

DISTRIBUTION OF TABANIDS FROM THE GENUS *CHRYSOPS* (DIPTERA: TABANIDAE) IN CROATIA

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Accepted: March 7th 2008

In the Croatian fauna the genus *Chrysops* is represented by the following species: *Chrysops caecutiens* (L., 1758), *Chrysops flavipes* Meigen 1804, *Chrysops italicus* Meigen 1804, *Chrysops parallelogrammus* Zeller 1842, *Chrysops relictus* Meigen 1820, *Chrysops rufipes* Meigen 1820 and *Chrysops viduatus* (Fabricius 1794). Only two species, *Chrysops viduatus* and *Chrysops caecutiens*, are distributed both in the inland and Mediterranean part of Croatia, mostly on wet habitats. *Chrysops viduatus* covers 93 fields, whereas *Chrysops caecutiens* covers 54 fields on the UTM net of Croatia. The species *Chrysops italicus* and *Chrysops flavipes* have been sampled in the Mediterranean part of Croatia mostly at localities with brackish water. Other species from the genus *Chrysops* are distributed in the inland part of Croatia with a moderate continental climate. The species *Chrysops parallelogrammus* is distributed only at localities in the immediate vicinity of the Drava River. *Chrysops viduatus* is the most abundant species within the genus *Chrysops* in Croatia at 50.20% of all sampled specimens.

Diptera, Tabanidae, *Chrysops*, distribution, Croatia

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U fauni Hrvatske rod *Chrysops* zastupljen je ovim vrstama: *Chrysops caecutiens* (L., 1758), *Chrysops flavipes* Meigen 1804, *Chrysops italicus* Meigen 1804, *Chrysops parallelogrammus* Zeller 1842, *Chrysops relictus* Meigen 1820, *Chrysops rufipes* Meigen 1820 i *Chrysops viduatus* (Fabricius 1794). Jedino su vrste *Chrysops viduatus* i *Chrysops caecutiens* rasprostranjene u kontinentalnom i mediteranskom dijelu Hrvatske uglavnom na vlažnim staništima. Vrsta *Chrysops viduatus* pokriva 93 polja, a *Chrysops caecutiens* 54 polja na UTM mreži Hrvatske. Vrste *Chrysops italicus* i *Chrysops flavipes*

uzorkovane su u mediteranskom dijelu Hrvatske uglavnom na postajama s bočatom vodom. Ostale vrste roda *Chrysops* rasprostranjene su u kontinentalnom dijelu Hrvatske unutar pojasa s umjerenom kontinentalnom klimom. A vrsta *Chrysops parallelogrammus* rasprostranjena je jedino na postajama u neposrednoj blizini rijeke Drave. Vrsta *Chrysops viduatus* najbrojnija je vrsta unutar roda *Chrysops* u Hrvatskoj s 50,20 % svih uzorkovanih jedinki.

dvokrilci, obadi, *Chrysops*, rasprostranjenje, Hrvatska

Introduction

The family Tabanidae has been intensively studied in Croatia in the 1990's and there are several comprehensive papers dealing with the tabanid fauna of Croatia. Tabanids are worldwide known as important mechanical vectors of viruses, bacteria, protozoans and helminths, causing diseases in both wild and domestic animals (Foil, 1989). The only human pathogen known to be transmitted cyclically is loa loa filariasis by *Chrysops* sp. (Gibson & Torr, 1999). The first isolates of spiroplasma (tsp) in the Palaearctic region have recently been obtained from some European tabanid species such as *Chrysops caecutiens* and *Chrysops viduatus* (Le Goff et al. 1991). Nearly all female tabanids feed on vertebrate blood, which provides the nutrients necessary for reproduction and development. Therefore, only females have great medical and veterinary importance (Baranov, 1945; Chvála et al. 1972). The Tabanidae family comprises so far 78 species in the fauna of Croatia (Krčmar et al. 1996; Krčmar et al. 2003, Krčmar & Merdić, 2007). The purpose of this study was to present a list of the species of tabanids from the genus *Chrysops* in Croatia with the information on the abundance and distribution of this genus.

Materials and methods

Thoroughgoing faunistic research was carried out in Croatia between 1992 and 2005. Female tabanids were collected on livestock, by Malaise and Manitoba traps, or were captured from car windows. Furthermore, some specimens were collected on vegetation (blossoms of different plants). The following lists of species include all available literary records and the data from the tabanid collection of Dr. J. Mikuska. The classification used follows Chvála et al. (1972) and the Palaearctic Catalogue (Chvála, 1988). For every species there is a record of the

sampling place, UTM fields, date, number of specimens and sex. Distribution of the established tabanid species is represented on the UTM net with 10x10 km basic fields.

Results and Discussion

In the tabanid fauna of Croatia the genus *Chrysops* is represented by 7 species. The most numerous is the species *Chrysops viduatus* (Fabricius, 1794) at 50.20%, whereas other species are represented as follows: *Chrysops relictus* Meigen, 1820 at 16.63%, *Chrysops parallelogrammus* Zeller, 1842 at 16.47%, *Chrysops caecutiens* (L., 1758) at 11.60%, *Chrysops rufipes* Meigen, 1820 at 3.22%, *Chrysops italicus* Meigen, 1804 at 1.34%, and *Chrysops flavipes* Meigen,

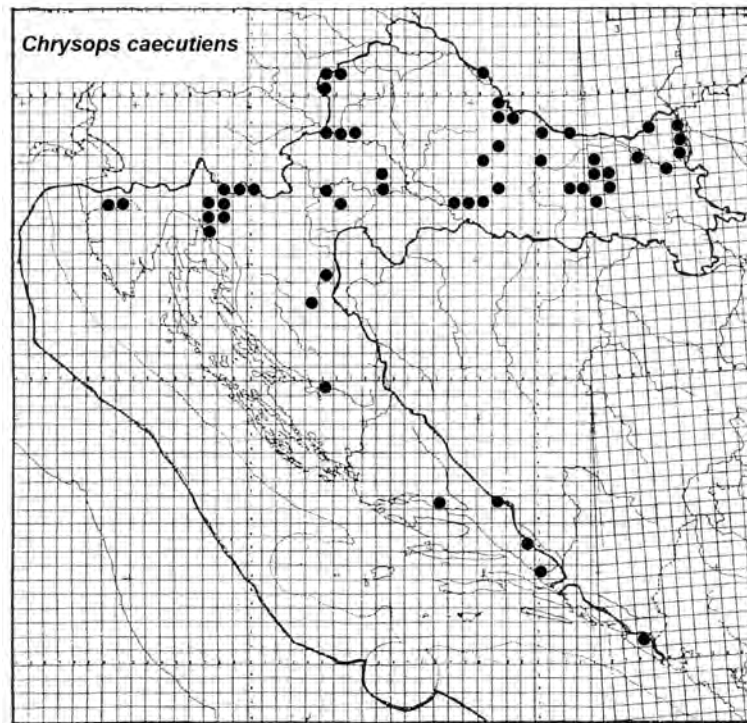


Figure 1. Distribution of *Chrysops caecutiens* (L., 1758) in Croatia.

Table 1. The number of specimens of the species *Ch. caecutiens* collected in Croatia.

Localities	UTM	Date	Specimens	Source of data
Novska	XL 52	17.08.1963.	1♀	Leclercq, 1965.
Buzet	VL 12	16.08.1975.	1♀	Leclercq, 1976.
Livade	VL 02	14.08.1975.	15♀	Leclercq, 1976.
Livade	VL 02	19.08.1975.	23♀	Leclercq, 1976.
Kopački rit	CR 35	-	46♀	Majer & Mikuska, 1988.
Mrzla Vodica	VL 72	18.08.1889.	1♀	Moucha, 1965.
Pregrada	WM 51	17.07.1848.	1♀	Moucha, 1965.
Zagreb	WL 77	19.06.1891.	1♀	Moucha, 1965.
Crikvenica	VL 70	27.06.1893.	1♀	Moucha, 1965.
Podsused	WL 67	11.07.1894.	1♀	Moucha, 1965.
Fužine	VL 71	24.07.1895.	1♀	Moucha, 1965.
Fužine	VL 71	08.08.1895.	2♀	Moucha, 1965.
Fužine	VL 71	06.06.1897.	1♀	Moucha, 1965.
Osijek	CR 24	28.07.1898.	1♀	Moucha, 1965.
Zagreb	WL 77	23.07.1903.	1♀	Moucha, 1965.
Skrad	VL 93	20.07.1914.	1♀	Moucha, 1965.
Špišić Bukovica	XL 78	31.05.1917.	3♀	Moucha, 1965.
Brestovac	XL 65	02.08.1918.	2♀	Moucha, 1965.
Pakrac	XL 73	09.08.1918.	1♀	Moucha, 1965.
Zapeć	WL 03	15.08.1923.	2♀	Moucha, 1965.
Ljeskovac Plitvički	WK 46	27.06.1964.	16♀	Moucha, 1965.
Krapina	WM 61	-	1♀	Moucha, 1965.
Sadilovac	WK 58	-	1♀	Moucha, 1965.
Londžica	BR 74	24.06.1969.	1♀	Rucner, 1994.
Prkos – Našice	BR 74	25.06.1969.	3♀	Rucner, 1994.
Kalje (Lekenik)	WL 94	21.07.1970.	1♀	Rucner, 1994.
Čudomerščak	WL 57	05.08.1970.	1♀	Rucner, 1994.
Bektež	YL 23	12.08.1970.	1♀	Rucner, 1994.
Draganić Lug	WL 54	19.08.1970.	1♀	Rucner, 1994.
Podunavlje	CR 35	24.07.1987.	1♀	J. Mikuska collection
Bokane	YL 05	10.07.1989.	4♀	J. Mikuska collection
Grubišno Polje	XL 76	15.07.1989.	1♀	J. Mikuska collection
Podgorje Bračevačko	BR 83	13.07.1990.	2♀	J. Mikuska collection
Macute	YL 05	26.07.1990.	2♀	J. Mikuska collection
Repaš	YL 05	07.07.2001.	1♀	J. Mikuska collection
Sekulinci	YL 33	10.08.2001.	1♀	J. Mikuska collection
Bektež	YL 23	10.08.2001.	1♀	J. Mikuska collection

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Omiš	XJ 31	21.05.2002.	4♀	J. Mikuska collection
Gruda	BN 81	08.07.2002.	1♀	J. Mikuska collection
Podolje	CR 17	19.08.2002.	2♀	J. Mikuska collection
Podolje	CR 17	24.05.2003.	4♂	J. Mikuska collection
Podolje	CR 17	24.05.2003.	8♀	J. Mikuska collection
Podolje	CR 17	26.05.2003.	1♂	J. Mikuska collection
Podolje	CR 17	26.05.2003.	1♀	J. Mikuska collection
Koška	BR 84	07.06.1992.	2♀	S. Krčmar collection
Petrijevci	CR 05	21.05.1993.	1♀	S. Krčmar collection
Petrijevci	CR 05	27.05.1993.	1♀	S. Krčmar collection
Petrijevci	CR 05	29.05.1993.	1♀	S. Krčmar collection
Petrijevci	CR 05	02.06.1993.	1♀	S. Krčmar collection
Klokočevci	BR 75	30.06.1993.	1♀	S. Krčmar collection
Petrijevci	CR 05	09.07.1993.	2♀	S. Krčmar collection
Šag	CR 05	25.07.1993.	1♀	S. Krčmar collection
Petrijevci	CR 05	18.06.1994.	2♀	S. Krčmar collection
Brod na Kupu	VL 83	24.06.1994.	1♀	S. Krčmar collection
Kumrovec	WM 50	19.07.1994.	1♀	S. Krčmar collection
Borovik	BR 72	30.07.1994.	1♀	S. Krčmar collection
Opuzen	YH 06	30.05.1995.	1♀	S. Krčmar collection
Omiš	XJ 31	31.05.1995.	3♀	S. Krčmar collection
Imotski	XJ 71	20.06.1995.	2♀	S. Krčmar collection
Glavina Donja	XJ 71	21.06.1995.	4♀	S. Krčmar collection
Segetac	XL 42	30.06.1995.	1♀	S. Krčmar collection
Borovik	BR 72	03.07.1995.	1♀	S. Krčmar collection
Brodić	XL 79	11.07.1995.	2♀	S. Krčmar collection
Mekiš	XL 79	11.07.1995.	1♀	S. Krčmar collection
Podravske Sesvete	XL 79	11.07.1995.	1♀	S. Krčmar collection
Donji Čaglić	XL 62	15.07.1995.	3♀	S. Krčmar collection
Repaš	XM 61	24.07.1995.	1♀	S. Krčmar collection
Zaton	WJ 59	02.06.1996.	1♀	S. Krčmar collection
Obrovac	WJ 59	02.06.1996.	8♀	S. Krčmar collection
Omiš	XJ 31	03.06.1996.	5♀	S. Krčmar collection
Omiš	XJ 31	05.06.1996.	8♀	S. Krčmar collection
Lokve	VL 82	29.06.1996.	7♀	S. Krčmar collection
Omiš	XJ 31	10.07.1996.	1♀	S. Krčmar collection
Lipovljani	XL 42	10.06.1997.	4♀	S. Krčmar collection
Lokve	VL 82	25.06.1997.	4♀	S. Krčmar collection
Petrinja	WL 93	20.08.1997.	1♀	S. Krčmar collection
Gvozd	WL 62	20.08.1997.	1♀	S. Krčmar collection
Tikveš - Kopački rit	CR 36	28.05.1999.	1♀	S. Krčmar collection

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Zmajevac	CR 37	28.05.2000.	1♀	S. Krčmar collection
Brod na Kupu	VL 83	16.06.2000.	1♀	S. Krčmar collection
Matić poljana	VL 81	21.06.2000.	1♀	S. Krčmar collection
Zmajevac	CR 37	05.07.2000.	1♀	S. Krčmar collection
Branjina	CR 37	16.05.2002.	30♀	S. Krčmar collection
Monjoroš (Zmajevac)	CR 37	01.06. 2002.	3♀	S. Krčmar collection
Monjoroš (Zmajevac)	CR 37	10.07.2002.	1♀	S. Krčmar collection
Orah - Sv. Ilije	XH 98	07.06.2003.	4♀	S. Krčmar collection
Tikveš	CR 36	2.08.2004	1♀	S. Krčmar collection
Bušetina	XL 88	28.05.2005.	2♀	S. Krčmar collection
Monjoroš (Zmajevac)	CR 37	14.06.2005.	1♀	S. Krčmar collection
Noskovci	YL 27	18.06.2005.	1♀	S. Krčmar collection
Repaš	XM 61	18.06.2005.	1♀	S. Krčmar collection
Monjoroš (Zmajevac)	CR 37	15.07.2005.	1♀	S. Krčmar collection
Repaš	XM 61	16.07.2005.	1♀	S. Krčmar collection
Podravske Sesvete	XL 79	16.07.2005.	1♀	S. Krčmar collection
Novaki	YL 07	16.07.2005.	1♀	S. Krčmar collection
Monjoroš (Zmajevac)	CR 37	10.08.2005.	1♀	S. Krčmar collection
Σ	54		295	

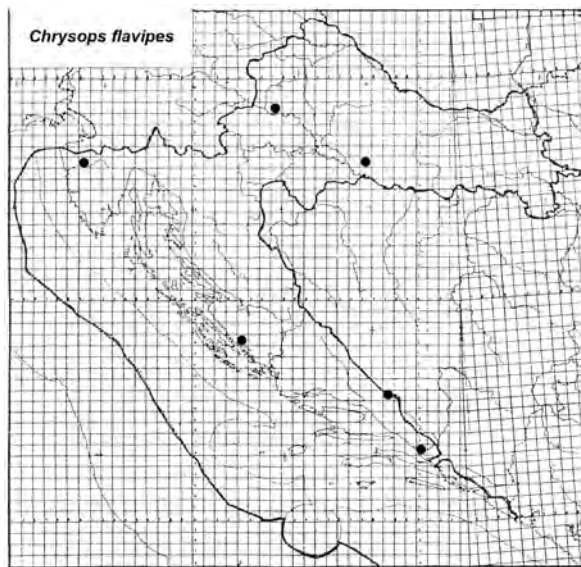
Figure 2. Distribution of *Chrysops flavipes* Meigen, 1804 in Croatia.

Table 2. The number of specimens of the species *Ch. flavipes* collected in Croatia.

Localities	UTM	Date	Specimens	Source of data
Zagreb	WL 77	18.07.1886.	1♂	Moucha, 1965.
Novska	XL 52	17.08.1963.	1♂	Leclercq, 1965.
Livade	VL 02	19.08.1975.	2♀	Leclercq, 1976.
Opuzen	YH 06	30.05.1995.	1♀	S. Krčmar collection
Imotski	XJ 71	20.06.1995.	1♀	S. Krčmar collection
Vransko jezero	WJ 46	27.07.1995.	1♀	S. Krčmar collection
Vransko jezero	WJ 46	03.06.1996.	7♀	S. Krčmar collection
Σ	6		14	

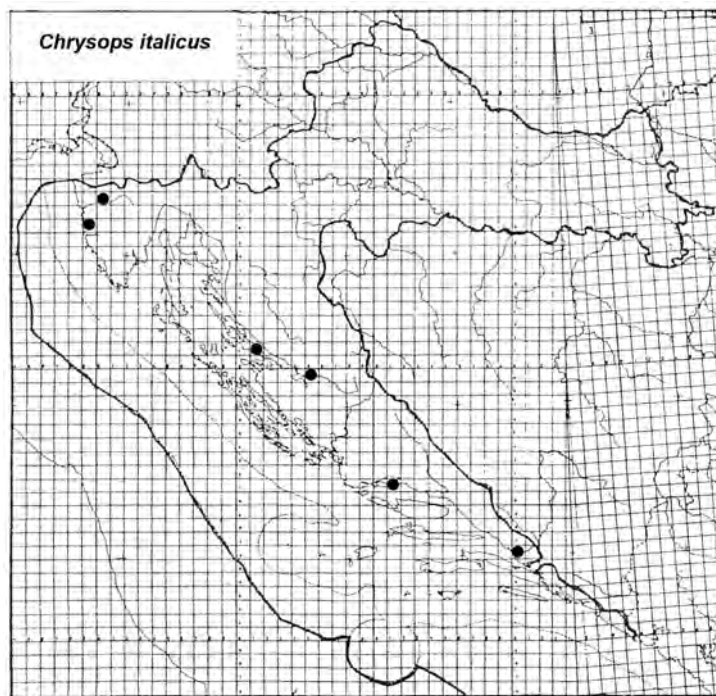


Figure 3. Distribution of *Chrysops italicus* Meigen, 1804 in Croatia.

Table 3. The number of specimens of the species *Ch. italicus* collected in Croatia.

Localities	UTM	Date	Specimens	Source of data
Split	XJ 11	-	1♂	Strobl, 1893.
Split	XJ 11	-	-	Strobl, 1898.
Split	XJ 11	-	-	Strobl, 1900.
Lucija	VL 02	10.06.1964.	2♀,5♂	Moucha, 1965.
Ušće Neretve	YH 06	15.09.1948.	2♀	Krčmar & Leclercq, 1997
Funtana	UL 90	21.07.1995.	1♀	S. Krčmar collection
Obrovac	WJ 59	02.06.1996.	4♀	S. Krčmar collection
Dinjiška	WK 11	20.07.1996.	1♀	S. Krčmar collection
Dinjiška	WK 11	23.07.1996.	4♀	S. Krčmar collection
Dinjiška	WK 11	05.06.2001.	3♀	J. Mikuska collection
Ušće Neretve	YH 06	22.05.2002.	10♀	S. Krčmar collection
Ušće Neretve	YH 06	09.07.2002.	1♀	S. Krčmar collection
Σ	6		34	

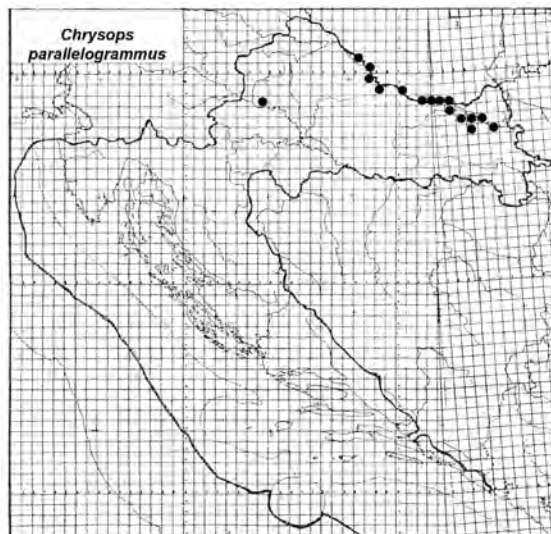
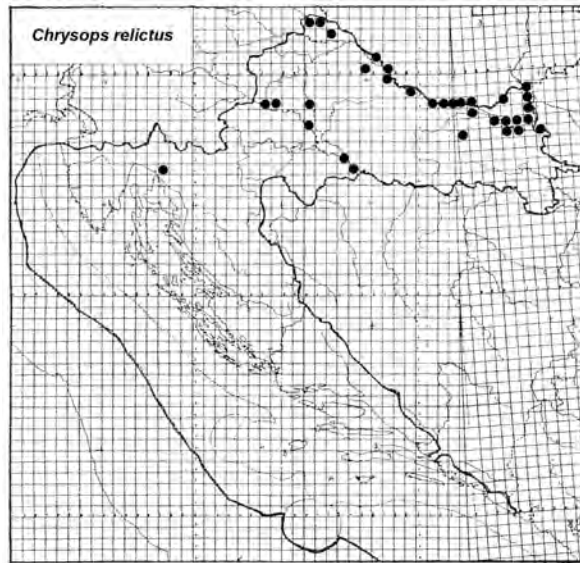
Figure 4. Distribution of *Chrysops parallelogrammus* Zeller, 1842 in Croatia.

Table 4. The number of specimens of the species *Ch. parallelogrammus* collected in Croatia.

Localities	UTM	Date	Specimens	Source of data
Osijek	CR 24	22.07.1896.	1♂	Moucha, 1965.
Zagreb	WL 77	19.05.1916.	1♂	Moucha, 1965.
Josipovac	CR 15	23.07.1992.	1♀	S. Krčmar collection
Josipovac	CR 15	14.05.1993.	2♀	S. Krčmar collection
Petrijevci	CR 05	26.05.1993.	7♀	S. Krčmar collection
Petrijevci	CR 05	27.05.1993.	6♀	S. Krčmar collection
Petrijevci	CR 05	29.05.1993.	8♀	S. Krčmar collection
Petrijevci	CR 05	31.05.1993.	1♀	S. Krčmar collection
Petrijevci	CR 05	02.06.1993.	25♀	S. Krčmar collection
Donji Miholjac	BR 87	04.06.1993.	1♀	S. Krčmar collection
Petrijevci	CR 05	12.06.1993.	1♀	S. Krčmar collection
Petrijevci	CR 05	19.06.1993.	21♀	S. Krčmar collection
Petrijevci	CR 05	22.06.1993.	8♀	S. Krčmar collection
Osijek	CR 24	30.06.1993.	1♀	S. Krčmar collection
Šestilovac (Viljevo)	BR 77	30.06.1993.	18♀	S. Krčmar collection
Sveti Đurađ	BR 86	30.06.1993.	9♀	S. Krčmar collection
Petrijevci	CR 05	08.07.1993.	11♀	S. Krčmar collection
Petrijevci	CR 05	09.07.1993.	38♀	S. Krčmar collection
Petrijevci	CR 05	10.07.1993.	46♀	S. Krčmar collection
Čokadinci	CR 04	11.07.1993.	1♀	S. Krčmar collection
Petrijevci	CR 05	25.07.1993.	8♀	S. Krčmar collection
Šag	CR 05	25.07.1993.	13♀	S. Krčmar collection
Petrijevci	CR 05	29.07.1993.	36♀	S. Krčmar collection
Petrijevci	CR 05	08.08.1993.	1♀	S. Krčmar collection

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Petrijevci	CR 05	12.08.1993.	14♀	S. Krčmar collection
Petrijevci	CR 05	13.08.1993.	4♀	S. Krčmar collection
Gat	BR 95	15.08.1993.	26♀	S. Krčmar collection
Petrijevci	CR 05	09.09.1993.	1♀	S. Krčmar collection
Brodić	XL 79	26.05.1994.	1♀	S. Krčmar collection
Lijepa Greda	XM 70	26.05.1994.	1♀	S. Krčmar collection
Petrijevci	CR 05	18.06.1994.	25♀	S. Krčmar collection
Petrijevci	CR 05	30.06.1994.	7♀	S. Krčmar collection
Petrijevci	CR 05	02.07.1994.	13♀	S. Krčmar collection
Sveti Đurađ	BR 86	04.07.1994.	3♀	S. Krčmar collection
Petrijevci	CR 05	16.07.1994.	5♀	S. Krčmar collection
Petrijevci	CR 05	23.07.1994.	13♀	S. Krčmar collection
Petrijevci	CR 05	06.08.1994.	1♀	S. Krčmar collection
Petrijevci	CR 05	02.07.1995.	1♀	S. Krčmar collection
Budakovac	YL 08	11.07.1995.	1♀	S. Krčmar collection
Repaš	XM 61	24.07.1995.	2♀	S. Krčmar collection
Lijepa Greda	XM 70	07.07.2001.	7♀	J. Mikuska collection
Noskovci	YL 27	18.06.2005.	1♀	S. Krčmar collection
Brodić	XL 79	16.07.2005.	3♀	S. Krčmar collection
Ferdinandovac	XM 70	20.08.2005.	1♀	S. Krčmar collection
Podravska Moslavina	YL 37	20.08.2005.	1♀	S. Krčmar collection
Brodić	XL 79	20.08.2005.	20♀	S. Krčmar collection
Okrugljača	XL 88	20.08.2005.	1♀	S. Krčmar collection
Noskovci	YL 27	20.08.2005.	2♀	S. Krčmar collection
Σ	16		419	

Figure 5. Distribution of *Chrysops relictus* Meigen, 1820 in Croatia.Table 5. The number of specimens of the species *Ch. relictus* collected in Croatia.

Localities	UTM	Date	Specimens	Source of data
Podsused	WL 67	11.08.1894.	1♀	Moucha, 1965.
Fužine	VL 71	01.08.1895.	1♀	Moucha, 1965.
Božjakovina	XL 07	21.05.1898.	1♀	Moucha, 1965.
Osijek	CR 24	22.08.1898.	1♀	Moucha, 1965.
Osijek	CR 24	22.08.1898.	1♂	Moucha, 1965.
Zagreb	WL 77	17.06.1909.	2♀	Moucha, 1965.
Donji Miholjac	BR 87	16.08.1915.	1♀	Moucha, 1965.
Podunavlje	CR 35	04.07.1987.	4♀	J. Mikuska collection
Podunavlje	CR 35	20.07.1987.	3♀	J. Mikuska collection
Čošak šume (Podunavlje)	CR 35	22.07.1987.	3♀	J. Mikuska collection
Podunavlje	CR 35	24.07.1987.	1♀	J. Mikuska collection
Kopačevo	CR 25	25.07.1987.	1♀	J. Mikuska collection
Kopački rit	CR 35	25.07.1987.	13♀	J. Mikuska collection

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Podunavlje	CR 35	26.07.1987.	2♀	J. Mikuska collection
Čošak šume (Podunavlje)	CR 35	29.07.1987.	2♀	J. Mikuska collection
Aljmaš	CR 44	04.08.1987.	1♀	J. Mikuska collection
Sakadaš	CR 25	11.08.1987.	1♀	J. Mikuska collection
Podunavlje	CR 35	14.08.1987.	1♀	J. Mikuska collection
Podunavlje	CR 35	17.08.1987.	1♀	J. Mikuska collection
Donji Miholjac	BR 87	18.08.1987.	1♀	J. Mikuska collection
Bezdan	CR 14	20.08.1987.	1♀	J. Mikuska collection
Podunavlje	CR 35	24.08.1987.	3♀	J. Mikuska collection
Podunavlje	CR 35	27.08.1987.	1♀	J. Mikuska collection
Sakadaš	CR 25	06.07.1988.	1♀	J. Mikuska collection
Kopački rit	CR 35	02.08.1988.	2♀	J. Mikuska collection
Kopački rit	CR 35	08.08.1989.	5♀	J. Mikuska collection
Kopački rit	CR 35	15.08.1989.	3♀	J. Mikuska collection
Kopački rit	CR 35	02.09.1989.	1♀	J. Mikuska collection
Kopački rit	CR 35	10.05.1990.	3♀	J. Mikuska collection
Kopačevo	CR 25	16.05.1990.	1♀	J. Mikuska collection
Sakadaš	CR 25	16.05.1990.	1♀	J. Mikuska collection
Donji Miholjac	BR 87	20.06.1990.	1♀	J. Mikuska collection
Trebež	XL 32	14.07.1990.	7♀	J. Mikuska collection
Batina	CR 38	16.08.1990.	1♀	J. Mikuska collection
Kopački rit	CR 35	17.08.1990.	4♀	J. Mikuska collection
Kopačevo	CR 25	16.06.2001.	1♀	J. Mikuska collection
Repaš	XM 61	07.07.2001.	5♀	J. Mikuska collection
Lijepa Greda	XM 70	07.07.2001.	6♀	J. Mikuska collection
Mekiš	XM 70	07.07.2001.	1♀	J. Mikuska collection
Kopački rit	CR 35	17.05.2002.	1♀	J. Mikuska collection
Kopačevo	CR 25	16.08.2002.	2♀	J. Mikuska collection
Repaš	XM 61	02.07.2003.	1♀	J. Mikuska collection
Lijepa Greda	XM 70	02.07.2003.	5♀	J. Mikuska collection
Josipovac	CR 15	18.07.1992.	1♀	S. Krčmar collection
Josipovac	CR 15	23.07.1992.	1♀	S. Krčmar collection
Donji Miholjac	BR 87	04.06.1993.	1♀	S. Krčmar collection
Petrijevci	CR 05	19.06.1993.	1♀	S. Krčmar collection
Šestilovac (Viljevo)	BR 77	30.06.1993.	1♀	S. Krčmar collection
Sveti Đurađ	BR 86	30.06.1993.	4♀	S. Krčmar collection
Osijek	CR 24	08.07.1993.	3♀	S. Krčmar collection

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Petrijevci	CR 05	10.07.1993.	2♀	S. Krčmar collection
Petrijevci	CR 05	08.08.1993.	1♀	S. Krčmar collection
Petrijevci	CR 05	12.08.1993.	1♀	S. Krčmar collection
Petrijevci	CR 05	18.06.1994.	1♀	S. Krčmar collection
Petrijevci	CR 05	30.06.1994.	2♀	S. Krčmar collection
Petrijevci	CR 05	02.07.1994.	3♀	S. Krčmar collection
Sveti Đurađ	BR 86	04.07.1994.	1♀	S. Krčmar collection
Trebarljevo	XL 05	17.07.1994.	1♀	S. Krčmar collection
Hrženica	XM 23	08.07.1995.	18♀	S. Krčmar collection
Šenkovec	XM 04	08.07.1995.	1♀	S. Krčmar collection
Lijepa Greda	XM 70	11.07.1995.	11♀	S. Krčmar collection
Brodić	XL 79	11.07.1995.	3♀	S. Krčmar collection
Sopje	YL 17	11.07.1995.	1♀	S. Krčmar collection
Đurdenovac	BR 74	20.07.1995.	2♀	S. Krčmar collection
Repaš	XM 61	24.07.1995.	3♀	S. Krčmar collection
Belica	XM 14	25.07.1995.	1♀	S. Krčmar collection
Krapje dol	XL 41	20.06.1996.	3♀	S. Krčmar collection
Donji Miholjac	BR 87	16.06.1997.	5♀	S. Krčmar collection
Šestilovac	BR 77	16.06.1997.	3♀	S. Krčmar collection
Kopačevo	CR 25	28.05.1998.	2♀	S. Krčmar collection
Kopački rit	CR 25	27.08.1998.	2♀	S. Krčmar collection
Monjoroš (Zmajevac)	CR 37	19.07.1999.	1♀	S. Krčmar collection
Monjoroš (Zmajevac)	CR 37	26.05.2000.	1♀	S. Krčmar collection
Monjoroš (Zmajevac)	CR 37	27.05.2000.	8♀	S. Krčmar collection
Monjoroš (Zmajevac)	CR 37	28.05.2000.	8♀	S. Krčmar collection
Monjoroš (Zmajevac)	CR 37	29.05.2000.	1♀	S. Krčmar collection
Monjoroš (Zmajevac)	CR 37	03.06.2000.	6♀	S. Krčmar collection
Batina	CR 38	03.06.2000.	2♀	S. Krčmar collection
Monjoroš (Zmajevac)	CR 37	10.06.2000.	1♀	S. Krčmar collection
Monjoroš (Zmajevac)	CR 37	14.06.2000.	19♀	S. Krčmar collection
Monjoroš (Zmajevac)	CR 37	21.06.2000.	3♀	S. Krčmar collection
Monjoroš (Zmajevac)	CR 37	26.06.2001.	1♀	S. Krčmar collection
Monjoroš (Zmajevac)	CR 37	27.06.2001.	1♀	S. Krčmar collection
Monjoroš (Zmajevac)	CR 37	27.07.2001.	1♀	S. Krčmar collection
Monjoroš (Zmajevac)	CR 37	28.07.2001.	2♀	S. Krčmar collection
Monjoroš (Zmajevac)	CR 37	09.08.2001.	7♀	S. Krčmar collection
Monjoroš (Zmajevac)	CR 37	18.08.2001.	1♀	S. Krčmar collection

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Monjoroš (Zmajevac)	CR 37	31.05.2002.	7♀	S. Krčmar collection
Monjoroš (Zmajevac)	CR 37	01.06.2002.	26♀	S. Krčmar collection
Monjoroš (Zmajevac)	CR 37	02.06.2002.	2♀	S. Krčmar collection
Monjoroš (Zmajevac)	CR 37	03.06.2002.	3♀	S. Krčmar collection
Monjoroš (Zmajevac)	CR 37	18.06.2002.	5♀	S. Krčmar collection
Monjoroš (Zmajevac)	CR 37	20.06.2002.	3♀	S. Krčmar collection
Monjoroš (Zmajevac)	CR 37	04.07.2002.	29♀	S. Krčmar collection
Monjoroš (Zmajevac)	CR 37	05.07.2002.	7♀	S. Krčmar collection
Monjoroš (Zmajevac)	CR 37	06.07.2002.	17♀	S. Krčmar collection
Monjoroš (Zmajevac)	CR 37	07.07.2002.	4♀	S. Krčmar collection
Monjoroš (Zmajevac)	CR 37	08.07.2002.	2♀	S. Krčmar collection
Monjoroš (Zmajevac)	CR 37	09.07.2002.	4♀	S. Krčmar collection
Monjoroš (Zmajevac)	CR 37	10.07.2002.	1♀	S. Krčmar collection
Monjoroš (Zmajevac)	CR 37	30.07.2002.	4♀	S. Krčmar collection
Monjoroš (Zmajevac)	CR 37	31.07.2002.	1♀	S. Krčmar collection
Monjoroš (Zmajevac)	CR 37	03.08.2002.	1♀	S. Krčmar collection
Monjoroš (Zmajevac)	CR 37	21.08.2002.	2♀	S. Krčmar collection
Monjoroš (Zmajevac)	CR 37	03.09.2002.	1♀	S. Krčmar collection
Monjoroš (Zmajevac)	CR 37	24.05.2003.	1♀	S. Krčmar collection
Podolje	CR 17	26.05.2003.	1♀	S. Krčmar collection
Monjoroš (Zmajevac)	CR 37	29.07.2003.	2♀	S. Krčmar collection
Monjoroš (Zmajevac)	CR 37	28.08.2003.	1♀	S. Krčmar collection
Sakadaš	CR 25	1.06.2004.	3♀	S. Krčmar collection
Tikveš	CR 36	8.07.2004.	1♀	S. Krčmar collection
Tikveš	CR 36	6.08.2004.	1♀	S. Krčmar collection
Tikveš	CR 36	16.08.2004.	2♀	S. Krčmar collection
Tikveš	CR 36	30.08.2004.	1♀	S. Krčmar collection
Donji Miholjac	BR 87	28.05.2005.	1♀	S. Krčmar collection
Sopje	YL 17	28.05.2005.	1♀	S. Krčmar collection
Monjoroš (Zmajevac)	CR 37	14.06.2005.	2♀	S. Krčmar collection
Monjoroš (Zmajevac)	CR 37	16.06.2005.	2♀	S. Krčmar collection
Monjoroš (Zmajevac)	CR 37	17.06.2005.	1♀	S. Krčmar collection
Noskovci	YL 27	18.06.2005.	1♀	S. Krčmar collection
Repaš	XM 61	18.06.2005.	2♀	S. Krčmar collection
Monjoroš (Zmajevac)	CR 37	22.06.2005.	2♀	S. Krčmar collection
Monjoroš (Zmajevac)	CR 37	24.06.2005.	2♀	S. Krčmar collection
Monjoroš (Zmajevac)	CR 37	25.06.2005.	3♀	S. Krčmar collection

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Monjoroš (Zmajevac)	CR 37	28.06.2005.	1♀	S. Krčmar collection
Monjoroš (Zmajevac)	CR 37	29.06.2005.	1♀	S. Krčmar collection
Monjoroš (Zmajevac)	CR 37	14.07.2005.	1♀	S. Krčmar collection
Brezovica	XL 98	16.07.2005.	1♀	S. Krčmar collection
Podravska Moslavina	YL 37	16.07.2005.	1♀	S. Krčmar collection
Noskovci	YL 27	16.07.2005.	1♀	S. Krčmar collection
Gabajeva Greda	XM 50	16.07.2005.	3♀	S. Krčmar collection
Monjoroš (Zmajevac)	CR 37	17.07.2005.	1♀	S. Krčmar collection
Ferdinandovac	XM 70	20.08.2005.	6♀	S. Krčmar collection
Podravska Moslavina	YL 37	20.08.2005.	1♀	S. Krčmar collection
Brodic	XL 79	20.08.2005.	14♀	S. Krčmar collection
Noskovci	YL 27	20.08.2005.	2♀	S. Krčmar collection
Σ	33		423	

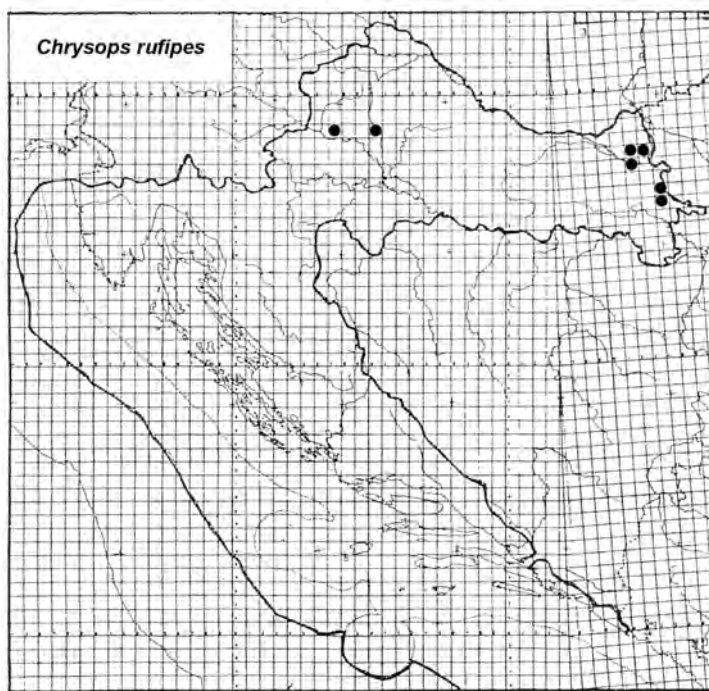
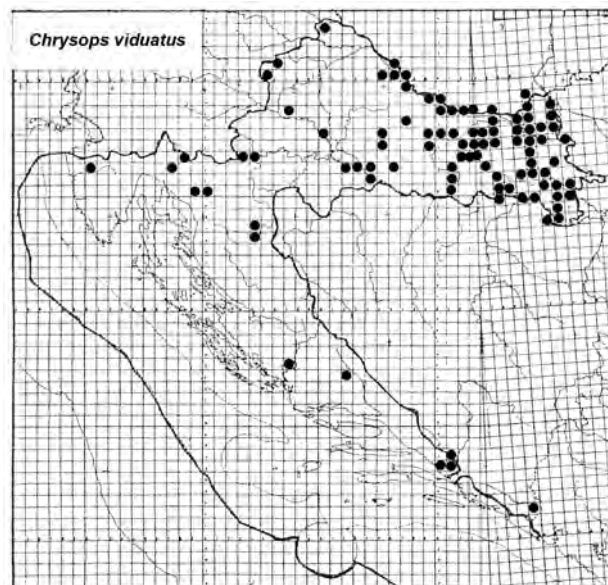


Figure 6. Distribution of *Chrysops rufipes* Meigen, 1820 in Croatia.

Table 6. The number of specimens of the species *Ch. rufipes* collected in Croatia.

Localities	UTM	Date	Specimens	Source of data
Osijek	CR 24	27.05.1893.	2♀	Moucha, 1965.
Zagreb	WL 77	06.07.1894.	1♀	Moucha, 1965.
Božjakovina	XL 07	13.06.1916.	1♀	Moucha, 1965.
Vukovar	CR 42	09.08.1917.	2♀	Moucha, 1965.
Kopačevo	CR 25	23.06.1987.	1♀,3♂	J. Mikuska collection
Kopačevo	CR 25	24.06.1987.	3♀,3♂	J. Mikuska collection
Kopačevo	CR 25	25.06.1987.	2♂	J. Mikuska collection
Kopačevo	CR 25	26.06.1987.	3♂	J. Mikuska collection
Kopačevo	CR 25	28.06.1987.	2♀,4♂	J. Mikuska collection
Kopačevo	CR 25	30.06.1987.	1♀	J. Mikuska collection
Kopačevo	CR 25	03.07.1987.	1♀,1♂	J. Mikuska collection
Grabovo	CR 41	03.07.1987.	1♂	J. Mikuska collection
Kopačevo	CR 25	04.07.1987.	2♂	J. Mikuska collection
Kopačevo	CR 25	06.07.1987.	2♀,1♂	J. Mikuska collection
Kopačevo	CR 25	07.06.1988.	2♂	J. Mikuska collection
Kopačevo	CR 25	09.06.1988.	3♂	J. Mikuska collection
Kopačevo	CR 25	12.06.1988.	1♀	J. Mikuska collection
Kopačevo	CR 25	14.06.1988.	2♀,2♂	J. Mikuska collection
Kopačevo	CR 25	07.07.1988.	1♀	J. Mikuska collection
Kopačevo	CR 25	08.06.1989.	1♀	J. Mikuska collection
Kopačevo	CR 25	10.05.2002.	3♂	J. Mikuska collection
Kopački rit	CR 35	17.05.2002.	1♀	J. Mikuska collection
Kopačevo	CR 25	06.05.2003.	2♂	J. Mikuska collection
Kopačevo	CR 25	28.05.1998.	2♀	S. Krčmar collection
Sakadaš	CR 25	20.05.2000.	20♂, 4♀	S. Krčmar collection
Sakadaš	CR 25	24.05.2000.	1♂, 1♀	S. Krčmar collection
Σ	7		82	

Figure 7. Distribution of *Chrysops viduatus* (Fabricius, 1794) in Croatia.Table 7. The number of specimens of the species *Ch. viduatus* collected in Croatia.

Localities	UTM	Date	Specimens	Source of data
Krka	WJ 75	-	-	Moucha, 1959.
Opuzen	YH 06	20.06.1928.	1♂	Moucha, 1959.
Krapina	WM 61	-	1♂, 1♀	Moucha, 1965.
Zagreb	WL 77	01.07.1899.	1♀	Moucha, 1965.
Ljeskovac Plitvički	WK 46	27.06.1964.	1♀	Moucha, 1965.
Krka	WJ 75	-	-	Strobl, 1893.
Krka	WJ 75	-	-	Strobl, 1898.
Krka	WJ 75	-	-	Strobl, 1900.
Livade	VL 02	14.08.1975.	20♀	Leclercq, 1976.
Motovun	VL 02	14.08.1975.	2♀	Leclercq, 1976.
Kopački rit	CR 35	10.07.1982.	1♀	Majer & Mikuska 1988.
Aljmaš	CR 44	27.06.1987.	1♀	J. Mikuska collection
Eblin	CR 35	30.06.1987.	1♀	J. Mikuska collection
Podunavlje	CR 35	30.06.1987.	2♀	J. Mikuska collection

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Podunavlje	CR 35	01.07.1987.	2♀	J. Mikuska collection
Ernestinovo	CR 13	09.07.1987.	1♀	J. Mikuska collection
Privlaka	CR 30	09.07.1987.	29♀	J. Mikuska collection
Zmajevac	CR 37	20.07.1987.	2♀	J. Mikuska collection
Podunavlje	CR 35	24.07.1987.	3♀	J. Mikuska collection
Bezdan	CR 14	29.07.1987.	2♀	J. Mikuska collection
Podunavlje	CR 35	17.08.1987.	2♀	J. Mikuska collection
Podunavlje	CR 35	24.08.1987.	5♀	J. Mikuska collection
Podunavlje	CR 35	27.08.1987.	3♀	J. Mikuska collection
Ćošak šume (Podunavlje)	CR 35	29.08.1987.	3♀	J. Mikuska collection
Vođinci	CR 11	21.06.1988.	1♀	J. Mikuska collection
Zdenački gaj	XL 55	23.06.1988.	2♀	J. Mikuska collection
Kopački rit	CR 35	02.07.1988.	1♀	J. Mikuska collection
Kopački rit	CR 35	26.07.1988.	2♀	J. Mikuska collection
Podunavlje	CR 35	12.06.1989.	1♀	J. Mikuska collection
Tikveš	CR 36	07.07.1989.	2♀	J. Mikuska collection
Bokane	YL 05	10.07.1989.	1♀	J. Mikuska collection
Grubišno Polje	XL 76	15.07.1989.	14♀	J. Mikuska collection
Jakšić	YL 12	19.07.1989.	1♀	J. Mikuska collection
Muško ostrvo	CR 01	20.07.1989.	1♀	J. Mikuska collection
Spačva - Virovi	CQ 39	20.07.1989.	2♀	J. Mikuska collection
Durgutovica	CR 12	20.07.1989.	1♀	J. Mikuska collection
Pleternica	YL 11	16.08.1989.	1♀	J. Mikuska collection
Kunjevci	CR 20	28.06.1990.	1♀	J. Mikuska collection
Spačva - Virovi	CQ 39	28.06.1990.	1♀	J. Mikuska collection
Lipovljani	XL 42	27.06.1990.	10♀	J. Mikuska collection
Trebež	XL 32	14.07.1990.	3♀	J. Mikuska collection
Muško ostrvo	CR 01	23.07.1990.	1♀	J. Mikuska collection
Tikveš	CR 36	16.06.2001.	1♀	J. Mikuska collection
Repaš	XM 61	07.07.2001.	12♀	J. Mikuska collection
Repaš-most	XM 60	07.07.2001.	1♀	J. Mikuska collection
Lijepa Greda	XM 70	07.07.2001.	6♀	J. Mikuska collection
Haljevo (Beli Manastir)	CR 16	07.07.2001.	1♀	J. Mikuska collection
Busiklica (Kneževo)	CR 18	26.07.2001.	8♀	J. Mikuska collection
Bektež	YL 33	27.07.2001.	1♀	J. Mikuska collection
Podunavlje	CR 35	31.07.2001.	27♀	J. Mikuska collection
Kopački rit	CR 35	04.08.2001.	12♀	J. Mikuska collection
Podunavlje	CR 35	09.08.2001.	29♀	J. Mikuska collection
Kopački rit	CR 35	17.05.2002.	2♀	J. Mikuska collection
Modro oko	YH 06	22.05.2002.	13♀	J. Mikuska collection
Modro oko	YH 06	15.06.2002.	4♀	J. Mikuska collection

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Modro oko	YH 06	09.07.2002.	3 ♀	J. Mikuska collection
Kopačevo	CR 25	16.08.2002.	1 ♀	J. Mikuska collection
Podolje	CR 17	19.08.2002.	2 ♀	J. Mikuska collection
Modro oko	YH 06	14.05.2003.	2 ♀	J. Mikuska collection
Vriještica	YH 17	14.05.2003.	13 ♀	J. Mikuska collection
Modro oko	YH 06	15.05.2003.	8 ♀	J. Mikuska collection
Vriještica	YH 17	16.05.2003.	35 ♀	J. Mikuska collection
Iševnica	VL 83	28.06.2003.	1 ♀	J. Mikuska collection
Koška	BR 84	07.06.1992.	1 ♀	S. Krčmar collection
Josipovac	CR 15	23.07.1992.	1 ♀	S. Krčmar collection
Josipovac	CR 15	30.07.1992.	1 ♀	S. Krčmar collection
Petrijevci	CR 05	27.05.1993.	1 ♀	S. Krčmar collection
Petrijevci	CR 05	29.05.1993.	3 ♀	S. Krčmar collection
Petrijevci	CR 05	02.06.1993.	1 ♀	S. Krčmar collection
Petrijevci	CR 05	19.06.1993.	2 ♀	S. Krčmar collection
Jelisavec	BR 74	30.06.1993.	1 ♀	S. Krčmar collection
Klokočevci	BR 75	30.06.1993.	15 ♀	S. Krčmar collection
Sveti Đurađ	BR 86	30.06.1993.	1 ♀	S. Krčmar collection
Čokadinci	CR 04	03.07.1993.	1 ♀	S. Krčmar collection
Osijek	CR 24	04.07.1993.	2 ♀	S. Krčmar collection
Petrijevci	CR 05	08.07.1993.	2 ♀	S. Krčmar collection
Petrijevci	CR 05	09.07.1993.	6 ♀	S. Krčmar collection
Petrijevci	CR 05	10.07.1993.	4 ♀	S. Krčmar collection
Čokadinci	CR 04	11.07.1993.	7 ♀	S. Krčmar collection
Šag	CR 05	25.07.1993.	1 ♀	S. Krčmar collection
Kaniška Iva	XL 54	07.06.1994.	1 ♀	S. Krčmar collection
Plesmo	XL 41	08.06.1994.	1 ♀	S. Krčmar collection
Puska	XL 42	08.06.1994.	2 ♀	S. Krčmar collection
Petrijevci	CR 05	18.06.1994.	9 ♀	S. Krčmar collection
Bokšić lug	YL 35	02.07.1994.	1 ♀	S. Krčmar collection
Petrijevci	CR 05	16.07.1994.	3 ♀	S. Krčmar collection
Mužilovica	XL 32	17.07.1994.	3 ♀	S. Krčmar collection
Trebarljevo	XL 05	17.07.1994.	45 ♀	S. Krčmar collection
Kumrovec	WM 50	19.07.1994.	1 ♀	S. Krčmar collection
Petrijevci	CR 05	23.07.1994.	2 ♀	S. Krčmar collection
Bokšić lug	BR 75	26.07.1994.	2 ♀	S. Krčmar collection
Zovkov gaj	YL 35	26.07.1994.	1 ♀	S. Krčmar collection
Borovik	BR 72	30.07.1994.	1 ♀	S. Krčmar collection
Čokadinci	CR 04	30.07.1994.	2 ♀	S. Krčmar collection
Borovik	BR 72	05.08.1994.	5 ♀	S. Krčmar collection
Bokšić lug	YL 35	09.08.1994.	2 ♀	S. Krčmar collection

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Borovik	BR 72	16.08.1994.	1♀	S. Krčmar collection
Modro oko	YH 06	30.05.1995.	2♀	S. Krčmar collection
Borovik	BR 72	08.06.1995.	2♀	S. Krčmar collection
Petrijevci	CR 05	11.06.1995.	1♀	S. Krčmar collection
Petrijevci	CR 05	17.06.1995.	1♀	S. Krčmar collection
Posavski Podgajci	CQ 27	28.06.1995.	17♀	S. Krčmar collection
Bošnjaci (Virovi)	CQ 39	28.06.1995.	1♀	S. Krčmar collection
Plesmo	XL 41	30.06.1995.	2♀	S. Krčmar collection
Segetac	XL 42	30.06.1995.	26♀	S. Krčmar collection
Petrijevci	CR 05	02.07.1995.	5♀	S. Krčmar collection
Vukojevci	BR 74	02.07.1995.	1♀	S. Krčmar collection
Čokadinci	CR 04	02.07.1995.	1♀	S. Krčmar collection
Čokadinci	CR 04	03.07.1995.	2♀	S. Krčmar collection
Borovik	BR 72	03.07.1995.	3♀	S. Krčmar collection
Bokšić Lug	YL 35	08.07.1995.	6♀	S. Krčmar collection
Šenkovec	XM 04	08.07.1995.	1♀	S. Krčmar collection
Šenkovec	XM 04	09.07.1995.	2♀	S. Krčmar collection
Podravlje Osijek	CR 24	10.07.1995.	1♀	S. Krčmar collection
Lijepa Greda	XM 70	11.07.1995.	12♀	S. Krčmar collection
Novaki	YL 07	11.07.1995.	2♀	S. Krčmar collection
Sopje	YL 17	11.07.1995.	1♀	S. Krčmar collection
Podravska Moslavina	YL 37	11.07.1995.	2♀	S. Krčmar collection
Jelas polje	YL 10	14.07.1995.	2♀	S. Krčmar collection
Svilaj	BQ 89	14.07.1995.	1♀	S. Krčmar collection
Velika Kapanica	BR 90	14.07.1995.	3♀	S. Krčmar collection
Donji Čaglić	XL 62	15.07.1995.	1♀	S. Krčmar collection
Levanjska Varoš	BR 72	15.07.1995.	1♀	S. Krčmar collection
Funtana	UL 90	21.07.1995.	4♀	S. Krčmar collection
Karlovac	WL 43	22.07.1995.	2♀	S. Krčmar collection
Repaš	XM 61	24.07.1995.	2♀	S. Krčmar collection
Kondrić	BR 81	23.08.1995.	1♀	S. Krčmar collection
Spačva (Virovi)	CQ 39	25.05.1996.	11♀	S. Krčmar collection
Županja	CQ 19	25.05.1996.	1♀	S. Krčmar collection
Opuzen	YH 06	04.06.1996.	1♀	S. Krčmar collection
Modro oko	YH 06	04.06.1996.	37♀	S. Krčmar collection
Metković	YH 16	04.06.1996.	2♀	S. Krčmar collection
Badžula	YH 16	04.06.1996.	1♀	S. Krčmar collection
Ušće Neretve	YH 06	04.06.1996.	2♀	S. Krčmar collection
Spačva (Virovi)	CQ 39	08.06.1996.	7♀	S. Krčmar collection
Otok	CR 30	08.06.1996.	3♀	S. Krčmar collection
Privlaka	CR 20	08.06.1996.	1♀	S. Krčmar collection

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Grudnjak	YL 35	18.06.1996.	1♀	S. Krčmar collection
Babina Greda	CQ 09	21.06.1996.	3♀	S. Krčmar collection
Duga Resa	WL 33	02.07.1996.	1♀	S. Krčmar collection
Spačva (Virovi)	CQ 39	04.07.1996.	28♀	S. Krčmar collection
Kunjevci	CR 21	04.07.1996.	5♀	S. Krčmar collection
Nuštar	CR 32	20.07.1996.	1♀	S. Krčmar collection
Spačva (Virovi)	CQ 39	27.07.1996.	17♀	S. Krčmar collection
Babina Greda	CQ 09	05.07.1996.	52♀	S. Krčmar collection
Vrpolje	BR 90	05.07.1996.	51♀	S. Krčmar collection
Babina Greda	CQ 09	13.07.1996.	26♀	S. Krčmar collection
Petrijevci	CR 05	18.07.1996.	1♀	S. Krčmar collection
Lozovac	WJ 75	23.07.1996.	1♀	S. Krčmar collection
Plitvička jezera	WK 47	24.07.1996.	1♀	S. Krčmar collection
Lijepa Greda	XM 70	11.07.1996.	3♀	S. Krčmar collection
Šag	CR 05	13.07.1996.	1♀	S. Krčmar collection
Nard	CR 06	13.07.1996.	3♀	S. Krčmar collection
Babina Greda	CQ 09	05.08.1996.	3♀	S. Krčmar collection
Grudnjak	YL 35	05.08.1996.	15♀	S. Krčmar collection
Babina Greda	CQ 09	20.08.1996.	1♀	S. Krčmar collection
Feričanci	YL 34	07.06.1997.	15♀	S. Krčmar collection
Lacići	BR 85	07.06.1997.	2♀	S. Krčmar collection
Lipovljani	XL 42	10.06.1997.	2♀	S. Krčmar collection
Lacići	BR 85	16.06.1997.	4♀	S. Krčmar collection
Lipovljani	XL 42	20.06.1997.	2♀	S. Krčmar collection
Isevnica	VL 83	24.06.1997.	1♀	S. Krčmar collection
Jasenak	WL 00	28.06.1997.	1♀	S. Krčmar collection
Čeralije	YL 15	05.07.1997.	5♀	S. Krčmar collection
Novo Zvečevo	XL 94	05.07.1997.	3♀	S. Krčmar collection
Voćin	XL 95	05.07.1997.	1♀	S. Krčmar collection
Kolodvar (Osijek)	CR 14	17.07.1997.	6♀	S. Krčmar collection
Zoljan (Našice)	BR 63	17.07.1997.	1♀	S. Krčmar collection
Mikleuš	YL 15	17.07.1997.	4♀	S. Krčmar collection
Kutjevo	YL 23	17.07.1997.	2♀	S. Krčmar collection
Bokšić Lug	YL 35	05.08.1997.	2♀	S. Krčmar collection
Paučje	BR 72	15.08.1997.	2♀	S. Krčmar collection
Kopački rit	CR 35	03.06.1998.	1♀	S. Krčmar collection
Kopačevo	CR 25	04.06.1998.	1♀	S. Krčmar collection
Tikveš	CR 36	05.06.1998.	1♀	S. Krčmar collection
Haljevo (Beli Manastir)	CR 16	05.06.1998.	6♀	S. Krčmar collection
Haljevo (Beli Manastir)	CR 16	17.06.1998.	3♀	S. Krčmar collection
Čeminac	CR 16	17.06.1998.	1♀	S. Krčmar collection

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Tikveš	CR 36	29.06.1998.	2♀	S. Krčmar collection
Tikveš	CR 36	30.06.1998.	2♀	S. Krčmar collection
Hordovanj (Kopački rit)	CR 35	30.06.1998.	5♀	S. Krčmar collection
Sakadaško jezero	CR 25	30.06.1998.	4♀	S. Krčmar collection
Tikveš	CR 35	30.06.1998.	1♀	S. Krčmar collection
Tikveš	CR 36	16.07.1998.	3♀	S. Krčmar collection
Haljevo (Beli Manastir)	CR 16	16.07.1998.	2♀	S. Krčmar collection
Kopačevo	CR 25	18.07.1998.	1♀	S. Krčmar collection
Sakadaško jezero	CR 25	26.07.1998.	2♀	S. Krčmar collection
Kopački rit	CR 35	27.07.1998.	2♀	S. Krčmar collection
Tikveš	CR 36	27.07.1998.	12♀	S. Krčmar collection
Kopački rit	CR 35	30.07.1998.	1♀	S. Krčmar collection
Kozjak	CR 35	03.08.1998.	3♀	S. Krčmar collection
Haljevo (Beli Manastir)	CR 16	04.08.1998.	10♀	S. Krčmar collection
Haljevo (Beli Manastir)	CR 16	10.08.1998.	5♀	S. Krčmar collection
Tikveš	CR 36	28.05.1999.	4♀	S. Krčmar collection
Posavski Podgajci	CQ 27	16.06.1999.	3♀	S. Krčmar collection
Štitar	CQ 19	16.06.1999.	1♀	S. Krčmar collection
Rajevo Selo	CQ 27	16.06.1999.	8♀	S. Krčmar collection
Vrbanja	CQ 38	16.06.1999.	15♀	S. Krčmar collection
Lipovac	CQ 49	16.06.1999.	11♀	S. Krčmar collection
Podgrađe	CQ 49	16.06.1999.	13♀	S. Krčmar collection
Nijemci	CR 40	16.06.1999.	6♀	S. Krčmar collection
Tikveš	CR 35	25.06.1999.	2♀	S. Krčmar collection
Orahovica	YL 24	05.07.1999.	1♀	S. Krčmar collection
Bošnjački Virovi	CQ 37	16.07.1999.	3♀	S. Krčmar collection
Tikveš	CR 36	29.07.1999.	1♀	S. Krčmar collection
Sakadaško jezero	CR 25	29.07.1999.	2♀	S. Krčmar collection
Monjoroš (Zmajevac)	CR 37	19.08.1999.	1♀	S. Krčmar collection
Monjoroš (Zmajevac)	CR 37	27.05.2000.	10♀	S. Krčmar collection
Monjoroš (Zmajevac)	CR 37	28.05.2000.	11♀	S. Krčmar collection
Monjoroš (Zmajevac)	CR 37	03.06.2000.	3♀	S. Krčmar collection
Monjoroš (Zmajevac)	CR 37	14.06.2000.	41♀	S. Krčmar collection
Čigoč	XL 22	15.06.2000.	2♀	S. Krčmar collection
Monjoroš (Zmajevac)	CR 37	21.06.2000.	3♀	S. Krčmar collection
Tikveš	CR 36	05.07.2000.	6♀	S. Krčmar collection
Oprisavci	BR 80	01.08.2000.	1♀	S. Krčmar collection
Oprisavci	BR 80	10.08.2000.	3♀	S. Krčmar collection
Haljevo - šuma	CR 16	23.08.2000.	3♀	S. Krčmar collection
Monjoroš (Zmajevac)	CR 37	27.07.2001.	1♀	S. Krčmar collection
Monjoroš (Zmajevac)	CR 37	28.07.2001.	1♀	S. Krčmar collection
Monjoroš (Zmajevac)	CR 37	09.08.2001.	2♀	S. Krčmar collection
Monjoroš (Zmajevac)	CR 37	10.08.2001.	1♀	S. Krčmar collection

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Monjoroš (Zmajevac)	CR 37	02.06.2002.	1 ♀	S. Krčmar collection
Monjoroš (Zmajevac)	CR 37	03.06.2002.	1 ♀	S. Krčmar collection
Monjoroš (Zmajevac)	CR 37	17.06.2002.	1 ♂	S. Krčmar collection
Monjoroš (Zmajevac)	CR 37	18.06.2002.	5 ♀	S. Krčmar collection
Monjoroš (Zmajevac)	CR 37	19.06.2002.	3 ♀	S. Krčmar collection
Monjoroš (Zmajevac)	CR 37	20.06.2002.	2 ♀	S. Krčmar collection
Monjoroš (Zmajevac)	CR 37	23.06.2002.	1 ♀	S. Krčmar collection
Jankovac	YL 24	03.07.2002.	1 ♀	S. Krčmar collection
Monjoroš (Zmajevac)	CR 37	04.07.2002.	2 ♀	S. Krčmar collection
Monjoroš (Zmajevac)	CR 37	05.07.2002.	1 ♀	S. Krčmar collection
Monjoroš (Zmajevac)	CR 37	06.07.2002.	1 ♀	S. Krčmar collection
Monjoroš (Zmajevac)	CR 37	10.07.2002.	4 ♀	S. Krčmar collection
Zelin Mrzlovodički	VL 72	14.07.2002.	2 ♀	S. Krčmar collection
Monjoroš (Zmajevac)	CR 37	30.07.2002.	2 ♀	S. Krčmar collection
Monjoroš (Zmajevac)	CR 37	3.08.2002.	1 ♀	S. Krčmar collection
Desne	YH 06	05.06.2003.	33 ♀	S. Krčmar collection
Vriještica	YH 17	06.06.2003.	16 ♀	S. Krčmar collection
Modro oko	YH 06	06.06.2003.	2 ♀	S. Krčmar collection
Vriještica	YH 17	07.06.2003.	2 ♀	S. Krčmar collection
Rumin	XJ 24	10.06.2003.	1 ♀	S. Krčmar collection
Vriještica	YH 17	15.07.2003.	1 ♀	S. Krčmar collection
Kupari	BN 92	07.08.2003.	1 ♀	S. Krčmar collection
Tikveš	CR 36	28.06.2004.	1 ♀	S. Krčmar collection
Tikveš	CR 36	6.07.2004.	1 ♀	S. Krčmar collection
Tikveš	CR 36	8.07.2004.	1 ♀	S. Krčmar collection
Tikveš	CR 36	1.08.2004.	1 ♀	S. Krčmar collection
Tikveš	CR 36	2.08.2004.	3 ♀	S. Krčmar collection
Tikveš	CR 36	2.08.2004.	2 ♀	S. Krčmar collection
Tikveš	CR 36	12.08.2004.	1 ♀	S. Krčmar collection
Tikveš	CR 36	16.08.2004.	1 ♀	S. Krčmar collection
Tikveš	CR 36	30.08.2004.	1 ♀	S. Krčmar collection
Novaki	YL 07	28.05.2005.	1 ♀	S. Krčmar collection
Sopje	YL 17	18.06.2005.	6 ♀	S. Krčmar collection
Novaki	YL 07	18.06.2005.	6 ♀	S. Krčmar collection
Podravska Moslavina	YL 37	18.06.2005.	5 ♀	S. Krčmar collection
Donji Miholjac	BR 87	18.06.2005.	1 ♀	S. Krčmar collection
Ferdinandovac	XM 70	18.06.2005.	1 ♀	S. Krčmar collection
Brezovica	XL 98	18.06.2005.	4 ♀	S. Krčmar collection
Gabajeva Greda	XM 50	18.06.2005.	1 ♀	S. Krčmar collection
Monjoroš (Zmajevac)	CR 37	18.06.2005.	1 ♀	S. Krčmar collection
Monjoroš (Zmajevac)	CR 37	22.06.2005.	1 ♀	S. Krčmar collection
Monjoroš (Zmajevac)	CR 37	28.06.2005.	1 ♀	S. Krčmar collection
Monjoroš (Zmajevac)	CR 37	29.06.2005.	4 ♀	S. Krčmar collection
Monjoroš (Zmajevac)	CR 37	14.07.2005.	1 ♀	S. Krčmar collection
Monjoroš (Zmajevac)	CR 37	15.07.2005.	6 ♀	S. Krčmar collection
Repaš	XM 61	16.07.2005.	1 ♀	S. Krčmar collection

Brezovica	XL 98	16.07.2005.	2♀	S. Krčmar collection
Podravska Moslavina	YL 37	16.07.2005	1♀	S. Krčmar collection
Noskovci	YL 27	16.07.2005.	1♀	S. Krčmar collection
Sopje	YL 17	16.07.2005.	2♀	S. Krčmar collection
Brodić	XL 79	16.07.2005.	3♀	S. Krčmar collection
Gabajeva Greda	XM 50	16.07.2005.	1♀	S. Krčmar collection
Budakovac	YL 08	16.07.2005.	1♀	S. Krčmar collection
Ferdinandovac	XM 70	16.07.2005.	1♀	S. Krčmar collection
Monjoroš (Zmajevac)	CR 37	18.07.2005.	1♀	S. Krčmar collection
Monjoroš (Zmajevac)	CR 37	19.07.2005.	2♀	S. Krčmar collection
Monjoroš (Zmajevac)	CR 37	31.07.2005.	1♀	S. Krčmar collection
Monjoroš (Zmajevac)	CR 37	2.08.2005.	1♀	S. Krčmar collection
Monjoroš (Zmajevac)	CR 37	3.08.2005.	8♀	S. Krčmar collection
Brodić	XL 79	20.08.2005.	1♀	S. Krčmar collection
Noskovci	YL 27	20.08.2005.	3♀	S. Krčmar collection
Σ	93		1277	

1804 at 0.55 %. *Chrysops viduatus*, the most common species of the *Chrysops* genus, covers a total of 93 fields on the UTM net of Croatia (Table 7, Figure 7). In Croatia, this species is predominantly distributed within a moderate continental climate, but it is also represented by a small number of specimens in the Mediterranean region. Also, nearly identical distribution was found for the species *Chrysops caecutiens* (Table 1, Figure 1). Both species are common near wet areas, forests, meadows and pastures. Specimens of the species *Chrysops parallelogrammus* were collected only on the localities covered with a dense vegetation of reeds that are in the immediate vicinity of the river Drava (Table 4, Figure 4). The distribution of *Chrysops parallelogrammus* covers 16 fields on the UTM grid of Croatia, all situated in the middle course of the Drava River (Table 4, Figure 4). However, according to the literature records one specimen was collected in 1916 outside the Drava River zone (Moucha, 1965). Furthermore, specimens of the species *Chrysops relictus* and *Chrysops rufipes* were exclusively sampled in the inland part of Croatia (Table 5, 6; Figure 5, 6). All specimens of the species *Chrysops rufipes* were collected by means of a sampling net on the reeds. Unlike all the other species of the *Chrysops* genus the females of this species alone were not collected while taking a blood meal on cattle. The remaining two species of the *Chrysops* genus are mostly distributed in the Mediterranean part of Croatia. These species are *Chrysops italicus* and *Chrysops flavipes*. The species *Chrysops italicus* is halophilous species and the most of the specimens were collected

at the mouth of the Neretva River into the Adriatic Sea (Table 3, Figure 3). The brackish water of the Neretva near the mouth is most likely very favorable for the development of larval stages of halophilous species of tabanids, and this is probably the main reason for a greater abundance of this species in the mentioned areas. This is also supported by the fact that the larvae of the species *Chrysops italicus* live exclusively in brackish waters (Chvála et al. 1972). Most of the specimens of the species *Chrysops flavipes* were collected on the banks of Vransko Lake a few kilometers away from the Adriatic Sea (Table 2; Figure 2). However according to the literature records this species was also found in the inland part of Croatia (Leclercq, 1965; Moucha, 1965). That is not surprising because *Chrysops flavipes* sporadically reaches the area of Central Europe (Chvála et al. 1972). These two Mediterranean species are the least represented in the *Chrysops* genus in Croatia (Table 2, 3). According to the data from old publications the genus *Chrysops* in Croatia is represented by 8 species. In publications from the first half of the 20th century many scientists classified the species *Chrysops melicharri* under the "Illyrian" area and it was later so classified in the Croatian fauna (Surcouf, 1924; Kröber, 1932). This classification is not correct because this species has been collected near Monfalcone in Italy (Mik, 1898). These are the basic reasons why the species *Chrysops mellicharii* was excluded from the list of tabanid fauna of Croatia (Krčmar et al. 1996). Finally, in the genus *Chrysops* only 7 species have been recorded in Croatia to date.

Conclusion

The genus *Chrysops* in Croatia includes 7 species. These species are predominantly distributed in the continental part of Croatia with a moderate continental climate. The species *Chrysops flavipes* and *Chrysops italicus* are mostly distributed in the Mediterranean region of Croatia. All specimens of the species *Chrysops parallelogrammus* were collected only at localities in the immediate vicinity of the Drava River. The most abundant species of the genus *Chrysops* is *Chrysops viduatus*, which accounts for 50.20 % of all specimens, while the remaining 6 species make up the remaining 49.80 %. Also, *Chrysops viduatus* covers the most (93) fields on the UTM net of Croatia. All specimens of the species *Chrysops rufipes* were collected exclusively by means of a sampling net on the plants. Specimens of all other species were collected on domestic animals or by traps baited with different synthetic or natural attractants.

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Acknowledgments

We would like express our gratitude to Dr. J. Mikuska[†] for his help in the field research.

