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First record of *Syrphophilus bizonarius* (Gravenhorst, 1829) (Hymenoptera, Ichneumonidae, Diplazontinae) from Algeria

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Abstract
First record of Syrphophilus bizonarius *(Gravenhorst, 1829) (Hymenoptera, Ichneumonidae, Diplazontinae) from Algeria*. The subfamily Diplazontinae (Hymenoptera, Ichneumonidae) has been little studied in Algeria. Following our study in the region of Tizi–Ouzou from March to May 2020, we report the presence of the species *Syrphophilus bizonarius* (Gravenhorst, 1829) for the first time in this country, starting from a single male individual that emerged from a hoverfly pupa of *Episyrphus balteatus* (De Geer, 1776) (Diptera, Syrphidae, Syrphinae).

Key words: Ichneumonidae, Diplazontinae, *Syrphophilus bizonarius, Episyrphus balteatus*, Algeria, Tizi–Ouzou

Resumen
Primer registro de Syrphophilus bizonarius *(Gravenhorst, 1829) (Hymenoptera, Ichneumonidae, Diplazontinae) en Argelia*. La subfamilia Diplazontinae (Hymenoptera, Ichneumonidae) ha sido muy poco estudiada en Argelia. El estudio realizado en la región de Tizi–Ouzou entre los meses de marzo y mayo de 2020 permitió registrar por primera vez la presencia de la especie *Syrphophilus bizonarius* (Gravenhorst, 1829) en la misma a partir de un ejemplar macho surgido de una pupa del sírfido *Episyrphus balteatus* (De Geer, 1776) (Diptera, Syrphidae, Syrphinae).

Palabras clave: Ichneumonidae, Diplazontinae, *Syrphophilus bizonarius, Episyrphus balteatus*, Argelia, Tizi–Ouzou

Resum
Primer registre de Syrphophilus bizonarius *(Gravenhorst, 1829) (Hymenoptera, Ichneumonidae, Diplazontinae) a Algèria*. La subfamília Diplazontinae (Hymenoptera, Ichneumonidae) ha estat molt poc estudiada a Algèria. L'estudi portat a terme a la regió de Tizi–Ouzou entre els mesos de març i maig de 2020 va permetre registrar–hi per primera vegada la presència de l'espècie *Syrphophilus bizonarius* (Gravenhorst, 1829) a partir d'un exemplar mascle sorgit d'una pupa del sírfid *Episyrphus balteatus* (De Geer, 1776) (Diptera, Syrphidae, Syrphinae).

Paraules clau: Ichneumonidae, Diplazontinae, *Syrphophilus bizonarius, Episyrphus balteatus*, Algèria, Tizi–Ouzou

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Introduction

Diplazontinae is a subfamily of Ichneumonidae (Insecta, Hymenoptera). Morphologically well–defined and small, it is quite easily recognizable, especially by its enlarged and upper mandibles that are bilobed at the tip, the short or absent sternum of the mesopleura, and the short and basally enlarged first tergite. In females, the ovipositor is short, extending little or no further than the tip of the abdomen (Goulet and Huber, 1993). With the exception of the species of the genus *Bioblapsis* (Förster, 1869) (Klopfstein, 2014), members of this subfamily are koinobiont endoparasitoids specialized in parasitizing larvae of aphidophagous hoverflies (Diptera, Syrphidae, Syrphinae) (Quicke, 2015). However, they can also be used as natural enemies against several pests, and can parasitize the larvae of the sorghum shoot fly *Atherigona soccata* (Bleton and Fieuzet, 1943). Moreover, in the framework of biological control, *Syrphophilus bizonarius* (Gravenhorst, 1829) has been observed on apples from Italy to Israel. To date, 340 species belonging to the subfamily Diplazontinae have been described worldwide. Most of these have been described from the holarctic region, with the boreal and alpine areas being particularly rich in species (Manukyan, 1995; Klopfstein, 2007). In Algeria, however, very little information is available about this group, and *Diplazon laetatorius* (Fabricius, 1781) is the only species recorded in the country to date (Aroun, 2015).

Material and methods

This study was based on the examination of material collected to breed aphidophagous hoverflies from March to May 2020. The sampling site was Draâ Ben Khedda city (36º 72' 64.43" 3º 96' 39.31"), located in Tizi–Ouzou region (North Algeria) (fig. 1). The climate in Tizi–Ouzou is classified as Csa (a warm temperate climate with dry, hot summers) (Köppen et al., 2011). The material was identified according to the works of Klopfstein (2014) and Broad and Shaw (2018).

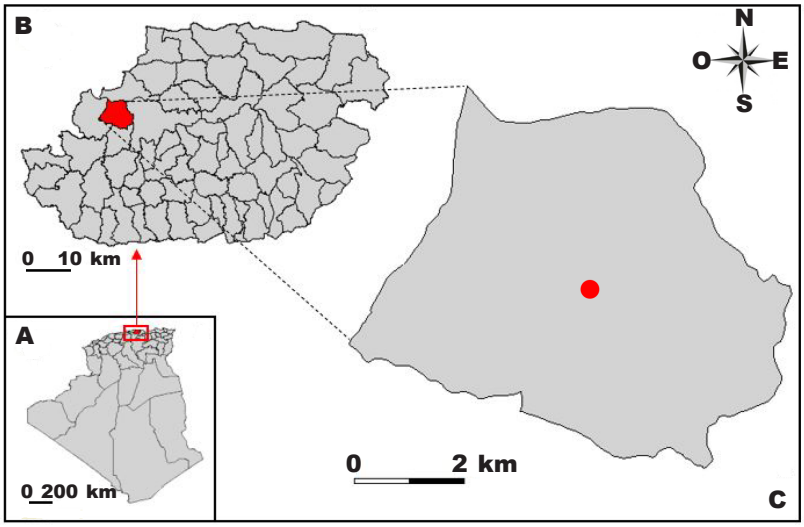

Fig. 1. A, study area; B, map of Algeria; C, map of northern Algeria showing the Tizi–Ouzou region.

Fig. 1. A, área de estudio; B, mapa de Argelia; C, mapa del norte de Argelia en el que se muestra la región de Tizi–Ouzou.

Results

The parasitoid species *S. bizonarius* is reported here for the first time in Algeria. A single male emerged from a pupa of *Episyrphus balteatus* (De Geer, 1776). The hoverfly larva was feeding on the black bean aphid *Aphis fabae* (Scopoli, 1763).

Description

According to Klopfstein (2014), the fore wing length measures between 3.5 and 4.5 mm. The antennae of both sexes have 17–21 flagellomeres. The mesoscutum is smooth and shiny between the faint perforations. The mesopleuron is smooth and shiny between weak perforations spaced more apart than their diameter. The sternaulus is strongly impressed. The propodeum has a complete set of strong carinae surrounding basal, lateral, and petiolaris areas, all of which show a rough sculpture.

Colouration of males

Antenna brown to orange, paler in the lower portion (fig. 2). Head and mesosoma black, face with yellow inner orbits, yellow on hind corner of pronotum, clypeus, mouthparts, tegula, sometimes subtegular ridge, small to large shoulder mark, and upper mesepimeron; scutellum usually yellow, at least with yellow apex. Legs orange, hind tarsus dark. Metasoma orange on tergites 2 to 3 or 4, but sometimes dark and with orange or yellow apical bands only on tergites 2 to 3 (Klopfstein, 2014).

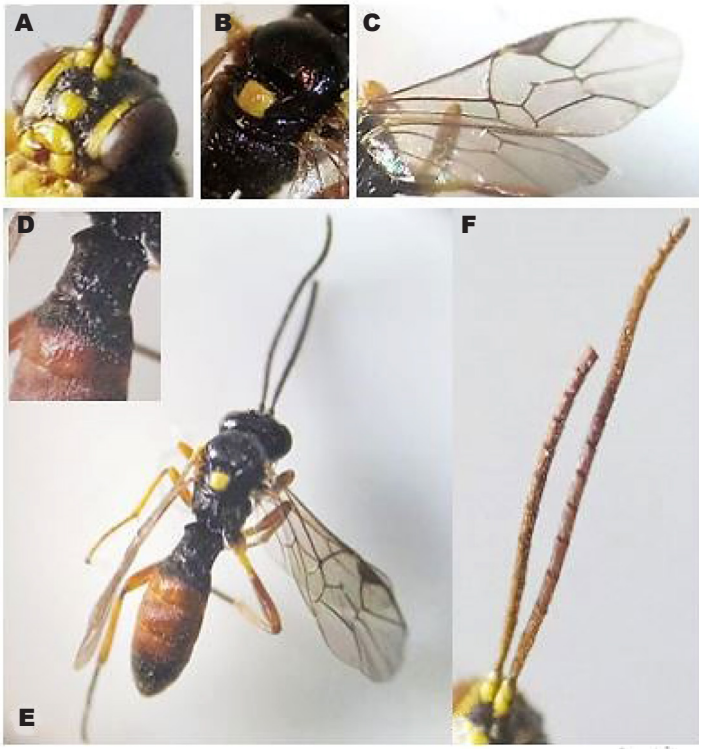

Fig. 2. Male of *Syrphophylus bizonarius* (G×2): A, frontal view of head; B, dorsal view of mesosoma and propodeum; C, right wings; D, base of metasoma; E, dorsal view of habitus; F, antennae.

Fig. 2. Macho de Syrphophylus bizonarius *(G×2): A, vista frontal de la cabeza; B, vista dorsal del mesosoma y el propodeo; C, alas derechas; D, base del metasoma; E, vista dorsal del biotipo; F, antenas.*

Discussion

According to Fitton and Rotheray (1982), Scaramozzino (1995), and Klopfstein (2014), *Syrphophilus* (Dasch, 1964) is a genus with only five species: *S. bizonarius*, *S. tricinctorius* (Thunberg, 1824), *S. scabriculus* (Holmgren, 1858), *S. asperatus* (Dasch, 1964), and *S. stibarus* (Momoi, 1973). Only the species *S. bizonarius* was found in this study, emerging from a pupa of *E. balteatus*. This species is known to parasitize pupae of hoverfly species such as *Eupeodes corollae* (Fabricius, 1794), *E. balteatus*, *Eupeodes luniger* (Meigen, 1822), *Sphaerophoria scripta* (Linnaeus, 1758) and *Syrphus vitripennis* (Meigen, 1822) (Dušek et al., 1979). Tomanovic et al. (2008), affirm that this wasp can also attack *Syrphus ribesii* (Linnaeus, 1758). Mifsud (2012) reported it for the first time in Malta on a pupa of *E. balteatus.*

Syrphophlus bizonarius is widely distributed in Holarctic and Oriental regions (Dasch, 1964). It occurs in North America, Asia, Europe, and Africa (Steffen et al., 2015). Several censuses

have been conducted in many European countries (Van Achterberg and Zwakhals, 2004). In Asia, it has been recorded in India, Mongolia, Azerbaijan and China (Yu et al., 2012). In 2014, this species was reported for the first time in Iran by Hasanshahi et al. (2014). In Africa, was recorded from Morocco by Greathead and Greathead (1992). In 2010, it was reported for the first time from Egypt (Gadallah et al., 2010). In this paper we report the presence of the syrphid parasitoid *S. bizonarius* for the first time in Algeria. This ichneumonid wasp may contribute to the biological control of common pests in Algeria.

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References

Aroun, M. E. F., 2015. Le complexe aphides et ennemis naturels en milieux cultivé et forestier en Algérie. PhD thesis, ENSA (École Nationale Supérieure Agronomique d'Alger) Higher National School of Agronomy of Algeria, Algeria,

Broad, G. R., Shaw, M. R., 2018. *Ichneumonid wasps (Hymenoptera: Ichneumonidae): their classification and biology*. Royal Entomological Society, London, UK.

Dasch, C. E., 1964. Ichneumon–flies of America north of Mexico: 5. Subfamily Diplazontinae. *Memoirs of the American Entomological Institute,* 3: 1–304.

Dušek J., Láska P., Šedivý J., 1979. Parasitization of aphidophagous Syrphidae (Diptera) by Ichneumonidae (Hymenoptera) in the Palaearctic region. *Acta Entomologica Bohemoslovaca,* 76: 366–378.

Fitton, M. G., Rotheray, G. E., 1982. A key to the European genera of diplazontine ichneumon–flies, with notes on the British fauna. *Systematic Entomology,* 7: 311–320.

Gadallah, N. S., Ahmed, R. S., El–Heneidy, A. H., Mahmoud, S. M., 2010. Ichneumonidae from the Suez Canal region Egypt (Hymenoptera, Ichneumonoidea). *Linzer biologische Beiträge*, 42(2): 1293–1310.

Goulet, H., Huber, J., 1993. *Hymenoptera of the world: an identification guide to families*. Research Branch, Agriculture Canada Publication 1894/E, Ottawa, Canada.

Greathead, D. J., Greathead, A. H., 1992. Biological control of insect pests by insect parasitoids and predators: the BIOCAT database. *Biocontrol News and Information,* 13(4): 61N–68N.

Hasanshahi, G., Abbasipour, H., Jussila, R., Jahan F., Dosti, Z., 2014. First record of the genus and species, *Syrphophilus bizonarius* from Iran. *Biocontrol in Plant Protection,* 1(2): 111–113.

Klopfstein, S., 2007. Artenvielfalt der Diplazontinae auf der Alp Flix (Hymenoptera: Ichneumonidae). *Nachrichtenblatt der Bayerischen Entomologen,* 56(3/4): 114–115.

– 2014. Revision of the Western Palaearctic Diplazontinae (Hymenoptera, Ichneumonidae). *Zootaxa,* 3801(1): 1–143, Doi: 10.11646/zootaxa.3801.1.1

Köppen, W., Volken, E., Brönnimann, S., 2011. The thermal zones of the earth according to the duration of hot, moderate and cold periods and to the impact of heat on the organic world. *Meteorologische Zeitschrift,* 20(3): 351–360 [translated from: Die Wärmezonen der Erde, nach der Dauer der heissen, gemässigten und kaltenZeit und nach der Wirkungder-Wärme auf die organische Welt betrachtet, *Meteorologische Zeitschrift,* 1884(1): 215–226].

Manukyan, A. R., 1995. The geographic distribution of the Diplazontinae (Hymenoptera, Ichneumonidae) in the Palaearctic region, with description of two new species. *Acta Zoologica Fennica,* 199: 55–60.

Mifsud, D., 2012. *Syrphophilus bizonarius* (Gravenhorst, 1829) (Hymenoptera) – new to Malta, with a revised check–list of the Ichneumonidae of the Maltese Islands. *Bulletin of*

the Entomological Society of Malta, 5: 179–183.
Quicke, D. J., 2015. *The Braconid and Ichneumonid parasitoid wasps: biology, systematics, evolution and ecology*. Wiley Blackwell, Oxford, UK.
Scaramozzino, P. L., 1995. Hymenoptera Ichneumonidae. In: *Checklist delle specie della fauna italiana*, 94: 1–62 (A. Minelli, S. E. Ruffo, S. La Posta, Eds.). Calderini, Bologna, Italia.
Steffen, K., Grousset, F., Schrader, G., Petter, F., Suffert, M., 2015. Identification of pests and pathogens recorded in Europe with relation to fruit imports. *Bulletin OEPP/EPPO Bulletin,* 45(2): 223–239, Doi: 10.1111/epp.12215
Tomanovic, Z., Kavallieratos, N. G., Starý, P., Petrović–Obradović, O., Athanassiou, C. G., Stanisavljević, L. Z., 2008. Cereal aphids (Hemiptera: Aphidoidea) in Serbia: Seasonal dynamics and natural enemies. *European Journal of Entomology,* 105(3): 495–501, Doi: 10.14411/eje.2008.064
Van Achterberg, K., Zwakhals, K., 2004. Family Ichneumonidae. Fauna Europaea version 2.4. Available online at: http://www.faunaeur.org [Accessed on 25th September 2021].
Yu, D. S., Van Achterberg, C., Horstmann, K., 2012. Taxapad 2012, Ichneumonoidea 2011. Database on flash–drive. Available online at: www.taxapad.com [Accessed on 25th September 2021].