

Exceptionally Preserved Faunas from the Lower Ordovician of the Anti-Atlas, Morocco

Peter Van Roy¹, Bertrand Lefebvre², Khadija El Hariri³, and Ahmid Hafid³

¹ Research Unit Palaeontology, Department of Geology & Soil Science, Ghent University, Krijgslaan 281, building S8, B-9000 Ghent, Belgium

² UMR CNRS 5125 Paléoenvironnements et Paléobiosphère, bâtiment Géode, campus de la Doua, Université Claude Bernard-Lyon 1, 2 rue Raphaël Dubois, F-69622 Villeurbanne Cedex, Lyon France

³ Faculté des Sciences et Techniques, Département des Sciences de la Terre, laboratoire de Géosciences et Environnement BP. 549, Boulevard Abdelkrim Khattabi, 40000, Marrakech, Maroc

The Ordovician is well-represented in Morocco by extensive marine outcrops which are primarily situated in the eastern and central Anti-Atlas regions, and in the west of the country, around Rabat. As a result of the large outcrop volume, and the varied environments that are represented, the Moroccan Ordovician is a prime target for palaeontological research. Historically, Cambro-Ordovician faunas from Morocco were first mentioned in the 1920s, but studies started only in earnest from the 1930s onwards. By the 1950s, the classical shelly faunas of the Cambro-Ordovician had become one of the main research topics in Moroccan palaeontology, a situation which persists to the present day. Work on the Ordovician took on a new dimension with the discovery in the Anti-Atlas region of several Konservat-Lagerstätten, i.e. sites containing exceptionally preserved fossils, at the end of the 1990s. Of particular interest in this respect are several recently discovered sites situated to the north of Zagora. Stratigraphically, these sites belong to the Lower and Upper Fezouata Formations and range in age from the latest Tremadoc to the middle Arenig. In addition to rich classical shelly faunas, these localities also yielded various articulated sponges, palaeoscolecid and other soft-bodied vermiform organisms, exceptionally complete machaeridians, a whole range of unmineralised arthropods and trilobites with preserved appendages and spectacularly complete echinoderm material. Apart from the scientific importance common to Konservat-Lagerstätten in general, the new Moroccan sites have added significance because of their Early Ordovician age. They are the first exceptional fossil sites from this time interval, critically documenting the onset of the Great Ordovician Biodiversification Event, one of the two greatest and most significant evolutionary radiations in the Phanerozoic history of life. In consequence, the new Moroccan localities have the potential to provide profound new insights into the mechanisms of the Ordovician radiation and the first stages of the resulting faunal turnover, a topic which until now has almost exclusively been studied on the basis of classical shelly faunas alone.

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