

## HOVERFLY FAUNA (DIPTERA: SYRPHIDAE) OF THE LANDSCAPE OF OUTSTANDING FEATURES “VLASINA”

TAMARA TOT<sup>1</sup>, MIHAILO VUJIĆ<sup>2</sup>, LAURA LIKOV<sup>1</sup>, ZORICA NEDELJKOVIĆ<sup>3</sup>,  
SNEŽANA RADENKOVIĆ<sup>1</sup> and ANTE VUJIĆ<sup>1</sup>

<sup>1</sup> University of Novi Sad, Faculty of Sciences, Department of Biology and Ecology,  
Trg Dositeja Obradovića 2, Novi Sad 21000, Serbia  
Email: tamaratot90@gmail.com, laura.likov@dbe.uns.ac.rs, snezana.radenkovic@dbe.uns.ac.rs,  
ante.vujic@dbe.uns.ac.rs

<sup>2</sup> Bulevar revolucije 33, Vrčin, Beograd 11000, Serbia  
Email: mihailovujic01@gmail.com

<sup>3</sup> Biosense Institute-Research Institute for Information Technologies in Biosystems,  
Dr Zorana Đinđića 1, Novi Sad 21000, Serbia  
Email: zoricaned14@gmail.com

### Abstract

In the many years of research organized between 1977 and 2017, a total of 76 hoverfly species were collected in the protected Landscape of Outstanding Features “Vlasina” (southeastern Serbia) on six localities. Among the identified taxa there is a rare species, *Cheilosia longula* (Zetterstedt, 1838), which is protected in Serbia. Additionally, one potentially new hoverfly species is registered (*Merodon* aff. *cinereus*). The first species checklist of hoverflies for Vlasina is proposed.

KEY WORDS: Syrphidae, Vlasina, fauna, new records, threatened species

### Introduction

Hoverflies (Diptera: Syrphidae) represent one of the most species-rich dipteran families, with over 6000 described species from 188 genera (Thompson, 2013). European syrphid fauna accounts for about 870 species (Speight, 2016). Widespread in the world, they represent an ecologically important group of insects that perform ecosystem services such as plant pollination, predation of plant pests and nutrient recycling (Rotheray & Gilbert, 2011).

The Landscape of Outstanding Features “Vlasina” is located in southeastern Serbia, mostly in the municipality of Surdulica. The specificity of the Vlasina biotope is determined by the high diversity of its flora, fauna and ecosystems. Despite its relatively small area (127 km<sup>2</sup>), Vlasina has many endemic and protected species due to the presence of different types of habitats (mires, wetlands, forests, meadows and grasslands) (according to the Law on the Environmental Protection, Official Gazette of Republic of Serbia, No.66/91). The available data on the specific fauna structure of Vlasina refer mostly to vertebrate species, while data on insect fauna are scarce. In total, 11 species of Odonata, 42 species of Orthoptera (Pavićević & Zatezalo, 2014), 54 species of Coleoptera (22 species of Cerambycidae and 32 species of Scarabaeoidea), 101 species of Lepidoptera (Tot *et al.*, 2015) and 169 species of Heteroptera (Šeat, 2017) have been recorded so far.

The collecting of hoverflies in Serbia started in the mid-20th century and covers a period of more than 60 years. Previous investigations on the diversity of hoverflies in the wider surroundings of Vlasina Lake were few and systematic studies are lacking. They include only certain genera: *Brachyopa* Meigen, 1822 (Vujić, 1991), *Cheilosia* Meigen, 1822 (Vujić, 1996), *Criorhina* Meigen, 1822 (Vujić & Milankov, 1990), *Eristalis* Latreille, 1804 (Šimić & Vujić, 1990), *Merodon* Meigen, 1803 (Vujić *et al.*, 2012), *Neoascia* Williston, 1887 (Vujić, 1990), *Scaeva* Fabricius, 1805 (Radenković *et al.*, 1995), *Syrphus* Fabricius, 1775 (Nedeljković *et al.*, 2010) and *Volucella* Geoffroy, 1764 (Nedeljković *et al.*, 2003). However, most of these data are recorded from localities outside the boundaries of the protected area, which is why they are not included in the list given below.

Vlasina is already known as a biodiversity hotspot for many organism (IBA-Important Bird Area, IPA-Important Plant Area, PBA-Prime Butterfly Area), including hoverflies (PHA-Prime Hoverfly Area) (Vujić *et al.*, 2016). As previous hoverfly studies in the Vlasina region are scarce, the aim of this study was to summarize published and new records in order to give the first species checklist of hoverflies for this area.

## Materials and Methods

Research into the hoverfly fauna of Vlasina was conducted in the period 1977-2017 within the boundaries of the protected area (Fig. 1) on six localities: 1. Vlasina Lake (42.732793N 22.335378E, 1176 m a.s.l.), 2. Delnice (42.716468N 22.313565E, 1408 m a.s.l.), 3. Vrtop (42.791688N 22.374657E, 1658 m a.s.l.), 4. Vučja River (42.75363N 22.3955E, 889 m a.s.l.), 5. Veliki Čemernik (42.72663N 22.278897E, 1531 m a.s.l.), 6. Vlasina Rid (42.725815N 22.325153E, 1308 m a.s.l.) (Fig. 2). Images of the localities are presented in Fig. 3.

Specimens were collected by the standard sweep-netting method. The collected material was prepared, pinned and labelled. Identification of adults was based on external morphological features and male terminalia using a Nikon SMZ 745T stereomicroscope. The material was identified according to the following publications: Hippa *et al.* (2001), Nedeljković (2011), Speight & Sarthou (2014), Van Veen (2004), Vujić (1990) and Vujić (1992). Insect material is deposited in the Department of Biology and Ecology, University of Novi Sad (FSUNS). A map of the investigated localities was created using QGIS 2.18.13 software (Free, 2015).

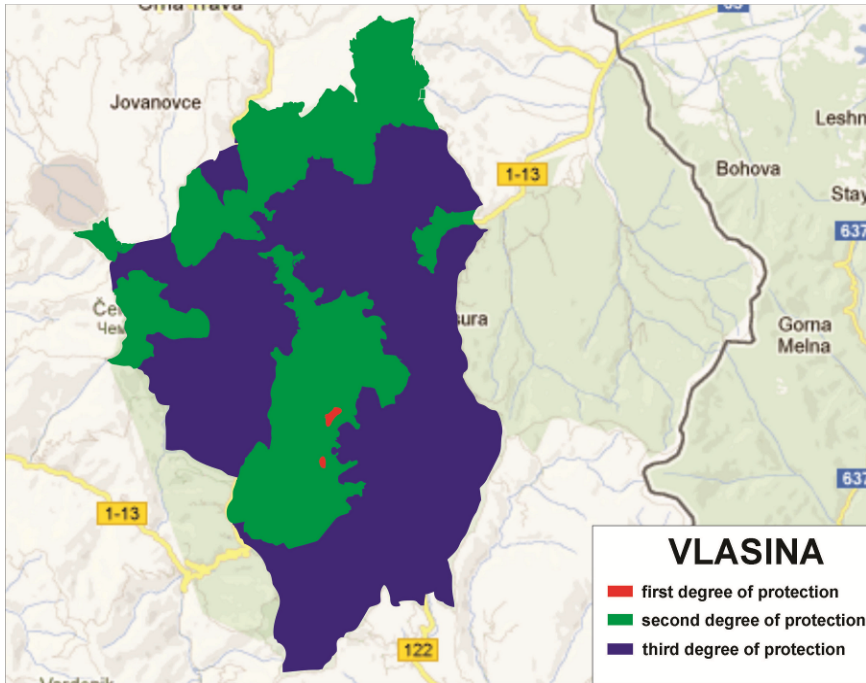


Figure 1. Boundaries of Landscape of Outstanding Features Vlasina with degrees of protection (<http://www.serbiaecotour.rs/sr/zasticena-podrucja/vlasina>).

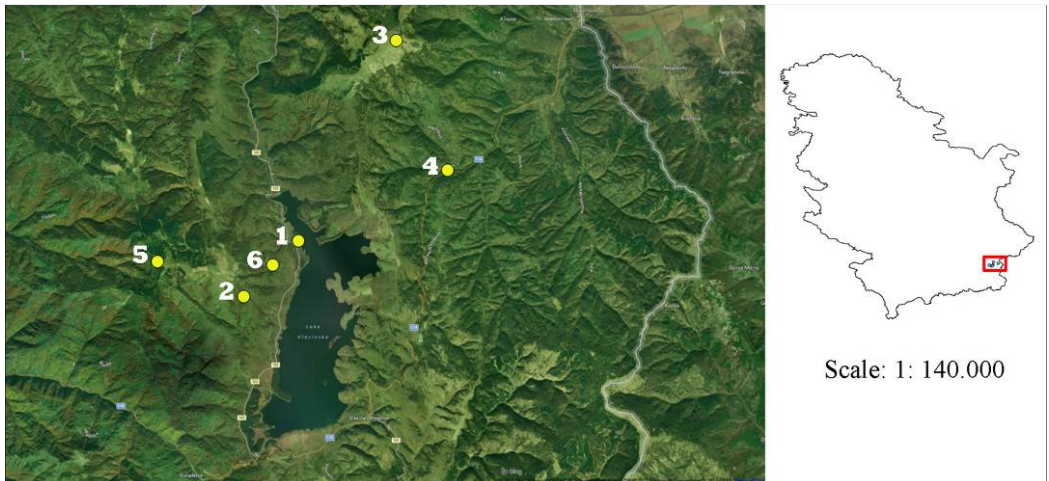


Figure 2. Map of investigated localities.



## Results

The present paper gives data on 76 species of 32 genera. The registered taxa are listed below in alphabetical order.

### *Anasimyia lineata* (Fabricius, 1787)

New data: Vlasina: Vlasina Lake, 22.06.1991, 2 ♀♀, leg. A. Vujić; 11.07.2017, 4 ♂♂, 5 ♀♀, leg. T. Tot, M. Vujić.

Notes: The species prefers alluvial wetlands.

### *Baccha elongata* (Fabricius, 1775)

New data: Vlasina: Delnice, 12.07.2017, 1 ♀, leg. T. Tot, M. Vujić; Vlasina: Vrtop, 15.07.2017, 1 ♀, leg. T. Tot, M. Vujić.

Notes: The species is widely distributed in Serbia.

### *Cheilosia barbata* Loew, 1857

Published in Vujić (1996).

New data: Vlasina: Vučja River, 13.07.2017, 2 ♂♂, leg. T. Tot, M. Vujić.

Notes: The species is widely distributed on the Balkan Peninsula.

### *Ch. illustrata* (Harris, 1780)

New data: Vlasina: Vrtop, 15.07.2017, 1 ♀, leg. T. Tot, M. Vujić.

Notes: The species is distributed in the mountainous regions of Serbia.

### *Ch. longula* (Zetterstedt, 1838)

New data: Vlasina: Vučja River, 13.07.2017, 1 ♂, 1 ♀, leg. T. Tot, M. Vujić.

Notes: The species is widely distributed in Europe, but rare on the Balkan Peninsula. In Serbia the species is protected.

### *Ch. proxima* (Zetterstedt, 1843)

New data: Vlasina: Veliki Čemernik, 14.07.2017, 1 ♀, leg. T. Tot, M. Vujić.

Notes: The species is widely distributed on the Balkan Peninsula.

### *Ch. scutellata* (Fallén, 1817)

Published in Vujić (1996).

New data: Vlasina: Delnice, 12.07.2017, 1 ♀, leg. T. Tot, M. Vujić; Vlasina: Vučja River, 13.07.2017, 1 ♂, 1 ♀, leg. T. Tot, M. Vujić.

Notes: Widely distributed species.

*Ch. soror* (Zetterstedt, 1843)

Published in Vujić (1996).

Notes: The species is widely distributed on the Balkan Peninsula.

*Ch. variabilis* (Panzer, 1798)

Published in Vujić (1996).

Notes: One of the most abundant species of the genus *Cheilosia* Meigen, 1822 on the Balkan Peninsula.

*Ch. vernalis* (Fallén, 1817)

New data: Vlasina: Delnice, 12.07.2017, 1 ♀, leg. T. Tot, M. Vujić.

Notes: The species is widely distributed on the Balkan Peninsula.

*Chrysogaster solstitialis* (Fallén, 1817)

New data: Vlasina: Delnice, 12.07.2017, 1 ♂, 4 ♀♀, leg. T. Tot, M. Vujić; Vlasina: Vučja River, 13.07.2017, 2 ♀♀, leg. T. Tot, M. Vujić; Vlasina: Vrtop, 15.07.2017, 2 ♂♂, 2 ♀♀, leg. T. Tot, M. Vujić.

Notes: The species is distributed in the mountainous regions of Serbia.

*Ch. bicinctum* (Linnaeus, 1758)

New data: Vlasina: Vlasina Lake, 01-05.08.1991, 2 ♂♂, 2 ♀♀, leg. A. Vujić; Vlasina: Veliki Čemernik, 21.07.1993, 1 ♀, leg. A. Vujić, 14.07.2017, 1 ♂, leg. T. Tot, M. Vujić; Vlasina: Delnice, 12.07.2017, 7 ♂♂, leg. T. Tot, M. Vujić; Vlasina: Vlasina Rid, 13.07.2017, 1 ♂, leg. T. Tot, M. Vujić; Vlasina: Vučja River, 13.07.2017, 1 ♂, leg. T. Tot, M. Vujić; Vlasina: Vrtop, 15.07.2017, 3 ♂♂, 1 ♀, leg. T. Tot, M. Vujić.

Notes: The species is predominantly distributed in the mountainous regions of Serbia.

*Ch. cautum* (Harris, 1776)

New data: Vlasina: Vlasina Rid, 13.07.2017, 1 ♀, leg. T. Tot, M. Vujić.

Notes: The species is widely distributed in Serbia.

*Ch. elegans* Loew, 1841

New data: Vlasina: Vlasina Lake, 01-05.08.1991, 1 ♂, leg. A. Vujić; Vlasina: Delnice, 12.07.2017, 3 ♂♂, leg. T. Tot, M. Vujić; Vlasina: Vlasina Rid, 13.07.2017, 1 ♂, leg. T. Tot, M. Vujić; Vlasina: Vučja River, 13.07.2017, 1 ♂, leg. T. Tot, M. Vujić; Vlasina: Veliki Čemernik, 14.07.2017, 1 ♂, leg. T. Tot, M. Vujić; Vlasina: Vrtop, 15.07.2017, 1 ♂, leg. T. Tot, M. Vujić.

Notes: The species is distributed in the mountainous regions of Serbia.

*Ch. fasciatum* Muller, 1764

New data: Vlasina: Veliki Čemernik, 14.07.2017, 1 ♀, leg. T. Tot, M. Vujić.

Notes: The species is recorded on higher mountains of Serbia.

*Ch. festivum* (Linnaeus, 1758)

New data: Vlasina: Veliki Čemernik, 20.07.1993, 1 ♂, leg. A. Vujić; 21.07.1993, 3 ♂♂, leg. D. Radović; 14.07.2017, 4 ♀♀, leg. T. Tot, M. Vujić.

Notes: The species is recorded in lower regions of Serbia.

*Ch. montanum* Nedeljković & Vujić, 2015

New data: Vlasina: Veliki Čemernik, 14.07.2017, 1 ♀, leg. T. Tot, M. Vujić; Vlasina: Vrtop, 15.07.2017, 2 ♀♀, leg. T. Tot, M. Vujić.

Notes: The species is recorded only on three localities (Golija, Zlatar, Vlasina) in Serbia so far.

*Ch. octomaculatum* Curtis, 1837

New data: Vlasina: Vlasina Lake, 01-05.08.1991, 1 ♂, leg. A. Vujić.

Notes: The species is distributed mainly in the mountainous regions of Serbia.

*Ch. tomentosum* Giglio-Tos, 1890

New data: Vlasina: Delnice, 12.07.2017, 1 ♀, leg. T. Tot, M. Vujić; Vlasina: Veliki Čemernik, 14.07.2017, 2 ♂♂, leg. T. Tot, M. Vujić; Vlasina: Vrtop, 15.07.2017, 1 ♂, 1 ♀, leg. T. Tot, M. Vujić.

Notes: The species is recorded only on several localities (Kopaonik, Šar Planina, Stara Planina, Vlasina) in Serbia so far.

*Ch. vernale* Loew, 1841

New data: Vlasina: Delnice, 12.07.2017, 1 ♀, leg. T. Tot, M. Vujić.

Notes: The species is recorded in lower regions of Serbia.

*Ch. verralli* Collin, 1940

New data: Vlasina: Vlasina Lake, 01-05.08.1991, 1 ♂, leg. A. Vujić; Vlasina: Vlasina Rid, 13.07.2017, 1 ♂, leg. T. Tot, M. Vujić.

Notes: The species is recorded on lower mountains of Serbia.

*Dasysyrphus albostrigatus* (Fallén, 1817)

New data: Vlasina: Vlasina Lake, 01-05.08.1991, 1 ♂, leg. A. Vujić; Vlasina: Veliki Čemernik, 20.07.1993, 1 ♂, leg. A. Vujić; Vlasina: Delnice, 12.07.2017, 1 ♀, leg. T. Tot, M. Vujić; Vlasina: Vlasina Rid, 13.07.2017, 1 ♂, leg. T. Tot, M. Vujić; Vlasina: Vrtop, 15.07.2017, 1 ♀, leg. T. Tot, M. Vujić.

Notes: The species is widely distributed in Serbia.

*D. pinastri* (De Geer, 1776) sensu Doczkal, 1996

New data: Vlasina: Vlasina Lake, 16.06.1988, 1 ♂, leg. A. Vujić, 01-05.08.1991, 1 ♀, leg. A. Vujić.

Notes: The species is distributed in the mountainous regions of Serbia.

*D. venustus* (Meigen, 1822)

New data: Vlasina; Vlasina Lake, 01.06.1988, 1 ♀, leg. A. Vujić.

Notes: The species is distributed in the mountainous regions of Serbia.

*Epistrophe diaphana* (Zetterstedt, 1843)

New data: Vlasina: Vlasina Lake, 01-05.08.1991, 1 ♂, leg. A. Vujić.

Notes: The species is distributed in the mountainous regions of Serbia.

*E. grossulariae* (Meigen, 1822)

New data: Vlasina: Vlasina Lake, 01-05.08.1991, 4 ♂♂, leg. A. Vujić; Vlasina: Veliki Čemernik, 20.07.1993, 1 ♂, leg. A. Vujić; Vlasina: Vlasina Rid, 13.07.2017, 1 ♂, leg. T. Tot, M. Vujić; Vlasina: Vrtop, 15.07.2017, 1 ♂, leg. T. Tot, M. Vujić.

Notes: The species is mainly distributed in the mountainous regions of Serbia.

*Episyrphus balteatus* (De Geer, 1776)

New data: Vlasina: Vlasina Lake, 01-05.08.1991, 2 ♂♂, leg. A. Vujić, 22.06.1991, 1 ♂, leg. A. Vujić, 11.07.2017, 1 ♂, leg. T. Tot, M. Vujić; Vlasina: Delnice, 12.07.2017, 3 ♀♀, leg. T. Tot, M. Vujić; Vlasina, Vlasina Rid, 13.07.2017, 1 ♂, 1 ♀, leg. T. Tot, M. Vujić; Vlasina: Vučja River, 13.07.2017, 2 ♂♂, leg. T. Tot, M. Vujić; Vlasina: Veliki Čemernik, 14.07.2017, 1 ♂, 1 ♀, leg. T. Tot, M. Vujić; Vlasina: Vrtop, 15.07.2017, 1 ♂, 2 ♀♀, leg. T. Tot, M. Vujić.

Notes: Widely distributed species.

*Eristalis arbustorum* Linnaeus, 1758

New data: Vlasina: Vlasina Lake, 01-05.08.1991, 1 ♂, 1 ♀, leg. A. Vujić; Vlasina: Veliki Čemernik, 20.07.1993, 1 ♂, leg. A. Vujić, 21.07.1993, 1 ♂, leg. D. Radović.

Notes: This species during sampling in 2017 was numerous at every locality, so it is only recorded visually.

*Eristalis jugorum* Egger, 1858

New data: Vlasina: Veliki Čemernik, 14.07.2017, 1 ♂, leg. T. Tot, M. Vujić; Vlasina: Vrtop, 15.07.2017, 1 ♀, leg. T. Tot, M. Vujić.

Notes: The species is distributed in the mountainous regions of Serbia.

*E. pertinax* (Scopoli, 1763)

New data: Vlasina: Vlasina Lake, 01-05.08.1991, 1 ♂, leg. A. Vujić; Vlasina: Veliki Čemernik, 21.07.1993, 2 ♂♂, 1 ♀, leg. A. Vujić, 14.07.2017, 1 ♂, leg. T. Tot, M. Vujić; Vlasina: Vlasina Rid, 13.07.2017, 1 ♂, leg. T. Tot, M. Vujić; Vlasina: Vrtop, 15.07.2017, 2 ♂♂, leg. T. Tot, M. Vujić.

Notes: The species is very common and abundant in forests in Serbia.

*E. similis* (Fallén, 1817)

New data: Vlasina: Veliki Čemernik, 20.07.1993, 1 ♀, leg. D. Radović; Vlasina: Vrtop, 15.07.2017, 1 ♂, 1 ♀, leg. T. Tot, M. Vujić.



Notes: The species is widely distributed on the Balkan Peninsula.

*E. tenax* Linnaeus, 1758

New data: Vlasina: Vlasina Lake, 01-05.08.1991, 2 ♂♂, leg. A. Vujić; Vlasina: Veliki Čemernik, 20.07.1993, 1 ♂, leg. D. Radović.

Notes: This species during sampling in 2017 was numerous at every locality, so it is only recorded visually.

*Eupeodes corollae* (Fabricius, 1794)

New data: Vlasina: Vlasina Lake, 22.06.1991, 1 ♂, leg. A. Vujić; Vlasina: Delnice, 12.07.2017, 1 ♂, 2 ♀♀, leg. T. Tot, M. Vujić; Vlasina: Vlasina Rid, 13.07.2017, 1 ♂, leg. T. Tot, M. Vujić; Vlasina: Vučja River, 13.07.2017, 3 ♀♀, leg. T. Tot, M. Vujić; Vlasina: Veliki Čemernik, 14.07.2017, 9 ♂♂, 5 ♀♀, leg. T. Tot, M. Vujić; Vlasina: Vrtop, 15.07.2017, 6 ♂♂, 4 ♀♀, leg. T. Tot, M. Vujić.

Notes: The species is widely distributed in Serbia.

*E. flaviceps* Rondani, 1857

New data: Vlasina: Vrtop, 15.07.2017, 1 ♀, leg. T. Tot, M. Vujić.

Notes: The species is recorded in mountainous regions of Serbia with a small number of specimens.

*E. lapponicus* (Zetterstedt, 1838)

New data: Vlasina: Veliki Čemernik, 14.07.2017, 1 ♂, leg. T. Tot, M. Vujić.

Notes: The species is distributed in the mountainous regions of Serbia.

*E. luniger* (Meigen, 1822)

New data: Vlasina: Vlasina Lake, 01-05.08.1991, 1 ♂, leg. A. Vujić; Vlasina: Veliki Čemernik, 20.07.1993, 1 ♂, leg. A. Vujić, 14.07.2017, 3 ♂♂, 3 ♀♀, leg. T. Tot, M. Vujić; Vlasina: Vlasina Rid, 13.07.2017, 1 ♀, leg. T. Tot, M. Vujić; Vlasina: Vrtop, 15.07.2017, 1 ♂, leg. T. Tot, M. Vujić.

Notes: The species is widely distributed in Serbia.

*Leucozona lucorum* (Linnaeus, 1758) (Fig. 4).

New data: Vlasina: Vlasina Lake, 01-05.08.1991, 1 ♂, leg. A. Vujić; Vlasina: Delnice, 12.07.2017, 1 ♀, leg. T. Tot, M. Vujić.

Notes: The species is distributed in the mountainous regions of Serbia.

*Melangyna cincta* (Fallén, 1817)

New data: Vlasina: Vlasina Lake, 01.06.1988, 2 ♂♂, leg. A. Vujić.

Notes: The species is widely distributed in Serbia.



Figure 4. Female of *Leucozona lucorum* (Linnaeus, 1758) (Photo by Z. Nedeljković).

*Melangyna compositarum* (Verrall, 1873)

New data: Vlasina: Vlasina Lake, 01-05.08.1991, 3 ♂♂, leg. A. Vujić; Vlasina: Veliki Čemernik, 21.07.1991, 1 ♂, 3 ♀♀, leg. D. Radović, A. Vujić, 20.07.1993, 2 ♂♂, 2 ♀♀, leg. A. Vujić.

Notes: The species is distributed in the mountainous regions of Serbia.

*M. guttata* (Fallén, 1817)

New data: Vlasina: Veliki Čemernik, 20.07.1993, 2 ♂♂, leg. A. Vujić.

Notes: The species is recorded in mountainous regions of Serbia with a small number of specimens.

*M. lasiophthalma* (Zetterstedt, 1843)

New data: Vlasina: Vlasina Lake, 01-05.08.1991, 1 ♂, 1 ♀, leg. A. Vujić.

Notes: The species is widely distributed in Serbia.

*Melanostoma mellinum* (Linnaeus, 1758)

New data: Vlasina: Vlasina Lake, 01-05.08.1991, 1 ♂, leg. A. Vujić, 22.06.1991, 1 ♀, leg. A. Vujić, 11.07.2017, 1 ♀, leg. T. Tot, M. Vujić; Vlasina: Delnice, 12.07.2017, 1 ♂, leg. T. Tot, M. Vujić; Vlasina: Vučja River, 13.07.2017, 2 ♀♀, leg. T. Tot, M. Vujić; Vlasina: Veliki Čemernik, 14.07.2017, 1 ♀, leg. T. Tot, M. Vujić.

Notes: The species is widely distributed in Serbia.

*M. scalare* (Fabricius, 1794)

New data: Vlasina. Vlasina Lake, 01-05.08.1991, 1 ♂, leg. A. Vujić; Vlasina: Delnice, 12.07.2017, 1 ♂, leg. T. Tot, M. Vujić; Vlasina: Vučja River, 13.07.2017, 5 ♂♂, 1 ♀, leg. T. Tot, M. Vujić; Vlasina: Vrtop, 15.07.2017, 2 ♂♂, 3 ♀♀, leg. T. Tot, M. Vujić.

Notes: The species is widely distributed in Serbia.

*Meliscaeva auricollis* (Meigen, 1822)

New data: Vlasina: Delnice, 12.07.2017, 1 ♀, leg. T. Tot, M. Vujić; Vlasina: Vlasina Rid, 13.07.2017, 1 ♀, leg. T. Tot, M. Vujić; Vlasina: Veliki Čemernik, 14.07.2017, 3 ♂♂, 1 ♀, leg. T. Tot, M. Vujić; Vlasina: Vrtop, 15.07.2017, 1 ♀, leg. T. Tot, M. Vujić.

Notes: The species is mainly distributed in the mountainous regions of Serbia.

*M. cinctella* (Zetterstedt, 1843)

New data: Vlasina: Veliki Čemernik, 14.07.2017, 1 ♀, leg. T. Tot, M. Vujić.

Notes: The species is recorded in mountainous regions of Serbia.

*Merodon* aff. *cinereus*

New data: Vlasina: Veliki Čemernik, 14.07.2017, 23 ♂♂, 2 ♀♀, leg. T. Tot, M. Vujić.

Notes: Undescribed species, potentially new for science.

*M. armipes* Rondani, 1843

Published in Vujić *et al.*, 2012.

Notes: The species is widely distributed on the Balkan Peninsula.

*M. moenium* (Wiedemann in Meigen, 1822)

New data: Vlasina: Veliki Čemernik, 14.07.2017, 10 ♂♂, 1 ♀, leg. T. Tot, M. Vujić.

Notes: One of the most abundant species of the genus *Merodon* Meigen, 1803 on the Balkan Peninsula.

*Myathropa florea* (Linnaeus, 1758)

New data: Vlasina: Veliki Čemernik, 21.07.1993, 1 ♀, leg. D. Radović; Vlasina: Delnice, 12.07.2017, 1 ♀, leg. T. Tot, M. Vujić; Vlasina: Vrtop, 15.07.2017, 2 ♂♂, leg. T. Tot, M. Vujić; Vlasina: Vlasina 13.07.2017, 1 ♂, 1 ♀, leg. T. Tot, M. Vujić.

Notes: Widely distributed species.

*Myolepta dubia* (Fabricius, 1805)

New data: Vlasina: Veliki Čemernik, 21.07.1993, 1 ♂, leg. A. Vujić.

Notes: The species is recorded on several mountains in Serbia with a relatively small number of specimens.

*Neoascia obliqua* Coe, 1940

Published in Vujić (1990).

Notes: The species is recorded in mountainous regions of Serbia.

*N. tenur* (Harris, 1780)

New data: Vlasina: Veliki Čemernik, 14.07.2017, 1 ♂, leg. T. Tot, M. Vujić.

Notes: The species is recorded in mountainous regions and wetlands of Serbia with a small number of specimens.

*Paragus haemorrhous* Meigen, 1822

New data: Vlasina: Vlasina Lake, 11.07.2017, 1 ♂, leg. T. Tot, M. Vujić; Vlasina: Delnice, 12.07.2017, 1 ♂, leg. T. Tot, M. Vujić; Vlasina: Vrtop, 15.07.2017, 1 ♂, leg. T. Tot, M. Vujić.

Notes: The species is widely distributed in Serbia.

*Parasyrphus lineolus* (Zetterstedt, 1843)

New data: Vlasina: Vrtop, 15.07.2017, 1 ♀, leg. T. Tot, M. Vujić.

Notes: The species is distributed in the mountainous regions of Serbia.

*P. punctulatus* (Verrall, 1873)

New data: Vlasina: Vlasina Lake, 01.06.1988, 1 ♂, leg. A. Vujić.

Notes: The species is widely distributed in Serbia.

*P. vittiger* (Zetterstedt, 1843)

New data: Vlasina: Vlasina Lake, 04.07.1977, 1 ♀, leg. S. Šimić.

Notes: The species is distributed in the mountainous regions of Serbia.

*Platycheirus albimanus* (Fabricius, 1781)

New data: Vlasina: Delnice, 12.07.2017, 1 ♂, leg. T. Tot, M. Vujić; Vlasina: Vrtop, 15.07.2017, 1 ♂, 1 ♀, leg. T. Tot, M. Vujić.

Notes: The species is widely distributed in Serbia.

*P. europaeus* Goeldlin, Maibach & Speight, 1990

New data: Vlasina: Vrtop, 15.07.2017, 1 ♂, leg. T. Tot, M. Vujić.

Notes: The species is distributed in the mountainous regions of Serbia.

*Scaeva dignota* (Rondani, 1857)

Published in Radenković *et al.*, 1995.

Notes: The species is distributed in the mountainous regions of Serbia.

*Scaeva pyrastris* (Linnaeus, 1758)

New data: Vlasina: Vlasina Lake, 01-05.08.1991, 2 ♀♀, leg. A. Vujić; Veliki Čemernik, 20.07.1993, 1 ♂, leg. D. Radović, 14.07.2017, 7 ♀♀, leg. T. Tot, M. Vujić; Vlasina: Delnice, 12.07.2017, 4 ♀♀, leg. T. Tot, M. Vujić; Vlasina: Vlasina Rid, 13.07.2017, 4 ♀♀, leg. T. Tot, M. Vujić; Vlasina: Vlasina: Vrtop, 15.07.2017, 9 ♀♀, leg. T. Tot, M. Vujić.

Notes: The species is widely distributed in Serbia.

*Scaeva selenitica* (Meigen, 1822)

New data: Vlasina: Vlasina Lake, 22.06.1991, 1 ♀, leg. A. Vujić, 11.07.2017, 2 ♂♂, leg. T. Tot, M. Vujić; Vlasina: Delnice, 12.07.2017, 4 ♂♂, leg. T. Tot, M. Vujić; Vlasina: Vlasina: Vlasina Rid, 13.07.2017, 2 ♂♂, leg. T. Tot, M. Vujić; Veliki Čemernik, 14.07.2017, 7 ♂♂, leg. T. Tot, M. Vujić; Vlasina: Vrtop, 15.07.2017, 3 ♀♀, leg. T. Tot, M. Vujić.

Notes: The species is widely distributed in Serbia.

*Sericomyia lappona* (Linnaeus, 1758)

New data: Vlasina: Veliki Čemernik, 14.07.2017, 1 ♀, leg. T. Tot, M. Vujić.

Notes: The species is recorded only on several localities (Golija, Dubašnica, Kopaonik, Vlasina) in Serbia so far.

*Spazigaster ambulans* (Fabricius, 1798)

New data: Vlasina: Veliki Čemernik, 20.07.1993, 1 ♂, leg. A. Vujić; Vlasina: Delnice, 12.07.2017, 1 ♂, leg. T. Tot, M. Vujić.

Notes: The species is recorded in mountainous regions of Serbia.

*Sphaerophoria scripta* (Linnaeus, 1758)

New data: Vlasina: Vlasina Lake, 01-05.08.1991, 1 ♂, leg. A. Vujić, 22.06.1991, 3 ♂♂, 1 ♀, leg. A. Vujić; Vlasina: Vučja River, 13.07.2017, 1 ♂, leg. T. Tot, M. Vujić; Vlasina: Vrtop, 15.07.2017, 1 ♀, leg. T. Tot, M. Vujić.

Notes: Widely distributed species.

*Sphegina clavata* (Scopoli, 1763)

New data: Vlasina: Vučja River, 13.07.2017, 1 ♂, leg. T. Tot, M. Vujić.

Notes: The species is distributed in the mountainous regions of Serbia.

*S. elegans* Schummel, 1843

New data: Vlasina: Delnice, 12.07.2017, 2 ♀♀, leg. T. Tot, M. Vujić; Vlasina: Vučja River, 13.07.2017, 4 ♀♀, leg. T. Tot, M. Vujić.

Notes: The species is recorded only on several localities in Serbia with a small number of specimens.

*Syritta pipiens* (Linnaeus, 1758)

New data: Vlasina: Delnice, 12.07.2017, 1 ♀, leg. T. Tot, M. Vujić; Vlasina: Vlasina Rid, 13.07.2017, 2 ♂♂, leg. T. Tot, M. Vujić; Vlasina: Vučja River, 13.07.2017, 1 ♂, leg. T. Tot, M. Vujić.

Notes: Widely distributed species.

*Syrphus ribesii* (Linnaeus, 1758)

Published in Nedeljković *et al.*, 2010.

New data: Vlasina: Veliki Čemernik, 21.07.1991, 1 ♂♂, 2 ♀♀, leg. D. Radović, A. Vujić, 14.07.2017, 3 ♂♂, 1 ♀, leg. T. Tot, M. Vujić; Vlasina: Delnice, 12.07.2017, 3 ♂♂, 1 ♀, leg. T. Tot, M. Vujić; Vlasina: Vlasina Rid, 13.07.2017, 1 ♀, leg. T. Tot, M. Vujić; Vlasina: Vlasina: Vrtop, 15.07.2017, 1 ♂, leg. T. Tot, M. Vujić.

Notes: The species is widely distributed in Serbia.

*S. torvus* Osten Sacken, 1875

Published in Nedeljković *et al.*, 2010.

New data: Vlasina: Vlasina Rid, 13.07.2017, 2 ♀♀, leg. T. Tot, M. Vujić; Vlasina: Veliki Čemernik, 14.07.2017, 9 ♂♂, leg. T. Tot, M. Vujić; Vlasina: Vrtop, 15.07.2017, 2 ♂♂, 1 ♀, leg. T. Tot, M. Vujić.

Notes: The species is widely distributed in Serbia.

*S. vitripennis* Meigen, 1822

New data: Vlasina: Vlasina Lake, 01.06.1988, 1 ♂, 2 ♀♀, leg. A. Vujić, 01-05.08.1991, 1 ♂, 1 ♀, leg. A. Vujić; Vlasina: Delnice, 12.07.2017, 8 ♂♂, 3 ♀♀, leg. T. Tot, M. Vujić; Vlasina: Vlasina Rid, 13.07.2017, 1 ♀, leg. T. Tot, M. Vujić; Vlasina: Veliki Čemernik, 14.07.2017, 1 ♀, leg. T. Tot, M. Vujić; Vlasina: Vrtop, 15.07.2017, 5 ♂♂, 1 ♀, leg. T. Tot, M. Vujić.

Notes: The species is widely distributed in Serbia.

*Volucella bombylans* (Linnaeus, 1758)

New data: Vlasina: Delnice, 12.07.2017, 1 ♀, leg. T. Tot, M. Vujić; Vlasina: Veliki Čemernik, 14.07.2017, 1 ♂, 1 ♀, leg. T. Tot, M. Vujić; Vlasina: Vrtop, 15.07.2017, 1 ♂, 1 ♀, leg. T. Tot, M. Vujić.

Notes: The species is mainly distributed in the mountainous regions of Serbia.

*V. pellucens* (Linnaeus, 1758)

Published in Nedeljković *et al.*, 2003.

New data: Vlasina: Vlasina Lake, 11.07.2017, 1 ♂, leg. T. Tot, M. Vujić; Vlasina: Delnice, 12.07.2017, 1 ♀, leg. T. Tot, M. Vujić; Vlasina: Vrtop, 15.07.2017, 4 ♀♀, leg. T. Tot, M. Vujić.

Notes: The species is mainly distributed in the mountainous regions of Serbia.

*V. zonaria* (Poda, 1761)

New data: Vlasina: Delnice, 12.07.2017, 1 ♂, leg. T. Tot, M. Vujić.

Notes: The species is widely distributed in Serbia.

*Xanthandrus comtus* (Harris, 1780)

New data: Vlasina: Vlasina Lake, 01.06.1988, 1 ♀, leg. A. Vujić, 01-05.08.1991, 1 ♂, leg. A. Vujić; Vlasina: Delnice, 12.07.2017, 1 ♂, leg. T. Tot, M. Vujić; Vlasina: Vučja River, 13.07.2017, 1 ♂, leg. T. Tot, M. Vujić; Vlasina: Veliki Čemernik, 14.07.2017, 1 ♀, leg. T. Tot, M. Vujić; Vlasina: Vrtop, 15.07.2017, 3 ♂♂, 4 ♀♀, leg. T. Tot, M. Vujić.

Notes: The species is distributed in the mountainous regions of Serbia.

*Xanthogramma stackelbergi* Violovitsh, 1975

New data: Vlasina: Vučja River, 13.07.2017, 1 ♂, leg. T. Tot, M. Vujić.

Notes: The species is mainly distributed in the mountainous regions of Serbia.

*Xylota sylvarum* (Linnaeus, 1758)

New data: Vlasina, Vlasina Rid, 13.07.2017, 2 ♀♀, leg. T. Tot, M. Vujić; Vlasina: Vrtop, 15.07.2017, 2 ♀♀, leg. T. Tot, M. Vujić.

Notes: The species is widely distributed in Serbia.

## Discussion

Based on published literature and new data from a period of 40 years, 76 hoverfly species of 32 genera were confirmed for the Landscape of Outstanding Features "Vlasina". After true bugs (with 169 recorded species) and butterflies (with 101 recorded species), hoverflies represent one of the richest insect groups in this landscape.

The most remarkable finding is the potentially new hoverfly species for science, the description of which is in preparation: *Merodon* aff. *cinereus* (Vujić *et al.*, in prep.).

New findings of *Chrysotoxum montanum* Nedeljković & Vujić, 2015 (Nedeljković *et al.*, 2015), and *Chrysotoxum tomentosum* Giglio-Tos, 1890 (Nedeljković *et al.*, 2013), also represent very important data, since up to now *Ch. tomentosum* was collected only on Mts. Kopaonik, Šar Planina and Stara Planina, while *Ch. montanum* on Mts. Golija and Zlatar.

Although widespread in northern Europe and Siberia, *Cheilosia longula* is rare on the Balkan Peninsula. This species is only recorded on Mt. Kopaonik so far. It is listed as a protected species in Serbia based on the Code of regulations on the declaration and protection of strictly protected and protected wild species of plants, animals and fungi (Official Gazette of RS, nos. 5/2010 and 47/2011).

The richest localities, with a presence of more than 30 different species, are Vlasina Lake (38 species), Veliki Čemernik (37 species) and Vrtop (33 species). Delnice (29 species) and Vlasina Rid (19 species) are characterized by a lower number of hoverfly species, while Vučja River (16 species) is the poorest locality as regards number of species.

The most common genera were *Chrysotoxum* Meigen, 1822 (10) and *Cheilosia* Meigen, 1822 (8), while the most abundant species were *Chrysotoxum binctum*, *Chrysotoxum elegans*, *Episyrphus balteatus*, *Eristalis arbustorum*, *Eristalis tenax* and *Eupeodes corollae*, which are found at all investigated localities.

Vlasina Lake and its immediate surroundings are characterized by the presence of a specific biogeocenosis, mainly mires, wetlands, forests, meadows and pastures (according to the Law on Environmental Protection,

Official Gazette of Republic of Serbia, No.66/91). This explains why the above mentioned species are registered in this area, since more than half of them exclusively inhabit humid habitats (Speight, 2016).

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## ФАУНА ОСОЛИКИХ МУВА (DIPTERA: SYRPHIDAE) ПРЕДЕЛА ИЗУЗЕТНИХ ОДЛИКА “ВЛАСИНА”

ТАМАРА ТОТ, МИХАИЛО ВУЈИЋ, ЛАУРА ЛИКОВ, ЗОРИЦА НЕДЕЉКОВИЋ,  
СНЕЖАНА РАДЕНКОВИЋ И АНТЕ ВУЈИЋ

### ИЗВОД

Током вишегодишњих теренских истраживања организованих у периоду од 1977-2017. године на шест локалитета унутар подручја Предео изузетних одлика “Власина” (југоисточна Србија) сакупљено је укупно 76 врста осоликих мува. Међу идентификованим таксонима налази се ретка врста *Cheilosis longula* (Zetterstedt, 1838), која је заштићена у Србији. Поред тога забележена је и једна потенцијално нова врста за науку (*Merodon* aff. *cinereus*). У раду је дата прва листа осоликих мува за ово подручје.

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