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ON THE ENTOMOFAUNA OF MT. DURMITOR (NORTHERN MONTENEGRO): BRACONID WASPS OF THE SUBFAMILY OPIINAE (BRACONIDAE, HYMENOPTERA)

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Abstract - Braconids are primary parasites of other insects and their eggs, larvae, and adults, and species have been recently discovered that lay their eggs in plant seeds. Classified into about 25 genera, more than 1,400 species of Opiinae are known at the present time in the world fauna. They have been registered in all zoogeographic regions. The Opiinae are solitary endoparasites of the larvae of cyclorhaphous Diptera, most often those of species belonging to the families Agromyzidae, Tephritidae, Anthomyiidae, Ephydriidae. In investigations conducted on Mt. Durmitor since 1982, we have up to now established 10 species of braconids of the subfamily Opiinae (*Opius peterseni* Fi., *O. caudatus* Wesm., *O. parvungula* Th., *O. levis* Wesm., *O. pallipes* Wesm., *O. quasiquisti* Fi., *O. exilis* Hal., *O. filicornis* Th., *O. lugens* Hal., and *O. meracus* Fi.), eight of which are new for the fauna of Serbia and Montenegro.

Key words: Hymenoptera, Braconidae, Opiinae, *Opius*, distribution, ecology, Mt. Durmitor, Montenegro

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INTRODUCTION

The Opiinae are one of the most voluminous subfamilies of parasitic wasps of the family Braconidae. Braconids are primary parasites of other insects and their eggs, larvae, and imagoes, and species have been recently discovered that lay their eggs in plant seeds (Macedo *et al.* 1989, 1998; Marsh, 1991; Infante *et al.* 1995). Phytophagy in this group has shaken all ideas held to date about the phylogenetic place of the Doryctinae, which were regarded as the most primitive. The evolution of braconids has apparently proceeded in several directions at the same time. This has resulted in the development of more than 30 subfamilies with about 45,000 species, which cannot be considered the final number because the fauna of tropical regions - known to be the richest - has been least investigated.

Two groups - ectoparasitic and endoparasitic - developed within the family Braconidae. Egg, larval, and imaginal parasitism developed among endoparasitic braconids. The evolution of endoparasitic braconids pro-

ceeded in the direction of specialization for parasitization of certain groups of hosts. Three groups (subfamilies) of endoparasitic braconids became narrowly specialized: Alysiinae, for parasitism of dipteran larvae; Opiinae, also for parasitism of dipteran larvae; and Aphidiinae, for parasitism of the larvae and imagoes of plant lice of the subfamily Aphidiinae.

Classified into about 25 genera, more than 1,400 species of Opiinae are known at the present time in the world fauna (Fischer, 1981). They have been registered in all zoogeographic regions. The Opiinae are solitary endoparasites of the larvae of cyclorhaphous Diptera, most often those of species belonging to the families Agromyzidae, Tephritidae, Anthomyiidae, Ephydriidae, etc. A smaller number of species are egg and larval parasites (Van den Bosch and Haramoto, 1951), while some species parasitize larvae of Coleoptera and Lepidoptera, although these findings are doubtful for the time being and need to be verified (Fischer, 1981).

Species of the subfamily Opiinae are small wasps,

usually 1-3 mm long, and only some of them are larger (4-4.5 mm). Their wings have an elongated pterostigma. The radial cell extends to the tip of the wings. A preoral pit is developed in most species, as in cyclostomate braconids (Doryctinae, Braconinae, Rogadinae), the presence of such a pit being considered a plesiomorphic characteristic. The parasitic wasps of the family Braconidae of Mt. Durmitor (and indeed the whole of Montenegro) have been very little investigated. Up to now, there have been no systematic investigations of this group, as is also the case with the majority of other groups of insects.

Species of the subfamily Opiinae in the fauna of Montenegro have been almost completely unstudied to date.

MATERIALS AND METHODS

Durmitor is one of the most beautiful mountains in the Dinarid Range. It is surrounded by the canyons of the rivers Tara, Piva, and Komarnica. A peculiarity of the region is the great difference in elevation of some parts and great complexity of the relief with more than 30 peaks higher than 2,000 m.

The present study is based on specimens collected in investigations conducted at various localities on Mt. Durmitor since 1982.

RESULTS AND DISCUSSION

In the investigations we have up to now established 10 species of braconids of the subfamily Opiinae (*Opius peterseni* Fi., *O. caudatus* Wesm., *O. parvungula* Th., *O. levis* Wesm., *O. pallipes* Wesm., *O. quasiquisti* Fi., *O. exilis* Hal., *O. filicornis* Th., *O. lugens* Hal., and *O. meracus* Fi.), eight of which are new for the fauna of Serbia and Montenegro.

Opius caudatus Wesm. - One male, 3 September 1989, Žabljak (collected by M. Brajković) (Fig. 1). This species has been registered to date in the whole of Europe, including our country. Fischer (1981) lists it as a parasite of larvae of Cerambycidae (*Callidium* sp., *Pogonohaerus hispidulus* L., and *Pyrrhidium sanguineum* L.).

Opius pallipes Wesm. (Fig. 2) - One female, 4 August 1980, the lake Zminje Jezero (collected by M. Brajković); one male, 12 August 1988, Virak (collected

by M. Brajković); one female, 4 September 1982, canyon of the Tara (collected by M. Brajković). Fischer (1960), Papp (1973), and Brajković *et al.* (1997) list it for the former Yugoslavia. The species is distributed throughout the entire Palearctic and has an exceptionally wide range of hosts from different families of Diptera (Agromyzidae, Anthomyiidae, Drosophilidae, and Tephritidae). It also parasitizes *Cacoecia rosana* L. of the family Tortricidae (Lepidoptera).



Fig. 1. *Opius caudatus* Wesm.

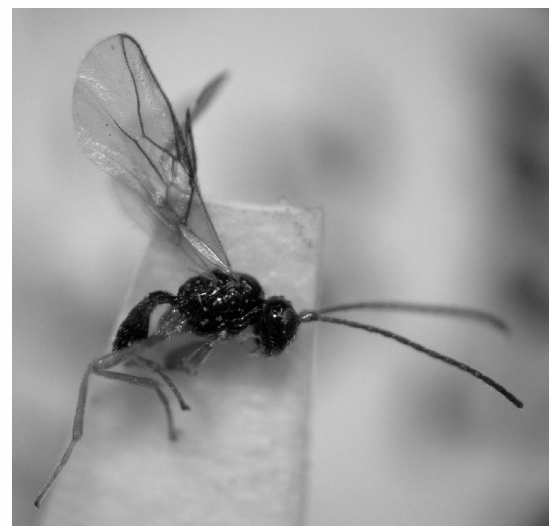


Fig. 2. *Opius pallipes* Wesm.

Optus lugens Hal. (Fig. 3) - Two males, 4 September 1982, canyon of the Tara (collected by M. Brajkovi). This species is here registered for the first time in our country. It has been registered to date in Europe, Russia, and Mongolia, and was recently recorded for the fauna of Greece (P a p, 1990). The given species parasitizes larvae of species from the families Agromyzidae and Cecidomyiidae (Diptera) (F i s c h e r, 1972).



Fig. 3. *Optus lugens* Hal.



Fig. 4. *Optus peterseni* Fi.

Optus peterseni Fi. (Fig. 4) - One female, August 1982, the lake Malo Jezero (1,770 m above sea level) (collected by M. Brajkovi). Here registered for the first time in our country, the indicated species has also been found to date in Denmark and Hungary (F i s c h e r, 1971). The hosts of this species are so far unknown.

Optus parvungula Th. (Fig. 5) - One female, 3 August 1983, Mt. Durmitor (collected by M. Brajkovi). This too is a species new for our fauna. It has been registered to date from Europe to the Far East. The given species is a parasite of several species from the family Agromyzidae (F i s c h e r, 1981).



Fig. 5. *Optus parvungula* Th.

Optus levis Wesm. (Fig. 6) - One male, August 1982, the lake Barno Jezero (1,543 m above sea level) (collected by M. Brajkovi); one male, 18 August 1982, Pitomine (collected by M. Brajkovi). This is the first finding of the given species in our country. The species has a



Fig. 6. *Optus levis* Wesm.

wide distribution. An inhabitant of the Palearctic and North Africa, it has been established as a parasite of several species of the family Agromyzidae (F i s c h e r, 1972).

Optus exilis Hal. (Fig. 7) - One female, 10 August 1980, Mt. Durmitor (1,450 m above sea level) (collected by M. Brajkovi); one female, 4 September 1982, canyon

of the Tara (collected by M. Brajković). This species too is new for the fauna of our country. It has been registered to date in much of the Palearctic. The given species is a parasite of the species *Liriomyza congesta* Beck.



Fig. 7. *Opius exilis* Hal.

Opius filicornis Th. (Fig. 8) - One male, 18 August 1982, Pitomine (collected by M. Brajković); one male, 4 September 1982, canyon of the Tara (collected by M. Brajković); one male, 3 September 1982, Žabljak (collected by M. Brajković); one male, 4 August 1982, the lake Zminje Jezero (collected by M. Brajković). This is a new species for the fauna of our country. Registered in Western Europe and Central Asia, it is a parasite of the species *Phytomyza scotina* Hendel.

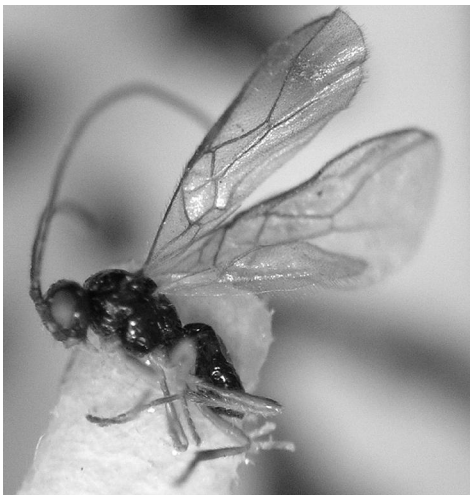


Fig. 8. *Opius filicornis* Th.

Opius meracus Fi. (Fig. 9) - One female, August 1982, the lake Malo Jezero (collected by M. Brajković). This species was found for the first time in our country. Registered to date in Western Europe and the central part of Russia, it is known as a parasite of the species *Napomyza nigrifula* Zett. (Tobias *et al.* 1986).



Fig. 9. *Opius meracus* Fi.



Fig. 10. *Opius quasiquisti* Fi.

tember 1982, canyon of the Tara (collected by M. Brajković). This too is a new species for the fauna of our country. The distribution of the given species is fairly limited, and its hosts for the time being are unknown.

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О ФАУНИ БРАКОНИДА ПОДФАМИЛИЈЕ ОПИНАЕ (BRACONIDAE, HYMENOPTERA) ДУРМИТОРА, СЕВЕРНА ЦРНА ГОРА

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Opiinae су једна од обимнијих субфамилија паразитских оса фамилије Braconidae. Braconidae су примарни паразити других инсеката, њихових јаја, ларви и имага, а недавно су откривене и врсте које полажу јаја у семење биљака. За сада је у светској фауни познато преко 1,400 врста. Opiinae класификованих у око 25 родова (Fischer, 1981). Регистроване су у свим зоогеографским областима. Opiinae су солитарни ендопаразити ларви циклорафних s Diptera, најчешће фамилија

Agromyzidae, Tephritidae, Anthomyiidae, Ephydriidae и др.

Нашим истраживањима од 1982.г. до сада утврдили смо 10 врста бракониди из субфамилије Opiinae, од којих су 8 врста нове за фауну Србије и Црне Горе: *Opius peterseni* Fi., *O. caudatus* Wesm., *O. parvungula* Th., *O. levis* Wesm., *O. pallipes* Wesm., *O. quasiquisti* Fi., *O. exilis* Hal., *O. filicornis* Th., *O. lugens* Hal. и *O. meracus* Fi.