

**New thalassinid anomuran (Crustacea, Decapoda)
coprolites from the Anisian of the Préalpes médianes rigides
of Switzerland and France (Chablais).**

by

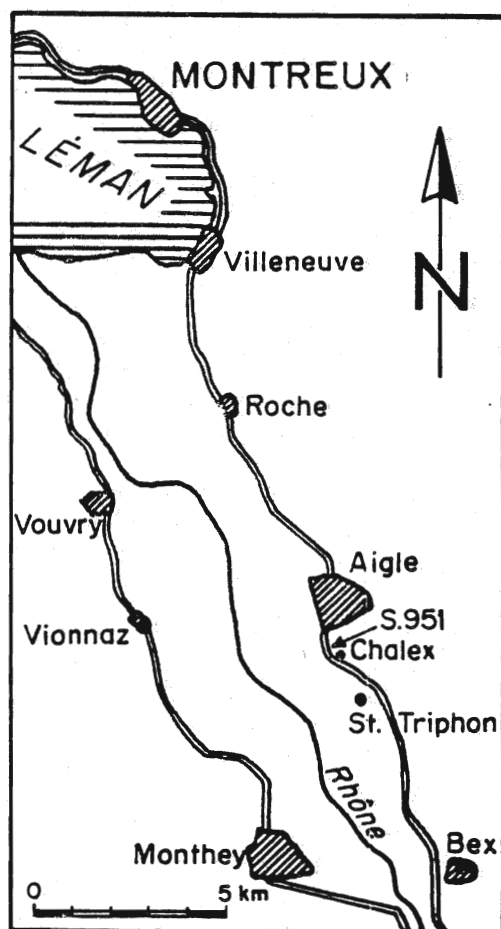
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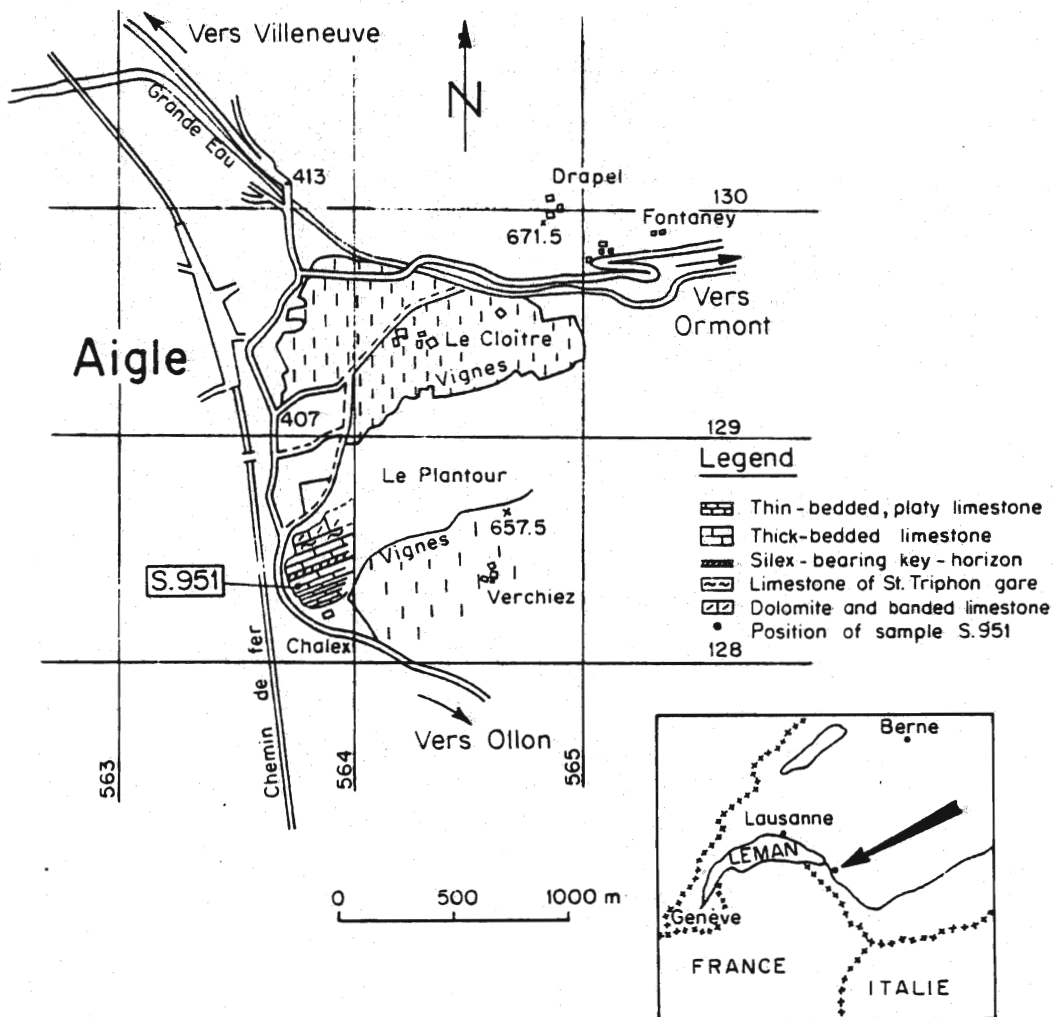
Text-figure 1 Geographic map showing the localities St-Triphon and Chalex.

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Summary

The thalassinid anomuran coprolites *Palaxius aiglensis*, n. sp., and *Palaxius rhomboideus*, n. sp., from the Préalpes médianes rigides of Switzerland and France are confined to the upper part of Baud's sequences IV of middle? to upper Anisian age. In some localities they are associated with rare *Glomospirella* aff. *G. triphonensis* Baud, Zaninetti and Brönnimann, 1971, *Glomospirella* sp., *Glomospira* sp., *Spiroplectamina* sp.? and *Ammobaculites* sp. However, the diagnostic foraminifera of Baud's sequence IV *Meandrosira dinarica* Kochansky-Devide and Pantic, 1965, *Glomospira densa* (Pantic), 1965 and *Glomospira* aff. *G. grandis* (Salaj), 1967, are absent in our material.

The calcareous sedimentary facies of the middle? to upper Anisian sequence IV is suggestive of a very shallow-water type of environment.



Text-figure 2 Geographic map showing the situation of Septfontaine sample S.951 at Chalex.

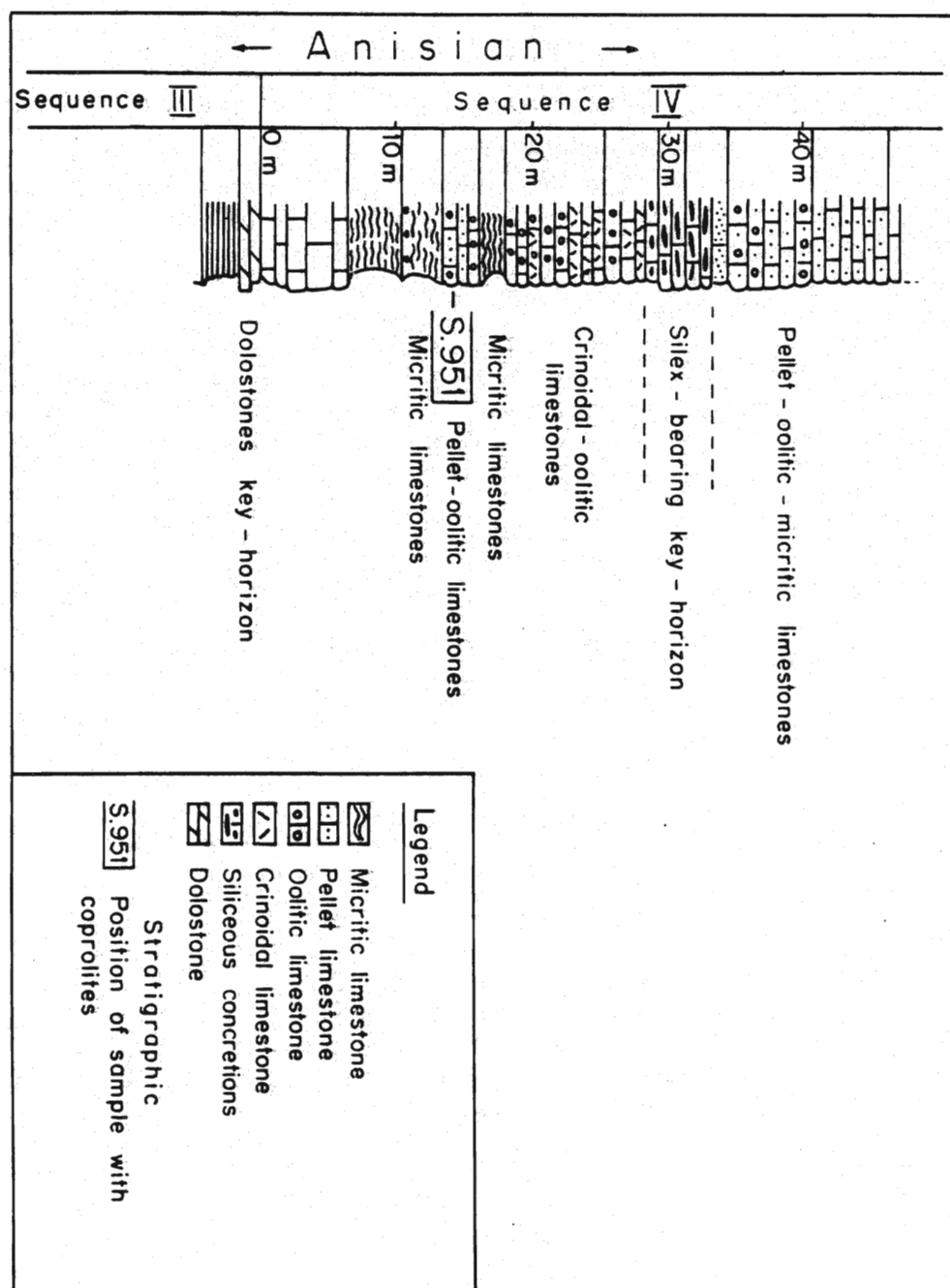
In the course of stratigraphic and micropaleontologic studies by Brönnimann, Septfontaine and Zaninetti of the Anisian limestones belonging to the nappes of the Préalpes médianes rigides romandes exposed in the stratigraphically inverted section at St-Triphon, 2.6 km SSE of the railroad station of Aigle, and in the almost vertically dipping section at the road cut about 1.2 km S of Aigle, just N of the locality Chalex (text-fig. 1, 2), a characteristic association of 2 palaxine coprolites, *Palaxius aiglensis*, n. sp., and *Palaxius rhomboideus*, n. sp., was encountered in sample Septfontaine S. 951 from the road cut at Chalex. Baud found this coprolite association at several other localities in the Préalpes médianes rigides in Switzerland and France (Chablais) (text-fig. 4). The stratigraphic situation of this coprolite association seems in all the mentioned localities to be confined to Baud's middle? to upper Anisian sequence IV. The coprolites occur either in or a few meters below or above the silex-bearing key-horizon of sequence IV. The position of this key-horizon is shown by text-fig. 2 and 3. We are re-illustrating in an emended form Baud's synthetic stratigraphic chart of the middle? to upper Anisian as text-fig. 3 a (Baud, Zaninetti and Brönnimann, 1971, p. 76, text-fig. 2).

Class Crustacea
Order Decapoda (Anomura)
Tribe Thalassinidea
Genus *Palaxius* Brönnimann and Norton, 1960.

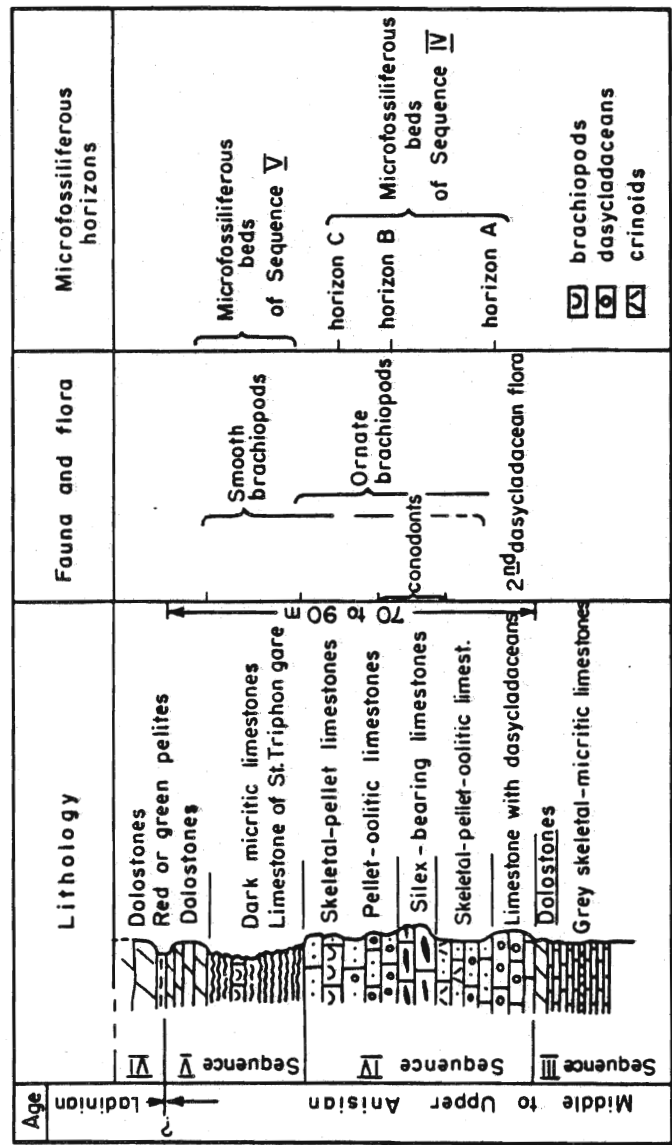
Palaxius aiglensis Brönnimann, Zaninetti and Baud, n. sp.
Pl. 1, Fig. 1-7. Text-fig. 5-7.

Description of holotype:

We designate as holotype of *Palaxius aiglensis*, n. sp., the transverse section of a rod-shaped coprolite, from thin-section S. 951, illustrated by pl. 1, fig. 2, and by text-fig. 5 A. The holotype is from a dark dolomitic limestone which in thin sections shows abundant densely packed dark pellets of micritic texture and echinoderm fragments in a strongly recrystallized, dolomitic, fractured, clear ground mass. The holotype is subcircular in general outlines, slightly larger than high with its „dorsal“ side convex and its „ventral“ side flattened. The maximum diameter in the plane of the bilateral symmetry is about 280 μ and that perpendicular to the plane of symmetry about 320 μ . The cross sections of the longitudinal canals are crescent-shaped, typically palaxine, with their concave sides directed laterally away from the plane of bilateral symmetry. Their tips do not seem to be much enlarged. The number of canals is 6. They are arranged in 2 symmetric groups of 3 each. The maximum length of a crescent is about 80 μ and its width ranges from about 10 to 15 μ . The pair of „ventral“ crescents are somewhat smaller about 56 μ in length than the lateral and „dorsal“ crescents which attain a length of about 80 μ .



Text-figure 3 Stratigraphic chart showing the position of Septfontaine sample S. 951 (holotype of *Palaxius aiglensis*, n. sp.).



Text-figure 3a Synthetic stratigraphic section of the Upper Anisian of the Préalpes médianes rigides (after Baud, Zaninetti and Brönnimann, 1971).

Stratigraphic situation of sample S. 951:

Sample S. 951 from which the thin sections containing the holotype of *P. aiglensis*, n.sp., was cut is from Anisian beds outcropping on the N side of the main road from Aigle to Bex, about 1 km south of Aigle, SE of Lac Léman, Switzerland. The coordinates of the outcrop are 563.75/128.32, 400 m (text-fig. 2). As shown by text-fig. 3 sample S. 951 comes from a limestone bed about 15 m above the dolomite horizon which separates the thin-bedded platy limestones, in part „calcaires vermiculés“, of Baud's sequence III from the thick-bedded limestones of his sequence IV. Above and below the bed of pelletalitic limestone from which sample S. 951 has been collected occur micritic limestones with the abundant wavy argillaceous pellicules characteristic of the „calcaires vermiculés“. Higher up follow 10 m of oolitic limestones occasionally rich in echinoderm probably crinoid fragments which are overlain by 5 m of silex-bearing limestone (silex-bearing key-horizon). The listed calcareous sediments are suggestive of tidal flat and of sub-tidal but very shallow and clear warm to temperate water environments. According to Baud, Zaninetti and Brönnimann (1971) the sequences III and IV are of middle ? to upper Anisian age.

In thin sections from S. 951, *P. aiglensis*, n. sp., is associated with *Palaxius rhomboideus* Brönnimann, Zaninetti and Baud, n. sp., and with rare *Glomospira* sp.

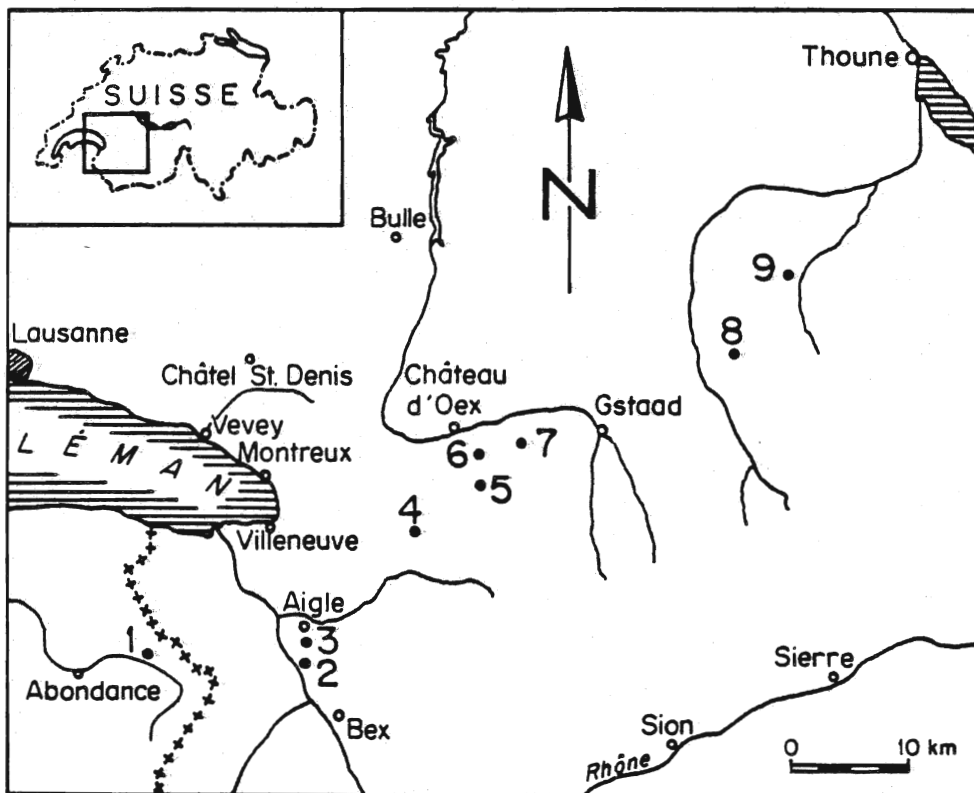
Remarks:

The remarkable feature of *Palaxius aiglensis*, n. sp., are the laterally not centrally directed concave portions of the crescent-shaped longitudinal canals. The concave sides of *Palaxius quaternarius* Brönnimann, Cros and Zaninetti, 1972, *Palaxius triasicus* (Elliott), 1962, *Palaxius habanensis* Brönnimann and Norton, 1960 (type species of *Palaxius* Brönnimann and Norton, 1960), *Palaxius petensis* Brönnimann and Norton, 1960, and of *Palaxius sirticus* Brönnimann and Norton, 1960, are facing each other or are directed toward the center of the coprolite. As the coprolites from sample S. 951 are without exception dolomitized, the crescents may not always exhibit their true outlines and a rapid examination may lead the observer to consider them as roughly subcircular in outline. This is particularly the case in oblique cuts as those shown by text-fig. 5 B and F.

Palaxius aiglensis, n. sp., was found by Baud, who is studying the stratigraphy of the Anisian of the Préalpes médianes rigides, also at the following localities usually associated with *Palaxius rhomboideus* Brönnimann, Zaninetti and Baud, n. sp., within his middle? to upper Anisian sequence IV (text-fig. 4):

Locality	Sample	Stratigraphic position
Eperon du Nant, Val d'Abondance, Chablais, Haute-Savoie, France	Baud EN 103001 (4 thin sections)	Sequence IV of Baud. Niveau 13; 15 m below the limestones with silex.
Wirienhor, Diemtigtal, Switzerland	Baud TW 81307 (6 thin sections)	Sequence IV of Baud. Niveau 21, 20 m above the limestones with silex.
	Baud TW 80608 (5 thin sections)	Sequence IV of Baud. Niveau 11, 8 m below the limestones with silex.

Spielgerten, Ferneltal, Switzerland	Baud SW 81202 (3 thin sections)	Sequence IV of Baud. Niveau 30; 12 m below the <u>limestones</u> with silex.
	Baud SW 81216 (4 thin sections)	Sequence IV of Baud. Niveau 44; 25 m above the <u>limestones</u> with silex.
Rocher Plat near Château d'Oex, Switzerland	Baud RP 81501 (6 thin sections)	Sequence IV of Baud. Niveau 12; 30 m above the <u>limestones</u> with silex.



Text-figure 4 Geographic map showing the Baud localities (after Baud, Zaninetti and Brönnimann, 1971);

- 1 Eperon de Nant, Val d'Abondance, Chablais, France.
- 2 St-Triphon
- 3 Chalex (road cut S of Aigle)
- 4 Mont d'Or (Cirque de l'Ecule et de Dorchaux)
- 5 Coumatta
- 6 Rocher du Midi Rochers de
- 7 Rocher Plat Château d'Oex
- 8 Rothorn, Spielgerten (Fermeltal)
- 9 Wirienhorn (Diemtital)

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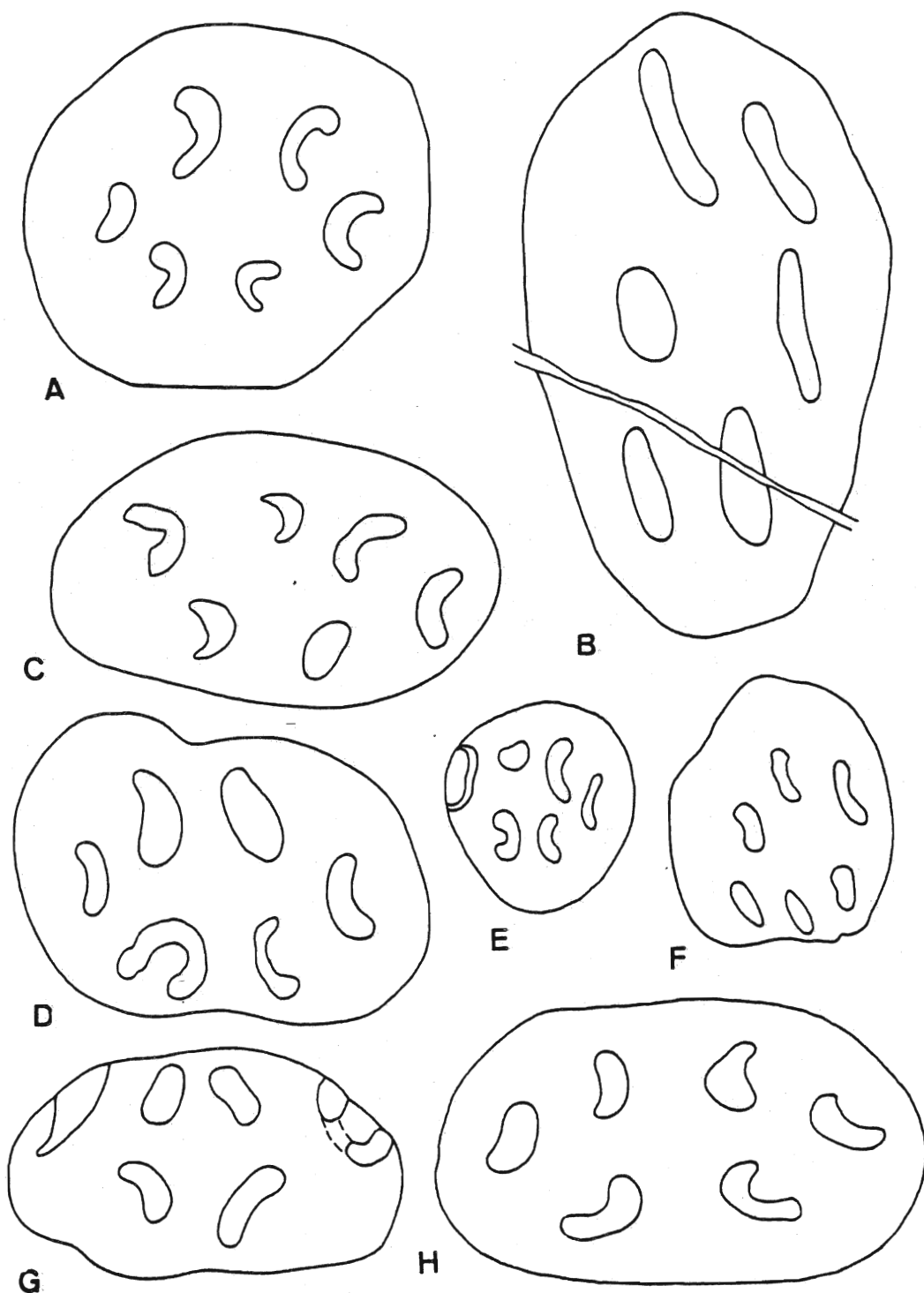
The coprolites from these localities are illustrated by pl. 1, fig. 1, 3–7, and by text-fig. 5 B-H, 6 and 7. They are generally less recrystallized than those from S. 951 at the road cut between Aigle and Ollon. The crescent-like cross sections of the longitudinal canals may show slightly enlarged tips. In the cross sections illustrated by pl. 1, fig. 1, 3, 4, 6 it was further noticed that the „ventral“ crescents are usually somewhat shorter than the lateral and „dorsal“ ones. In pl. 1, fig. 7, we have illustrated a diagenetically deformed cross section showing the „micro-boudinage effect“. The crescent-like form as well as the number of the canals are well preserved. Coprolites have also been examined in thin sections from the following Baud localities: Mont d'Or, Cirque de l'Ecuale et de Dorchaux, N of Col des Mosses, Switzerland, Baud samples 6869 and OE 91002; St-Triphon, Baud sample 9854 b, and doubtfully in sample 9854 d. All the listed samples are from Baud's sequence IV (text-fig. 3a). The coprolites are found either in the limestones with silex or some meters above of below this stratigraphic key-horizon. The coprolites from the listed 4 Baud samples from Mont d'Or and St-Triphon are either strongly recrystallized or longitudinally or strongly obliquely cut and do not permit analysis of form and disposition of the longitudinal canals. A single cut of a nondescript coprolite was encountered in a thin section from Baud sample RM 91501 from Rocher du Midi, Château d'Oex, pertaining to the upper part of Baud's sequence III of Middle Anisian age. No coprolites have so far been recorded in Baud's Lower Anisian sequences I and II. *Palaxius aiglensis*, n. sp., occurs throughout the Préalpes médianes rigides and apparently exclusively in Baud's sequence IV of middle? to upper Anisian age. Within this sequence the following horizons have furnished *Palaxius aiglensis*, n. sp.:

- a) the upper part of sequence IV, near Baud's bed C which is 20 to 30 m above the key limestones with silex.
- b) Baud's bed B which corresponds to the limestones with silex at the road cut southeast of Aigle (text-fig. 2, 3).
- c) the lower part of sequence IV, above the beds with *Physoporella prealpina* and above Baud's bed A which lies about 8 to 15 m below the limestones with silex.

The limestones with coprolites show in thin sections a micritic, or a pelmicritic to pelsparitic texture. Echinoderm and pelecypod fragments occur throughout and apart from many fracture lines there are lines of stress indicated by deformed pellets and coprolites („micro-boudinage effect“). Pellets are occasionally recrystallized as small patches of large-sized dolomite rhomboheders.

Range:

Palaxius aiglensis, n. sp., is of middle? to upper Anisian age.



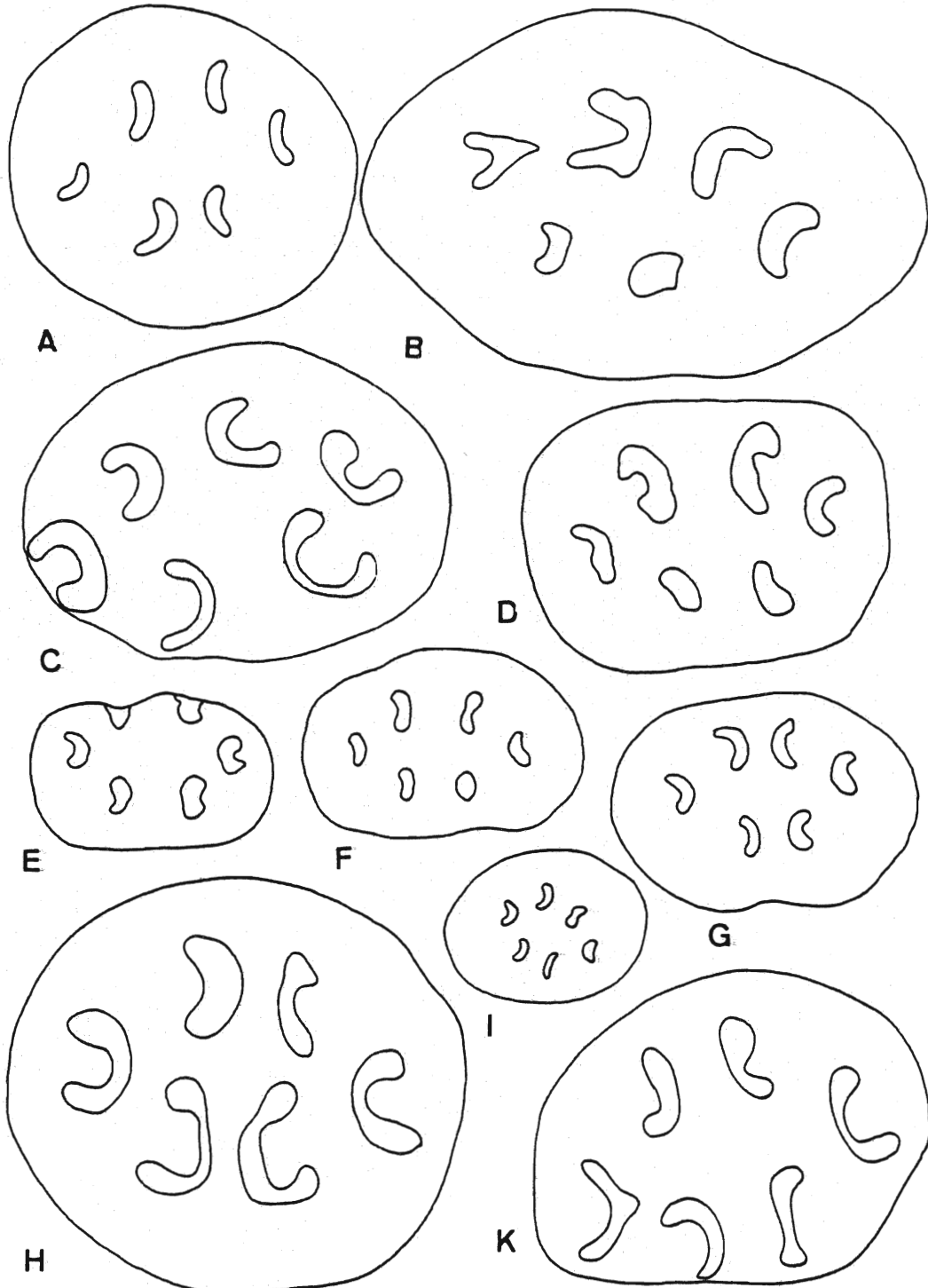
Text-figure 5 *Palaxius aiglensis* Brönnimann, Zaninetti and Baud, n. sp.

A-D, G, H: from sample S. 951, Chalex.

E, F: from Baud sample SW 81202, Spielgarten.

Holotype: 5 A

All approx. 175 x.



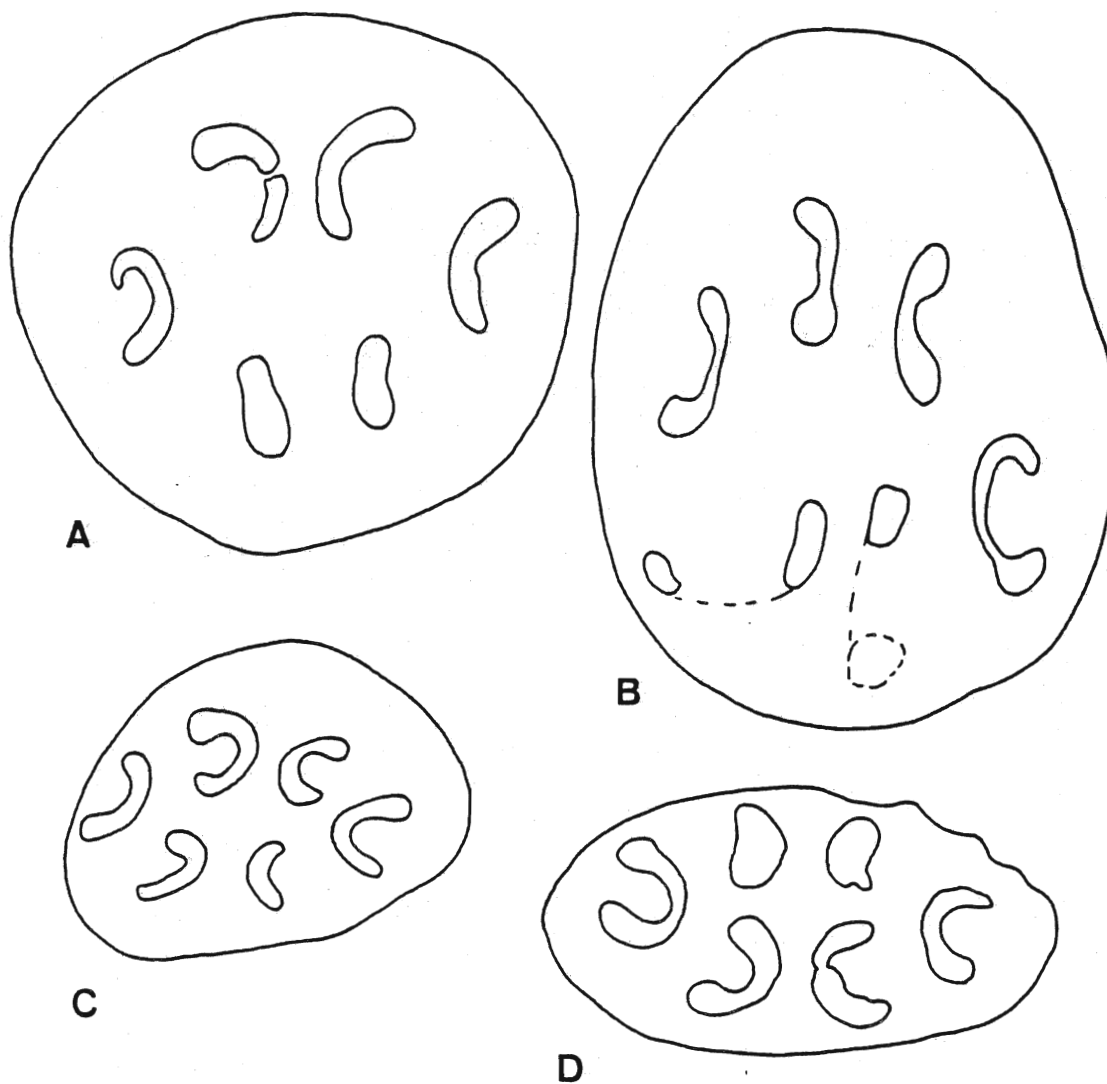
Text-figure 6 *Palaxius aiglensis* Brönnimann, Zaninetti and Baud, n. sp

A: Baud sample SW 81202

C, I, H, K: Baud sample SW 81216 Spielgarten

B, D, E, F, G: Baud sample EN 103001, Eperon de Nant.

All approx. 175 x.



Text-figure 7 *Palaxius aiglensis* Brönnimann, Zaninetti and Baud, n. sp.
A, B, D: Baud sample TW 81307, Wirienhorn.
C: Baud sample SW 81216, Spielgarten.
All approx. 175 x.

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Palaxius rhomboideus, Brönnimann, Zaninetti and Baud, n. sp.

Pl. 1, fig. 8–18. Text-fig. 8 A–K

Description of holotype:

We designate as holotype of *Palaxius rhomboideus*, n. sp., the transverse section of the rod-like coprolite illustrated by pl. 1, fig. 17 and by text-fig. 8 D. It is from sample SW 81216, Spielgerten, Fermeltal, Switzerland (text-fig. 4), from Baud's sequence IV, middle ? to upper Anisian, niveau 44, 25 m above the limestones with silex (text-fig. 3a).

The outlines of the transverse section of *Palaxius rhomboideus*, n. sp., approximates roughly a rhombus although it is „ventrally“ broadly rounded to slightly grooved. „Dorsally“ it is pointed in the plane of symmetry. Also the lateral extensions are somewhat pointed. Its maximum height in the plane of bilateral symmetry is about 143μ , and its maximum width perpendicular to the plane of bilateral symmetry about 265μ . The new palaxine species is characterized by 2 longitudinal canals which in transverse section are crescent-shaped. The crescents are rather uniform in thickness and do not possess enlarged tips. They are arranged symmetrically to the plane of symmetry. Their concave sides are laterally directed, away from the center of the coprolites, similar to those in *Palaxius aiglensis* Brönnimann, Zaninetti and Baud, n. sp. Their maximum length is about 56μ and their width about 10μ .

Remarks:

Palaxius rhomboideus, n. sp., is throughout associated with but occurs never as commonly as *Palaxius aiglensis*, n. sp. The similar palaxine features of the longitudinal canals as seen in transverse section suggest that both species are closely related. The roughly pointed lateral extensions are in some specimens slightly upturned (pl. 1, fig. 14). These fecal pellets are frequently strongly worn and the original rhomboid outline may become ovoid to ellipsoid. Recrystallization frequently attacks the lumina of the canals so that the original crescent-like outlines become elongate to roughly rounded. The dimensions of the illustrated specimens of *P. rhomboideus* range rather widely from about 255μ to 360μ in width and from about 120μ to 192μ in height.

Range:

Palaxius rhomboideus, n. sp., occurs in the middle? to upper Anisian.

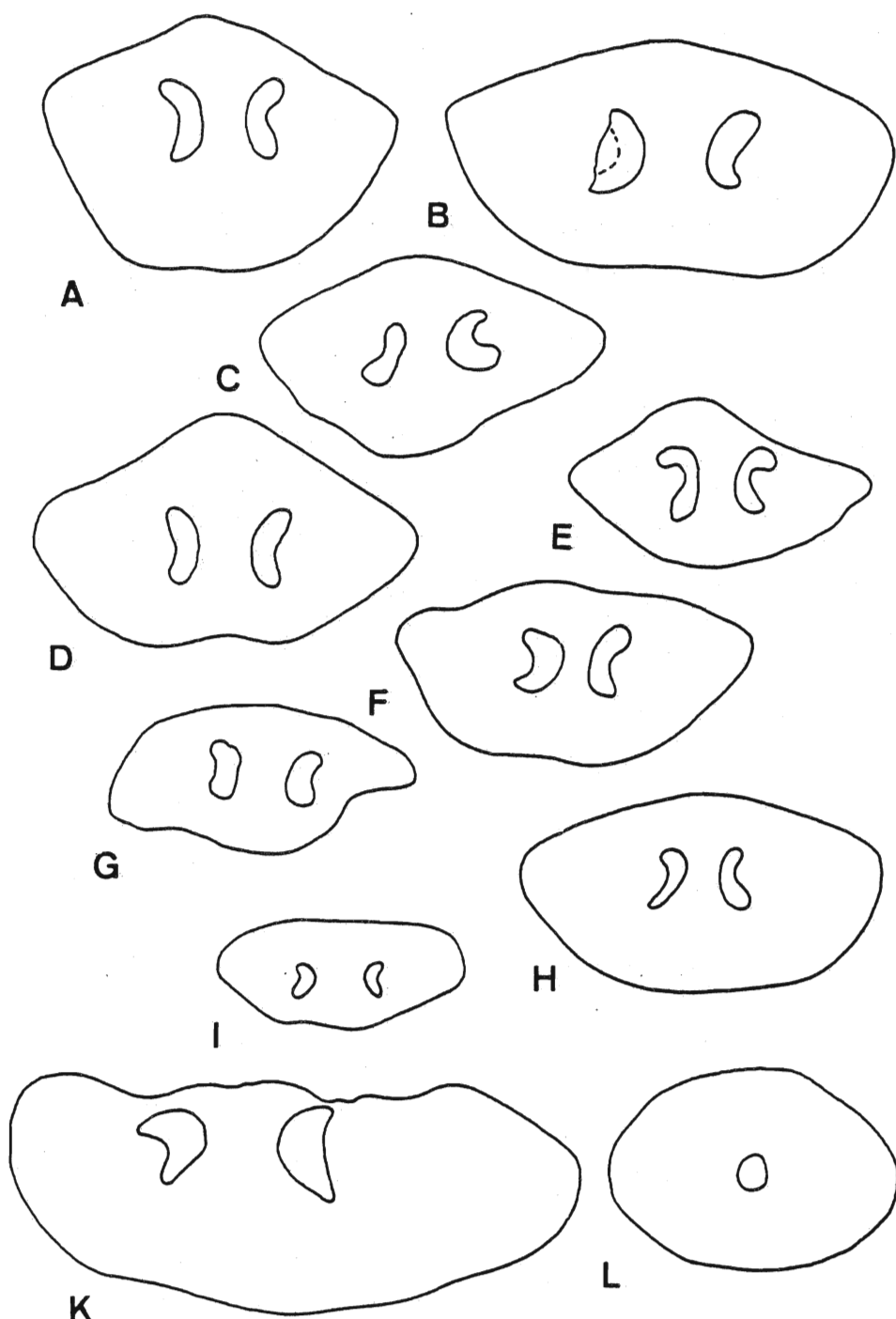
Favreina? sp.

Text-fig. 8 L

We have illustrated by text-fig. 8 L a transverse section of a favreine? coprolite with a single central, rounded longitudinal canal. We are placing this transverse section with all reservation in *Favreina* Brönnimann.

Remarks on associated microfossils.

Associated with *P. aiglensis*, n. sp., and *P. rhomboideus*, n. sp., occur the following micro-organisms of which the Foraminifera are illustrated by text-fig. 9:



Text-figure 8 *Palaxius rhomboideus* Brönnimann, Zaninetti and Baud, n. sp.

A, G, K: Baud sample EN 103001, Eperon de Nant.

B, F, H: Baud sample SW 81202, Spielgarten.

C, D, E, I: Baud sample SW 81216, Spielgarten.

Holotype: 8 A.

Favreina sp.?

L: Baud sample SW 81216, Spielgarten.

All approx. 175 x.

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S. 951: *Glomospira* sp.

Baud RD 81501:

Glomospirella sp.

Ammobaculites? sp.

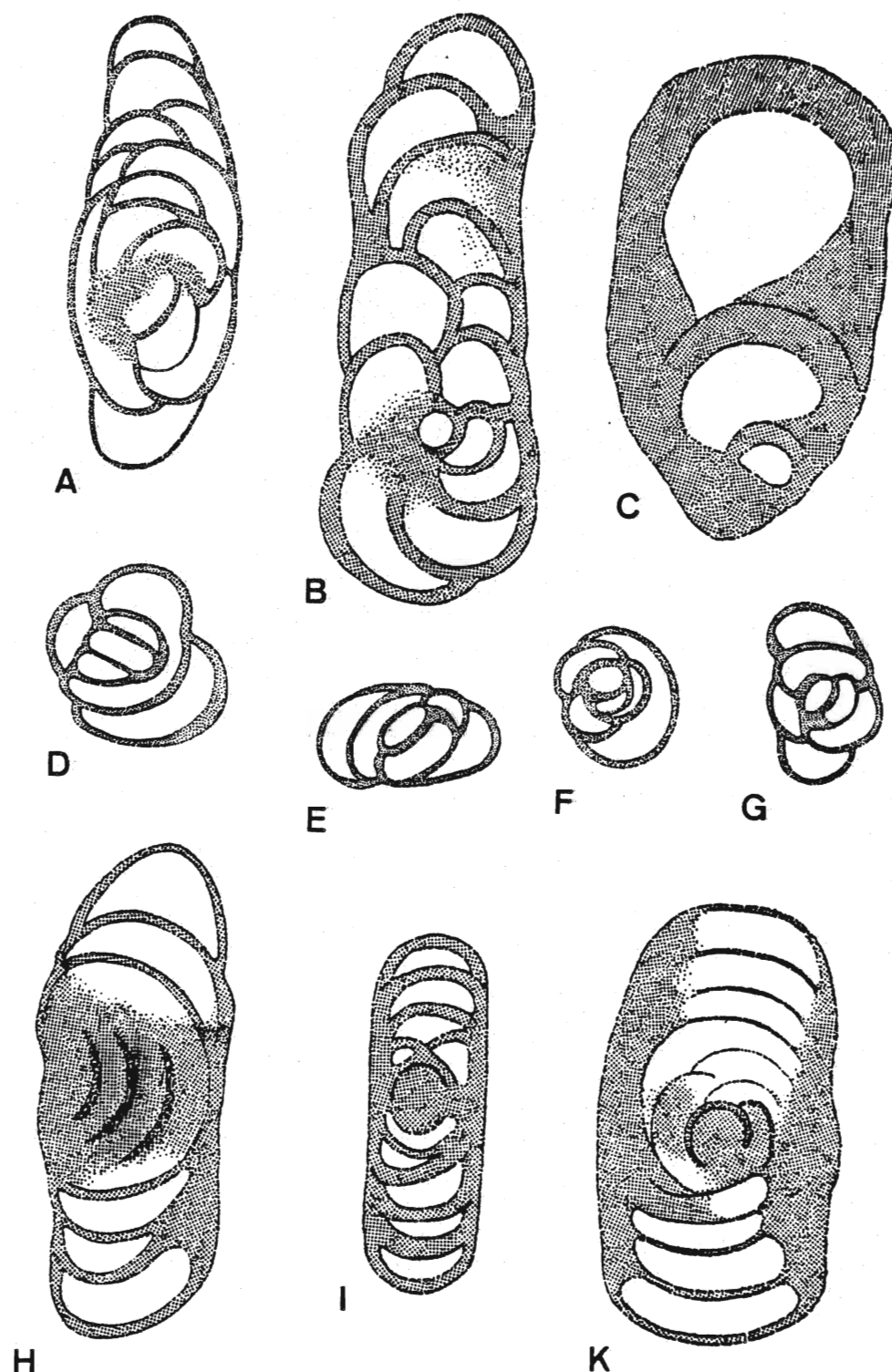
Spirorbis sp. A (thick-walled form)

Spriorbis sp. B (thin-walled form)

Baud SW 81202:

Glomospirella aff. *G. triphonensis* Baud, Zaninetti and Brönnimann.

Glomospirella triphonensis has been recorded by Baud, Zaninetti and Brönnimann (1971, p. 82, 93) from Baud's sequence V of uppermost Upper Anisian age.



Text-figure 9 A

Glomospirella sp.
Baud sample SW 81202, thin section 2, Spielgarten. 175 x.

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- B *Spiroplectammina* sp.?
Baud sample RP 81501, thin section 2, Rocher Plat,
Château d'Oex. 175 x.
- C *Ammobaculites* sp. Baud sample RP 81501, thin section 6,
Rocher Plat, Château d'Oex. 175 x.
- D-G *Glomospira* sp.
Septfontaine sample S. 951, road cut near Chalex.
All 175 x.
- H-K *Glomospirella* aff. *G. triphonensis*
Baud, Zaninetti and Brönnimann, 1971.
Baud sample RP 81501, thin section 3,
Rocher Plat, Château d'Oex.
All 400 x.

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Préalpes du Chablais, France). Arch. Sciences, Genève, vol. 24, p. 73–95.

Explanation to Plate 1

- Fig. 1-7 *Palaxius aiglensis* Brönnimann, Zaninetti and Baud, n. sp.
Fig. 1, 5-7 Baud SW 81216, Spielgarten Sequence IV.
Fig. 2 Septfontaine S. 951 road cut SE of Aigle, Sequence IV. Holotype.
Fig. 3 Baud R. P. 81501, Rocher Plat, Sequence IV.
Fig. 4 Baud. E. N. 103001, Eperon de Nant, Sequence IV.
Fig. 1, 3-7 150 x appr.
Fig. 2 220 x appr.
- Fig. 8-18 *Palaxius rhomboideus* Brönnimann, Zaninetti and Baud, n. sp.
Fig. 8, 15-18 Baud S. W. 81216, Spielgarten, Sequence IV. Fig. 17
Holotype.
Fig. 9, 10, 13 Baud E. N. 103001, Eperon de Nant, Sequence IV.
Fig. 11, 12, 14 Baud S. W. 81202, Wierienhorn, Sequence IV.
All 150 x appr.

Plate 1

