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Tabanus sudeticus Zeller, 1842 and *Philipomyia graeca* (Fabricius, 1794) first records in the fauna of Plitvice Lakes National Park

Tabanus sudeticus Zeller, 1842 i *Philipomyia graeca* (Fabricius, 1794) prvi nalazi u fauni Nacionalnog parka Plitvička jezera

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Abstract

Recent studies in the Plitvice Lakes National Park have recorded six species of horseflies (Tabanidae). *Tabanus sudeticus* Zeller, 1842 and *Philipomyia graeca* (Fabricius, 1794), represent new species for the fauna of the Plitvice Lakes National Park. With the findings of these two new species, 11 species of horseflies (Tabanidae) have been recorded in Plitvice Lakes National Park so far, classified into four genera and two subfamilies. The most numerous is the genus *Tabanus* L., 1758 with seven species, followed by *Chrysops* Meigen, 1803 with two species, *Haematopota* Meigen, 1803 and *Philipomyia* Olsufjev, 1964 with one species each.

Keywords: Croatia, Diptera, Europe, horseflies, Plitvice Lakes, Tabanidae

Sažetak

U nedavnim istraživanjima u Nacionalnom parku Plitvička jezera zabilježeno je šest vrsta obada (Tabanidae). Dvije vrste *Tabanus sudeticus* Zeller, 1842 i *Philipomyia graeca* (Fabricius, 1794) predstavljaju nove vrste za faunu Nacionalnog parka Plitvička jezera. Nalazom ovih dviju vrsta, na području Nacionalnog parka Plitvička jezera zabilježeno je do sada 11 vrsta obada (Tabanidae), svrstanih u četiri roda i dvije potporodice. Najbrojniji je rod *Tabanus* L., 1758 sa sedam vrsta, slijede rodovi *Chrysops* Meigen, 1803 s dvije vrste, *Haematopota* Meigen, 1803 i *Philipomyia* Olsufjev, 1964 s po jednom vrstom obada.

Ključne riječi: Diptera, Europa, Hrvatska, obadi, Plitvička jezera, Tabanidae

Introduction – *Uvod*

Scientific research at the Plitvice Lakes dates back to the early 19th century (Bralić, 1991); however, research activity increased significantly after 1949, when the area was officially declared as a National park. Thirty years later, in 1979, Plitvice Lakes were included in the UNESCO World Natural Heritage List, which further contributed to the significance of this National Park (Bralić, 1991). Of all the remaining seven National Parks in Croatia, the Plitvice Lakes National Park is the best researched in terms of entomofauna, especially in terms of the aquatic Diptera fauna (Radošević et al., 2025). Studies on aquatic Diptera in the Plitvice Lakes National Park resulted in 157 species and 7 taxa classified into 13 families (Ivković et al., 2020), but since then this number has been even higher (Radošević et al., 2025). The horseflies (Tabanidae) family is one of the least represented in terms of the number of species in the Diptera fauna in the Plitvice Lakes National Park. Although they are very active predators in the larval stage, feeding on Oligochaeta and larvae of other dipterans, they affect the density and diversity of other dipteran families (Chvála et al., 1972). Therefore, this study aims to compile a checklist of all horsefly species identified in the Plitvice Lakes National Park, based on both recent field research and a literature review.

Materials and Methods – *Materijali i metode*

The horseflies were sampled together with other aquatic dipterans at several localities in Plitvice Lakes National Park along the banks of the Bijela and Crna Rijeka streams using emergent traps. Sampling was carried out in the period from mid-June 2021 to mid-July 2025. The collected insects were stored in plastic vials with a 96% ethanol solution. Identification to the family level was carried out in the laboratory of the Biology Department of the Faculty of Science in Zagreb according to available identification keys (Nilsson, 1997; Oosterbroek, 2006). This was followed by identification to the species level by various specialists for individual families of dipterans in Croatia or abroad. In this way, the horseflies (Tabanidae) were identified in the laboratory of the Department of Biology of the Josip Juraj Strossmayer University in Osijek. Identification of the collected horseflies was performed according to (Chvála et al., 1972, Krčmar et al., 2011). Also, the presence of some species was determined upon a review of literature data.

Results and Discussion – *Rezultati i rasprava*

Until 2020, only two species of horseflies from the genus *Chrysops* had been recorded in the Plitvice Lakes National Park (Ivković et al., 2020). The study of some dipteran families in the following years, as well as a review of literature data, resulted in records of seven more species of horseflies (Krčmar and Pezzi, 2024). By sorting unidentified insects from the Plitvice Lakes National Park during the winter months of last year, 28 horseflies were found in the collected insect samples. A total of 6 horsefly species were identified in these samples, classified into three genera (Table 1).

Table 1 Identified horseflies (Tabanidae) during 2025 in Plitvice Lakes National Park (* first record)
Tablica 1. Determinirani obadi (Tabanidae) tijekom 2025. godine u Nacionalnom parku Plitvička jezera (*prvi nalaz).

Species *Vrste*	Locality *Lokalitet*	Date *Datum*	Specimens and sex *Jedinke i spol*
Chrysops caecutiens	Stream Ljeskovac	15.07.2025	1♀
Tabanus exclusus	Bijela Rijeka Stream	28.07.2022	6♀, 2♂
	Bijela Rijeka Stream	30.08.2022	2♀
	Bijela Rijeka Stream	31.07.2025	4♀
Tabanus glaucopis	Bijela Rijeka Stream	28.07.2022	2♀
	Bijela Rijeka Stream	30.08.2022	1♀, 1♂
	Bijela Rijeka Stream	31.07.2025	1♂
*Tabanus sudeticus**	Bijela Rijeka Stream	28.07.2022	1♀
	Bijela Rijeka Stream	31.07.2025	1♂
Tabanus tergestinus	Bijela Rijeka Stream	28.07.2022	3♀
	Bijela Rijeka Stream	31.07.2025	1♂
	Stream Kavga	15.07.2025	1♀
*Philipomyia graeca**	Crna Rijeka Stream	30.06.2021	1♂
∑ 6			28

Among these six species *Tabanus sudeticus* Zeller, 1842 and *Philipomyia graeca* (Fabricius, 1794) were recorded for the first time in the fauna of Plitvice Lakes National Park (Figures 1-3). *Tabanus sudeticus* is a common species and widely distributed across Europe (Chvála et al., 1972). Despite its wide distribution in Europe and Croatia, there is little data on the presence of this species in areas of high protection category - strict reserves, national parks and nature parks. Of these high categories of protected nature areas, this horsefly species was recorded only in the area of one national park and five nature parks (Krčmar and Pezzi, 2024). The flight period of *T. sudeticus* lasts from June to the end of August (Chvála et al., 1972; Krčmar, 1999a) and the dates of the findings of this species at Plitvice Lakes fit perfectly within that period. *Philipomyia graeca* is a Mediterranean species, with its northern distribution border limit located in Central Europe (Chvála et al., 1972). Although it is very common in the Mediterranean part of Croatia (Krčmar, 1999b), some specimens have also been collected in the Continental region, specifically on the southern slopes of the Medvednica, Dilj, Krndija and Papuk mountain massifs, as well as in the Alpine region of Croatia (Krčmar et al., 2010; Krčmar and Pezzi, 2024). It has been recorded in the area of three national parks and five nature parks in Croatia (Krčmar and Pezzi, 2024). The flight period of this species lasts from May to the end of July (Chvála et al., 1972). The date of the *P. graeca* finding in Plitvice

Lakes National Park coincides with the flight period of this species in Europe. Summarizing all previous findings with this recent data, 11 species of horseflies (Tabanidae) have been recorded in the Plitvice Lakes National Park (Table 2).

Table 2 Systematic list of horseflies (Tabanidae) in Plitvice Lakes National Park
Tablica 2. Sistematski popis obada (Tabanidae) u Nacionalnom parku Plitvička jezera.

Subfamily *Potporodica*	Genus *Rod*	Species *Vrste*
Chrysopsinae	*Chrysops* Meigen, 1803	*Chrysops caecutiens* (L., 1758)
		Chrysops viduatus (Fabricius, 1794)
Tabaninae	*Tabanus* L., 1758	*Tabanus bromius* L., 1758
		Tabanus exclusus Pandellé, 1883
		Tabanus glaucopis Meigen, 1820
		Tabanus maculicornis Zetterstedt, 1842
		Tabanus spodopterus s.str. (spodopterus spodopterus) Meigen, 1820
		Tabanus sudeticus Zeller, 1842
		Tabanus tergestinus Egger, 1859
	Haematopota Meigen, 1803	*Haematopota italica* Meigen, 1804
	Philipomyia Olsufjev, 1964	*Philipomyia graeca* (Fabricius, 1794)
∑ 2	4	11

Comparing the diversity of horsefly fauna recorded in the Plitvice Lakes National Park with other national parks in Croatia, it was found that more horsefly species were recorded in the Northern Velebit National Park and the Krka National Park (Krčmar and Pezzi, 2024). These data clearly indicate that the fauna of horseflies in the area of national parks in Croatia has not been sufficiently studied. This recorded number of 11 horsefly species is certainly not final, highlighting the need for further systematic research into the horsefly fauna in Plitvice Lakes National Park.



Figure 1 *Tabanus sudeticus*, ♂ (male) (Photo T. Koren)
Slika 1. *Tabanus sudeticus*, ♂ (mužjak) (Slikao T. Koren).



Figure 2 *Tabanus sudeticus*, ♀ (female) (Photo S. Krčmar)
Slika 2. *Tabanus sudeticus*, ♀ (ženka) (Slikao S. Krčmar).



Figure 3 *Philipomyia graeca*, ♂ (male) (Photo S. Krčmar)
Slika 3. *Philipomyia graeca*, ♂ (mužjak) (Slikao S. Krčmar).

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