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Horse flies (Tabanidae, Diptera) of Sarnena Gora Mountains

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Abstract. The study on the composition of the tabanid fauna has been conducted on the territory of Sarnena Gora Mountains. The summarized references data and the results of the present study show that the Sarnena Gora Mountains tabanid fauna was represented by 53 species-group taxa (51 species and 2 subspecies). They belonged to 10 genera: *Silvius* (1 species), *Chrysops* (4 species), *Atylotus* (3 species), *Therioplectes* (2 species and 1 subspecies), *Hybomitra* (5 species), *Tabanus* (22 species and 1 subspecies), *Heptatoma* (1 species), *Haematopota* (10 species), *Dasyrhamphis* (2 species) and *Philipomyia* (1 species). Forty three tabanid localities have been registered in the study area of which 8 are new. Seven new localities of *Tabanus sudeticus* Zeller, 1842 have been reported on the territory of Sarnena Gora Mountains.

Key words: tabanids, fauna, Sarnena Gora Mountains, Bulgaria.

Introduction

Studies on the composition of the tabanid fauna in Sarnena Gora Mountains date from the beginning of the last century. At the beginning of the 20th century Nedialkov (1912) reported 5 species (*Chrysops relictus* Meigen, 1820, *Therioplectes gigas* (Herbst, 1787), *Tabanus lunatus* Fabricius, 1794, *Tabanus bromius* Linnaeus, 1758 and *Dasyrhamphis umbrinus* (Meigen, 1820) from Chirpan area. Drensky (1929) reported three species (*Silvius alpinus* (Scopoli, 1763), *Tabanus bromius* Linnaeus, 1758 and *T. glaucopis* Meigen, 1820) from the village of Turia, and two species (*Therioplectes gigas* (Herbst, 1787) and *Therioplectes tricolor* Zeller, 1842) from Chirpan. The presence of the species *Silvius alpinus*, *Tabanus bromius* and *T. glaucopis* in the fauna of Sarnena Gora Mountains was confirmed by Ganeva (1998) in a systematic study of the fauna and ecology of the tabanids in Stara Zagora region. She identified 47 species from 5 localities in the eastern part of Sarnena Gora Mountains (Ganeva, 1998). In her subsequent studies on the Tabanidae family, Ganeva (2002) reported another species, *Dasyrhamphis umbrinus* Mg., registered in the area of the village of Oryahovitsa. Studies on the diversity of the tabanid fauna of Sarnena Gora Mountains continued with field collections in the period 2002-2005. The analysis of the reference data and the collected material from 16 localities (13, of which, new ones) gives reason for Ganeva (2011) to summarize that the tabanid fauna of Sarnena Gora Mountains is represented by 48 species from 10 genera. New data on the species diversity of tabanids in the area are published by Ganeva & Kalmushka (2012) as a result of an in-depth and focused study of the fauna and phenology of tabanids in the Chirpan Eminences. They report 28 species, 13 of which are new to the area studied.

The episodic field collections, conducted in different localities on the territory of Sarnena Gora Mountains, indicate the presence of a rich, in relation to species, tabanid fauna, which has not been sufficiently studied. There is no information in the references about the composition and distribution of the tabanids in the other two parts of Sredna Gora Mountains - Sasthinska and Ihtimanska. This was the main reason for the initiation of a research project on the systematic study of the Sredna Gora Mountains tabanid fauna. The results in this paper are a part of this study concerning only Sarnena Gora Mountains and are published for the first time.

Material and Methods

The study on the species composition of the tabanids in Sarnena Gora Mountains is part of the conducted study of the group in Sredna Gora Mts. The tabanid fauna was studied on the basis of materials collected from 13 localities on the territory of Sarnena Gora Mountains. The altitude of the field collections varied from 285 m (L13) to 955m (L4). Horse flies were collected by sweep net between May and July, 2009. The processing of the insects was carried out in the laboratory. The collected specimens were identified according to the keys of Chvála *et al.* (1972) and Olsufjev (1977). A total of 319 (317♀ и 2♂) specimens were collected, processed and determined to species.

A list of the identified tabanid species and a list of the studied localities are presented. The sequence of species was done according to the Catalogue of Palaearctic Diptera (Chvála 1988). The list of the localities indicates the altitude, coordinates, collection dates and the number of collected specimens. Altitude and geographical coordinates were obtained through measurement with a Garmin GPS Navigator Etrex Vista HCx.

List of localities

Locality 1 (L1). Saedinenie village, 357 m a. s. l., 42.36N, 25.30E: 7.06.09, 7♀.

*Locality 2 (L2). Naydenovo village, 345 m a. s. l., 42.383N, 25.267E: 7.06.09, 10♀; 14.06.09, 9♀.

Locality 3 (L3). Gorno Novo selo village, 597 m a. s. l., 42.450N, 25.233E: 7.06.09, 1♀.

Locality 4 (L4). Kavakliyka chalet, 955 m a. s. l., 42.484N, 25.220E: 7.06.09, 14♀; 10.07.09, 4♀; 20.07.09, 3♀.

*Locality 5 (L5). 1 km after Kavakliyka chalet in the direction of Gorno Novo selo village, 902 m a. s. l., 14.06.09, 43♀; 10.07.09, 27♀.

*Locality 6 (L6). The fork for Kavakliyka chalet and Turia village, 14.06.09, 14♀+1♂; 10.07.09, 8♀; 20.07.09, 10♀.

Locality 7 (L7). Turia vilage, 475 m a. s. l., 42.567N, 25.183E: 10.07.09, 45♀; 20.07.09, 17♀.

*Locality 8 (L8). The fork for Bogdan peak, 10.07.09, 12♀.

*Locality 9 (L9). Babek village, 347 m a. s. l., 42.26N, 25.4E: 7.06.09, 9♀; 14.06.09, 7♀+1♂; 10.07.09, 11♀; 20.07.09, 2♀.

*Locality 10 (L10). Svezhen village, 720 m a. s. l., 42.500N, 25.017E: 7.06.09, 11♀; 10.07.09, 2♀.

*Locality 11 (L11). Mrachenik village, 596 m a. s. l., 42.500N, 24.967 E: 7.06.09, 16♀.

*Locality 12 (L12). Nauchen village, 415 m a. s. l., 42.560N, 26.083E: 22.05.09, 12 ♀; 30.06.09, 21♀.

Locality 13 (L13). Korten village, 285 m a. s. l., 22.05.09, 2 ♀;

* - new localities in Sarnena Gora Mountains.

Results and Discussion

As a result of the study up to 319 specimens (317♀ and 2♂) were collected and identified. Seventeen species of 7 genera were identified: *Silvius* (1 species), *Chrysops* (2 species), *Atylotus* (1 species), *Hybomitra* (2 species), *Tabanus* (9 species), *Haematopota* (1 species) and *Philipomyia* (1 species) (table 1). Tabanus genus stands out with the biggest species diversity - 9 species. The mass species *T. maculicornis*, *T. tergestinus* and *Tabanus quatuornotatus*, registered for the study period, are among them (table 1). The highest activity was reported for *T. maculicornis* (101 specimens, 31.66%) and *T. tergestinus* (68 specimens, 21.32%) during the study period (table 1). The peak in the *T. maculicornis* activity is in the first half of July (10.07.09 - 61 ♀ specimens) and of *T. tergestinus* - in the first half of June (14.06.09 - 27♀ + 1♂) (table 1). *Philipomyia graeca* (33 specimens, 10.34%) is also included in the dominant structure of the tabanid community in the study area (table 1). The activity peak of *Philipomyia graeca* is in the first half of June (7-14.06., table 1), which corresponds to its phenological characteristics.

Table 1. Tabanids (Tabanidae, Diptera) from Sarnena Gora Mountains, captured between May and July, 2009.

Species	22.05.09	7.06.09	14.06.09	30.06.09	10.07.09	20.07.09	N	R/A
Silvius alpinus					2♀	2♀	4♀	1.25
Chrysops caecutiens		5♀	1♀		2♀		8♀	2.51
Chrysops viduatus		1♀					1♀	0.31
Atylotus loewianus					1♀			0.31
Hybomitra ciureai		2	4		2		8♀	2.51
Hybomitra distinguenda			2				2♀	0.63
Tabanus bifarius		7	6				13♀	4.08
T. briani		1	1				2♀	0.63
T. bromius				5	8	7	20♀	6.27
T. cordiger		1	1		1		3♀	0.94
T. glaucopis						7	7♀	2.19
T. maculicornis		**11**	**15**	**2**	**61**	**12**	**101♀**	**31.66**
T. quatuornotatus	**13**	**13**	**4**				**30♀**	**9.40**
T. sudeticus			1♂		16♀		16♀+1♂	5.33
T. tergestinus	**1**	**14**	**27♀+1♂**	**14♀**	**7**	**4**	**67♀+1♂**	**21.32**
Haematopota pluvialis			1♀				1♀	0.31
Philipomyia graeca		**13**	**11**		**9♀**		**33♀**	**10.34**
Total number of species	2	10	12	3	10	5	17	
Total number of specimens	**14♀**	68♀	73♀+2♂	21♀	109♀	32♀	317♀+2♂	99.99

In terms of species diversity most species were recorded in the study localities in the area of Kavakliika chalet (L4) and in the village of Turia (L7) - with 9 species each, followed by L5 (1 km after Kavakliika chalet), L6 (fork for Kavakliyka chalet and Turia village) and L9 (Babek village) - with 8 species each (table 2). The largest is the number of tabanids caught in L5 (1 km after Kavakliika chalet) and L7 (Turia village) - 70 and 62 respectively (Table 2).

Table 2. Collected fly samples (Tabanidae, Diptera) in each locality from Sarnena Gora Mountains between May and July, 2009 (after the sign „+" the number of captured male specimens is given).

Species	L1	L2	L 3	L 4	L 5	L 6	L 7	L 8	L 9	L 10	L 11	L 12	L 13	N
S. alpinus					1♀		3♀							**4**
C. caecutiens		4♀		1♀					3♀					**8**
C. viduatus	1♀													**1**
A. loewianus							1♀							**1**
H. ciureai	1♀	1♀		1♀	3♀	1♀	1♀							**8**
H. distinguenda					1♀				1♀					**2**
T. bifarius		4♀			4♀	1♀			3♀	1♀				**13**
T. briani									1♀		1♀			**2**
T. bromius						1♀	13♀	1♀				5♀		**20**
T. cordiger	1♀				1♀		1♀							**3**
T. glaucopis				3♀		3♀	1♀							**7**
T. maculicornis				6♀	29♀	14♀	34♀	7♀	4♀	3♀	2♀	2♀		**101**
T. quatuornotatus	2♀	1♀		3♀	4♀				1♀	2♀	4♀	12♀	1♀	**30**
T. sudeticus				2♀	3♀	1♂	2♀	1♀	7♀	1♀				**16+1**
T. tergestinus	2♀	7♀		1♀	14♀	4♀	6♀	3♀	9♀+1	2♀	4♀	14♀	1♀	**67+1**
H. pluvialis		1♀												**1**
Ph. graeca		1♀	1♀	4♀	10♀	8♀				4♀	5♀			**33**
Total number of species	5	7	1	**9**	**8**	**8**	**9**	4	**8**	6	5	4	2	**17**
Total number of specimens	**7♀**	**19♀**	**1♀**	**21♀**	**70♀**	**32+1**	**62♀**	**12♀**	**29+1**	**13**	**16**	**33♀**	**2♀**	**317+2**

In the course of the study 7 new localities for *T. sudeticus* were recorded on the territory of Sarnena Gora Mountains. They are vertically located from 347 to 955 m a.s.l. So far, data on the distribution of *T. sudeticus* in the area have only been published by Ganeva & Kalmushka (2012). They report two localities of the species on the Chirpan Eminences territory. From the above it becomes clear that *T. sudeticus* has already been established in 9 localities in Sarnena Gora Mountains.

The analysis of the references data and the results of the present study give us the reason to summarize that the tabanid fauna of the Sarnena Gora Mountains is represented by 51 species and 2 subspecies from 10 genera: *Silvius* (1 species), *Chrysops* (4 species), *Atylotus* (3 species) , *Therioplectes* (2 species and 1 subspecies), *Hybomitra* (5 species), *Tabanus* (22 species and 1 subspecies), *Heptatoma* (1 species), *Haematopota* (10 species), *Dasyrhamphis* (2 species) and *Philipomyia* (1 species) (table 3). The established species diversity represents 66.25% of Bulgaria's tabanid fauna (80 species, Ganeva, 2017).

The data in Table 3 show that only the species *Chrysops relictus* and *Tabanus lunatus*, reported by Nedialkov (1912), and *Therioplectes tricolor*, reported by Drensky (1929), have not yet been confirmed in our studies. The other 50 species-group taxa were reported by us as a result of the region's collections during the1998-2012 period (table 3). Of these, *Hybomitra ciureai*, *Tabanus bifarius*, *T. bromius*, *T. glaucopis*, *T. quatuornotatus, T.tergestinus* and *Philipomyia graeca* have been recorded in all our studies and form the group of mass species in many localities. Together with 14 other species whose presence in the Sarnena Gora mountains fauna we have confirmed three or four times, they determine the type of the tabanid fauna in the area (Table 3).

Through this study we report 8 new tabanid localities in Sarnena Gora Mountains. The total number of localities in the study area where material was collected during the 1998-2012 period is 43. New localities are reported for *Silvius alpinus* (Kavakliyka chalet), *Chrysops viduatus* (Saedinenie village), *Atylotus loewianus* (Turia village) and *T. briani* (Babek village and Murchenik village).

Table 3. Horse flies (Diptera: Tabanidae) of Sarnena Gora Mountains as reported by various sources; + - species, reported by the authors as a result of the study, l. d. – by literature data.

Species 1	Nedyalkov (1912) 2	Drensky (1929) 3	Ganeva (1998) 4	Ganeva (2002) 5	Ganeva (2011) 6	Ganeva & Kalmushka (2012) 7	Present study 8
Silvius alpinus		+	+		l. d.		**4**♀
Chrysops caecutiens			+		+	+	**8**♀
Chr. ludens			+		+	+	
Chr. relictus	+					l.d.	
Chr. viduatus			+		+		**1**♀
Atylotus flavoguttatus			+		l.d.		
A. loewianus			+		+	+	**1**♀
A.rusticus			+		l.d.		
Therioplectes gigas	+	+				+	
Th. tricolor		+				l.d.	
Th. tricolor pallidicauda			+		l.d.	+	
Hybomitra caucasi			+		l.d.	+	
Hybomitra ciureai			+	+	+	+	**8**♀
H. decora			+		l.d.		
H.distinguenda			+		l.d.	+	**2**♀
H.pilosa			+		l.d.		
Tabanus autumnalis			+	+	+	+	
T. bifarius			+	+	+	+	**13**♀
T. bovinus			+		+		
T. briani			+		l.d.		**2**♀
T. bromius	+	+	+	+	+	+	**20**♀
T. cordiger			+		+		**3**♀
T. exclusus			+	+	+	+	
T. glaucopis		+	+	+	+	+	**7**♀
T. indrae			+		l.d.		
T. lunatus	+					l.d.	
T. maculicornis			+		+	+	**101**♀
T. miki			+		+		
T. prometheus			+	+	l.d.		
T. quatuornotatus			+	+	+	+	**30**
T. regularis			+		l.d.		
T. rupium			+		+		
T. shannonellus			+	+	+		
T. spectabilis			+	+	l.d.	+	
T. spodopterus ponticus			+		+	+	
T. sudeticus						+	**16**♀**+1**♂
T. tergestinus			+	+	+	+	**67**♀**+1**♂
T. tinctus			+	+	+	+	
T. unifasciatus			+	+	+	+	
Heptatoma pellucens			+		l.d.		
Haematopota bigoti			+		l.d.		
H. csikii			+		l.d.		
H.grandis			+		l.d.		
H. italica			+		+		
H. longeantennata			+		l.d.		
H. ocelligera			+		l.d.		
H. pandazisi			+		l.d.		

H. pluvialis			+		+	+	**1**♀
H. scutellata			+		l.d.		
H. subcylindrica			+		l.d.		
Dasyrhamphis ater			+		l.d.	+	
D. umbrinus	+			+	l.d.	l.d.	
Philipomyia graeca			+	+	+	+	**33**♀
Total number of specimens							**317**♀**+2**♂
Total number of species	**5**	**5**	**47**	**15**	**24+24 by l.d.**	**24+4 by l.d.**	**17**

Checklist of Tabanidae (Diptera) from
Sarnena Gora Mountains
Family Tabanidae

Subfamily Chrysopsinae

Genus *Silvius* Meigen, 1820

Silvius (Silvius) alpinus (Scopoli, 1763)

Genus *Chrysops* Meigen, 1803

Chrysops (Chrysops) caecutiens (Linnaeus, 1758)
Chrysops (Chrysops) ludens Loew, 1858
Chrysops (Chrysops) relictus Meigen, 1820
Chrysops (Chrysops) viduatus (Fabricius, 1794)

Subfamily Tabaninae

Genus *Atylotus* Osten-Sacken, 1876

Atylotus flavoguttatus (Szilady, 1915)
Atylotus loewianus (Villeneuve, 1920)
Atylotus rusticus (Linnaeus, 1767)

Genus *Therioplectes* Zeller, 1842

Therioplectes gigas (Herbst, 1787)
Therioplectes tricolor Zeller, 1842
Therioplectes tricolor pallidicauda (Olsufjev, 1937)

Genus *Hybomitra* Enderlein, 1922

Hybomitra caucasi (Szilady, 1923)
Hybomitra ciureai (Séguy, 1937)
Hybomitra decora (Loew, 1858)
Hybomitra distinguenda (Verrall, 1909)
Hybomitra pilosa (Loew, 1858)

Genus *Tabanus* Linnaeus, 1758

Tabanus autumnalis Linnaeus, 1761
Tabanus bifarius Loew, 1858
Tabanus bovinus Linnaeus, 1758
Tabanus briani Leclercq, 1962
Tabanus bromius Linnaeus, 1758
Tabanus cordiger Meigen, 1820
Tabanus exclusus Pandellé, 1883
Tabanus glaucopis Meigen, 1820
Tabanus indrae Hauser, 1939
Tabanus lunatus Fabricius, 1794

Tabanus maculicornis Zetterstedt, 1842
Tabanus miki Brauer in Br.& Bergenstamm,1880
Tabanus prometheus Szilady, 1923
Tabanus quatuornotatus Meigen, 1820
Tabanus regularis Jaennicke, 1866
Tabanus rupium (Brauer in Br.& Bergenstamm, 1880)
Tabanus shannonellus Kröber, 1936
Tabanus spectabilis Loew, 1858
Tabanus spodopterus ponticus Olsufjev, Moucha & Chvála, 1967
Tabanus sudeticus Zeller, 1842
Tabanus tergestinus Egger, 1859
Tabanus tinctus Walker, 1850
Tabanus unifasciatus Loew, 1858

Genus *Heptatoma* Meigen, 1803

Heptatoma pellucens (Fabricius, 1776)

Genus *Haematopota* Meigen, 1803

Haematopota bigoti Gobert, 1880
Haematopota csikii Szilady, 1922
Haematopota grandis Meigen, 1820
Haematopota italica Meigen, 1804
Haematopota longeantennata (Olsufjev, 1937)
Haematopota ocelligera (Kröber, 1922)
Haematopota pandazisi (Kröber, 1936)
Haematopota pluvialis (Linnaeus, 1758)
Haematopota scutellata (Olsufjev, Moucha & Chvála, 1964)
Haematopota subcylindrica Pandellé, 1883

Genus *Dasyrhamphis* Enderlein, 1922

Dasyrhamphis ater (Rossi, 1790)
Dasyrhamphis umbrinus (Meigen, 1820)

Genus *Philipomyia* Olsufjev, 1964

Philipomyia graeca (Fabricius, 1794)

Conclusions

On the basis of the references data and the results of the present study, it can be summarized that the tabanid fauna of Sarnena Gora Mountains was represented by 51 species and 2 subspecies belonging to 10 genera. Forty three tabanid localities have been found, 8 of which are new. Seven new localities have been recorded in Sarnena Gora Mountains for *T. sudeticus*. Up to now this species was currently known for the study area only from the Chirpan Eminences territory. The type of the tabanid fauna was formed by 21 species, 7 of which are the most common species in the area.

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