

QTA of prismatic calcite layers of some bivalves, a link to trichite ancestrals

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The study of crystallographic textures in gastropods has revealed that QTA may be a method of revealing phylogenetic relationships. It may be instructive to study bivalve microstructures in the same way. This work focuses on a study of the textures of the calcite prisms of a number of modern pteriomorph bivalves. Specifically, we examined and compared calcite prisms from two mytilids (*Mytilus edulis* and *Bathymodiolus thermophilus*), which are only very distantly related and almost certainly represent totally separate innovations of calcite prisms, and a number of pterioidea (*Amusium papiraceum*, *Pteria penguin* and *Pinna nobilis*). Our study also includes a sample of the prismatic calcite shell of the enigmatic Mesozoic bivalve *Trichites* sp..

Our studies show that *Pteria penguin* (Pterioidea) and *Pinna nobilis* (Pinnoidea) have very similar textures which support the sister taxa relationship of the Pinnoidea and Pterioidea. The textures displayed by trichites are also rather similar confirming that a search for an affiliation of this enigmatic genus within either of these superfamilies is justified. However, if we except the slightly inclined c-axis distribution of *Trichites*, shows an ODF maximum closer to that of *Pinna nobilis* than *Pteria penguin*. This provides independent evidence that *Trichites* should be included within the Pinnoidea.

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