

Horse Flies (Diptera: Tabanidae) on the Lower Part of the Neretva River in Southern Croatia

by Stjepan KRČMAR¹ & Marcel LECLERCQ²

¹ Department of Biology, Faculty of Education, University J.J. Strossmayer, L. Jägera 9, 31000 Osijek, Croatia.

² Faculté des Sciences Agronomiques de Gembloux, Unité de Zoologie générale et appliquée (Prof. Ch. Gaspar), B-5030 Gembloux, Belgique.

Summary

Faunistical and ecological research work have been carried out on 6 localities in areas around the Neretva river during 1995 and 1996. All together 739 horse flies were collected. The identification and review literature established 33 species of horse flies classified in eight genera: Chrysops, Atylotus, Theriopectes, Hybomitra, Tabanus, Haematopota, Dasyrhamphis and Philipomyia. This faunistic research of horse flies resulted in the recording of the Hybomitra expollicata and Tabanus regularis, new species in the fauna of Croatia. Three species, Hybomitra ciureai, Hybomitra muehlfeldi and Hybomitra acuminata, make up 54,52% of the horse fly fauna of the investigated area.

Key words: Diptera, Tabanidae, Neretva river, Southern Croatia.

Introduction

Tabanidae are among the most free-living adult flies which play a role as livestock pests (FOIL *et al.*, 1994). Therefore the research of horse flies is not only of faunistic but also of great scientific and economic importance. The horse flies for this research were collected in the region around the lower part of the Neretva river. In the last few decades a significant part of that area has been thoroughly transformed from marshland into fertile agricultural land. Still, it is the largest marshland area in the Croatian maritime region containing the last relics of natural swamps. The results of the performed research will contribute to a better understanding of the fauna marshes around the lower Neretva river that were, until recently, the kingdom of fish and wading birds.

Methods

The research was carried out in the lower valley of the Neretva river, around the lakes Modro Oko, Desne, Kuti and Baćina. These areas are combinations of marsh, lake and karstic zones. They have a rich marsh vegetation and the steep banks of the lakes are covered with thick mediterranean shrub vegetation. The horse flies were collected in 1995 and 1996 from May to the middle of August in six localities (Fig. 1), Opuzen (YH 06); Modro Oko (YH 06); mouth of the Neretva River (YH 06); Baćina (XH 97); Metković (YH 16); Badžula (YH 16) by means of a snare on the cattle put out to pasture and on inflorescences of the plant *Paliurus spina christi*. All collected specimens were determined by means of keys (CHVALA *et al.*, 1972; OLSUFJEV, 1977) and the names of the species were written according to the catalogue (LECLERCQ & OLSUFJEV, 1981).

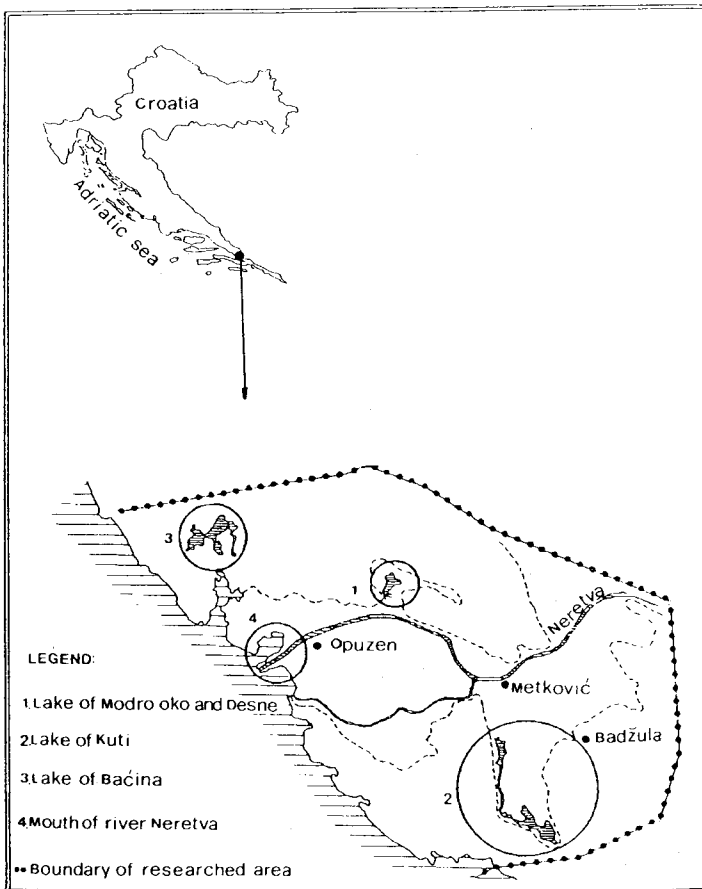


Fig. 1. Researched area of the lower part of the Neretva river, Southern Croatia.

Results and Discussion

All together 739 specimens were collected (Table 2), belonging to 33 species of horse flies grouped into the subfamilies Chrysopsinae and Tabaninae and the genera: *Chrysops*, *Atylotus*, *Theriopectes*, *Hybomitra*, *Tabanus*, *Haematopota*, *Dasyrhamphis* and *Philipomyia*. Three species: *Hybomitra ciureai*, *Hybomitra muehlfeldi* and *Hybomitra acuminata* made up 54,52% of the fauna of horse flies in the researched area, while 45,48% were representatives of other species (Table 1).

The most numerous genus is *Hybomitra* with 420 (56,83%) collected specimens. Next in number are the genus *Tabanus* with 120 (16,23%) collected specimens, *Theriopectes* with 51 (6,90%), *Chrysops* with 49 (6,63%), *Dasyrhamphis* with 40 (5,41%), *Philipomyia* with 31 (4,19%), *Haematopota* with 27 (3,65%) and finally the genus *Atylotus* with only 1 (0,13%) collected specimen. From the collected sample two species of horse flies new to the fauna of Croatia were determined, these are *Hybomitra expollicata* and *Tabanus regularis*. The species *Hybomitra expollicata* was represented by 7 specimens within the sample. They were collected in Opuzen (YH 06) on 30th May 1995 (1♀), 19th May 1996 (1♀), 4th June 1996 (2♀), 7th August 1996 (1♀) and in the localities Modro Oko (YH 06) on 30th May 1995 (1♀) and 4th June 1996 (1♀). All collected specimens were female, caught while they were taking their blood meal on cows. Beside the region around the lower part of the Neretva river, this species was also recorded on two localities in central Dalmatia on the river Cetina in Omis (XJ 31), on 3rd June 1996 (1♀), 5th June 1996 (3♀) and 7th August 1996 (1♀) and next to the pond in Obrovac (WJ 59), on 2nd June 1996 (1♀). This species appears exclusively in isolated saline habitats. In Europe it is a very local in distribution, found along the Spanish coast from the line Valencia - Alicante to Zamora (PORTILLO, 1985), in France (Aude, Bouches - du - Rhône, Gard, Hérault, Loire-Atlantique, Pyrénées-Orientales, Var Vendée), Italy (Sardinia), Rumania, Germany (Stassfurt, Rügen, Hiddensee), Denmark, Sweden (Öland), England, Belgium, the Netherlands, USSR - Siberia, Moldavia, Ukraine, Kazakstan, Uzbekistan and all the way to the Far East - Manchuria and Mongolia (OLSUFJEV, 1977; PARVU *et al.*, 1984), as well as in China and Turkey (LECLERCQ & VALA, 1998 in preparation). The second new species is *Tabanus regularis* caught at the localities in Opuzen (YH 06), on 7th August 1996 (1♀) and in localities in central Dalmatia: Omiš (XJ 31), on 26th July 1995 (2♀), 7th August 1996 (1♀) and Turjaci (XJ 33), on 8th August 1996 (1♀). During the examination a part of the collection of horse flies in the Croatian Museum of Natural Sciences in Zagreb an additional 5 specimens of the species *Tabanus regularis* were determined. These were collected in localities in Trnovec (WM 61), on 15th July 1939 (1♀), 15th July 1955 (1♀), in Pag (WK 02), on 13th June 1958 (1♀), and Split (XJ 11), on 25th June 1962 (1♂). This species has been recorded in most Mediterranean countries: Portugal, Spain, France, Italy, Cyprus, Greece, Israel, Morocco, Algeria, Tunisia, and also in Bulgaria, Turkey and Slovakia which is the northern

Table 1. The number of collected species of horse flies in the researched area.

Species	Collected specimens	%
<i>Hybomitra ciureai</i> (Séguy, 1937)	179	24,22
<i>Hybomitra muehlfeldi</i> (Brauer, 1880)	151	20,43
<i>Hybomitra acuminata</i> (Loew, 1858)	73	9,87
<i>Tabanus autumnalis</i> Linnaeus, 1761	47	6,35
<i>Chrysops pictus</i> Meigen, 1820	45	6,08
<i>Dayrhamphis anthracinus</i> (Meigen, 1820)	40	5,41
<i>Theriopectes nunicatus</i> (Szilady, 1927)	36	4,87
<i>Philipomyia graeca</i> (Fabricius, 1794)	31	4,19
<i>Tabanus sudeticus</i> Zeller, 1842	23	3,11
<i>Tabanus bromius</i> Linnaeus, 1758	21	2,84
<i>Theriopectes gigas</i> (Herbst, 1787)	15	2,03
<i>Haematopota pandazisi</i> Kröber, 1936	13	1,76
<i>Tabanus exclusus</i> Pandellé, 1883	11	1,48
<i>Hybomitra ukrainica</i> (Olsufjev, 1952)	10	1,35
<i>Haematopota grandis</i> Meigen, 1820	10	1,35
<i>Hybomitra expollicata</i> (Pandellé, 1883)	7	0,94
<i>Tabanus tergestinus</i> Egger, 1859	4	0,54
<i>Tabanus bifarius</i> Loew, 1858	3	0,40
<i>Chrysops italicus</i> Meigen, 1804	2	0,27
<i>Tabanus miki</i> Brauer, 1880	2	0,27
<i>Tabanus quatuornotatus</i> Meigen 1820	2	0,27
<i>Tabanus spectabilis</i> Loew, 1858	2	0,27
<i>Haematopota italica</i> Meigen, 1804	2	0,27
<i>Chrysops caecutiens</i> Linné, 1758	1	0,13
<i>Chrysops flavipes</i> Meigen, 1804	1	0,13
<i>Atylotus loewianus</i> (Villeneuve, 1920)	1	0,13
<i>Tabanus eggeri</i> Schiner, 1868	1	0,13
<i>Tabanus regularis</i> Jaenicke 1866	1	0,13
<i>Tabanus shannonellus</i> Kröber, 1936	1	0,13
<i>Tabanus spodopterus</i> Meigen 1820	1	0,13
<i>Tabanus obsolescens</i> Pandellé, 1883	1	0,13
<i>Haematopota pluvialis</i> (Linné, 1758)	1	0,13
<i>Haematopota bigoti</i> Gobert, 1880	1	0,13
Σ 33	739	100

border of the spreading of this species in Europe (CHVALA *et al.*, 1972). *Tabanus regularis* was also recorded in Iraq, Iran and Azerbaijan (CHVALA *et al.*, 1972). In the localities covered with reeds along the Neretva river specimens of the species *Haematopota bigoti* and *Hybomitra ukrainica* were also collected in a habitat similar to that in Petrijevci (CR 05), where

Table 2. Number of collected horse flies specimens on the lower part of the Neretva river.

Localities	Collected specimens	%
Opuzen	281	38,02
Modro Oko	256	34,64
Metković	138	18,67
Badžula	32	4,33
Baćina	27	3,65
Ušće Neretve	5	0,67
Σ	739	100

they were first determined in Croatian fauna (KRČMAR & MAJER, 1994; KRČMAR & MIKUSKA, 1994). The collected sample contained only 12 male horse flies. Seven males of the species *Dasyrhamphis anthracinus* were caught by means of a snare after 8 o'clock in the morning on yellow blossoms of the plant *Paliurus spina christi* on 30th May 1995 in the localities in Baćina (XH 97), on the banks of the Baćina Lakes. On the same day on localities in Opuzen (YH 06), there was also collected one male specimen of the species *Dasyrhamphis anthracinus*. On 4th June 1996 in the localities in Baćina (XH 97), 4♂ specimens of the species *Dasyrhamphis anthracinus* were caught on the bank of the lake around seven o'clock in the morning, after they had been observed fluttering in position at 1 to 1,5 m above ground. All other collected specimens are female, caught on cows and horses during pasturing. The determined species indicate certain faunistic characteristics of the Mediterranean, since most of the collected specimens belonged to Mediterranean species that are well adapted to the marshland habitats around the lower part of the Neretva river. The acquired results should serve as an encouragement for further, even more systematic entomological research of the region around the lower part of the Neretva, because in our examination of the literature about horse flies in Croatia, we have only come across one piece of information about the species *Chrysops viduatus* which was recorded on 20th June 1928 (1♂) in Opuzen according to (MOUCHA, 1959). In the collections of the Croatian Museum of Natural Sciences in Zagreb we have also found (2♀) specimens of the species *Chrysops italicus* collected on 15th September 1948 at the mouth of the river Neretva. On the territory around the lower part of the Neretva river all together 33 species of horse flies were recorded.

List of the ascertained species of horse flies, including UTM marks, dates, and numbers of the specimens caught in the lower part of the Neretva river.

1. *Chrysops caecutiens* Linné, 1758: Opuzen (YH 06), 30.V.1995 (1♀).
2. *Chrysops flavipes* Meigen, 1804: Opuzen (YH 06), 30.V.1995 (1♀).
3. *Chrysops italicus* Meigen, 1804: Ušće Neretve (YH 06), 15.IX.1948 (2♀).

This species is a part of the Croatian Natural Museum collection in Zagreb.

4. *Chrysops pictus* (Meigen, 1820): Modro Oko (YH 06), 30.V.1995 (2♀), 4.VI.1996 (37♀); Opuzen (YH 06), 4.VI.1996 (1♀); Metković (YH 16), 4.VI.1996 (2♀); Badžula (YH 16), 4.VI.1996 (1♀); Ušće Neretve (YH 06), 4.VI.1996 (2♀).
5. *Atylotus loewianus* (Villeneuve, 1920): Opuzen (YH 06), 11.VII.1996 (1♀).
6. *Therioptectes gigas* (Herbst, 1787): Opuzen (YH 06), 30.V.1995 (4♀), 19.V.1996 (6♀), 4.VI.1996 (3♀); Modro Oko (YH 06), 4.VI.1996 (1♀); Badžula (YH 16), 4.VI.1996 (1♀).
7. *Therioptectes tunicatus* (Szilady, 1927): Opuzen (YH 06), 30.V.1995 (9♀), 19.V.1996 (8♀), 4.VI.1996 (6♀); Modro Oko (YH 06), 30.V.1995 (2♀), 4.VI.1996 (10♀); Metković (YH 16), 4.VI.1996 (1♀).
8. *Hybomitra acuminata* (Loew, 1858): Bačina (XH 97), 30.V.1995 (1♀); Opuzen (YH 06), 30.V.1995 (5♀), 19.V.1996 (4♀), 4.VI.1996 (8♀); Modro Oko (YH 06), 30.V.1995 (2♀), 4.VI.1996 (18♀); Metković (YH 16), 4.VI.1996 (20♀); Badžula (YH 16), 4.VI.1996 (15♀).
9. *Hybomitra ciureai* (Séguy, 1937): Opuzen (YH 06), 30.V.1995 (41♀), 26.VII.1995 (4♀), 19.V.1996 (12♀), 4.VI.1996 (23♀); Modro Oko (YH 06), 30.V.1995 (2♀), 4.VI.1996 (28♀); Metković (YH 16), 4.VI.1996 (68♀); Badžula (YH 16), 4.VI.1996 (1♀).
10. *Hybomitra muehlfeldi* (Brauer, 1880): Opuzen (YH 06), 30.V.1995 (23♀), 26.VII.1995 (1♀), 19.V.1996 (2♀), 4.VI.1996 (7♀); Modro Oko (YH 06), 30.V.1995 (11♀), 4.VI.1996 (67♀); Metković (YH 16), 4.VI.1996 (35♀); Badžula (YH 16), 4.VI.1996 (5♀).
11. *Hybomitra ukrainica* (Olsufjev, 1952): Opuzen (YH 06), 30.V.1995 (2♀), 4.VI.1996 (1♀); Modro Oko (YH 06), 4.VI.1996 (6♀); Metković (YH 16), 4.VI.1996 (1♀).
12. *Hybomitra expollicata* (Pandellé, 1883): Opuzen (YH 06), 30.V.1995 (1♀), 19.V.1996 (1♀), 4.VI.1996 (2♀), 7.VIII.1996 (1♀); Modro Oko (YH 06), 30.V.1995 (1♀), 4.VI.1996 (1♀).
13. *Tabanus autumnalis* Linnaeus, 1761: Bačina (XH 97), 30.V.1995 (2♀); Opuzen (YH 06), 30.V.1995 (7♀), 26.VII.1995 (2♀), 19.V.1996 (9♀), 4.VI.1996 (4♀), 11.VII.1996 (6♀), 7.VIII.1996 (1♀); Modro Oko (YH 06), 30.V.1995 (1♀), 4.VI.1996 (12♀); Metković (YH 16), 4.VI.1996 (3♀).
14. *Tabanus bifarius* Loew, 1858: Bačina (XH 97), 30.V.1995 (1♀); Metković (YH 16), 4.VI.1996 (2♀).
15. *Tabanus bromius* Linnaeus, 1758: Opuzen (YH 06), 26.VII.1995 (4♀), 4.VI.1996 (5♀), 11.VII.1996 (6♀); Bačina (XH 97), 26.VII.1995 (1♀); Modro Oko (YH 06), 4.VI.1996 (2♀); Metković (YH 16), 4.VI.1996 (3♀).
16. *Tabanus eggeri* Schiner, 1868: Opuzen (YH 06), 26.VII.1995 (1♀).
17. *Tabanus exclusus* Pandellé, 1883: Opuzen (YH 06), 11.VII.1996 (1♀), 7.VIII.1996 (10♀).
18. *Tabanus miki* Brauer, 1880: Opuzen (YH 06), 26.VII.1995 (1♀), 4.VI.1996 (1♀).

19. *Tabanus obsolescens* Pandellé, 1883: Opuzen (YH 06), 7.VIII.1996 (1♀).
20. *Tabanus quatuornotatus* Meigen, 1820: Modro Oko (YH 06), 4.VI.1996 (1♀); Metković (YH 16), 4.VI.1996 (1♀).
21. *Tabanus regularis* Jaennicke, 1866: Opuzen (YH 06), 7.VIII.1996 (1♀).
22. *Tabanus shannonellus* Kröber, 1936: Opuzen (YH 06), 7.VIII.1996 (1♀).
23. *Tabanus spectabilis* Loew, 1858: Opuzen (YH 06), 26.VII.1995 (1♀), 4.VI.1996 (1♀).
24. *Tabanus spodopterus* Meigen, 1820: Opuzen (YH 06), 11.VII.1996 (1♀).
25. *Tabanus sudeticus* Zeller, 1842: Opuzen (YH 06), 4.VI.1996 (3♀), 11.VII.1996 (2♀); Modro Oko (YH 06), 4.VI.1996 (13♀); Badžula (YH 16), 4.VI.1996 (4♀); Ušće Neretve (YH 06), 4.VI.1996 (1♀).
26. *Tabanus tergestinus* Egger, 1859: Opuzen (YH 06), 26.VII.1995 (1♀), 11.VII.1996 (1♀), 7.VIII.1996 (1♀); Modro Oko (YH 06), 4.VI.1996 (1♀).
27. *Haematopota bigoti* Gobert, 1880: Opuzen (YH 06), 26.VII.1995 (1♀).
28. *Haematopota grandis* Meigen, 1820: Opuzen (YH 06), 30.V.1995 (5♀), 26.VII.1995 (1♀), 4.VI.1996 (1♀); Modro Oko (YH 06), 4.VI.1996 (2♀); Metković (YH 16), 4.VI.1996 (1♀).
29. *Haematopota italica* Meigen, 1804: Opuzen (YH 06), 26.VII.1995 (2♀).
30. *Haematopota pandazisi* Kröber, 1936: Opuzen (YH 06), 26.VII.1995 (1♀), 7.VIII.1996 (12♀).
31. *Haematopota pluvialis* (Linné, 1758): Opuzen (YH 06), 19.V.1996 (1♀).
32. *Dasyrhamphis anthracinus* (Meigen, 1820): Baćina (XH 97), 30.V.1995 (7♂, 6♀), 4.VI.1996 (4♂); Opuzen (YH 06), 30.V.1995 (1♂), 4.VI.1996 (2♀); Modro Oko (YH 06), 4.VI.1996 (20♀).
33. *Philipomyia graeca* (Fabricius, 1794): Baćina (XH 97), 30.V.1995 (2♀), 4.VI.1996 (3♀); Opuzen (YH 06), 19.V.1996 (1♀), 11.VII.1996 (2♀), 7.VIII.1996 (1♀); Modro Oko (YH 06), 4.VI.1996 (-16♀); Metković (YH 16), 4.VI.1996 (1♀); Badžula (YH 16), 4.VI.1996 (5♀).

Conclusion

Through the determination of 739 collected specimens and through the review of the literature, 33 species of horse flies were ascertained for the region of the lower part of the Neretva river. *Hybomitra expollicata* and *Tabanus regularis* are species new to the fauna of Croatia. The species *Hybomitra ciureai*, *Hybomitra muehlfeldi* and *Hybomitra acuminata* make up 54,52% of the fauna of horse flies recorded in the researched area. The collected sample contains only 12 male horse flies of the species *Dasyrhamphis anthracinus*, the majority of which were caught on the blossoms

of plant *Paliurus spina christi*. All other collected specimens are female caught on livestock.

References

- CHVALA, M., LYNEBORG, L. & MOUCHA, J., 1972. - *The Horse flies of Europe (Diptera, Tabanidae)*. Entomological Society of Copenhagen, E. W. classey Ltd, Hampton Middlesex ed., 499 pp.
- FOIL, L.D. & HOGSETTE, J.A., 1994. - Biology and control of Tabanids, stable flies and horn flies. *Revue Scientifique et Technique*, 13: 1125-58.
- KRČMAR, S. & MAJER, J., 1994. - *Hybomitra ucrainica* (OLSUFJEV, 1952) a New Species in the Fauna of Horse flies (Diptera: Tabanidae) in Croatia. *Natura Croatica*, 3: 261-264.
- KRČMAR, S. & MIKUSKA, J., 1994. - *Haematopota bigoti* (GOBERT, 1881) a Newly recorded Species of Horsefly (Diptera: Tabanidae) Fauna of Croatia. *Natura Croatica*, 3: 257-260.
- LECLERCQ, M. & VALA, J.C., 1998. - Diptères Tabanidae euroméditerranéens. Faune de France. *Féd. Soc. Sci. nat. Paris* (en préparation).
- LECLERCQ, M. & OLSUFJEV, N.G., 1981. - Nouveau catalogue des Tabanidae Palearctiques (Diptera). *Notes Fauniques de Gembloux*, 6: 1-51.
- MOUCHA, J., 1959. - Zur Kenntniss der Tabanidenfauna Jugoslawiens (Diptera: Tabanidae). *Acta Faunistica Entomologica Musei Nationalis Pragae*, 5: 17-28.
- OLSUFJEV, N.G., 1977. - *Fauna CCCP, Nasekomye dvukrilie*. VII, 2: Tabanidae. Akademia nauk CCCP, Zoologičeskij instityt n° 113: 435 pp. Leningrad.
- PARVU, C. & GIRAY, H., 1984. - Contribution to the knowledge of some Tabanids (Diptera) of Turkey. *Travaux du Museum d'Histoire naturelle Grigore Antipa*, 25: 217-225.
- PORTILLO, M., 1985. - Tabanidae (Diptera de Espana: IV *Hybomitra* Enderlein 1922). *Boletim Sociedade Portuguesa Entomologia*. II Congreso Iberico Entomologia Suppl. I: 369-377.