The five parameters were : mean epithelial thickness (MET), mean diverticulum radius (MDR), mean luminar radius (MLR) and the ratios MET/MDR and MLR/MET. They were calculated by the method of geometrical transformation (Marigomez *et al*, 1990).

The reproductive state of the animals was calculated as the percentage of the total area of a tranverse section of the digestive gland occupied by digestive tissue, gonad and connective tissue.

A correlation analysis showed that both MET and MDR were highly correlated with the percentage of digestive tissue, and therefore they are not good indicators of pollution. On the other hand, the ratios MET/MDR and MLR/MET proved to be better indicators of stress as they are independient of intrinsec variables such as the reproductive cycle.

The *Littorina saxatilis* species complex - interpretation using random amplified polymorphic DNAs.

S. Crossland, D. Coates, J. Grahame & P.J. Mill
Department of Pure and Applied Biology, The University of Leeds, Leeds, LS2 9JT, UK

The *Littorina saxatilis* species complex is generally thought to comprise four recognised species. *L. saxatilis* (Olivi), *L. arcana* Hannaford Ellis and *L. nigrolineata* (Gray) are generally regarded as "good" species by most workers. The status of *L. neglecta* Bean has recently been called into question (B. Johannesson & K. Johannesson, 1990 ; K. Johannesson & B. Johannesson, 1990 ; Reid, 1993). The four species are known to be very similar, with no consistent genetic differences reported between them (Crossland *et al.*, 1993).

We have used Random Amplified Polymorphic DNAs (RAPDs) to detect differences between the taxa. RAPDs has already been shown to separate sympatric populations of *Littorina saxatilis* and *L. arcana* from Cornwall (Crossland *et al.*, 1993). The study has now been extended to include all four taxa from two shores in Pembrokeshire, Wales ; one shore is sheltered, the other exposed.

Analysis of data was carried out using the methods outlined in Crossland *et al.*, 1993. This involved calculating Nei and Li's- F-percent similarity index and clustering the resulting matrix using the UPGMA algorithm (Sokal & Sneath, 1969).

The data reported here show clear differences between the species *Littorina nigrolineata, L. arcana* and *L. saxatilis*. "*Littorina neglecta*" remains unresolved from *L. saxatilis*, and on the basis of this investigation cannot be elevated from the status of ecotype. This study has shown that RAPDs can provide molecular information about population structure even when little is known of the organisms' genetics.

References

Crossland, S., D. Coates, J. Grahame, & P.J. Mill, 1993. *Mar. Ecol. Prog. Ser.*, 96 : 301-305.
Johannesson, B. & K. Johannesson, 1990. *Hydrobiologia*, 193 : 71-87.
Johannesson K. & B. Johannesson, 1990. *Hydrobiologia*, 193 : 89-97.
Reid, D.G. 1993. *J. Moll. Stud.*, 59 : 51-62.
Sokal & Sneath, 1969. Principles of numerical taxonomy. Freeman, San Fransisco.