

Fossil "Art": scientific, educational and tourist importance of the palaeontological diversity from Naturtejo Geopark (Portugal)

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Geopark Naturtejo da Meseta Meridional has been developing the inventory of the geological and mining heritage since 2004, due mainly to the large size of the territory, spanning over 4600 km², and the interesting geodiversity at the southern border of the Centre Iberian Zone of Iberian Massif, part of the Variscan Belt.

This inventory that will be formally presented in 2011 includes 17 fossil sites, among classical and newly discovered sites, with regional to international importance. Some of the oldest fossils from the Iberian Peninsula were found at the Naturtejo Geopark, corresponding to cyanobacteria aged Middle-Late Ediacaran and found in a turbidite sequence of Beiras Group cropping out at Erges valley near Salvaterra do Extremo. Most of the fossil sites belong to the Armorican Quartzite Formation which is a peri-Gondwanan distributed biofacies famous for its trace fossils like Skolithos piperocks and Cruziana ichnodiversity, as well as obolid brachiopods shell beds, but almost devoided as body fossils. The Penha Garcia Ichnological Park, a most-visited attraction of Naturtejo Geopark, is recognized for the unusual abundance and preservation of such trace fossils, including the record of diverse feeding patterns during the life cycle of giant trilobites. These beautiful patterns coined "Roller Coaster Behaviour" came from Lower Ordovician and were included in the famous travelling exhibition "Fossil Art" of Crafoord awarded German palaeobiologist Adolf Seilacher. The remaining Ordovician is well represented by fossil sites in Penha Garcia and Ródão synclines, including calymenid trilobites, bivalves, orthoceratid cephalopods, orthid brachiopods, didymograptid graptolites, echinoderms and ostracod arthropods. The fossil site of Portela da Milhariça was recently found recording for the first time Lower Silurian outcrops at the Naturtejo Geopark. Cyrtograptus graptolites, bivalves and possible remains of eurypterids are among the first fossils found. The fluvial terrace of Pinhal records the first incision of Tejo River on the Neoproterozoic-to-Lower Palaeozoic and Palaeogene-Neogene rocks of Naturtejo Geopark during the Pleistocene. In these conglomerates 7 fossil tree logs were found resulting from the erosion of middle to late Miocene arkoses and deposition by Tejo in flooding plain environments. The fossil trees were found by Romans two thousand years ago during exploitation of the conglomerates for gold. Four of these fossils were saved and are now part of the collections of the archaeological and geological museum of Vila Velha de Ródão, and are displayed in the garden of the House of Arts and Culture of Tejo, in the same town. The most recent fossil site was dated of 33500 years ago and corresponds to sandstones from the last fluvial terrace to be developed by Tejo River. The Foz do Enxarrique fossil site, at the urban area of Vila Velha de Ródão, provided remains of large

mammals such as red deer and auroch. But the most important finding was the remains of *Elephas antiquus*, corresponding to the last record of this important elephant before its final extinction from Europe.

Fossil sites and palaeontological data achieved from active research at the Naturtejo Geopark is included in several tourism packages and educational programmes proposed by Naturtejo for national and international tour operators. 11500 people visit the Penha Garcia Ichnological Park every year and its Fossils Trail, thus contributing to local development. Cruziana trace fossils and trilobites that produced them become the geobrand for nature tourism and landscape touring, not only for the Geopark but also for the entire tourism of the Centre Region. They are actually being already used in innovative business opportunities.



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