

The Central Tunisian Atlas as potential key area for late Mesozoic non-marine research and supra-regional biostratigraphy: A micropalaeontological perspective

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Non-marine (here used for 'continental' aquatic or limnic/lacustrine, and terrestrial palaeoenvironments and deposits) calcareous microfossils such as ostracods and charophytes are among – if not the – most useful groups for biostratigraphical and palaeoenvironmental application in late Mesozoic successions. While regional biostratigraphy based on Mid–Late Jurassic–Early Cretaceous non-marine ostracods and charophytes has a long tradition, the practical implementation to supra-regional biostratigraphy is still strongly hampered. During the last few decades, however, modern insights into non-marine ostracod and charophyte palaeobiology and palaeobiogeography and new data have expedited the process of taxonomic revision and facilitated new approaches and tests for prior hypotheses of supra-regional to global distribution. In particular, the dispersal strategies and mechanisms of certain non-marine ostracod groups and of charophytes are the same, i.e., they are passively transported by larger animals over short and long distances, crossing migration barriers.

Mesozoic non-marine to marine transitions and respective successions are known from the Central Tunisian Atlas (CTA) and the Tunisian Saharan Platform (TSP) (north Gondwana, southern Tethys margin). Transgressions and regressions onto the essentially stable Saharan Platform and coeval tectonics produced a complex pattern of basins and islands, and the non-marine successions of both the CTA and TSP well document deposits of contemporaneous Peri-Tethyan islands (PTIs) offshore northern Gondwana. Ongoing research in Tunisian Mid-Jurassic to mid-Cretaceous non-marine (lacustrine) sedimentary archives reveals partially new, rich ostracod faunas and charophyte floras, many elements of which can be linked to Gondwana, i.e., West Africa and South America on the one hand, and Eurasia (partially North America) on the other hand. Considering varying dispersal vectors coming into question at different time intervals (e.g., evolution of birds) in the context of plate tectonics, palaeoclimate and sea-level changes, the late Mesozoic PTIs are coming into the centre of attention for non-marine supra-regional correlation as based on ostracods and charophytes. Our new discoveries do not only improve the regional biostratigraphy but also facilitate (improved) supra-regional correlations in this time interval and support concrete considerations of faunal and floral exchanges between South America and Asia via North Africa and the PTIs, for example. New joint research projects involving Tunisian and Austrian scientists are dealing with the documentation, characterisation, refined stratigraphy, and evolution of late Mesozoic lake-systems and their deposits in the Central Tunisian Atlas. This includes the regional to supra-regional context with respect to non-marine to marine correlations and the relation of these ancient lake ecosystems to, and their control by, (plate-)tectonics, palaeoclimate and sea-level changes.