Archaeometric analyses of carbonate ballast stones: a key for reconstructing ancient maritime routes

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Résumé

Ballast stones consisting mainly of blocks and pebbles of calcarenites and quartzose calcarenites were discovered in the stern area of a sailing vessel that was wrecked in the middle to the third quarter of the 2nd c. BC in Paržine Bay (Ilovik Island, Croatia). The carbonate biota and the silicoclastic content of the ballast stones suggest a common origin for the whole material. Planktonic foraminifer identification as well as the Sr isotope ratios of both benthic and planktonic formaninifera indicate an age not older than 500 ka. Four main lithofacies have been recognized from both micro- and macroscopic analyses: 1) tightly cemented bioclastic quartzarenite and quartzose calcarenite with flute-casts (LF1A), 2) cross-bedded, tightly cemented quartzose calcarenite and calcarenite (LF1B), 3) rhodalgal-molluscan floatstone with quartzose calcarenite matrix (LF2), 4) poorly cemented, bioturbated quartzose calcarenite and calcarenite (LF3). Some lithofacies such as LF1B lithofacies may represent eolianites, which are very ubiquitous on all the coasts of the Mediterranean and Adriatic domain, the other lithofacies are not recognized in Pleistocene and Holocene outcrops on the Croatian coast. The analysis of outcrops and rock samples from the Adriatic and Ionian coast of Italy (from Ancona to Taranto) revealed a lithofacies assemblage similar to that of the Ilovik ballast in and near the city of Brindisi (Apulia) within terraced deposits of Middle to Late Pleistocene age. Carbon and Oxygen isotope ratios of the ballast stones matches perfectly with those of terraced deposits from the Brindisi area. The provenance analysis of the ballast stones from the Ilovik-Paržine ship offers direct evidence of a maritime route linking Brindisi (lat. *Brundisium*), one of the major ports of the Apulian coast, to the northern Adriatic in the Late Hellenistic period.

Mots-Clés: Carbonates, Provenance, Ballast stone, Pleistocene

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