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COMPOSITION, STRUCTURE AND ZOOGEOGRAPHICAL ASPECTS OF THE HORSEFLY FAUNA (DIPTERA, TABANIDAE) ON THE TERRITORY OF THE BAKADZHITSITE HILLS, SOUTH-EAST BULGARIA

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Abstract: The study was carried out at 4 localities on the territory of the Bakadzhitsite hills, Southeastern Bulgaria during the active period of the tabanids (08.2008; 06.-08. 2009-2011, 05.-08. 2013-2014). A total of 826 tabanid specimens were collected and processed. As a result 27 species and subspecies from 7 genera were recorded: *Atylotus* (1 species), *Therioplectes* (1 subspecies), *Hybomitra* (3 species), *Tabanus* (14 species and 1 subspecies), *Haematopota* (2 species), *Dasyrhamphis* (3 species) and *Philipomyia* (2 species). Twenty-five species and 2 subspecies were reported for the first time for the Bakadzhitsite hills. This is the first study on the tabanid fauna in the area under investigation. The dominant species in the tabanid assemblages on the Bakadzhitsite hills are: *Philipomyia graeca* (23.85%), *Tabanus tergestinus* (23.74%), *T. bifarius* (12.71%) and *T. bromius* (8.35%). The elements of the Mediterranean subregional fauna (74.08% of species) predominate in the horsefly fauna of the studied region.

INTRODUCTION

The tabanids are bloodsucking flies having both economic and epizootological importance. Tabanids are fed both on healthy and sick animals, even on fresh cadavers (Olsufjev, 1977). The biological and ethological features of tabanids are extremely important for their successful involvement in the transmission and spreading of pathogenic organisms.

The information about the role and the specificity of the performance of several arthropods (tabanids, mosquitos, ticks etc.) as vectors of both human and animal diseases attract the attention of specialists to the creation of information

system for control of arthropod vectors (Thomson and Conor, 2000). Thus studies concerning species composition, distribution and abundance of tabanids appear to be a research field of continuous interest.

At present, the tabanid fauna of Bulgaria is represented by 80 species (Ganeva, 2017). They are 37.55% of Europe's 213 tabanid species known to date (www.faunaeur.org). However, its territory is still under-studied, both in terms of the species diversity of tabanids and their phenological and ecological characteristics.

In this regard, the territory of the Bakadzhitsite hills is a part of the still unexplored regions of Bulgaria in terms of the tabanid composition and activity. This determined the purpose of the present study to investigate the composition, the dominant structure and the zoogeographical characteristic of the tabanid fauna at the Bakadzhitsite hills.

According to Velev *et al.* (2002), physically and geographically, the Bakadzhitsite hills are situated in the Tundzha-Bourgas subregion of the Upper Thracian-Burgas region. They are low hills with a total length of about 40 km and about 10 km wide. The Bakadzhitsite hills are located in the trans-continental climatic region of Bulgaria (Velev, 2002), but are under the combined influence of the transcontinental and Continental-Mediterranean climates. Annual seasons have mitigated extreme values, as in the winter the snow cover is short-lived.

The Bakadzhitsite hills consist of three divisions: Tarnavski Bakadzhik (western part), Tamarinski Bakadzhik (central part) and Voynishki Bakadzhik (eastern part). The highest peak of the hills - St. Sava peak (515 m) is located in their western part (Tarnavski Bakadzhik) and the average altitude of the hills is about 300 m.

On the territory of the Bakadzhitsite hills there are two protected areas of type B: BG0000402 "Bakadzhitsite" and BG0000513 "Voynishki Bakadzhik" under Directive 92/43/ EEC for the conservation of natural habitats and of wild flora and fauna.

MATERIAL AND METHODS

Sampling and processing of specimens

The tabanid fauna was studied on the basis of material, collected from 3 main localities on the territory of the Bakadzhitsite hills during the period 2009-2011 (30.06. 2009; 18.07.2009; 14.06.2010; 6.07.2010; 13.08.2011) and 2013-2014 (3.05.2013; 20.05.2013; 29.06.2013; 24.05.2014; 8.06.2014; 16.08.2014; 30.08.2014) and one more locality during the route collection Vojnishki Bakadzhik - Strandzha Mountain (08.2008).

Horse flies were collected by sweep net. The processing of the insects was carried out in the laboratory. The collected specimens were identified according to the keys of Chvala *et al. (*1972) and Olsufjev (1977). A total of 826 tabanid specimens were collected and processed. Of these, 794 were females and 32 were male specimens.

Altitude and geographical coordinates were obtained through measurement with a Garmin GPS Navigator Etrex VistaHCx.

A list of the studied localities and a list of the identified tabanid species are presented.

The list of the localities indicates the altitude, the geographic coordinates, the collection dates and the total number of collected specimens from each locality.

The localities as well as the number, gender of the captured specimens and the dates of the catches were indicated for each species. The sequence of species was done according to the Catalogue of Palaearctic Diptera (Chvála, 1988).

Analysis of the structure of the tabanid assemblages

The criteria adopted for analysing the dominance structure were those based on the relative abundance (RA) used by Skufin (1949): dominant species (RA ≥ 8 %), subdominant species (2% ≤ RA ≤ 8%), scarce species (0.5 % ≤ RA ≤ 2 %) and rare species (RA≤ 0.5 %).

Study area

The three main localities, where the systematic studies on the species composition of the tabanids have been carried out, are located within the territory of BG0000402 "Bakadzhitsite" Protected Zone.

Locality 1 (267 m a.s.l.) is situated in the area of a micro dam, located about 2 km southeast of the village of Chargan (Yambol) in the northwestern outskirts of the Bakadzhitsite hills. The vegetation in the region is predominantly shrub and grass.

Locality 2 (341 m a.s.l.) is a meadow, about 100 m in diameter. The vegetation is grass, shrub and trees.

Locality 3 (446 m a.s.l.) is situated at the foot of St. Spas peak. The predominant vegetation is trees.

Locality 4 (245 m a.s.l.) is situated at 2 km from the bifurcation to the village of Aleksandrovo in the region of Voynishki Bakadzhik.

List of localities

1. **Locality 1 (L1):** 267 m, 42º27′50.26′′N; 26º38′31.44′′E: **30.06.2009,** 74♀♀, 4♂♂; **8.07.2009,** 21♀♀; **14.06.2010,** 82♀♀; **6.07.2010,** 55♀♀; **13.08.2011,** 28♀♀, 2♂♂; **3.05.2013,** 4♀♀; **20.05.2013**, 11♀♀, 1♂; **29.06.2013**, 38♀♀, 8♂♂; **24.05.2014**, 2♀♀; **30.08.2014,** 1♀.
2. **Locality 2 (L2):** 341 m, 42º27′18.66′′N; 26º38′23.22′′E: **30.06.2009,** 11♀♀; **18.07.2009,** 20♀♀; **14.06.2010,** 79♀♀; **13.08.2011,** 35♀♀, 2♂♂; **3.05.2013,** 11♀♀; **20.05.2013,** 8♀♀; **29.06.2013,** 20♀♀, 1♂; **8.06.2014,** 59♀♀; **16.08.2014,** 1♀, 3♂♂.
3. **Locality 3 (L3):** 446 m, 42º27′07.03′′N; 26º38′55.31′′E: **30.06.2009,** 84♀♀, 1♂; **18.07.2009,** 28♀♀, 1♂; **14.06.2010,** 45♀♀, 3♂♂; **6.07.2010,** 22♀♀, 1♂; **13.08.2011,** 18♀♀, 2♂♂; **3.05.2013,** 9♀♀; **20.05.2013,** 4♀♀, 1♂; **29.06.2013,** 17♀♀, 1♂; **8.06.2014,** 3♀♀.
4. **Locality 4 (L4):** 245 m, 42º22′54.84′′N; 26º51′15.23′′E: **16.08.2008,** 4♀♀, 1♂.

RESULTS AND DISCUSSION

Species composition

As a result of the study 826 tabanid specimens were collected and processed. 794 female and 32 male specimens were determined to the species. 27 species and subspecies from 7 genera were established: *Atylotus* (1 species), *Therioplectes* (1 subspecies), *Hybomitra* (3 species), *Tabanus* (14 species and 1 subspecies), *Haematopota* (2 species), *Dasyrhamphis* (3 species) and *Philipomyia* (2 species). The 27 species and subspecies registered represent 33.75% of the 80 tabanid species and subspecies known for Bulgaria tabanid fauna (Ganeva, 2017). The established species are reported for the first time on the territory of the Bakadzhitsite hills. This is the first investigation on the tabanid fauna in the study region.

List of species

Family Tabanidae

Subfamily Tabaninae

Genus *Atylotus* Osten-Sacken, 1876

Atylotus loewianus (Villeneuve, 1920): **L4**: 16.08.2008, **1**♀.

Genus *Therioplectes* Zeller, 1842

Therioplectes tricolor pallidicauda (**Olsufjev, 1937): L3:** 20.05.2013, **1**♀.

Genus *Hybomitra* Enderlein, 1922

***Hybomitra ciureai* (Séguy, 1937): L1:** 30.06.2009, 3♀♀; 18.07.2009, 1♀; 16.06.2010, 1♀; **L2:** 30.06.2009, 1♀; 20.05.2013, 1♀; 08.06.2014, 1♀; 16.08.2014, 1♂; **L3:** 14.06.2010, 3♀♀

***Hybomitra distinguenda* (Verrall, 1909): L3:** 30.06.2009, 1♀.

***Hybomitra pilosa* (Loew, 1858): L1:** 03.05.2013, 4♀♀; **L2:** 03.05.2013, 11♀♀; **L3:** 03.05.2013, 9♀♀; 20.05.2013, 1♀.

Genus *Tabanus* Linnaeus, 1758

***Tabanus autumnalis* Linnaeus, 1761: L1:** 13.08.2011, 1♀+1♂; 20.05.2013, 4♀♀; 29.06.2013, 1♀; **L2:** 13.08.2011, 1♂; 20.05.2013, 2♀♀; **L3:** 13.08.2011, 1♀; 29.06.2013, 1♀;

Tabanus bifarius Loew, 1858: L1: 30.06.2009, 2♀♀; 14.06.2010, 54♀♀; 29.06.2013, 1♀; **L2:** 14.06.2010, 22♀♀; 29.06.2013, 1♀; 08.06.2014, 19 ♀♀; **L3:** 30.06.2009, 1♀; 14.06.2010, 3♀♀+1♂; 29.06.2013, 1♀;

***Tabanus bromius* Linnaeus, 1758: L1:** 30.06.2009, 9♀♀+3♂♂; 18.07.2009, 4♀♀; 06.07.2010, 5♀♀; 13.08.2011, 7♀♀+1♂; 29.06.2013, 4♀♀; 30.08.2014, 1♀; **L2:** 18.07.2009, 1♀; 13.08.2011, 12♀♀+1♂; 29.06.2013, 2♀♀; 16.08.2014, 2♂♂; **L3:** 30.06.2009, 5♀♀; 18.07.2009, 1♀; 06.07.2010, 2♀♀; 13.08.2011, 5♀♀; 29.06.2013, 4♀♀;

***Tabanus exclusus* Pandellé, 1883: L1:** 13.08.2011, 13♀♀; **L2:** 13.08.2011, 20♀♀; **L3:** 13.08.2011, 10♀♀+1♂; L4: 16.08.2008, 2♀♀;

***Tabanus indrae* Hauser: L3:** 20.05.2013, 1♂

***Tabanus miki* Brauer, 1880: L1:** 30.06.2009, 2♀♀**; L3:** 30.06.2009, 2♀♀;
***Tabanus quatuornotatus* Meigen, 1820: L1:** 18.07.2009, 1♀; 14.06.2010, 1♀; 20.05.2013, 6♀♀; **L2:** 14.06.2010, 2♀♀; 20.05.2013, 2♀♀; 24.05.2014, 1♀; 08.06.2014, 3♀♀; **L3:** 14.06.2010, 1♀; 20.05.2013, 2♀♀; 08.06.2014, 1♀.
***Tabanus shannonellus* Kröber, 1936: L4:** 16.08.2008, 1♀.
***Tabanus smirnovi* Olsufjev, 1962: L1:** 29.06.2013, 1♀.
***Tabanus spectabilis* Loew, 1858: L1:** 13.08.2011, 1♀.
***Tabanus spodopterus ponticus* Olsufjev, Moucha & Chvála, 1967: L1:** 30.06.2009, 10♀♀+1♂; 18.07.2009, 4♀♀; 13.08.2011, 1♀; 29.06.2013, 4♀♀+7♂♂; **L2:** 18.07.2009, 1♀; 29.06.2013, 8♀♀+1♂; **L3:** 30.06.2009, 3♀♀+1♂; 18.07.2009, 1♀; 06.07.2010, 2♀♀; 13.08.2011, 1♀+1♂; 29.06.2013, 3♀♀+1♂.
***Tabanus sudeticus* Zeller, 1842: L1:** 30.06.2009, 1♀; 06.07.2010, 1♀; 13.08.2011, 1♀; 29.06.2013, 2♀♀; **L2:** 13.08.2011, 1♀; L3: 18.07.2009, 1♀; 13.08.2011, 1♀; 29.06.2013, 1♀.
***Tabanus tergestinus* Egger, 1859: L1:** 30.06.2009, 21♀♀; 18.07.2009, 11♀♀; 14.06.2010, 6♀♀; 06.07.2010, 41♀♀; 13.08.2011, 1♀; 29.06.2013, 17♀♀+1♂; **L2:** 18.07.2009, 17♀♀; 14.06.2010, 10♀♀; 13.08.2011, 1♀; 29.06.2013, 6♀♀; **L3:** 30.06.2009, 10♀♀; 18.07.2009, 22♀♀+1♂; 14.06.2010, 9♀♀; 06.07.2010, 15♀♀+1♂; 29.06.2013, 5♀♀; **L4:** 16.08.2008, 1♂.
***Tabanus tinctus* Walker, 1850: L1:** 13.08.2011, 1♀; 29.06.2013, 1♀.
***Tabanus unifasciatus* Loew, 1858: L1:** 13.08.2011, 2♀♀; 29.06.2013; 1♀.

Genus *Haematopota* Meigen, 1803

***Haematopota grandis* Meigen, 1820: L2:** 16.08.2014, 1♀.
***Haematopota pluvialis* (Linnaeus, 1758): L1:** 29.06.2013, 1♀; 24.05.2014, 1♀; **L2:** 13.08.2011, 1♀; 08.06.2014, 1♀.

Genus *Dasyrhamphis* Enderlein, 1922

***Dasyrhamphis anthracinus* (Meigen, 1820): L3:** 14.06.2010, 1♂.
***Dasyrhamphis ater* (Rossi, 1790): L1:** 20.05.2013, 1♀+1♂; **L2:** 14.06.2010, 2♀♀; 20.05.2013, 1♀; 08.06.2014, 3♀♀.
***Dasyrhamphis umbrinus* (Meigen, 1820): L1:** 14.06.2010, 11♀♀; 06.07.2010, 7♀♀; 29.06.2013, 1♀; **L2:** 14.06.2010, 9♀♀; 20.05.2013, 1♀; 29.06.2013, 1♀; 08.06.2014, 13♀♀.

Genus *Philipomyia* Olsufjev, 1964

***Philipomyia aprica* (Meigen, 1820): L2:** 30.06.2009, 1♀; 14.06.2010, 5♀♀; 08.06.2014, 1♀; L3: 30.06.2009, 3♀♀; 14.06.2010, 1♀; 06.07.2010, 1♀.
***Philipomyia graeca* (Fabricius, 1794): L1:** 30.06.2009, 26♀♀; 14.06.2010, 9♀♀; 06.07.2010, 1♀; 29.06.2013, 4♀♀; **L2:** 30.06.2009, 9♀♀; 18.07.2009, 1♀; 14.06.2010, 28♀♀; 20.05.2013, 1♀; 29.06.2013, 2♀♀; 08.06.2014, 18♀♀; **L3:** 30.06.2009, 60♀♀; 18.07.2009, 3♀♀; 14.06.2010, 28♀♀+1♂; 06.07.2010, 2♀♀; 29.06.2013, 2♀♀; 08.06.2014, 2♀♀.

Dominance structure

According to Skufin's scale for the relative abundance of species (Skufin, 1949), 4 of the established species are dominant; 4 species and 1 subspecies - subdominant; 5 species are scarce, and the remaining thirteen (12 species and 1 subspecies) taxa are rare (Table 1).

The dominant species in the tabanid assemblages in the Bakadzhitsite hills refer to 2 genera: the genus *Tabanus* (3 species) and the genus *Philipomyia* (1 species). The populations of dominant species *Ph. graeca* (23.85%), *T. tergestinus* (23.74%), *T. bifarius* (12.71%) and *T. bromius* (8.35%) represented 68.65% of the total number of tabanid specimens collected in the Bakadzhitsite hills (Table 1). *T. tergestinus* was recorded in all the localities studied, while the other dominant species were found only in the three main localities situated in the Bakadzhitsite Protected Zone. The highest number was reported for *Ph. graeca* (23.85%) and *T. tergestinus* (23.74%) populations (Table 1).

Table 1. Species composition and number of captured specimens of tabanids (Diptera: Tabanidae) on the territory of the Bakadzhitsite hills (2008; 2009-2011; 2013-2014)

Species	Locality 1	Locality 2	Locality 3	Locality 4	Total specimens	Relative abundance (RA, %)
	2009-2014	2009-2014	2009-2014	2008		
A. loewianus				1	1	0.12
Th.tricolor pallidicauda			1		1	0.12
H. ciureai	5	3+1*	3		11+1	1.45
H.distinguenda			1		1	0.12
H. pilosa	4	11	10		25	3.03
T. autumnalis	6+1	2+1	2		10+2	1.45
T. bifarius	**57**	**42**	**5+1**		**104+1**	**12.71**
T.bromius	**30+4**	**15+3**	**17**		**62+7**	**8.35**
T.exclusus	13	20	10+1	2	45+1	5.57
T. indrae			+ 1		+ 1	0.12
T. miki	2		2		4	0.48
T. quatuornotatus	8	8	4		20	2.42
T.shannonellus				1	1	0.12
T. smirnovi	1				1	0.12
T. spectabilis	1				1	0.12
T. sp. ponticus	19+8	9+1	10+3		38+12	6.06
T.sudeticus	5	1	3		9	1.09
T.tergestinus	**97+1**	**34**	**61+2**	**+ 1**	**192+4**	**23.74**
T.tinctus	2				2	0.24
T.unifasciatus	3				3	0.36
H. grandis		1			1	0.12
H. pluvialis	2	2			4	0.48
D. anthracinus			+ 1		+ 1	0.12
D. ater	1+1	6			7+1	0.97
D. umbrinus	19	24			43	5.21
Ph. aprica		7	5		12	1.45
Ph. graeca	**40**	**59**	**97+1**		**196+1**	**23.85**
Number of species and subspecies	19	16	17	4	27	
Total number of specimens	**315+15**	**244+6**	**231+10**	**4+1**	**794+32**	**99.99%**

* after the sign "+" the number of captured male specimens is given

In the three main localities, *Ph.graeca* was not registered only in 2011, and *T. tergestinus* only in 2014. The probable reasons for the lack of activity of the two most abundant species in the area in only one of the study years may be sought in their phenological characteristics or in the nature of meteorological conditions throughout the active season and during field collections. Regarding their phenological features, *Ph. graeca* is a summer species, and *T. tergestinus* – polyseasonal (Ganeva, 1998; 2004). Specimens of *Ph. graeca* appear in the area of the Chirpan Eminences (The Upper-Thracian lowland) during the second half of May (Kalmushka, 2014) and fly till the end of July at the latest in the region of the Upper-Thracian lowland (Ganeva, 1998; 2004). The field collection in 2011 was made only once, in August (13.08.2011), which explains the absence of *Ph. graeca* in the composition of the tabanid assemblages at that time. Unlike *Ph. graeca, T. tergestinus* is a polyseasonal species that is activated in early June and flies to mid-September (Ganeva, 1998; 2001; 2004). Thus, the reason for the lack of activity of *T. tergestinus* in 2014 should be sought in the meteorological conditions peculiarities before and during the tabanids' active season. The spring and summer of 2014 were characterized by many rainy days accompanied by significant rainfall. Low temperatures and high soil moisture have a negative impact on the development of larvae, the pupation period and the time of imagination of tabanids such as poikilothermic organisms. This is also the most likely cause of *T. tergestinus's* lack of activity during the 2014 active season.

Subdominant species belong to three genera: *Hybomitra* (1 species), *Tabanus* (2 species and 1 subspecies) and *Dasyrhamphis* (1 species). Their populations account for 22.29% of the total number of the tabanid assemblages in the area. The population of *T. spodopterus ponticus* (6.06%) is the highest. It was registered in the three main localities throughout the study period (Table 1). The second in number subdominant species - *T. exclusus* (5.57%) was found in the four localities, but only in 2008 and 2011. *T. exclusus* was a late summer species that reached the maximum in its activity in August. The field collections in 2008 and 2011 were made in August, which explains the registration of the species only in that period. *D. umbrinus* (5.21%) is the third in number subdominant species in the area. In terms of phenology, *D. umbrinus* is a summer species flying in Stara Zagora region (The Upper-Thracian lowland) from the beginning of June to the first half of July (Ganeva, 1998). During our study we recorded the activity of specimens of this species during the third decade of May (20.05.2013, 1♀). The periods of activity of *D. umbrinus* coincide with those indicated by Trifonov et al. (1964), for the region of Southeastern Bulgaria. Activity of *D. umbrinus* was reported from the second half of May to the middle of July in two of the main localities in the Bakadzhitsite hills. The remaining two subdominant species *H. pilosa* (3.03%) and *T. quatuornotatus* (2.42%) were observed in the three main localities but in a different number of field collections. *H. pilosa* is a spring species flying from late April to early June (Ganeva, 1998). We reported

some activity in the area of the Bakadzhitsite hills only in May 2013. Unlike *H. pilosa, T. quatuornotatus* is an early summer species flying from mid-May to early August, but the activity peak is around mid-June. The species was not observed in the explored area in 2008 and 2011 when field collections were made in August.

Five scarce species were established in the tabanid assemblages of the Bakadzhitsite hills (Table 1). The number of specimens belonging to the five scarce species represents 6.41% of the total of collected tabanids in the study area. The scarce species belong to 4 genera: *Hybomitra* (1 species), *Tabanus* (2 species), *Dasyrhamphis* (1 species) and *Philipomyia* (1 species). *Hybomitra ciureai, T. autumnalis* and *Ph. aprica* populations showed the highest numbers. The three species participated by 1.45% in the total tabanid activity in the area. The first two species were reported from the three major localities, while *Ph. aprica* was only registered in two of them. The remaining two scarce species *T. sudeticus* (1.09%) and *D. ater* (0.97%) are part of the tabanid assemblages of the three (*T. sudeticus*) or only the two (*D. ater*) major localities.

Twelve species and one subspecies of the tabanid assemblages on the Bakadzhitsite hills had a relative abundance lower than 0.5% (Table 1). They are rare species and represent 2.28% of the total catch. The highest concentration of rare species was found out in locality 1, situated next to the micro dam at the foot of the Bakadzhitsite hills. Blood-sucking flies of six species were captured there, two of them (*T. miki* and *H. pluvialis*) being recorded, respectively, in the second (*H. pluvialis*) and in the third locality (*T. miki)* (Table 1).

Zoogeographical aspects of the tabanid fauna from Bakadzhitsite hills

According to zoogeographical division of the tabanid fauna (Olsufjev, 1977, 1980), the 27 species and subspecies of the tabanids found in the Bakadzhitsite hills, are related to 5 faunistic complexes of two subregional type of fauna in Palearctic: Boreurasian type with Euro-Siberian forest and Forest-steppe fauna complex and Mediterranean type of fauna with 3 faunistic complexes: Southern European, Pontic-Hyrcanian and Mediterranean-Middle Asian.

The Euro-Siberian forest faunistic complex is represented on the territory of the Bakadzhitsite hills by 4 species (*Hybomitra distinguenda, Tabanus miki, T. sudeticus* and *Haematopota pluvialis*), whereas the Forest-steppe faunistic complex - by 3 species (*Hybomitra ciureai, Tabanus autumnalis* and *T. bromius*) (Olsufjev, 1977). It follows that these 7 species of Boreurasian subregional fauna represent 25.92% of the tabanid fauna composition there.

The Mediterranean subregional fauna is represented on the studied territory through the species from 3 faunistic complexes.

The South European faunistic complex in the region is represented by 10 species: *Atylotus loewianus, Tabanus bifarius, T. quatuornotatus, T. tergestinus, T. tinctus, T. unifasciatus, Haematopota grandis, Dasyrhamphis umbrinus, Philipomyia aprica* and *Ph. graeca* (Olsufjev, 1977, 1980).

Only one species (*Tabanus spectabilis*) from the Mediterranean-Middle Asian faunistic complex and 3 species (*Therioplectes tricolor pallidicauda, T. indrae* and *T. smirnovi*) from the Pontic-Hyrcanian faunistic complex (East-Mediterranean) were established (Olsufjev, 1977; 1980).

There are no data about the zoogeographic belonging of *H. pilosa, Tabanus exclusus, T. shannonellus, T. spodopterus ponticus, Dasyrhamphis ater* and *D. anthracinus* in Olsufjev's publications (1977, 1980). According to Chvála *et al.* (1972), *T. shannonellus* and *T. spodopterus ponticus* are Eastern-Mediterranean species by distribution and the other species are Southern European. According to Olsufjev (1977, 1980), the above species refer to the Mediterranean sub-regional fauna taking into consideration their distribution. Consequently, the Mediterranean fauna is represented by 20 species on the territory of the Bakadzhitsite hills (74.08%).

On the basis of the above, it can be concluded that the elements of the Mediterranean sub-regional fauna (74.08%) predominate in the tabanid fauna of the Bakadzhitsite hills.

CONCLUSION

As a result of the research carried out on the bloodsucking flies (Diptera: Tabanidae) on the territory of the Bakadzhitsite hills, it can be summarized that this is the first study on the tabanid fauna in the area explored. Twenty-five species and two subspecies from 7 genera were reported for the first time for the Bakadzhitsite hills. The dominant species are *Ph. graeca* (23.85%), *T. tergestinus* (23.74%), *T. bifarius* (12.71%) and *T. bromius* (8.35%).

The established differences of the structural and diversity parameters of the tabanid assemblages in the studied region are due to the influence of the microclimatic peculiarities of the biotopes and the ecological requirements of the tabanids to them. The elements of the Mediterranean sub-regional fauna (74.08% of the species) predominate in the horsefly fauna of the region studied.

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Author contribution statement: DG designed the experiment. DG and MM collected the specimens and analyzed the data. DG and MHM wrote the manuscript.

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