

## 9. A BIOMETRICAL STUDY OF POPULATIONS OF THE EUROPEAN SEA-URCHIN *ECHINUS ESCULENTUS* (ECHINODERMATA: ECHINOIDEA) FROM FOUR AREAS OF THE BRITISH ISLES

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### SUMMARY

Results submitted by mainly amateur diving groups during Underwater Conservation Year 1977 in the United Kingdom show that there are regional differences in the relationship between both size and shape of specimens of the European sea-urchin *Echinus esculentus* Linnaeus and the depth at which they occur. Populations from South-West England are significantly bigger at all depths than those from the other areas surveyed, those from Western Scotland increase in size more rapidly with increasing depth of water, and those from the North Sea decrease in size with increasing depth. Two sites surveyed in South-West Ireland show that exposure may affect the size of urchins inhabiting shallow waters. The results are compared with those of a similar survey by Larsson (1968) on the same species in Swedish waters.

### INTRODUCTION

The European sea-urchin, *Echinus esculentus* Linnaeus, was the subject of a nationwide survey during 1977 as part of a special project for amateur divers during Underwater Conservation Year (UCY 77) in the United Kingdom. The project was timely, since there has been unsupported evidence over the past few years that populations of the animal have been suffering at the hands of collectors for the curio trade (see, for instance, Natural Environment Research Council, 1973). It is possible that the animal may also become the subject of additional pressure from the luxury food trade, since the roe is considered a delicacy by some (Southward and Southward, 1975). In addition, there is contradiction in the results of previous studies that have examined the population structure of this animal in European seas: Moore (1935) and Reid (1935), working on dredged material from the Isle of Man and Scotland, both state that the largest urchins inhabit shallow water, while Larsson (1968), who used SCUBA techniques to study populations in the Koster Fjord region of Sweden, found larger specimens in deeper water.

Studies of extensive populations, and over a wide geographical area, require larger teams of investigators than are usually available in the normal course of scientific work, and for this reason the opportunity to use the diving expertise of competent amateurs during a year of special effort was welcomed. Before the start of the project, standardised instructions were prepared which outlined in straightforward terms the procedures to be adopted. Several different observational and experimental projects were suggested (Nichols, 1978a), and this paper describes the results of one, an investigation of the size and shape of the urchins relative to the depth of water at which they live.

### METHODS

Details of the instructions sent out to diving groups prior to the start of the project are given in Nichols (1979). Diving groups were advised to construct a simple pair of calipers with which the two dimensions of diameter and height could be taken on the animal while underwater and read off along the side of a recording board. Since this was also a conservation exercise, a more elaborate design of calipers was suggested to some teams which obviated the need to disturb the urchins, even when taking the *height* measurement.