

# Las Hoyas: A Cretaceous Wetland

A multidisciplinary synthesis after  
25 years of research on an exceptional  
fossil Lagerstätte from Spain

Francisco José Poyato-Ariza &  
Ángela D. Buscalioni  
(editors)



Verlag Dr. Friedrich Pfeil · München

## Las Hoyas: A Cretaceous Wetland

At human scale, 25 years seems time enough to relate academic and scientific experiences. The particular experiences presented in this book are based, first of all, on the earliest works and research at Las Hoyas led by Prof. José Luis Sanz. This book honors him as a tribute to those early years of Las Hoyas, where, while admiring the beauty of its fossils, we all learned the huge diversity of the nature and, at the same time, how to handle a number of enthusiastic students, manage the collection, and ask for funds year after year. The best of what we have all learnt from Prof. Sanz is the importance of a work that is properly done, and this sort of obsession will hound us forever.

Much or little was made in these 25 years, depending on how one looks at it. Either way, this synthesis volume aims to convey the story of our experience in the study of Las Hoyas. The present book is aimed to both specialists and informed aficionados. It incorporates many international researchers who have largely contributed to the understanding of the palaeobiology and taphonomy of this locality. The volume is organized into four major parts. Part I is devoted to the Las Hoyas environment by providing the geological framework to understand how the interpretation of this fossil Lagerstätte has changed from a deep lake at first to the current hypothesis of a shallow aquatic environment made of a mosaic of pools, filled by microbial mats, in a wetland-like landscape. Part II unfolds the palaeobiology of the different groups of plants and animals recorded at Las Hoyas by providing an updated revision of their taxonomic diversity. The information provided for each group is presented in a homogeneous manner by developing a summarized description of the specimens, their life styles and ecomorphology, phylogenetic context, preservation, and relevance of the Las Hoyas record within a worldwide or European frame. The processes involved in the fossil preservation are explored in Part III. This part includes not only the study of the preservation of the fossils themselves, but also some chapters devoted to experimental taphonomy and the role of microbial mats in preservation. Part IV incorporates our experience in the fieldwork in establishing how palaeoecological restorations need of a previous taphonomic study. The final chapter presents restorations by some brilliant young artists of the landscape and organisms living in the Las Hoyas Wetland during the Early Cretaceous in the framework of their trophic network. An Addendum incorporates taxa discovered or described during the elaboration of the present volume, and a final Appendix presents an updated taxonomic classification of the biota from Las Hoyas.

Find more information at  
[www.pfeil-verlag.de](http://www.pfeil-verlag.de)

### Order form

Order online at [www.pfeil-verlag.de](http://www.pfeil-verlag.de)

Address
Email

Verlag Dr. Friedrich Pfeil  
Wolfratshausener Straße 27  
81379 München  
Germany

Phone: + 49 89 742827-0 · Fax: + 49 89 7242772  
E-mail: [info@pfeil-verlag.de](mailto:info@pfeil-verlag.de) · [www.pfeil-verlag.de](http://www.pfeil-verlag.de)

I hereby order

### Las Hoyas: A Cretaceous Wetland

ISBN 978-3-89937-153-6

€ 75

Copy (copies)



Plus SHIPPING costs: € 15 to EU countries / € 20 to other countries

PAYMENT:  Please send proforma invoice

Please charge my CC:  Master/Eurocard  Visa  American Express

Card number:

Expiry date:   /   Card verification number:

Card holders signature:

Date

Signature for order

# Las Hoyas:

## A Cretaceous Wetland

A multidisciplinary synthesis after 25 years of research on an exceptional fossil Lagerstätte from Spain

Francisco José Poyato-Ariza & Ángela D. Buscalioni (editors)

262 pages, 32.6 × 24.5 cm

41 coloured and 1 b&w plates, 64 coloured and 101 b&w figures (altogether 838 photos and drawings)

ISBN 978-3-89937-153-6

75 Euro

plus shipping charges: € 15 to EU countries / € 20 to other countries

### Contents

Contributors (authors) (p. 6)

Acknowledgements (p. 8)

**Preface: a bit of history**

(Francisco José Poyato-Ariza & Ángela D. Buscalioni) (p. 9)

### I Introduction

I.1 **Relevance of Las Hoyas as a Mesozoic Lagerstätte** (Á. D. Buscalioni & F. J. Poyato-Ariza) (p. 13)

I.2 **Environmental reconstruction: a historical review** (Marian Fregenal-Martínez & Nieves Meléndez) (p. 14)

### II Fossil Record

II.1 **Las Hoyas in the Tree of Life** (F. J. Poyato-Ariza, H. Martín-Abad & Guillermo Navalón-Fernández) (p. 29)

II.2 **Palynomorphs** (Montserrat de la Fuente & Reinhard Zetter) (p. 31)

II.3 **Plants and their landscapes** (Carles Martín-Closas, Bernard Gomez & Véronique Daviero-Gomez) (p. 43)

II.4 **Mollusca** (Graciela Delvene & Martin Clive Munt) (p. 57)

II.5 **Arachnida** (Paul A. Selden) (p. 64)

II.6 **Diplopoda** (P. A. Selden & William A. Shear) (p. 68)

II.7 **Insecta** (Xavier Delclòs & Carmen Soriano) (p. 70)

II.8 **Ostracoda** (Julio Rodríguez-Lázaro) (p. 89)

II.9 **Spelaeogriffacea** (Damiá Jaume, Eva Pinardo-Moya & Geoff A. Boxshall) (p. 94)

II.10 **Decapoda** (Alessandro Garassino) (p. 98)

II.11 **Chondrichthyes** (Rodrigo Soler-Gijón, F. J. Poyato-Ariza, John G. Maisey & Jennifer A. Lane) (p. 103)

II.12 **Osteichthyan fishes** (F. J. Poyato-Ariza & H. Martín-Abad) (p. 114)

II.13 **Albanerpetontidae** (Susan E. Evans) (p. 133)

II.14 **Urodela** (S. E. Evans) (p. 138)

II.15 **Salientia** (Ana María Báez) (p. 143)

II.16 **Chelonia** (Adán Pérez-García, Marcelo S. de la Fuente & Francisco Ortega) (p. 151)

II.17 **Squamata** (S. E. Evans & Arnau Bolet) (p. 156)

II.18 **Crocodylomorpha** (A. D. Buscalioni & Beatriz Chamero) (p. 162)

II.19 **Pterosauria** (Romain Vullo & Jesús Marugán-Lobón) (p. 170)

II.20a **Dinosauria (Ornithischia)** (Mercedes Llandres Serrano, R. Vullo & F. Ortega) (p. 175)

II.20b **Dinosauria (non-avian Saurischia)** (Fernando Escaso, F. Ortega & José Luis Sanz) (p. 177)

II.21 **Aves** (J. L. Sanz, B. Chamero, Luis M. Chiappe, J. Marugán-Lobón, Jingmai K. O'Connor, F. Ortega & F. Escaso) (p. 183)

II.22 **Feathers** (J. Marugán-Lobón & R. Vullo) (p. 190)

II.23 **Ichnoassemblage (trace fossils)** (Jordi M. de Gibert, José J. Moratalla, M. Gabriela Mángano & Luis A. Buatois) (p. 195)

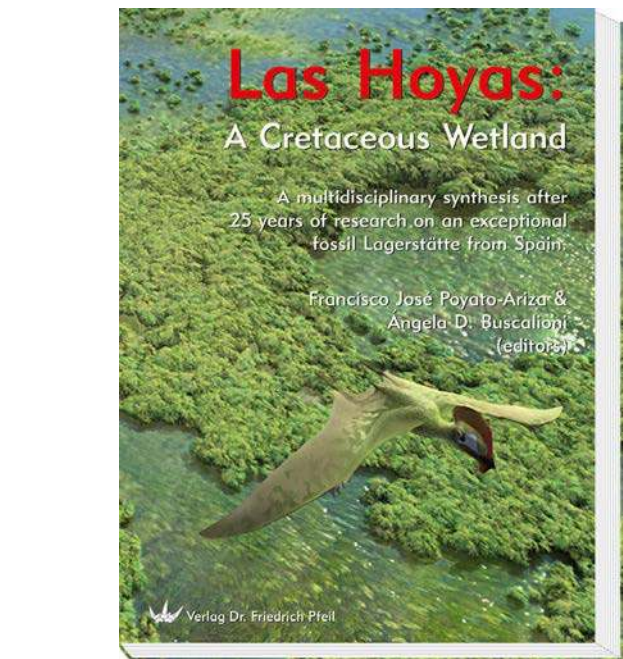
### III Taphonomy

III.1 **Biostratinomic factors involved in fish preservation** (H. Martín-Abad & F. J. Poyato-Ariza) (p. 202)

III.2 **Anuran biostratinomy** (Álvaro López-García, H. Martín-Abad & Óscar Cambra-Moo) (p. 211)

III.3 **Molecular preservation** (Derek E. G. Briggs, Neal S. Gupta & Ó. Cambra-Moo) (p. 216)

III.4 **Microbial mats and preservation** (María del Carmen Guerrero, Ana Isabel López-Archilla & Miguel Iniesto) (p. 220)



III.5 **Exceptional preservation** (F. J. Poyato-Ariza & Á. D. Buscalioni) (p. 229)

### IV Palaeoecology

IV.1 **From Taphonomy to Palaeoecology** (A. D. Buscalioni & F. J. Poyato-Ariza) (p. 232)

IV.2 **The wetland of Las Hoyas** (Á. D. Buscalioni, F. J. Poyato-Ariza, J. Marugán-Lobón, M. Fregenal-Martínez, Óscar Sanisidro, G. Navalón & Carlos de Miguel) (p. 238)

**Addendum 1: New taxa and some latest findings** (p. 254)

**Addendum 2: Spinolestes** (p. 256)

**Appendix: Systematic list** (p. 258)

**Added in proof** (p. 260)

