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## Taxonomy, phylogeny and host plants of some *Abia* sawflies (Hymenoptera, Cimbicidae)

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### Abstract

We briefly review the taxonomy of *Abia*, and attempt to clarify their systematics by phylogenetic tree reconstructions inferred from three (nuclear and mitochondrial) genes of some West Palaearctic and Nearctic species. The main question which we asked is whether the distinction, made by several authors, of two genera within this group is justified. Based on the species here sampled, our results strongly support a clade recognised widely in earlier literature as *Abia* or *Abia* (*Abia*), but do not always support another clade, *Zaraea* or *Abia* (*Zaraea*), as monophyletic. In the interests of nomenclatural stability and for other practical reasons, the two nominal genera should be treated as synonyms. Host plant associations may be useful in the systematics of *Abia* species, but this topic requires further investigation and inclusion of more species in phylogenetic analyses.

**Key words:** Symphyta, Caprifoliaceae, Dipsacaceae, Palaearctic, Nearctic

### Introduction

The Abiinae of the Cimbicidae is at present considered to comprise three genera containing a total of 55 extant species: *Abia* Leach, 1817 (45 spp., Holarctic), *Allabia* Semenov & Gussakovskij, 1937 (2 spp., East Palaearctic and Oriental) and *Orientabia* Malaise, 1934 (8 spp., East Palaearctic and Oriental) (Taeger *et al.* 2010). The known host plants of West Palaearctic and Nearctic Abiinae larvae are restricted to the Caprifoliaceae and Dipsacaceae (Taeger *et al.* 1998, Smith 1979). Both these families are today placed in the order Dipsacales (Backlund & Bremer 1997; AGP III 2009). Hosts of East Palaearctic and Oriental *Abia* spp. are unknown, except for *Abia akebiae* (Takeuchi, 1931) attached to *Akebia* spp. (Okutani 1967). Recorded hosts of *Orientabia* spp. are: *Ilex serrata* for *O. iridescens* (Marlatt, 1898) (Okutani 1967) and *Weigela coraeensis* for *O. japonica* (Cameron, 1887) (Takeuchi 1949). *Weigela* was placed in the Dipsacales by Donoghue *et al.* (2001) and *Ilex* in the Aquifoliales, which has mostly been considered in recent phylogenies to belong to the same clade [campanulids: euasterid II] as the Dipsacales (e.g. Chase & Reveal 2009). Apparently anomalous amongst hosts of Abiinae is *Akebia*, belonging to the Ranunculales, which is phylogenetically only very distantly related to the other hosts (Chase & Reveal 2009). Larvae of the two other subfamilies of Cimbicidae represented in the northern hemisphere have very different hosts: Cimbicinae (Holarctic) feed on leaves of woody hosts belonging to the Salicaceae, Rosaceae, Betulaceae and Fagaceae (all members of the fabid clade of Rosanae), and Corynidiinae (Palaearctic) on herbaceous members of the Geraniaceae, Papaveraceae, Crassulaceae and probably Rosaceae (Scheibelreiter 1979, Viitasaari 1990, Taeger *et al.* 1998). The host families of the Corynidiinae thus belong to the eudicotyledons, but are only distantly related to each other (AGP III 2009). Only one other subfamily of Cimbicidae is recognised (Taeger *et al.* 2010): the Neotropical Pachylostictinae, whose hosts are unknown.

An exhaustive review of the complicated and highly changeable treatments of the taxonomy of *Abia* was given by Kangas (1946). During most of the 20<sup>th</sup> century, West Palaearctic *Abia* species were generally placed in two

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