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# Reconstruction of the Late Miocene to Pliocene continental succession of the Samos Island: Palaeoenvironmental implications for the Eastern Aegean domain

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## Résumé

On Samos Island (East Aegean region, Greece), two sedimentary basins are filled by thick continental series dated to the Late Miocene to Early Pliocene. A multi-disciplinary study has been performed, including 1) the definition of twenty-one sedimentary facies; 2) a review of the biological components; and 3) carbon, oxygen, and strontium stable isotopes analyses. Various depositional settings and hydrochemical compositions characterise the succession. Five main stages of basin evolution have been identified: 1) The Late Serravallian is marked by the development of alluvial fans and fan delta; 2) during the Lower Tortonian, isolated shallow lakes with variable salinity, from fresh- to brackish, developed under warm and relatively humid conditions; 3) the Middle to upper Tortonian is marked by the development of a large and deep lake with saline and alkaline waters, under colder and drier conditions; 4) the Latest Tortonian to Messinian period is represented by an ephemeral alluvial system, developed under dry climate; 5) during the Zanclean, a palustrine and paludal wetland system, dominated by tufa carbonates, developed under moderately humid conditions. This succession is particularly interesting for reconstructing the palaeoenvironmental

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evolution of the transition zone between the Mediterranean domain and the Paratethys and circum-Paratethys areas. The geochemical data and the presence of flora (diatoms) and fauna (gastropods) of marine affinity suggest transient incursions of marine-related water or groundwater inflows as early as the Lower Tortonian. The Samos succession records the complex interaction between the regional geodynamics and climate. The extensional regime of the Eastern Aegean zone generates subsidence, interrupted at the mid-Tortonian (9 Ma) by a brief compressive event and a major exposure of the basins. Furthermore, the Late Miocene progressive aridification, followed by a change to more humid climatic conditions (Pliocene), is also a major driver of sedimentation.

**Mots-Clés:** Lacustrine carbonates, Depositional models, Paleoclimate, Tectonic, Aegean area, Late Miocene