

The Shell Structure and Composition of Recent Molluscs from the Atlantic Coasts

Tudor T. Davies

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The Shell Structure and Composition
of Recent Molluscs from the Atlantic Coasts

by TUDOR T. DAVIES

Department of Geology, Dalhousie University, Halifax, N.S.

Although there has been considerable research on the shell morphology of recent and fossil molluscs, little attention has been given to the shell structure and composition. Shell material is an important source of sediment, and it has been suggested that it may be a useful source of palaeoecologic data. Previous authors have correlated shell structure and composition with genetic, ontogenetic and ecologic factors, especially temperature and salinity. Some of the conclusions are conflicting, and the analytical techniques that have been used are inadequate.

A project was initiated at SWANSEA UNIVERSITY, Great Britain in 1960 to study a number of recent species which were collected,

with the aid of a number of Marine laboratories from localities between Iceland and the Mediterranean. During my tenure of an N.R.C. Fellowship in the Geology Dept. at DALHOUSIE UNIVERSITY this work is being extended to the North American Atlantic Coasts. Population samples of the same mollusc species have been collected from localities on the Canadian Coast with the help of the FISHERIES RESEARCH BOARD.

The analysis techniques particularly for calcite:aragonite determination in polymorphic shells have been refined and best available methods selected for trace element analysis.

The population samples show, that in most cases, the growth rate increases with increasing water temperature between the Mediterranean and the Arctic, although slight modifications to the general pattern are introduced by local factors such as degree of intertidal exposure and salinity variation. Molluscs secrete distinct architectural layers in the shell and each structural layer of a particular species has a distinctive mineralogy and trace element content. The relative development of the layers in a shell controls the mineralogic and trace element content, and is a function of the growth rate and maturity of the animal. By interrelating growth rates, individual maturity and shell chemistry and mineralogy it is possible to deduce the ecology of the animal.

Although it has been established at least for the mollusc species studied, that the shells can provide an ecologic record, their stability is questionable. To test the degree of alteration of the shell material, fossil shells from Pleistocene deposits and some sub fossil shells dredged from the continental shelf will be examined.

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