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PNSO FIELD GUIDE TO THE ANCIENT WORLD: AGE OF PTEROSAURS

Yang, Y., & Zhao, C. 2021. 106 pp. Brown Books Publishing Group. ISBN(10): 1612545297 and ISBN(13): 9781612545295.

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BRYOPHYTES FROM THE TRIASSIC OF SAN JUAN, ARGENTINA

New fossil liverworts, mosses, and thallose forms are described from the Middle Triassic of Barreal depocenter adding important data to the bryophyte fossil record.

REVISION OF FOSSIL COLEOPTERA FROM CHINA

Re-examination of *Mesoceratocanthus* from the Early Cretaceous Yixian Formation demonstrates that it should be assigned to the passaloid lineage (Passalopalpidae + Passalidae) and appears closely related to the extinct family Passalopalpidae.

TAXONOMY AND PHYLOGENY OF EARLY SOUTH AMERICAN CAIMANINES

Redescription of *Notocaiman stromeri* (middle Palaeocene, Las Violetas Formation, Chubut Province) reinforces a geographically broad diversification of the genus Eocaiman, from the Paleocene to the Eocene/Miocene in this continent.

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PNSO FIELD GUIDE TO THE ANCIENT WORLD: AGE OF PTEROSAURS. *Yang, Y., & Zhao, C.* 2021. 106 pp. Brown Books Publishing Group. ISBN(10): 1612545297 and ISBN(13): 9781612545295.

The book conveys an excellent motivation to introduce us to the world of flying reptiles, or pterosaurs, as some prefer to call them. It shows the great diversity of species that inhabited our planet in the different periods of the Mesozoic Era. The two young scientists who wrote this book try to transmit to society, especially families, their fascination with the world of pterosaurs. Ms. Yang Yang does it through her stories based on the latest scientific research. An excellent illustration undoubtedly accompanies this as an atlas, made by Mr. Zhao Chuang, a scientific artist who motivates each child's imagination who reads this book. The colours seem so realistic, sober and natural they make you travel immediately to the natural environment where flying reptiles lived, and each illustration is based on a story told by Yang Yang. This book shows that species appeared and disappeared over hundreds of millions of years, none more fascinating than the other, simply unique. They went through cycles of life and death like every being on earth until they survived as long as possible. The cover of the book is striking; it seems to be the living reconstruction of the azhdarchid *Tupandactylus* from Brazil, with an imposing appearance. Although the illustration on page five corresponds to the genus *Dsungaripterus* considered molluscivore, its posterior teeth do not seem to reflect this morphology since they were different from its anterior teeth, which were rounded and blunt. The book at the beginning describes in an incredible way how life appeared on earth as well as the animals that could fly and glide chronologically. This sheet depicting the conquest of the aerial environment is very visual for both children and young people. It includes invertebrate and vertebrate animals, such as insects, prolacertiformes reptiles, pterosaurs, dinosaurs, birds, mammals, and even the first airplane and the first space rocket (the spacecraft Vostok 1). Below is an excellent and accurate illustration referring to the Geological timetable of the Pterosaurs depicted in the book. Standard colours have been used in the chronostratigraphic chart scale for each Mesozoic period, with a unique miniature reconstruction of each pterosaur species. Interestingly, according to a geographical area, the authors have depicted the pterosaurs developed in the book, differentiating between Asia, North America, South America, Europe and Australia. This book is quite complete; however, not all the species have been included. Many pterosaurs from Asia, South America, the United States, Europe, Argentina, and Chile have been considered but unfortunately, some taxa such as *Wenupteryx uzi*, species described in Codorniú *et al.* (2006) and named in Codorniú and Gasparini (2013) from the Neuquén Basin (Patagonia, Argentina); and also *Allkaruen koi* from the Cañadón Asfalto formation from Chubut (Codorniú *et al.*, 2016) have not. This last taxon reveals some important characters in the origin and evolution of the pterodactyloid neurocranium and would also be worth including in this book. In the same way, an *Allkaruen* print could be added before China's Jurassic pterosaurs, with an approximate 170 Ma of age, since the Cañadón Asfalto formation is considered as Toarcian-Bathonian. Another suggestion would be to add the recently published new taxon of ctenochasmatids from Uruguay, *Tacuadactylus luciae* (Soto *et al.*, 2021), and the new findings from the Atacama Desert in Chile (Alarcón Muñoz *et al.*, 2020, 2022), which show that a colony of ctenochasmatids lived in the region at that time. After the introductory prints, the book begins the story with the silent Triassic period and the desire to venture into the aerial environment by reptiles and explains the animals' motivation. It exposes taxa from 220 Ma and so on and so forth, advancing in time. There is a simple paragraph with scant morphological details accompanying each taxon in each illustration. The story of *Darwinopterus* is nice and shows the sexual dimorphism (males with a crest are more colourful than females who lack a crest) and the care of unhatched eggs by the female, and the parental care for the first weeks until they can fly. There is an impressive and wonderful reconstruction of the ctenochasmatid *Plataleorhynchus*, as well as of the *Orientognathus*; its

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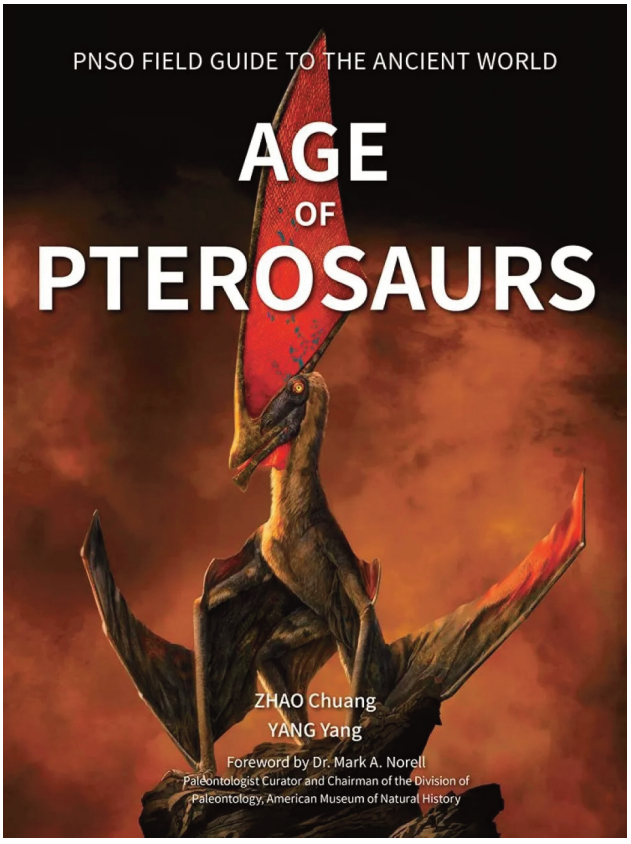

Figura 1. Cover of the book "Pnso field guide to the ancient world: Age of Pterosaurs" by Yang, Y., & Zhao, C.

butterfly-like painted wings make this jurassic pterosaur very attractive. Other very striking and interesting paleoartistic reconstructions are *Lonchognathosaurus* very particular with the tortoise, and *Elanodactylus* with its colour of eyes, which gives it a great presence; the primitive istiodactyid *Hangshanopterus* hunting maniraptores. The maxillary and mandibular *Coloborhynchus'* crests are painted in bold colours that stand out from the body colour in a remarkable way. The reconstruction of *Hamipterus* in life is very good, showing that perhaps both males and females had crests, with some degree of sexual dimorphism along with a story that reflects and shows much of the finding, such as guarding the nest and suddenly die and be buried by mudflows, due to floods. Although the *Pterodaustro*'s history from Argentina is very beautiful, something similar happened to *Hamipterus* in China when a mudflow dragged an egg with the embryo inside (Chiappe *et al.*, 2004; Codorniú *et al.*, 2004, 2017), near the bottom of the lake. The lake was not so shallow (10 meters deep), as it had been formed in a semi-desert environment and not in a forest. A colony of *Pterodaustro* represented by a juvenile (Codorniú and Chiappe, 2004), sub-adults, and adult individuals (the latter less frequent) lived together in the lake. The muscular bag seems to be a crop similar to the crop of birds or perhaps a gular sac. As for its morphology, it would be good to change the end of the maxilla in the paleoartistic illustration since it is sharply pointed and not rounded; and the mandible ends with two teeth that are prolonged forward, very strong, and arranged in alveoli; these data are well described in a section in Codorniú *et al.* (2013). It is very astonishing, the history and illustration of both *Nyctosaurus*, and the azhdarchid *Bakonydraco*, where both males fight in the air, in full flight, to conquer the opposite sex. And so, for each species of pterosaur, the living reconstructions are wonderful. The authors go detailing the flying giants that existed towards the end of the Cretaceous and then at the end, in a single print, they explain how these and many other reptiles became extinct from the face of the earth. Pterosaurs would no longer occupy the aerial environment; pterosaurs became completely extinct. Throughout the book, the names of the pterosaur families are written in italics, as if they were a specific taxon, which makes me wonder if this is due to informality or if it should be edited, keeping the scientific names of the species in italics. Reference number 28 is repeated in reference number 29. The book ends with the chronicles of the events that occurred in the age of pterosaurs, corresponding to each period. In conclusion, to launch such a long-term project is a great idea and to make this type of publication such an easy and descriptive way to read, including not only pterosaurs but other groups of animals as well. I would like to congratulate the writers and artists of this book on being part of this great project and reaching out to society attractively and scientifically.

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