

A new species of *Anteon* (Hymenoptera, Dryinidae) from Turkey

Stefano Speranza¹, Massimo Olmi², Leonardo Capradossi³, Mario Contarini¹

1 Department of Agriculture and Forestry Sciences (DAFNE), University of Tuscia, Via San Camillo de Lellis, I-01100 Viterbo, Italy **2** Tropical Entomology Research Center, Via De Gasperi 10. I-01100 Viterbo, Italy **3** Via Pericle Scriboni 28, 01017 Tuscania, Italy

Corresponding author: Mario Contarini (contarini@unitus.it)

Academic editor: M. Proshchalykin | Received 28 March 2021 | Accepted 3 May 2021 | Published 24 August 2021

<http://zoobank.org/AB92A7DC-FCC3-4015-9B71-61BA91680103>

Citation: Speranza S, Olmi M, Capradossi L, Contarini M (2021) A new species of *Anteon* (Hymenoptera, Dryinidae) from Turkey. In: Proshchalykin MYu, Gokhman VE (Eds) Hymenoptera studies through space and time: A collection of papers dedicated to the 75th anniversary of Arkady S. Lelej. Journal of Hymenoptera Research 84: 373–380. <https://doi.org/10.3897/jhr.84.66615>

Abstract

A new species from Turkey, *Anteon leleji* **sp. nov.** (Hymenoptera, Dryinidae), is described and illustrated. Its relationship with Palaearctic and Afrotropical species of *Anteon* is discussed. The new species is close to *A. xericum* Olmi & van Harten described from Yemen, and known also from other Afrotropical countries. The key to the Palaearctic species of *Anteon* is modified to include the new species. New records of *Anteon* species from Turkey are registered.

Keywords

Anteon leleji, *A. xericum* Anteoninae, Chrysidoidea, key, Mugla

Introduction

Dryinidae (Hymenoptera, Chrysidoidea) are parasitoids and often also predators of leafhoppers, planthoppers and treehoppers (Hemiptera, Auchenorrhyncha) (Guglielmino et al. 2013). The family consists of 52 genera (Olmi et al. 2020), including *Anteon* Jurine, 1807. This genus includes 464 species and is known to parasitize

leafhoppers of the family Cicadellidae (Olmí et al. 2019). *Anteon* species can be easily recognized for the following characters (see Olmí et al. 2019 for keys and figures): female with distinct ocelli; fore wing with distal part of 2r-rs&Rs vein much shorter than proximal part; chelate protarsus; rudimentary claw absent; inner side of the enlarged claw with a proximal prominence bearing one long bristle; male with three basal cells of the fore wing completely enclosed by pigmented veins; fore wing with PostabR1 (= radius) absent or shorter than pterostigma; pterostigma less than 4 × as long as broad; distal part of 2r-rs&Rs vein much shorter than proximal part; hypopygium not umbrella-shaped.

In the Western Palaearctic region, the genus *Anteon* can be considered sufficiently known in Western Europe mainly because of the papers of Olmí (1999, 2021). On the contrary in Eastern Europe and the Middle East it is insufficiently known due to lack of research (Olmí 2011; Derafshan et al. 2021). In Turkey, the following six species of *Anteon* are known (Olmí and Xu 2015; Olmí et al. 2019): *Anteon abdunnouri* Olmí, 1987; *Anteon ephippiger* (Dalman, 1818); *Anteon infectum* (Haliday, 1837); *Anteon jurineanum* Latreille, 1809; *Anteon pubicorne* (Dalman, 1818); *Anteon scapulare* (Haliday, 1837).

In 2020, we received on loan a specimen of *Anteon* collected in Turkey. It resulted to be a new species described herein.

Materials and methods

The description follows the terminology used by Olmí et al. (2019). The measurements reported are relative, except for the total length (head to abdominal tip, excluding antennae and sting), which is expressed in millimetres. The following abbreviations are used in the descriptions: POL – the distance between the inner edges of the two lateral ocelli, OL – the distance between the inner edges of a lateral ocellus and the median ocellus, OOL – the distance from the outer edge of a lateral ocellus to the compound eye, OPL – the distance from the posterior edge of a lateral ocellus to the occipital carina, TL – the distance from the posterior edge of an eye to the occipital carina. The term “disc of metapectal-propodeal complex” is here used in the sense of Kawada et al. (2015). It corresponds to the term “dorsal surface of propodeum” *sensu* Olmí (1984). The term “propodeal declivity” *sensu* Kawada et al. (2015) used here, corresponds to the term “posterior surface of propodeum” *sensu* Olmí (1984). The names of veins of the forewing are here used in the sense of Olmí et al. (2019). The “stigmatal vein” (*sensu* Olmí 1984) is here named “second radial-radial sector crossvein & radial sector vein (2r-rs&Rs)”.

The types of all Palaearctic species of *Anteon* have been previously examined by the authors.

The specimens examined in this paper were studied by a stereomicroscope Wild M5. The multifocal photos were taken by one of the coauthors (LC) using a mirrorless camera Sony Alpha 6300 with cross table Proxxon KT 70. Captured images were

merged into a single in-focus image using ZereneStacker version 1.04. Plates were composed by Photoshop CS6. Line drawings were made by a camera lucida combined with a microscope Leitz Laborlux 12.

The specimen studied in this paper is deposited in the collections of the Oberösterreichisches Landesmuseum, Linz (Austria) (OLL).

Results

Genus *Anteon* Jurine, 1807

Anteon leleji sp. nov.

<http://zoobank.org/2E12F6A5-A1AB-4664-96B6-64C6E5D98D4C>

Figures 1–3

Material examined. *Holotype*: ♂, Turkey, Mugla Prov., Mugla university campus, 37°09'38"N, 28°22'11"E, XI.2015–IV.2016, Malaise trap, Barták & Kubík leg. (OLL).

Diagnosis. Macropterous male of *Anteon* with mesoscutum punctate, unsculptured among punctures (Fig. 1A); propodeal declivity without longitudinal keels (Fig. 1E); paramere with numerous transverse folds and papillae on inner margin (Fig. 2A).

Description. *Male*. Fully winged (Fig. 1A–C); body length 2.1 mm. Black, except mandible testaceous and antenna and legs brown. Antenna filiform; antennomeres in following proportions: 9:5:6:7:6:6:6:6:8 (antennae broken; last four antennomeres glued on the label (Fig. 1E)). Head (Fig. 1D) dull, granulate and slightly rugose; frontal line indistinct, complete; occipital carina complete; POL = 6; OL = 3; OOL = 5; OPL = 3.5; TL = 4; greatest breadth of lateral ocellus about as long as OL. Mesoscutum (Fig. 1A) shiny, punctate, unsculptured among punctures. Notauli incomplete, reaching approximately $0.3 \times$ length of mesoscutum. Mesoscutellum and metanotum shiny, unsculptured. Metapectal-propodeal complex with transverse keel separating disc and propodeal declivity; metapectal-propodeal disc reticulate rugose; propodeal declivity (Fig. 1F) without longitudinal keels, with areolae less wide than those of metapectal-propodeal disc. Fore wing hyaline, without dark transverse bands; distal part of stigmal vein (2r-rs&Rs) much shorter than proximal part (3:7). Paramere (Fig. 2A) without inner process, with numerous transverse folds. Tibial spurs 1/1/2.

Female. Unknown.

Hosts. Unknown.

Etymology. The species is named after Prof. Arkady S. Lelej (Federal Scientific Center of the East Asia Terrestrial Biodiversity, Far Eastern Branch of the Russian Academy of Sciences, Vladivostok, Russia) on the occasion of his seventy-fifth birthday.

Distribution. Turkey.

Remarks. Because of the above diagnosis, *A. leleji* sp. nov. is similar to *A. xericum* Olmi & van Harten, 2006, species described from Yemen, but Afrotropical, being

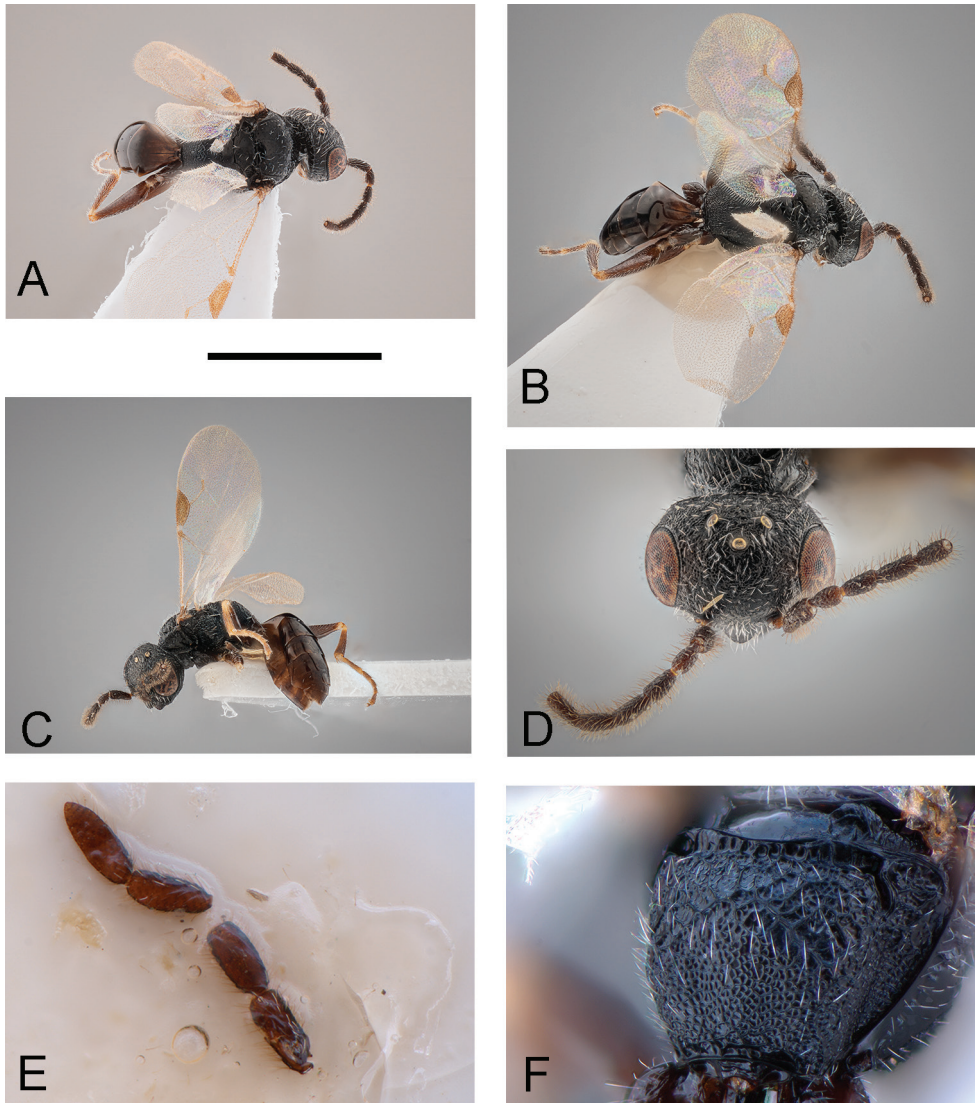


Figure 1. *Anteon leleji* sp. nov., holotype, male **A–C** habitus, dorsal view (**A**), dorso-lateral view (**B**), lateral view (**C**) **D** head, dorsal view **E** antennomeres 7–10 **F** propodeal declivity. Scale bar: 1.6 mm (**A**); 1.3 mm (**B**); 1.5 mm (**C**); 0.5 mm (**D**); 0.4 mm (**E**); 0.3 mm (**F**).

known also from Kenya, Madagascar, South Africa and Tanzania (Olm et al. 2019). From the point of view of Dryinidae, Yemen is mainly Afrotropical. However, there are a few exceptions represented by Palearctic species, such as *Anteon abdunnouri* Olmi, 1987 and *Echthrodolphax tauricus* Ponomarenko, 1970 (Olm 1999, 2021; Olmi et al. 2019). For this reason, Yemen is also treated as a Palearctic country, albeit at the margins (see Olmi et al. 2019 for further comments). Following the above description of *A. leleji* sp. nov., the key to the males of the Western Palearctic species of *Anteon* published by Olmi (1999), should be modified by replacing couplet 3 as follows:

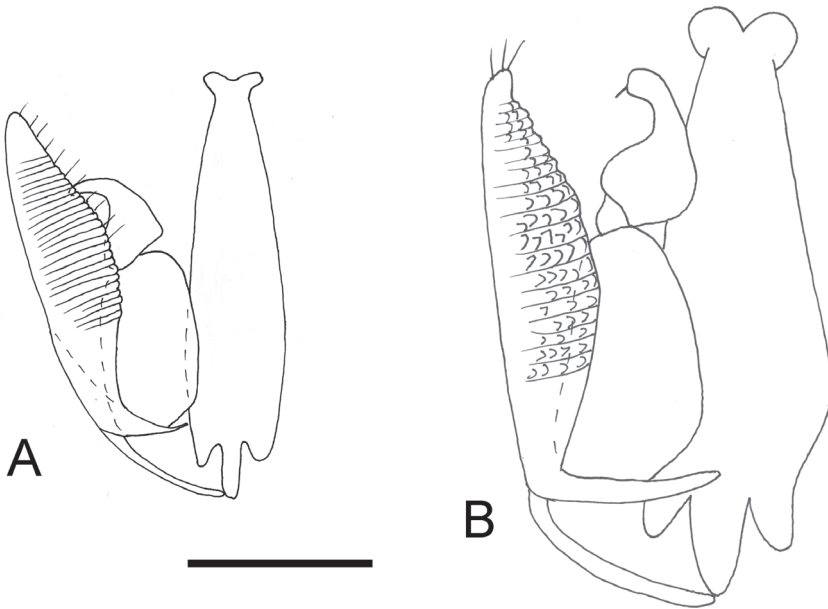


Figure 2. *Anteon leleji* sp. nov., holotype, male (A) and *A. xericum* Olmi & van Harten, holotype, male (B) A, B genital armature (right half removed). Scale bar: 0.09 mm (A); 0.05 mm (B).

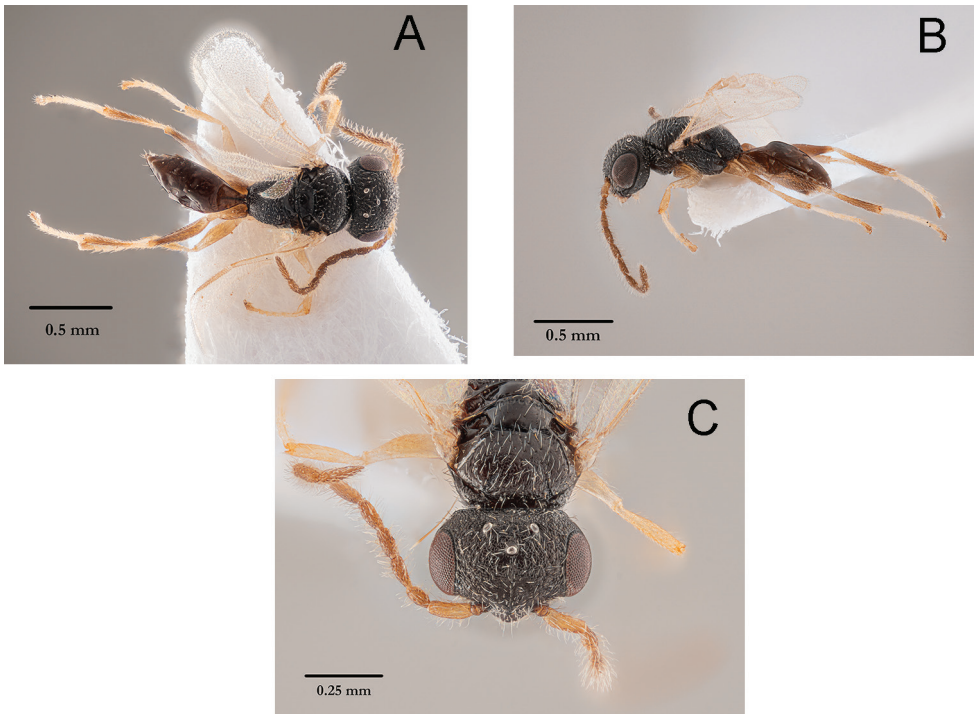


Figure 3. *Anteon xericum* Olmi & van Harten, holotype, male A, B habitus, dorsal view (A), lateral view (B) C head and part of mesosoma (except metaplectal-propodeal complex), dorsal view.

1	Short-winged (fig. 98 in Olmi 1999)	<i>A. phoenicium</i> Olmi
–	Fully winged (Figs 1A, 3A)	2
2	Propodeal declivity without longitudinal keels (Figs 1F, 3A)	3
–	Propodeal declivity with two longitudinal keels (Plates XIV, XVII in Olmi 1999)	8
3	Paramere with numerous transverse folds (Fig. 2A, B).....	3'
–	Paramere without transverse folds (figs 75, 76B, 77D in Olmi 1999)	4
3'	Mesoscutum punctate, unsculptured among punctures (Fig. 1A); paramere without papillae among transverse folds (Fig. 2A)	<i>A. leleji</i> sp. nov.
–	Mesoscutum completely strongly or very slightly granulate, or at least with anterior half granulate (Fig. 3C); paramere with papillae among transverse folds (Fig. 2B).....	<i>A. xericum</i> Olmi & van Harten

Discussion

Species of the genus *Anteon* usually have very large geographic distributions (Olmi 1999; Olmi et al. 2019). Species that have been recorded from only one country or region are expected to be found in other regions in future. *Anteon leleji* sp. nov. should not be an exception. As Western Europe is well known, probably *A. leleji* sp. nov. should be a species present in the Middle East or maybe also in Eastern Europe. The Middle East is insufficiently known. Recent investigations in Iran (mainly thanks to Prof. Ehsan Rakhshani research group, Zabol University, Iran) (Derafshan et al. 2016, 2017, 2020, 2021) are trying to fill this gap. However, the work is hard, since the Middle East covers wide range and the number of involved researchers is too small.

Another big gap regards the hosts of *Anteon*. They are almost unknown in the entire Middle East. The species, whose hosts are recorded in the Middle East, are only two (Guglielmino et al. 2013).

Following the description of *A. leleji* sp. nov., eight are the *Anteon* species recorded in the Middle East (Olmi 1999, 2021; Olmi and Xu 2015; present paper), of which seven registered from Turkey. However, the species present in Turkey are more numerous. We can register here the following six new records, based on material identified by the authors and deposited in OLL:

1. *Anteon flavicorne* (Dalman, 1818): from Turkey, Samsun, University campus, 41°22'N, 36°11'E, Malaise trap, 22.VI–4.VII.2014, Barták & Kubík leg., 1 ♀ (OLL).

2. *Anteon fulviventre* (Haliday, 1828): from Turkey, Samsun, University campus, 41°22'N, 36°11'E, Malaise trap, 22.VI–4.VII.2014, Barták & Kubík leg., 1 ♀, 2 ♂ (OLL).

3. *Anteon gaullei* Kieffer, 1905: from Turkey, Akyaka, 37°03'N, 28°19'E, 30m, IV–V.2013, forest, Barták & Kubík leg., 4 ♂ (OLL).

4. *Anteon reticulatum* Kieffer, 1905: from Turkey, Samsun, University campus, 41°22'N, 36°11'E, Malaise trap, 22.VI–4.VII.2014, Barták & Kubík leg., 1 ♀ (OLL).

5. *Anteon tripartitum* Kieffer, 1905: from Turkey, Mugla, University Campus, 37°09'N, 28°22'E, 720m, IV.2015, Malaise trap, Barták & Kubík leg., 1 ♀, 2 ♂ (OLL).

6. *Anteon tschirnhausi* Olmi, 2011: from Turkey, Mugla, University campus, 650m, 18–21.V.2011, PT + SW, Barták & Kubík leg., 1 ♀ (OLL); Mugla, University Campus, 37°09.42'N, 28°22.13'E, 700m, 26.V–26.VI.2015, Malaise trap, H. Kavak leg., 1 ♀ (OLL).

Following the above new records, the species of *Anteon* recorded from Turkey are now 13.

Acknowledgements

Many thanks to Martin Schwarz (Biologie Zentrum des Oberösterreichisches Landesmuseum, Linz, Austria) for sending on loan the specimen of *Anteon* studied in the present paper. We are grateful to Maksim Proshchalykin (subject editor; Federal Scientific Center of the East Asia Terrestrial Biodiversity, Vladivostok, Russia), Denis Brothers (University of Natal, Pietermaritzburg, South Africa), Toshiharu Mita (Kyushu University, Motooka, Japan) and Wesley Dondoni Colombo (Universidade Federal do Espírito Santo, Vitoria, Brazil) for their precious comments and suggestions. This research has been supported by the European Commission under the Grant Agreement number 774571 (project PANTHEON –‘Precision farming of hazelnut orchards’) and was carried out in the frame of the MIUR (Italian Ministry for Education, University and Research) initiative “Department of excellence” (Law 232/2016).

References

- Derafshan HA, Olmi M, Ghafouri Moghaddam M, Nader E, Rakhshani E (2021) New records of pincer wasps (Hymenoptera, Chrysidoidea, Dryinidae) from Iran with description of the male of *Dryinus tamaricicola* Rakhshani & Olmi. *Zoosystema*, in press.
- Derafshan HA, Olmi M, Ghafouri Moghaddam M, Rakhshani E (2020) Taxonomy of Iranian Gonatopodinae (Hymenoptera, Dryinidae), with description of a new species. *Zootaxa* 4789(2): 371–402. <https://doi.org/10.11646/zootaxa.4789.2.3>
- Derafshan HA, Rakhshani E, Olmi M (2016) A review of the genus *Dryinus* Latreille, 1804 (Hymenoptera, Chrysidoidea, Dryinidae) from Iran, with description of a new species. *Zootaxa* 4117(3): 411–420. <https://doi.org/10.11646/zootaxa.4117.3.8>
- Derafshan HA, Rakhshani E, Olmi M, Vafaei M (2017) Discovery of the genus *Mirodryinus* Ponomarenko, 1972 (Hymenoptera, Chrysidoidea, Dryinidae) associated with salt cedar trees in the eastern part of Iran. *Turkish Journal of Zoology* 41: 345–353. <https://doi.org/10.3906/zoo-1605-35>
- Guglielmino A, Olmi M, Bückle C (2013) An updated host-parasite catalogue of world Dryinidae (Hymenoptera: Chrysidoidea). *Zootaxa* 3740: 1–113. <https://doi.org/10.11646/zootaxa.3740.1.1>

- Kawada R, Lanes GO, Azevedo CO (2015) Evolution of metapostnotum in flat wasps (Hymenoptera, Bethyloidea): implications for homology assessments in Chrysoidea. *PLoS ONE* 10: e0140051. <https://doi.org/10.1371/journal.pone.0140051>
- Olmi M (1984) A revision of the Dryinidae (Hymenoptera). *Memoirs of the American Entomological Institute* 37: I–XII + 1–1913.
- Olmi M (1999) Hymenoptera Dryinidae-Emboleidae. *Fauna d'Italia* 37. Edizioni Calderini, Bologna, 425 pp.
- Olmi M (2011 [“2009”]) A contribution to the knowledge of world Dryinidae (Hymenoptera Chrysoidea). *Frustula entomologica* (N. S.) 32: 43–76.
- Olmi M (2021) Fauna Europaea, Dryinidae. https://fauna-eu.org/cdm_dataportal/taxon/a5baed32-8f07-491a-9f56-2c83c4564b3f [accessed 17 February 2021]
- Olmi M, Copeland RS, van Noort S (2019) Dryinidae of the Afrotropical region (Hymenoptera, Chrysoidea). *Zootaxa* 4630(1): 1–619. <https://doi.org/10.11646/zootaxa.4630.1.1>
- Olmi M, Perkovsky EE, Martynova KV, Contarini M, Bückle C, Guglielmino A (2020) An important intermediate step in the evolution of pincer wasps: an extraordinary new type of chela from mid-Cretaceous Burmese amber (Hymenoptera, Dryinidae). *Cretaceous Research* 111: e104420. <https://doi.org/10.1016/j.cretres.2020.104420>
- Olmi M, Xu Z (2015) Dryinidae of the Eastern Palearctic region (Hymenoptera: Chrysoidea). *Zootaxa* 3996(1): 1–253. <https://doi.org/10.11646/zootaxa.3996.1.1>