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Unique, unusual, unknown: A first assessment of Hymenoptera biodiversity at Evolution Canyon, Israel

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Hymenoptera belong to the four mega-diverse insect orders and occupy fundamental roles in all terrestrial ecosystems. However, many species are still unknown and knowledge about the biology and distribution of described species is often sparse. The Mediterranean Basin harbors several biodiversity hotspots, one of the most prominent being Israel on the land bridge between Africa and Eurasia (Europe and Asia). The Israeli flora and fauna is influenced by all three continents and therefore comprises several unique ecosystems like the Evolution Canyon, a small valley in the Mount Carmel National Park close to Haifa. The Evolution Canyon's almost perfect east-west orientation causes a huge difference in the amount of received sun-radiation on the two slopes. This leads to significant microclimatic differences within a small area: The xeric and tropic northern 'African slope' faces the more humid and temperate southern 'European slope', thus providing a microscale model for research on fundamental evolutionary processes, such as speciation and adaption to environmental changes. Although previous studies covered a broad variety of study organisms from bacteria to fungi, crops, beetles, flies and rodents, Hymenoptera have remained largely unstudied at the Evolution Canyon. To establish a base for future biodiversity research in this area, my Master's thesis represents a first biodiversity assessment of Hymenoptera at the Evolution Canyon with special emphasis on the biologically diverse family Pteromalidae (Chalcidoidea). Within two weeks, more than 9,000 specimens representing 42 hymenopteran families were collected at the Evolution Canyon including several rarely collected families, such as Orussidae, Heloridae, Stephanidae, Embolemidae and Sclerogibbidae. Furthermore, an undescribed species of Scolebythidae was recorded, representing the first West-Palearctic record of this extremely rarely collected family. Additionally, an integrative taxonomic approach combining morphological data and COI-DNA-barcodes was applied to diagnose 53 species of Pteromalidae in 27 genera at the Evolution Canyon. A statistical assessment of pteromalid diversity at the 'African' and 'European slope' is presented.

Chalcidoidea diversity at the Evolution Canyon