

First Iberian aspidothoracid megasecopteran insect and associated plants evidencing herbivory in a tropical Carboniferous forest from León, Spain

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We describe *Aspidothorax hispanicus* sp. nov. from Gzhelian, Pennsylvanian strata of León, Spain, representing the first occurrence of Aspidothoracidae in the Iberian Peninsula. This discovery expands the paleogeographical range of the family, previously known only from the Russian Federation and France. The new insect is preserved in close association with foliar remains of medullosan (*Alethopteris zeilleri*) and callistophytalean (*Pseudomariopteris cordato-ovata*) seedferns whose environmental preferences suggest that the new insect species inhabited humid tropical forests. The fossil leaves bear six types of damage, probably produced by insects, belonging to three functional feeding groups: margin feeding, hole feeding, and piercing and sucking. This diversity of interactions highlights varied feeding strategies, including chewing, piercing and sucking behaviors, evidencing a more complex range of herbivory in the area than previously known. The stylet mouthparts of Megasecoptera make these insects strong candidates for producing the piercing and sucking damage on the associated plants. The presence of dark patches and spots on the fossil wing, probably represents a camouflage strategy against predators, such as Palaeodictyoptera and other active hunters. The dark wing apex might also reflect the presence of sexual dimorphism or courtship behavior. This new assemblage of insects, in addition to plants and plant-insect interactions, contributes to a broader paleoecological understanding of the Carboniferous forests of the La Magdalena Coalfield.

Key words: Insecta, Megasecoptera, Paleoptera, plant-insect interactions, tropical paleoecosystem, Gzhelian, Carboniferous, León Province, Spain.

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