

REMARKS ON NEUROPTERA OF NORTH-EASTERN SLOVENIA (GORIČKO)

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The abundance of species of Neuroptera was studied in the traditional cultural landscape of Goričko (NE Slovenia). The insects were collected during 1997, 1998 and 1999 at 12 different localities. The green lacewing *Chrysoperla carnea* sensu lato was the most dominant species in the region. This species was the only one found in cultivated fields in Goričko district.

Key words: Neuroptera, Goričko, Slovenia

INTRODUCTION

The north-eastern part of Slovenia (Goričko) is known to be one of the best preserved and undamaged natural habitats of our country because of its traditional farming. This region is mainly influenced by Central-European and Pannonian climates, and is a very interesting natural area. However, no study has been made of its neuropteran fauna. Preservation of Goričko makes its fauna of special interest to us. The aim of this study was therefore to provide preliminary information on the presence and distribution of different Neuroptera in Goričko.

MATERIALS AND METHODS

Neuroptera were investigated at 12 different localities in Goričko: Ledavsko lake (1), Kuzma (2), Grad (3), Vidonci (4), Mačkovci (5), Stanjevci (6), Čepinci (7), Markovci (8), Bokračiči (9), Križevci (10), Krplivnik (11) and Hodoš (12). These numbered localities are indicated in Fig. 1. Nine sites (1, 3, 5, 6, 8–12) were natural habitats, representing typical vegetation of Goričko. They included (a) forests comprising chestnut (*Castanea sativa*), trembling poplar (*Populus tremula*), alder (*Alnus glutinosa*), beech (*Fagus sylvatica*), oak (*Quercus petraea*) and pine (*Pinus sylvestris*), (b) meadows and (c) edges of forests. The other three sites (2, 4 and 7) included agricultural surfaces, e.g. meadows located between fields. The results presented here were obtained in July 1997, June and July 1998 and from May to August 1999. Larvae and adults were collected twice a month with a net, by beating branches of bushes and trees over an umbrella, by picking the larvae from the field and at night with light traps using the bulb with tungsten filament.

RESULTS AND DISCUSSION

Species of the following families were found: Coniopterygidae, Osmylidae, Sisyridae, Mantispidae, Hemerobiidae, Chrysopidae, Myrmeleontidae and Ascalaphidae. The results are shown in Table 1.

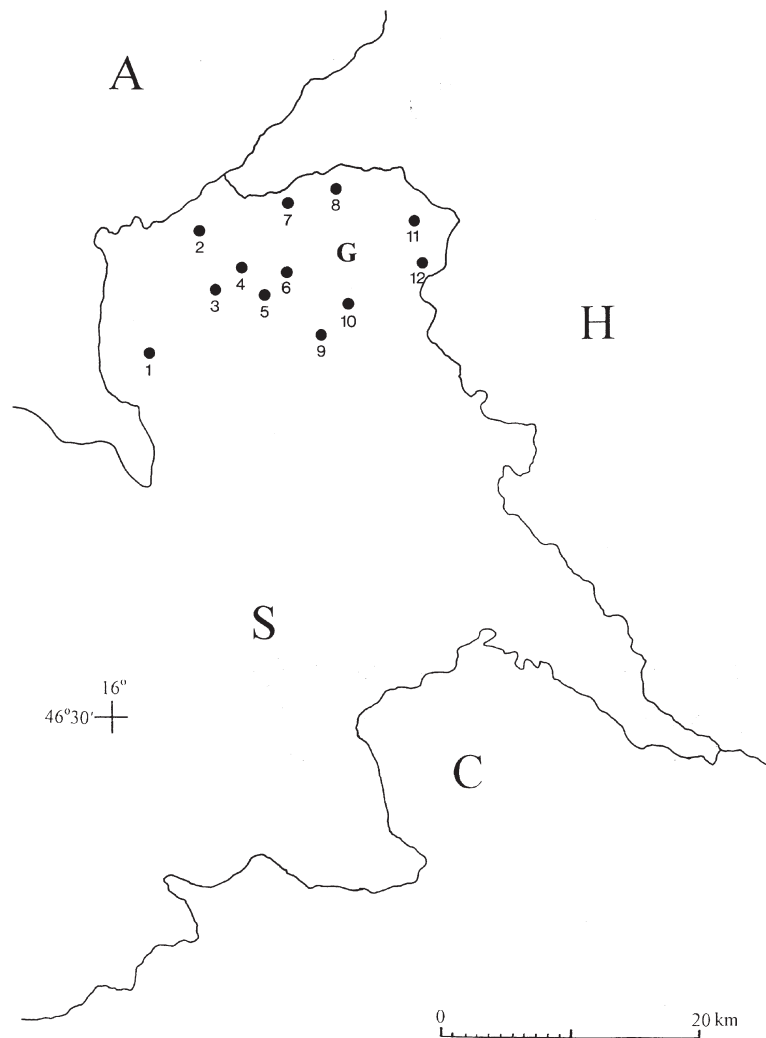


Fig. 1. A map of Goričko with collecting sites. Abbreviations: 1 = Ledavsko lake, 2 = Kuzma, 3 = Grad, 4 = Vidonci, 5 = Mačkovci, 6 = Stanjevci, 7 = Čepinci, 8 = Markovci, 9 = Bokračci, 10 = Križevci, 11 = Krplivnik, 12 = Hodoš, S = Slovenia, G = Goričko, A = Austria, H = Hungary, C = Croatia

All of recorded species of Neuroptera in Goričko are also present in other parts in Slovenia and have been studied by DEVETAK (1984, 1992). Similar studies have been carried out in Austria (HÖLZEL *et al.* 1980) and in Hungary (SZIRÁKI *et al.* 1992).

Table 1. List of species of Neuroptera collected in Goričko. The numbers in the right part of the table indicate localities (see Material and methods) in which Neuroptera were found. The presence of Neuroptera in agricultural sufraces was investigated in Kuzma, Vidonci and Čepinci (localities 2, 4 and 7). The other 9 sites were natural habitats representing typical vegetation of the Goričko area

	1	2	3	4	5	6	7	8	9	10	11	12
Coniopterygidae												
<i>Coniopteryx pygmaea</i> ENDERLEIN, 1906												*
<i>Semidalis aleyrodiformis</i> (STEPHENS, 1836)							*	*				
<i>Aleuropteryx loewii</i> KLAPALEK, 1894							*					
Osmylidae												
<i>Osmylus fulvicephalus</i> (SCOPOLI, 1763)							*					*
Sisyridae												
<i>Sisyra terminalis</i> CURTIS, 1854		*										
Mantispidae												
<i>Mantispa styriaca</i> (PODA, 1761)						*		*				
Hemerobiidae												
<i>Hemerobius (H.) micans</i> OLIVIER, 1792			*	*	*		*	*	*			*
<i>Hemerobius (H.) lutescens</i> FABRICIUS, 1793					*							
<i>Hemerobius (H.) humulinus</i> LINNAEUS, 1758							*					
<i>Hemerobius (H.) handschini</i> TJEDER, 1957							*					
<i>Hemerobius (Brauerobius) marginatus</i> STEPHENS, 1836					*				*			
<i>Drepanepteryx phalaenoides</i> (LINNAEUS, 1758)							*					
<i>Micromus variegatus</i> (FABRICIUS, 1793)							*					
<i>Micromus angulatus</i> (STEPHENS, 1836)							*					
Chrysopidae												
<i>Chrysoperla carnea</i> (STEPHENS, 1836) sensu lato	*	*	*	*	*		*	*	*	*	*	*
<i>Chrysopa perla</i> (LINNAEUS, 1758)		*		*	*		*	*		*	*	
Myrmeleontidae												
<i>Euroleon nostras</i> (GEOFFROY in FOURCROY, 1785)			*					*				
<i>Dendroleon pantherinus</i> (FABRICIUS, 1787)								*				
Ascalaphidae												
<i>Libelloides macaronius macaronius</i> (SCOPOLI, 1763)							*					
Total number of species collected	2	2	3	3	5	1	12	7	3	2	4	2

The green lacewing *Chrysoperla carnea*, treated here in the accepted sense of the “complex”, was the dominant neuropteran with respect to the number of specimen collected in Goričko region. BROOKS (1994) recognized four distinct species groups within *Chrysoperla*-complex, based on morphology of the male genitalia and wings. Recently, 5 sibling species were recognized within the *carnea*-group of *Chrysoperla* based on their distinctive vibrational courtship songs (HENRY *et al.* 1996). These green lacewings, present in 11 investigated localities and absent only from Stanjevcı (locality 6), are of great importance as a natural aphid enemies. The presence of *Chrysoperla carnea* is expected also in Stanjevcı, but its absence in our list may be the consequence of the lack of sufficient collecting data. Therefore its presence in Stanjevcı should be checked in the near future. *Chrysoperla carnea* was the only neuropteran species found in some cultivated fields (e. g. fields of cereals). In the contrary, *Mantispa styriaca* inhabited only natural areas, e.g. forest edges. Also *Coniopteryx pygmaea*, *Sisyra terminalis*, *Hemerobius lutescens*, *H. marginatus*, *Euroleon nostras* as well as *Dendroleon pantherinus* were present only in natural habitats.

Chrysoperla is the second most abundant species found in Goričko. It was present on 7 different localities, as *Hemerobius micans*.

Neuroptera showed the highest number of species (12) in Čepinci (locality 7). Such result has not come entirely as a surprise. This agricultural surface borders on the forest edge, therefore a relatively high number of species was expected there. A higher number of species at forest edges than at other areas appears to be the rule rather than exception, as was also shown in the study assessing the contribution of forest ecotone structures to regional biodiversity, presented by DUELLI *et al.* (2002).

The focus of our work was on survey of different neuropteran species in Goričko. As there are some rare and endangered species of Neuroptera (e. g. *Osmylus fulvicephalus*, *Mantispa styriaca* and *Libelloides macaronius*) in Goričko, this part of Slovenia should receive greater concern of nature-conservation organisations. As different other neuropteran species are expected in Goričko, we intend to continue our research of Neuroptera in this region.

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