

THE EVOLUTION OF BIVALVES DEFENCES: CONSTRAINTS AND PREADAPTATIONS

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The marked increase in predation pressure at the close of the Palaeozoic must have had a profound effect on the evolution of the bivalves (Vermeij, 1983). In particular the epifaunal bivalves were extremely vulnerable to attack by the major molluscivore groups; fish, asteroids, crustaceans and boring and wedging gastropods.

The range of techniques employed by these molluscivores ranges from crushing and prising to boring and the range of effective defensive measures is correspondingly broad. Different methods of attack require different and, perhaps conflicting, defensive strategies. The bivalves undergo a massive radiation at the beginning of the Mesozoic, a time coincident with the increase in predation pressure (with the important exception of the boring gastropods which evolved much later in the Cretaceous). Given the range of methods of attack and the myriad of possible prey responses it is possible to interpret almost any change in life habit or morphology happening at that time as defensive. Temporal coincidence is not sufficient and such interpretations should be supported with experimental data from predation on Recent malacofauna.

Nevertheless, a number of bivalve life habits may be interpreted as having evolved in response to predation pressure. Inevitably certain taxa are prevented from evolving particular defence mechanisms by the constraints of their body plans. The aim of this paper is to explore the different evolutionary pathways followed by different clades in terms of their constructional potentialities and constraints.

VERMEIJ, G.J. 1983. Traces and trends of predation with special reference to bivalved animals. *Palaeontology*, 26: 455-463.