convergent with that of decapod crustaceans, owing to its role as a reinforcement preventing the epicuticle and the mineralised exocuticle from splitting off. *P.C. is Senior Research Assistant of the National Fund for Scientific Research (F.N.R.S., Belgium). Supported by the Fund for Joint Basic Research (convention n°2.4527.89).*

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13 ULTRASTRUCTURE OF THE INTEGUMENT OF THE SEA SPIDER *PYCNOGONUM LITTORALE* (STRÖM) (PYCNOGONIDA).

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Recent studies suggest that all arthropod cuticles are structured according to the same basic pattern but have undergone major adaptives changes, keeping with the integument physiology and to the habitat of each species. In this respect, pycnogonids appear as a very original and interresting group to study, being commonly considered to form a class among the chelicerates and believed to descend from an early line of marine arthropods that never became terrestrial. Althought their phylogenetical connection with terrestrial arachnids remains unclear, pycnogonid are quite remote from Mandibulata, some of which have independantly colonised terrestrial habitats. As to the ultrastructure of their integument, no information is available.In this preliminary study of the leg and cephalic cuticle of the coastal sea spider *Pycnogonum littorale,* we show that the cuticle presents the same basic organisation as marine benthic crustaceans, but also original features, confirming that this group is in many respects aberrant. Overlying a classical simple epidermis, the cuticle includes two main layers: a thin surface epicuticle and a much thicker lamellated procuticle. The epicuticle seems to consist of three layers closely resembling those observed in marine decapod crustaceans (1): an outer surface coat, the cuticulin layer, which is assumed to be a primitive, general feature of the arthropod cuticle, and a thin inner epicuticle. The procuticle is not mineralised and shows neither any obvious horizontal subdivision (*i.e.* exo- and endocuticle) nor pore canals. Owing to the relatively important thickness of its lamellae, decreasing gradually toward the epidermis, its appearance fits the benthic structural pattern defined in crustaceans (2). The most unusual features of the pycnogonid integument is the presence of large dermal glands within the cuticle, opening at the cuticle surface through short , epicuticle-lined ducts. On the basis of these and

previous observations, we conclude that the adaptative modifications of the arthropod cuticle result in showing greater differences between closely related marine and terrestrial species than between distant taxa living in the same environment. *P.C. is Senior Research Assistant of the National Fund for Scientific Research (F.N.R.S., Belgium). Supported by the Fund for Joint Basic Research (convention n°2.4527.89).*

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14 CYTOCHEMICAL DEMONSTRATION OF ACID PHOSPHATASE ACTIVITY IN INVERTEBRATE CALCIUM-SALT-CONTAINING TISSUES BY THE RECENT CERIUM-BASED METHOD.

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Acid phosphatase (AcPase) is well-known as a characteristic lysosomal degradative enzyme. It has often been used in cytochemistry to locate these organelles in many tissues of vertebrates, but seldom in invertebrates. The recently modified method for demonstrating AcPases, using cerium as capturing agent (1), has hitherto never been applied to tissues containing calcium salts, probably due to technical difficulties resulting from the dissolution of the phosphates and carbonates that nonspecifically precipitate with cerium. The purpose of this study was to demonstrate lysosomal AcPase activity in calcium-salt-containing invertebrate tissues by the cerium-based cytochemical method (1) after prior EDTA-decalcification. The technique was applied to two tissues of premoulting *Carcinus maenas* crabs: the epidermis underlying the mineralised cuticle and the digestive gland whose resorbing cells contain calcium-phosphate spherules. To test the effect of the EDTA treatment and the reliability of our results, we applied the method to a control material, the liver of the japanese quail *Coturnix coturnix japonica*, and AcPase activity was demonstrated in parallel by the classical histochemical method on cryosections of the same tissues. The sites of AcPase activity identified were the same, using both histochemical and cytochemical methods. As expected, primary and secondary lysosomes are identified in quail liver. In the crab epidermis and resorbing cells of the digestive gland, a positive reaction occurs in the terminal cisternae of the Golgi complexes and in lysosomes located in the apical half of the cells. On the basis of these observations, we conclude that the cerium-based method is suitable for ultrastructural demonstration of lysosomal AcPase activity in calcium-salt-containing