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ABSTRACTS

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Survey of fossil and Recent evidence for the phylogeny and classification of the Anomalodesmata

A survey of the extensive fossil and living record of the Anomalodesmata, inspired by and interpreted in consideration of functional analyses by Sir Maurice Yonge and his students, has led to a major reclassification of the group. Re-evaluation of neglected taxonomic relationships among eulamellibranch bivalves reveals some previously misinterpreted taxa. Information from fossils has led to a reappraisal of the systematic position of the Myacea, Pholadacea, Gastrochaenacea and Hiatellacea, expanding the subclass and inevitably leading to nomenclatural changes. Some problems of relationship remain unresolved. The Anomalodesmata in common with other groups of sedentary infaunal bivalves exhibit both an historically conservative morphology and more recent adaptations for a wider range of substrate and feeding habit.

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Evolution of *Muellerius capillaris* (Nematoda: Protostrongylidae) larvae in *Cernuella (Xeromagna) cespitum arigonis* (Stylommatophora) infected in the laboratory and kept in its natural environment

In this work (between December 1979 and January 1981), the larval development of *M. capillaris* (Müller, 1889) was studied in *Cernuella (X.) cespitum arigonis* (Schmidt, 1853) experimentally infected and kept outdoors under controlled conditions. The snails (collected in the surroundings of León, Spain), were checked (10%) in order to prove the absence of the natural infection by Nematoda. At the beginning of each month a batch of 100 molluscs were infected with 200 L-I of *M. capillaris*. These snails, along with 100 control specimens were moved immediately to the experimental land (about 8 km from León) and put into small plots isolated by metal fabric in order to avoid their re-infection. The euthanasia of the infected molluscs (8 to 10) was carried out weekly or fortnightly according to warmer or colder months, respectively.

In the evolution of the *M. capillaris* the following parameters have been considered: (1) Degree of evolution (% of the total amount of larvae (I, II, III) found in each mollusc, calculated on the total number of larvae that had penetrated it); (2) Percentage of L-III per mollusc (also according to the penetration); (3) Average of the total number of L-(I, II, III) per snail; (4) Average of the total number of L-III per mollusc.

The L-I penetration was similar in the twelve experiments (63.8%). The average of the parameters values mentioned above, in the May to October infections, were 15.9% (1st), 16.5% (2nd), 22.8 (3rd) and 21.3 (4th); moreover the first L-III were observed on the 21st day (p.i.). In the rest of the experiments (with lower temperatures) the larvae development decreased and the values of the parameters were 6.4% (1st), 7.5% (2nd), 14.9 (3rd) and 16.2 (4th); and the first L-III were seen on the 51st day (p.i.). The % and total number of L-III were, generally, related in a positive way to the thermic integral. There are no statistically significant differences between the mortality rate of the infected molluscs and that of the control snails.

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Ultrastructural studies of the protobranchiate bivalve mollusc, *Acila castrensis*: description of cellular elements of the heart-kidney complex and demonstration of the presence of the respiratory pigment, haemocyanin

Protobranchiate molluscs are considered to constitute the primitive taxon within the class Bivalvia, in large part due to the contributions of Sir Maurice Yonge. His investigations of protobranchs associated functional morphology with their mode of life, i.e. shallow burrowers in inshore waters or waters of great depth. Further investigations, including the present study, substantiate the primitive nature of the taxon. An electron microscopical study was used to examine the heart-kidney complex of the protobranchiate mollusc, *Acila castrensis*. The characters discussed include the arrangement and cytology of the pericardial glands as sites of ultrafiltration, the type of kidney cells and the presence of the common respiratory pigment, haemocyanin, in the haemolymph of protobranchs.

The pericardial glands, located on the surface of the tubular auricles, consist of specialized epithelial cells called podocytes. Basal extensions (pedicels) form a network with minute slits and, together with the underlying basement membrane, form a filtration barrier between the haemal spaces and the pericardial cavity. As reported elsewhere, ultrastructural studies of the pericardial gland led to the discovery of the copper-containing respiratory pigment, haemocyanin, in the haemolymph of the blood spaces. Characterization of the protein demonstrated that shape and size of the molecules are similar to the haemocyanin of gastropods. This is the first substantiated report of haemocyanin in the class Bivalvia and indicates a commonality of bivalves with the other major molluscan classes.