Géologie Méditerranéenne
Tome XXVI n° 1/2, 1999, pp. 67-77.

Occurence of the genus *Distefanella* Parona (Rudist, Bivalvia) in the Cenomanian beds of Western Turkey

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ABSTRACT

Two known species (*Distefanella bassanii* PARONA and *Distefanella* cf *montagnei* SLISKOVIC) and also a new species (*Distefanella tavassiana* n. sp.) of the genus *Distefanella* PARONA are first determined from the marbles of the Menderes metamorphic massif, around Tavas-western Turkey. The specimens of the genus are found together with the rudists with palleal canals indicating clearly middle-late Cenomanian age.

On the biogeographical point of view, the presence of the genus in the Cenomanian beds of Turkey, is a very important data showing a wide geographic and stratigraphic distribution of the genus in the Mediterranean province.

RÉSUMÉ

Le genre *Distefanella* Parona (Rudiste, Bivalvia) dans le Cénomanien de la Turquie occidentale. Deux espèces connues (*Distefanella bassanii* PARONA et *Distefanella* cf. *montagnei* SLISKOVIC) ainsi qu'une nouvelle espèce (*Distefanella tavassiana* n. sp.) de *Distefanella* PARONA, sont déterminées pour la première fois dans les marbres du massif métamorphique du Menderes, dans les environs de Tavas (Turquie occidentale). Les exemplaires du genre sont trouvés avec des rudistes à canaux indiquant clairement un âge cénomanien (moyen-supérieur).

Du point de vue biogéographique, la présence du genre dans le Cénomanien de Turquie, est une importante donnée attestant la vaste distribution géographique et stratigraphique de ce genre dans la Province méditerranéenne.

KEY-WORDS : Cenomanian, Western Turkey, Menderes metamorphic massif, Rudists, *Distefanella*, Mediterranean province.
MOTS-CLÉS : Cénomanien, Turquie occidentale, Massif métamorphique du Menderes, Rudistes, *Distefanella*, Province méditerranéenne.

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I - INTRODUCTION

Although the rudist genus *Distefanella* PARONA has a wide geographic distribution in the Mediterranean province (POLSAK, 1968 ; POLSAK & MAMUZIC, 1969 ; SLISKOVIC, 1971 ; ACCORDI *et al.*, 1982 ; MARTIN-CHIVELET *et al.*, 1990), there was not any data on the existence of this genus in the rudist fauna from the different regions of Turkey (KARACABEY, 1972 ; ÖZER, 1983, 1992 a, b, c). The first occurence of this genus in Turkey, has been recently reported by ÖZER (1998) from the marbles of the Menderes metamorphic massif The study of these specimens reveals two known species, and also a new species which are here determined.

The specimens of the genus are collected from the Cenomanian beds of the Menderes Massif cropping out in the north of the Serinhisar (formerly Kizilhisar) village, Tavas area (fig. 1).

II - GEOLOGICAL SETTING AND STRATIGRAPHY

In the western part of Turkey occurs the tectonic belts, such as, from north to south, Izmir-Ankara zone, Karaburun belt, Menderes Massif, Lycian nappes, and Beydaglari carbonates (fig. 1). The Menderes Massif is differentiated from the other belts by occuring of metamorphic rocks.

Menderes metamorphics consist of, in ascending

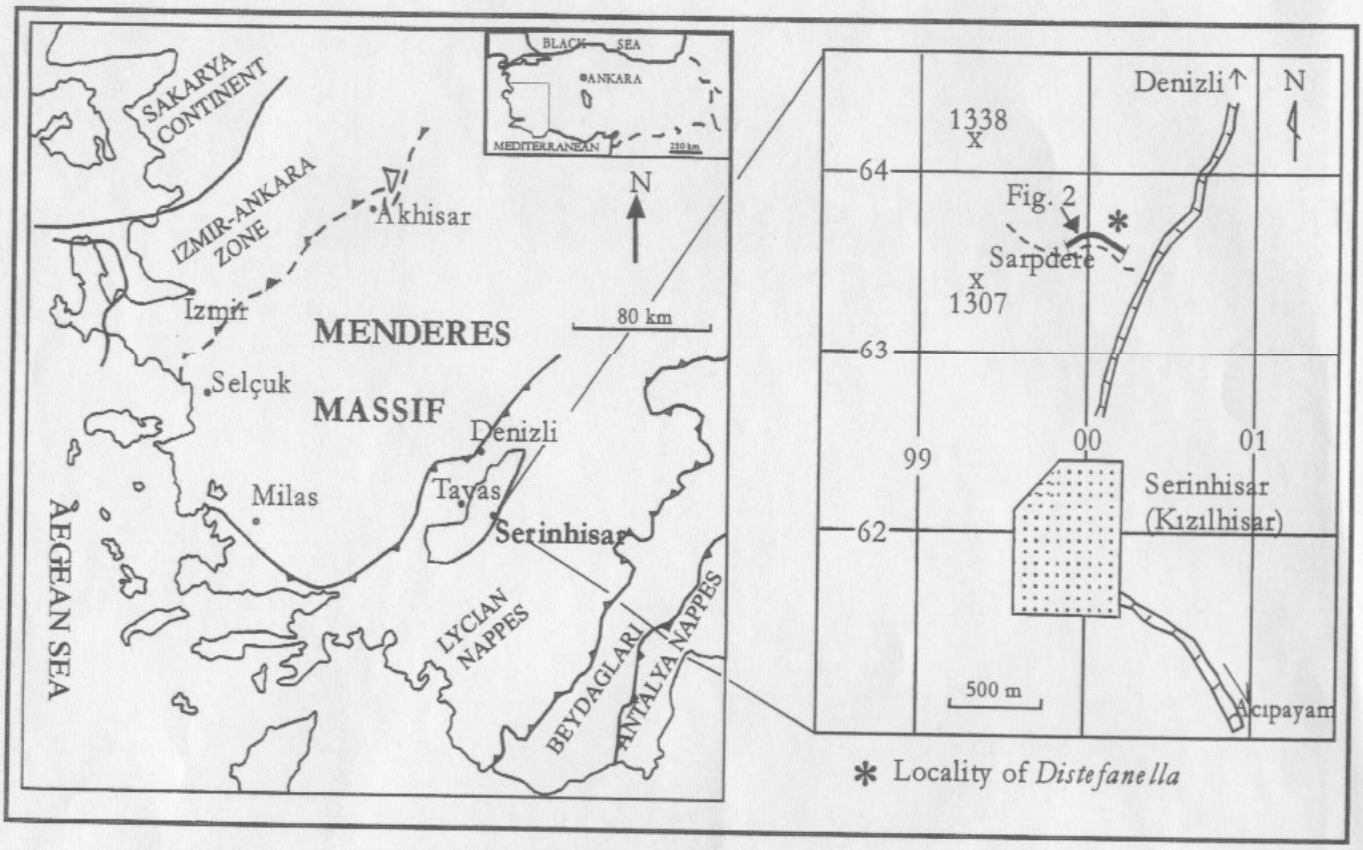

Figure 1 — Map showing the main tectonic belts of the western Turkey and the location of the *Distefanella* PARONA in the Serinhisar (Tavas area) belonging one of the sliver of the Menderes metamorphic massif.

order, the core series (gneisses, schists, metagranites, migmatites and gabbros) of Precambrian to Cambrian age, and cover series (micaschists, metaquartzites, platform-type marbles with emery and rudists, pelagic marbles and flysh-type rocks) of Permo-Carboniferous, Mesozoic and Lower Tertiary ages (BRINKMANN, 1967 ; DÜRR, 1975 ; ÇAGLAYAN *et al.*, 1980 ; SENGÖR *et al.*, 1984 ; KONAK *et al.*, 1987 ; OKAY, 1989 ; DORA *et al.*, 1990 ; DÜRR *et al.*, 1995).

Menderes Massif crops out mainly over a large area in the western of Turkey, however one of the sliver is also observed in the Kale-Tavas area where the specimens of the *Distefanella* are found (fig. 1).

In the Kale-Tavas area Menderes metamorphics are represented by the cover series. The Mesozoic neritic, monotonous, platform-type marbles are observed in a major NE-SW striking mountain chain extending over a large area from southeast of Tavas to Denizli showing an imbricated internal structure (POISSON & SARP, 1977 ; POISSON, 1985 ; OKAY, 1989 ; ÖZKAYA, 1990, 1991). According to the previous studies, Serinhisar (formerly Kizilhisar) is a single fossiliferous locality represented mainly by the rudists in Kale-Tavas area (ÇAGLAYAN *et al.*, 1980 ; POISSON & SARP, 1977 ; OKAY, 1989 ; ÖZKAYA, 1990, 1991). The rudists of this locality are observed in the Sarpdere section, north of Serinhisar (fig. 1).

In the Sarpdere section, two formations named by OKAY (1989) are distinguished as follows (fig. 2) :

Yilanli formation : The formation consists of mainly grey, massive, rudist-bearing platform type marbles. The succesion is characterized by the alternation of bioclastic and rudistid levels in the lower part of the section. These levels are approximately 25-30 m thick, and mainly composed of rudist with canals indicating middle-late Cenomanian age : *Neocaprina gigantea* PLENICAR, *Caprina schiosensis* BOEHM, *Ichthyosarcolites rotundus* POLSAK, *I. tricarinatus* PARONA, *I. bicarinatus* (GEMMELLARO), *I. poljaki* POLSAK, *Spraeucaprina* cf. *forojuliensis* BOEHM, *Schiosia* cf. *schiosensis* BOEHM (Pl. I, figs. 4, 5, Pl. II, fig. 5). The known species of genus *Distefanella* PARONA like *Distefanella bassanii* PARONA, *Distefanella* cf. *montagnei* SLISKOVIC and also a new species *Distefanella tavassiana* n. sp. are found in these levels (Pl. I, figs. 1 to 3, Pl. II, figs. 1-4). *Durania* sp., *Eoradiolites* cf. *liratus* (CONRAD), *Chondrodonta* sp. and *Apricardia* sp., are also associated to this fauna. The rudist-bearing marbles pass upward to grey, massive, 30-35 m thick, unfossiliferous marbles. Towards to upper part section rudist-bearing, 10-15 m thick, grey marbles are appeared. The rudist diversity of these levels is very low. Only, some small buildups mainly consisting of *Vaccinites taburni* GUISCARDI of Santonian-Campanian age, are observed. These levels also show intercalation of bioclastic marbles. The uppermost part of the formation consists of massive, grey marbles.

Zeybekölentepe formation : The formation consists of red-pinkish shales, mudstones and breccias. The age of the formation is accepted as Paleocene-Early Eocene according to the previous studies (POISSON & SARP, 1977 ; OKAY, 1989 ; ÖZKAYA, 1990).

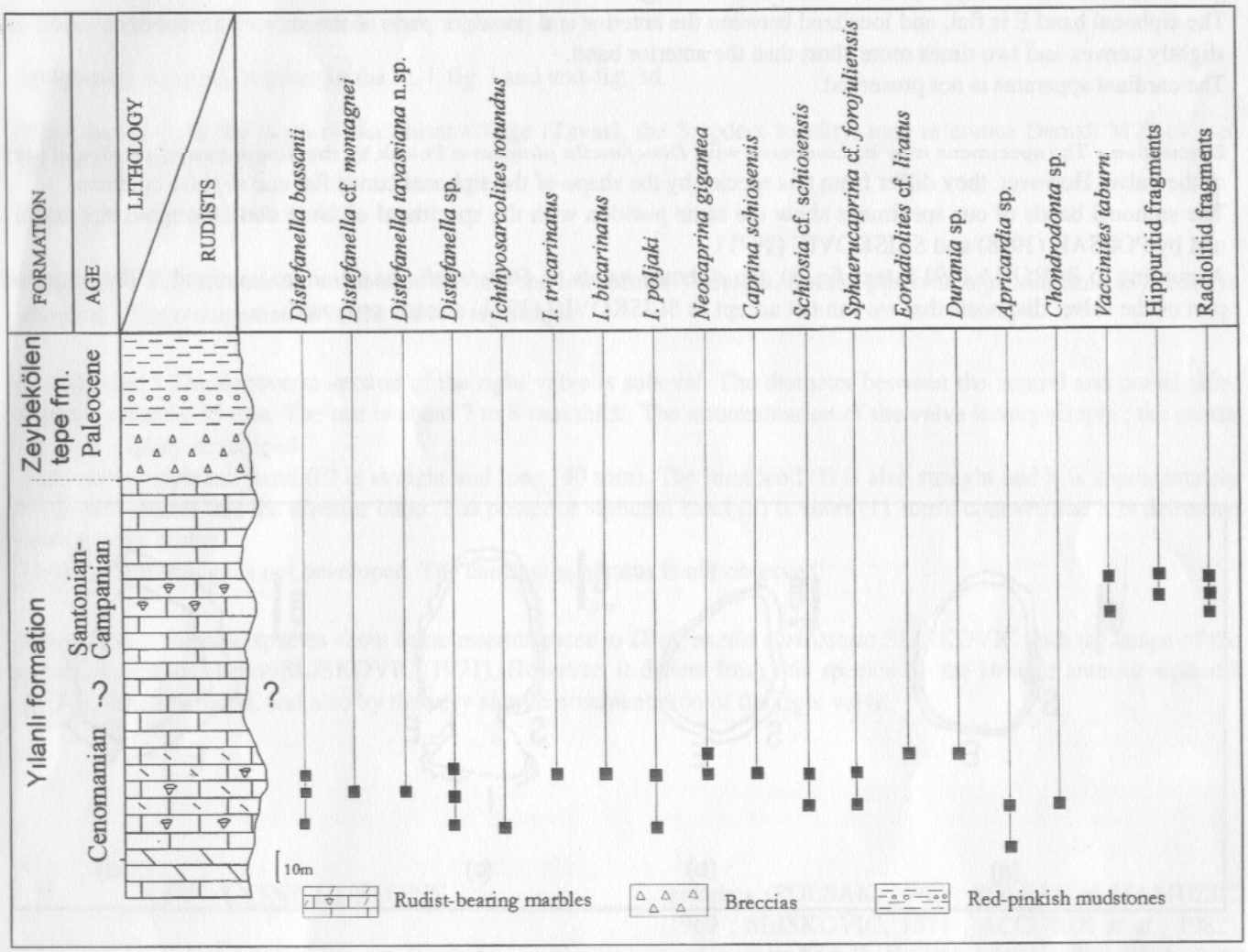

Figure 2 — Sarpdere-Serinhisar stratigraphic columnar section showing the distribution of the rudists (see fig. 1 for location).

III - PALEONTOLOGY

Class : Bivalvia
Order : Hippuritoida
Family : Radiolitidae GRAY
Genus : *Distefanella* PARONA, 1901

Distefanella bassanii PARONA, 1901
(P1. I, fig. 3 ; P1. II, figs 1, 2, 4 ; text-fig. 3 a, b)

1901 *Distefanella bassanii*, Parona, p. 209, pl. II, fig. 6a, b, 7, pl. Ill, fig. 6, 7 a-c.
1911 *Distefanella bassanii,* Parona, p. II, text-fig. 2.
1926 *Distefanella bassanii*, Parona, p. 39, text-fig. 5.
1957 *Distefanella bassanii*, Pasic, p. 88, pl. 3I, fig. 2, 3.

Description : Many sections of the right valve show characteristic transverse sections and shape of the siphonal bands of the species. The transverse section of the valve is subtriangulary. The dorsal part of the valve is very diminushed, so some sections look like a triangular shape. The sections are generally small, the dorso-ventral distance vary from 25 mm to 55 mm. The test is thin, about 0,5 mm. The periphery of the test is generally straight, however irregular longitudinal costae are observed at some sections (P1. II, fig. 2).
The siphonal band E is flat, and localized between the anterior and posterior parts of the valve. The siphonal band S is slightly convex and two times more short than the anterior band.
The cardinal apparatus is not preserved.

Discussion : The specimens may be compared with *Distefanella planikana* Polsak by the diminution of the dorsal part of the valve. However, they differ from this species by the shape of the siphonal bands flat and slightly convexe
The siphonal bands of our specimens show the same position with the specimens of Istria and Herzegovine determined by POLSAK (1968) and SLISKOVIC (1971).
According to PARONA (1911, text-fig. 3), the siphonal bands of *Distefanella bassanii* are localized at the posterior part of the valve, diagnosis that we can not accept as SLISKOVIC (1971) already proposed.

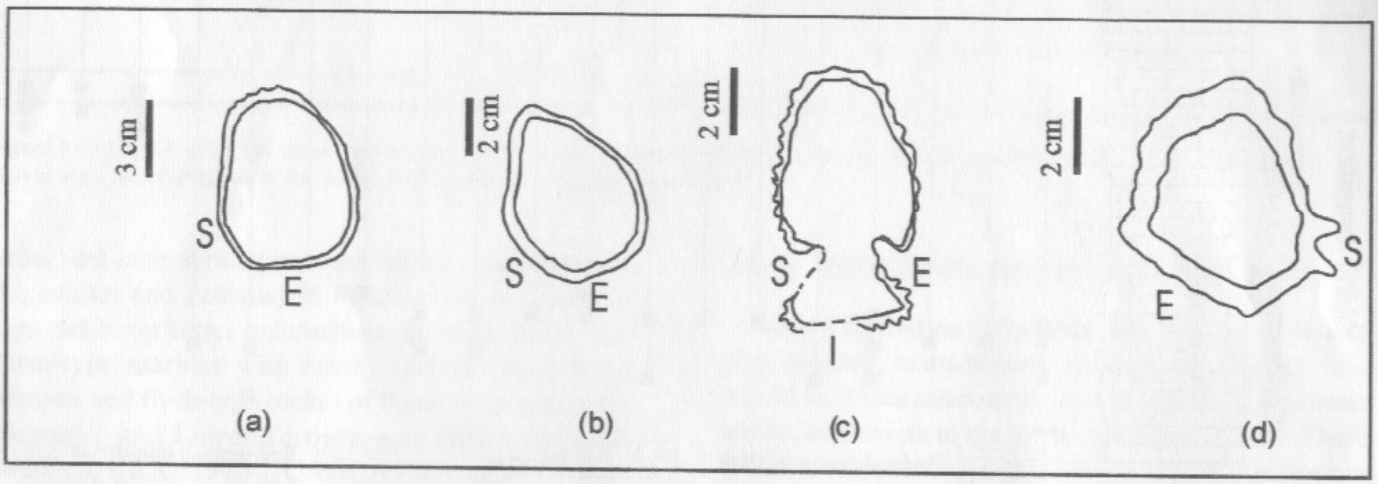

Figure 3 - Transverse sections of *Distefanella* PARONA. a and b : *Distefanella bassanii* PARONA. Transverse sections of the right valves ; S and E : posterior and anterior siphonal bands ; I : interband. Compare with fig; 1 and 4 of the plate II. c : *Distefanella* cf. *montagnei* SLISKOVIC. Transverse section of the right valve. Compare with fig. 3 of the plate II. d : *Distefanella tavassiana* n. sp. Transverse section of the right valve. Note the straight anterior siphonal band (E) and interband (I), and also concave posterior siphonal band (S). Compare with fig. 1 of the plate I.

Distefanella cf. *montagnei* SLISKOVIC, 1971
(Pl. II fig. 3 ; text-fig. 3 c)

1971 *Distefanella montagnei*, SLISKOVIC, p. 85, text-figs. 7, 8. pl. 4, figs. l, la, 2, 3, 4, 5, pl. 6, figs. 5, 6.

Description : Two right valve sections allow to determine this species. The anterior siphonal band (E) and the interband (I) show characteristic structure of the species. The siphonal band E is short, but strongly concave. The posterior siphonal band (S) is not clearly observed, however it seems to be short and concave. The interband (I) is very large and convexe.
The costae are large and separated by the sillons.

Remarks : The structure of the siphonal region of the specimens show clear resemblances with those of the Herzegovine (SLISKOVIC, 1971) ; however the valve section of our specimens is not circular probably because of the metamorphism.

***Distefanellea tavassiana n.* sp.**
(Pl. I, figs. 1, 2 ; text-fig. 3 d)

Derivation of name : From Tavas where the specimens have been found.

Material : five transverse sections of the right valve.

Holotype : Holotype is given in the Pl. I, fig. l and text-fig. 3d.

Type locality : In the north of Serinhisar village (Tavas), the Sarpdere locality, map reference Denizli M22-c4 (see fig. 1 for the coordinates).

Type level : Cenomanian (middle-late).

Diagnosis : The anterior siphonal band (E) and the interband (I) straight, but the posterior siphonal band (S) concave and short. The ornamentation of the valve very simple.

Description : The transverse section of the right valve is suboval. The diameter between the ventral and dorsal sides is approximately 55 mm. The test is about 7 to 8 mm thick. The ornamentation of the valve is very simple ; the costae are very slightly developed.
The anterior siphonal band (E) is straight and long (40 mm). The interband (I) is also straight and it is approximately two times shorter that the anterior band. The posterior siphonal band (S) is short (11 mm), concave and it is delimited by two ridge costae.
The ligamental ridge is not developed. The cardinal apparatus is not observed.

Discussion : The new species show some resemblances to *Distefanella raricostata* SLISKOVIC with the shape of the posterior siphonal band (SLISKOVIC, 1971). However, it differs from this species by the straight anterior siphonal band and the interband, and also by the very simple ornamentation of the right valve.

IV - CONCLUSIONS

The paleontologic study of the rudist fauna from the metamorphic sequence of the Tavas area, allowed to determine the genus *Distefanella* PARONA for the first time in Turkey. The specimens of the genus are clearly discovered in the Cenomanian beds characterized by the rudists with pallial canals. The species of *Ichthyosarcolites* DESMAREST and *Neocaprina gigantea* PLENICAR are found in the Cenomanian (middle-upper) beds of the Slovenia, Dinarids externes, Istria, Herzegovine, Italy (Apennins, Gargano, Sicily) and Greece (Parnasse) (PLENICAR, 1965 ; SLISKOVIC, 1965 ; POLSAK, 1967 ; CARBONE *et al.*, 1971 ; PRATURLON et SIRNA, 1976 ; COMBES *et al.*, 1981 ; SIRNA, 1982 ; CAMOIN, 1983), and also Turkey (Beydaglari carbonate platform) (ÖZER, 1988).

The biogeographic evidences show that the genus *Distefanella* are especially localized in Italy (Matese, Marge south-east), Istria, Herzegovine, Dinarides externes (POLSAK, 1968 ; POLSAK et MAMUZIC, 1969 ; SLISKOVIC, 1971 ; ACCORDI *et al.*, 1982), and also in France-Aquitaine basin (PLATEL, 1987) and are generally found in Turonian beds. However, some species are also determined from Coniacian, Santonian-Campanian and Maastrichtian sequences of the Herzegovine and Italy (PEJOVIC, 1968 ; SLISKOVIC, 1971 ; RUBERTI, 1997). The first occurence of the genus in the Cenomanian has been presented by MARTIN-CHIVELET *et al.* (1990). The second information of *Distefanella* from the Cenomanian of Turkey indicate the wide geographic and stratigraphic distribution of the genus in the Mediterranean province.

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PLATE I

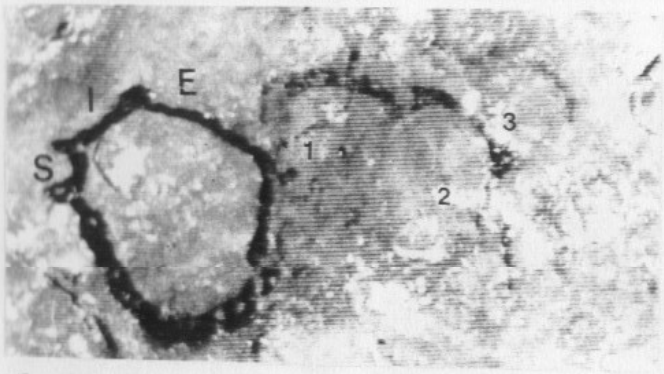
FIG. 1 : ***Distefanella tavassiana*** n. sp. - Holotype. Transverse section of the right valve. Note straight anterior siphonal band (E) and interband (I), and concave posterior siphonal band (S). Some paratypes (1. 2. 3) are also observed (x 0. 5). Compare with text-fig. 3 d.

FIG. 2 : ***Distefanella tavassiana*** n. sp. - Paratype. Transverse section of the right valve. Posterior siphonal band is partly preserved. However, the anterior siphonal band and interband show characteristic features of the new species. Note preservation of the some costae (x 0. 5).

FIG. 3 : ***Distefanella bassanii*** PARONA. Transverse sections of the right valves(x 0. 2).

FIG. 4 : ***Ichthyosarcolites rotundus*** POLSAK. Transverse section of the right valve(x 0. 5).

FIG. 5 : ***Ichthyosarcolites poljaki*** POLSAK. Transverse section of the right valve. The ridges (1. 2and 3) are well developed. Note small round or oval canals (arrows)(x 0. 6).



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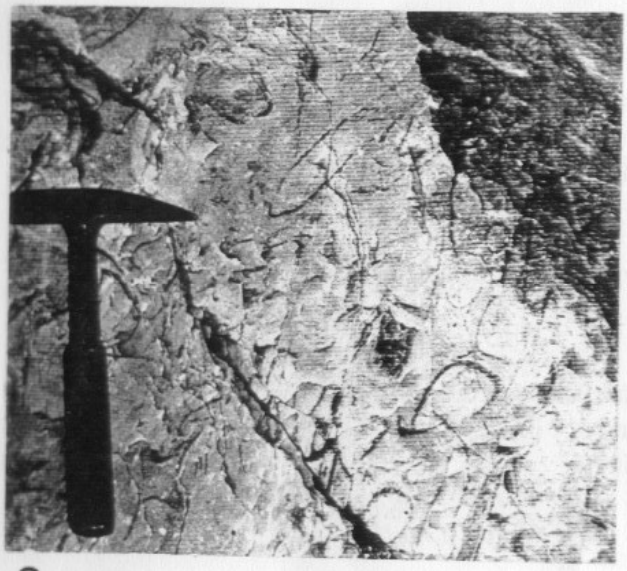

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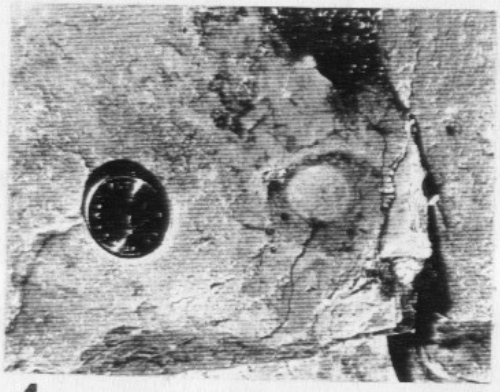

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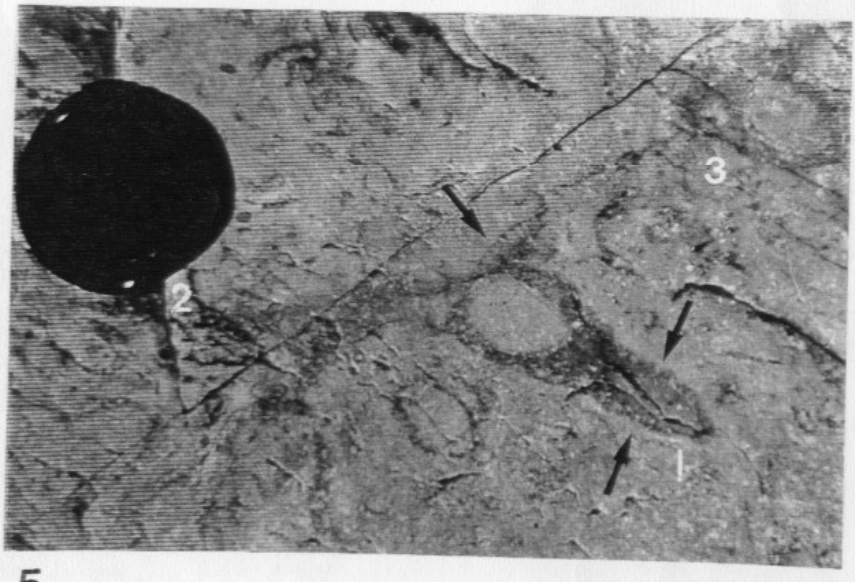

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PLATE II

FIG. 1, 2, 4 : ***Distefanella bassanii*** PARONA. Transverse sections of the right valves. Compare with text-fig. 3 a. b (x 0. 5).

FIG. 3 : ***Distefanella*** cf ***montagnei*** SLISKOVIC. Transverse section of the right valve. Compare with text-fig. 3 c (x 0. 5).

FIG. 5 : ***Neocaprina gigantea*** PLENICAR. Transverse section of the right valve. Note the accessory canals (oma, omp and arrow) b and b' : tooth sockets, ma and mp : myophores, CV : central cavity, Vb : external carina (x 0. 6).

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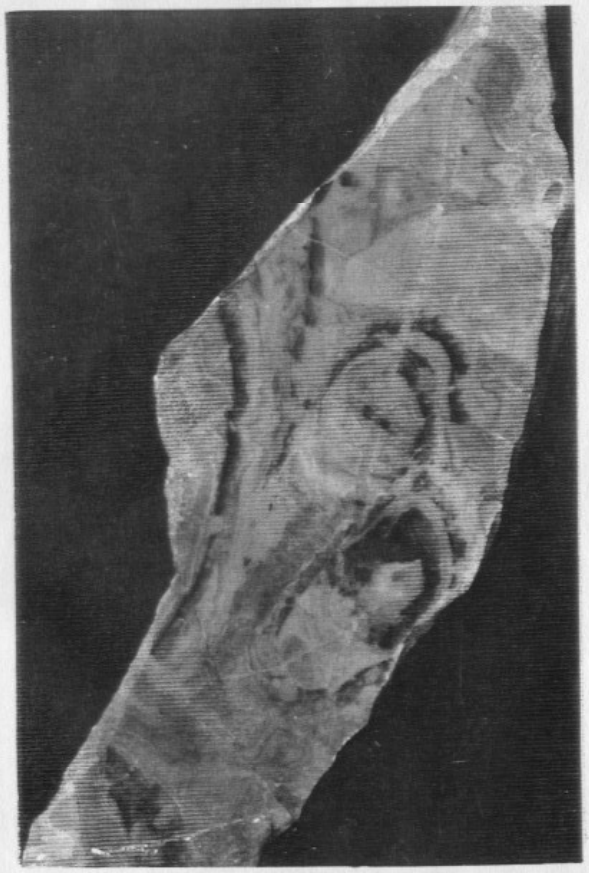

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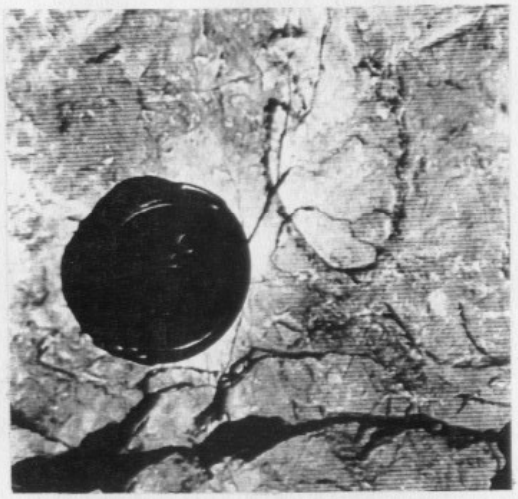

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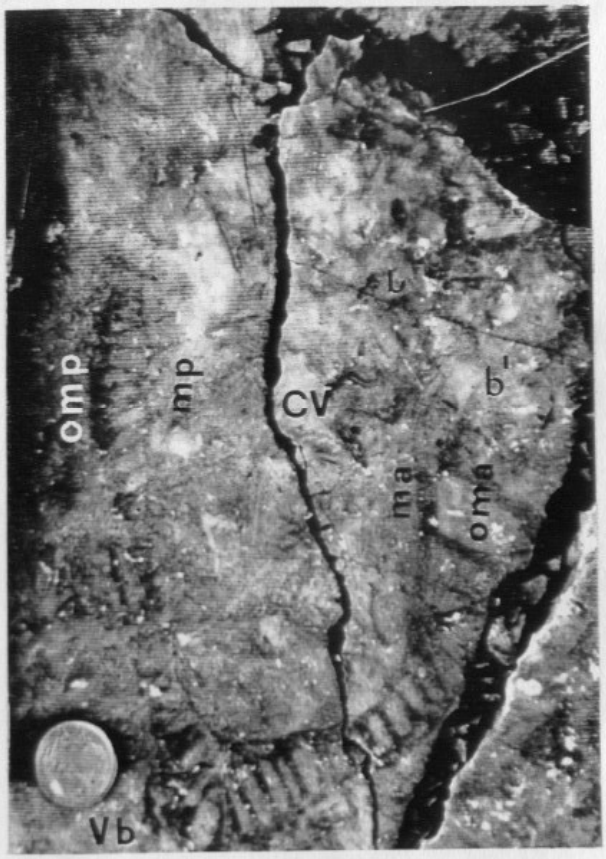

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