Systematics, distribution and biology of the Australian 'micro-flea' wasps, 
*Baeus* spp. (Hymenoptera: Scelionidae): parasitoids of spider eggs

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Abstract

Baeus represents one of the most unusual genera of parasitic wasps in that females are apparently wingless, highly compact and flea-like in appearance. They are endoparasitoids of spider eggs of host families associated with above-ground vegetation and cryobiotic niches such as leaf-litter. The genus has remained poorly studied, with only 25 species described world-wide, with three from Australia; B. dux Girault, B. leai Dodd and B. saliens (Hickman). This study revises the Australian fauna, and describes 17 new species: Baeus arthuri Stevens sp. nov., B. glenysae Stevens sp. nov., B. hallarakeri Stevens sp. nov., B. iqbal Stevens sp. nov., B. jenningsi Stevens sp. nov., B. maryae Stevens sp. nov., B. matthewi Stevens sp. nov., B. moorei Stevens sp. nov., B. murphyi Stevens sp. nov., B. mymyae Stevens sp. nov., B. ocellatus Stevens sp. nov., B. prolatusspissus Stevens sp. nov., B. scrobiculus Stevens sp. nov., B. spirolimbus Stevens sp. nov., B. tropaeumusbrevis Stevens sp. nov., B. tropaeumusdensus Stevens sp. nov., and B. vulcanus Stevens sp. nov. In addition, information is presented on the distribution of species which generally show the greatest diversity along the eastern seaboard of the Australian continent, including Tasmania. The biology of Baeus, its monophyly and relationships within the Baeini are also discussed. The African genera Angolobaeus Kozlov syn. nov. (type species Parabaeus machadoi Risbec, from Angola) and Paraneurobaeus Risbec syn. nov. (type species Paraneurobaeus arachnevora Risbec, from Cameroon) are placed in synonymy with Baeus, and a lectotype is designated for P. arachnevora Risbec.

Key words: Baeini, Ceratobaeus, Idris, egg parasitoid, spider host

Introduction

The Scelionidae are small wasps, 0.5–12 mm in length, that are endoparasitic on the eggs of insects and spiders. They have a hypodermic-like ovipositor that is used to pierce the chorion of a host egg, in which they lay their own egg. The scelionid larva then consumes the contents of the host egg, pupates within it, and emerges as a fully developed adult (Austin 1983, 1985; Austin et al. 2005). Although the tribal classification of the family is somewhat problematic in that numerous groups are probably not monophyletic (see Murphy et al. in press) they, none-the-less, are mostly easy to recognise morphologically and appear to have relatively fixed host relationships. For example, members of the Scelionini sensu str. parasitise the eggs of acridid grasshoppers, the Gryononi parasitise heteropteran eggs, the Embidobiini attack embiid eggs, and the Teleasini and Xenomerini (Teleasinae) parasitise eggs of carabid beetles (e.g. Masner 1976; Austin et al. 2005).

The Baeini (sensu Austin and Field 1997) is the only scelionid tribe that utilises the eggs of spiders as a host food source for their larvae. As a group they have radiated into numerous araneid families (Austin 1985: Iqbal & Austin 2000b) and, because of their relatively high degree of host specificity, have speciated along with the diverse fauna of spiders that are found in three key habitats; soil and leaf-litter, under the bark of trees, and the foliage of shrubs and bushes. Even though members of the tribe are often the most diverse scelionid groups in some habitats, the vast majority of species remain undescribed for all regions of the world. In Australia, where at least some taxonomic work has been undertaken on the group (e.g. Austin 1986, 1988; Iqbal & Austin 2000b), at least 80% of species have not yet been described, with the fauna probably exceeding 1,000 species.

Members of the Baeini can be recognized by three synapomorphies other than their host biology, however none are unequivocal for the group. These are the female antenna comprised of four compact clavomeres that are usually completely fused to each other; the antennal scape not reaching above the level of the anterior ocellus; and tridentate mandibles with a convex outer surface (Austin & Field 1997). A recent molecular study has shown that most Baeini (Idris Foerster, Ceratobaeus Ashmead, Baeus Haliday and Odontacolus Priesner) form a monophyletic group, but that the Australasian genera Mirobaeiodes Dodd and Neobaeus Austin are more closely related to other genera of scelionids associated with non-spiders hosts (Carey et al. 2006; Murphy et al. in press).