





Research article

Long-legged flies (Diptera: Empidoidea: Dolichopodidae) from Vitosha Mountain, Bulgaria: first contribution and overview

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Abstract: The paper gives information about 41 dolichopodid species established in Vitosha Mountain. Twenty-one species are newly recorded for the studied area, and one of them, *Thrypticus divisus*, is new to the fauna of Bulgaria.

Keywords: Bulgaria, Dolichopodidae, new records, Vitosha Mountain

Introduction

The family Dolichopodidae belongs to the superfamily Empidoidea of the suborder Brachycera, order Diptera. Family Dolichopodidae is widespread in all zoogeographic regions/zones of the planet without Antarctic. Most species of the family Dolichopodidae are found in moist habitats: on vegetation around rivers, streams, forests, marshes, lakes, etc. A large number of representatives of the genus *Medetera* and some species of other genera can be found in dry places. Today approximately 8300 species from 261 genera are described worldwide (Grichanov, 2023). For the fauna of Bulgaria 213 species are known (Kechev & Koychev, 2021; Kechev et al., 2022a, b).

Family Dolichopodidae has not been subject of special investigation up to now and only isolated records have been made over the years in Vitosha Mountain. The main purpose of this study is to give new information about the distribution of the family Dolichopodidae in Vitosha Mountain, new data for Bulgaria and to summaries the old and new records of the species in the mountain.

in the Vitosha Mountain. The main characteristics of the localities are shown in Table 1 and Fig. 1. The material was collected in the period August–November 2023. After collecting, the adults were put in vials containing 95% ethanol. The species were sorted in the laboratory, using a stereo microscope, Carl Zeiss. For the determination of dolichopodids were used identification guides, mainly by Parent (1938), d’Assis Fonseca (1978), Grichanov (2007) and Negrobov & Stackelberg (1969). Hubenov (1990) was used for the physiographic characteristics of the studied area. The faunistic list includes the following information: name of the species, material (male and female) and sites of collection. Species new to the fauna of the Vitosha Mountain are marked with one asterisk (*) and species new to Bulgaria are marked with two asterisks (**). The material presented in this paper as new to the Vitosha Mountain is housed in Mihail Kechev’s collection in the Forest Research Institute, Bulgarian Academy of Sciences, Department of Forest Entomology, Phytopathology and Game Fauna, Sofia, Bulgaria.

Studied area

Vitosha Mountain (Fig. 1) is located in Southwestern Bulgaria, south of Sofia. It is surrounded by the Pernik, Samokov and Sofia Valleys and the Lozenska,

Material and methods

The material for the present work was collected by means of sweep net by the authors from 19 localities

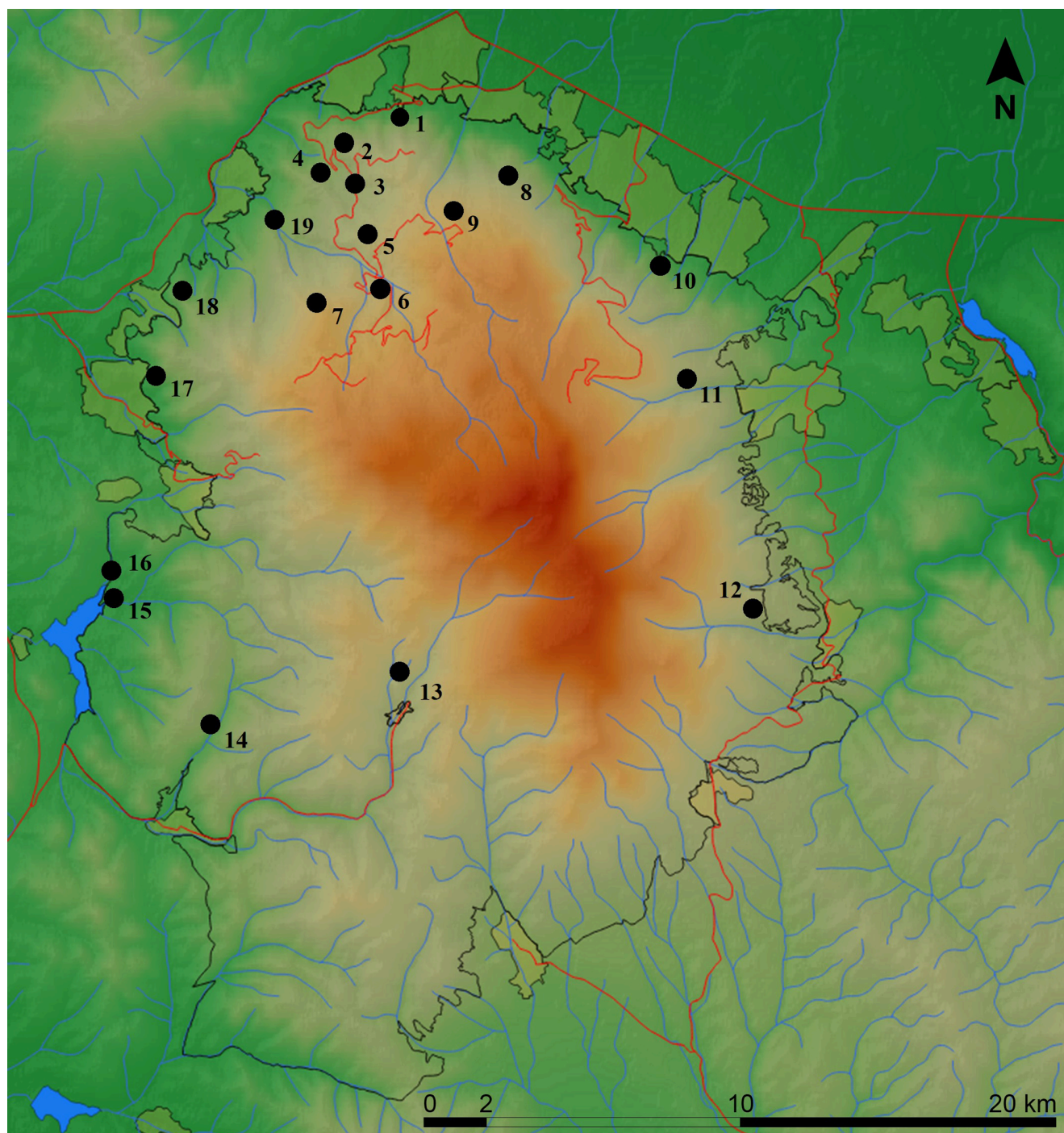


Fig. 1. The map of localities in Vitosha Mountain.

Plana, Verila, Golo Bardo and Lyulin Mountains. Vitosha belongs to the Temperate continental climate sub-region of the European continental region and is fully included in the Mountain climate region. Vitosha has 10 peaks above 2000 m a.s.l. and 27 peaks above 1500 m a.s.l., and the highest peak is Cherni Vrah (2290 m).

Vitosha refers to the Illyrian (Balkan) province of the European broad-leaved forest ecoregion. There are four vegetation zones in the mountain:

1. Belt of mixed oak-hornbeam forests. The average height is 1270 m, to which the upper limit of the belt reaches: it varies from 1100 to 1400 m depending on the exposition.

Table 1. Main characteristics of the localities.

No.	Site	Habitat	Latitude	Longitude	Altitude, m (a.s.l.)
1	Byalata Voda	hydrophyte grasses and shrubs	42.3829	23.1350	976
2	Tihiya Kut area	meadow	42.3821	23.1310	1055
3	Dendrarium (lakes)	hydrophyte grasses and shrubs	42.3740	23.1310	1201
4	Iglikina Polyana	meadow	42.3742	23.1329	1171
5	Zlatni Mostove	hydrophyte grasses and shrubs	42.3634	23.1420	1392
6	Kumata Chalet	hydrophyte grasses and shrubs	42.3522	23.1567	1774
7	Zvezditsa Chalet	meadow	42.3515	23.1406	1720
8	Boyana Lake	hydrophyte grasses and shrubs	42.3808	23.1609	1054
9	Boyana Waterfall	hydrophyte grasses and shrubs	42.3747	23.1518	1258
10	Simeonovo Lakes	meadow	42.3626	23.1947	948
11	Bistrishka Reka River (above the Bistritsa Village)	hydrophyte grasses and shrubs	42.3524	23.2026	1075
12	Zheleznitsa River (above the Zheleznitsa Village)	hydrophyte grasses and shrubs	42.3238	23.2145	1053
13	Chuyetlovo (above the village)	hydrophyte grasses and shrubs	42.3121	23.1447	1273
14	Struma River (near Bosnek Village)	hydrophyte grasses and shrubs	42.3004	23.0935	892
15	Studena Reservoir	hydrophyte grasses and shrubs	42.3240	23.0917	873
16		hydrophyte grasses and shrubs	42.3222	23.0941	869
17	Rudartsi Lake	hydrophyte grasses and shrubs	42.3505	23.0945	779
18	Marchaev Reservoir	hydrophyte grasses and shrubs	42.3535	23.0941	774
19	Vladayska Reka River (above the Vladaya Village)	hydrophyte grasses and shrubs	42.3711	23.1201	978

2. Belt of beech forests. The average height, at which the upper border of the belt passes, is 1650 m and varies from 1400 to 1840 m at different exposures.

3. Belt of coniferous forests. The average height is 1870 m and, varying from 1700 to 2050 m.

4. Subalpine belt. It covers the territory above the upper forest line. It is characterised by a strong development of psychrophile and mesophyte shrub and grass formations.

Faunistic results

Diaphorinae

* *Argyra leucocephala* (Meigen, 1824). Material examined: Site 11: 30.08.2023, 2 ♀♀, leg. G. Zaemdzhikova.

* *Chrysotus gramineus* (Fallen, 1823). Material examined: Site 2: 12.08.2023, 2 ♀♀; Site 10: 13.08.2023, 1 ♂, 1 ♀, leg. G. Zaemdzhikova.

* *Chrysotus pennatus* Lichtwardt, 1902. Material examined: Site 3: 9.08.2023, 1 ♂, leg. M. Kechev, G. Zaemdzhikova, B. Koychev.

Dolichopodinae

Dolichopus arbustorum Stannius, 1831. Known records for Vitosha: Bistritsa Village, Vladayska Reka River and Zheleznitsa Village (Beschovski, 2013).

Dolichopus argyrotarsis Wahlberg, 1850. Known records for Vitosha Mountain: Karkama area (Beschovski, 2013).

Dolichopus campestris Meigen, 1824. Known records for Vitosha Mountain: Bistritsa Village (Beschovski, 2013).

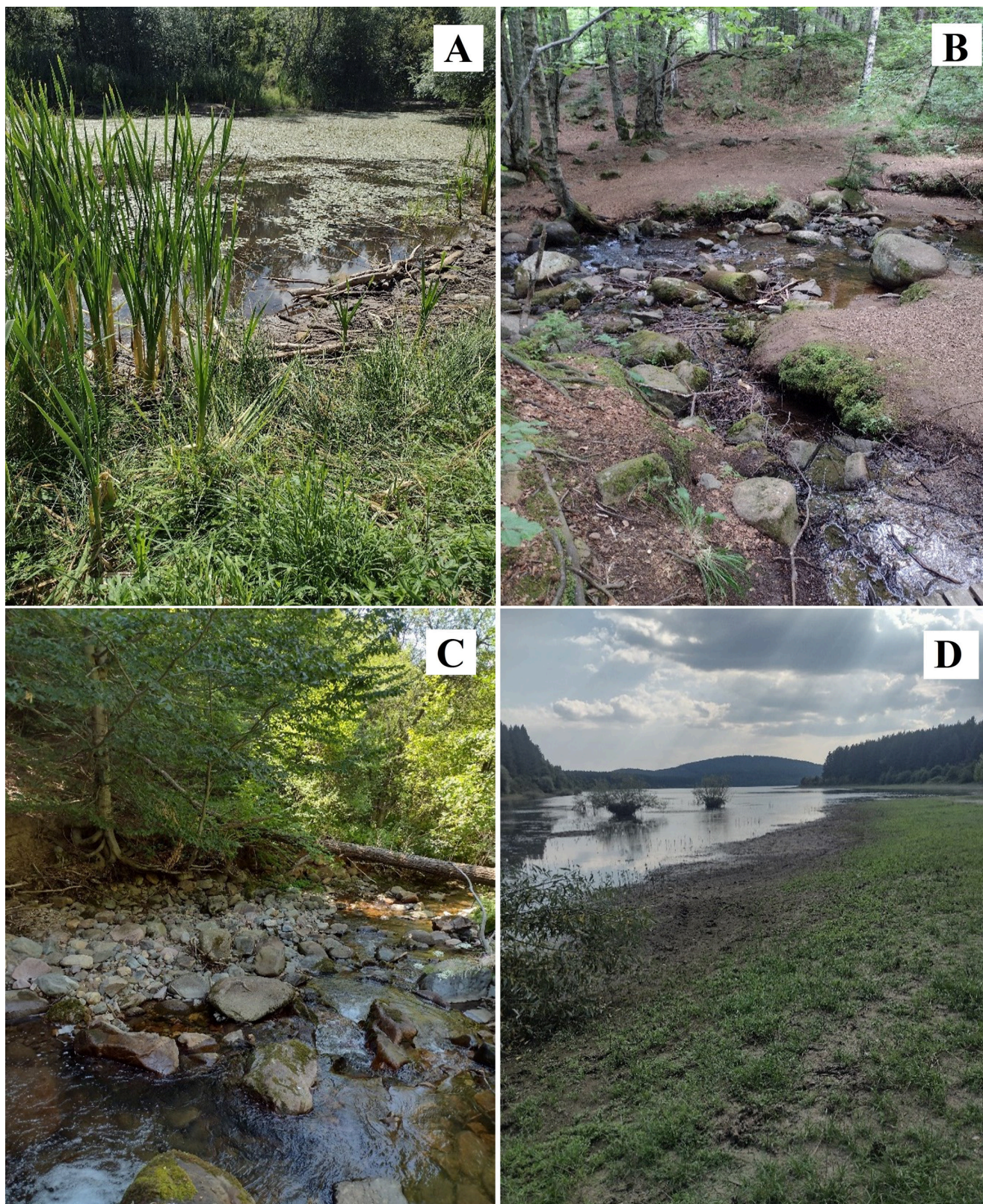


Fig. 2. The habitats of Dolichopodidae in Vitosha Mountain: A) Dendrarium – Site 3; B) Zlatni Mostove – Site 5; C) Struma River (near Bosnek Village) – Site 14; D) Studena Reservoir – Site 16.

Dolichopus discifer Stannius, 1831. Known for Vitosha Mountain (Kechev et al., 2022b). Remark. The synonymisation of *Dolichopus discifer* Stannius, 1831 with *Dolichopus nigricornis* Meigen, 1824 and *D. patellatus* Meigen, 1831 was discussed in a previous paper (Kechev et al., 2014).

Dolichopus lepidus Staeger, 1842. Known records for Vitosha Mountain: Bistritsa Village (Beschovski, 2013).

Dolichopus litorellus Zetterstedt, 1852. Known records for Vitosha Mountain: Bistritsa Village (Beschovski, 2013).

Dolichopus pennatus Meigen, 1824. Known records for Vitosha Mountain: Karkama area (Beschovski 2013).

Dolichopus plumipes (Scopoli, 1763). Known records for Vitosha Mountain: Bistritsa Village (Beschovski, 2013; Hubenov, 2018). Material examined: Site 1: 12.08.2023, 1 ♀, leg. G. Zaemdzhikova; Site 16: 23.08.2022, 2 ♂♂, 3 ♀♀, leg. M. Kechev, G. Zaemdzhikova, B. Koychev.

* *Dolichopus signifer* Haliday, 1838. Material examined: Site 16: 23.08.2022, 1 ♂, 1 ♀, leg. M. Kechev, G. Zaemdzhikova, B. Koychev.

Dolichopus simplex Meigen, 1824. Known records for Vitosha Mountain: Zheleznitsa Village (above the village, near the Selskata Reka River) and Bistritsa Village (Beschovski, 2013).

Dolichopus unguatus (Linnaeus, 1758). Known records for Vitosha Mountain: Zheleznitsa Village and Bistritsa Village (Beschovski, 2013).

* *Gymnopternus angustifrons* (Staeger, 1842). Material examined: Site 12: 29.08.2023, 1 ♂, leg. G. Zaemdzhikova.

* *Hercostomus chetifer* (Walker, 1849). Material examined: Site 11: 30.08.2023, 1 ♂, leg. G. Zaemdzhikova

* *Hercostomus fugax* (Loew, 1857). Material examined: Site 5: 9.08.2023, 1 ♀, leg. M. Kechev, G. Zaemdzhikova, B. Koychev; Site 7: 20.08.2023, 1 ♂; Site 6: 20.08.2023, 2 ♂♂, 1 ♀, leg. G. Zaemdzhikova.

Hercostomus longiventris (Loew, 1857). Known for Vitosha Mountain (Kechev et al., 2022b).

* *Sybstroma discipes* (Germar, 1817). Material examined: Site 1: 2.09.2023, 4 ♂♂, leg. G. Zaemdzhikova.

* *Sybstroma obscurellus* (Fallén, 1823). Material examined: Site 1: 26.08.2023, 1 ♂; Site 10: 29.08.2023, 2 ♂♂, leg. G. Zaemdzhikova; Site 14:

23.08.2023, 2 ♂♂; Site 16: 23.08.2023, 1 ♂, 1 ♀, leg. M. Kechev, G. Zaemdzhikova, B. Koychev.

Hydrophorinae

Hydrophorus balticus (Meigen, 1824). Known for Vitosha (Kechev et al., 2022b). Material examined: Site 7: 20.08.2023, 1 ♂, 1 ♀, leg. G. Zaemdzhikova.

Hydrophorus bipunctatus (Lehmann, 1822). Known for Vitosha Mountain (Kechev et al., 2022b). Material examined: Site 11: 30.08.2023, 1 ♀, leg. G. Zaemdzhikova.

* *Liancalus virens* (Scopoli, 1763). Material examined: Site 5: 9.08.2023, 1 ♀, leg. M. Kechev, G. Zaemdzhikova, B. Koychev.

Medeteranae

Medetera jacula (Fallén, 1823). Known for Vitosha Mountain (Kechev, 2021). Material examined: Site 1: 02.09.2023, 2 ♂♂, leg. G. Zaemdzhikova; Site 15: 09.11.2023, 1 ♂, leg. B. Koychev.

* *Medetera micacea* Loew, 1857. Material examined: Site 1: 12.08.2023, 1 ♂, leg. G. Zaemdzhikova.

Medetera pinicola Kowarz, 1877. Known records for Vitosha Mountain: Bistrishko Branishte Reserve (Doychev et al. 2016).

** *Thrypticus divisus* (Strobl, 1880). Material examined: Site 3: 9.08.2023, 1 ♂, leg. M. Kechev, G. Zaemdzhikova, B. Koychev; Site 6: 20.08.2023, 1 ♂, leg. G. Zaemdzhikova.

Neurigoninae

* *Neurigona quadrifasciata* (Fabricius, 1781). Material examined: Site 16: 23.08.2023, 1 ♀, leg. M. Kechev, G. Zaemdzhikova, B. Koychev.

Oncopygius distans (Loew, 1857). Known records for Vitosha: Karkama (Beschovski 2012).

Raphiinae

* *Rhaphium appendiculatum* Zetterstedt, 1849. Material examined: Site 8: 4.09.2023, 1 ♂, 1 ♀, Site 11: 30.08.2023, 2 ♂♂, leg. G. Zaemdzhikova.

Peloropecodinae

Chrysotimus flaviventris (Roser, 1840). Known for Vitosha Mountain (Kechev, 2021).

* *Chrysotimus molliculus* (Fallén, 1823). Material examined: Site 14: 23.08.2023, 1 ♂, leg. M. Kechev, G. Zaemdzhikova, B. Koychev.

Sciapodinae

Sciapus bellus Loew, 1873. Known for Vitosha Mountain (Kechev, 2021).

Sympycninae

* *Campsicnemus curvipes* (Fallén, 1823). Material examined: Site 1: 12.08.2023, 1 ♀; Site 3: 26.08.2023, 2 ♂♂, 2 ♀♀; Site 7: 20.08.2023, 1 ♂; Site 8: 4.09.2023, 1 ♂; Site 11: 30.08.2023, 3 ♂♂, 1 ♀, leg. G. Zaemdzhikova; Site 3: 9.08.2023, 5 ♂♂, 4 ♀♀; Site 5: 9.08.2023, 1 ♂, 3 ♀♀; Site 13: 23.08.2023, 1 ♂; Site 16: 23.08.2023, 1 ♂, 2 ♀♀, leg. M. Kechev, G. Zaemdzhikova, B. Koychev.

Campsicnemus umbripennis Loew, 1856. Known for Vitosha Mountain (Kechev et al., 2022b). Material examined: Site 1: 26.08.2023, 2 ♂♂, 2.09.2023, 1 ♂, 1 ♀; Site 4: 12.08.2023, 1 ♂, 1 ♀; Site 7: 20.08.2023, 1 ♂, 1 ♀; Site 11: 30.08.2023, 1 ♂, leg. G. Zaemdzhikova; Site 3: 9.08.2023, 7 ♂♂, 3 ♀♀, 26.08.2023, 2 ♂♂, 1 ♀; Site 5: 9.08.2023, 6 ♂♂, 4 ♀♀; Site 13: 23.08.2023, 1 ♂, Site 14: 23.08.2023, 1 ♂, leg. M. Kechev, G. Zaemdzhikova, B. Koychev.

* *Sympycnus pulicarius* (Fallén, 1823). Material examined: Site 1: 26.08.2023, 1 ♂, 3 ♀♀; Site 4: 12.08.2023, 1 ♂; Site 6: 20.08.2023, 2 ♂♂; Site 10: 13.08.2023, 3 ♂♂, 4 ♀♀; Site 11: 30.08.2023, 2 ♂♂; Site 17: 17.08.2023, 1 ♂, leg. G. Zaemdzhikova; Site 3: 9.08.2023, 8 ♂♂, 5 ♀♀; 26.08.2023, 1 ♂; Site 5: 9.08.2023, 2 ♂♂, 1 ♀; Site 13: 23.08.2023, 1 ♂, leg. M. Kechev, G. Zaemdzhikova, B. Koychev.

* *Syntormon pallipes* (Fabricius, 1794). Material examined: Site 3: 9.08.2023, 1 ♂; Site 13, 23.08.2023, 1 ♂, 8 ♀♀; Site 14, 23.08.2023, 2 ♂♂, leg. M. Kechev, G. Zaemdzhikova, B. Koychev; Site 6: 20.08.2023, 2 ♂♂, 3 ♀♀; Site 7: 20.08.2023, 6 ♂♂, 4 ♀♀; Site 17: 1 ♂, leg. G. Zaemdzhikova.

* *Syntormon pumilum* (Meigen, 1824). Material examined: Site 1: 26.08.2023, 1 ♀; Site 11:

30.08.2023, 1 ♀; Site 18: 17.08.2023, 1 ♂, leg. G. Zaemdzhikova; Site 3: 9.08.2023, 2 ♂♂, 1 ♀; Site 5: 9.08.2023, 1 ♂, 1 ♀; Site 13: 23.08.2023, 1 ♂, leg. M. Kechev, G. Zaemdzhikova, B. Koychev.

Telmaturgus tumidulus (Raddatz, 1873). Known records for Vitosha Mountain: Bistritsa Village (Beschovski 2012,).

* *Teuchophorus simplex* Mik, 1880. Material examined: Site 1: 12.08.2023, 2 ♂♂; 26.08.2023, 1 ♂, leg. G. Zaemdzhikova; Site 5: 9.08.2023, 1 ♀; Site 16: 23.08.2023, 1 ♂, leg. M. Kechev, G. Zaemdzhikova, B. Koychev.

Xanthochloinae

* *Xanthochlorus tenellus* (Wiedemann, 1817). Material examined: Site 1: 2.09.2023, 1 ♂; Site 9: 4.09.2023, 1 ♂, 2 ♀♀; Site 10: 30.08.2023, 1 ♀; Site 5: 9.08.2023, 1 ♂, 1 ♀; Site 16: 23.08.2023, 1 ♂, 1 ♀, Site 19: 26.08.2023, 1 ♂, leg. G. Zaemdzhikova.

Discussion

Forty-one species of the family Dolichopodidae known in Vitosha Mountain are recorded in the present paper. Twenty-one of them are new to the investigated area and one species, *Thrypticus divisus*, is recorded as new to the fauna of Bulgaria. *T. divisus* is widespread and known from Austria, Belgium, England, Finland, France, Germany, Ireland, Kazakhstan, Russia (European part, Leningrad Region), Sweden (Negrobov & Naglis, 2020). In the Balkan Peninsula it was found from Bosnia and Herzegovina and Croatia (Strobl, 1900).

Several other dolichopodids – *Dolichopus arbustorum*, *Dolichopus litorellus*, *Oncopygius distans* and *Telmaturgus tumidulus* are found from Vitosha Mountain only (Beschovski, 2012, 2013) and could be considered as rare for Bulgaria up to now. On the other hands, species like *Hydrophorus balticus*, *Medetera jacula*, *Rhaphium appendiculatum*, *Chrysotimus molliculus*, *Campsicnemus curvipes*, *C. umbripennis*, *Sympycnus pulicarius*, *Syntormon pallipes* and *Xanthochlorus tenellus* are very common and could be found at different altitudes and habitats.

Further research on the dolichopodids at this mountain will yield many more species, more than 100–120 dolichopodid flies for the area, which is due

to the varied topography, altitude and diversity of habitats. With this new record, the total number of Bulgarian dolichopodids increases to 214 species.

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