

The Rheic Ocean was one of the main seaways of the Palaeozoic world. The ocean separated the two largest mid-Palaeozoic continents: Gondwana and Laurussia, and, throughout its history, played a key role in shaping the climate and the evolution of many major groups of marine organisms. This included the development of coral reefs, arguably the most prolific in the Earth's history and reaching into exceptionally high latitudes, a pattern apparently enabled by the special palaeogeography of the Devonian Rheic Ocean, with its partial closure to the south, and thus its dominance by tropical water masses. Except for the two main landmasses, the Rheic Ocean was riddled with a mosaic of smaller continental blocks, the past positions of which remain incompletely understood. One particularly elusive element of the Rheic palaeogeography is the Devonian configuration of the north-western margin of Gondwana, and especially the position of the Moroccan Meseta – an assemblage of blocks once located at the periphery of north-western Gondwana. While some authors regard the Meseta as a marginal, continuous segment of the Gondwana shelf, others proposed a strikingly different scenario, envisaging that at some point the Meseta became separated from Gondwana by a broad ocean. This disagreement reflects the combination of the very complex geology of the Meseta and scarcity of palaeontological studies that would enable reliable palaeobiogeographic reconstructions. The aim of this project is to constraint the Devonian position of the Meseta with respect to the continental blocks considered as adjacent to it in various palaeogeographic models: the mainland part of Gondwana (present Anti-Atlas area, Morocco) and the collage of continental blocks of the so-called Armorica Terrane Assemblage (present western Europe). The project will apply an innovative approach that combines past seawater circulation (neodymium isotopes), seawater palaeotemperature (oxygen isotopes) and palaeoecological (taxonomic analyses) proxies in order to provide a broad insight into the Devonian palaeogeography of north-western Gondwana. The project will be an important contribution to the current discussion on the evolution of the Rheic Ocean and its distinctive faunas, and will provide a conceptual framework that can be followed by similar studies in other areas and time intervals.