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Source to sink relations between Neocomian sandstones from the Akamas area and Late Miocene sandstones from the Psematismenos area (Cyprus): Evidence from detrital U-Pb zircon geochronology

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In this study, U-Pb dating of detrital zircons from two sandstones samples collected from the Akamas sandstones Fm (Neocomian) and from the upper Pakhna Fm (Late Miocene) in Cyprus is combined with provenance analysis to investigate paleogeographic reconstructions. The sandstones of the Akamas Fm consist of poorly sorted, medium-grained, sub-rounded quartz arenite with accessory minerals dominated by tourmaline and zircon. The sandstones of the Pakhna Fm consist of fine-grained, sub-angular calcareous bioclastic lithic arkosic sandstones. Foraminifera clasts, volcanic rock fragments, Chert, siltite, epidote, pyroxene, rutile and zircons have been recognized in sandstones from the Pakhna Fm.

The U-Pb age distributions of detrital grains from the two sandstones display same geological periods, c. from 500 to 1000 Ma (i.e. Pre-Neoproterozoic), with both an important age peak c. 600 Ma. Few old zircons at c. 1900 and 2400 Ma, are observed in the sandstone of the Akamas Fm. Those results indicate that both samples share similar source of sediment; the Pakhna FM sandstone sample is showing in addition a volcanic and a chert source, likely associated to the recycling of the Cenomano - Turonian dated Troodos ophiolitic complex and of the Late Eocene chert deposit of the Lefkara Fm.

The ages of the zircons compared to the ages of the three tectonic Units of Cyprus (Troodos Ophiolite, the Mamonía Complex, and the Kyrenia Range), knowing that the oldest dated rocks on Cyprus are carbonate olistoliths yielding Permian Fusulinids (Kantara Limestone in the Kyrenia Range), indicate that zircons have been recycled possibly several times.

A comparison of the results, with Arabian-Nubian Shield geochronologic dataset indicates that zircons observed in sandstones may come from the recycling of: (1) Elat and Rutig Conglomerates and/or Cambro-Ordovician sandstones (Israel and Jordan), both locally sourced from Juvenile Neoproterozoic crust (2) and/or directly from the Arabian Nubian Shield itself.

