QUANTITATIVE TEXTURES OF CALCITIC PRISMATIC LAYERS IN TRICHITES AND BIVALVE MOLLUSCS

Chateigner D.[†], Morales M.[†], Denis F.[*], Jouanneaux A.[†] and Harper L.[‡]
[†]*LPEC, Univ. du Maine, Le Mans, France*
[*]*LBGE, Univ. du Maine, Le Mans, France*
[‡]*DESC, Cambridge, United Kingdom*

Phylogeny is necessary to interpret biogeography distribution and to understand the mechanisms involved in the evolution of organisms. Molluscs are ideal to test different phylogenetic ideas, because they are widely distributed, adapted to various habitats.

The quantitative characterisation of the textures in mollusc shells has recently been used to provide complementary phylogenetic information [1]. Not only textures show strong or moderate variations respectively between distant and closely related species, but they bring new potential characters like texture entropy and crystallographic relationships between adjacent layers. They also provide non-redundant information compared with electron microscopy in such systems: similar SEM images can exhibit noticeably different textures, and similar textures different micrographs [3].

The actual phylogeny of molluscs is partly constructed on fossils record, some of the clades being based on several “ghost” *taxa*. These latter are assumed to have existed by comparison with sister clades. Texture analysis can bring information on the remaining solid parts (e.g. fossils) and on their correlation with the texture of the actual species. It may provide the information needed to firmly link some of the clades to common ancestors.

In this work we describe the textures measured on the prismatic calcite layers of the three clades of calcite prism- forming groups. The chosen representative *taxa* for the existing species are the bivalves *Pinna nobilis* (from the Pinnoidea family), and *Pteria penguin* (from the Pteridea family). We compare the textures from the outer calcite layers of these species to the one of a *Trichite* fossil from Jurassic strata, considered up to know as an “unconventional” Pinnoidea.

[1] D. Chateigner, C. Hedegaard & H.-R. Wenk: Quantitative characterisation of mollusc shell textures. In "Textures of Materials, vol. 2" (Ed J.A. Szpunar), NRC Research Press, Ottawa 1999, p1495-1500.

[2] D. Chateigner, C. Hedegaard & H.-R. Wenk: Mollusc shell textures as a new tool for phylogeny: a non-trivial relatioship with SEM investigations. To appear J. of Struct. Geology.