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NOTES ON MEGALOPTERA AND NEUROPTERA (INSECTA: NEUROPTERIDA) OF THE BRDO PRI KRANJU ESTATE (SLOVENIA)

Dušan DEVETAK

Department of Biology, Faculty of Natural Sciences and Mathematics, University of Maribor, SI-2000 Maribor, Koroška cesta 160, Slovenia
E-mail: dusan.devetak@guest.arnes.si

ABSTRACT

In the former Yugoslavia-period, the Brdo estate was inaccessible to investigators. Research became possible in 1991, when Slovenia gained its independence. In this paper, the first survey of the lacewing fauna (Neuropterida: Megaloptera and Neuroptera) of the estate is given. Among 31 species listed, two Sisyra- and three Chrysoperla-species are the most important records. The three green-lacewing species were reported for the first time for the Gorenjska region and the two Sisyrid species are important because they are included in the Red List of Endangered Neuroptera in Slovenia.

Key words: Megaloptera, Neuroptera, Brdo pri Kranju estate

NOTE SU MEGALOPTERA E NEUROPTERA (INSECTA: NEUROPTERIDA) DELLA TENUTA DI BRDO VICINO A KRANJ (SLOVENIA)

SINTESI

Nel periodo dell'ex-Yugoslavia, la tenuta di Brdo è rimasta inaccessibile ai ricercatori. Le prime esplorazioni al suo interno sono state approvate nel 1991, quando la Slovenia si è proclamata stato indipendente. L'articolo riporta i risultati dei campionamenti casuali di insetti olometaboli (Neuropterida: Megaloptera and Neuroptera) effettuati nel 2007. Fra le 31 specie segnalate, due del genere Sisyra e tre del genere Chrysoperla risultano fra i ritrovamenti più importanti. Le tre specie di Chrysoperla sono riportate per la prima volta nella regione dell'Alta Carniola (Gorenjska), mentre le due specie di Sisyra sono importanti poiché compaiono nella Lista rossa delle specie a rischio di estinzione di Neuroptera in Slovenia.

Parole chiave: Megaloptera, Neuroptera, tenuta di Brdo vicino a Kranj

INTRODUCTION

Brdo pri Kranju is a protocalar estate of the Republic of Slovenia positioned in the NW part of the country, at the foothills of the Kamnik–Savinja Alps (Fig. 1). In the former Yugoslavia, Brdo was President Tito's residence for a long period and therefore impossible to investigate faunistically. This first became possible in 1991, when Slovenia declared its independence.

The Brdo estate (Fig. 2) is a relatively small landscape of about 490 hectares consisting of a park and patches of primordial nature; the natural and anthropogenous habitats thus interlace with each other. The Brdo Castle and the Congress Centre are positioned at the

edge of the Brdo Park. Whilst the park with two ponds represents a smaller part, the majority of the Brdo estate is characterized by various forest types, including coniferous, mixed and deciduous forests. Coniferous trees dominate. A stream running through the woodland creates a chain of seven ponds.

Knowledge on Neuropterida in Slovenian natural protected areas is poor. Only the Kozjansko Regional Park has been investigated so far (Klokočovnik *et al.*, 2010). A decade ago, Iztok Geister started the research project »Survey of the fauna and flora of the Brdo pri Kranju estate« and the survey of Neuropterida was a part of the project. My aim is to present the results of occasional samplings of Neuropterida in the area in 2007.

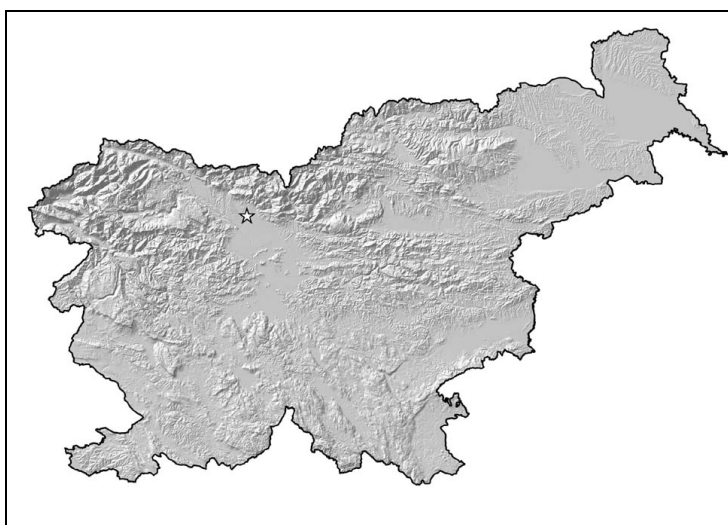


Fig. 1: Position of the Brdo pri Kranju estate in Slovenia (marked with asterisk).
Sl. 1: Položaj posestva Brdo pri Kranju v Sloveniji (označen z zvezdico).

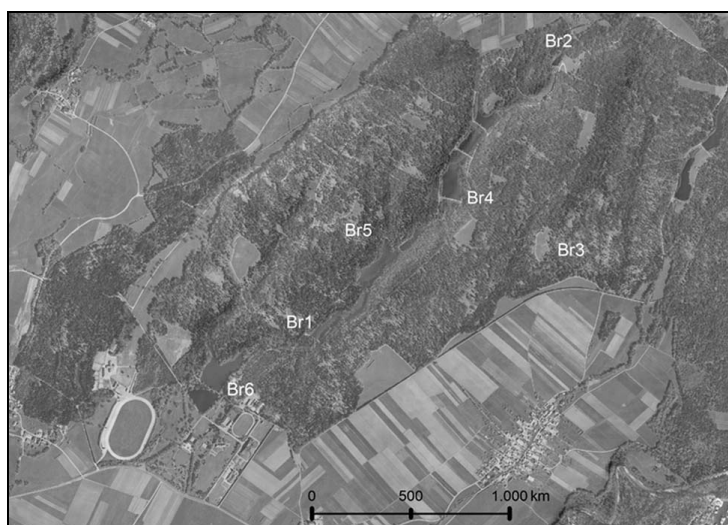


Fig. 2: The Brdo pri Kranju estate. For the abbreviations of the sampling localities see Material and methods.
Sl. 2: Posestvo Brdo pri Kranju. Za okrajšave lokalitet glej Material in metode.



Figs. 3–8: Habitat types of the Brdo pri Kranju estate. Fig. 3: Locality Br1: a pond. Figs 4–6: Locality Br2: a pond (Figs. 4, 6) and a forest edge (Fig. 5). Fig. 7: Locality Br3: a meadow. Fig. 8: Locality Br4: a forest edge. Sl. 3–8: Habitatni tipi posestva Brdo pri Kranju. Sl. 3: Lokaliteta Br1: ribnik. Sl. 4–6: Lokaliteta Br2: ribnik (Sl. 4, 6) in gozdni rob (Sl. 5). Sl. 7: Lokaliteta Br3: travnik. Sl. 8: Lokaliteta Br4: gozdni rob.

MATERIAL AND METHODS

On 17 May, 31 May, 19 July and 13 September 2007, adult Neuropterida were collected using a sweep net, while antlion larvae were excavated from their pits using a spoon, on the following sampling localities (Fig. 2):

- Locality Br1: habitat: a pond (Fig. 3) and a forest edge; altitude 455 m; 46° 16.686' N, 14° 23.098' E; dominant tree species: *Alnus* sp., *Picea abies*, *Salix* sp., *Acer pseudoplatanus*.
- Locality Br2: Belska Gmajna; habitat: a pond (Figs. 4, 6) and a forest edge (Fig. 5); altitudes 475–480 m; 46° 17.407' N, 14° 24.131' E; dominant tree species: *Pinus sylvestris*, *P. abies*, *Quercus robur*, *Alnus* sp.
- Locality Br3: habitat: a forest edge and a meadow (Fig. 7); altitude 460 m; 46° 16.955' N, 14° 23.980' E; dominant tree species: *P. sylvestris*, *P. abies*, *Q. robur*.
- Locality Br4: habitat: a pond and a forest edge (Fig. 8); altitude 470 m; 46° 17.182' N, 14° 23.641' E; dominant tree species: *Alnus* sp., *P. abies*, *Abies alba*, *Salix* sp., *A. pseudoplatanus*.
- Locality Br5: Belska Gmajna; habitat: a meadow and a forest edge; altitude 455 m; 46° 17.007' N, 14° 23.251' E; dominant tree species: *P. sylvestris*, *P. abies*, *Q. robur*.
- Locality Br6: habitat: a park and a pond; altitude 425 m; 46° 16.513' N, 14° 22.732' E; dominant tree species: *Alnus* sp., *P. abies*, *A. pseudoplatanus*, *Tilia cordata*.

Specimens are preserved in ethanol and deposited in the author's collection. Nomenclature and taxonomy is used in accordance with Aspöck *et al.* (1980) and Aspöck *et al.* (2001).

RESULTS AND DISCUSSION

The collected species of Megaloptera and Neuroptera are presented in List 1. In total, 31 species were recorded in the area.

List 1: Megaloptera and Neuroptera of the Brdo pri Kranju estate.**Seznam 1: Megaloptera in Neuroptera posestva Brdo pri Kranju.**

NEUROPTERIDA

Megaloptera

SIALIDAE

***Sialis lutaria* (Linnaeus, 1758)**

Br1, 17. V. 2007; Br2, 17. V. 2007.

Neuroptera

CONIOPTERYGIDAE

***Aleuropteryx loewii* Klapálek, 1894**

Br3, 17. V. 2007.

***Helicoconis lutea* (Wallengren, 1871)**

Br1, 17. V. 2007; Br4, 19. VII. 2007.

***Coniopteryx (C.) pygmaea* Enderlein, 1906**

Br3, 17. V. 2007; Br4, 19. VII. 2007.

***Conwentzia pineticola* Enderlein, 1905**

Br2, 17. V. 2007.

***Semidalis aleyrodiformis* (Stephens, 1836)**

Br1, 17. V. 2007, 31. V. 2007; Br2, 17. V. 2007; Br3, 17. V. 2007.

OSMYLIDAE

***Osmylus fulvicephalus* (Scopoli, 1763)**

Br1, 17. V. 2007, 31. V. 2007.

SISYRIDAE

***Sisyra nigra* (Retzius, 1783)**

Br1, 19. VII. 2007; Br4, 19. VII. 2007; Br6, 19. VII. 2007.

***Sisyra terminalis* Curtis, 1854**

Br1, 19. VII. 2007; Br4, 19. VII. 2007.

HEMEROBIIDAE

***Drepanopteryx phalaenoides* (Linnaeus, 1758)**

Br2, 17. V. 2007.

***Hemerobius (H.) humulinus* Linnaeus, 1758**

Br1, 31. V. 2007.

***Hemerobius (H.) stigma* Stephens, 1836**

Br1, 31. V. 2007; Br2, 31. V. 2007.

***Hemerobius (H.) pini* Stephens, 1836**

Br3, 17. V. 2007; Br4, 19. VII. 2007.

***Hemerobius (H.) contumax* Tjeder, 1932**

Br4, 19. VII. 2007.

***Hemerobius (H.) fenestratus* Tjeder, 1932**

Br4, 19. VII. 2007.

***Hemerobius (H.) atrifrons* McLachlan, 1868**

Br4, 19. VII. 2007.

***Hemerobius (H.) handschini* Tjeder, 1957**

Br2, 17. V. 2007; Br3, 17. V. 2007.

***Hemerobius (H.) micans* Olivier, 1792**

Br1, 31. V. 2007; Br4, 19. VII. 2007; Br6, on *Tilia cordata*, *Alnus*, 19. VII. 2007, 13. IX. 2007.

***Symphorobius (S.) elegans* (Stephens, 1836)**

Br1, 19. VII. 2007.

CHRYSOPIDAE

***Nineta pallida* (Schneider, 1851)**

Br4, 19. VII. 2007, on *Picea*.

***Chrysotropia ciliata* (Wesmael, 1841)**

Br1, 17. V. 2007, 19. VII. 2007; Br2, 17. V. 2007, 31. V. 2007; Br3, 17. V. 2007

***Chrysopa perla* (Linnaeus, 1758)**

Br1, 17. V. 2007, 31. V. 2007; Br3, 17. V. 2007

***Chrysopa nigricostata* Brauer, 1850**

Br2, 31. V. 2007.

***Chrysopa pallens* Rambur, 1838**

Br1, 31. V. 2007

***Dichochrysa ventralis* (Curtis, 1834)**

Br3, 17. V. 2007

Peyerimhoffina gracilis* (Schneider, 1851)**Br5, on *Picea abies*, 13. IX. 2007Chrysoperla carnea* (Stephens, 1836) sensu lato**Br1, 31. V. 2007; Br2, 17. V. 2007; 31. V. 2007; Br6, on *Tilia cordata*, 19. VII. 2007.***Chrysoperla lucasina* (Lacroix, 1912)**Br5, on *Quercus*, 13. IX. 2007.***Chrysoperla pallida* Henry, Brooks, Duelli & Johnson, 2002**

Br2, 17. V. 2007; Br3, 17. V. 2007.

MYRMELEONTIDAE

***Myrmeleon (M.) formicarius* Linnaeus, 1767**

Br3, 17. V. 2007.

***Euroleon nostras* (Geoffroy in Fourcroy, 1785)**

Br2, 17. V. 2007; Br3, 17. V. 2007.

All of the 31 species recorded in the area are common and widespread throughout Slovenia (Devetak,

1984, 1992a). In this small area, the species count is rather low especially for the low diversity of habitat types. Moreover, the sampling techniques used provide limited evidence on the species inhabiting the area. Other collecting techniques, like the use of light traps would certainly increase the number of species. The most outstanding results refer to the occurrence of two *Sisyra*- and three *Chrysoperla*-species. The two *Sisyra*-species are included in the Red List of Endangered Neuroptera in Slovenia as vulnerable (Devetak, 1992b). The genus *Chrysoperla* species are insufficiently known for Slovenia and have been recorded for the first time for the Gorenjska region.

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K POZNAVANJU MEGALOPTERA IN NEUROPTERA (INSECTA: NEUROPTERIDA) POSESTVA BRDO PRI KRANJU (SLOVENIJA)

Dušan DEVETAK

Oddelek za biologijo, Fakulteta za naravoslovje in matematiko, Univerza v Mariboru, SI-2000 Maribor, Koroška cesta 160

E-mail: dusan.devetak@guest.arnes.si

POVZETEK

Na območju Brda pri Kranju je bilo v času bivše Jugoslavije nemogoče izvajati favnistične raziskave. To se je spremenilo šele po osamosvojitvi, torej po letu 1991, ko je Slovenija postala samostojna država. V naključnih vzorčenjih leta 2007 smo na območju Brda nalovili 1 vrsto velekrilcev (Megaloptera) in 30 vrst pravih mrežekrilcev (Neuroptera). Med pomembnejše najdbe prištevamo dve vrsti spužvark (rod *Sisyra*) in tri vrste tenčičaric iz rodu *Chrysoperla*. Najdba spužvark je pomembna z naravovarstvenega vidika, najdba omenjenih vrst tenčičaric pa zaradi dejstva, da je rod *Chrysoperla* v Sloveniji še premalo raziskan.

Ključne besede: Megaloptera, Neuroptera, posestvo Brdo pri Kranju

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