

Hidden in plain sight: Cryptic diversity in North- and Central European Pteromalidae (Hymenoptera: Chalcidoidea)

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Despite their important role as key regulators in natural ecosystems, parasitoids like the Pteromalidae are largely not considered in nature conservation, mostly a result of their minute size and difficult morphological identification. With about 1,100 species in Northern- and Central-Europe, the family Pteromalidae accounts for every 10th species of Hymenoptera in this region and it is believed that many more are to be discovered. Often little is known about their biology and the impact of the rapid insect decline on those species that occupy mostly high trophic positions is not understood at all. To aid in future monitoring and research efforts, integrative taxonomy strives to combine several sources of data to delimit species and aids in quickly identifying them with molecular barcoding. In cooperation with two of the largest European diversity assessment initiatives, the German Barcode of Life (GBOL) project and the Swedish Malaise Trap Project (SMTP), a comprehensive barcoding database of the Cytochrome-c-oxidase subunit I (COI) region is being established. A tree-based approach of the molecular data aids in the morphological identification of the preserved voucher specimens to uncover unknown cryptic diversity and test current species hypotheses of North- and Central European Pteromalidae.

Due to an integrative taxonomic approach, probably one of the most common North- and



Fig. 1.: Feeding larva of *S. dubius* on paralyzed larva of *Protapion* sp. in red clover (*T. pratense*) inflorescence. Scale: 200µm

Central European pteromalid species, *Spinttherus dubius* (Nees, 1834) could be identified as a species complex. *S. dubius* is a parasitoid, attacking beetle larvae of the genus *Protapion* (Coleoptera: Apionidae) (Fig. 1), which feed of the ovule in clover species (*Trifolium* spp.), therefore being considered a pest organism in commercial cultivation. Molecular analyses suggest a minimum of two distinct groups within the *S. dubius* species complex, which can even be characterized morphologically upon closer inspection. Through mass rearings, differences in the biology of the two types could be observed, with different host ranges and numerical occurrence in nature.

This highlights the need to have a deeper look in currently recognized species concepts, illustrating, that our knowledge is severely lacking even in such ecologically important groups. In times of rapid loss of diversity, a comprehensive knowledge is mandatory for nature conservation in order to best preserve our natural ecosystems.

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Digitale Literatur/Digital Literature

Zeitschrift/Journal: [Mitteilungen des Entomologischen Vereins Stuttgart](#)

Jahr/Year: 2018

Band/Volume: [53 2018](#)

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Artikel/Article: [Hidden in plain sight: Cryptic diversity in North- and Central European Pteromalidae \(Hymenoptera: Chalcidoidea\) 8](#)