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Selected Diptera of City Park Kolmanka, Prešov (Slovakia)

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Selected Diptera of City Park Kolmanka, Prešov (Slovakia). – Acta Mus. Siles. Sci. Natur. 70: 125-134, 2021.

Abstract: In total 65 Diptera species from 20 families (Anisopodidae (2 spp.), Asilidae (1), Bibionidae (1), Clusiidae (1), Culicidae (8), Dolichopodidae (7), Drosophilidae (4), Dryomyzidae (1), Empididae (2), Heleomyzidae (5), Hybotidae (5), Lauxaniidae (4), Limoniidae (9), Opomyzidae (2), Pallopteridae (2), Psychodidae (6), Rhagionidae (2), Scatopsidae (1), Trichoceridae (1) and Ulidiidae (1)) were recorded. The species *Drapetis flavipes* Macquart, 1834 (Hybotidae), is recorded for the first time in Slovakia. Ten species belong among uncommon or rare (namely: *Atypophthalmus* (*Atypophthalmus*) *inustus* (Meigen, 1818), *Calliopum splendidum* Papp, 1978, *Dioctria linearis* (Fabricius, 1787), *Cheilotrichia* (*Empeda*) *neglecta* (Lackschewitz, 1927), *Chrysopilus asiliformis* (Preyssler, 1791), *Ochlerotatus* (*Ochlerotatus*) *nigrinus* (Eckstein 1918), *Philosepedon* (*Philosepedon*) *austriacum* Vaillant, 1974, *Suillia variegata* (Loew, 1862), *Toxoneura modesta* (Meigen, 1830) and *Trichomyia urbica* Curtis, 1839). On the other hand, two invasive species are also reported. *Drosophila* (*Sophophora*) *suzukii* (Matsumura, 1931) is an invasive crop pest and *Aedes* (*Finlaya*) *japonicus japonicus* (Theobald, 1901) is an invasive biting pest, a potential vector for various diseases. City parks are also important from the point of view of Diptera biodiversity and more attention needs to be paid to them.

Key words: flies, faunistics, interesting findings, first record, city park biodiversity

Introduction

The role of urban parks for the sustainability of a city is well known. The presence of natural areas contributes to the quality of human life in many ways. Besides many environmental and ecological services, urban nature provides important social and psychological benefits to human societies, enriching human life with meaning and emotions (e.g. Chiesura 2004). On the other hand, many insect groups can also benefit from this environment, e.g. flies, especially those of the families Phoridae (Hartop *et al.* 2015), Drosophilidae (Silva *et al.* 2005), Sepsidae (Ang *et al.* 2017) and other families (e.g. in Patitucci *et al.* 2015), or beetles (Komaromi *et al.* 2018), etc. However, in general, mosquitoes are the best studied insect group in these areas (e.g. Medeiros-Sousa *et al.* 2013, 2015, Paula *et al.* 2015, Ceretti-Junior *et al.* 2016, Carvalho *et al.* 2017, etc.).

From Central Europe, and especially from Slovakia, there are also several notes about insect research in urban nature (e.g. Malenovský & Kment 2004, Jendek *et al.* 2009; Šustek & Stanko 2012, Říha 2017, Pavlíková *et al.* 2020). Several works have also been published directly from the territory of the city of Prešov (Oboňa *et al.* 2017a,b, 2020, 2021, Maslova *et al.* 2018, van der Weele *et al.* 2018, Negrobov *et al.* 2019, 2020).

The aim of this paper is to spread knowledge about selected Diptera fauna of City Park Kolmanka (Prešov, Slovakia).

Material and methods

Diptera were collected by J. Oboňa, L. Mlynárová and P. Manko in the growing season in 2021 (exactly during months of May to October) by sweep-netting (15 minutes of netting for one sampling) for collection from vegetation growing in City Park Kolmanová záhrada (so-called "Kolmanka") (48°59'30.0"N 21°13'34.9"E, 247 m a.s.l., Fig. 1). The collection dates are as follows: 1.v.2021, 6.vi.2021, 5.vii.2021, 13.viii.2021, 12.ix.2021, 17.x.2021. The locality is a mixed forest (*Betula, Fagus, Quercus, Picea, Acer, Pinus*, etc.) with sunny stands. The captured specimens were preserved in 75% ethanol in the field.

In the laboratory, Jozef Oboňa identified male mosquitos (Culicidae) using Becker *et al.* (2010), also taking in account Harbach *et al*. (2017); Drosophilidae by Bächli *et al.* (2004), also taking in account Calabria *et al.* (2012); Limoniidae by Oosterbroek (2021) and Podenas *et al.* (2006); Psychodidae using Withers (1989), Jung (1956) and original papers with descriptions of species, e.g. Ježek (1977, 1985, 1990, 1995); and Trichoceridae using Krzemińska (2020). This material in alcohol is deposited in the collection of the Laboratory and Museum of Evo-lutionary Ecology, Department of Ecology, University of Prešov (LMEE PO). Libor Dvořák identified Anisopodidae (Söli & Rindal 2014), Asilidae (Geller-Grimm 2003), Bibionidae (Haenni 1982), Clusiidae (Stackelberg 1970), Opomyzidae (Drake 1993), Pallopteridae (Ozerov 2009), Rhagionidae (Rozkošný & Spitzer 1965) and Ulidiidae (Richter 1970). This material in alcohol is deposited in the private collection of L. Dvořák. Paul L. Th. Beuk identified Dolichopodidae (Chandler & Negrobov 2008, Grichanov 2006, Negrobov & Naglis 2016). This material in alcohol is deposited in the collection of the Natuurhistorisch Museum Maastricht, Maatricht, the Netherlands. Kateřina Dvořáková identified Dryomyzidae (Ozerov 1987), Heleomyzidae (Papp 1981) and Lauxaniidae (Semelbauer 2016). This material in alcohol is deposited in the private collection of K. Dvořáková. Ruud van der Weele and Patrick Grootaert used keys (e.g. Grootaert and Chvála 1992; Chvála 2005) for identifying the families Empididae and Hybotidae. This material is deposited in the private collection of R. van der Weele. Jean-Paul Haenni identified the Scatopsidae (Cook 1974), and the material deposited in the collection of Muséum d'histoire naturelle Neuchâtel (MHNN).

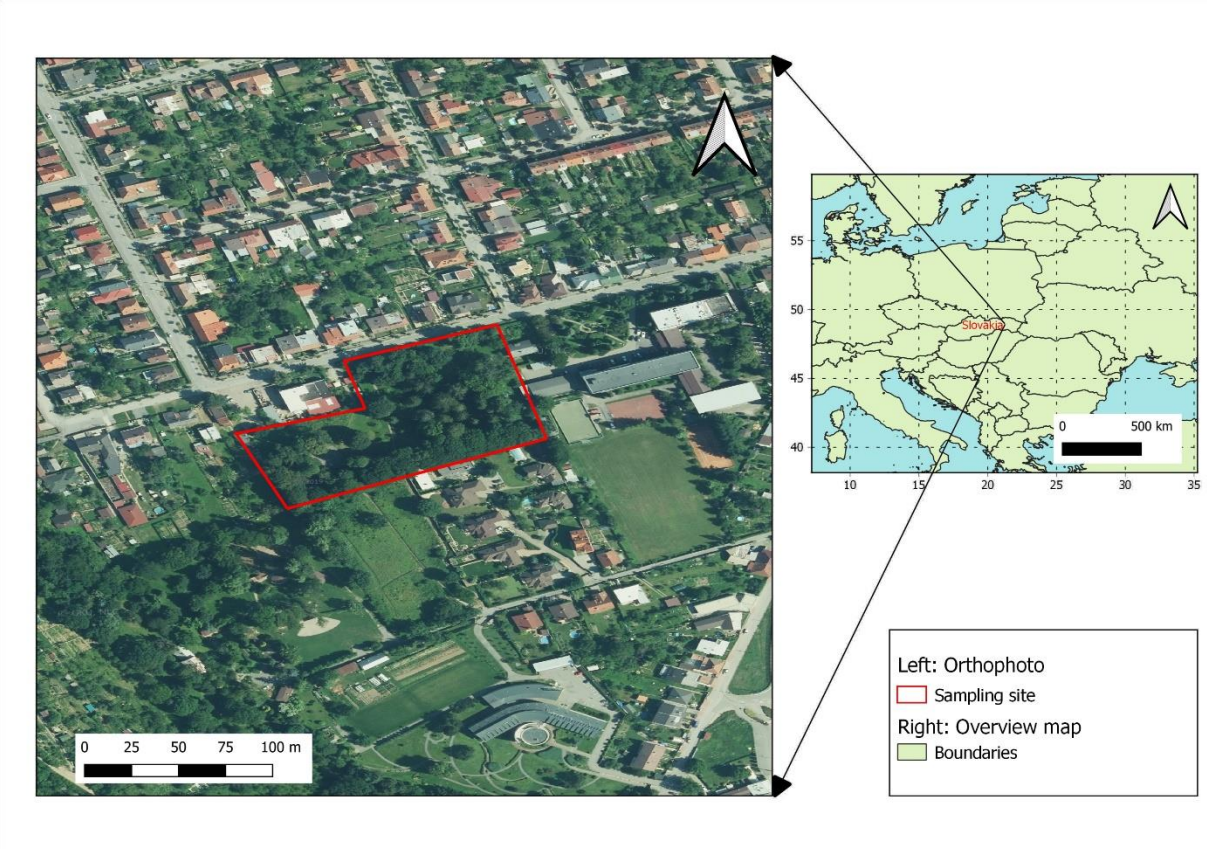

Fig 1: Map of the collecting area.

Results

ANISOPODIDAE

Sylvicola cinctus (Fabricius, 1787)
Material examined: 3 ♂♂, 1.v.; 2 ♂♂, 5.vii.; 1 ♀, 4 ♂♂, 13.viii.; 5 ♀♀, 3 ♂♂, 12.ix.; 1 ♀, 17.x.

Sylvicola fuscatus (Fabricius, 1775)
Material examined: 1 ♂, 6.vi. (all samples 2021); 3 ♂♂, 2 ♀♀, 5.vii.; 1 ♂, 13.viii.

ASILIDAE

Dioctria linearis (Fabricius, 1787)
Material examined: 1 ♀, 5.vii.
Note. Relatively rare species of thermophilic sunny stands.

BIBIONIDAE

Dilophus febrilis (Linnaeus, 1758)
Material examined: 1 ♀, 1.v.

CLUSIIDAE

Clusiodes albimanus (Meigen, 1830)
Material examined: 1 ♀, 1 ♂, 12.ix.

CULICIDAE

Aedes* (*Aedimorphus*) *vexans (Meigen 1830)
Material examined: 2 ♂♂, 6.vi.; 84 ♂♂, 5.vii.; 42 ♂♂, 13.viii.; 4 ♂♂, 12.ix.

Aedes* (*Finlaya*) *japonicus japonicus (Theobald, 1901)
Material examined: 1 ♂, 15.vii.; 7 ♂♂, 3.viii.; 2 ♂♂, 12.ix.; 1 ♂, 17.x.
Note: An invasive biting pest, a potential vector for various diseases (e.g. Čabanová *et al.* 2021).

Anopheles plumbeus (Stephens 1828)
Material examined: 2 ♂♂, 13.viii.

Culex* (*Culex*) *pipiens pipiens Linnaeus 1758
Material examined: 3 ♂♂, 5.vii.; 17 ♂♂, 13.viii.; 19 ♂♂, 12.ix.; 2 ♂♂, 17.x.

Culiseta* (*Culiseta*) *annulata (Schrank 1776)
Material examined: 1 ♂, 13.viii.

Ochlerotatus* (*Finlaya*) *geniculatus (Olivier 1791)
Material examined: 4 ♂, 5.vii.

Ochlerotatus* (*Ochlerotatus*) *communis (De Geer 1776)
Material examined: 1 ♂, 6.vi.; 1 ♂, 5.vii.

Ochlerotatus* (*Ochlerotatus*) *nigrinus (Eckstein 1918)
Material examined: 1 ♂, 6.vi.; 8 ♂♂, 5.vii.
Note: Not widely distributed and not a numerous species.

DOLICHOPODIDAE

Chrysotimus molliculus (Fallén, 1823)
Material examined: 3 ♀♀, 13.viii.

Medetera jacula (Fallén, 1823)
Material examined: 1 ♀ (cf.), 13.viii.

Medetera truncorum Meigen, 1824
Material examined: 1 ♂, 2 ♀♀, 5.vii.; 1 ♂, 1 ♀, 13.viii.; 1 ♂, 12.ix.

Neurigona quadrifasciata (Fabricius, 1781)
Material examined: 1 ♂, 1 ♀, 6.vi; 2 ♀♀, 5.vii.

Sciapus platypterus (Fabricius, 1805)
Material examined: 1 ♂, 5.vii.

Xanthochlorus ornatus (Haliday, 1832)
Material examined: 1 ♂, 6.vi.

Xanthochlorus tenellus (Wiedemann, 1817)
Material examined: 2 ♂♂, 1 ♀, 5.vii.; 1 ♀, 13.viii.

DROSOPHILIDAE

Drosophila* (*Drosophila*) *busckii Coquillett, 1901
Material examined: 1 ♂, 12.ix.

Drosophila* (*Sophophora*) *suzukii (Matsumura, 1931)
Material examined: 2 ♂, 12.ix.; 1 ♀, 17.x.
Note: An invasive crop pest (e.g. Mariychuk *et al.* 2020).

Chymomyza amoena (Loew, 1862)
Material examined: 2 ♂♂, 12.ix.

Leucophenga maculata (Dufour, 1839)
Material examined: 1 ♂, 12.ix.; 1 ♂, 17.x.

DRYOMYZIDAE

Dryope flaveola (Fabricius, 1794)
Material examined: 1 ♂, 17.x.

EMPIDIDAE

Empis* (*Empis*) *aestiva Loew, 1867
Material examined: 1 ♂, 1 ♀, 5.vii.

Empis* (*Xanthempis*) *lutea Meigen, 1804
Material examined: 1 ♂, 5.vii.

HELEOMYZIDAE

Suillia bicolor (Zetterstedt, 1838)
Material examined: 2 ♂♂, 2 ♀♀, 17.x.

Suillia fuscicornis (Zetterstedt, 1847)
Material examined: 1 ♀, 12.ix.

Suillia pallida (Fallén, 1820)
Material examined: 1 ♂, 6.vi.; 1 ♂, 17.x.

Suillia variegata (Loew, 1862)
Material examined: 1 ♂, 12.ix.
Note: A rare thermophilous species without any clear affinity to the habitat.

Tephrochlamys flavipes (Zetterstedt, 1838)
Material examined: 1 ♀, 17.x.

HYBOTIDAE

Drapetis flavipes Macquart, 1834
Material examined: 1 ♂, 5.vii.
Distribution: Austria, Belgium, Croatia, Czech Republic, France, Germany, Italy, Macedonia, Slovenia, Switzerland, Ukraine and North Africa (Chvála 2013, Grootaert *et al.* 2010). In the Czech Republic known only from Bohemia – see Chvála (2009). **First record for Slovakia.**

Elaphropeza ephippiata (Fallén, 1815)
Material examined: 1 ♂, 5.vii.; 2 ♂♂, 13.viii.

Ocydromia glabricula (Fallén, 1816)
Material examined: 1 ♂, 1 ♀, 12.ix.

Platypalpus ciliaris (Fallén, 1816)
Material examined: 1 ♂, 17.x.

Tachydromia annulimana Meigen, 1822
Material examined: 3 ♂♂, 5.vii.

LAUXANIIDAE

Calliopum splendidum Papp, 1978
Material examined: 1 ♀, 12.ix.; 1 ♀, 17.x.
Note. A rare species of shaded stands, mainly in beech forest (Semmelbauer 2016).

Meiosimyza decempunctata (Fallén, 1820)
Material examined: 1 ♀, 6.vi; 1 ♀, 5.vii.; 1 ♂, 13.viii, 1 ♂, 12.ix.

Meiosimyza rorida (Fallén, 1820)
Material examined: 1 ♀, 13.viii.

Tricholauxania praeusta (Fallén, 1820)
Material examined: 1 ♂, 5.vii.; 2 ♀♀, 2 ♂♂, 13.viii.; 1 ♀, 12.ix.

LIMONIDAE

Achyrolimonia decemmaculata (Loew, 1873)
Material examined: 2 ♂, 13.viii.

Atypophthalmus* (*Atypophthalmus*) *inustus (Meigen, 1818)
Material examined: 1 ♂, 5.vii.; 1 ♂, 13.viii.
Note: An uncommon species.

Dicranomyia* (*Dicranomyia*) *modesta (Meigen, 1818)
Material examined: 1 ♂, 13.viii.; 2 ♂♂, 12.ix.

Dicranoptycha livescens Loew, 1871
Material examined: 1 ♂, 13.viii.

Cheilotrichia* (*Empeda*) *neglecta (Lackschewitz, 1927)
Material examined: 1 ♂, 12.ix.
Note: An uncommon species.

Ilisia maculata (Meigen, 1804)
Material examined: 2 ♂♂, 12.ix.

Limonia nubeculosa Meigen, 1804
Material examined: 1 ♀, 12.ix; 3 ♂♂, 17.x.

Molophilus* (*Molophilus*) *propinquus (Egger, 1863)
Material examined: 2 ♂♂, 5.vii.; 1 ♂, 13.viii.

Symplecta* (*Psiloconopa*) *stictica stictica (Meigen, 1818)
Material examined: 1 ♀, 12.ix.

OPOMYZIDAE

Opomyza florum (Fabricius, 1794)
Material examined: 1 ♂, 12.ix.

Opomyza germinationis (Linnaeus, 1758)
Material examined: 1 ♀, 13.viii; 1 ♀, 12.ix.

PALLOPTERIDAE

Palloptera umbellatarum (Fabricius, 1775)
Material examined: 1 ♂, 6.vi.

Toxoneura modesta (Meigen, 1830)
Material examined: 2 ♂♂, 13.viii.
Note: An uncommon species of thermophilic sunny shrubs and forest margins.

PSYCHODIDAE

Logima satchelli (Quate, 1955)
Material examined: 3 ♂♂, 6.vi.

Philosepedon* (*Philosepedon*) *austriacum Vaillant, 1974
Material examined: 1 ♂, 1.v.; 2 ♂♂, 6.vi.
Note Local occurrence, a relatively rare European species (Oboňa & Ježek 2013).

Philosepedon* (*Philosepedon*) *humerale (Meigen, 1818)
Material examined: 4 ♂♂, 12.ix.; 2 ♂♂**,** 17.x.

Tinearia alternata (Say, 1824)
Material examined: 3 ♂♂, 6.vi.

Trichomyia urbica Curtis, 1839
Material examined: 1 ♂, 1.v.
Note: Not a common European species. In Jedlička & Stloukalová (2001) vulnerable, the current conservation status: CR (Oboňa & Ježek 2013).

Trichopsychoda hirtella (Tonnoir, 1919)
Material examined: 2 ♂♂, 13.viii.

RHAGIONIDAE

Chrysopilus asiliformis (Preyssler, 1791)
Material examined: 1 ♂, 5.vii.; 5 ♂♂, 13.viii.
Note: A typical species of sunny stands at lower elevations.

Rhagio maculatus (De Geer, 1776)
Material examined: 1 ♂, 6.vi.

SCATOPSIDAE

Apiloscatopse flavicollis (Meigen, 1818)
Material examined: 3 ♀♀, 17.x.
Note: A common species of wooded areas, with an autumnal flight period.

TRICHOCERIDAE

Trichocera annulata Meigen, 1818
Material examined: 3 ♂♂, 17.x.

ULIDIIDAE

Seioptera vibrans (Linnaeus, 1758)
Material examined: 1 ♂, 13.viii.

Conclusion

In total, 65 Diptera species – more than 340 specimens from 20 families – are recorded. One species, *Drapetis flavipes* Macquart, 1834, is recorded for the first time for Slovakia; ten species are uncommon or rare, and two species are invasive. The greatest biodiversity of the selected Diptera groups was recorded in August (24 species); the smallest in May (4 species).

The largest number of captured individuals of the selected Diptera was recorded in July (130 specimens, 23 species), the smallest in May (6 specimens, 4 species). Anisopodidae and Culicidae were present at the site for almost the entire research period. A dominant occurrence at the beginning of the season (May, Jun) was confirmed in Bibionidae, and families Drosophilidae, Opomyzidae, Scatopsidae and Trichoceridae were recorded at the end of growing season (September, October). The mid-season (July, August) was preferred mainly by species from the families e.g. Asilidae, Empididae, Heleomyzidae, Lauxaniidae and Pallopteridae. The most abundant families were Culicidae, with 8 species and 201 specimens, Limoniidae (9 species, 13 specimens) and Dolichopodidae (7 species, 20 specimens). Asilidae, Bibionidae, Clusiidae, Dryomyzidae, Scatopsidae, Trichoceridae and Ulidiidae were present with 1 only species each.

As stated in the introduction, insects can also benefit from environments like city parks. It is even possible to find new and rare species for the local and regional fauna, as well as invasive and non-native species. We can also support the opinion (see also Medeiros-Sousa *et al.* 2013, 2015, Paula *et al.* 2015, Ceretti-Junior *et al*. 2016, Carvalho *et al.* 2017, etc.) that mosquitoes are the best and most often studied insect group in these areas. In view of the above-mentioned results, can be confirm that there are presented a fauna of shaded forests, fauna of forest-steppes and fauna of sunny habitats.

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