

## Preface

# Dinosaur Palaeontology and Environment

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Since 1999 the small town of Salas de los Infantes (Burgos, Spain) has been the meeting point where a palaeontology congress on dinosaurs and their biotic environment has been and continues to be held. This is the only theme conference on Mesozoic dinosaurs that is organized in Spain. The sixth edition was published in September 2013 (*VI Jornadas Internacionales de Dinosaurios y su Entorno*/VI International Conference on Dinosaurs and their Environment; Torcida Fernández-Baldor and Huerta, 2013).

From its beginning, the symposium has presented studies that reflect the state of research on these fascinating animals, and have showed that several research groups located in different Spanish institutions have grown in number and experience over the years. Currently in Spain, the research work on dinosaurs and other contemporary species that interacted with them during the Mesozoic is internationally recognized for the interest of the studied fossil-sites and for the quality of the developed projects, despite living immersed in an unfavorable time for funding scientific research. This situation has led to the collaboration with specialists from other countries and greater attention in international scientific forums towards the Iberian palaeontological heritage.

This special issue *Dinosaur Palaeontology and Environment* consists of twelve papers dealing with diverse topics on vertebrate palaeobiology. It provides a view of the current state-of-the-art of the vertebrate palaeontology made in

Spain. The majority of the contributions are based on fossils found in the Iberian Peninsula and particularly in the Iberian Range, either skeletal bones or tracks and eggshells. The articles are focused on the second half of the Mesozoic: four in the Middle-Late Jurassic or the Jurassic-Cretaceous interval, four in the Early Cretaceous and four in the latest Cretaceous. Topics of study are diverse and range from the diversity of the Late Jurassic turtles of Europe to the evolution of the latest Cretaceous Iberian dinosaurs and associated fauna, passing through new records of crocodylomorphs in Teruel and the palaeobiological implications based on sauropod tracks from Portugal and Spain, among others.

Two articles are related to European turtles. In the first one, Pérez-García (2015a) revised the British record of *Tropidemys*, a plesiochelyd genus well known in the Kimmeridgian of Switzerland and Germany. “*Pelobatochelys*” *blakii* from the Kimmeridge Clay of Dorset (England) is considered to be a valid species of *Tropidemys*. Moreover, the presence of *Tropidemys* in the Lusitanian Basin enlarges the diversity of plesiochelyd turtles in the Late Jurassic of Portugal. In the second paper, the diversity of eucryptodiran turtles in the Late Jurassic of Europe is increased thanks to the revision of two problematic specimens: *Enaliochelys chelonia* from the Kimmeridgian of Cambridgeshire (England), regarded as a valid taxon by Pérez-García (2015b), and “*Thalassemys moseri*” from the Tithonian of the Oléron Island (France), which

is considered invalid and the material is assigned to a new genus and species (Pérez-García (2015b).

Two papers report on new finds of Iberian crocodylomorphs. Parrilla-Bel and Canudo (2015) describe vertebral elements that form part of the holotype of *Maledictosuchus riclaensis* from the Callovian of Teruel (Spain). This metriorhynchid genus and species has recently been diagnosed by its cranial elements (Parrilla-Bel et al., 2013). The study of the Ricla vertebrae helps to increase our knowledge of the postcranial skeleton of thalattosuchians. In addition, Puértolas-Pascual et al. (2015) presents new goniopholidid material, including cranial bones, found in a coal mine from the Albian of Andorra (Teruel). A phylogenetic analysis suggests that the specimen is closely related to *Anteophthalmosuchus escuchae*, which was erected on the basis of fossils discovered in the nearby coal mine of Ariño (Buscalioni et al., 2013). This and other taxa from the Albian of Teruel currently represent the last record of Goniopholididae in Europe.

With regard to dinosaurs, two articles of the volume are concerned with ornithopods. In one of them, Gasca et al. (2015) report on new remains belonging to the holotype specimen of *Delapparentia turolensis*, a large-sized iguanodont from the Early Cretaceous of Galve in Teruel (originally described by Ruiz-Omeñaca, 2011). The phylogenetic position of this taxon is analysed for the first time: Gasca et al. (2015) suggest as a working hypothesis the close affinity between the Spanish Barremian *Delapparentia* and the English Valanginian *Barilium*, highlighting certain similarities between the Weald faunas of Britain and Iberia. In the other paper, Company et al. (2015) describe diminutive fossil bones referable to hadrosaurids from the latest Cretaceous of Huesca in the south-central Pyrenees. The histological features show that the elements come from adult individuals approaching their final body size. This and other discoveries from the Maastrichtian of Europe are probably related to insular dwarfism. The described specimens from Huesca represent the smallest hadrosaurid found to date in Europe.

Two papers are synthetic works about the Iberian vertebrate fossil sites of Laño and Lo Hueco, both from the Late Cretaceous. Ortega et al. (2015) presents the recently discovered Konzentrat-Lagerstatt of Lo Hueco, located near the village of Fuentes (Cuenca, Iberian Range). The site has yielded a rich collection of fossils, mainly macrofossils of plants, invertebrates and vertebrates. The uniqueness of the Lo Hueco site is related to the richness, abundance and excellent preservation of the vertebrate fossils, particularly turtles, crocodiles and titanosaurian sauropods (e.g., multiple partial skeletons in articulation or high association). For this and other singularities, Lo Hueco is an unparalleled site throughout Europe (Barroso-Barcenilla et al., 2009). The biota is composed of a combination of new taxa (of which only a few have been described to date), new records of taxa previously known in the Iberian record, and relatively common taxa in the Late Cre-

taceous European archipelago. Some of the taxa at Lo Hueco are also present in the Laño quarry (Condado de Treviño), in the Basque-Cantabrian Region. As noted in this volume by Pereda Suberbiola et al. (2015), Laño is noteworthy by its taxonomic diversity: the late Campanian to early Maastrichtian fluvial beds (probably coetaneous to the wetland deposits of Lo Hueco) have yielded a large collection of bones and teeth, including abundant microfossils. The Laño assemblage is composed of nearly 40 vertebrate species (i.e., actinopterygians, lissamphibians, lepidosaurs, turtles, crocodyliforms, dinosaurs, pterosaurs, and mammals), making it one of the most diverse associations hitherto known for this age in Europe (see Csiki-Sava et al., 2015). In addition, an upper horizon of the Laño quarry has yielded a shallow marine vertebrate association of late Maastrichtian age, which consists of selachians, actinopterygians, mosasaurids, and plesiosaurs (about 37 species).

The parataxonomy of dinosaur eggshell and footprints is the subject of four articles in this publication. In one of them, Sellés and Vila (2015) re-evaluate the age of more than twenty historically significant vertebrate localities from the latest Cretaceous of the southern Pyrenees mainly on the basis of the dating of eggshells, and more concretely of *Megaloolithus* oospecies. This study has interesting implications for the dinosaur turnover proposed in southwestern Europe during the late Maastrichtian, and contributes to lay the groundwork for future studies on dinosaur biostratigraphy in Europe.

At last, three articles deal on dinosaur footprints. In Spain, Torcida Fernández-Baldor et al. (2015) describe biped and quadruped trackways from the Jurassic-Cretaceous interval of Las Sereas in Burgos (Tera Group, Cameros Basin). They are identified as theropod and sauropod trackways, respectively. The sauropod footprints have an unusual morphology and are reminiscent of those of *Polyonyx* from the Middle Jurassic of Portugal (Santos et al., 2009). The Las Sereas site includes outcrops that are unique Iberian records from a Tithonian-Berriasian carbonate-precipitating lacustrine or palustrine environment. In addition, Díaz-Martínez et al. (2015) describe small tridactyl footprints from a new Lower Cretaceous dinosaur tracksite of La Rioja. These tracks, identified as belonging to ornithopods, are the smallest found to date at the Urbión Group (Cameros Basin). The scarcity of small dinosaur footprints in the fossil record raises questions related to ecological biases, preservation biases, and weathering-erosional processes. In Portugal, Santos et al. (2015) report on two recently discovered sauropod trackways from the Lower Cretaceous of Parede, near Lisboa. One of these trackways is narrow-gauge with probable non-titanosaur affinity and represents one of the scarce occurrences of sauropod tracks in the Albian of the Iberian Peninsula (and the youngest sauropod tracks from the Cretaceous of Portugal). This study supports a correlation of narrow-gauge sauropod trackways with coastal environments.

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