

Multi-analyses investigation of Pliocene bivalve shells from the Rio Vaccaruzza section, Villalvernia (Piedmont, Italy)

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Bivalve shells are recognised as one of the best biotic archives of geochemical proxies for palaeoenvironmental and palaeoclimatic reconstructions. However, before performing geochemical analyses, screening tests are crucial to examine the shell preservation and to exclude diagenetic alterations which can affect the interpretations of the results. The best way of assessing the degree of alteration is to apply as many screening tests as possible. Here, we performed a multi-analyses investigation (X-Ray Powder Diffraction, Scanning Electron Microscopy and Raman Spectroscopy) to study and check the mineralogy and the microstructure of different species belonging to two bivalve families: Glycymerididae and Pectinidae. The specimens come from Bed 3 of the Rio Vaccaruzza section, Villalvernia (Piedmont, Italy) that is characterised by a muddy ochraceous sand lithology belonging to the Sabbie di Asti Formation. The section is assigned to the middle part of the Piacenzian (Pliocene) based on planktonic foraminifera and mollusc assemblages (Pavia et al., 2022). The XRD analysis was mainly applied to species of Glycymerididae, which show aragonitic pristine shells. Instead, the microstructure of specimens of both families was analysed through SEM images highlighting the original microstructures and the absence of traces of diagenetic alteration. Preliminary data based on Raman spectroscopy displays the distribution of the two carbonate phases (aragonite and calcite) in the shells of Pectinidae and the absence of calcitic phase in the aragonitic shells of Glycymerididae. This multi-analyses investigation shows the excellent preservation of these specimens that are thus suitable for subsequent palaeoenvironmental and palaeoclimatic reconstructions.

References

Pavia G., Dulai A., Festa A., Gennari R., Pavia M. & Carnevale G. (2022). Palaeontology of the Upper Pliocene marine deposits of Rio Vaccaruzza, Villalvernia (Piedmont, NW Italy). *Riv. It. Paleontol. Strat.*, 128(1): 129-210.