



2nd Palaeontological Virtual Congress: Palaeontology in the virtual era

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Introduction

After the success of the 1st Palaeontological Virtual Congress (Crespo and Manzanares 2019), we decided to try to repeat the success with a new edition. Thus, the 2nd Palaeontological Virtual Congress (2nd PVC; Fig. 1) was born. This second edition of the congress was already conceived in November 2019, prior to the events—sadly known to all—related to the pandemic of COVID-19 disease, and was successfully held during May 2020 (Barral 2020).



Fig. 1. Logo of the 2nd Palaeontological Virtual Congress, designed by Hugo Salais (source: author).

In this way, thanks to the collaboration of different institutions, some of them present in the previous edition such as Universitat de València, Museo Paleontológico de Alpuente, Museu Valencià d'Historia Natural, University of Bristol and, Universidad Nacional a Distancia, plus new incorporations such as Museo de La Plata, Consejo Nacional de Investigaciones Científicas y Técnicas (CONICET), University of Bath, Aristotle University of Thessaloniki, Instituto de Investigaciones en Paleobiología y Geología (IIPG) and Museo Paleontológico Egidio Feruglio, we decided to carry out this adventure again, with a more international character.

The Palaeontological Virtual Congress (PVC) was innovative in the world of palaeontology as it was the first congress developed in an exclusively virtual environment in this science. Three main goals moved us to carry out this second edition, with two main ones, the social and the ecological, to which the pandemic was added later. The new format that we developed for the PVC combines the benefits of traditional meetings with the advantages and simplicity of online platforms. Among the similarities with traditional congresses are the following: providing a forum for discussion, merchandising, guest lectures, “field trips”, and an abstract book, etc. Thanks to this format, we reached a high number of palaeontologists around the

world. We know the difficulties that researchers from developing countries, independent researchers, or researchers without grants face with travel to different congresses, and this was a good opportunity to strengthen their scientific connections. So, thanks to the volunteer work of the organising committee, we could provide a low registration fee. In addition, these kinds of congresses allow us to reduce the carbon footprint that we humans leave on our planet, as we avoid the pollution associated with a face-to-face meeting (including traveling by plane, car, or train) (Abbott 2019).

Results

Participation.—Thanks in part to the good reception of the 1st PVC, the second edition increased the numbers of the first edition and exceeded our expectations: 398 palaeontologists and palaeontology enthusiasts from 44 different nations and five continents were part of this initiative.

Congress format.—The meeting was organized as any traditional congress: keynotes, general sessions and workshops, and “field trips”. In charge of the keynotes were Michael Benton from University of Bristol, Anne Laure Decombeix from Centre National de la Recherche Scientifique-Unité Mixte de Recherche Botany and Modeling of Plant Architecture and Vegetation (CNRS-UMR AMAP), Jesús Lozano Fernández from Institute of Evolutionary Biology, Centro Superior de Investigaciones Científicas-Universidad Pompeu Fabra (CSIC-UPF), and, last but not least, Jim Kirkland and Don DeBlieux from Utah Geological Survey. Participants were able to choose from three forms of presentation: a video presentation with a duration of 10 to 15 minutes; presentation slides (between 10–30 slides); and a poster (up to 5 slides). As in any meeting, all the contributions have been published in the abstract book “2nd Palaeontological Virtual Congress. Book of abstracts. Palaeontology in the virtual era” (Vlachos et al. 2020), that can be downloaded for free on our website, together with the book of abstracts of the 1st PVC (Crespo et al. 2018).

Workshops.—Due to the diversity of topics in palaeontology, it was possible to present a variety of thematic sessions. This idea received a very warm welcome, and five

specific sessions and four general sessions were held on our virtual platform.

Specific sessions.—Evolution and Palaeobiodiversity in Neogene and Quaternary Islands moderated by Carolina Castillo Ruiz, Javier González-Dionis, Elena Cadavid Melero, and Sara Pérez Martín from Universidad de La Laguna (Spain) and Penélope Cruzado-Caballero from Instituto de Investigación en Paleobiología y Geología-CONICET-UNRN (Argentina), and Grupo Aragosaurus-IUCA, Universidad de Zaragoza (Spain).

Fossil insects, their record, ecology and evolution moderated by Jacek Szwedo from Uniwersytet Gdański (Poland).

Palynology as a tool in stratigraphic and paleoenvironmental research: advances and perspectives moderated by Adele Bertini, and Gabriele Niccolini from Università degli Studi di Firenze (Italy), and Nathalie Combourieu-Nebout from Histoire Naturelle de l'Homme Préhistorique (France).

PalaeoVC Early Career Session moderated by Bryan Shirley, and Niklas Hohmann from Friedrich-Alexander Universität Erlangen-Nürnberg (Germany), and Danae Thivaoui from Ethnikó ke Kapodistriakó Panepistímio Athinón (Greece).

Paleontology in Education and Society moderated by Rosalía Guerrero-Arenas, and Eduardo Jiménez-Hidalgo from Universidad del Mar (Mexico).

The general sessions are moderated by the organising committee and were divided into Palaeozoic, Mesozoic, Cenozoic, and General Palaeontology, where those papers that could not be classified in the first sessions were placed. The variety of sessions held during the congress provided the participants with a forum for the exchange of ideas and the opportunity to discuss each topic.

Virtual field trips.—After the success and positive feedback of the 1st PVC virtual field trips, we decided to repeat the experience. This time the virtual field trip was a wonderful walk in South Tyrol (North Italy), specifically in the Bletterbach Gorge, which is part of the Dolomites UNESCO World Heritage Site as the Bletterbach Geopark. In this visit we saw the formation from a drone, visited the museum associated with the area, and saw the main fossils found. All these virtual field trips can be visited permanently on our website.

Special issue

As in the first edition, we also wanted to prepare a special volume. On this occasion it is published in *Acta Palaeontologica Polonica*, to be able to continue with the same spirit as a traditional congress. For this reason, we decided to make a special issue, composed of 10 contributions, originating from the expanded abstracts that were presented in the congress.

Abel et al. (2021) discuss a pterodactyloid mandible from the lower Valanginian of Lower Saxony Basin, in Germany. The material represents one of the oldest identi-

fiable member of the Early Cretaceous clade *Anhangueria*, and one of the few known pterosaurs from the Valanginian stage.

Álvarez-Parra et al. (2021) present a new fossiliferous locality of early Miocene age from the Ribesalbes–Alcora Basin in Spain. Here, a quite diverse fauna represented by charophytes, terrestrial plants, arthropods (crustaceans and insects), gastropods, and fish remains, preserved in finely laminated limestone beds and laid down in a lacustrine environment, improve our knowledge about the palaeoecology and palaeoenvironmental evolution of the Basin during the Miocene.

Barasoain et al. (2021) provide the first description of the skull for *Vetelia*, a Miocene genus of armadillos from Argentina and Chile, and emend the diagnosis of the three species included in the genus. Further phylogenetic analysis reveal *Vetelia* to be a member of Priodontini within the subfamily Tolypeutinae, differently from previous hypothesis that included *Vetelia* in the subfamily Euphractinae, thus shedding new light on the evolutionary history of the poorly known Tolypeutinae.

Dankina et al. (2021) study Late Permian chondrichthyans and osteichthyans remains from the North-Sudetic Basin (southwest Poland), identifying an important ecological differentiation within the ichthyofauna dwelling the Zechstein sea.

Davidian et al. (2021) describe the first ichneumonoid aphidiine wasp species from the middle Eocene Sakhalinian amber (Sakhalin Province, Russian Federation). The new taxon represents to date the oldest named species of the genus and bears characters possibly related to an adaptation to parasitize aphids, thus shedding further light on the coevolution between aphids and aphidiine.

Martino et al. (2021) revise hippopotamid remains from the Messinian of Sicily originally used to erect the taxon *Hippopotamus siculus*. By means of morphological and morphometrical analyses, a provisional assignment to the genus *Hexaprotodon* is provided, as well as a discussion of the dispersal pattern across the peri-Mediterranean area.

Núñez-Blasco et al. (2021) describe and compare some specimens of the doedicurin glyptodont *Eleutherocercus solidus*. Cladistic analysis supports Doedicurinae as a monophyletic group of southern South American glyptodonts and the genus *Eleutherocercus* as a sister group of *Doedicurus*, the giant glyptodont of Pleistocene age representing the end member of a trend of latitudinal retraction of the subfamily probably triggered by climate change.

Reyna-Hernández et al. (2021) report hadrosaurid postcranial remains from Coahuila (Mexico) referred to *Lambeosaurinae* indet. and discuss the significance of the new material in the wider panorama of southern Laramidia during the Campanian–Maastrichtian.

Robledo et al. (2021) describe fossil fruits of the alismataceous plant *Sagittaria montevidensis* from the upper Miocene of Salta province (Argentina), representing the first pre-Quaternary remains of this kind of plants from

South America. The authors also provide a rapid review of the family Alismataceae, suggesting dispersal routes for the genus *Sagittaria* during the Oligocene–Miocene time interval.

Waseem et al. (2021) discuss $\delta^{18}\text{O}$ and $\delta^{13}\text{C}$ analyses on thirty fossil enamel samples belonging to different middle Miocene mammals from of the Siwalik sub-Group of Pakistan to investigate their palaeodiet and palaeoecology related to dense forests and woodlands.

The future

With this second edition, we are already consolidating our position in the increasingly competitive world of online congresses, as we were the first in the field of palaeontology to organise this type of conference. With the experience gained from these two editions, we are already preparing the third edition for 1–15 December 2021, with new surprises and new forums in which participants can interact in the next congress. Among them, to increase the range and diversity of nationalities and areas of expertise, we have created a social fund for participants from low and lower–middle income countries listed as such on The World Bank’s list. In addition, we are introducing the figure of ambassadors, for those participants who wish to advertise us among their colleagues in their country and/or speciality. We also set up a Discord server with multiple text and voice channels so you can give and receive feedback to and from your peers. We look forward to seeing you in the 3rd PVC!

Acknowledgements

Finally, we would like to thank all of the other members of the organising committee (Esther Manzanares, Carlos Martínez-Pérez, José Luis Herráiz, Arturo Gamonal, Fernando Antonio Martín Arnal, Humberto Gracián Ferrón, Francesc Gascó, and Evangelos Vlachos), our colleagues for organizing and coordinating the different thematic sessions, all of the authors for submitting their contributions and to the numerous reviewers that have made this volume and congress possible. We would like also to give special thanks to *Acta Palaeontologica Polonica*, in particular to the Editor in Chief Andrzej Kaim, Museu d’Història Natural de la Universitat de València, Sociedad Geológica de España, Sociedad Española de Paleontología, Paläontologische Gesellschaft, Transmitting Science, PeerJ Life & Environment, Pander Society, and Paleontological Society that have supported this initiative, specially to the University of Valencia (the Department of Botany and Geology) for hosting the space to develop this project. Thanks are also due to the helpful comments on the original manuscript provided by Daniel E. Barta (Oklahoma State University, Tahlequah, USA).

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