

Arthropods Diversity of the Late Carboniferous Souss Basin, Morocco: Paleoecology and Taphonomy

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Abstract : Continental sediments of the uppermost Carboniferous (late Pennsylvanian) El Menizla and Oued Issene formations of the Souss basin, Southwestern High Atlas Mountains, Morocco have yielded abundant well-preserved arthropods. The latter comprise freshwater and terrestrial elements, were found associated with plants, freshwater jellyfish and pelecypods. Arthropods are ubiquitous and typically restricted to the dominated lacustrine black shale taphofacies. The lithofacies interpretation and its correlation with the taphofacies led to the determination of the original depositional environment that was reconstructed as a fluvial-dominated with braided wide channel system and floodplain lakes to peat local backswamps sub-environments. The late Carboniferous fossiliferous strata have been correlated biostratigraphically with many other Pennsylvanian (Kasimovian/Gzhelian) deposits of North America and Europe on the basis of entomological studies. The faunal elements of the lentic biocoenosis of the Souss basin are depauperate, with the vagile forms slightly diverse than sessile ones. The prevailing groups are small shelly fauna, other habitat guild such as apterygotan Monura insect dasyleptids. The fossils recorded from the Souss basin includes crustaceans, of various sizes (μm - to mm) and morphologies, preservation state ranging from poorly preserved to rarely well-preserved specimens. Their remains sporadically found clustered and preserved as internal or external shell molds or steinkerns often disarticulated specimens. Ostracods as more likely Carbonita, their shells are preserved three-dimensionally. The clam shrimps conchostracans record of the Souss basin are often determined as pseudestherids and the Spinicaudatan leaiids. The moldic preservation is somewhat similar to pelecypods, they are known from internal casts or impressions. Monura insects are characterized by their low diversity, thus, only two species are known *Dasyleptus lucasi* Brongniart and *Dasyleptus noli* Rasnitsyn. The terrestrial component consists of pterygotan insects. They are diverse, significantly more frequent throughout the Souss basin fossil localities, numerically dominated by the members of Blattodea (cockroaches). The fossil record includes Blattodea, Protorthoptera, Diaphanopteroidea, Ephemeroptera (mayfly) , Calneuroidea, Grylloblattodea, Miomoptera and Palaeodictyoptera. Additionally, the composition of the preserved insect is mostly represented by completely isolated forewings, rare membranous hindwings, parts of the body or exceptionally preserved specimens, which may reflect a wide spectrum of taphonomic pathways. The steady increase in taxonomic diversity of fossil sites in the Souss basin, together with the taphonomic interpretation of arthropods assemblages, have contributed to provide a novel insight into the complex terrestrial ecosystem that thrived in this paleotropical key region during the late Pennsylvanian and additionally to understand climate-driven paleobiogeography and paleoecology of late Paleozoic non-marine arthropods.

Keywords : Souss, carboniferous, arthropods, taphonomy, paleoecology.

Conference Title : ICGP 2025 : International Conference on Geosciences and Paleontology

Conference Location : New York, United States

Conference Dates : June 03-04, 2025