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# The Sources of Cretaceous Karst Bauxites in Southern Italy: A Review

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Most circum-Mediterranean bauxites of Cretaceous age belong to the karst type—i.e., they are hosted in carbonate rocks and not directly derived from a lateritic profile. For this reason the identification of their sources is not always easy. In southern Italy, karst bauxites occur at a Late Cretaceous hiatus (varying between Aptian and Cenomanian, and between Cenomanian and Coniacian) in platform carbonates. The sedimentary characteristics of the host rocks and several paleogeographic reconstructions support a model in which the host carbonates formed in Bahamian-type platforms. Boehmite is the main Al-bearing mineral and is generally associated with clays (mainly kaolinite), hematite, Al-rich goethite, alumogoethite, and anatase. Detrital minerals consist of zircon, rutile, monazite, xenotime, apatite, ilmenite, and titanomagnetite. Two U-Pb isotope studies on zircon grains have shown that zircons record several age populations: Archean, Neoproterozoic (623–689 Ma), and Phanerozoic. It is relevant that the youngest zircons have an age of ~90 Ma, which perfectly falls into the Cenomanian to Coniacian stratigraphic interval of bauxite formation. The mechanisms by which the zircon grains could be incorporated into the Cretaceous bauxites are limited. There is no sedimentary evidence of a fluvial-detrital input, which may have produced an amount of material to be weathered during periods of emergence and karstification of the platforms. For this reason, it is more likely that a substantial amount of dust was transported by wind from different sources and accumulated on the carbonate platforms during the ±5 m.y. of bauxite formation. The youngest zircons have textures compatible with a magmatic crystallization and, therefore, probably derived from a Cretaceous volcanic material accumulated over the platforms, through pyroclastic fall mechanisms. The age, paleogeography, and inferred Cretaceous wind pattern are consistent with a prevailing origin from the Cretaceous volcanism of the Dinaric and Carpatho-Balkan orogenic belts. The older zircons may be interpreted as xenocrysts associated with the Cretaceous magmas or derived from different sources, including the Sahara Metacraton. Another possible evidence of an eastern provenance of the bauxite material is the higher Ni-Cr values detected in the easternmost Apulia deposits, which were nearer to the additional sources displayed by the ophiolitic suites outcropping in the Late Cretaceous in the areas that now correspond to Greece and Albania.