TRIQUETRORHABDULUS - an Oligocene/Miocene calcareous nannofossil genus

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The genus Triquetrorhabdulus was erected by MARTINI, 1965, for "three--edged rods, with pointed, rounded or truncated ends", T.carinatus was designated as the type species for Triquetrorhabdulus. Since then, several other species have been assigned to Triquetrorhabdulus (Fig.1) and some have been removed again, as T.inversus BUKRY & BRAMLETTE, 1969, which was used to define a new genus, Pseudotriquetrorhabdulus in WISE & CONSTANS, 1976.

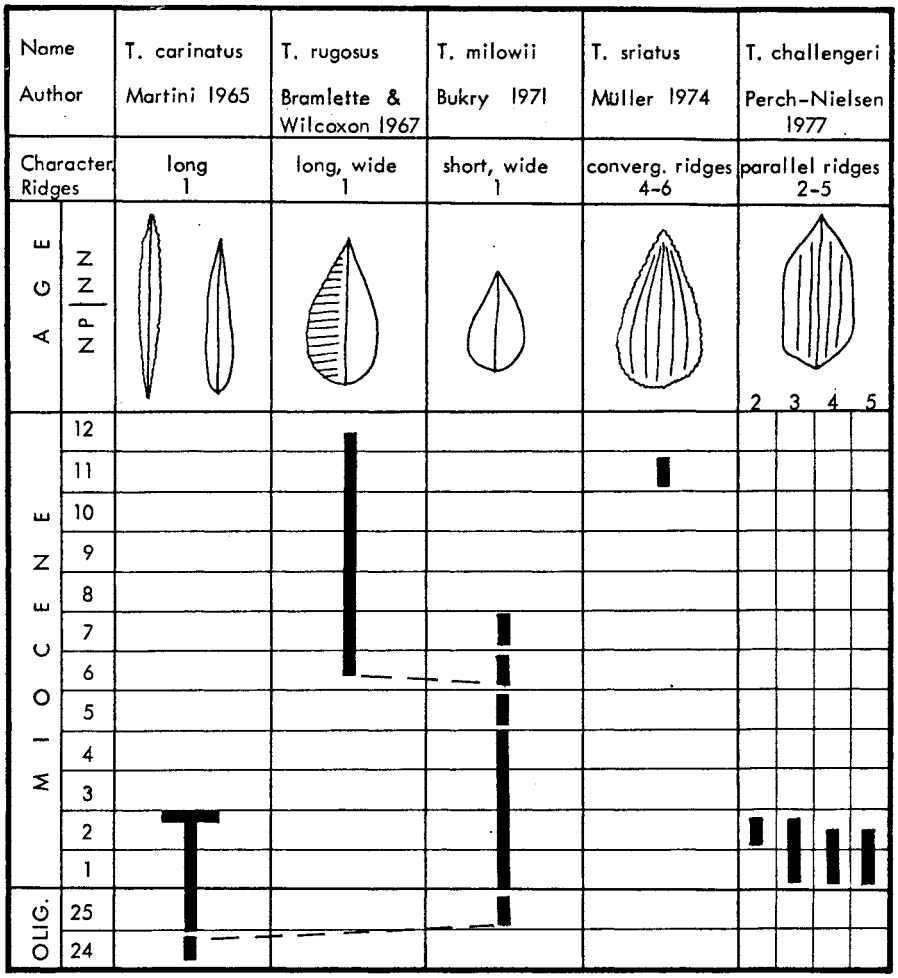

Fig. 1. The species of Triquetrorhabdulus and their ranges. T.martinii GARTNER, 1967, is not shown since it is considered to be a junior synonym of Rhabdothorax serratus (BRAMLETTE & WILCOXON) ROTH, 1970.

During the re-study of the Oligocene/Miocene interval of DSDP Site 356 on

Sao Paulo Plateau in the South-West Atlantic, counts of T.challengeri, which was described from this Site, were made. Fig.2 shows the results of this effort.

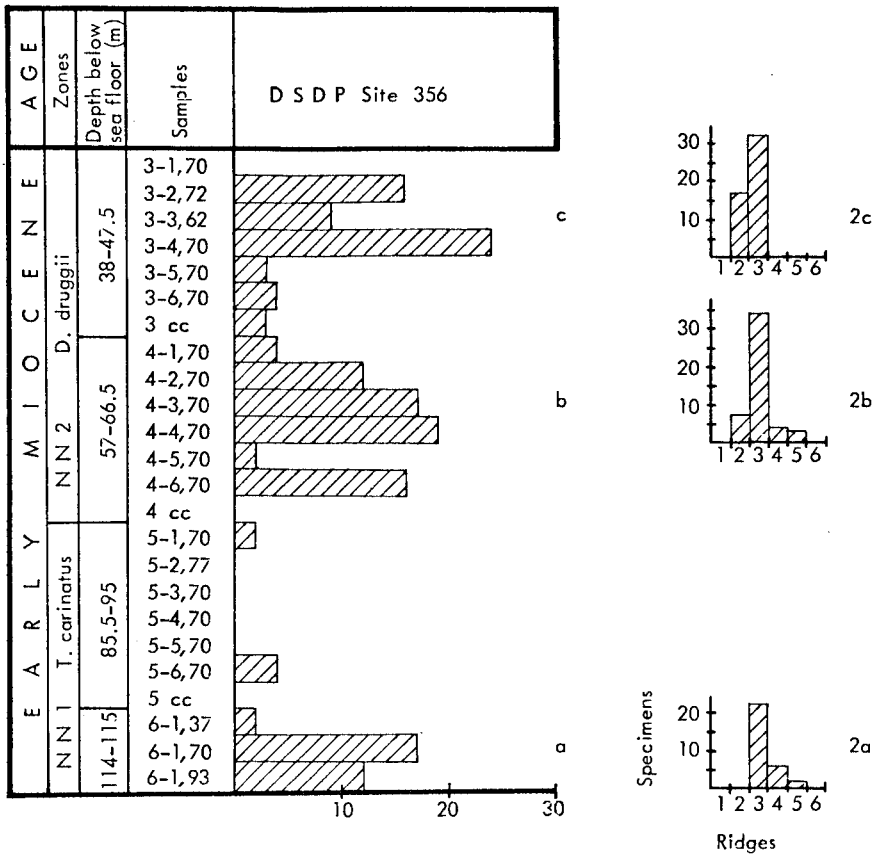

Fig.2 Abundance of T.challengeri and number of ridges at DSDP Site 356

The abundance of T.challengeri varies greatly in the samples (Fig.2), but no reason for this was evident in these samples with common to abundant, and reasonably well preserved coccoliths.

Counts of number of ridges (Figs 2a, 2b, 2c) show a maximum number of specimens with 3 ridges in all samples. Specimens with 4 and 5 ridges are found in Cores 6 through 4 (NN 1 & NN 2), they are absent in Core 3 (NN 2). Forms with two ridges are absent in Core 6, few in Core 4 and constitute about 1/3 of the specimens in Core 3. Thus the suspected trend from forms with many ridges in the lowermost Miocene to forms with fewer ridges higher in the sequence could be confirmed.

Measurements of the length and the width of T.carinatus in Cores 5 and 6, where T.carinatus is sometimes abundant and very well preserved, have not provided data to show any evolutionary trend from long to short, or slender

to wide forms (or the other way round).

Both the longest specimen (3µ x 36µ) and the widest specimen (6µ x 20µ) were found in sample 356 - 6-1, 93 cm. Thus extremely long and slender forms are found together with shorter and inflated ones. In either forms, the ends are pointed, as regarded to be characteristic of T.carinatus.

We can only speculate about the origin of Triquetrorhabdulus and the relations between the various species assigned to it. The earliest representative of the genus seems to be T.carinatus,which is already found in Oligocene sediments (NP 24), and has no obvious ancestor. T.milowii could have evolved from T.carinatus by widening during the Oligocene, its oldest specimens being of this age. We know of no intermediate forms between T.carinatus or T.milowii with one ridge, and the early form of T.challengeri with 3-5 ridges. Unfortunately, no search for an ancestor could be made, since upper Oligocene and lowermost Miocene sediments are missing at Site 356 (the only Site where T.challengeri has been found sofar) and T.challengeri is missing in complete O/M boundary sections. T.rugosus can be derived from T.milowii by the latters growth and developement of ribs perpendicular to the longitudinal main ridge during the Middle Miocene. T.striatus, with converging ridges, is found much higher in the Miocene and could have evolved from T.rugosus, no forms inbetween have been found, however. T.rugosus, on the other hand, may have been the ancestor of Amaurolithus, more precisely A.primus, thus also of Ceratolithus and thus to a Recent coccolithophorid (PERCH-NIELSEN, 1977:749).

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