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Comparative Zoogeographical Review of the Tachinid Fauna (Diptera: Tachinidae) of the Belasitsa and Slavyanka Mountains

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Abstract: A total of 178 species of parasitoid flies Tachinidae have been recorded from the two mountains so far (147 species from Belasitsa Mt. and 109 species from Slavyanka Mt.). The comparatively low degree of similarity (61.5%) of the fauna between these mountains is related to their natural features and uneven research. The greatest number of species was found in the zone of mesophilic and xeromesophilic mixed forests (125 species in Belasitsa and 102 species in Slavyanka). The degree of similarity between the Tachinidae fauna of the different vegetation belts ranged from 18.0% to 81.2 %. The tachinids belonged to 42 zoogeographical categories, divided into two supergroups: 1) species with Mediterranean type of distribution – more thermophilic and distributed mainly in the southern parts of the Palaearctic (22 species, or 12.4%); 2) species with Palaearctic and Eurosiberian type of distribution – more eurybiontic and widely distributed in the Palaearctic (156 species, or 87.6%). The distribution of the zoogeographical categories in the separate vegetation belts of the mountains is scrutinised.

Keywords: Diptera, Tachinidae, Belasitsa Mts., Slavyanka Mts., zoogeography, Bulgaria

Introduction

Until 1980, there were no studies on the tachinid fauna of the Slavyanka and Belasitsa Mountains. The first species, reported from Slavyanka Mt., is *Loewia brevifrons* (Rond.) (Jacentkovský 1936, 1937). Hubenov (1980a, 1980b, 1982a) presented information for 17 species from this mountain, of which 14 species were reported for the first time from Bulgaria. The first data for the Tachinidae of Belasitsa Mt. were reported by Hubenov (1982a, 1982b, 1983): 14 species, of which 13 species were new for Bulgaria. Following these studies, the tachinid fauna of both mountains has been investigated systematically and the recorded species have been assigned to zoogeographical categories (Hubenov 1988, 1995). Nowadays, 109 species of the family Tachinidae from Slavyanka Mt. are known from the Bulgarian territory, and 147 species – from Belasitsa Mt..

The aim of this work is to present the Tachinidae distribution in the Slavyanka and Belasitsa Mountains, as well as to make a comparative zoogeographical analysis of the fauna.

Investigated regions, materials and methods

The two mountains differ greatly from one another in terms of their physicogeographical features.

Belasitsa Mt. is situated in the south westernmost part of Bulgaria, on the border with Greece and Macedonia. It stretches west-eastwards and is about 60 km long and 10-12 km wide. The highest point, Radomir Peak, is 2029 m a. s. l. Half of its northern slope is situated on the territory of Bulgaria. Belasitsa Mt. belongs to the Continental-Mediterranean climatic area and includes parts of Petrich-Sandanski (to 300 m), Maleshevska-Pirin low mountain (300-1000 m) and South Bulgarian mountain climatic regions (above 1000 m) (Stanev 1991). The mountain belongs to the Macedonian-Thracian province of the European deciduous forest area. The vegetation is

differentiated in a system of four vegetation zones (Velchev & Tonkov 1986, Bondev 1991, 2002): 1) Xerothermic oak forests, fragmentary presented in the western and eastern part – up to 300-400 m a. s. l.; 2) Mesophylic and xeromesophylic mixed forests – from 300-400 m to 800-900 m a. s. l., in which *Castanea sativa* Mill. prevails; 3) Beech forests – from 800-900 m to 1700 m a. s. l.; 4) Subalpine vegetation – above 1700 m a. s. l. A coniferous belt lacks, the relict phytocenoses of *Platanus orientalis* L. are characteristic for the lower parts of the mountain, and in the subalpine zone there is not *Pinus montana* L. (Velchev & Tonkov 1986, Bondev 1991). Belasitsa Mt. belongs to the Rila-Rhodope zoogeographical region (Georgiev 2002).

Slavyanka Mt. is situated between the valleys of the rivers Struma and Mesta, south of Pirin Mt., from which it is separated by Paril Col. It stretches west-eastwards and is about 20 km long and 10-12 km wide. The maximum height at Gotsev Peak is 2212 m a. s. l. The northern slope of the mountain is on the territory of Bulgaria. Slavyanka Mt. belongs to Continental-Mediterranean climatic area and includes parts of Petrich-Sandanski, South Bulgarian Mountain and Mestenski climatic regions (Stanev 1991). Because of the karstic terrain, the mountain is relatively anhydrous. Slavyanka Mt. belongs to the Macedonian-Thracian province of the European deciduous forest area. The vegetation is differentiated in a system of four vegetation zones (Velchev & Tonkov 1986, Bondev 1991, 2002): 1) Xerothermic oak forests, which are divided by Paril Col into eastern and western part – up to 600 m a. s. l.; 2) Oak-hornbeam mixed forests – from 600 to 1000 m a. s. l.; 3) Coniferous forests – from 1000 to 1900 m a. s. l.; 4) Subalpine vegetation – above 1900 m a. s. l. A beech belt lacks. For the coniferous zone, the Mediterranean plant formation of *Pinus heldreichii* Christ. is characteristic. In the subalpine zone, there is no *Pinus montana* Mill. (Velchev & Tonkov 1986, Bondev 1991). Slavyanka Mt. belongs to the Rila-Rhodope zoogeographical region (Georgiev 2002).

The materials from Belasitsa Mt. were collected from 27 localities, grouped in six starting points: south and south-east of the town of Petrich, Belasitsa hut, Populyo area, south of Kolarovo village towards Radomir Peak, south-east of Klyuch village and south-west of Skrut village towards Tumba Peak. The materials were collected mostly during 1979-1988. The material from Slavyanka Mt. was collected from 17 localities, combined into four starting points: south and south-east of Petrovo village along the Petrovska River valley; south of Goleshovo village towards Gotsev Peak; south-west of Paril village to Gotsev Peak; west of Nova Lovcha village. The main part of the materials was collected during 1979-1982. Specimens from the collections of the National Museum of Natural History, Sofia, collected by P. Drensky in 1935-1938, was also included, with data for the altitude.

The materials were collected mainly from the northern slopes of the mountains. Route and stationary methods for collecting of imagos were used. They were caught on the blossoms of *Euphorbia* Author, *Daucus* Author, *Torilis* Author, *Angelica* Author, *Heracleum* Author, *Aegopodium* Author, *Eryngium* Author, *Seseli* Author, *Peucedanum* Author, *Hedera* Author, *Sambucus* Author, *Mentha* Author, *Origanum* Author, *Thymus* Author, *Achilea* Author, *Senecio* Author, *Leucathemum* Author and *Cirsium* Author; on leaves of bushes and trees and through sweeping of herbaceous vegetation.

Zoogeographical analysis for species categorisation was used. This method allows obtaining data information about species complexes with different zoogeographical character based on the published data regarding taxa distribution and results of the sums. To compare tachinid fauna of the vegetation belts, Czekanowski-Dice-Sörensen coefficient of similarity was used. The data for species distribution are taken from papers of Mesnil (1944-1975, 1980), Crosskey (1980), Herting (1983, 1984), Herting & Dely-Draskovits (1993), Andersen (1996), Ziegler & Shima (1996), O'Hara & Wood (2004), Richter (2004), Tschorsnig et al. (2005), Pape et al. (2015), etc..

Abbreviations used: Afrotropical-Mediterranean (**am**), Boreomontane (**bm**), Cosmopolitan (**c**), Central and South European (**cse**), Disjunct Eurosiberian (**des**), Disjunct Palaearctic (**dp**), European (**e**), East European-Central Asian (**eeca**), Eurosiberian-Central Asian (**esca**), European-South Siberian (**ess**), European-Turanian (**et**), Holarctic (**h**), species introduced in North America (**h***), Holoeurosiberian (**hes**), Holomediterranean (**hm**), Holarctic-Oriental (**ho**), Holopalaearctic (**hp**), Holarctic-Palaeotropical-Australian (**hpta**), Mediterranean-Central Asian (**mca**), Mediterranean and South Siberian (**mss**), Mediterranean-Turanian (**mt**), North Mediterranean (**nm**), North Mediterranean-Turanian (**nmt**), Oriental-Mediterranean (**om**), Palaearctic-Afrotropical (**pa**), Palaearctic-Palaeotropical-Australian (**ppta**), Palaearctic-Oriental (**po**), South European (**se**), South European and South Siberian (**sess**), South Palaearctic (**sp**), South Palaearctic-Afrotropical (**spa**), South Palaearctic-Palaeotropical-Australian (**sppta**), Transpalaearctic (**tp**), West and Central Eurosiberian

(**wces**), West and Central Palaearctic (**wcp**), West Eurosiberian (**wes**), West Palaearctic (**wp**).

Results and Discussion

A total of 178 species of the family Tachinidae have been recorded from Belasitsa and Slavyanka Mountains (Table 1). They belong to 110 genera and four subfamilies. The most numerous was the subfamily Exoristinae, with 73 species, followed by Tachininae (47 species), Phasiinae (31 species) and Dexiinae (27 species). Many genera contained comparatively small number of species. This is a typical feature of the family Tachinidae. The richest genera included from five to seven species in total for both mountains. These were *Exorista* Author, Year (five species), *Tachina* Author, Year (six species), *Linnaemya* Author, year (seven species), *Gymnosoma* Author, Year (seven species) and *Cylindromyia* Author, Year (six species). For the investigated area of the two mountains (about 0.29% of the country's territory), the number of the recorded species was large and represented 43.5% of the known 409 species of the family Tachinidae in Bulgaria. A total of 147 species (35.9% of the Bulgarian species) have been recorded from Belasitsa Mt. and 109 species (26.7% of the Bulgarian species) have been found in Slavyanka Mt. The number of species registered in the two mountains was smaller than the one from Pirin Mt. (203 species, Hubenov 1992). A total of 78 species were common to both mountains, while 69 species have been found only in Belasitsa Mt. and 31 species – in Slavyanka Mt. only. The relatively low level of similarity of the tachinid fauna between the two mountains (61.5%) was due to their specific natural conditions and insufficiently investigation. The wide distribution of the tachinids suggests that further investigations are likely to show similar fauna of the separate mountains in Bulgaria. The species of the family have vast ranges and the endemics are an exception. Usually they are newly described taxa or rare species with unclear distribution. Endemic forms are not known from the investigated area of the two mountains.

A total of 76 tachinid species (51.7%) have been registered in the xerothermic oak forests belt of Belasitsa Mt. in spite of its fragmentation and small area. This was related to the open spaces in which species of Sandanski-Petrich valley penetrate and the belt above it (112 species – Beschovski & Hubenov 1986). Most species were found in the belt of mesophilic and xeromesophilic mixed forests (125 species or 85.0%). The great number of species in the beech belt (113 species or 76.9%) was distinctive for Belasitsa Mt. It could be explained with the upper limit of this belt being situated higher due to the lack of coniferous forests, the availability of open spaces and low anthropogenic impact. The species composition of the sub-alpine zone (25 species or 11.0%) in Belasitsa Mt. was richer than in Slavyanka Mt. (18 species or 16.5%) and Pirin Mt. (13 species or 6.4%). This was related to its lower limit because of the lack of coniferous belt. The regions situated between 600 and 1000 m a. s. l. in Belasitsa Mt. are optimal for the development of maximum number of tachinid species. With regard to the hypsometric belts (across 200 m), the maximum number of species was located at 600-800 m a. s. l. (114 species or 77.5%) and 800-1000 m a. s. l. (105 species or 71.4%) (Hubenov 1995). This could be explained with the great number of common species and the high degree of similarity (80.7%) of the tachinid fauna in the second and third vegetation belts (Table 2). The regions situated between 400 and 800 m a. s. l. were optimal for the development of maximum number of species of the family Tachinidae in Bulgaria (Hubenov 1993) but on the northern slope of Belasitsa Mt. they were located about 200 m higher. This was probably related to the specific climatic features of the mountain.

The greatest number of species was found (102 or 93.6%) in the second vegetation belt of Slavyanka Mt. (Table 1). This was connected with the karstic terrain, the open spaces in all parts of the northern slope and the small area of the first vegetation belt which was not apparent around the Paril Col. The great number of species in the coniferous belt (95 or 87.2%) was distinctive for Slavyanka Mt. It could be explained with the vast area of this belt, the heterogeneous character of the constituent plant communities and the lack of beech belt. The foregoing was connected with the great number of common species and the high degree of similarity of the tachinid fauna in the first three vegetation belts (Table 3). The highest degree of similarity was between the second and the third vegetation belts (81.2%) but the latter one was coniferous (not beech). A total of 18 species (16.5%) was found in the sub-alpine zone, of which none was specific for this zone. All these species were found in the neighbouring coniferous forests and most of them (from nine to 11 species) in the other zones, as well. The tachinid fauna of Slavyanka Mt. is less studied than the fauna of Belasitsa Mt.

On the basis of their vertical distribution, the recorded tachinids could be divided into three groups: distributed in one vegetation belt (25 species or 17.0% in Belasitsa Mt. and 15 species or 13.8% in Slavyanka Mt.), distributed in more than one veg-

Table 1. Distribution of the family Tachinidae (Diptera) in Belasitsa Mt. and Slavyanka Mt.

Taxa	Belasitsa Mt.				Slavyanka Mt.				Area
	Xerothermic oak forests – up to 400 m	Mesophyllic and xeromesophyllic mixed forests – from 400 m to 800 m	Beech forests – from 800 to 1600 m	Subalpine vegetation – over 1600 m	Xerothermic oak forests – up to 600 m	Oak-hornbeam mixed forests – from 600 m to 1000 m	Coniferous forests – from 1000 to 1900 m	Subalpine vegetation – over 1900 m	
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
Exoristinae									
Exorista (*Exorista*) *larvarum* (Linnaeus, 1758)	+	+			+	+			hp
Exorista (*Podotachina*) *grandis* (Zetterstedt, 1844)	+	+	+						ess
Exorista (*Podotachina*) *sorbillans* (Wiedemann, 1830)	+	+			+	+	+		sppta
Exorista (*Adenia*) *mimula* (Meigen, 1824)	+	+	+		+	+	+		hp
Exorista (*Adenia*) *rustica* (Fallén, 1810)	+	+	+		+	+	+		hp
Chetogena filipalpis Rondani, 1859		+			+	+			nmt
Chetogena obliquata (Fallén, 1810)		+	+			+	+		tp
Parasetigena silvestris (Robineau-Desvoidy, 1863)	+	+	+						des
Phorocera assimilis (Fallén, 1810)	+	+	+						? des
Phorocera grandis (Rondani, 1859)		+	+						dp
Phorocera obscura (Fallén, 1810)	+	+	+		+	+	+		des
Bessa parallela (Meigen, 1824)		+							hes
Belida angelicae (Meigen, 1824)						+			wcp
Meigenia dorsalis (Meigen, 1824)	+	+	+	+	+	+	+		hes
Meigenia mutabilis (Fallén, 1810)	+	+	+	+	+	+	+	+	wcp
Zaira cinerea (Fallén, 1810)	+	+	+		+	+	+		tp
Medina luctuosa (Meigen, 1824)		+	+						hes
Lecanipa bicincta (Meigen, 1824)		+	+						wces
Lecanipa leucomelas (Meigen, 1824)			+						e
Admontia maculisquama (Zetterstedt, 1859)		+	+						e
Admontia podomyia Brauer & Bergenstamm, 1889				+					e, bm
Oswaldia spectabilis (Meigen, 1824)			+						e
Lomachantha parra Rondani, 1859							+		et
Erynniopsis antennata (Rondani, 1861)	+								? hm
Blondelia nigripes (Fallén, 1810)	+	+	+	+	+	+	+	+	tp, h*
Compsilura concinnata (Meigen, 1824)	+	+	+		+	+			hes, h*
Acemya acuticornis (Meigen, 1824)							+		ess
Smidtia amoena (Meigen, 1824)	+	+	+		+	+			hes
Winthemia quadripustulata (Fabricius, 1794)		+	+						h
Nemorilla floralis (Fallén, 1810)		+							hp
Aplomya confinis (Fallén, 1820)	+	+	+		+	+	+		hp
Phebelia nigripalpis (Robineau-Desvoidy, 1847)			+			+	+		des
Ptesiomyia alacris (Meigen, 1824)							+		e
Tlephusa cincinna (Rondani, 1859)						+	+		ess
Epicampocera succincta (Meigen, 1824)		+	+		+	+	+		tp

Table 1. Continued

1	2	3	4	5	6	7	8	9	10
Phryxe nemea (Meigen, 1824)	+	+	+	+	+	+	+		hes
Phryxe prima (Brauer & Bergenstamm, 1889)		+				+	+		mt
Phryxe vulgaris (Fallén, 1810)	+	+	+	+	+	+	+	+	h
Periarchiclops scutellaris (Fallén, 1820)							+		wces
Pseudoperichaeta nigrolineata (Walker, 1853)						+	+		des
Lydella stabulans (Meigen, 1824)	+	+	+						wes
Cadurciella tritaeniata (Rondani, 1859)		+	+						des
Drino atropivora (Robineau-Desvoidy, 1830)	+	+	+		+	+	+		sp
Drino inconspicua (Meigen, 1830)					+	+	+		wces
Drino lota (Meigen, 1824)		+	+		+	+	+		pat
Drino vicina (Zetterstedt, 1849)	+	+	+		+	+	+		wces
Huebneria affinis (Fallén, 1810)		+	+	+	+	+	+	+	ess
Carcelia (*Carcelia*) *gnava* (Meigen, 1824)		+							des
Carcelia (*Carcelia*) *lucorum* (Meigen, 1824)		+	+		+	+	+		tp
Thecocarcelia acutangulata (Macquart, 1850)	+				+	+	+		spat
Erycia festinans (Meigen, 1824)					+	+	+		wces
Alsomyia capillata (Rondani, 1859)		+			+	+			hm
Platymya antennata (Brauer & Bergenstamm, 1891)						+	+		wp
Platymya fimbriata (Meigen, 1824)			+	+					tp, bm
Eumea linearicornis (Zetterstedt, 1844)		+	+			+	+		hes
Pales pavida (Meigen, 1824)	+	+	+		+	+			hp
Pales pumicata (Meigen, 1824)		+	+						nm
Phryno vetula (Meigen, 1824)		+							des
Allophorocera ferruginea (Meigen, 1824)		+	+						hes
Eurysthaea scutellaris (Robineau-Desvoidy, 1848)		+	+						e
Elodia ambulatoria (Meigen, 1824)		+	+						wcp
Sturmia bella (Meigen, 1824)					+	+	+		po
Blepharipa pratensis (Meigen, 1824)	+	+	+						tp, h*
Masicera pavoniae (Robineau-Desvoidy, 1830)					+	+			wp
Masicera silvatica (Fallén, 1810)	+	+	+						e
Prosopea nigricans (Egger, 1861)	+	+	+		+	+	+		wcp
Gaedia connexa (Meigen, 1824)					+	+	+		e
Gaedia distincta Egger, 1861						+	+		ess
Gonia bimaculata Wiedemann, 1819	+	+							atm
Gonia capitata (De Geer, 1776)		+	+	+		+	+	+	wcp
Pseudogonia parisiaca (Robineau-Desvoidy, 1851)					+	+	+		ess
Pseudogonia rufifrons (Wiedemann, 1830)	+	+							ppta
Spallanzania hebes (Fallén, 1820)	+	+	+						ho
Tachininae									
Tachina (*Tachina*) *grossa* (Linnaeus, 1758)	+	+	+						hes
Tachina (*Eudoromyia*) *casta* (Rondani, 1859)	+								nm
Tachina (*Eudoromyia*) *fera* (Linnaeus, 1761)	+	+	+	+	+	+	+	+	hp
Tachina (*Eudoromyia*) *magnicornis* (Zetterstedt, 1844)	+	+	+	+	+	+	+		hp
Tachina (*Eudoromyia*) *nupta* (Rondani, 1859)		+	+						tp
Tachina (*Echinogaster*) *praeceps* Meigen, 1824					+	+	+		tp
Nowickia (*Nowickia*) *marklini* (Zetterstedt, 1838)			+	+			+	+	h
Nowickia (*Fabriciella*) *atripalpis* (Robineau-Desvoidy, 1863)				+					hes, bm
Nowickia (*Fabriciella*) *ferox* (Panzer, 1809)			+	+		+	+	+	wes
Nowickia (*Fabriciella*) *rondanii* (Giglio-Tos, 1890)			+			+	+		sess
Cnephaotachina danilevskyi (Portshinsky, 1882)					+	+			mca
Peleteria abdominalis Robineau-Desvoidy, 1830			+		+	+	+		nm
Peleteria ferina (Zetterstedt, 1844)	+	+	+		+	+	+		hes

Table 1. Continued

1	2	3	4	5	6	7	8	9	10
Peleteria rubescens (Robineau-Desvoidy, 1830)	+	+	+	+	+	+	+	+	tp
Peleteria varia (Fabricius, 1794)	+	+	+		+	+	+		ppta
Nemoraea pellucida (Meigen, 1824)		+	+						tp
Linnaemya (*Linnaemya*) *comta* (Fallén, 1810)	+	+	+		+	+	+		ho
Linnaemya (*Bonellimyia*) *impudica* (Rondani, 1859)		+	+		+	+	+		cse
Linnaemya (*Ophina*) *haemorrhoidalis* (Fallén, 1810)		+	+	+		+	+	+	hes, bm
Linnaemya (*Ophina*) *olsufjevi* Zimin, 1954		+							hes
Linnaemya (*Ophina*) *picta* (Meigen, 1824)		+	+						po
Linnaemya (*Ophina*) *rossica* Zimin, 1954			+	+		+	+		hes
Linnaemya (*Homoeonychia*) *lithosiophaga* (Rondani, 1859)	+	+							hm
Ernestia rudis (Fallén, 1810)		+	+						tp
Eurithia caesia (Fallén, 1810)			+	+		+	+		hes
Eurithia consobrina (Meigen, 1824)						+	+		hes
Zophomyia temula (Scopoli, 1763)	+	+	+						tp
Cleonice callida (Meigen, 1824)						+	+		des
Loewia brevifrons (Rondani, 1856)					+	+	+		nm
Loewia phaeoptera (Meigen, 1824)		+	+						e
Pelatachina tibialis (Fallén, 1810)						+	+		hes
Macquartia chalconota (Meigen, 1824)		+	+						wes
Macquartia dispar (Fallén, 1820)					+	+	+		ess
Macquartia grisea (Fallén, 1810)		+							e
Macquartia tenebricosa (Meigen, 1824)	+	+	+	+					wcp
Graphogaster brunnescens Villeneuve, 1907					+	+	+		ess
Actia crassicornis (Meigen, 1824)		+	+			+	+		ess
Peribaea tibialis (Robineau-Desvoidy, 1851)	+	+							spat
Siphona cristata (Fabricius, 1805)	+								h
Aphria longirostris (Meigen, 1824)		+	+		+	+	+	+	wcp
Demoticus plebejus (Fallén, 1810)							+		wes
Bithia glirina (Rondani, 1861)	+	+	+		+	+	+		wes
Bithia modesta (Meigen, 1824)	+	+	+		+	+	+		hm
Leskia aurea (Fallén, 1820)		+	+						hes
Mintho rufiventris (Fallén, 1817)		+							tp
Microphthalma europaea Egger, 1860	+								? om
Dexiosoma caninum (Fabricius, 1781)			+						des
Dexiinae									
Billaea fortis (Rondani, 1862)		+	+						des
Billaea irrorata (Meigen, 1826)		+							e
Billaea pectinata (Meigen, 1826)	+	+	+		+	+			mca
Billaea steini (Brauer & Bergenstamm, 1891)						+			des
Dinera carinifrons (Fallén, 1817)	+	+	+	+	+	+	+	+	hes
Dinera ferina (Fallén, 1817)		+	+		+	+	+		wes
Estheria petiolata (Bonsdorff, 1866)	+	+	+	+	+	+	+	+	wces
Estheria picta (Meigen, 1826)	+	+	+						wcp
Dexia rustica (Fabricius, 1775)	+	+	+		+	+			hes
Prosena siberita (Fabricius, 1775)		+	+	+	+	+	+		hpta
Zeuxia cinerea Meigen, 1826	+	+	+		+	+	+		wp
Eriothrix apenninus (Rondani, 1862)						+	+	+	wp
Eriothrix rufomaculatus (De Geer, 1776)	+	+	+	+	+	+	+	+	tp
Ramonda spathulata (Fallén, 1820)	+	+	+		+	+	+		tp
Athrycia impressa (Wulp, 1869)						+	+		ess
Athrycia trepida (Meigen, 1824)	+	+	+						tp
Voria ruralis (Fallén, 1810)		+	+						c

Table 1. Continued

1	2	3	4	5	6	7	8	9	10
Hyleorus elatus (Meigen, 1838)					+	+	+		hes
Phyllomya volvulus (Fabricius, 1794)	+	+	+						hes
Thelaira nigripes (Fabricius, 1794)		+	+		+	+	+		tp
Halidaya aurea Egger, 1856	+	+	+		+	+	+		hes
Stomina caliendrata (Rondani, 1862)	+	+							mca
Stomina tachinoides (Fallén, 1817)		+	+						wcp
Rhamphina pedemontana (Meigen, 1824)			+						se, ? nm
Dufouria chalybeata (Meigen, 1824)					+	+	+		dp
Dufouria nigrita (Fallén, 1810)	+	+	+		+	+	+		wcp
Chetoptilia puella (Rondani, 1862)		+							des
Phasiinae									
Eliozeta helluo (Fabricius, 1805)	+	+			+	+			tp
Eliozeta pellucens (Fallén, 1820)	+	+			+	+			des
Clytiomya continua (Panzer, 1798)	+	+	+		+	+	+		tp
Ectophasia crassipennis (Fabricius, 1794)	+	+	+		+	+	+		tp
Ectophasia oblonga (Robineau-Desvoidy, 1830)	+	+	+		+	+	+		wp
Gymnosoma clavatum (Rohdendorf, 1947)	+	+	+		+	+	+	+	tp
Gymnosoma desertorum (Rohdendorf, 1947)	+	+	+		+	+	+		eeca
Gymnosoma dolycoridis Dupuis, 1961		+	+		+	+	+		ess
Gymnosoma inornatum Zimin, 1966	+	+	+		+	+	+		tp
Gymnosoma nitens Meigen, 1824		+	+			+	+	+	esca
Gymnosoma nudifrons Herting, 1966		+	+		+	+	+		hes
Gymnosoma rotundatum (Linnaeus, 1758)	+	+	+	+	+	+	+		tp
Elomya lateralis (Meigen, 1824)	+	+	+		+	+	+		tp
Phasia (*Phasia*) *obesa* (Fabricius, 1798)	+	+	+		+	+	+		tp
Phasia (*Phasia*) *subcoleoptrata* (Linnaeus, 1767)		+	+						tp
Phasia (*Hyalomya*) *pusilla* Meigen, 1824	+	+							tp
Dionaea aurifrons (Meigen, 1824)		+	+		+	+	+		tp
Leucostoma tetraptera (Meigen, 1824)		+	+						wcp
Clairvillia biguttata (Meigen, 1824)	+	+							dp
Labigastera forcipata (Meigen, 1824)			+						wes
Labigastera pauciseta (Rondani, 1861)		+	+						e, ? cse
Cylindromyia (*Cylindromyia*) *bicolor* (Olivier, 1812)	+	+			+	+	+		mca
Cylindromyia (*Cylindromyia*) *brassicaria* (Fabricius, 1775)	+	+	+	+	+	+	+	+	hp
Cylindromyia (*Cylindromyia*) *brevicornis* (Loew, 1844)			+						des
Cylindromyia (*Dupuisia*) *crassa* (Loew, 1845)					+	+	+		mss
Cylindromyia (*Calocyptera*) *intermedia* (Meigen, 1824)	+	+	+						h
Cylindromyia (*Neocyptera*) *interrupta* (Meigen, 1824)		+	+						h
Hemyda vittata (Meigen, 1824)		+							hes
Besseria lateritia (Meigen, 1824)	+				+	+			? mt
Phania curvicauda (Fallén, 1820)						+	+		e
Phania funesta (Meigen, 1824)	+	+							e
Number of species	**76**	**125**	**113**	**25**	**82**	**102**	**95**	**18**	**178**

etation belt (108 species or 73.5% in Belasitsa Mt.; 85 species or 78.0% in Slavyanka Mt.) and distributed in all four vegetation belts (14 species or 9.5% in Belasitsa Mt.; 11 species or 10.1% in Slavyanka Mt.). These groups are provisional (especially the first one) and depend on the tachinid peculiarities and explored region, as well as on the level of investigation. There was a correlation between the horizontal and vertical tachinid distribution. Only five species with wide Palaearctic distribution have been found in all nine hypsometric belts of Belasitsa Mt. (Hubenov 1995). The species registered above 1800 m a. s. l. in Belasitsa Mt. (nine species) and above 1900 m a. s. l. in Slavyanka Mt. (18 species) were with Holarctic, Palaearctic, Eurosiberian, European and Boreomontane distribution.

Table 2. Degree of similarity of the tachinid fauna in percentages according to vegetation belts in Belasitsa Mt.

Vegetation belts	Mesophyllic and xeromesophyllic mixed forests	Beech forests	Subalpine vegetation
Xerothermic oak forests	69.6 (70)	60.3 (57)	27.7 (14)
Mesophyllic and xeromesophyllic mixed forests		80.7 (96)	24.0 (18)
Beech forests			33.3 (23)

Note. Common species are given in brackets

Table 3. Degree of similarity of the tachinid fauna in percentages according to vegetation belts in Slavyanka Mt.

Vegetation belts	Oak-hornbeam mixed forests	Coniferous forests	Subalpine vegetation
Xerothermic oak forests	78.3 (72)	66.7 (59)	18.0 (9)
Oak-hornbeam mixed forests		81.2 (80)	18.3 (11)
Coniferous forests			31.9 (18)

Note. Common species are given in brackets

Zoogeographical categorisation of the species was made on the basis of current data about their distribution (Table 1). Thus the tachinids were divided into 42 zoogeographical categories, combined into two main groups and five subgroups (Table 4).

Species distributed in the Palaearctic and beyond it. This group (17 species or 11.6% in Belasitsa Mt. and nine species or 8.2% in Slavyanka Mt.) included 11 zoogeographical categories, of which seven combined species of northern type (widely distributed in Holarctic and Palaearctic) and four species of southern type (distributed only in the southern parts of the Palaearctic). The group was not important for the zoogeographical characteristic of the tachinids in the investigated region because of its heterogeneity and small number of species. The difference between the separate vegetation belts with respect to this group in the two mountains was from 3.3 to 5.5% (from two to 15 species). Taxa of southern type were presented in the first two vegetation belts of Belasitsa Mt. and in the first three vegetation belts of Slavyanka Mt. In the belt of the mesophilic and xeromesophilic mixed forests of Belasitsa Mt. the species *Exorista sorbillans* Wied. (South Palearctic-Palaeotropical-Australian), *Gonia bimaculata* Wied. (Afrotropical-Mediterranean) and *Peribaea tibialis* R.-D. (South Palaearctic-Afrotropical) were recorded. In the first three vegetation belts of Slavyanka Mt. the species *E. sorbillans* and *Thecocarcelia acutangulata* Macq. (South Palaearctic-Afrotropical) were found. Three species of northern type were recorded from the subalpine zone: two Holarctic (*Phryxe vulgaris* Fall. and *Nowickia marklini* Zett.) and one Holarctic-Palaeotropical-Australian species (*Prosena siberita* Fabricius), found only in Belasitsa Mt. Other species of the group of northern type in this belt of Slavyanka Mt. are very likely to be registered in the future as a result of their distribution and the poor knowledge on the higher parts of the mountain. The northern type species have vast areas and ecological flexibility. The cosmopolitan *Voria ruralis* Fall. and subcosmopolitan *Prosena siberita* F., the most widely distributed Tachinidae in the investigated regions, belong to this group. The Holarctic species (five species) that were the most numerous, together with the introduced in North America, Transpalaearctic and Holoeurosiberian taxa (*Blondelia nigripes* Fall., *Compsilura concinnata* Meig. and *Blepharipa pratensis* Meig.), formed a complex of eight species (Table 1).

Species distributed only in the Palaearctic but in more than one subregion (**Palaearctic type**). A total of 62 species (55 species or 37.4% in Belasitsa Mt. and 43 species or 39.4% in Slavyanka Mt.) from this group, combined into nine zoogeographical cat-

Table 4. Zoogeographical characteristic of Tachinidae from the vegetation belts from the studied mountains.

Zoogeographical categories	Belasitsa Mt.				Slavyanka Mt.			
	Xerothermic oak forests	Mesophyllic and xeromesophyllic mixed forests	Beech forests	Subalpine vegetation	Xerothermic oak forests	Oak-hornbeam mixed forests	Coniferous forests	Subalpine vegetation
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**
Species distributed in Palaearctic and out of it	**15.8 (12)**	**12.0 (15)**	**10.6 (12)**	**12.0 (3)**	**9.7 (8)**	**7.8 (8)**	**9.5 (9)**	**11.1 (2)**
North type	**9.2 (7)**	**9.6 (12)**	**10.6 (12)**	**12.0 (3)**	**7.3 (6)**	**5.9 (6)**	**7.4 (7)**	**11.1 (2)**
Cosmopolitan		0.8 (1)	0.9 (1)					
Holarctic-Palaeotropical-Australian		0.8 (1)	0.9 (1)	4.0 (1)	1.2 (1)	0.9 (1)	1.1 (1)	
Palearctic-Palaeotropical-Australian	2.6 (2)	1.6 (2)	0.9 (1)		1.2 (1)	0.9 (1)	1.1 (1)	
Palearctic-Afrotropical		0.8 (1)	0.9 (1)		1.2 (1)	0.9 (1)	1.1 (1)	
Holarctic-Oriental	2.6 (2)	1.6 (2)	1.8 (2)		1.2 (1)	0.9 (1)	1.1 (1)	
Palearctic-Oriental		0.8 (1)	0.9 (1)		1.2 (1)	0.9 (1)	1.1 (1)	
Holarctic	3.9 (3)	3.2 (4)	4.4 (5)	8.0 (2)	1.2 (1)	0.9 (1)	2.1 (2)	11.1 (2)
South type	**6.6 (5)**	**2.4 (3)**			**2.4 (2)**	**1.9 (2)**	**2.1 (2)**	
South Palearctic-Palaeotropical-Australian	1.3 (1)	0.8 (1)			1.2 (1)	0.9 (1)	1.1 (1)	
South Palaearctic-Afrotropical	2.6 (2)	0.8 (1)			1.2 (1)	0.9 (1)	1.1 (1)	
Afrotropical-Mediterranean	1.3 (1)	0.8 (1)						
Oriental-Mediterranean	1.3 (1)							
Species with Palaearctic distribution	**84.2 (64)**	**88.0 (110)**	**89.4 (101)**	**88.0 (22)**	**90.2 (74)**	**92.1 (94)**	**90.5 (86)**	**88.9 (16)**
Palaearctic type	**46.1 (35)**	**42.4 (53)**	**42.5 (48)**	**44.0 (11)**	**47.5 (39)**	**40.2 (41)**	**42.1 (40)**	**66.7 (12)**
Holopalaearctic	10.5 (8)	7.2 (9)	6.2 (7)	12.0 (3)	13.4 (11)	7.8 (8)	8.4 (8)	11.1 (2)
Transpalaearctic	23.7 (18)	21.6 (27)	22.1 (25)	20.0 (5)	21.9 (18)	17.6 (18)	18.9 (18)	22.2 (4)
West and Central Palaearctic	5.3 (4)	8.0 (10)	8.8 (10)	12.0 (3)	4.9 (4)	5.9 (6)	5.3 (5)	16.7 (3)
West Palaearctic	2.6 (2)	1.6 (2)	1.8 (2)		3.6 (3)	4.9 (5)	4.2 (4)	11.1 (2)
Disjunct Palaearctic	1.3 (1)	1.6 (2)	0.9 (1)		1.2 (1)	0.9 (1)	1.1 (1)	

Table 1. Continued

1	2	3	4	5	6	7	8	9
South Palearctic	1.3 (1)	0.8 (1)	0.9 (1)		1.2 (1)	0.9 (1)	1.1 (1)	
Eurosiberian-Central Asian		0.8 (1)	0.9 (1)			0.9 (1)	1.1 (1)	5.5 (1)
East European-Central Asian	1.3 (1)	0.8 (1)	0.9 (1)		1.2 (1)	0.9 (1)	1.1 (1)	
European-Turanian							1.1 (1)	
Eurosiberian type	**27.6 (21)**	**38.4 (48)**	**42.5 (48)**	**44.0 (11)**	**30.5 (25)**	**41.2 (42)**	**42.1 (40)**	**22.2 (4)**
Holoeurosiberian	13.2 (10)	15.2 (19)	15.9 (18)	28.0 (7)	12.2 (10)	15.7 (16)	13.7 (13)	11.1 (2)
West and Central Eurosiberian	2.6 (2)	2.4 (3)	2.6 (3)	4.0 (1)	4.9 (4)	3.9 (4)	5.3 (5)	5.5 (1)
West Eurosiberian	2.6 (2)	3.2 (4)	5.3 (6)	4.0 (1)	2.4 (2)	2.9 (3)	4.2 (4)	5.5 (1)
Disjunct Eurosiberian	5.3 (4)	7.2 (9)	7.1 (8)		2.4 (2)	5.9 (6)	4.2 (4)	
European and South Siberian	1.3 (1)	3.2 (4)	3.5 (4)	4.0 (1)	6.1 (5)	8.8 (9)	9.5 (9)	
South European and South Siberian			0.9 (1)			0.9 (1)	1.1 (1)	
European	2.6 (2)	6.4 (8)	6.2 (7)	4.0 (1)	1.2 (1)	1.9 (2)	3.1 (3)	
Central and South European		0.8 (1)	0.9 (1)		1.2 (1)	0.9 (1)	1.1 (1)	
Mediterranean type	**10.5 (8)**	**7.2 (9)**	**4.4 (5)**		**12.2 (10)**	**10.8 (11)**	**6.3 (6)**	
Mediterranean and South Siberian					1.2 (1)	0.9 (1)	1.1 (1)	
Mediterranean-Central Asian	3.9 (3)	2.4 (3)	0.9 (1)		3.6 (3)	2.9 (3)	1.1 (1)	
Mediterranean-Turanian	1.3 (1)	0.8 (1)			1.2 (1)	1.9 (2)	1.1 (1)	
North Mediterranean-Turanian		0.8 (1)			1.2 (1)	0.9 (1)		
Holomediterranean	3.9 (3)	2.4 (3)	0.9 (1)		2.4 (2)	1.9 (2)	1.1 (1)	
North Mediterranean	1.3 (1)	0.8 (1)	1.8 (2)		2.4 (2)	1.9 (2)	2.1 (2)	
South European			0.9 (1)					
Number of species	**76**	**125**	**113**	**25**	**82**	**102**	**95**	**18**

Note. Figures in brackets indicate the number of species

egories, were registered from both mountains (Table 5). Its character was determined by Transpalaearctic (28 species or 19.0% in Belasitsa Mt. and 18 species or 16.5% in Slavyanka Mt.), Holopalaearctic (ten species or 6.8% in Belasitsa Mt. and nine species or 8.2% in Slavyanka Mt.) and West and Central Palaearctic (ten species or 6.8% in Belasitsa Mt. and six species or 5.5% in Slavyanka Mt.) species which were the most numerous. The correlation of these categories remained the same in the separate vegetation belts of the two mountains with small deviations, and ranges from 4.9% to 23.7% (six to 28 species). Three species (*Phorocera grandis* Rond., *Dufouria chalybeata* Meig. and *Clairvillia biguttata*

Table 5. Zoogeographical characteristic of Tachinidae (Diptera) from Belasitsa Mt. and Slavyanka Mt.

Zoogeographical categories	Total		Belasitsa Mt.		Slavyanka Mt.	
	number	%	number	%	number	%
Species distributed in Palaearctic and out of it	**19**	**10.7**	**17**	**11.6**	**9**	**8.2**
North type	**14**	**7.9**	**12**	**8.2**	**7**	**6.4**
Cosmopolitan	1	0.6	1	0.7		
Holarctic-Palaeotropical-Australian	1	0.6	1	0.7	1	0.9
Palearctic-Palaeotropical-Australian	2	1.1	1	0.7	2	1.8
Palearctic-Afrotropical	1	0.6	1	0.7	1	0.9
Holarctic-Oriental	2	1.1	2	1.4	1	0.9
Palearctic-Oriental	2	1.1	1	0.7	1	0.9
Holarctic	5	2.8	5	3.4	1	0.9
South type	**5**	**2.8**	**5**	**3.4**	**2**	**1.8**
South Palearctic-Palaeotropical-Australian	1	0.6	1	0.7	1	0.9
South Palaearctic-Afrotropical	2	1.1	2	1.4	1	0.9
Afrotropical-Mediterranean	1	0.6	1	0.7		
Oriental-Mediterranean	1	0.6	1	0.7		
Species with Palaearctic distribution	**159**	**89.3**	**130**	**88.4**	**100**	**91.7**
Palaearctic type	**62**	**34.8**	**55**	**37.4**	**43**	**39.4**
Holopalaearctic	10	5.6	10	6.8	9	8.2
Transpalaearctic	28	15.7	28	19.0	18	16.5
West and Central Palaearctic	12	6.7	10	6.8	6	5.5
West Palaearctic	5	2.8	2	1.4	5	4.6
Disjunct Palaearctic	3	1.7	2	1.4	1	0.9
South Palearctic	1	0.6	1	0.7	1	0.9
Eurosiberian-Central Asian	1	0.6	1	0.7	1	0.9
East European-Central Asian	1	0.6	1	0.7	1	0.9
European-Turanian	1	0.6			1	0.9
Eurosiberian type	**80**	**44.9**	**60**	**40.8**	**46**	**42.2**
Holoeurosiberian	25	14.0	22	14.9	16	14.7
West and Central Eurosiberian	6	3.4	3	2.0	5	4.6
West Eurosiberian	7	3.9	6	4.1	4	3.7
Disjunct Eurosiberian	15	8.4	12	8.2	6	5.5
European and South Siberian	11	6.2	4	2.7	10	9.2
South European and South Siberian	1	0.6	1	0.7	1	0.9
European	14	7.9	11	7.5	3	2.7
Central and South European	1	0.6	1	0.7	1	0.9
Mediterranean type	**17**	**9.6**	**15**	**10.2**	**11**	**10.1**
Mediterranean and South Siberian	1	0.6			1	0.9
Mediterranean-Central Asian	4	2.2	4	2.7	3	2.7
Mediterranean-Turanian	1	0.6	1	0.7	1	0.9
North Mediterranean-Turanian	1	0.6	1	0.7	1	0.9
Holomediterranean	4	2.2	4	2.7	2	1.8
North Mediterranean	5	2.8	4	2.7	3	2.7
South European	1	0.6	1	0.7		
Number of species	**178**		**147**		**109**	

Meig.) had a longitudinal disjunction of the areas in regard to Siberia and Central Asia. Probably some of these species were presented with sparse populations and might be found in the mentioned territories under further investigations. The Transpalaearctic species *Platymya fimbriata* (Meig.) has a boreomontane type of distribution. A total of six species, found in all vegetation belts of both the mountains, belonged

to this category (nine species from Belasitsa Mt. and eight species from Slavyanka Mt.). Thus most species with wide vertical distribution (11 species) belonged to this group. It included from 42.4 to 46.1% (11 to 53 species) of the species composition of the separate vegetation belts of Belasitsa Mt. and from 40.2 to 66.7% (12 to 41 species) of the species of the different vegetation belts of Slavyanka Mt. (Table 4). The vast areas and wide vertical distribution of taxa of this group were an indication of the greater ecological flexibility of its species.

Species distributed within one subregion of the Palaearctic. This group (97 species – 54.5%) included species with Eurosiberian (80 species – 44.9%) and Mediterranean (17 species – 9.6%) type of distribution (Table 5). The Mediterranean-Central Asian species should also be included here according to many authors who combine Mediterranean and Central Asian subregions. The species with Mediterranean type of distribution were accepted in a general way and include elements (Submediterranean, Subiranian and Pontian), that could be considered separately as well (Gruev & Kusmanov 1994, 1999).

Eurosiberian species (combined into eight zoogeographical categories). These were 60 species (40.8%) of Belasitsa Mt. and 46 species (42.2%) of Slavyanka Mt., of which the best represented were the Holoeurosiberian (22 species, or 14.9% from Belasitsa Mt. and 16 species, or 14.7% from Slavyanka Mt.), European-South Siberian (four species or 2.7% from Belasitsa Mt. and ten species or 9.2% from Slavyanka Mt.), European (11 species or 7.5% from Belasitsa Mt. and three species or 2.7% from Slavyanka Mt.) and the Disjunct Eurosiberian (12 species or 8.2% from Belasitsa Mt. and six species or 5.5% from Slavyanka Mt.) species. The latter have a longitudinal disjunction of the areas in regard to Siberia and are not found in the sub-alpine zone. The number of species from the mentioned categories in the separate vegetation belts ranged from 0% to 28.0% (0-19 species). The Boreomontane forms *Admontia podomyia* B. & B., *Nowickia atripalpis* R.-D. and *Linnaemya haemorrhoidalis* Fall. have a latitudinal disjunction of their areas. The finding of *L. haemorrhoidalis* in the second vegetation belt of the both mountains was an interesting finding. Finding of boreomontane forms at a low altitude has been reported for other insect groups as well (Josifov 1963, 1976, Georgiev & Hubenov 2006). It is supposed that the humid mountain valleys, characterised with cooler climate, have facilitated the migration of Boreomontane species to the lowlands. The Eurosiberian forms included from 27.6 % to 44.0% (11 to 48 species) of the species composition of the separate vegetation belts of Belasitsa Mt. and from 22.2 to 42.1% (four to 40 species) of the species of the different vegetation belts of Slavyanka Mt. (Table 4). There were no significant differences in the vertical distribution of this group in the two mountains except that only three areographical categories were presented in the sub-alpine zone of Slavyanka Mt. – Holoeurosiberian, West and Central Eurosiberian and West Eurosiberian species. Only the species *Dinera carinifrons* Fall. (Holoeurosiberian) and *Estheria petiolata* Bons. (West and Central Eurosiberian) were collected in all vegetation belts of the both mountains.

Mediterranean species (combined into seven zoogeographical categories). These were 15 species (10.2%) from Belasitsa Mt. and 11 species (10.1%) from Slavyanka Mt. Their number decreased rapidly with the altitude. They were presented in the first three vegetation belts but most of them were occurred only in one or two vegetation belts (Tables 1, 4). The great percentage of Mediterranean species, known from one or two vegetation belts, their lack in the sub-alpine zone and their scarce populations are due to the lower ecological flexibility of the species from this group in comparison with the previous ones. In the neighbouring region, Sandanski-Petrich valley (the region with the strongest Mediterannean influence in Bulgaria), these species reached 17% (Beschovski & Hubenov 1986). The Mediterannean species included from 4.4 to 12.2% (five to 11 species) of the tachinids of the separate vegetation belts in the two mountains (Table 4). The Mediterranean-Central Asian, Holomediterranean and North Mediterranean species were the most numerous (four species each – 2.7% from Belasitsa Mt. and two- three species each – 1.8-2.7% from Slavyanka Mt.). There were no significant differences in the vertical distribution of this group in the two mountains except that Mediterranean and South Siberian species were not present in Belasitsa Mt., and South European species – in Slavyanka Mt. (Tables 4, 5).

Conclusion

A total of 178 tachinid species that belong to 110 genera and 4 subfamilies have been reported from the two mountains. The species known from Belasitsa Mt. are 147 (35.9% of the Bulgarian species), and the species from Slavyanka Mt. are 109 (26.7% of the Bulgarian species). The degree of similarity between the tachinids of the two mountains was 61.5%. The tachinid fauna can be divided into 2 main groups: 1) species with Mediterranean type of distribution (22

species – 12.4%) – more thermophilic and distributed mainly in the southern parts of the Palaearctic. Five species of southern type, distributed in the Palaearctic and beyond it, could be also formally included in this group. 2) species with Palaearctic and Eurosiberian type of distribution (156 species – 87.6%) – more cold-resistant and more widely distributed in Palaearctic. Fourteen species of northern type, distributed in the Palaearctic and out of it, could be formally included in this group as well. The zoogeographical character of the Tachinidae fauna was determined by the second group. The percentage of the typical Mediterranean species in the two mountains was almost identical (10.1 – 10.2%). The ratio between the two main groups was different in the separate vegetation belts of the two mountains but without great percentage differences between the mountains themselves.

Xerothermic oak forests (76 species, or 51.7% from Belasitsa Mt. and 82 species, or 75.2% from Slavyanka Mt.). Of the species with Mediterranean type of distribution (13 species, or 17.1% from Belasitsa Mt. and 12 species, or 14.6% from Slavyanka Mt.), the Mediterranean-Central Asian and Holomediterranean species were most numerous, and of the species with Palaearctic and Eurosiberian type of distribution (63 species, or 82.9% from Belasitsa Mt. and 70 species, or 85.4% from Slavyanka Mt.) – the Transpalaearctic, Holoeurosiberian and Holopalaearctic species were best represented.

Mesophyllic and xeromesophyllic mixed forests (125 species – 85.0% in Belasitsa Mt. and 102 species – 93.6% in Slavyanka Mt.). Of the species with Mediterranean type of distribution (12 species – 9.6% from Belasitsa Mt. and 13 species – 12.7% from Slavyanka Mt.) the Mediterranean-Central Asian and Holomediterranean species prevailed, and of the species with Palaearctic and Eurosiberian type of distribution (113 species or 90.4% from Belasitsa Mt. and 89 species or 87.3% from Slavyanka Mt.) – the Transpalaearctic, Holoeurosiberian, West and Central Palaearctic, Holopalaearctic and Disjunct Eurosiberian species prevailed. The number of the Transpalaearctic and Holoeurosiberian species increased and Oriental-Mediterranean, European-Turanian and South European species were not recorded. The percentage of Mediterranean species decreased.

Beech forests of Belasitsa Mt. (113 species, or 76.9%) and **Coniferous forests of Slavyanka Mt.** (95 species, or 82.6%). Of the species with Mediterranean type of distribution (five species, or 4.4% from Belasitsa Mt. and eight species, or 8.4% from Slavyanka Mt.) the North Mediterranean species were most numerous and of the species with Palaearctic and Eurosiberian type of distribution (108 species, or 95.6% from Belasitsa Mt. and 87 species, or 91.6% from Slavyanka Mt.) the Transpalaearctic, Holoeurosiberian, Holopalaearctic and West and Central Palaearctic species were most numerous. North Mediterranean-Turanian species were not observed in the two mountains and the distributed in the Palaearctic and beyond it species of southern type of Belasitsa Mt. were not presented. The number of West Eurosiberian and European species increased and the percentage of Mediterranean species decreased.

Subalpine vegetation (25 species, or 17.0% from Belasitsa Mt. and 18 species, or 16.5% from Slavyanka Mt.). Species with Mediterranean type of distribution had not been recorded. The species with Palaearctic and Eurosiberian type of distribution belonged to 9-10 areographical categories (for every mountain), of which the Transpalaearctic and West and Central Palaearctic species were most numerous.

References

Andersen S. 1996. The Siphonini (Diptera: Tachinidae) of Europe. – *Fauna entomologica Scandinavica*, **33**: 148 p.

Beschovski V., Z. Hubenov 1986. Die Insekten von der Familie Tachinidae (Diptera) in den Submediterranbiotopen Südwestbulgariens. I. Artenbestand und zoogeographische Charakteristik der Tachinidae im Tal zwischen Sandanski und Petrič. – In: Botev B., V. Golemanski, V. Beschovski and V. Georgiev (eds.): Fauna of Southwestern Bulgaria. 1. Sofia, Publishing house of the Bulgarian Academy of Sciences, 118-129. (In Bulgarian).

Bondev I. 1991.The vegetation of Bulgaria. Sofia, Kliment Ohridski University Press, 184 p. (In Bulgarian).

Bondev I. 2002. Geobotanic regioning. – In: Geography of Bulgaria. Sofia, ForCom, 336-352. (In Bulgarian).

Crosskey R. 1980. Family Tachinidae. – In: Catalogue of the Diptera of the Afrotropical Region. London, Br. Mus. (Nat. Hist.), 822-882.

Georgiev V. 2002. Zoogeographic regioning. – In: Geography of Bulgaria. Sofia, ForCom, 373-375. (In Bulgarian).

Georgiev G., Z. Hubenov 2006. Vertical distribution and zoogeographical characteristics of Cerambycidae (Coleoptera) family in Bulgaria. – *Acta zoologica bulgarica*, **58**(3): 315-343.

Gruev B., B. Kusmanov 1994. General biogeography. Sofia, Univ. K. Ohridski, 498 p. (In Bulgarian).

Gruev B., B. Kusmanov 1999. General biogeography. Plovdiv, Plovdiv University, 344 p. (In Bulgarian).

Herting B. 1983. Phasiinae. – In: Lindner E. (Ed.): Die Fliegen der

paläarktischen Region. 64c. Stuttgart, Schweizerbartsche Verlagsbuchhandlung, 1-88.

Herting B. 1984. Catalogue of Palearctic Tachinidae (Diptera). – Stuttg. Beitr. Naturk., **A**: 1-228.

Herting B., A. Dely-Draskovits 1993. Family Tachinidae. – In: Soós Á., L. Papp (eds.): Catalogue of Palearctic Diptera. 13. Amsterdam. Elsevier, 118-624.

Hubenov Z. 1980a. Tachinid species Tachinidae (Diptera), new for the fauna of Bulgaria. – Acta zoologica bulgarica, **14**: 79-82.

Hubenov Z. 1980b. A contribution to the studies on the fauna and biology of the species of family Tachinidae (Diptera) in Bulgaria. – *Acta zoologica bulgarica*, **15**: 77-80.

Hubenov Z. 1982a. Morphologische Untersuchungen über den Artenkomplex *Phasia crassipennis* F. – *Ent. Abh. Mus. Tierk. Dresden*, **45** (5): 91-98.

Hubenov Z. 1982b. Eine neue *Phasia*-Art aus Bulgarien (Diptera, Tachinidae). – *Reichenbachia*, **20** (19): 163-166.

Hubenov Z. 1983. A contribution to the studies on family Tachinidae (Diptera). – *Acta zoologica bulgarica*, **23**: 57-61.

Hubenov, Z. 1988. Species composition and zoogeographical characteristics of the family Tachinidae (Diptera) from the Slavjanka mountain. – *Acta zoologica bulgarica*, **36**: 17-30. (In Bulgarian).

Hubenov Z. 1992. Artenbestand Höhenverbreitung und zoogeografische Characteristik der Fmilie Tachinidae (Diptera) aus dem Piringebirge. – *Acta zoologica bulgarica*, **44**: 3-18.

Hubenov Z. 1993. Höhenverbreitung der Familie Tachinidae (Diptera) in Bulgarien. – *Acta zoologica bulgarica*, **46**: 24-38.

Hubenov Z. 1995. Artenbestand, Vertikalverbreitung und zoogeographische Characteristik der Familie Tachinidae (Diptera) aus dem Belasiza-Gebirge. – *Acta zoologica bulgarica*, **48**: 48-61.

Jacentkovsky D. 1936. Beitrag zur Kentnis der Raupenfliegen (Tachinariae, Diptera) Bulgariens. – *Mitteil. aus dem Konigl. Naturwis. Inst. in Sofia*, **9**: 109-134.

Jacentkovsky D. 1937. Příspěvek k studiu biologické obrany proti lesním škůdcům. – Sborník vys. školy zeměd. v Brně, **D**24: 54 p.

Josifov M. 1963. Heteropteren aus der Umgebung von Petrič (SW Bulgarien). – *Bull. Inst. zool. mus*., **13**: 93-132. (In Bulgarian).

Josifov M. 1976. Artbildung bei den Heteropteren im Mittelmeerraum als Folge der postglazialen Disjunktion ihrer Areale. – *Acta zoologica bulgarica*, **4**: 11-19. (In Bulgarian).

Mesnil L. 1944-1975. Larvaevorinae. – In: E. Lindner (ed.): Die Fliegen der paläarktischen Region. 64g. Stuttgart, Schweizerbartsche Verlagsbuchhandlung, 1435 p.

Mesnil L. 1980. Dexiinae. – In: E. Lindner (ed.): Die Fliegen der paläarktischen Region. 64f. Stuttgart, Schweizerbartsche Verlagsbuchhandlung, 1-52.

O'Hara J., M. Wood 2004. Catalogue of the Tachinidae (Diptera) of America north of Mexico. – Memoirs on Entomology, International, **18**: 410 p.

Pape T., P. Beuk, A. Pont, A. Shatalkin, A. Ozerov, A. Woźnica, B. Merz, C. Bystrowski, C. Raper, C. Bergström, C. Kehlmaier, D. Clements, D. Greathead, E. Kameneva, E. Nartshuk, F. Petersen, G. Weber, G. Bächli, F. Geller-Grimm, G. Van de Weyer, H. Tschorsnig, H. de Jong, van J. Zuijlen, J. Vaňhara, J. Roháček, J. Ziegler, J. Majer, K. Hůrka, K. Holston, K. Rognes, L. Greve-Jensen, L. Munari, M. de Meyer, M. Pollet, M. Speight, M. Ebejer, M. Martinez, M. Carles-Tolrá, M. Földvári, M. Chvála, M. Barták, N. Evenhuis, P. Chandler, P. Cerretti, R. Meier, R. Rozkosny, S. Prescher, S. Gaimari, T. Zatwarnicki, T. Zeegers, T. Dikow, V. Korneyev, V. Richter, V. Michelsen, V. Tanasijtshuk, W. Mathis, Z. Hubenov, Y. de Jong. 2015. Fauna Europaea: Diptera – Brachycera. – Biodiversity Data Journal 3: e4187. doi: 10.3897/BDJ.3.e4187

Richter V. 2004. Tachinidae. – In: Ler P. (Ed.): Key to the insects of Russian Far East. Diptera and Sifonaptera. **6** (3). Vladivostok, Dalnauka, 148-398. (In Russian).

Tschorsnig H.-P., V. Richter, P. Cerretti, T. Zeegers, C. Bergström, J. Vanchara, G. Van de Weyer, C. Bystrowsky, C. Raper, J. Ziegler and Z. Hubenov 2005. Tachinidae (Diptera). – In: Fauna Europaea, http://www.faunaeur.org.

Stanev S. 1991. Climatic regions of Bulgaria. – In: The climate of Bulgaria. Sofia, Bulgarian Academy of Sciences, 53-89. (In Bulgarian).

Velchev V., S. Tonkov. 1986. Vegetation and flora of Southwest Bulgaria. – In: Fauna of Southwestern Bulgaria. Sofia, Bulgarian Academy of Sciences, 20-43. (In Bulgarian).

Ziegler J., H. Shima. 1996. Tachinid flies of the Ussuri area (Diptera: Tachinidae). – *Beiträge zur Entomologie*, **46** (2): 379-478.

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