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Original Article

Contribution to the Knowledge of the Acaenitinae and Diplazontinae (Hymenoptera: Ichneumonidae) fauna of Elazığ Province in Eastern Türkiye

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ABSTRACT

This study aimed to evaluate Ichneumonidae samples collected from Elazığ province, located in eastern Türkiye. At the end of the study, two species belonging to the subfamily Acaenitinae Förster, 1869 and one species belonging to the subfamily Diplazontinae Viereck, 1918 were identified and listed. Among these species, *Phaenolobus areolator* (Constantineanu & Constantineanu, 1968) has been recorded in the Eastern and Southeastern Anatolia Regions; *Phaenolobus fulvicornis* (Gravenhorst, 1829) in the Eastern Anatolia, Mediterranean and Black Sea Regions; and *Diplazon laetatorius* (Fabricius, 1781) across all regions of Türkiye. *Phaenolobus areolator* and *Phaenolobus fulvicornis* are relatively poorly known species in Türkiye, whereas *Diplazon laetatorius* is a widespread species. With this study, these species have been recorded from Elazığ Province fort he first time. In addition, information on the locality, collection date, host plant and distribution of each species in Türkiye provided.

Key words: Ichneumonidae, Acaenitinae, Diplazontinae, Elazığ, Türkiye

Türkiye'nin Doğusunda Yer Alan Elazığ İlinin Acaenitinae ve Diplazontinae (Hymenoptera: Ichneumonidae) Faunasına Katkılar

ÖZ

Bu çalışma, Türkiye'nin doğusunda yer alan Elazığ ilinden toplanan Ichneumonidae örneklerini değerlendirilmeyi amaçlamıştır. Çalışma sonucunda, Acaenitinae Förster, 1869 alt familyasına ait iki tür ve Diplazontinae Viereck, 1918 alt familyasına ait bir tür tanımlanmış ve listelenmiştir. Bu türler arasında, *Phaenolobus areolator* (Constantineanu & Constantineanu, 1968) Doğu Anadolu ve Güneydoğu Anadolu Bölgelerinde; *Phaenolobus fulvicornis* (Gravenhorst, 1829) Doğu Anadolu, Akdeniz ve Karadeniz Bölgelerinde ve *Diplazon laetatorius* (Fabricius, 1781) ise Türkiye'nin tüm bölgelerinde tespit edilmiştir. *Diplazon laetatorius* yaygın bir tür olmasına rağmen, *Phaenolobus areolator* ve *Phaenolobus fulvicornis* Türkiye'de nispeten az bilinen türlerdir. Bu çalışma ile bu türler Elazığ ilinden ilk kez kaydedilmiştir. Ayrıca her türün lokalitesi, toplanma tarihi, konukçu bitkisi ve Türkiye'deki dağılımı hakkında bilgi verilmiştir.

Anahtar kelimeler: Ichneumonidae, Acaenitinae, Diplazontinae, Elazığ, Türkiye.

INTRODUCTION

Ichneumonidae known as the ichneumon wasps, Darwin wasps, or ichneumonids is the largest Hymenoptera family (Giovanni et al., 2015) and a family of parasitoid wasps of Hymenoptera. Ichneumonidae one of the most diverse groups within the Hymenoptera with divided into 42 subfamilies with over 25.000 species currently described (Bennett et al., 2019). Besides having the highest endemism rates, this family is also highly relevant for the practice of biological control since the species that comprise it obligatorily deposit their eggs in

arthropods (Pádua et al., 2024). Although the members of the Ichneumonidae represent one of the most important groups of parasitoids for pest management is concerned, the researches on ichneumonid fauna of Türkiye were explored very restricted (Özbek et al., 2003).

The subfamily Acaenitinae is moderately large with 28 genera and about 280 species in the world (Yu et al., 2016). Most of the species are associated with forest. The hosts are different Coleoptera and conceivably Lepidoptera, boring in wood tissues (Sheng and Sun, 2014). Kolarov (1995), in his catalogue listed two species in five genera of the subfamily Acaenitinae occurring in Türkiye (Kolarov, 1989; Sedivy, 1958). Later, this number increased with the contributions of several authors (Çoruh and Kolarov, 2013; Çoruh et al. 2014; Çulcu, 2015; Doğru, 2022; Kolarov and Gürbüz, 2010; Kolarov et al., 2002).

Diplazontinae is a small to medium large subfamily of Ichneumonidae and comprises more than 23 genera and 350 species in the World (Yu et al., 2016). These subfamily members are koinobiont endoparasitoids of Syrphidae (Diptera). Oviposition is into the egg or larvae and adult emergence is occurs from the puparium of hosts (Shaw and Wahl, 1989). Diplazontinae is best generally represented in the Afrotropical, Australasian, Holarctic, Neotropical, Oceanic and Oriental Regions (Çoruh, 2011). Kolarov (1995), in his catalogue listed 10 species in 4 genera of the subfamily Diplazontinae occurring in Türkiye (Avcı ve Özbek, 1991; Düzgüneş, 1982; Erkin, 1983; Kolarov, 1989; Öncüer, 1991; Soydanbay, 1976, 1978; Tuatay et al., 1972), Since then several authors (Alaserhat and Güçlü, 2020; Anlaş et al., 2008; Buncukçu, 2008; Çoruh, 2011; Çoruh et al., 2014; Doğru, 2022; Duman et al., 2013; Eroğlu et al., 2011; Gülmez et al., 2021; Gürbüz, 2005; Gürbüz et al., 2008; Gürbüz et al., 2009a; Gürbüz et al., 2011; İnecikliоğlu, 1922; Kaplan, 2023; Kıraç, 2012; Kıraç and Gürbüz, 2020; Kolarov, 2015; Kolarov et al., 2017; Kolarov and Çalmaşur, 2011; Özdemir, 2001; Sarı and Çoruh, 2018; Yurtcan et al., 1999) have made valuable contributions to our knowledge of Diplazontinae fauna in Türkiye.

The purpose of this study is identify the Ichneumonidae (Acaenitinae and Diplazontinae) species collected from Elazığ Eastern of Türkiye, to make this data available to researchers and relevant people and to contribute the biodiversity.

MATERIALS AND METHODS

Adult specimens of Ichneumonidae were collected from Elazığ province, located in the west of the Eastern Anatolia Region of Türkiye (Figure 1). Akçakiraz is located in the southeast of Elazığ. Its altitude ranges from 880 m to 1100 m., it has a very mild structure compared to the typical continental climate. Sweeping nets were used to obtain samples on flowering plants. The collected specimens were killed with ethyl acetate and prepared and labeled according to taxonomic rules and regulations.

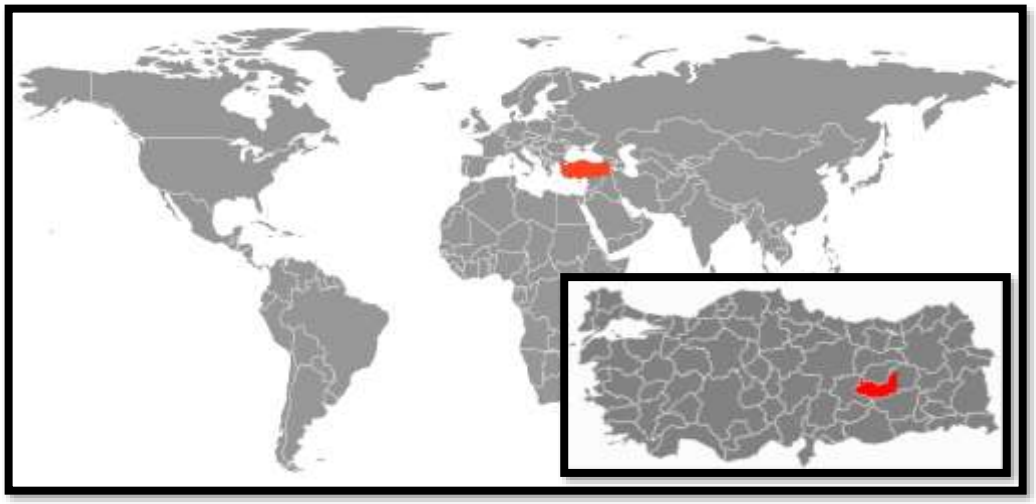

Figure 1. Location map of Elazığ Province.

The material is deposited in the collection of Department of Plant Protection, Faculty of Agriculture, Atatürk University (EMET). General geographic distribution and associated plants belonging to species were taken by Yu et al. (2016). The specimens were identified by Dr. Janko KOLAROV (Bulgaria).

RESULTS AND DISCUSSION

As a result of the study, three species belonging to the Ichneumonidae (Acaenitinae and Diplazontinae) family were determined. All of these species are the first record for Elazığ insect fauna.

Subfamily Acaenitinae Förster, 1869

Phaenolobus areolator (Constantineanu & Constantineanu, 1968)

Orginal name: *Moldacoenitus areolator.*

Identifier: *Moldacoenitus areolator* Constantineanu & Constantineanu, 1968

Materyal examined: TR: Elazığ, Akçakiraz, 38 36' 50.98" N, 39° 17' 20.99" E, 893 m, 19.V.2023, ♀, leg: Y. Bulak Korkmaz.

Hosts: Unknown.

Associate (plants): Unknown.

Distribution in Türkiye: Anatolia (Izquerdo, 1985; Kolarov, 1995); Erzurum, Kars, Şanlıurfa (Çoruh and Kolarov, 2013); Erzurum (Çoruh et al., 2014; Kolarov et al., 2002) (Figure 2a).

General Geographic Distribution: Palaearctic Region.

Remarks: New record for Elazığ.

Phaenolobus fulvicornis (Gravenhorst, 1829)

Original name: *Acoenites fulvicornis.*

Identifier: *Acoenites fulvicornis* Gravenhorst, 1829

Synonym history: *Collyria erythrogaster*.

Materyal examined: TR: Elazığ, Akçakiraz, 38 36' 50.98" N, 39° 17' 20.99" E, 893 m, 19.V.2023, ♂, leg: Y. Bulak Korkmaz.

Hosts: Coleoptera: *Phytoecia cephalotes* Küster, *Phytoecia coerulescens* (Scopoli).

Associate (plants): *Anthriscus sylvestris* (L.), *Heracleum sphondylium* L., (Apiaceae); *Salvia sylvestris* L. (Lamiaceae).

Distribution in Türkiye: Anatolia (Kolarov, 1995; Scaramozzino, 1986), Erzurum (Kolarov et al., 2002); Isparta (Gürbüz, 2005); Isparta (Gürbüz et al., 2009a); Adana, Isparta (Kolarov and Gürbüz, 2010); Artvin, Bayburt, Erzurum, Kars (Çoruh and Kolarov, 2013); Erzurum (Çoruh et al., 2014); Bayburt, Erzurum (Çoruh and Çalmaşur, 2016); Rize (Kolarov et al., 2016); Erzurum (Sarı and Çoruh, 2018) (Figure 2b).

General Geographic Distribution: Palaearctic Region.

Remarks: New record for Elazığ.

Subfamily Diplazontinae Viereck, 1918

Diplazon laetatorius (Fabricius, 1781)

Original name: *Ichneumon laetatorius.*

Identifier: *Ichneumon laetatorius* Fabricius, 1781

Synonym history: *Anomalon attractus*, *Bassus albovarius, Bassus balearicus, Bassus cinctipes; Bassus generosus, Bassus ikiti, Bassus senegalensis, Bassus sycophanta, Bassus terminalis, Bassus tripicticrus, Bassus venustulus, Ichneumon dichrous, Scolobates varipes.*

Materyal examined: TR: Elazığ, Akçakiraz, 38 36' 50.98"N, 39° 17' 20.99" E, 893 m, 19.V.2023, ♀, leg: Y. Bulak Korkmaz.

Hosts: There are 78 host information available for this species.

Associate (plants): *Baccharis pilularis* DC., *Cynara scolymus* L., (Asteraceae); *Citrullus lanatus* (Thunb.) (Cucurbitaceae); *Citrus sinensis* (L.) (Rutaceae); *Heracleum sphondylium* (Eltrot), *Peucedanum oreoselinum* (L.) (Apiaceae); *Listera ovata* (L.) (Orchidaceae); *Malus domestica* (L.) (Rosaceae); *Oryza sativa* (L.), *Poa pratensis* (L.), (Poaceae); *Picea excelsa* (Lam.) (Pinaceae); *Vicia faba* (L.) (Fabaceae).

Distribution in Türkiye: Ankara, İstanbul (Düzgüneş, 1982; Erkin, 1988; Kolarov, 1989; Öncüer, 1991; Soydanbay, 1976, 1978; Tuatay et al., 1972); Erzurum (Avcı and Özbek, 1991); Ankara, İstanbul (Kolarov, 1995); Edirne, Tekirdağ, Kırklareli, İstanbul (Yurtcan et al., 1999), Afyon, Ankara, Bolu, Burdur, Eskişehir, Isparta, Nevşehir, Konya (Özdemir, 2001); Isparta (Gürbüz, 2005); Adana (Buncukçu, 2008, Gürbüz et al., 2008); İzmir (Anlaş et al., 2009); Isparta (Gürbüz et al., 2009); Artvin, Erzincan, Erzurum, Trabzon, Şanlıurfa (Çoruh, 2011), Eskişehir (Eroğlu et al., 2011); Adana, Hatay, Osmaniye (Gürbüz et al., 2011); Erzincan (Kolarov and Çalmaşur, 2011); Denizli (Kıraç, 2012); Diyarbakır, Şanlıurfa (Duman et al., 2013); Erzurum (Çoruh et al., 2014); Adana, Adıyaman, Afyon, Aydın, Denizli, Erzincan, Erzurum, Isparta, İçel, Kahramanmaraş, Kırklareli, Muğla, Sinop, Zonguldak (Kolarov, 2015); Denizli (Kıraç and Gürbüz, 2020); Giresun (Kolarov et al., 2017); Erzurum (Sarı and Çoruh, 2018); Erzincan, Gümüşhane (Alaserhat and Güçlü, 2020); Adıyaman, Siirt (Gülmez et al., 2021); Edirne (Doğru, 2022; İneciklioğlu, 2022); Bingöl, Diyarbakır (Kaplan, 2023) (Figure 2c).

General Geographic Distribution: Nearctic, Neotropical, Oceanic, Oriental, Palaearctic Regions.

Remarks: New record for Elazığ.

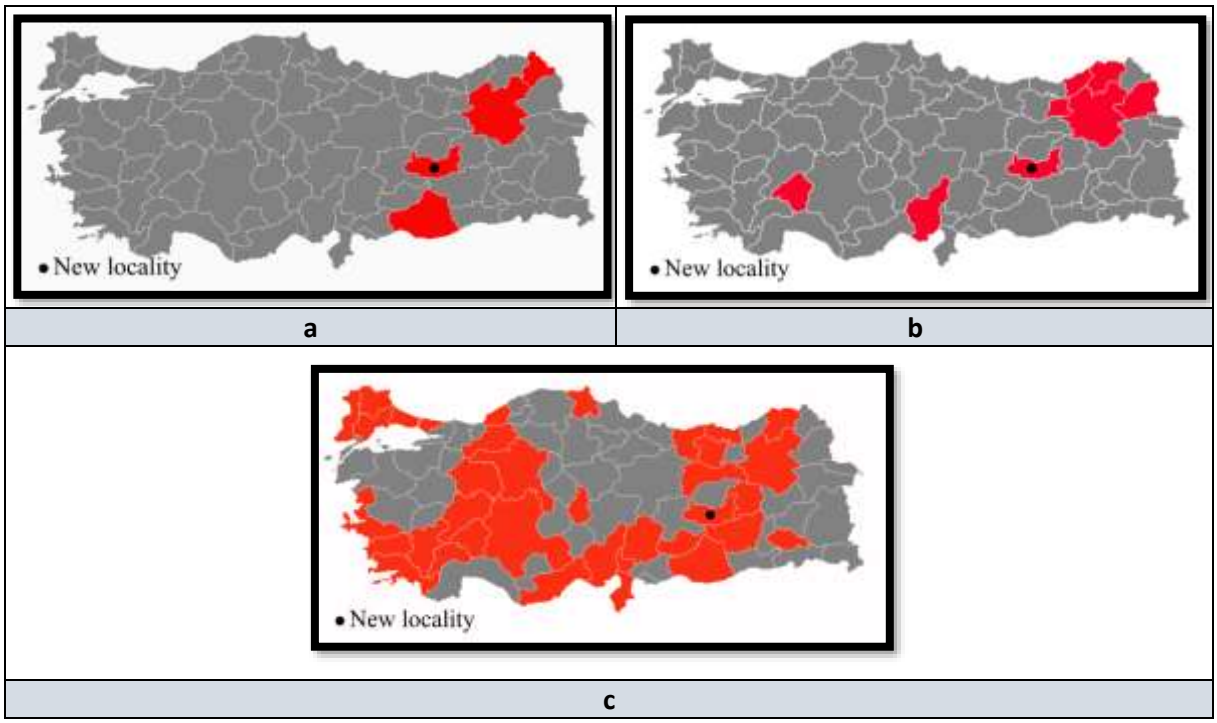

Figure 2. Distribution of Türkiye: a) *Phaenolobus areolator* (Constantineanu & Constantineanu, 1968), b) *Phaenolobus fulvicornis* (Gravenhorst, 1829), c) *Diplazon laetatorius* (Fabricius, 1781)

CONCLUSION

Türkiye, which can be found between three continents, hosts many and different insect and plant species due to its topographic geography and different climate types. Due to this structure of Türkiye, it is necessary and important to examine ichneumonids in terms of taxonomic and biodiversity. Although ichneumonids are very important parasitoid group, they have not been studied sufficiently in Türkiye. The number of species, which was 393 in 1995, reached approximately 460 in 30 years.

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Declaration of interests

The authors declare that they have no conflict of interest.

Author Contributions

Saliha ÇORUH: Conceptualization; data curation; formal analysis; methodology; software; writing— original draft; writing—review and editing.

Yeşim BULAK KORKMAZ: Conceptualization; data curation; formal analysis; investigation; methodology; software; writing— original draft; writing—review and editing.

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