Turkish Journal of Zoology

Volume 47 | Number 3 Article 5

1-1-2023

Fauna and distribution of Algerian Ichneumonidae (Hymenoptera, Ichneumonidae)

KHALIDA DJOUAMA

SANTIAGO BORDERA

TÜBİTAK

Turkish Journal of Zoology

http://journals.tubitak.gov.tr/zoology/

Research Article

Turk J Zool
(2023) 47: 170-174
© TÜBİTAK
doi:10.55730/1300-0179.3128

Fauna and distribution of Algerian Ichneumonidae (Hymenoptera, Ichneumonidae)

Khalida DJOUAMA[1,*], **Santiago BORDERA**[2]
[1]Department of Zoology, National Higher Agronomic School, El Harrach, Algiers
[2]Department of Environmental Sciences and Natural Resources, University of Alicante, Alicante, Spain

Received: 10.02.2023 • **Accepted/Published Online:** 11.04.2023 • **Final Version:** 04.05.2023

Abstract: In the present paper, 14 species of Ichneumonidae collected in Biskra region (Algeria) are reported. The species *Trathala hierochontica* (Schmiedeknecht, 1910), *Diplazon laetatorius* Fabricius, 1781, *Ophion obscuratus* Fabricius, 1798, *Enicospilus tournieri* (Vollenhoven, 1879), *Dichrogaster schimitcheki* (Fahringer, 1935), *Dichrogaster longicaudata* (Thomson, 1884), *Gelis imitatus* (Schwarz, 2016) and *Lysibia nana* (Gravenhorst, 1829) are reported as new records for the Algerian fauna.

Key words: Darwin wasps, distribution, parasitoids

1. Introduction

The family Ichneumonidae is the most species-rich family among the large insect order Hymenoptera with more than 25,000 described species (Yu et al., 2016). The latest published estimate on this family suggests that the total number of species may exceed 100,000 species (Gauld, 2002). Ichneumonidae are parasitoids of other arthropods, mainly insects, but the majority of species are solitary endoparasitoids of endopterygote larvae and pupae (Gauld and Bolton, 1988).These insects play a crucial role in the functioning of agricultural ecosystems and maintaining the equilibrium in arthropod populations (La Salle and Gauld, 1993). Ichneumonids can be used as biological indicators of habitat disturbance (Idris et al., 2001), their role as bioindicators of land-use and human impact is well known (Mazón and Bordera, 2014). The Algerian Ichneumonidae fauna has been poorly studied. There are numerous isolated citations of species from the country (e.g., Delrio, 1974; Scaramozzino, 1983; Vas, 2020, etc.), but only few published studies focused mainly on Algerian Ichneumonidae fauna (Lucas, 1849; Pic, 1897, 1898). According to Yu et al. (2016), 237 of ichneumonid species are recorded from Algeria, since then, three species have been added to the list: *Campoletis crassicornis* (Tschek, 1871) (Vas, 2020), *Syrphophilus bizonarius* (Gravenhorst, 1829) (Ait Amar et al., 2022) and *Mesochoroides ocellator* (Riedel and Araujo, 2022).

The aim of this study is to increase the taxonomic knowledge of the ichneumonid species of Algeria, reporting new records for the country from the Biskra region, and providing new distribution data.

2. Materials and methods

2.1. Study area

The Ichneumonidae recorded in this paper were collected from four localities in Biskra Province. The Ain Naga station is a private farm (34°41'31.734" N, 6°6'52.269" E, 2 m). The station occupies an area of 9 ha, of condiment crops: coriander (*Coriandrum sativum* L., 1753), fenugreek (*Trigonella foenum-graecum* L., 1753), safflower (*Carthamus tinctorius* L., 1753), mint (*Mentha spicata* L., 1753), and black cumin (*Nigella sativa* L., 1753). The second habitat is a private exploitation, Ain Naga (Horaya) (34°41'4.23" N, 6°7'27.28" E, 2 m). It is located in an agricultural sector, east of Biskra, 5 km from Sidi Okba. It occupies an area of 252 ha cultivated with eggplant, tomato and pepper. The third habitat Tolga is a palm grove. It is located in an agricultural sector, in the municipality of Lichana (34°43'58.738" N, 5°26'11.823"E, 152 m). It occupies 15 ha of date palm and other crops such as pomegranate and vine. The fourth habitat is located at the El Outaya plain in the north of the Biskra region (35°1'12.124"N, 5°36' 25.654"E, 200 m),with an area of 40 ha mostly cultivated of olive trees.

2.2. Sampling method

Specimens were collected using Pitfall traps and Malaise traps, for a period of 8 months from December 2016 to August 2017. The material was pinned or mounted on small

* Correspondence: khalida2.djouama@gmail.com

cards and are housed at the collection of the insectarium of the National Higher Agronomic School (El Harrach, Algeria). Species distributions are from Yu et al. (2016). Terminology and microsculpture are from Broad et al. (2018). Newly recorded species are marked with an asterisk.

3. Results

A total of 14 species have been found, of them 8 species are newly recorded for the fauna of Algeria. All species are new records for Biskra Province.

List of species

Family Ichneumonidae

Subfamily Cremastinae Foerster, 1869

***Trathala hierochontica* (Schmiedeknecht, 1910)**

Diagnosis.

This species can be distinguished by the combination of the following characters: head yellow without a black band in the middle; stemmaticum blackish brown, vertex posteriorly yellowish brown; antennal flagellomeres blackish brown with a yellowish brown band in the middle; apex of posterior tibia brown without blackish band and metasoma brown.

Material examined.

Algeria: Ain Naga, 2 m, 28/I/2017, 1♀, Pitfall trap.

General distribution.

Palaearctic: Bulgaria, Dagestan Republic, Egypt, France, Iran, Israel, Morocco, Russia, Romania, Türkiye (Yu et al., 2016).

Subfamily Cryptinae Kirby, 1837

Tribe Cryptini Kirby, 1837

***Mesostenus transfuga* Gravenhorst, 1829**

Diagnosis.

This species can be distinguished by the combination of the following characters: frons convex and finely punctate, antenna with 26–28 flagellomeres; femora not thickened; hind femora 3.6–4.2 times as long as high; anterior part of tergite I without teeth and metasoma posteriorly darkened.

Material examined.

Algeria: El Outaya, 200 m, 25/III/2017, 2♀♀, 1♂, Pitfall trap; 26/V/2017, 1♀, Malaise trap.

General distribution.

Palaearctic: Algeria, Austria, Azerbaijan, Azores Islands, Belgium, Bulgaria, Czech Republic, Egypt, Finland, Former Czechoslovakia, France, Germany, Greece, Hungary, Iran, Ireland, Israel, Italy, Kazakhstan, Latvia, Lithuania, Moldova, Mongolia, Poland, Portugal, Romania, Russia, Spain, Sweden, Switzerland, The Canary Islands (Spain), Turkmenistan, Ukraine, United Kingdom (Yu et al., 2016).

Distribution in Algeria: Bouzereah. Reported by Habermehl (1919) as *Mesostenus ingenuus* Toskinet.

Subfamily Diplazontinae Viereck 1918

***Diplazon laetatorius* Fabricius, 1781**

Diagnosis.

This species can be easily distinguished by the combination of the following characters: mesoscutum and mesopleuron black; coxae and trochanters entirely orange or yellow; hind tibia tricolored black, white, black, and orange, the orange band covering at least the apical quarter of the tibia; petiolar area of propodeum always fully enclosed; tergite I strongly arched and metasoma bright orange at least on most of tergites II and III.

Material examined.

Algeria: Ain Naga, 2 m, 28/II/2017, 2♀♀; 26/III/2017, 4♀♀, Pitfall trap; Tolga, 152 m, 24/IV/2018, 1♀, Pitfall trap.

General distribution.

Worldwide (Yu et al., 2016).

Subfamily Ichneumoninae Latreille, 1802

Tribe Ichneumonini Latreille, 1802

***Ctenochares bicolorus* (Linnaeus, 1767)**

Diagnosis.

This species can be distinguished by the combination of the following characters: flagellum with whitish band, lateral carinae of scutellum strong, reaching posterior part; lateral longitudinal, lateromedian longitudinal and posterior transverse carina of propodeum absent; forewing pale yellow with dark spots at the apex; tarsal claws pectinate and hind coxa and femur black.

Material examined.

Algeria: Ain Naga, 2 m, 28/II/2017, 1♀, Malaise trap; El Outaya, 200 m, 25/IV/2017, 1♀, Sweep net.

General distribution.

Afrotropical: Angola, Cameroon, Congo, Ethiopia, Guinea, Namibia, Nigeria, South Africa, Tanzania, Zimbabwe; Australasian: Australia, New Zealand; Palaearctic: Algeria, Egypt, France, Greece, Italy, Malta, Morocco, Portugal, Spain, Tunisia (Yu et al., 2016).

Distribution in Algeria: Alger, as *Ichneumon xanthomelas* (Brullé) by Lucas (1849) and as *Ctenochares instructor* (Fabicius) by Habermehl (1916); Blidah, as *Celmis apicalis* (Brullé) by Tosquinet (1896), Oran as *Ichneumon xanthomelas* (Brullé) by Lucas (1849). Reported from Algeria without locality data by Berthoumieu (1894), as *Joppites xanthomelas* (Brullé); Dalla Torre (1902), as *Joppites instructor* (Fabricius); Meyer (1933), as *Ctenochares instructor* (Fabricius 1793) and by Tosquinet (1896), as *Ichneumon xanthomelas* (Brullé).

Subfamily Mesochorinae Förster, 1869

***Mesochorus* sp.**

Material examined.

Algeria: Sidi Okba, 2m, 01/I/2017, 1♀, Pitfall trap,

Subfamily Ophioninae Shuckard, 1840

Tribe Enicospilini Stephens, 1835

***Enicospilus tournieri* (Vollenhoven, 1879)**

Diagnosis.

This species can be distinguished by the combination of the following characters: head strongly narrowed posteriorly to eyes; hind ocelli adjacent to the eyes; eyes convergent ventrally in frontal view; propodeum granulate and central scleroma of fenestra absent.

Material examined.

Algeria: Sidi Okba, 2 m, 28/II/2017, 3♀♀; 26/III/2017, 1♂, Pitfall trap.

General distribution.

Palaearctic: Afghanistan, Azerbaijan, Belgium, Bulgaria, China, Egypt, France, Germany, Hungary, Iran, Italy, Kazakhstan, Moldova, Morocco, Netherlands, Poland, Romania, Russia, Spain, Switzerland, Türkiye, Ukraine, United Kingdom, Uzbekistan (Yu et al., 2016).

Tribe Ophionini Fabricius, 1798

***Ophion obscuratus* Fabricius, 1798**

Diagnosis.

This species can be distinguished by the combination of the following characters: head narrowed posteriorly to eyes; occipital carina uniformly curved ventrally; mesoscutum with pale yellowish longitudinal marks; mesopleuron smooth, without striations; propodeum with lateral longitudinal carinae; fore wing hyaline, with vein 2r&RS barely swollen proximally and forming an angle with the pterostigma of less than 45° and posterior margin of sternite I at the same level of spiracle.

Material examined.

Algeria: Ain Naga, 2 m, 24/IX/2017, 1♀, Malaise trap; Sidi Okba, 2 m, 26/III/2017, 1♂, Pitfall trap.

General distribution.

Neotropical: Argentina; Oriental: Myanmar, Nepal, India; Palaearctic: Austria, Belgium, Belarus, Bulgaria, China, Former Czechoslovakia, Egypt, Finland, France, Germany, Greece, Hungary, Ireland, Israel, Japan, Korea, Latvia, Luxembourg, Moldova, Morocco, Netherlands, Norway, Poland, Romania, Russia, Spain, Sweden, Tajikistan, Türkiye, Ukraine, United Kingdom (Yu et al., 2016).

Subfamily Phygadeuontinae Förster, 1869

***Dichrogaster longicaudata* (Thomson, 1884)**

Diagnosis.

This species can be distinguished by the combination of the following characters: mandible width, at base of teeth, 2.5 times the width of the second flagellomere; mesoscutum entirely shiny, with medium-sized punctures; mesosoma black.

Material examined.

Algeria: Sidi Okba, 2m, 20/IV/2017, 2♀♀, Pitfall trap.

General distribution.

Nearctic: Canada, United States; Palaearctic: Austria, Bulgaria, Czech Republic, Former Czechoslovakia, Egypt, Finland, France, Germany, Greece, Iran, Iraq, Israel, Italy, Madeira Islands (Portugal), Malta, Moldova, Mongolia, Norway, Poland, Serbia, Spain, Sweden, Former Yugoslavia, Türkiye (Yu et al., 2016).

***Dichrogaster saharator* (Aubert, 1964)**

Diagnosis.

This species can be distinguished by the combination of the following characters: second flagellomere 2.5 times as long as wide; mesoscutum entirely shiny, with medium-sized punctures; mesosoma orange and tergites III-VII blackish.

Material examined.

Algeria: Sidi Okba, 2 m, 28/I/2017, 1♀,28/II/2017, 2♀♀, Pitfall trap.

General distribution.

Palaearctic: Algeria, Bulgaria, Egypt, Iran, Israel, Türkiye (Yu et al., 2016).

Distribution in Algeria: Reported from Nahia, Mt. Ougarta as *Otacustes aestivalis saharator* by Aubert (1964) = *Dichrogaster sharator* (Aubert) (Townes, 1983).

***Dichrogaster schimitscheki* (Fahringer, 1935)**

Diagnosis.

This species can be distinguished by the combination of the following characters: mandible short, width at base of teeth, 1.1 times the width of the second flagellomere; second flagellomere 2.5 times longer than wide; mesoscutum entirely shiny, with medium-sized punctures, the majority of punctures separated by 1.5 to 2.5 times their diameter.

Material examined.

Algeria: Ain Naga, 2 m, 24/II/2017, 2♀♀, Pitfall trap.

General distribution.

Nearctic: Canada, United States; Palaearctic: Austria, Bulgaria, Former Czechoslovakia, Finland, Germany, Norway, Poland, Russia, Sweden, Türkiye, United Kingdom (Yu et al., 2016).

***Gelis imitatus* Schwarz, 2016**

Diagnosis.

This species can be distinguished by the combination of the following characters: head in dorsal view strongly narrowed posteriorly to eyes, granulate and mat; ocelli small; malar space longer than basal width of mandible; antenna with 22 flagellomeres, the third 4.6 times as long as wide; fore wing darkened, vein 2m-cu nearly straight with two distinct bullae, areolet open.

Material examined.

Algeria: Ain Naga, 2 m, 26/III/2017, 1♀, Pitfall trap.

General distribution.

Palaearctic: Austria, Czech Republic, France, Germany, Greece, Italy, Spain, Syria, Türkiye (Yu et al., 2016).

***Gelis* sp. 1**

Material examined.

Algeria: Ain Naga, 2 m, 26/III/2017, 1♂, Pitfall trap.

***Gelis* sp. 2**

Material examined.

Algeria: Ain Naga, 2 m, 26/III/2017, 2♂♂, 20/IV/2017, 1 ♀, Pitfall trap.

****Lysibia nana* (Gravenhorst, 1829)**

Diagnosis.

This species can be distinguished by the combination of the following characters: first flagellomere 2.3 times as long as wide; area superomedia matt with fine rugae and tergite II finely wrinkled. In males, apical part of parameres long and upcurved and flagellum with tyloids in the form of a longitudinal ridge.

Material examined.

Algeria: Ain Naga, 2 m, 26/III/2017, 1♂, Pitfall trap.

General distribution.

This species is widespread throughout the Holarctic, Oriental and Oceanic regions (Yu et al., 2016).

4. Discussion

In the present paper 14 species have been found, most of these species have been reported in previous studies from neighboring countries as Morocco, Tunisia and Spain (Yu et al., 2016). Some of the reported species as *Lysibia nana* and *Diplazon laetatorius* are cosmopolitan and widespread throughout the world (Yu et al., 2016); therefore, the scarcity of studies about Ichneumonidae in Algeria is probably the reason why they have never been reported before and demonstrate that knowledge of Ichneumonidae fauna in Algeria is still very incomplete and has yet to be extended.

Acknowledgments

Most of this work was accomplished during a scientific visit by the first author to the University of Alicante (Spain) which was funded by the National Higher Agronomic School, Algiers.

References

Ait Amar S, Benoufella–Kitous K, Medjdoub–Bensaad F, Al Hussain Kareem, A (2022). First record of *Syrphophilus bizonarius* (Gravenhorst, 1829) (Hymenoptera, Ichneumonidae, Diplazontinae) from Algeria. Arxius de Miscel·lània Zoològica 20: 47-52. https://doi. org/10.32800/amz.2022.20.004

Aubert JF (1964). Révision des travaux concernant les Ichneumonides de France et 4e supplément au catalogue de Gaulle (85 espèces nouvelles pour la faune française). Bulletin de la Société Linnéenne de Lyon 33: 57-65,81-84 (in French). https://doi. org/10.3406/linly.1964.12933

Berthoumieu V (1894). Ichneumonides d'Europe et des pays limitrophes. Annales de la Société Entomologique de France 63: 505-592 (in French).

Broad GR, Shaw MR, Fitton MG (2018). The ichneumonid wasps of Britain and Ireland (Hymenoptera: Ichneumonidae): their classification and biology. Handbooks for the Identification of British Insects 7 (12): 1-418.

Dalla Torre CG (1902). Catalogus hymenopterorum hucusque descriptorum systematicus et synonymicus. Volumen III: Trigonalidae, Megalyridae, Stephanidae, Ichneumonidae, Agriotypidae, Evaniidae, Pelecinidae. Guilelmi Engelmann. Lipsiae. p. 1141 (in German).

Delrio G (1975). Revision des especes ouest-palearctiques du genre *Netelia* Gray (Hym., Ichneumonidae). Annali della Facolta di Agraria 23: 1-126 (in French).

Gauld ID (2002). The Ichneumonidae of Costa Rica, 4. Memoirs of the American Entomological Institute 66: 1-768.

Gauld I, Bolton B (1988). The Hymenoptera. London. Oxford Univ. Press.

Habermehl H (1916). Beiträge zur Kenntnis der palaearktischen Ichneumonidenfauna. Zeitschrift für Wissenschaftliche Insektenbiologie 12: 232-237 (in German).

Habermehl H (1919). Beiträge zur Kenntnis der palaearktischen Ichneumonidenfauna. Zeitschrift für Wissenschaftliche Insektenbiologie, 14: 285-292 (in German).

Idris AB, Sajap AS, Noor Farikha H, Yaakob AB, Ruslan MY (2001). Preliminary Study on Diversity and Abundance of Ichneumonids and Braconids (Insecta: Hymenoptera) at the Ayer Hitam Forest Reserve. Pertanika Journal Tropical Agriculture Science 24 (1): 43-48.

LaSalle J, Gauld ID (1993). Hymenoptera: their biodiversity, and their impact on the diversity of other organisms, 1–26.In Hymenoptera and Biodiversity, LaSalle J,Gauld I D, Eds. p. 348.

Lucas H (1849). Exploration scientifique de l'Algérie pendant les années 1840, 1841, 1842. Sciences physiques, Zoologie, III. Insectes. Paris. p. 527 (in French).

Maźon M, Bordera S (2014). Diversity of Ichneumonidae (Insecta: Hymenoptera) in a protected area of Central Spain: What are we protecting? Insect Conservation and Diversity 7 (5) : 432-452.

Meyer NF (1933). Keys to parasitic Hymenoptera (family Ichneumonidae) of the USSR and adjacent countries. Vol. 1. Introduction and Ichneumoninae. Zoological Institute of the Academy of Sciences of the USSR 9 (1): 1-458.

Pic M (1897). Ichneumonides capturés en Algérie et description d'une espèce nouvelle (Hymén.). Bulletin de la Société entomologique de France 2 (16): 265-266 (in French). https:// doi.org/10.3406/bsef.1897.22103

Pic M (1898). Diagnoses d'Ichneumoniens nouveaux (Hymén.) recueillis par M.L. Bleuse en Algérie. Bulletin de la Société entomologique de France 3 (19): 352-353 (in French). https://doi.org/10.3406/bsef.1898.28650

Riedel M, Araujo RO (2022). Contribution to the taxonomy of Mesochorinae (Hymenoptera, Ichneumonidae) with description of a new genus from Northern Africa. Mitteilungen der Deutschen Entomologischen Gesellschaft 112: 41-48.

Scaramozzino PL (1983). *Colpotrochia giachinoi* n. sp., un nuovo Metopiinae (Hymenoptera: Ichneumonidae) del Nord Africa. Bollettino Museo Regionale di Scienze Naturali Torino 1: 87-92 (in Italian with an abstract in English).

Tosquinet J (1896). Contributions à la faune entomologique de l'Afrique. Ichneumonides. Mémoires de la Société Entomologique de Belgique, 5: 1-430 (in French).

Townes HK (1983). Revisions of twenty genera of Gelini (Ichneumonidae). Memoirs of the American Entomological Institute 35: 1-281.

Vas Z (2020). New species and records of Ichneumonidae (Hymenoptera). Folia Entomologica Hungarica, 81: 95104. http://doi.org/10.17112/FoliaEntHung.2020.81.95

Yu DS, Van Achterberg C, Horstmann K (2016). World Ichneumonoidea 2015. Taxonomy, Biology, Morphology and Distribution. Taxapad Interactive Catalogue. Database on flash-drive. Nepean, Ottawa, Canada.