



New records of Aphid Parasitoids (Hymenoptera, Braconidae, Aphidiinae) from Turkey

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Abstract

Aphid parasitoid, as one of the most important natural enemies of aphid, has been sporadically studied in Turkey. Our findings should contribute to better knowledge of the Turkish and Near East aphidiins fauna. All specimens were collected by sweeping from western and northern Turkey, especially from Marmara and the Black Sea region during the 1989–2004 period. We present new data for Aphidiinae of Turkey and Near East which include eight new species (Toxares deltiger Hal., Aphidius urticae Hal., Ephedrus lacertosus (Hal.), Lipolexis gracilis Först., Monoctonus crepidis (Hal.), Praon abjectum (Hal.), Praon longicornis Marsh., Praon pubescens Starý) and two new genera (Toxares and Lipolexis). We pointed out basal position of T. deltiger within Aphidiinae with emphasis on several plesiomorphous character states, such as braconid type of wing venation, large number of longitudinal placodes on flagellomeres 1 and 2 and short and triangular ovipositor sheath. We presumed the small fovea on median part of mesonotum in T. deltiger as an apomorphic character. Newly recorded species will help estimate their possible role in agroecosystems of targeted areas.

INTRODUCTION

Aphidiinae wasps are solitary endoparasitoids on aphids (1). They are one of the most important natural enemies of aphids. Kavalieratos *et al.* (2, 3, 4, 5) and Tomanović *et al.* (6, 7) presented extensive review of Aphidiinae in southeastern Europe, including some data for Turkey. So far, this important group has been sporadically studied in Turkey with several recent publications in urban areas (8) and natural ecosystems and agroecosystems (9, 10). El-Mali *et al.* (11) documented available information on Turkish Aphidiinae, with a list of 44 species and over 130 tritrophic (parasitoid-host aphid-host plant) associations. Concerning floral and habitat richness in Turkey, more diversified Aphidiinae fauna can be expected.

Our paper represents additional contribution to the knowledge on Aphidiinae of Turkey and Near East, including several new records of genera and species. Also, the paper emphasizes the importance of a new record of *Toxares deltiger* Hal., a rarely collected species with poorly known biology and one of the species of key importance for Aphidiinae origin.

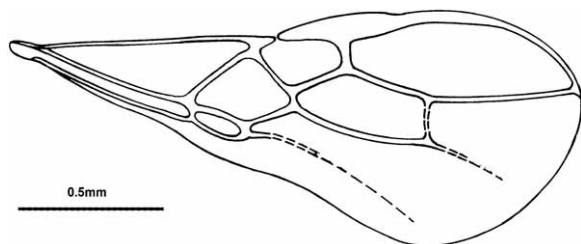


Figure 1.

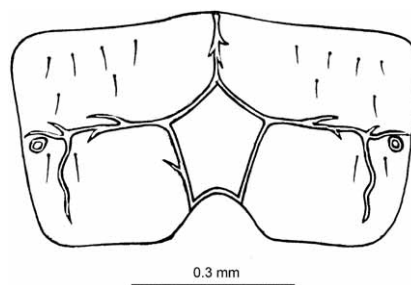


Figure 5.



Figure 2.

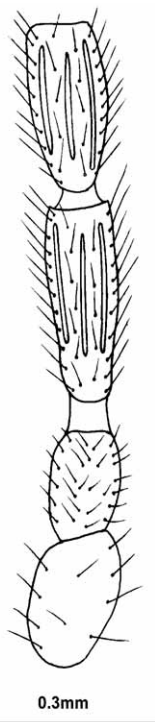


Figure 3.

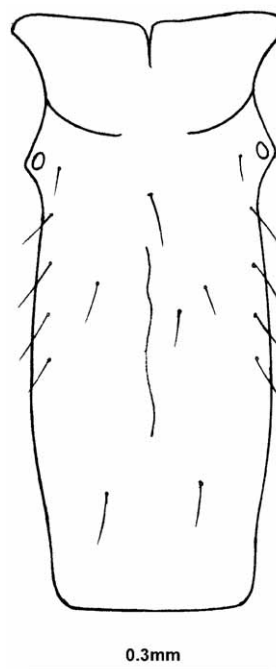


Figure 6.

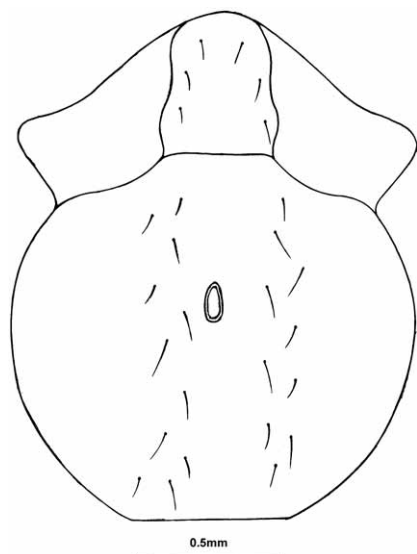


Figure 4.

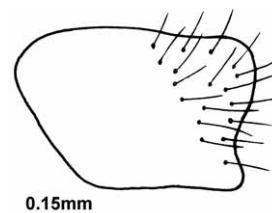


Figure 7.

Figures 1–7. *Toxares deltiger* Hal., female. (1) Forewing, (2) Antennae, lateral view, (3) Antennae, basal part (F_1 and F_2), (4) Mesonotum, dorsal aspect, (5) Propodeum, dorsal aspect, (6) Petiole, dorsal aspect, (7) Ovipositor sheath, lateral view.

MATERIAL AND METHODS

All specimens were collected by sweeping from western and northern Turkey, especially from Marmara and the Black Sea region during the 1989–2004 period. This sampling method did not include host plants and host aphids identification. We sampled specimens from different type of habitats, ranging from sea to high mountains. The collected parasitoids were dissected and slide-mounted in Canada balsam. The external morphology of parasitoids was illustrated using an OLYMPUS BH2 phase-contrast microscope with a drawing tube.

The morphological terminology is based on Sharkey and Wharton (12).

RESULTS AND DISCUSSION

Review of new records of Aphidiinae in Turkey:

Toxares deltiger Haliday, (1833)

Figs. 1–7

Bayburt – Merkez, 30.viii.2004, ♀.

Aphidius urticae Haliday, 1834

Bursa – Keles – Barakli, 13.vii.1993, ♀,

Edirne – Trakya Üniv. Merkez.Kampus, 21.v.1989, 2♀♀,

Erzurum – Abdurrahmangazi, 19.vii.1990, ♂,

Samsun – Salipazari – Derbentaltı, 03.vii.2003, ♂,

Sinop – Demirci, 11.vi.2002, 2♂♂,

Sinop – Kabalı, 11.vi.2002, 4♀♀,

Tekirdag – Sarköy, 25.vi.2003, ♂,

Kastamonu Daday Ballıdag, 01.vii.2001, 2♀♀.

Ephedrus lacertosus (Haliday, 1833)

Gumushane – Mescitli, 02.vii.2004, ♀.

Lipolexis gracilis Förster, 1862

Adapazari – Göktepe, 08.vii.1993, ♂.

Monoctonus crepidis (Haliday, 1834)

Kastamonu – Ballıdag, 29.viii.2002, ♀,

Kastamonu – Daday – Sarpun, 29.viii.2002, ♀.

Praon abjectum (Haliday, 1833)

Balikesir – Yakupköy, 14.vii.1993, 2♀♀,

Balikesir – Yakupköy, 14.vii.1993, ♀,

Bilecik – Ayvacık, 09.vii.1993, ♂,

Bursa – Uludag – Yesilartla, 19.ix.1992, 4♀♀.

Praon longicorne Marshall, 1896

Sinop-Boyabat Avdullu (Cangal dagı), 02.vii.2001, ♂,

Kastamonu-Daday, 29.viii.2002, ♀,

Kastamonu-Daday, Ballıdag, 01.vii.2001, ♀,

Samsun – Salipazari – Derbentaltı, 03.vii.2003, ♂,

Samsun – S.pazari – A. Tepemevkii,, 03.vii.2003, 2♀♀,

Tokat – Pazar – Ballica,, 07.vii.2003, 3♀♀,

Giresun-Alucra, 02.vii.2004 ♀,

Gumushane-Kelkit-Koycuk, 02.vii.2004, ♀,

Gumushane-Siran Yesilbuk, 29.viii.2004, ♀.

Praon pubescens Starý, 1961

Kastamonu – Daday – Ballıdag, 01.vii.2001, ♀.

According to Achterberg (13) *Toxares deltiger* is rarely collected in Europe and this species has not been recorded so far from Near to Middle East. Although we

collected specimens by sweeping, based on the known data *T. deltiger* prefers to parasitize Macrosiphini aphids. In Czech Republic it reared from *Acyrtosiphon caraganae* (Chol.) / *Caragana arborescens*, *Cryptomyzus ribis* (L.) / *Ribes* sp. and *Macrosiphum euphorbiae* (Thomas) / *Chenopodium* sp. associations (14). In England (15) and Poland (16) *T. deltiger* emerged from cereal aphid, *Metopolophium dirhodum* Walker. Also, in Bavaria (Germany) it was widely found in the traps situated in maize fields (P. Starý, pers. comm).

Toxares deltiger represents one of the basal lineage within Aphidiinae. It is characterized by several plesiomorphies such as braconid type of wing venation (Figure 1), a large number of longitudinal placodes on flagellomeres 1 and 2 (Figure 3), short and triangular ovipositor sheath (Figure 7). Also, *T. deltiger* possess small fovea on the median part of mesonotum (Figure 4) which are most probably of apomorphic character. Fovea is developed in some small *Ephedrus persicae* Froggatt biotypes (17). On the basis of the presence fovea, Chen and Shi (18) described *Foveoephedrus* as separate genus. It is clear that this character and its importance for classification need further evaluation.

Aphidius urticae was previously reported in Turkey as parasitoids of *Acyrtosiphon pisum* (Harr.) (19), but this biotype was established as *Aphidius eadyi* Starý, Gonzalez & Hall (20). *Aphidius urticae* represents a species group which parasitized mainly Macrosiphini aphids in forest and semi-forest type of habitats. *Lipolexis gracilis* mainly parasitizes *Aphis* spp. and show wide distribution in Europe. By contrast, this species has rare distribution in Near East and Central Asia (Georgia (21); Pakistan (22)). *Praon abjectum* is a common parasitoid of small aphid hosts, mainly from *Aphis* L. and related genera, including many pest aphids (5, 14). This is first finding of *P. abjectum* in the Near East.

Monoctonus crepidis and *Praon pubescens* are specific to *Nasonovia* spp. aphids from mountains. *Ephedrus lacertosus* and *Praon longicorne* are parasitoids *Macrosiphum-Amphorophora* related aphid hosts from forest and semiforest type of habitats. Both species represent new data for the Near East. *Ephedrus lacertosus* was first recorded in Turkey and the Near East and rarely collected in the Palearctic (23).

These new data will contribute to the better knowledge of aphid parasitoids in Turkey and the Near East. Also, they will help to estimate a possible role of these parasitoid species in agroecosystems of targeted areas.

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