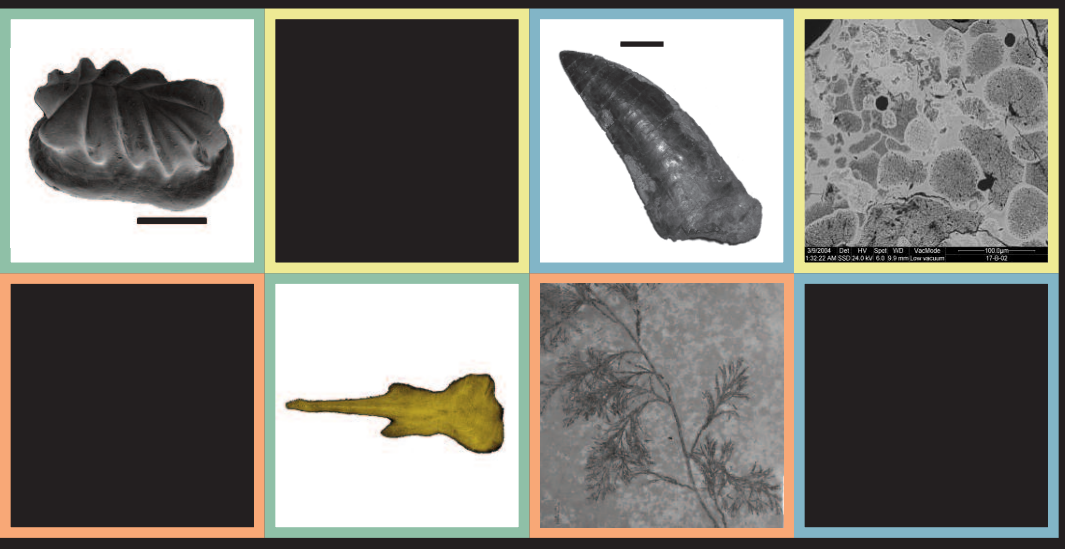
1ST INTERNATIONAL MEETING OF EARLY-STAGE RESEARCHERS IN PALAEONTOLOGY | 1ST IMERP
1XIV ENCUENTRO DE JÓVENES INVESTIGADORES EN PALEONTOLOGÍA | XIV EJIP

New perspectives on the Evolution of Phanerozoic Biotas and Ecosystems



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CONFERENCE PROCEEDINGS

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Conference proceedings
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XIV Encuentro de Jóvenes Investigadores en Paleontología

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New perspectives on the Evolution of Phanerozoic Biotas and Ecosystems Conference proceedings

Esther Manzanares, Humberto G. Ferrón, Maite Suñer, Borja Holgado, Vicente D. Crespo, Samuel Mansino, Ana Fagoaga, Rafael Marquina, Ignacio García-Sanz, Carlos Martínez-Pérez, Marçal Joanes-Rosés, Borja Cascales-Miñana, María Dolores Marin-Monfort (Editors)

The application of Synchrotron X-Ray Tomographic Microscopy to the functional study of the conodont skeleton

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Conodonts were soft-bodied organisms, which unique hard-parts were a set of teeth-like elements placed in their oral cavity. This anatomical feature, together with the presence of a notochord, a tail supported by rays and V-shaped muscle blocks, have centred the debate about their biological affinities, with some authors identifying them as stem-vertebrates, and others as a group of basal agnathan. Beyond this debate, conodont fossil record is one of the best compared to other groups, being major components of the Palaeozoic and early Mesozoic ecosystems. Besides its biological affinities, conodont element function also remains controversial, debating between the filter and the teeth-like function hypotheses. Until recent, conodont functional analysis has been limited to analogy and qualitative analytical approaches, but more recently, novel quantitative computational methods, such as computed tomography, are opening new opportunities to study the function of these elements. Following this, in this work we study the function of various taxa belonging to the *Epigondolella-Mockina* linage from the Upper Triassic of Italy using Synchrotron X-Ray Tomographic Microscopy (SXRTM). Our functional analysis was centred on the development of their occlusal cycle based on the 3D models (digital and physical) obtained from several P1 clusters scanned with the SXRTM, and corroborated by microwear analyses in single specimens of the same taxa.

The development of the 3D models allowed us to describe their occlusal cycle and corroborated by the presence of microwear on the predicted functional surfaces, suggesting that these elements developed a tooth-like function comparable to other conodont taxa. Interestingly, the tomographic study of the inner microstructures allowed us to identify the same wear pattern, in the same locations, providing strong support that the P1 elements of several taxa belonging to the *Epigondolella-Mockina* linage where indeed used as teeth; and more interesting, that they were retained through the whole life of these animals and not shed and replaced as it has been proposed before. These results confirm previous works, shedding light on the ecology of these important marine organisms.

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