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Revision of the Western Palaearctic species of the genus *Dinotrema* Foerster, 1862 (Hymenoptera, Braconidae, Alysiinae)

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Table of contents

ABSTRACT

The first comprehensive revision of the Western Palaearctic species of the genus *Dinotrema* Foerster, 1862 is provided. 174 species of this genus are redescribed and illustrated. Ten species are described as new, viz, *D. acompressum* **sp. nov.**, *D. cahitum* **sp. nov.**, *D. collybiae* **sp. nov.**, *D. digitatum* **sp. nov.**, *D. glabrideum* **sp. nov.**, *D. helote* **sp. nov.**, *D. lepiotae* **sp. nov.**, *D. norwegicum* **sp. nov.**, *D. oxybellum* **sp. nov.** and *D. torpi* **sp. nov.** The following new combinations are suggested: *Dinotrema adventum* (Fischer), **comb. nov.**, *D. aurelianum* (Fischer), **comb. nov.**, *D. cetiusmonte* (Fischer), **comb. nov.**, *D. converginerve* (Fischer), **comb. nov.**, *D. intermissum* (Fischer), **comb. nov.**, *D. leptocorne* (Fischer), **comb. nov.**, *D. longicarinatum* (Fischer), **comb. nov.**, and *D. thurnense* (Fischer), **comb. nov.** The following names are synonymised: *Dinotrema naeviformis* (Fischer) with *D. costulatum* (Thomson), *Dinotrema aequale* Tobias with *D. tarbagataicum* Tobias, *D. alua* (Stelfox et Graham) with *D. tauricum* (Telenga), *D. isometricum* (Fischer) with *D. cruciatum* (Fischer), *D. isosoma* (Fischer) with *D. cruciforme* (Fischer), and *D. ovalisignum* (Fischer) with *D. catharinae* (Fischer) (**syn. nov.**). A key to all Western Palaearctic species of *Dinotrema* is provided for the first time.

Key words: Braconidae, Alysiinae, *Dinotrema*, key, new species

INTRODUCTION

Although with substantially fewer described species than the sister family, Ichneumonidae (Hymenoptera, Apocrita), Braconidae is still one of the most species-rich families with approximately 19,200 (Aguilar *et al*. 2013) recorded species around the world. The majority of braconid species are primary parasitoids of the immature stages of Lepidoptera, Coleoptera and Diptera (Tobias 1967; Sharkey 1993). During immature stages, they develop on or inside the body of their hosts (almost exclusively other insects), hosts mainly with complete metamorphosis (Holometabola) or (rarely) with a simple metamorphosis (Hemimetabola). Two biological distinctions are important in Braconidae, namely their classification as idiobiont or koinobiont parasitoids. Most are endoparasitic koinobionts (usual in non-cyclostome braconids), although there is a significant number of ectoparasitic idiobionts (only known from the cyclostome clade of Braconidae).

Braconidae are important regulators of predominantly phytophagous insect populations (LaSalle & Gauld 1992). Some braconid species are economically significant with their potential for pest control (Elpino-Campos *et al*. 2007). These wasps have serious ecological interest because of their role in regulating populations of phytophagous insects, causing a direct effect on host species population sizes and indirect effects on the diversity and survival of host plants (La Salle & Gauld 1992; Torezan-Silingardi 2011).

There are two major phylogenetic lineages within the Braconidae, namely cyclostomes and non-cyclostomes. Within the cyclostome lineage, two subfamilies, Alysiinae and Opiinae, are relatively isolated because of their close phylogenetic relationship, great diversity, and peculiar biological features (Griffiths 1964; Achterberg 1983; Gimeno *et al*. 1997; Belshaw *et al.* 1998; Zaldivar-Riverón *et al*. 2006).

The subfamily Alysiinae is a monophyletic group on the basis of such distinctive apomorphic characters as the shape and position of the exodont mandibles, the total loss of the occipital and prepectal carinae, and koinobiont specialisation on Diptera-Cyclorrapha, and this monophyly has been corroborated by molecular phylogenetic studies (Gimeno *et al*. 1997; Zaldivar-Riverón *et al.* 2006). About 2000 species and 104 genera have been described worldwide within Alysiinae (Yu *et al*. 2012), which is divided into two large and polymorphic tribes, Alysiini and Dacnusini (Shenefelt 1974, Yu *et al*. 2005). Griffiths (1964, 1966a, 1966b, 1968a, 1968b, 1984) considered the tribe Dacnusini to be monophyletic. On the other hand, the Alysiini is possibly paraphyletic or even polyphyletic (Wharton 2002). Morphologically, these two tribes are mainly distinguished by the presence (Alysiini) or absence (Dacnusini) of the fore wing vein cuqu 2 (r-m or second radiomedial); accordingly Alysiini has three submarginal (radiomedial) cells while Dacnusini have only two.

Summarising host-parasitoid relationships, Alysiini are abundant parasitoids of Diptera-Cyclorrapha hosts, often in humid habitats and ephemeral substrates. In contrast, Dacnusini are almost exclusively specialized on leaf and stem miners of the families Agromyzidae, Ephydridae and Chloropidae. Whilst Alysiini are found in almost all zoogeographical regions of the world, the Dacnusini are predominantly found in the temperate and boreal regions of the Northern Hemisphere.

Despite the vast literature on this subfamily, its generic classification is quite imperfect and complicated. Griffiths (1964, 1966a, 1966b, 1968a, 1968b, 1984) formed the generic conceptions in the tribe Dacnusini, while

wide. Lower tooth wider than upper tooth. Antennae 14-segmented. First flagellar segment 3.8–4.0 times as long as its apical width. Middle flagellar segments 2.0 times as long as their width. Mesosoma in lateral view 1.05–1.10 times as long as high. Mesoscutum 1.10–1.15 times as long as its maximum width. Notauli mainly absent. Mesoscutal pit present, elongated. Prescutellar depression without lateral carinae. Sternaulus (precoxal suture) present, not reaching anterior and posterior margins of mesopleuron. Posterior mesopleural furrow smooth. Propodeum smooth, with short median longitudinal carina, with emerging carinae and not reaching propodeal edges. Propodeal spiracles relatively small. Hind femur 4.0 times as long as its maximum width. First metasomal tergite 1.5 times as long as its apical width, almost smooth with fine striation. Ovipositor 2.0 times as long as first tergite, shorter than metasoma, 1.35–1.40 times as long as hind femur. Main colour brown and dark brown.

Comparative diagnosis. This species resembles *D. longicarinatum* Fischer, *D. incarinatum* (Fischer) and *D. significarium* (Fischer). *Dinotrema zimmermannae* differs from *D. longicarinatum* in having the mandible 1.00–1.05 times as long as wide (1.2 times in *D. longicarinatum*), first flagellar segment 3.8–4.0 times as long as wide (3.0 times in *D. longicarinatum*), mesoscutal pit elongated (rounded in *D. longicarinatum*), and first metasomal tergite 1.5 times as long as its apical width and almost smooth (2.0 times and striate in *D. longicarinatum*). On the other hand, *D. zimmermannae* differs from *D. incarinatum* in having the mandible 1.00–1.05 times as long as wide (1.6 times in *D. incarinatum*), middle flagellar segments 2.0 times as long as wide (2.3–2.5 times in *D. incarinatum*), sternaulus (precoxal suture) not reaching anterior margin of mesopleuron (reaching in *D. incarinatum*), and first metasomal tergite 1.5 times as long as its apical width (1.75 times in *D. incarinatum*). Finally, *D. zimmermannae* differs from *D. significarium* in having the mandible 1.00–1.05 times as long as wide (1.25 times in *D. significarium*), first flagellar segment 3.8–4.0 times as long as wide (2.8 times in *D. significarium*), hind femur 4.0 times as long as its maximum width (4.5 times in *D. significarium*), and first metasomal tergite 1.5 times as long as its apical width (2.0 times in *D. significarium*).

Distribution. Spain.

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