

34.3. MIOCENE AND QUATERNARY EBRIDIANS FROM THE MEDITERRANEAN SEA, DEEP SEA DRILLING PROJECT LEG 13

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INTRODUCTION

As is the case with some other groups of siliceous microfossils, the ebridians have been almost completely neglected by paleontologists and stratigraphers. Nearly all our knowledge of their biology and paleobiology, their systematics, and their evolutionary trends are linked with the names of Hovasse and especially Deflandre, whose investigations extend over a rather short period (1932-1951). In spite of the significant progress achieved within this interval, our knowledge of fossil ebridians is still insufficient for their use in biostratigraphy.

The evolution of the ebridians occurred through the Tertiary, particularly between Paleocene and Miocene. This rapid evolution renders them susceptible of furnishing good marker fossils to assist in the correlation of diatomaceous sediments. There are at present two main obstacles to the full realization of such an objective: (a) the small number of species already known, and (b) the insufficient knowledge of their stratigraphic range. To reduce these obstacles an accurate description of the numerous assemblages from more or less continuous sections is required, and that is the purpose of the present report.

EBRIDIANS IN MEDITERRANEAN DEEP SEA CORES

In the Leg 13 materials, ebridians were encountered in only a very few cores from Sites 124, 127 and 128. Their occurrence is restricted to some sediments, such as diatomaceous and sapropelitic marls, which contain diatoms and other siliceous microfossils.

The richest and most diverse assemblage was found in Section 124-13-2, between 60 and 129 cm, in a sequence of diatomaceous marls within the (?) upper Miocene evaporitic series. It is composed of the following five species: *Hermesinum schulzi* Hov., *Hermesinum* sp., *Podamphoropsis joidesi* n.g., n. sp., *Ammodoichium rectangulare* (Schulz), and *Ebria mediterranensis* n. sp. As shown in Figure 1, *Ebria mediterranensis* is the most frequent species of the assemblage, its frequency varying between 95 and 99 per cent. It is absent only in the lowermost sample of the mentioned section (124-13-2, 127 to 129 cm). On the other hand, *Podamphoropsis joidesi* is present in all investigated

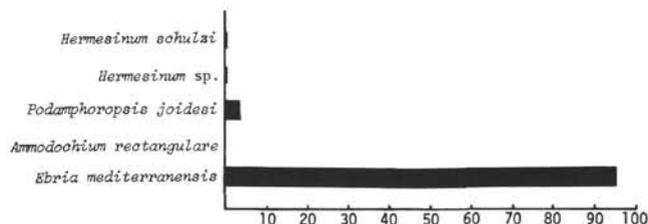


Figure 1. Relative frequency of the ebridians in 124-13-2, 89-90 cm.

samples of this section (124-13-2, 60-61 cm, 89-90 cm, 116-119 cm, 127-129 cm), but always with a low frequency (1 to 5%). As for the other species, their abundance is quite insignificant.

At Sites 127 and 128, located in the Hellenic Trough, the occurrence of ebridians is limited to a restricted level in the upper part of the Quaternary, to the bottom of *Helicopontosphaera carteri* assemblage zone (Sections 127-5-6, at about 101 meters below the sea floor, and 128-3-4 to 128-3-6, at 85 to 88 meters below the sea floor). *Hermesinum adriaticum* is the only ebridian species present in these Quaternary cores, and this situation is wholly similar to that found in the Recent Mediterranean Sea, whence the species was first described.

SYSTEMATICS

Family EBRIOPSIDAE Deflandre

Genus HERMESINUM Zacharias

Hermesinum schulzi Hovasse, 1932 (Plate 1, Figures 13, 14)

Ebria antiqua (?) Gemeinhardt, 1931, pl. 10, figs 21, 22.
Hermesinum schulzi Hovasse, 1932b, p. 125.

Contrary to the situation in most Miocene diatomites, this species is very rare (one or two specimens on a slide) in the (?) upper Miocene at 124-13-2, 89 to 90 cm, the only sample where it was recorded.

Hermesinum adriaticum Zacharias, 1906 (Plate 2, Figures 1-5)

Hermesinum adriaticum Zacharias, 1906 (*vide* Loeblich III *et al.*, 1968, p. 168, fig. 20, pl. 40, figs. 9a-10); Hovasse, 1932a, fig. 9.

Typical specimens of this species are common in the upper sapropelitic level of the Quaternary at 127-5-6, 126-129 cm, 147-150 cm, and 128-3-4, 126-128 cm; 128-3-5, 5-8 cm, 20-23 cm, 41-44 cm; 128-3-6, 78-81 cm, 97-100 cm, 107-110 cm, 120-123 cm. They are wholly absent in the lower levels, where there are also rich siliceous microfossil assemblages. This short appearance of the species in the Quaternary sediments of the two sites is useful for local correlation.

Hermesinum sp. (Plate 1, Figures 10-12)

The three illustrated specimens probably belong to two different species, although the one in Plate 1, Figure 10 could be an anomalous specimen. They are of *H. adriaticum* or *H. longispinosum* (Hov.) Deflandre type, but their apical spine is very short or even completely reduced. In this latter case they are similar to *H. apatridum* Deflandre. Their belonging to one species or the other thus remains doubtful. They are very rare in the Upper (?) Miocene at 124-13-2, 89 to 90 cm.

Genus PODAMPHOROPSIS n.g.

Type species: Podamphoropsis joidesi n. g., n. sp.

Definition: Skeleton with initial triaena but without opisthoclades; rhabde disaxled and reduced to a short spine; actine al in the prolongation of the proclade pl; actines a2 and a3 equal and usually distinguishable from proclades p2 and p3; synclades almost rectangular, forming a triangular nuclear ring. Loric stage unknown.

Remarks: This new genus is doubtless closely related to *Podamphora* from which it arises by the atrophy of its rhabde and opisthoclares. Its stratigraphic range corresponds to that of its type species.

Podamphoropsis joidesi n. sp.

(Plate 1, Figures 1-9)

Description: Large skeleton composed of three-costulate clades, usually with transverse wrinkles on faces and spines on the external edge. Among the atrophied elements the rhabde is preserved only as a very short spine; the opisthoclarid o1 has completely disappeared, whereas short remnants of o2 and o3 may sometimes be seen at the angle between actine a2 and proclade p2, and, respectively, a3 and p3. Actine a1 in prolongation of proclade p1; actines a2 and a3 equal, long, forming an obtuse angle with their proclades, which are long and arcuate and united at their upper ends by straight or slightly curved synclades. Nuclear ring large, triangular.

Holotype: Plate 1, Figure 9; DSDP 13-124-13-2, 89-90 cm; Upper (?) Miocene. Coll. of the Geological Institute, Bucharest.

Dimensions: Height of skeleton without rhabde 35-45 μ ; breadth of skeleton 30-43 μ ; length of rhabde 2-4 μ . Dimensions based on twenty specimens.

Remarks: *Podamphoropsis joidesi*, named for the JOIDES Deep Sea Drilling Project, was recorded within the interval 60 to 129 cm of Section 124-13-2. Its frequency, relative to the ebridian assemblage, is generally 1 to 4 per cent. There is, as shown in Plate 1, a high variability in both shape and size.

Family AMMODOCHIIDAE Deflandre

Genus AMMODOCHIUM Hovasse

***Ammodoichium rectangulare* (Schulz), 1928**

(Plate 2, Figures 6, 7)

Ebria antiqua var. *rectangularis* Schulz, 1928, p. 274, Fig. 42; Gemeinhardt, 1930, p. 82, fig. 69.

Ammodoichium prismaticum Hovasse, 1932b, p. 121, fig. 2.

Ammodoichium rectangulare Deflandre, 1932, p. 305, figs. 1-10, 12, 13.

Only two specimens of this species were found in Sample 124-13-2, 89 to 90 cm. One of them (Plate 2, Figure 6) is rather similar to *A. pyramidale* Hov.

Family EBRIIDAE (Lemmermann) Deflandre

Genus EBRIA Borgert

***Ebria mediterraneensis* n. sp.**

(Plate 2, Figures 8-30)

Description: Skeleton with initial triode. Proclades short, slightly divergent or perpendicular to actines. Proclades p2 and p3 equal, p1

prolonged in a rod obliquely rising to the axis of the triode and tying to p2 and p3 by equal arcuate synclades sa12 and sa31, respectively. The third synclade, sa23, opposite p1 is much longer and arcuate in a semicircle or bent in a V-shape. The nuclear ring formed of the three synclades is oval and oblique to the plan of the triode, its uppermost point being at the junction with p1. With or without an upper window open as a rule on the rod tying p1 to the nuclear ring. Opisthoclares very short, divergent and bifurcate, each branch being able, at its turn, to fork or even ramify irregularly. A branch of o2 and o3 sometimes rises and unites to the synclade sa23 at a certain point. Without posterior synclades.

Holotype: Plate 2, Figure 20; DSDP 13-124-13-2, 89-90 cm; Upper (?) Miocene. Coll. of Geological Institute, Bucharest.

Dimensions (based on 300 specimens): Total height 17-23 μ , breadth 20-28 μ .

Remarks: This new species is rather similar to *E. hannai* Deflandre from the Miocene diatomite of Malaga Cove, California; it differs from it in having rather frequently an upper window, no posterior synclades and no connective rod uniting the posterior synclade sp23 to the anterior synclade sa23, the ramifications of the opisthoclares o2 and o3 tying directly, as shown, to the anterior synclade sa23.

E. mediterraneensis seems to be derived from *E. hannai* by the disappearance of its posterior synclades and opening of an upper window in a certain number of specimens (some 30 per cent).

Among the normal forms, some abnormal ones (1 per cent) with an additional actine (Plate 2, Figure 30) have been recorded as well.

This species is the most frequent ebridian in Samples 13-124-13-2, 60-61 cm and 89-90 cm (about 95 per cent), and even one of the most frequent species of the siliceous microfossil assemblage.

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PLATE 1

(All figures X1740)

- Figures 1-9. *Podamphoropsis joidesi* n. g., n. sp.; 13-124-13-2, 89-90 cm.
- Figures 10-12. *Hermesinum* sp.; 13-124-13-2, 89-90 cm.
- Figures 13, 14. *Hermesinum schulzi* Hov.; 13-124-13-2, 89-90 cm.

PLATE 1

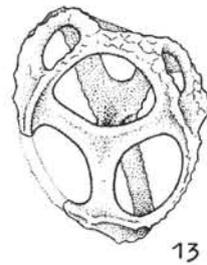
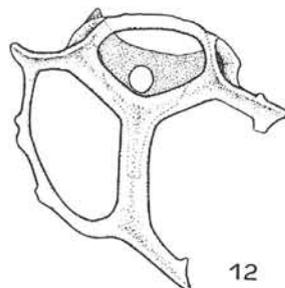
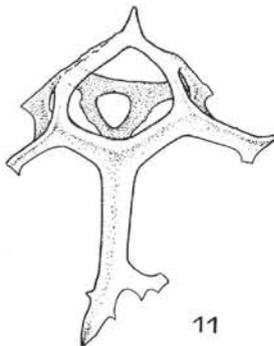
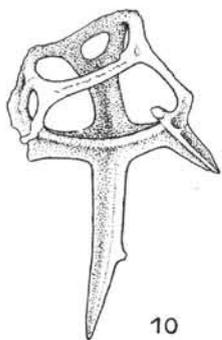
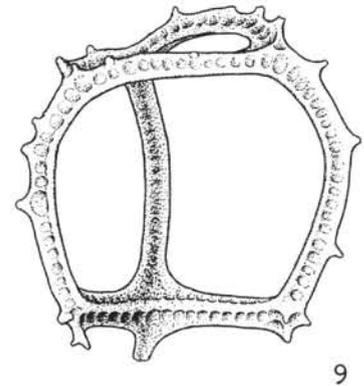
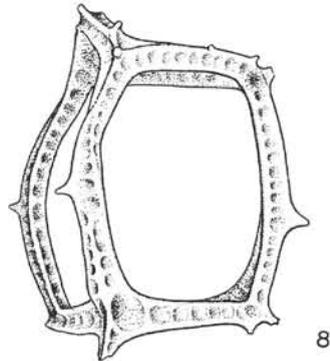
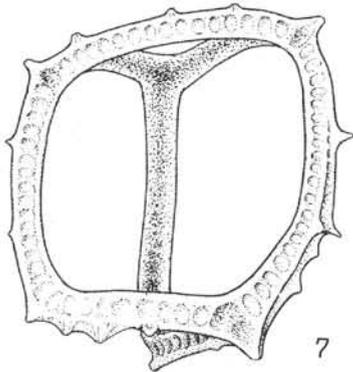
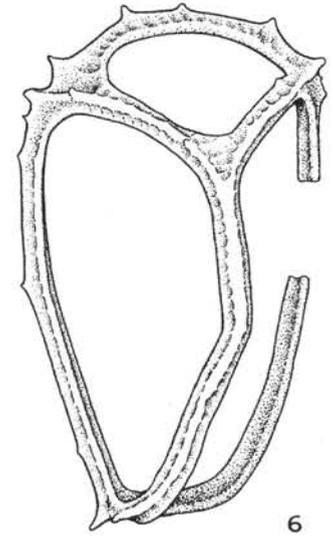
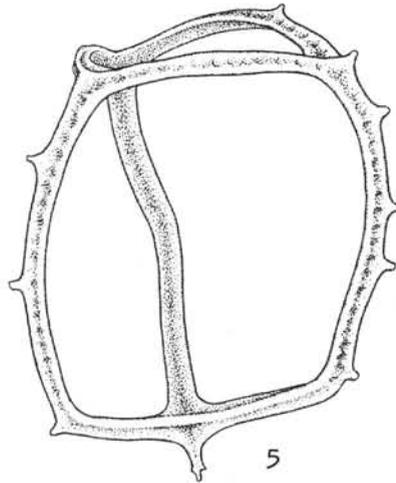
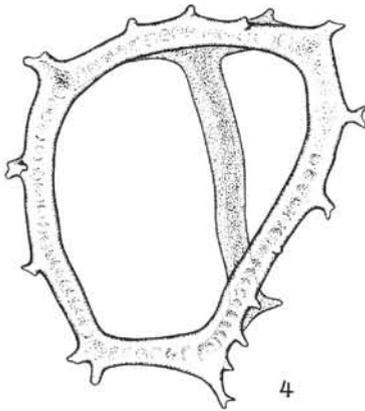
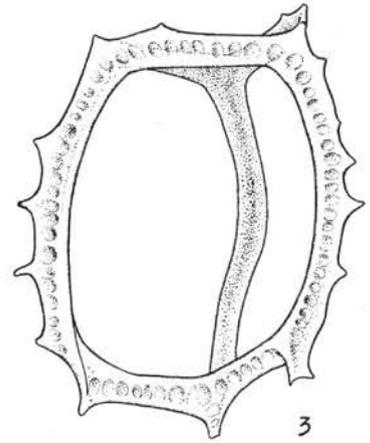
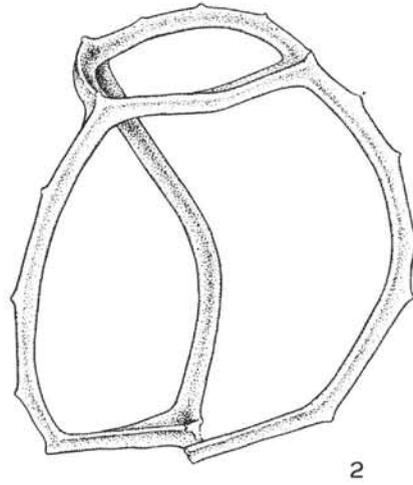
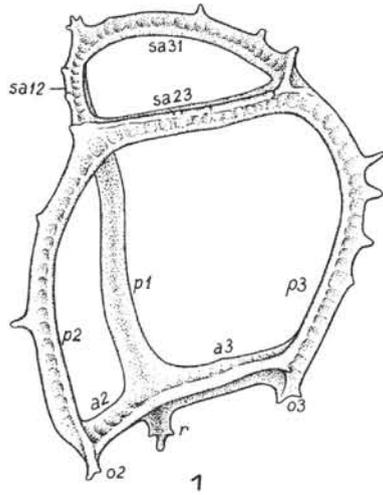


PLATE 2
(All figures X1740)

- Figures 1-5. *Hermesinum adriaticum* Zach.; figs. 1-3, 13-128-3-6, 97-100 cm; Figures 4, 5, 13-128-3-6, 68-71 cm.
- Figures 6, 7. *Ammodochium rectangulare* (Schulz); 13-124-13-2, 89-90 cm.
- Figures 8-30. *Ebria mediterraneensis* n. sp.; 13-124-13-2, 89-90 cm.

PLATE 2

