

A REVIEW OF HOMOLOBINAE (HYMENOPTERA: BRACONIDAE) OF SERBIA AND MONTENEGRO

VLADIMIR ŽIKIĆ

Faculty of Sciences and Mathematics, Department of Biology and Ecology, University of Niš, Serbia
Email: vzikic@yahoo.com

Abstract

This work presents the first retrospective of *Homolobus* species registered in Serbia and Montenegro. The following species are recorded: *H. (Phylacter) annulicornis*, *H. (Homolobus) discolor*, *H. (Chartolobus) infumator* and *H. (Apatia) truncator*.

KEY WORDS: *Homolobus*, Homolobini, parasitoids

Introduction

The subfamily Homolobinae van Achterberg, 1979 is a small group of parasitoids that now includes only two genera, *Homolobus* Foerster 1862 and *Exasticolus* van Achterberg, 1979 (Shaw, 2010), since the genus *Zelee* Curtis, 1832 was transferred to the already formed subfamily Euphorinae, and the genus *Charmon* Haliday, 1833 was transferred to the new subfamily Charmontinae van Achterberg, 1979 (van Achterberg, 1991). In most cases, Homolobinae have large eyes, long antennae and a long, laterally compressed abdomen and short ovipositor. They are light in color, yellowish, orange or light brown. The majority of species are nocturnal and are easily attracted by light (Shaw & Huddleston, 1991). Some species e.g., *H. (P.) annulicornis* (Nees, 1834) and *H. (C.) infumator* (Lyle, 1914), represent larger members of the family Braconidae, reaching about 10 mm in length. These are solitary koinobiont endoparasitoids of so-called 'Macrolepidoptera' larvae, predominantly from Noctuidae and Geometridae (van Achterberg, 1992). All species from the genus *Homolobus* overwinter as cocoons (Shaw & Huddleston, 1991).

The subfamily Homolobinae comprises only two genera: a cosmopolitan *Homolobus*, with about 50 species classified in five subgenera, and the New World genus, *Exasticolus*, represented by six species. Since it is a small braconid subfamily with just a few species from the only genus present in Europe (*Homolobus*), in

Serbia and Montenegro its fauna has never been systematically processed and no results have been published. The only data of the diversity of *Homolobus* on the investigated territories were published in papers by Brajković (1989), Žikić *et al.* (2000, 2010) and Papp (2010).

The aim of this study was to re-examine the specimens of the family Homolobinae present in the Braconidae Collection of the Faculty of Sciences and Mathematics collected in Serbia and Montenegro, and to present unpublished data on Homolobinae from these countries identified by Dr. Jenő Papp from the Hungarian Natural History Museum (Department of Zoology), Budapest, Hungary. Records of the taxa identified in this study are also shown in the map of localities.

Materials and Methods

For this study, Homolobinae individuals were collected using a sweep net (not indicated in the text), Malaise trap, as well as light trap methods (indicated in the text). The period of collecting was from 1980 to 2012. Some of the specimens were pinned and stored as dry material, while others were preserved in 96% ethanol. The data on specimens given in brackets were provided by Prof. Dr. Jenő Papp of the Hungarian Natural History Museum in Budapest. Specimens marked with an asterisk are deposited in the Hungarian Natural History Museum (Department of Zoology), Budapest, Hungary. Unmarked specimens are deposited in the collection of the Faculty of Sciences and Mathematics, Department of Biology and Ecology, University of Niš, Serbia.

The abbreviations for collectors: AĆ – A. Ćetković, DP – D. Pavičević, FP – F. Petrović, LM – L. Mihajlović, MT – M. Tomić, VČ – I. Vučković, VŽ – V. Žikić, ŽT – Ž. Tomanović.

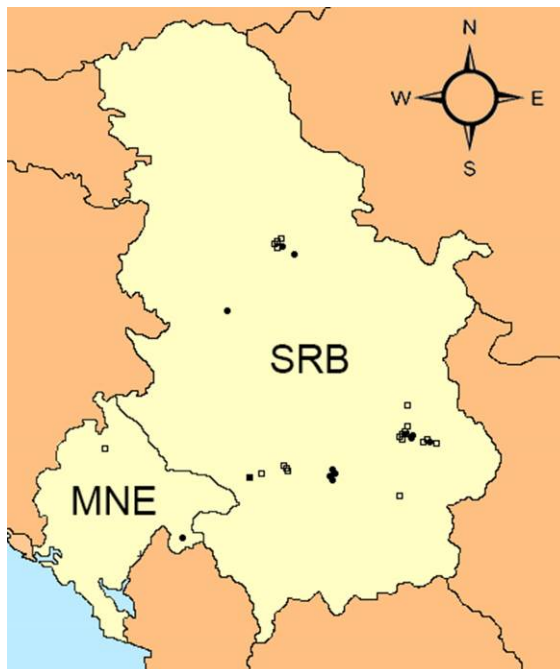


Figure 1. Sampling localities of three *Homolobus* species; *H. (P.) annulicornis* (●), *H. (C.) infumator* (■), *H. (A.) truncator* (□).

Results

Analyzing the available material as well as the literature data, four species of the genus *Homolobus* are registered for the fauna of Serbia and Montenegro: *H. (P.) annulicornis* (Nees), *H. (H.) discolor* (Wesmael), *H. (C.) infumator* (Lyle) and *H. (A.) truncator* (Say) (Brajković, 1989; Žikić *et al.*, 2000, 2010; Papp, 2010). The sampling localities are given in the Fig. 1, with the exception of *H. (H.) discolor*.



Figure 2. *Homolobus (P.) annulicornis*, female, A – general habitus, B – petiole, C – head frontal view, D – head dorsal view, E – claw, F – hind wing.

Homolobus (Phylacter) annulicornis (Nees, 1834)

Material examined: Serbia: 2 ♀♀, 2 ♂♂ Prokuplje, Mala Draguša, [*1 ♂] 05.08.1980, [*1 ♀] 04.07.1983, [*1 ♀] 04.09.1983, [*1 ♂] 01.05.1986, leg. AČ; *1 ♀ Valjevo, Lastra, 19.05.1984, leg. AČ; 1 ♀ Belgrade, Raja, Grkovo, 10.10.1988, leg. DP; 1 ♀ Obrenovac, Draževac, 26.07-04.08.1996 (Mal. trap), leg. LM; 1 ♀ Sićevačka Klisura (gorge), 13.09.1997, leg. VŽ. 1 ♀ Niš, Pantelej, 04.10.2009 (Light trap) leg VŽ; 1 ♀, Niš, Pantelej, 30.09.2008 (Light trap), leg. VŽ. Montenegro: 2 ♀♀ Plavsko Jezero (lake), 08.08.2006 (Mal. trap), VŽ.

Diagnosis (♀): Marginal cell of hind wing lacking cross vein; vein 2-SC+R horizontal (Fig. 2F, arrowed) unlike *H. (P.) meridionalis* (Shaw, 2015) where it is vertical; base of fore wing with distal part of 1A+2A straight; antennal segments 3-6 without a ridge on inner side as in *H. (C.) infumator* (Fig. 3F). Hind leg with tarsus pale yellowish or whitish (especially segments 2-4); tibia orange; tarsal claws with a small subapical tooth (Fig. 2E); ovipositor sheath longer than half length of the hind tibia (Fig. 2A); metasoma dorsally orange, paler than propodeum; (♂) metasoma dorsally brownish, darker than propodeum; body length ca. 10 mm.

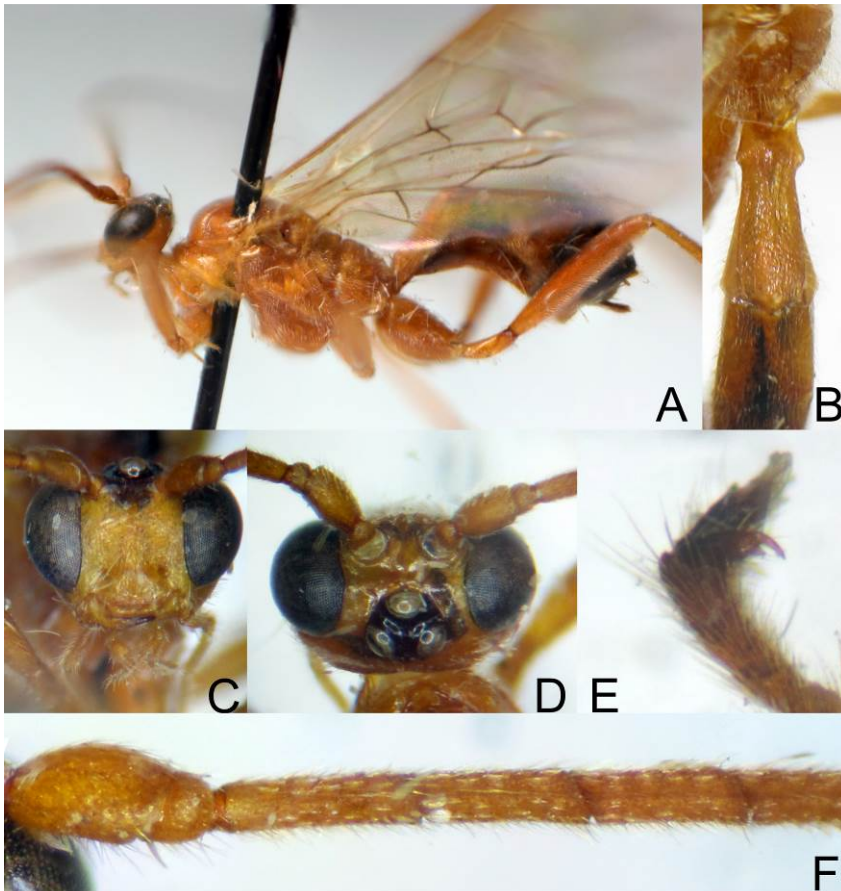


Figure 3. *Homolobus (C.) infumator*, female, A – general habitus, B – petiole, C – head frontal view, D – head dorsal view, E – claw, F – antenna (basal segments).

Homolobus (Chartolobus) infumator (Lyle, 1914)

Material examined: Serbia: 2 ♀♀: [*1 ♀] + [1 ♀] Mt. Kopaonik, Jošanička Banja, 06.08.1986, leg. IV; 1 ♀ Niš, Pantelej, 20.07.2006, leg. VŽ.

Diagnosis (♀): Marginal cell of hind wing lacking cross vein; base of fore wing with distal part of 1A+2A straight; antennal segments 3-6 with a ridge on inner side as in *H. (C.) infumator* (Fig. 2F). Hind leg tarsus colored orange like tibia; tarsal claws with a small subapical tooth (Fig. 3E); ovipositor sheath a 1/4 as long as hind tibia (Fig. 4A); propodeum and metasoma orange; body color variable, from yellow, orange to brownish; body length 8.5 mm.



Figure 4. *Homolobus (A.) truncator*, female, A – general habitus, B – petiole, C – head frontal view, D – head dorsal view, E – claw.

Homolobus (Apatia) truncator (Say, 1829)

Material examined: Serbia: 1 ♂ Beograd, Rajla, Grkovo, 10.10.1988, leg. DP; 5 ♀♀ 1 ♂ Obrenovac, Draževac, (Mal. trap), [1 ♂] 30.07-06.08.1994, [2 ♀♀] 01-05.08.1995, [3 ♀♀] 26.07-04.08.1996, leg. LM;

1 ♀, 1 ♂ Kopaonik, Konaci, 05.07.2000, leg. ŽT; 3 ♀♀, 2 ♂♂ Niš, Popovac, (Mal. trap), [1 ♀] 16.06-20.07.2006; [1 ♀, 1 ♂] 01-11.07.2012, [1 ♀] 15-31.07.2012, [1 ♂] 05.09-10.10.2012, leg. VŽ; 1 ♂ Niš, Popovac, 17.06.2006, leg. VŽ; 1 ♀ Niš, 01.10.2011, leg. VŽ; 1 ♂ Niš, Pantelej, 07.07.2013 (Light trap), leg. VŽ; 1 ♀ Vučje, 16.05-14.06.1997, leg. MT; 1 ♀, 3 ♂♂ Sičevačka Klisura (gorge), [1 ♀] 09.09.1997, [2 ♂] 16.09.1997, leg. [1 ♂] 22.09.1997, leg. VŽ; 1 ♀ Kopaonik, Treska, Šiljak 1450-1550 m, 22.06.1986, leg. AČ; 2 ♀♀ Prokuplje, Mala Draguša, [1 ♀] 22.08.1987, [1 ♀] 28.08.1987, leg. AČ; 1 ♂ Sokobanja, Bovansko Jezero (lake), 25.08.2012, leg. VŽ. Montenegro: 2 ♂♂ Durmitor, Žabljak, 03.08.2005, leg. VŽ.

Diagnosis (♀): Marginal cell of hind wing lacking cross vein; hind tarsus same color as tibia; tarsal claws simple, without tooth such as in previous two species (Fig. 4E); antennal segments 3-6 without a ridge on inner side; ovipositor sheath about 1/4 as long as hind tibia; body length 5-8 mm.

Discussion

The species *Homolobus (Phylacter) annulicornis* is widely spread through Palearctic and Oriental regions (Yu *et al.*, 2012). Regarding host specificity, it is specialized to parasitize caterpillars from the family Noctuidae. Attacking several species, it was characterized as a narrow oligophagous parasitoid (Györfi, 1959; van Achterberg, 1979; Čapek *et al.*, 1982; Tobias, 1986; Waring, 2003; Shaw, 2010). According to literature data, *H. (P.) annulicornis* is a plurivoltine species, found on caterpillars of the summer generation; it was also reared from overwintering host larvae (Achterberg, 1979; Shaw, 2010). The habitus of *H. (P.) annulicornis* is presented in Fig. 2.

Homolobus (Chartolobus) infumator has a wide range of distribution including Holarctic, Neotropical and Oriental regions (Yu *et al.*, 2012). With some exceptions, the target host group for this parasitoid is the family Geometridae (e. g. *Alcis repandata* (L.), *Bupalus piniarius* (L.), *Ematurga atomaria* (L.) and several other species), but it is also found parasitizing *Agonopterix alstromeriana* (Clerck) (Depressariidae) and *Dendrolimus superans* (Butler) (Lasiocampidae). The first report on the presence of this species on the territory of Serbia was published by Papp (2010). The general habitus and body parts of *H. infumator* are presented in Fig. 3.

The presence of *Homolobus (Homolobus) discolor* (Wesmael, 1835) in Serbian fauna was published in Brajković (1989), but in the Braconidae collection made by this author there were no specimens to be considered here. Since for *H. (H.) discolor* a precise sampling location was not by Brajković (1989), the sampling locality is not displayed on the map. According to Shaw (2010), *Homolobus (H.) discolor* is a thelytokous species since the males are completely unknown. It is a widespread species inhabiting Europe, Russia and Japan (Yu *et al.*, 2012). There are about 20 lepidopteran species found to be hosts for this parasitoid. They are mostly from the family Geometridae, e.g. *Alcis repandata* (L.), *Campaea margaritata* (L.), *Odontopera bidentate* (Clerck) *Peribatodes rhomboidaria* (Denis & Schiffermüller) or *Selidosema brunnearia* (de Villers), (Tobias, 1976; van Achterberg, 1979; Shaw, 2012), but also from Noctuidae, such as *Acrionicta aceris* (L.) and *Calliergus ramosa* (Esper, 1786) (Györfi, 1959; Čapek, 1960). It is noted that *H. discolor* produces two broods in a season (Shaw, 2010).

As a cosmopolitan species, *Homolobus (Apatia) truncator* inhabits Eastern and Western Palearctic, Nearctic, Neotropical, Afrotropical and Oriental regions (Yu *et al.*, 2012). This parasitoid exhibits a broad oligophagous host specificity with a host range of about 50 species, of which some are economically important as agricultural pests, such as *Agrotis ipsilon* (Hufnagel), *Helicoverpa zea* (Boddie), and several species of the genus *Spodoptera*, such as *S. exigua* (Hübner) and *S. frugiperda* (Smith) (Yu *et al.*, 2004). The female specimen of *H. (A.) truncator* is shown in Fig. 4.

Keeping in mind that of the eight *Homolobus* species occurring in Europe, six are present in neighboring countries (van Achterberg, 2004), it is expected to find them all in the faunas of Serbia and Montenegro in further investigations.

Acknowledgements

I am grateful to Dr. Mark Shaw (National Museums of Scotland, Edinburgh, U.K.) for checking and verification of the identification of *Homolobus* species. This research was supported by Grant III43001 of the Ministry of Education, Science and Technological Development of the Republic of Serbia.

References

- Achterberg, C. van (1979). A revision of the subfamily Zelinae auctt. (Hymenoptera: Braconidae). *Tijdschrift voor Entomologie*, 122, 241-479.
- Achterberg, C. van (1992). Revisionary notes on the subfamily Homolobinae (Hymenoptera: Braconidae). *Zoologische Mededelingen Leiden*, 66(25), 359-368.
- Achterberg, C. (1993). Illustrated key to the subfamilies of the Braconidae (Hymenoptera: Ichneumonoidea). *Zoologische Verhandelingen Leiden*, 283, 1-189.
- Achterberg, C. van (2013). Fauna Europaea: Hymenoptera, Braconidae. Fauna Europaea version 2.6.2. Available from: <http://faunaeur.org> [Accessed on 17.06.2018].
- Brajković, M. (1989). Knowledge of the Braconidae (Hymenoptera) fauna in Yugoslavia. (in Serbian with English summary). *Glasnik Prirodnjačkog muzeja*, B(43/44), 127-138.
- Čapek, M. (1960). Verzeichnis der Parasiten, die aus schädlichen Insekten an VULH in Banská Stiaivrica erzogen wurden. Teil I. Wirte der Brackwespen-Braconidae (Hymenoptera). *Vedecke Prace*, 1, 199-212.
- Čapek, M., Hladil, J., & Sedivy, J. (1982). Verzeichnis der aus verschiedenen Insekten erzogenen parasitschen Hymenopteren-Teil VI. *Entomological Problems*, 17, 325-371.
- Györfi, J. (1959). Neuere Beiträge zur Kenntnis der Wirte der Braconiden (Hymenoptera: Braconidae). *Beiträge zur Entomologie = Contributions to Entomology*, 9(1-2), 140-143.
- Papp, J. (2010). Contribution to the braconid fauna of the former Yugoslavia VI (Hymenoptera: Braconidae). *Entomofauna*: 31(25), 389-404.
- Shaw, M. R. (2010). Palaearctic Homolobinae (Hymenoptera: Braconidae) in the National Museums of Scotland, with host and distribution records and a key to British species. *Entomologist's Gazette*, 61(1), 43.
- Shaw, M. R., & Huddleston, T. (1991). Classification and biology of braconid wasps. *Handbooks for the identification of British insects, Natural History Museum, London*. 7(11), 1-126.
- Shaw, M. R. (2015). A rearing record of *Homolobus (Phylacter) meridionalis* van Achterberg (Hymenoptera: Braconidae, Homolobinae) in the south of France. *Entomologist's Gazette*, 66, 245-247.
- Tobias, V. I. (1986). Homolobinae, Orgilinae (Mimagathidinae, Microtypinae). pp. 263-274. In Medvedev G.S. (Ed.) 'Opredelitel Nasekomykh Evropejskoi Tsasti SSSR 3, Peredpontosatokrylye 4. *Opredelitel Faune SSSR, Nauka Press. Leningrad*, 145, 1-501. pp. 263-274.
- Tobias, V. I. (1976). Braconids of the Caucasus (Hymenoptera, Braconidae). (in Russian) *Opred. Faune SSSR. Nauka Press. Leningrad*, 110, 286 pp.

- Waring, P. (2003). Parasitoids *Homolobus annulicornis* (Nees) (Hymenoptera: Braconidae) and *Eumea linearicornis* (Zetterstedt) (Diptera: Tachinidae) reared from larvae of the white-spotted pinion moth *Cosmia diffinis* (L.) (Lepidoptera: Noctuidae), with notes on habitat. *Entomologists Record and Journal of Variation*, 115(3), 23-126.
- Yu, D. S., van Achterberg, C. V., & Horstmann, K. (2012). Taxapad 2012, Ichneumonoidea 2011. Database on flash-drive. Ottawa, Ontario, Canada.
- Žikić, V., Brajković, M., & Tomanović, Ž. (2000). Preliminary results of Braconid fauna research (Hymenoptera: Braconidae) found in Sićevo Gorge, Serbia. *Acta entomologica serbica*, 5(1/2), 95-110.
- Žikić, V., Achterberg, C. van, & Stanković, S. (2010). A contribution to Braconidae, Hybrizontidae (Hymenoptera: Ichneumonoidea) and Stephanidae (Hymenoptera: Stephanoidea) from the south-west Balkans. *Acta entomologica serbica*, 15(2), 227-235.

ПРЕГЛЕД ФАУНЕ ХОМОЛОБИНА (HYMENOPTERA: BRACONIDAE: HOMOLOBINAЕ) СРБИЈЕ И ЦРНЕ ГОРЕ

ВЛАДИМИР ЖИКИЋ

Извод

Ова студија представља ретроспективу четири врсте рода *Homolobus* које су регистроване на територијама Србије и Црне Горе: *H. (Phylacter) annulicornis*, *H. (Homolobus) discolor*, *H. (Chartolobus) infumator* и *H. (Apatia) truncator*.

Received: November 14th, 2018

Accepted: December 14th, 2018