

DREPANOTHECA SCHRADER, *ANAULUS* EHRENB. AND *EUNOTOGRAMMA* WEISSE: PHYLOGENETICS RELATIONSHIPS OF SOME 'NON-ARAPHID', 'NON-CENTRIC' DIATOMS WITH BOTH FOSSIL AND LIVING RELATIVES

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The genus *Drepanotheca* Schrader was first described for a handful of specimens found in the Oamaru fossil deposits, New Zealand. It included two species: *Drepanotheca macra* Schrader and *Drepanotheca bivittata* (Grun. et Pant.) Schrader. Its primary characters were a pair of transapical cross-members and the structure of the striae, which are more or less absent from the valve centre, scattered towards the margins – Schrader also mentioned the valves shape as crescent-like (“Schalen sichelförmig”). *Drepanotheca bivittata* was based on *Eunotogramma bivittata* Grun. et Pant., specimens from Miocene deposits in Felső-Esztergály (*Horné Strháre*) and Szent-Péter (*Pôtor*) in Slovakia, Central Europe. Schrader concluded that *Drepanotheca* was best considered a pennate diatom because it lacked a raphe and placed it among the ‘araphid’ diatoms in Araphideae, family Fragilariaceae. Schrader’s primary source of comparison for species in *Drepanotheca* was the ‘centric’ diatom genus *Eunotogramma* Weisse, as these too have characteristic valves with transapical bars. *Eunotogramma* has been placed in and associated with Biddulphiaceae, a bilaterally symmetrical group of ‘centric’ diatoms. In the order ‘Biddulphiées’, Van Heurck, for example, included eight genera of which *Anaulus* Ehrenb. was but one, its one species, *A. debilis* (Grun. in Van Heurck) Van Heurck, was assigned to the sub-genus (‘sous-generé’) *Eunotogramma* based on Van Heurck’s earlier view that *debilis* was a species of *Eunotogramma*. *A. debilis* also has many valves with cross-members, similar to that seen in *E. laevis*, placed at one time in *Anaulus*, but now considered the type of *Eunotogramma*. In short, it has been, and still is, difficult to determine the relationships of species currently in *Drepanotheca*, *Anaulus* and *Eunotogramma* and place them in any larger group (family, order, and so on). We will offer some suggestions to the following questions with respect to *Drepanotheca*:

How is *Drepanotheca* defined?

What species are to be included, assuming it can be defined?

How is it related to *Anaulus* and *Eunotogramma*?

Does it really contain ‘living fossils’?

This presentation will offer evidence to support our views with illustrations of valves from fossil material of the three genera, and offer some ideas as to how best classify these enigmatic taxa, particularly *Drepanotheca*.