

ein langfristiges Wildbienen-Monitoring bilden. Da die derzeitige Anzahl an erfahrenen Wildbienensachverständigen in Deutschland langfristig nicht ausreichend ist, um künftig Veränderungen in den Populationen untersuchen zu können, werden geeignete Schulungen entwickelt, die sowohl Kenntnisse über Wildbienen als auch deren Lebensräume und Nahrungspflanzen vermitteln.

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Parasitoid biology preserved in mineralized fossils

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The tremendous species diversity of Hymenoptera can be linked to the evolution of a parasitoid lifestyle. Multiple transitions between host species, developmental stages and modes of parasitoidism are considered key events linked to enormous adaptive radiations and an estimated 10–20% of all extant insects are parasitoid wasps. However, fossil evidences for host-parasitoid interactions are extremely rare, rendering evolutionary hypotheses assumptive. By pushing X-ray imaging and analysis to the limit we examined 1,510 phosphatized fly pupae from the later middle to late Eocene fissure fillings of the Quercy region in France (approximately 34–40 million years old). We identified 55 parasitization events by four parasitoid wasp species, providing unparalleled amounts of morphological and palaeoecological data (Van de Kamp et al. 2018). The parasitoids comprised four new species of Diapriidae representing the tribes Spilomicrini and Psilini. The most common species was *Xenomorphia resurrecta* (Fig. 1), of which we found 18 females and 24 males, followed by *X. handschini* with one female, four males and one pupa and *Coptera anka* with three females and one male. *Palaeortona quercyensis* was represented by one female only. Additionally, we identified a single unknown putative second instar wasp larva and a set of last larval instar mandibles, presumably left behind by the emerged parasitoid. All wasp species developed as solitary endoparasitoids inside the fly pupae and exhibit different morphological adaptations for exploiting the same hosts in the same habitat. Our results allow systematic and ecological placement of the new species and highlight the need to investigate ecological data preserved in the fossil record. We also present a new level for data visualization by using original morphological data to create true-to-life illustrations of the fossil parasitoids.

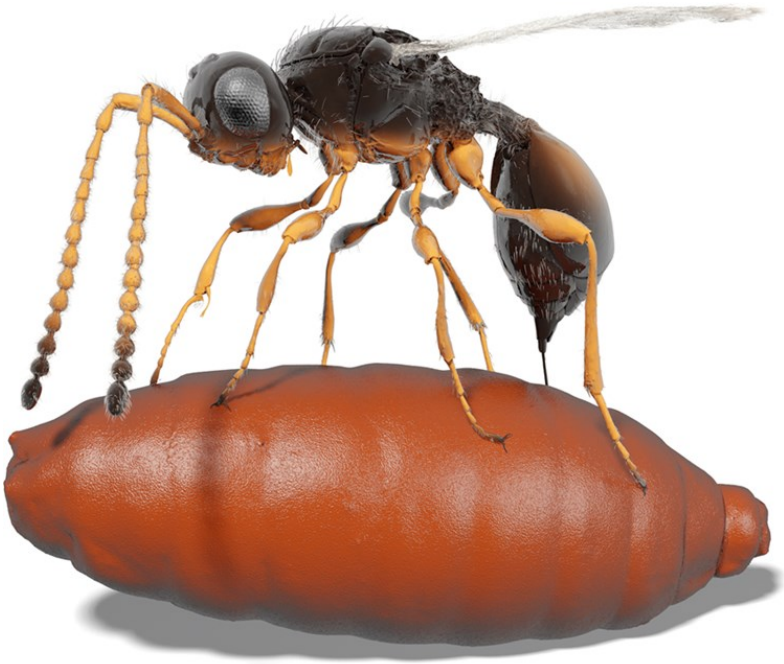


Fig. 1: The fossil diapiiid wasp *Xenomorphia resurrecta* ovipositing into a fly puparium. The picture is based on tomography data.

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