicus* (Elliott), 1962.
Fig. 5, 8, 10, 15 from thin section British Museum No. Z. 917.
Fig. 1–4, 6, 7, 9, 11–14, 17, 18 from thin
Fig. 1, 2, 8, 13: appr. 230 x
Fig. 4, 15: appr. 175 x.
Fig. 3, 5–7, 9–12, 14, 18: appr. 140 x.
- Fig. 16 *Palaxius* sp.
Thinsection British Museum No. Z. 918.
Appr. 670 x.

Explanation to Plate 2

- Fig. 1–7 *Favreina martellensis* Brönnimann and Zaninetti, n. sp.
Fig. 1, 4, 6, 7: Caron sample MI 11–10.68
Fig. 2: Caron sample MB 11–10.68
Fig. 3: Caron sample M 30–575
Holotype Fig. 6
All approx. 220 x.

Texturally the coprolites almost merge with the surrounding micritic, dolomitic, very finely laminated sediment. The dark specks are dolomite rhomboheders. The outlines of the coprolite bodies are usually suggested by an accumulation of dark dolomite rhomboheders.

Fig. 5: Baud sample EN 1030 1, thin section 3, Eperon du Nant, Val d'Abondance, Chablais, Haute-Savoie, France. 390 X.

F. martellensis is here associated with *Palaxius aiglensis* Brönnimann, Zaninetti and Baud and *Palaxius rhomboideus* Brönnimann, Zaninetti and Baud.

Plate 1

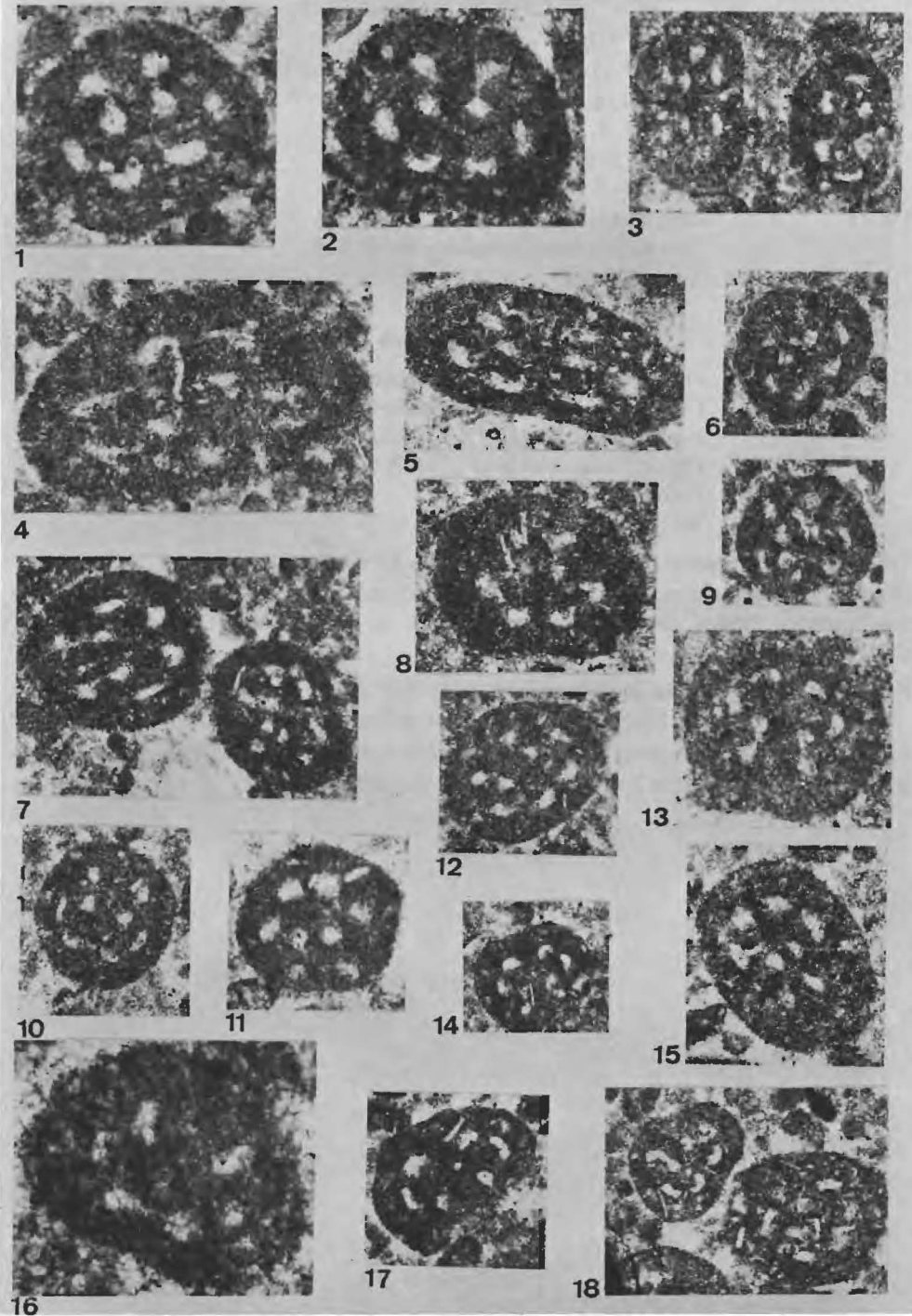


Plate 2

