THE ULTRASTRUCTURAL LOCALIZATION OF TRACE METALS IN THE LITTORINA LITTOREA (L) (Gastropod: Prosobranchiata) COLLECTED FROM THE TEES ESTUARY

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A dissertation submitted in partial qualification for the degree of Master of Science, the University of Newcastle upon Tyne

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I certify that no part of the material offered has been previously submitted by me for a degree or other qualification to this or any other University.

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ABSTRACT

The ultrastructural organisation of the cytoplasmic granules in the stomach epithelium and ctenidium cell of Littorina littorea *(L) is described. Tissues were compared from animals collected from polluted (Tees estuary) and clean sites (Cullercoats bay). The majority of granules are usually compartmentalised within membrane delineated vesicles. X-ray elemental microanalysis of these granules is also described. It has been shown that granules in the stomach epithelium have ligands which facilitate the binding of iron while ctenidium epithelial cells have ligands (possibly sulphur) responsible for binding copper. Both ligands in the stomach and ctenidial cells appear to be responsible for preventing the interaction of other metal pollutants such as chromium, vanadium, nickel, etc. with cellular processes. The value of identification and analysis of intracellular granules in* Littorina *as metal indicators in the marine environment is discussed.*