

plate, formed by the plate-like proximal radial bones. Well developed adductor muscles are present between the shoulder girdle and the fin rays, necessary for a powerful pectoral fin adduction. This -drag based- pectoral propulsion is optimised in *Pomatoschistus lozanoi* due to some morphological adaptations in skeletal and muscular structures. Thus in *Pomatoschistus lozanoi* the pectoral girdle seems to be better adapted to pectoral fin adduction than in a generalised teleost fish.

3 CLADISTICS AND METAZOAN RELATIONSHIPS.

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A recently published cladistic analysis of metazoan relationships (1) based on 77 developmental and morphological characters is shown to be defective with respect to both methodological issues and character interpretations. It is therefore not surprising that many conclusions of this analysis are not supported by the data. Originally the analysis was performed with the programs PHYSIS WAGNER.S and PAUP 2.4. From the resulting cladogram it was amongst others concluded that: 1) Hemichordata (= Pterobranchia + Enteropneusta) and Lophophorata (= Ectoprocta + Brachiopoda + Phoronida) are paraphyletic groups, 2) Pseudocoelomata is a sister group to the Acoelomata + Eucoelomata, 3) Acoelomata is a sister group to the Eucoelomata, 4) Entoprocta are deuterostomes and 5) Nemertea is a sister group to the protostomes. However a simple, but more exhaustive, re-analysis of the same data set using the program HENNIG86 showed that none of these conclusions is warranted. Moreover, a scrutiny of the data set revealed several erroneous character interpretations (e.g. eutely in Priapulida) or false homologies (e.g. the proboscis of Nemertea, Echiura and Enteropneusta). Hence we corrected the data set and re-analysed it again. This yielded a cladogram in which 1) the relationships between Acoelomata, Pseudocoelomata and Eucoelomata were unresolved, 2) both the Hemichordata and Lophophorata appeared as monophyletic groups and 3) both Nemertea and Entoprocta branched off together with Acoelomata + Protostomia. In conclusion, cladistic analyses of metazoan relationships may be very informative, but need to be performed with caution.

- (1) F. SCHRAM (1991). In: Simonetta, A.M. & Conway Morris, S. (Eds.), The early evolution of Metazoa and the significance of problematic taxa. Cambridge University Press.