

***Syntretus*, a genus of Euphorinae (Hymenoptera: Braconidae) new for Iran, with first record of two species**

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Abstract: The genus *Syntretus* Foerster of the subfamily Euphorinae (Hym.: Braconidae) is recorded from Iran for the first time. The specimens were collected using malaise traps from different habitats of Northern provinces during 2010 and 2011. Two species, *S. ocularis* van Achterberg & Haeselbarth and *S. xanthocephalus* (Marshall) were collected and identified. A brief discussion about diagnostic characters, as well as comments on general distribution of both species are presented.

Keywords: Braconidae, Euphorinae, *Syntretus*, new genus record, Northern Iran

Introduction

Braconidae is one of the largest families of the parasitoid wasps worldwide and is grouped into about 45 subfamilies, with a diverse habitat and biology (van Achterberg, 1993; Shaw and Huddleston, 1991). The subfamily Euphorinae Foerster, 1862 comprises a large and diverse group of 30 genera in the Palaearctic region (Tobias *et al.*, 1995; Yu *et al.*, 2005). Most genera of the subfamily Euphorinae are rather unusual parasitoids attacking adult stage of various insects (Shaw and Huddleston, 1991). The genus *Syntretus* Foerster, 1862 is distributed in Oriental, Holarctic, Afrotropical and Neotropical regions. Species of the genus *Syntretus* are small parasitoid wasps that attack adult Hymenoptera. Hosts are adult parasitoid wasps and adult bees (Hym.: Apoidea). Their biology has been studied by Cole (1959) and Alford (1968).

The genus *Syntretus* is distinguishable from other genera of the subfamily Euphorinae, by having tarsal claws distinctly bent and bifurcate, vein M+CU1 of fore wing unsclerotized and the ventrally fused situation of first metasomal segment (Shaw, 1985; van Achterberg and Haeselbarth, 2003). The genus *Syntretus* contains two subgenera *Exosyntretus* Belokobylskij, 1998 and *Syntretus* Foerster, 1862. The subgenus *Syntretus* can be separated from *Exosyntretus* by at least three distinct characters: vein 1-SC+R of hind wing sclerotized, areola on dorsal part of propodeum absent and third antennal segment longer than fourth segment (van Achterberg and Haeselbarth, 2003). Chen and van Achterberg (1997) published the identification key for the Chinese species. Belokobylskij (1993, 1996) studied the species of the genus *Syntretus* from Vietnam and Russia. European species of this genus were revised by van Achterberg and Haeselbarth (2003), who reported a total of 20 species. Papp (2004) also reported 12 species from Taiwan and 42 species are known worldwide. The subfamily Euphorinae in Turkey was studied by Yilmaz *et al.* (2010); she included three species in the genus *Syntretus*. Prior to this

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study no information was available about occurrence and diversity of the genus *Syntretus* in Iran. Therefore, the objective of this research was to determine the species of the genus *Syntretus* which are reported here for the first time to the entomological fauna of Iran.

Materials and Methods

Material was collected from different habitats of the Northern Iran during 2010 and 2011 using Malaise traps (Fig. 1). The specimens were extracted from the traps and sorted weekly. Identification of subfamily and genus was performed based on keys of van Achterberg (1993) and Chen and van Achterberg (1997). Identification of species of the genus *Syntretus* was done using van Achterberg and Haeselbarth (2003). Illustrations were made using an Olympus AX70 microscope equipped with a Sony CCD digital camera. Morphological terminology follows van Achterberg (1988). The specimens were deposited in the insect collection of the Department of Entomology, Tarbiat Modares University, Tehran.

Results and Discussion

Two species of *Syntretus* were collected and identified. Both species and the genus *Syntretus* are reported here for the first time from Iran.

Key to the species of *Syntretus* of Iran (based on females)

1- Laterope absent (Fig. 2E); median carina of propodeum distinct; length of ovipositor sheath 0.12 times as long as fore wing (Fig. 2A); vein 1-R1 of fore wing 1.2 times as long as pterostigma (Fig. 2C); eyes 1.5 times as long as temple in dorsal view; scutellum flat; antenna with 21 segments (Fig. 2B)..... ***S. ocularis***

- Laterope deep (Fig. 3E); median carina of propodeum absent; length of ovipositor sheath 0.15 times as long as fore wing (Fig. 3A); vein 1-R1 of fore wing 1.4 times as long as pterostigma (Fig. 3C); eyes 1.1 times as long as temple in dorsal view; scutellum distinctly convex; antenna with 22 segments (Fig. 3B).....***S. xanthocephalus***



Figure 1 The habitat in which specimens were collected by Malaise trap (Gaznasara).

***Syntretus (Syntretus) ocularis* van Achterberg & Haeselbarth, 2003 (Fig. 2A-F)**

Material examined: GUILAN province - Roodsar, Orkom (N 36°45'44.34'', E 50°18'11.88'', 1201 m a.s.l.), 17-May-2010, 1♀; MAZANDARAN province - Noor, Chamestan, Gaznasara (N 36°16'56.82'', E 52°10'58.50'', 2032 m a.s.l.), 27-June-2011, 1♂; leg. M. Khayrandish.

Diagnosis (Female): Length of body 3.1 mm; antennae 21-segmented (for Iranian specimens), third antennal segment 1.36 times longer than fourth segment (Fig. 2B); eyes 1.5 times as long as temple in dorsal view; fore wing densely setose, pterostigma 3.0 times as long as maximum width, 1-R1 vein of fore wing completely sclerotized, 1.22 times as long as pterostigma (Fig. 2C); 1-SC + R vein of hind wing sclerotized (Fig. 2D); first metasomal tergite smooth, without laterope (Fig. 2E), length of ovipositor sheath 0.15 times as long as fore wing; tarsal claws distinctly bent and bifurcate (Fig. 2F).

Colouration: Body yellowish-brown (Fig. 2A); antennae except for five basal segments dark brown; stemmaticum and ovipositor sheath black; metanotum and first tergite dark brown.

Distribution: Austria, Bulgaria, France, Germany, Italy, Netherlands, Turkey, Ukraine, United Kingdom (Yu *et al.*, 2005; Yu, 2012) Ireland, Scotland, Wales (van Achterberg and Haeselbarth, 2003). New record from Iran.

Biology: Unknown.

***Syntretus (Syntretus) xanthocephalus* (Marshall, 1887) (Fig. 3A-F)**

Material examined: GUILAN province - Roodsar, Orkom (N 36°45'44.34'', E 50°18'11.88'', 1201 m a.s.l.), 26-September-2010, 1♀; leg. A. Nadimi.

Diagnosis (Female): Length of body 2.5 mm; antennae 22-segmented, fourth antennal segment 1.25 times longer than third segment (Fig. 3B); eyes 1.1 times as long as temple in dorsal view; fore wing densely setose, pterostigma 3.1 times as long as its maximum width, 1-R1 vein of fore wing completely sclerotized, 1.36 times as long as pterostigma

(Fig. 3C); 1-SC + R vein of hind wing sclerotized (Fig. 3D); first metasomal tergite smooth, with laterope (Fig. 3E); length of ovipositor sheath about 0.12 times as long as fore wing; tarsal claws distinctly bent and bifurcate (Fig. 3F).

Colouration: Body yellowish-brown (Fig. 3A); antennae except for three basal segments dark brown; stemmaticum and ovipositor sheath black; metanotum, scutellum and first tergite dark brown.

Distribution: Austria, Bulgaria, China, Taiwan, Denmark, Germany, Ireland, Italy, Korea, Lithuania, Netherlands, Romania, Sweden, Switzerland, United Kingdom (Yu *et al.*, 2005), Hungary, Russia (Yu, 2012). New record from Iran.

Biology: This species oviposits in adult Ichneumonid wasps and has been reared as endoparasitoid on *Dirophanes invisor* (Thunberg, 1822) (Cole, 1959; van Achterberg and Haeselbarth, 2003; Yu *et al.*, 2005; Yu, 2012).

The knowledge of Euphorinae from Iran is limited, particularly for the genus *Syntretus*. The specimens were collected using Malaise traps in this study, for this reason nothing about biology of species is presented. Previous investigations showed that *Syntretus xanthocephalus* is a parasitoid of adult ichneumonid wasps (*Dirophanes invisor* (Thunberg 1824)), while *S. splendidus* (Marshall 1887) is a gregarious endoparasitoid of adult bumblebees including queens, workers and males (Cole, 1959; Alford, 1968; Schmid-Hempel *et al.*, 1990; Papp, 2004). Also, *S. trigonaphagus* Gloag, Shaw & Burwell is a parasitoid of *Trigona carbonaria* Smith (Apidae: Meliponinae) in Australia (Gloag *et al.*, 2009). In the paper of van Achterberg and Haeselbarth (2003) the species *S. ocularis* is collected from May to July, and the species *S. xanthocephalus* is collected in September. These data are in agreement with the present work from Iran: *S. ocularis* was collected in May-June, and *S. xanthocephalus* was collected in September. The collecting and emergence dates of these species in Iran coincide with known dates from other geographical regions.

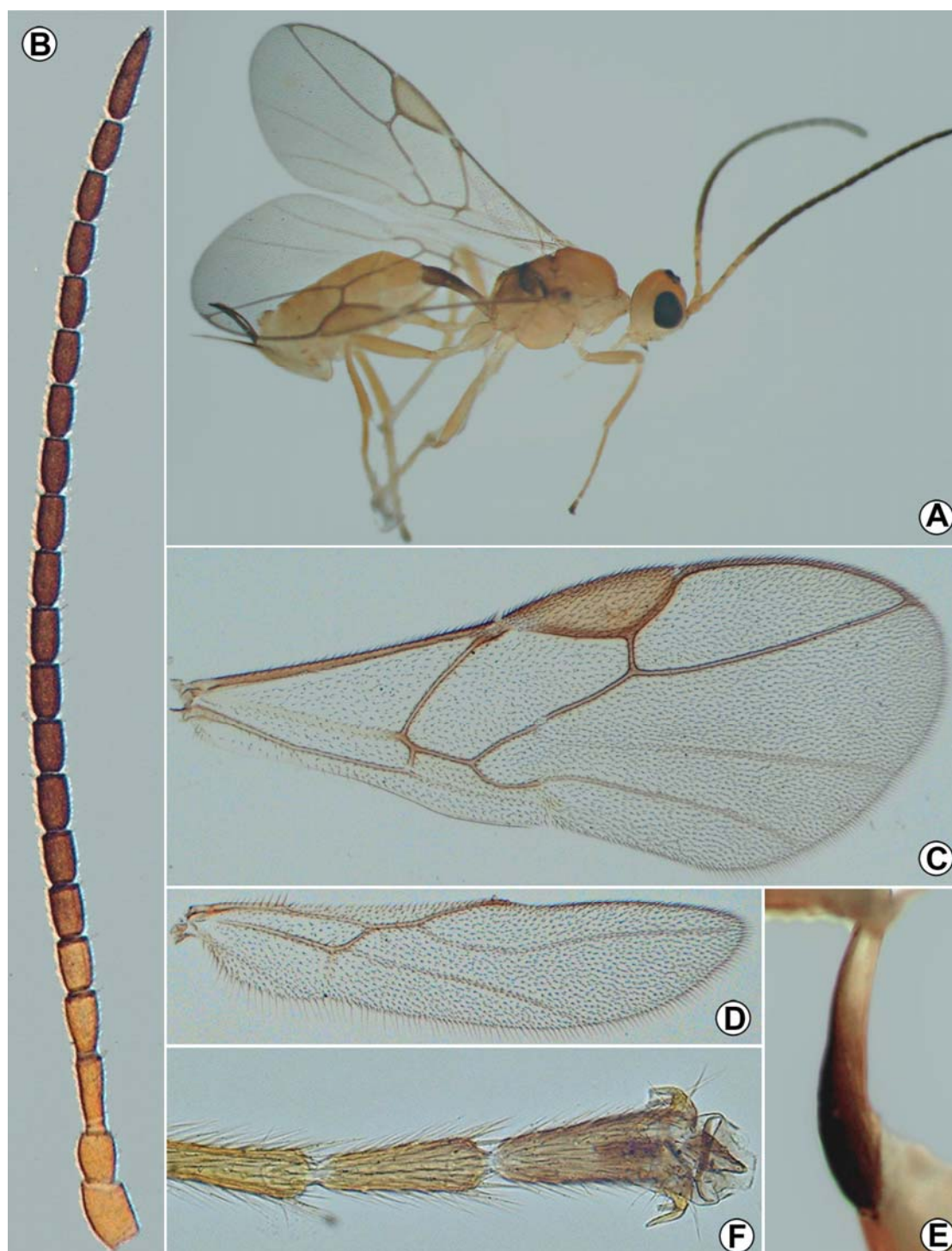


Figure 2 The external morphology of *Syntretus (Syntretus) ocularis*: A. Adult female, lateral view of general habitus; B. antenna; C. Forewing; D. Hind wing; E. First metasomal tergite; F. Last tarsal segments and tarsal claws.

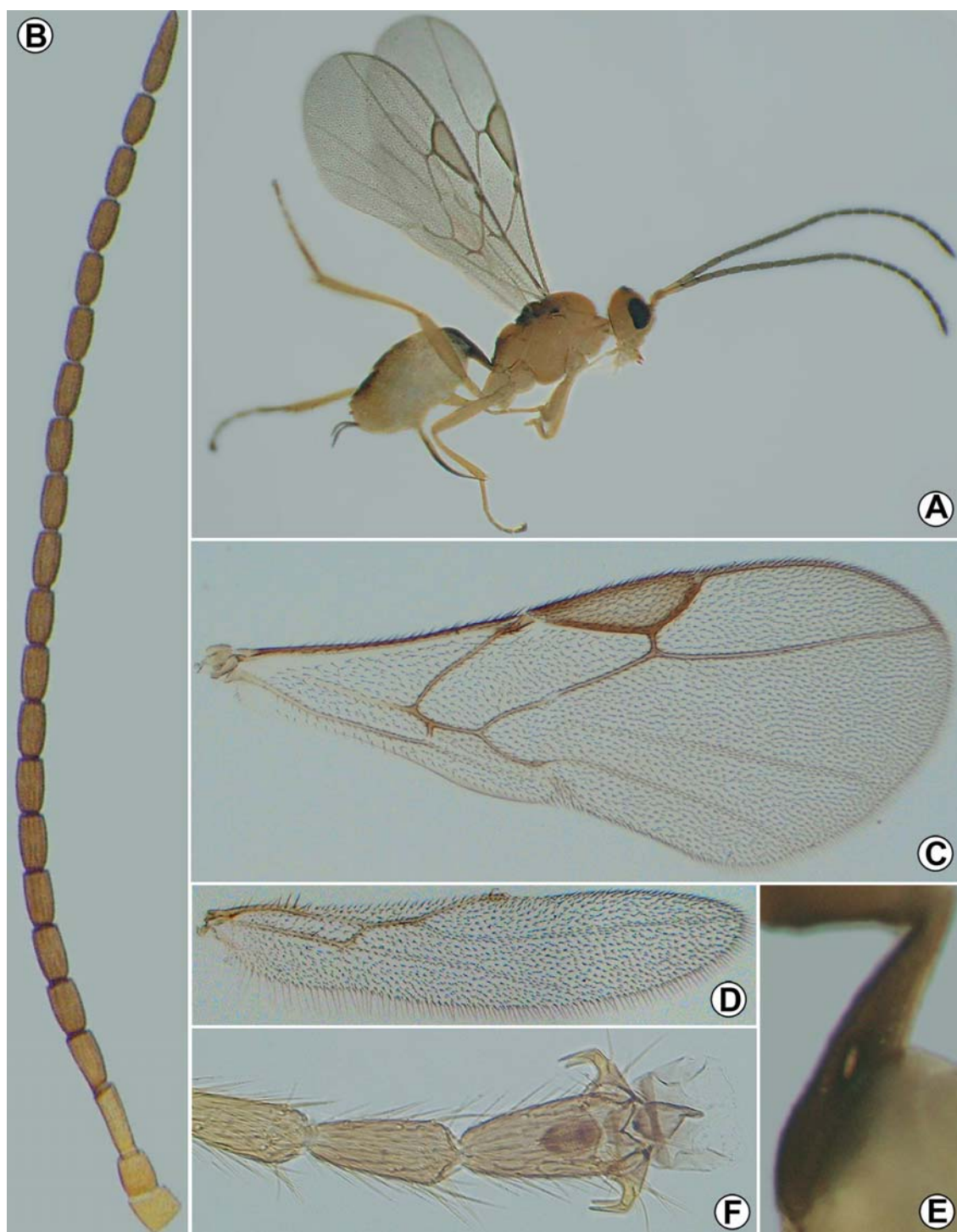


Figure 3 The external morphology of *Syntretus (Syntretus) xanthocephalus*: A. Adult female, lateral view of general habitus; B. antenna; C. Forewing; D. Hind wing; E. First metasomal tergite; F. Last tarsal segments and tarsal claws.

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References

- Alford, D. V. 1968. The biology and immature stages of *Syntretus splendidus* (Marshall) (Hymenoptera: Braconidae), a parasite of adult bumblebees. Transcriptions of the Royal Entomological Society of London, 120: 375-393.
- Belokobylskij, S. A. 1993. New taxonomic data on the braconid fauna (Hymenoptera: Braconidae) of Vietnam. Russian Entomological Journal, 2 (2): 37-67.
- Belokobylskij, S. A. 1996. New and rare species of the subfamily Euphorinae (Hymenoptera, Braconidae) from the Russian Far East. Zoologische Verhandelingen (Leiden), 70 (20): 275-296.
- Chen, X-X. and van Achterberg, C. 1997. Revision of the subfamily Euphorinae (excluding the tribe Meteorini Cresson) (Hymenoptera: Braconidae) from China. Zoologische Verhandelingen (Leiden), 313: 1- 217.
- Cole, L. R. 1959. On a new species of *Syntretus* Förster (Hym., Braconidae) parasitic on an adult ichneumonid, with a description of the larva and notes on its life history and that of its host, *Phaeogenes invisior* (Thunberg). Entomologist Monthly Magazine, 95: 18-21.
- Gloag, R., Shaw, S. R. and Burwell, C. 2009. A new species of *Syntretus* Foerster (Hymenoptera: Braconidae: Euphorinae), a parasitoid of the stingless bee *Trigona carbonaria* Smith (Hymenoptera: Apidae: Meliponinae). Australian Journal of Entomology, 48: 8-14.
- Papp, J. 2004. A synopsis of the *Syntretus* Foerster species of Taiwan (Hymenoptera: Braconidae: Euphorinae). Journal of Agricultural Research of China, 53: 39-62.
- Schmid-Hempel, P., Muller, C., Schmid-Hempel, R. and Shykoff, J. A. 1990. Frequency and ecological correlates of parasitism by conopid flies (Conopidae, Diptera) in populations of bumblebees. Insectes Sociaux, 37 (1): 14-30.
- Shaw, M. R. and Huddleston, T. 1991. Classification and Biology of Braconid Wasps (Hymenoptera: Braconidae). British Museum of Natural History, London.
- Shaw, S. R., 1985. A phylogenetic study of the subfamilies Meteorinae and Euphorinae (Hymenoptera: Braconidae). Entomography, 3: 277-370.
- Tobias, V. I., Belokobylskij, S. A. and Kotenka, A. G. 1995. Keys to the Insects of the European Part of the USSR: Volume III, Hymenoptera Part IV. 883 pp.
- van Achterberg, C. 1988. Revision of the subfamily Blacinae Foerster (Hymenoptera, Braconidae). Zoologische Verhandelingen (Leiden), 249: 1-324.
- van Achterberg, C. 1993. Illustrated key to the subfamilies of the Braconidae. (Hymenoptera: Ichneumonoidea). Zoologische Verhandelingen (Leiden), 283: 1-189.
- van Achterberg, C. and Haeselbarth, E. 2003. Revision of the genus *Syntretus* Foerster (Hymenoptera: Braconidae: Euphorinae) from Europe. Zoologische Verhandelingen (Leiden), 77 (2): 9-78.
- Yilmaz, T., Aydogdu, M. and Beyarslan, A. 2010. The distribution of Euphorinae wasps (Hymenoptera: Braconidae) in Turkey, with phytogeographical notes. Turkish Journal of Zoology, 34: 181-194.
- Yu, D. S. 2012. Home of Ichneumonoidea. Available on: <http://www.taxapad.com/global.php>.
- Yu, D. S., van Achterberg, C. and Horstmann, K. 2005. World Ichneumonoidea 2004. Taxonomy, biology, morphology and distribution [Braconidae]. Taxapad 2005 (Scientific names for information management) Interactive electronical catalogue on DVD/CD-ROM. Vancouver.

اولین گزارش دو گونه از جنس *Syntretus* (Hymenoptera: Braconidae: Euphorinae) از ایران

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چکیده: برای اولین بار جنس *Syntretus* Foerester از زیرخانواده Euphorinae (Hym.: Braconidae) از ایران گزارش شد. نمونه‌ها با استفاده از تله مالیز از زیستگاه‌های مختلف در استان‌های شمالی در طی سال‌های ۲۰۱۰ و ۲۰۱۱ جمع‌آوری شد. دو گونه شامل *S. ocularis* van Achterberg & Haeselbarth و *S. xanthocephalus* (Marshall) جمع‌آوری و شناسایی شد. خصوصیات افتراقی و پراکنش عمومی این گونه‌ها مورد بحث قرار گرفته است.

واژگان کلیدی: *Syntretus*, Euphorinae, Braconidae، گزارش جنس جدید، شمال ایران