THE HOVERFLIES (DIPTERA: SYRPHIDAE) OF THE ŽEMAITIJA NATIONAL PARK, NORTHWESTERN LITHUANIA

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Introduction

The hoverflies are one of the largest and most widespread families in the order Diptera. Recent estimates indicate that there are over 6100 described species belonging to about 200 genera (Pape *et al.*, 2011). These flies are rather diverse in body size and coloration, but very often they have contrasting markings or fluffy bodies, mimicking various groups of aculeate Hymenoptera. Adults of the family are significant pollinators of many plants including different wild ones, but also ornamental herbs, vegetables, and fruit trees, being one of the few families of Diptera, whose species are feeding exclusively on flowers with the small exceptions (Ssymank & Gilbert, 1993), and pollen is considered as the mandatory food for their females when they are raising eggs (Haslett, 1989). Some species of hoverflies are dominant insects in many habitats, including an agrarian environment, composing a corresponding part in the diet of insectivorous birds (Grim, 2006). There are some migrant species among these flies, making it possible to observe their decrease in the mainland and concentration along the seashores periodically, landing on boats sailing over the seas, and becoming food for marine animals (Schmid, 1999), but there are also much rarer species with lower dispersal rate and associated with more special situations (Gilbert, 2005).

The Žemaitija National Park is located in the northern part of western Lithuania (Plungė and Skuodas administrative districts). It is one of the five National Parks of Lithuania and was established in 1991 to protect natural areas surrounding the Plateliai Lake – the largest lake of the Žemaitija (Samogitia) historical and ethnographic region – with the wetland ecosystem, as well as the cultural heritage of traditional farmland (Bandzienė *et al.*, 2001). It is a very recent Park, and therefore, still bears many traces of intensive previous human activities: forest logging, military developments and several abandoned, overgrowing gravel pits. On the other hand, traditional farming has created specific habitats, such as untreated timber artifacts, ancient stone buildings, open meadows with glacial erratics and old manor parks (Kirstukas *et al.*, 2004).

This state-protected area is one of the most remote in relation to largest cities of Lithuania, and therefore, insects and other groups of small organisms in this area is relatively rarely studied. In the previous literature on the territory of the Park, only six species of hoverflies were mentioned (Podėnas & Pakalniškis, 2000; Lutovinovas, 2012; Steenis *et al.*, 2020). This number of species constitutes only a minute part of the actual species composition in this territory, when the total number of species recorded from our country is considered (Pakalniškis *et al.*, 2006). The goal of the present paper is to provide a more complete checklist of hoverfly species with indications concerning their abundance

and distribution.

Material and methods

The material was collected from several localities situated in the territory of the Žemaitija National Park (Fig. 1 [A–B]). Primarily sweeping flowers (1983, 1999, 2023) and more lately Malaise traps (2008) as well as yellow-white-blue Pan traps (2023) were applied for collecting the material, whereas some specimens were also identified from the photographs (2020, 2022, 2023). The majority of data were obtained by E. Lutovinovas & S. Kvašinskas (E.L. & S.K.) or E. Lutovinovas & G. Sidabrienė (E.L. & G.S.), with fewer records by S. Pakalniškis (S.P.). The identification, taxonomy and general distribution followed Veen (2004), Bartsch *et al.* (2009a, b), Steenis & Lucas (2011), Soszyński *et al.* (2013), Vujić *et al.* (2013) and Speight (2020). The list of hoverfly species of Lithuania was compiled from Pakalniškis *et al.* (2006) and later contributions (Lutovinovas, 2007; 2012; Lutovinovas & Kinduris, 2013; 2015; Lutovinovas & Venckus, 2015; Petrašiūnas, 2016; Lutovinovas & Pūtys, 2019; 2022; Lutovinovas *et al.*, 2023).

The studied material is deposited in the entomological collection of Nature Research Centre (Vilnius, Lithuania).

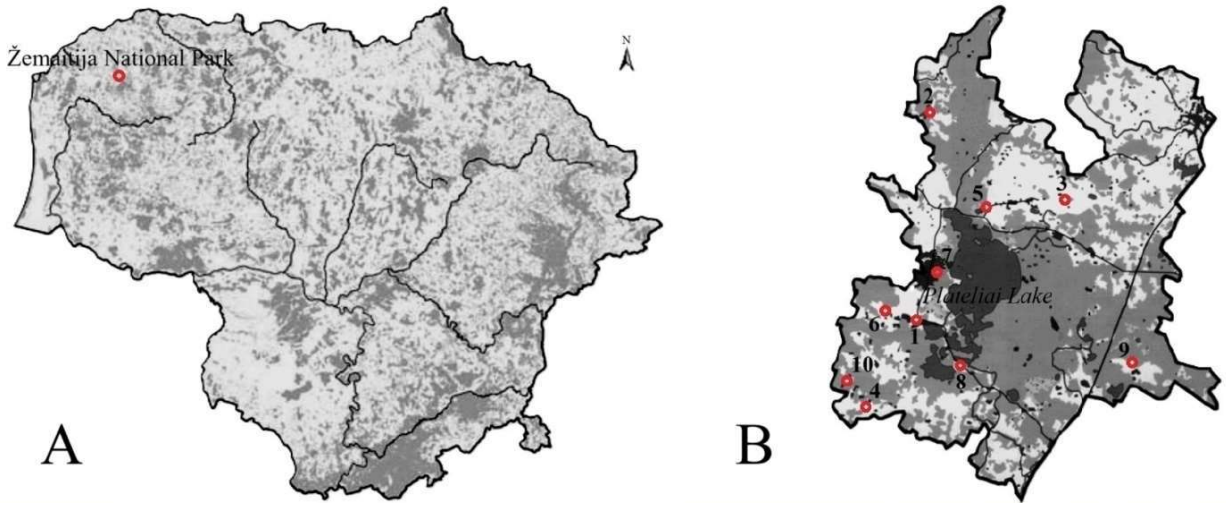

Fig. 1 [A–B]. A – location of the Žemaitija National Park within borders of Lithuania; B – studied localities within the borders of the Park.

List of localities

No.	Locality	Administrative district	Coordinates (LAT, LONG)
1	Beržoras	Plungė distr.	56.025000, 21.811111
2	Dvarviečiai	Skuodas distr.	56.108737, 21.816147
3	Getaučiai	Plungė distr.	56.076333, 21.913000
4	Godeliai	Plungė distr.	55.983056, 21.786944
5	Paežerės Rūdaičiai	Plungė distr.	56.071556, 21.855944
6	Pamedinčiai	Plungė distr.	56.023889, 21.783056
7	Plateliai	Plungė distr.	56.037500, 21.816389
8	Plokščiai	Plungė distr.	56.013056, 21.893056

9	Rukundžiai	Plungė distr.	56.009472, 21.969000
10	Stirbaičiai	Plungė distr.	56.000000, 21.755000

Results

A total of 120 hoverfly species are known up to date from the Žemaitija National Park, they are listed alphabetically within three subfamilies of Syrphidae (subfamily Microdontinae has not been recorded), ignoring their minor division into tribes and subtribes. The six previously published species are also provided with references of the previous records from the Žemaitija National Park, and their identities are either confirmed or rejected, based on the studied material. Altogether two species were excluded from the checklist after the collection material was revised. Two new species for the Lithuanian fauna are recorded, and they are marked with asterisks (*), while their diagnostic characters are figured and discussed. All other species, if not indicated otherwise, are recorded from the Žemaitija National Park for the first time.

Names of the localities, dates, numbers of specimens and collector names are given for the each species.

Checklist of species

SYRPHIDAE LATREILLE, 1802

Subfamily Milesiinae Rondani, 1845

***Anasimyia lineata* (Fabricius, 1787)**
Dvarviečiai, 21–22 05 2023, 3♀♀ (E.L. & G.S.).

***Anasimyia lunulata* (Meigen, 1822)**
Dvarviečiai, 22 05 2023, 1♂ (E.L. & G.S.).

***Blera fallax* (Linnaeus, 1758)**
Pamedinčiai, 26 05–02 06 2008, 1♀ (E.L. & S.K.).

***Brachyopa bicolor* (Fallén, 1817)**
Pamedinčiai, as a first record for the fauna of Lithuania (Lutovinovas, 2012); without an exact locality – duplicated record (Steenis *et al.*, 2020).
Pamedinčiai, 19–26 05 2008, 1♀ (E.L. & S.K.) – confirmed record.
Note: new material not found.

***Brachyopa panzeri* Goffe, 1945**
Plokščiai (*Brachyopa dorsata*: Podėnas & Pakalniškis, 2000 – misidentification); without an exact locality – duplicated record (Steenis *et al.*, 2020).
Plokščiai, 03–10 05 1999, 1♀ (S.P.) – corrected record.
Note: new material not found.

***Brachyopa vittata* Zetterstedt, 1843**
Pamedinčiai, as a first record for the fauna of Lithuania (Lutovinovas, 2012); without an exact locality – duplicated record (Steenis *et al.*, 2020).
Pamedinčiai, 19–26 05 2008, 1♀ (E.L. & S.K.) – confirmed record.
Note: new material not found.

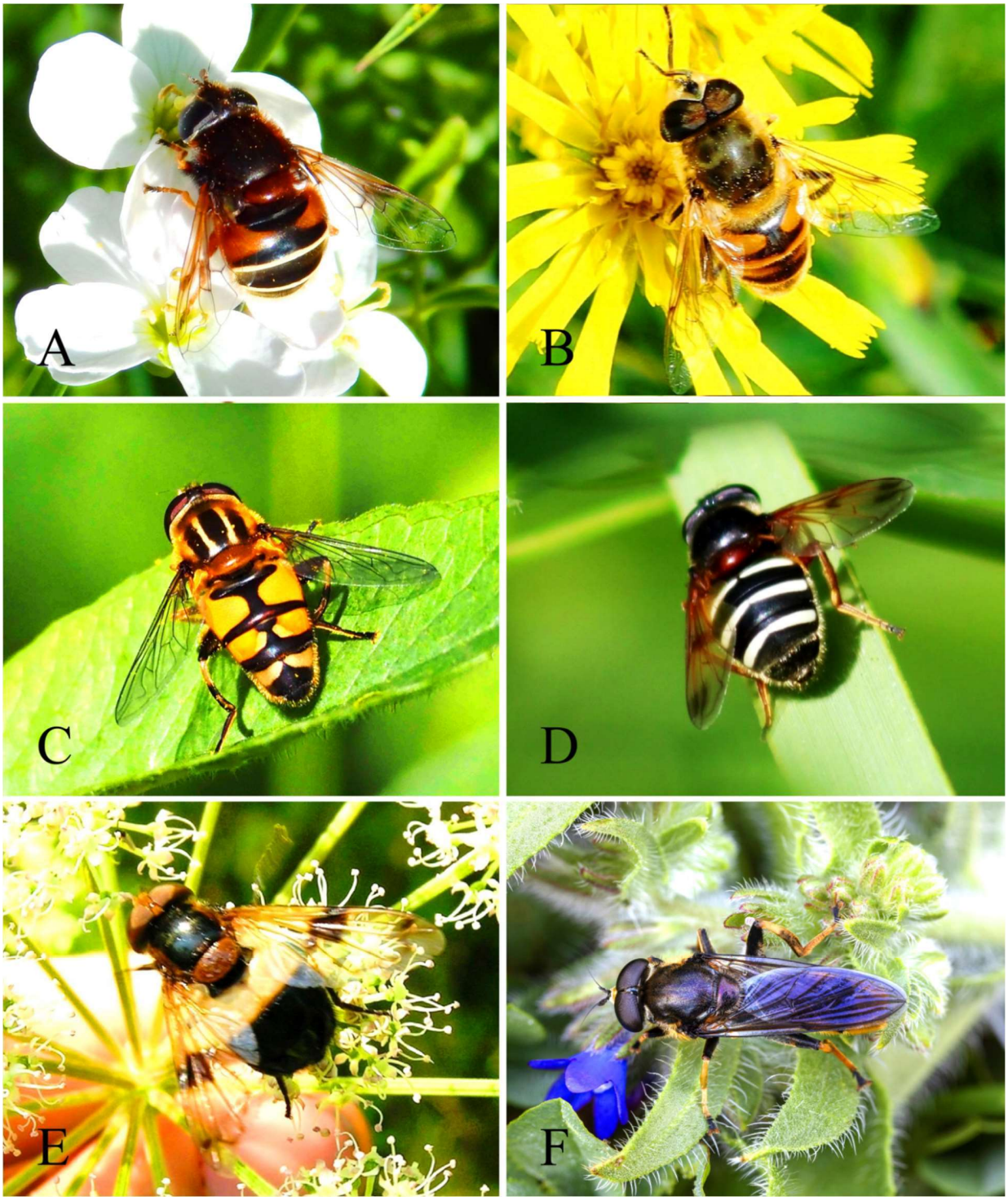

Fig. 2 [A–F]. Selected hoverflies of the subfamily Milesiinae from the Žemaitija National Park: A – *Eristalis cryptarum*, female (photo Z. Jokšienė); B – *E. tenax*, male (photo J. Motiejūnaitė); C – *Helophilus affinis*, male (photo G. Sidabrienė); D – *Sericomyia lappona*, female (ditto); E – *Volucella pellucens*, female (photo V. Tamutis); F – *Xylota sylvarum*, male (photo Ž. Pūtys).

***Brachypalpus laphriformis* (Fallén, 1816)**
Godeliai, 26 05–02 06 2008, 1♀ (E.L. & S.K.); Pamedinčiai, 05 05–02 06 2008, 1♂, 2♀♀ (E.L. & S.K.).

***Chalcosyrphus nemorum* (Fabricius, 1805)**
Dvarviečiai, 22 07–23 08 2023, 2♂♂ (E.L. & G.S.).

***Cheilosia albipila* Meigen, 1838**
Dvarviečiai, 23 04 2023, 1♀ (E.L. & G.S.); Godeliai, 07–21 04 2008, 2♂♂ (E.L. & S.K.); Pamedinčiai, 21–28 04 2008, 1♂ (E.L. & S.K.).

***Cheilosia carbonaria* Egger, 1860**
Dvarviečiai, 26 06 2023, 1♀ (E.L. & G.S.).

***Cheilosia chloris* (Meigen, 1822)**
Dvarviečiai, 23 04 2023, 4♀♀ (E.L. & G.S.); Pamedinčiai, 05–12 05 2008, 1♀ (E.L. & S.K.).

***Cheilosia chrysocoma* (Meigen, 1822)**
Dvarviečiai, 23 04 2023, 1♂ (E.L. & G.S.); Pamedinčiai, 21 04–26 05 2008, 3♂♂ (E.L. & S.K.).

***Cheilosia flavipes* (Panzer, 1798)**
Godeliai, 28 04–05 05 2008, 1♀ (E.L. & S.K.); Pamedinčiai, 12–19 05 2008, 1♂ (E.L. & S.K.).

***Cheilosia illustrata* (Harris, 1780)**
Dvarviečiai, 26 06 2023, 2♀♀ (E.L. & G.S.).

***Cheilosia impressa* Loew, 1840**
Dvarviečiai, 22 05 2023, 1♀ (E.L. & G.S.).

***Cheilosia latifrons* (Zetterstedt, 1843)**
Godeliai, 19–26 05 2008, 1♂ (E.L. & S.K.); Pamedinčiai, 05–12 05 2008, 1♀ (E.L. & S.K.).

***Cheilosia mutabilis* (Fallén, 1817)**
Dvarviečiai, 26 06–20 07 2023, 3♂♂ (E.L. & G.S.).

***Cheilosia pagana* (Meigen, 1822)**
Dvarviečiai, 23 04–21 08 2023, 8♂♂, 4♀♀ (E.L. & G.S.); Getaučiai, 23 04–23 08 2023, 1♂, 3♀♀ (E.L. & G.S.); Godeliai, 21 07–04 08 2008, 1♀ (E.L. & S.K.); Pamedinčiai, 21 07–04 08 2008, 1♀ (E.L. & S.K.).

***Cheilosia morio* B (Zetterstedt, 1838)**, sensu Bartsch *et al.* (2009b).
Godeliai, as a first record for the fauna of Lithuania (Lutovinovas, 2012).
Godeliai, 28 04–05 05 2008, 1♀ (E.L. & S.K.) – specified record (as '*morio* B').
Note: new material not found.

***Cheilosia psilophthalma* Becker, 1894**
Godeliai, 28 04–05 05 2008, 1♀ (E.L. & S.K.); Pamedinčiai, 28 04–05 05 2008, 1♀ (E.L. & S.K.).

***Cheilosia pubera* (Zetterstedt, 1838)**
Pamedinčiai, 21–28 04 2008, 1♂ (E.L. & S.K.).

***Cheilosia rufimana* (Becker, 1894)**
Pamedinčiai, 28 04–05 05 2008, 1♂, 2♀♀ (E.L. & S.K.).

***Cheilosia scutellata* (Fallén, 1817)**
Dvarviečiai, 22 09 2023, 1♀ (E.L. & G.S.).

***Cheilosia urbana* (Meigen, 1822)**
Dvarviečiai, 23 04 –22 05 2023, 2♀♀ (E.L. & G.S.); Godeliai, 21 04–05 05 2008, 1♂, 1♀ (E.L. & S.K.); Pamedinčiai, 21 04–12 05 2008, 3♂♂ (E.L. & S.K.).

***Cheilosia vernalis* (Fallén, 1817)**
Dvarviečiai, 21–22 05 2023, 1♂, 1♀ (E.L. & G.S.); Godeliai, 11–18 08 2008, 1♀ (E.L. & S.K.); Pamedinčiai, 05–12 05 2008, 1♀ (E.L. & S.K.).

***Cheilosia vulpina* (Meigen, 1822)**
Dvarviečiai, 22 07 2023, 1♂ (E.L. & G.S.); Godeliai, 14 07–18 08 2008, 2♂♂, 4♀♀ (E.L. & S.K.).

***Chrysogaster solstitialis* (Fallén, 1817)**
Dvarviečiai, 24 06–20 07 2023, 5♂♂, 1♀ (E.L. & G.S.); Godeliai, 14–21 07 2008, 2♀♀ (E.L. & S.K.).

***Criorhina asilica* (Fallén, 1816)**
Pamedinčiai, 09–16 06 2008, 1♂ (E.L. & S.K.).

***Eristalinus sepulchralis* (Linnaeus, 1758)**
Dvarviečiai, 24 06–22 07 2023, 7♂♂, 2♀♀ (E.L. & G.S.); Getaučiai, 23 07–24 08 2023, 2♂♂ (E.L. & G.S.).

***Eristalis arbustorum* (Linnaeus, 1758)**
Beržoras, 22 08 1983, 1♂ (S.P.); Getaučiai, 23 06 2023, 1♂ (E.L. & G.S.).

***Eristalis cryptarum* (Fabricius, 1794)**
Paežerės Rūdaičiai, 18 05 2023, 1♀ (photo G. Sidabrienė); Stirbaičiai, 18 05 2023, 1♀ (photo Z. Jokšienė; Fig. 2 [A]).

***Eristalis horticola* (De Geer, 1776)**
Dvarviečiai, 24 06 2023, 1♀ (E.L. & G.S.).

***Eristalis intricaria* (Linnaeus, 1758)**
Getaučiai, 23 06–22 08 2023, 1♂, 2♀♀ (E.L. & G.S.).

***Eristalis nemorum* (Linnaeus, 1758)**
Dvarviečiai, 24 06–22 09 2023, 5♂♂, 4♀♀ (E.L. & G.S.); Getaučiai, 22 05–24 08 2023, 5♂♂, 1♀ (E.L. & G.S.); Godeliai, 21 07–04 08 2008, 1♂ (E.L. & S.K.).

***Eristalis obscura* Loew, 1866**
Dvarviečiai, 21 05–20 07 2023, 1♂, 11♀♀ (E.L. & G.S.); Getaučiai, 24 08 2023, 1♀ (E.L. & G.S.).

***Eristalis oestracea* (Linnaeus, 1758)**
Dvarviečiai, 24–26 06 2023, 4♂♂ (E.L. & G.S.).

***Eristalis pertinax* (Scopoli, 1763)**
Beržoras, 22 08 1983, 1♀ (S.P.); Dvarviečiai, 21 05–20 07 2023, 6♂♂, 1♀ (E.L. & G.S.); Getaučiai, 22 08 2023, 1♂ (E.L. & G.S.).

***Eristalis rupium* (Fabricius, 1805)**
Dvarviečiai, 22 05 2023, 1♀ (E.L. & G.S.).

***Eristalis tenax* (Linnaeus, 1758)**
Dvarviečiai, 22 09 2023, 1♂, 3♀♀ (E.L. & G.S.); Getaučiai, 21 07–23 09 2023, 3♂♂, 4♀♀ (E.L. & G.S.); Plateliai, 22 09 2022, 1♀ (photo J. Motiejūnaitė); Stirbaičiai, 22 09 2022, 1♀ (photo J. Motiejūnaitė; Fig. 2 [B]).

***Eumerus flavitarsis* Zetterstedt, 1843**
Pamedinčiai, 14–21 07 2008, 1♀ (E.L. & S.K.).

***Eumerus strigatus* (Fallén, 1817)**
Godeliai, 23 06–18 08 2008, 1♂, 1♀ (E.L. & S.K.).

***Ferdinandea cuprea* (Scopoli, 1763)**
Godeliai, 14 07–25 08 2008, 5♂♂ (E.L. & S.K.); Pamedinčiai, 23 06–04 08 2008, 2♂♂, 1♀ (E.L. & S.K.).

***Ferdinandea ruficornis* (Fabricius, 1775)**
Pamedinčiai, as a first record for the fauna of Lithuania (Lutovinovas, 2012).
Pamedinčiai, 21 07–04 08 2008, 1♂ (E.L. & S.K.) – confirmed record.
Note: new material not found.

***Helophilus affinis* Wahlberg, 1844**
Pamedinčiai, 22 06 2023, 1♂ (photo G. Sidabrienė; Fig. 2 [C]).

***Helophilus hybridus* Loew, 1846**
Dvarviečiai, 21 05 2023, 1♀ (E.L. & G.S.); Getaučiai, 22 08 2023, 1♀ (E.L. & G.S.).

***Helophilus pendulus* (Linnaeus, 1758)**
Dvarviečiai, 21 05–22 09 2023, 5♂♂, 6♀♀ (E.L. & G.S.); Getaučiai, 22 08–23 09 2023, 3♂♂, 5♀♀ (E.L. & G.S.); Godeliai, 07–14 07 2008, 1♀ (E.L. & S.K.); Pamedinčiai, 01 06–29 09 2008, 2♂♂, 2♀♀ (E.L. & S.K.).

***Melanogaster aerosa* (Loew, 1843)**
Dvarviečiai, 26 06 2023, 1♀ (E.L. & G.S.); Getaučiai, 23–25 06 2023, 1♂, 2♀♀ (E.L. & G.S.); Plokščiai, 07–14 06 1999, 1♀ (S.P.).

***Myathropa florea* (Linnaeus, 1758)**
Dvarviečiai, 24 06–22 07 2023, 6♂♂, 2♀♀ (E.L. & G.S.); Getaučiai, 25 06–24 08 2023, 1♂, 1♀ (E.L. & G.S.).

***Neoascia meticulosa* (Scopoli, 1763)**
Godeliai, 07–14 07 2008, 1♀ (E.L. & S.K.).

***Neoascia podagrica* (Fabricius, 1775)**
Pamedinčiai, 14–21 07 2008, 1♂ (E.L. & S.K.).

***Orthonevra geniculata* (Meigen, 1830)**
Pamedinčiai, 19–26 05 2008, 1♀ (E.L. & S.K.).

***Orthonevra intermedia* (Lundbeck, 1916)**
Dvarviečiai, 24 06 2023, 1♂ (E.L. & G.S.); Getaučiai, 25 06 2023, 1♂ (E.L. & G.S.); Pamedinčiai, 01–09 06 2008, 1♀ (E.L. & S.K.).

***Orthonevra nobilis* (Fallén, 1817)**
Dvarviečiai, 26 06 2023, 1♂ (E.L. & G.S.).

***Orthonevra stackelbergi* Thompson & Torp, 1982**
Dvarviečiai, 26 06 2023, 1♂ (E.L. & G.S.).

***Parhelophilus frutetorum* (Fabricius, 1775)**
Dvarviečiai, 26 06–21 07 2023, 1♂, 1♀ (E.L. & G.S.).

***Parhelophilus versicolor* (Fabricius, 1794)**
Getaučiai, 23 06 2023, 1♀ (E.L. & G.S.).

***Rhingia campestris* Meigen, 1822**
Getaučiai, 22 05–24 08 2023, 2♀♀ (E.L. & G.S.); Godeliai, 19 05–02 06 2008, 2♀♀ (E.L. & S.K.); Pamedinčiai, 05–19 05 2008, 2♂♂ (E.L. & S.K.).

***Sericomyia lappona* (Linnaeus, 1758)**
Dvarviečiai, 21 05 2023, 1♀ (E.L. & G.S.); Rukundžiai, 17 06 2022, 1♀ (photo G. Sidabrienė; Fig. 2 [D]).

***Sericomyia silentis* (Harris, 1776)**
Dvarviečiai, 22 09 2023, 1♂, 1♀ (E.L. & G.S.); Getaučiai, 22–24 08 2023, 4♂♂, 3♀♀ (E.L. & G.S.); Pamedinčiai, 14 07–15 09 2008, 6♂♂, 1♀ (E.L. & S.K.); Stirbaičiai, 23 08 1983, 1♀ (S.P.).

***Sericomyia superbiens* (Müller, 1776)**
Dvarviečiai, 23 08–22 09 2023, 6♂♂, 2♀♀ (E.L. & G.S.); Getaučiai, 22 08–23 09 2023, 2♂♂, 1♀ (E.L. & G.S.).

***Syritta pipiens* (Linnaeus, 1758)**
Beržoras, 22 08 1983, 1♂ (S.P.); Getaučiai, 23 06–22 08 2023, 3♂♂ (E.L. & G.S.); Godeliai, 11–18 08 2008, 1♂ (E.L. & S.K.); Pamedinčiai, 14 07–29 09 2008, 2♀♀ (E.L. & S.K.).

***Temnostoma bombylans* (Fabricius, 1805)**
Getaučiai, 23 06 2023, 1♂ (E.L. & G.S.); Godeliai, 26 05–02 06 2008, 1♀ (E.L. & S.K.).

***Temnostoma vespiforme* (Linnaeus, 1758)**
Dvarviečiai, 24 06 2023, 1♂ (E.L. & G.S.).

***Tropidia scita* (Harris, 1780)**
Dvarviečiai, 26 06 2023, 1♂ (E.L. & G.S.).

***Volucella bombylans* (Linnaeus, 1758)**
Dvarviečiai, 24 06 2023, 2♀♀ (E.L. & G.S.).

***Volucella inanis* (Linnaeus, 1758)**
Dvarviečiai, 20 07 2023, 1♂ (E.L. & G.S.).

***Volucella pellucens* (Linnaeus, 1758)**
Dvarviečiai, 24 06–22 07 2023, 1♂, 3♀♀ (E.L. & G.S.); Plokščiai, 13 08 2020, 1♀ (photo V. Tamutis; Fig. 2 [E]).

***Xylota florum* (Fabricius, 1805)**
Dvarviečiai, 26 06 2023, 1♀ (E.L. & G.S.); Getaučiai, 23 07–24 08 2023, 1♂, 1♀ (E.L. & G.S.).

***Xylota meigeniana* Stackelberg, 1964**
Pamedinčiai, 11–18 08 2008, 1♂ (E.L. & S.K.).

***Xylota segnis* (Linnaeus, 1758)**
Dvarviečiai, 26 06–23 08 2023, 1♂, 3♀♀ (E.L. & G.S.); Getaučiai, 25 06–23 09 2023, 32♂♂, 39♀♀ (E.L. & G.S.).

***Xylota sylvarum* (Linnaeus, 1758)**
Beržoras, 24 06 2020, 1♂ (photo Ž. Pūtys; Fig. 2 [F]); Dvarviečiai, 26 06 2023, 1♂ (E.L. & G.S.); Pamedinčiai, 14–21 07 2008, 1♀ (E.L. & S.K.).

***Xylota tarda* Meigen, 1822**
Godeliai, 21 07–04 08 2008, 1♀ (E.L. & S.K.).

Subfamily Pipizinae Williston, 1885

***Neocnemodon vitripennis* (Meigen, 1822)**
Godeliai, 18–25 08 2008, 1♂, 1♀ (E.L. & S.K.).

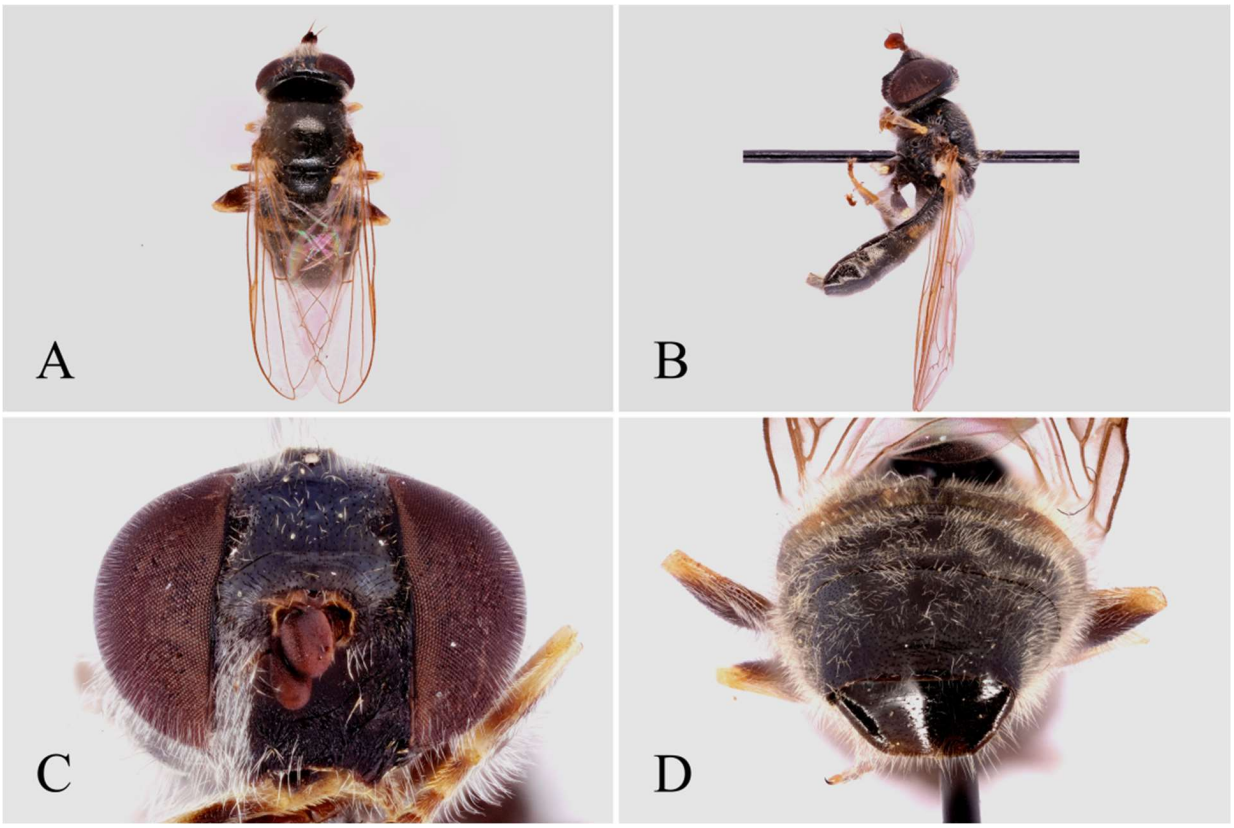

Fig. 3 [A–D]. *Pipiza accola*, dry-pinned female from the Žemaitija National Park: A, B – dorsal and lateral views of the whole body; C – frontal view of the head; D – dorsal view of the apex of abdomen (photos by E. Lutovinovas).

***Pipiza accola* Violovitsh, 1985**

Pamedinčiai, 28 04–05 05 2008, 1♀ (E.L. & S.K.; Fig. 3 [A–D]).

Note: first record for the territory of Lithuania (Pakalniškis *et al.*, 2006).

Diagnosis. This species belongs to the *P. luteitarsis* Zetterstedt group and resembles *P. luteitarsis* Zetterstedt and *P. luteibarba* Vujić, Radenković & Polić by the dense yellow hairs of the body and the lack of black hairs on abdomen, but more similar to the first species, because of the short and oval first flagellomere; this species could be recognized by the anterior part of frons and the face being broader than width of the eye in frontal view; male could be additionally differentiated by the convex frons, and female, by tergite 5 at the base about twice as wide as long (Veen, 2004; Bartsch *et al.*, 2009b; Vujić *et al.*, 2013; Speight, 2017).

***Pipiza austriaca* Meigen, 1822**

Dvarviečiai, 21 05–20 07 2023, 2♂♂, 1♀ (E.L. & G.S.).

***Pipiza noctiluca* (Linnaeus, 1758)**

Godeliai, 19 05–09 06 2008, 4♀♀ (E.L. & S.K.); Pamedinčiai, 01–09 06 2008, 1♀ (E.L. & S.K.).

***Pipiza notata* Meigen, 1822**

Dvarviečiai, 21 05–20 07 2023, 2♀♀ (E.L. & G.S.); Pamedinčiai, 26 05–10 08 2008, 4♀♀ (E.L. & S.K.).

***Pipizella viduata* (Linnaeus, 1758)**
Dvarviečiai, 21 05–26 06 2023, 1♂, 1♀ (E.L. & G.S.); Getaučiai, 22 05–23 06 2023, 1♂, 2♀♀ (E.L. & G.S.); Godeliai, 14–21 07 2008, 1♂ (E.L. & S.K.).

Subfamily Syrphinae Latreille, 1802

***Baccha elongata* (Fabricius, 1775)**
Beržoras, 22 08 1983, 1♀ (S.P.); Godeliai, 14 07–01 09 2008, 2♂♂, 2♀♀ (E.L. & S.K.); Pamedinčiai, 14 07–29 09 2008, 6♂♂, 8♀♀ (E.L. & S.K.).
***Chrysotoxum arcuatum* (Linnaeus, 1758)**
Godeliai, 21 07–04 08 2008, 1♀ (E.L. & S.K.).
***Chrysotoxum bicinctum* (Linnaeus, 1758)**
Dvarviečiai, 24–25 06 2023, 3♂♂ (E.L. & G.S.); Godeliai, 21 07–04 08 2008, 1♀ (E.L. & S.K.); Pamedinčiai, 04 08–21 07 2008, 1♀ (E.L. & S.K.).
***Chrysotoxum festivum* (Linnaeus, 1758)**
Dvarviečiai, 26 06 2023, 1♂ (E.L. & G.S.); Getaučiai, 23 06–24 08 2023, 2♂♂, 2♀♀ (E.L. & G.S.).
***Dasysyrphus venustus* (Meigen, 1822)**, sensu Soszyński *et al.* (2013).
Godeliai, 12–19 05 2008, 2♀♀ (E.L. & S.K.); Pamedinčiai, 05 05–09 06 2008, 1♂, 2♀♀ (E.L. & S.K.).
***Doros profuges* (Harris, 1780)**
Pamedinčiai, 30 06–08 07 2008, 2♀♀ (E.L. & S.K.).
***Epistrophe melanostoma* (Zetterstedt, 1843)**
Dvarviečiai, 21 05 2023, 1♀ (E.L. & G.S.).
***Epistrophe nitidicollis* (Meigen, 1822)**
Godeliai, 02–09 06 2008, 1♀ (E.L. & S.K.).
***Episyrphus balteatus* (De Geer, 1776)**
Dvarviečiai, 20 07–22 09 2023, 3♂♂, 6♀♀ (E.L. & G.S.); Getaučiai, 23 06–23 07 2023, 2♀♀ (E.L. & G.S.); Godeliai, 21 07–01 09 2008, 15♂♂, 9♀♀ (E.L. & S.K.); Pamedinčiai, 23 06–01 09 2008, 15♂18♀ (E.L. & S.K.).
***Eupeodes corollae* (Fabricius, 1794)**
Dvarviečiai, 21 05–22 07 2023, 1♂, 2♀♀ (E.L. & G.S.); Getaučiai, 23 06 2023, 1♀ (E.L. & G.S.); Pamedinčiai, 23 06–18 08 2008, 1♂, 11♀♀ (E.L. & S.K.).
***Eupeodes latifasciatus* (Macquart, 1829)**
Dvarviečiai, 21 05 2023, 2♀♀ (E.L. & G.S.); Pamedinčiai, 30 06–08 07 2008, 1♀ (E.L. & S.K.).
***Eupeodes luniger* (Meigen, 1822)**
Dvarviečiai, 20 07 2023, 1♀ (E.L. & G.S.); Pamedinčiai, 23–30 06 2008, 1♀ (E.L. & S.K.).
***Eupeodes nitens* (Zetterstedt, 1843)**
Pamedinčiai, 11–18 08 2008, 1♀ (E.L. & S.K.).
***Leucozona laternaria* (Müller, 1776)**
Dvarviečiai, 24 06–21 07 2023, 2♂♂, 2♀♀ (E.L. & G.S.).
***Leucozona lucorum* (Linnaeus, 1758)**
Pamedinčiai (*L. inopinata*: Lutovinovas, 2012 – misidentification).
Pamedinčiai, 26 05–02 06 2008, 1♂ (E.L. & S.K.) – corrected record.
Note: new material not found.

***Melangyna lasiophthalma* (Zetterstedt, 1843)**
Dvarviečiai, 23 04 2023, 1♀ (E.L. & G.S.); Godeliai, 29 03–02 06 2008, 1♂, 2♀♀ (E.L. & S.K.); Pamedinčiai, 28 03–28 04 2008, 4♀♀ (E.L. & S.K.).

***Melangyna umbellatarum* (Fabricius, 1794)**
Getaučiai, 22 08 2023, 1♀ (E.L. & G.S.).

***Melanostoma mellinum* (Linnaeus, 1758)**
Beržoras, 22 08 1983, 1♀ (S.P.); Dvarviečiai, 20 07–22 09 2023, 4♂♂, 2♀♀ (E.L. & G.S.); Getaučiai, 22 05–23 09 2023, 2♂♂, 1♀ (E.L. & G.S.); Godeliai, 05 05–04 08 2008, 10♂♂, 12♀♀ (E.L. & S.K.); Pamedinčiai, 05 05–18 08 2008, 17♂♂, 28♀♀ (E.L. & S.K.); Plateliai, 20–22 09 2022, 1♂, 2♀♀ (photos J. Motiejūnaitė; Fig. 5 [A]).

***Melanostoma scalare* (Fabricius, 1794)**
Dvarviečiai, 20 07–21 08 2023, 2♂♂ (E.L. & G.S.); Godeliai, 05 05–01 09 2008, 4♂♂, 9♀♀ (E.L. & S.K.); Pamedinčiai, 05 05–15 09 2008, 25♂♂, 54♀♀ (E.L. & S.K.).

***Meligramma euchroma* (Kowarz, 1885)**
Pamedinčiai, 12–19 05 2008, 1♀ (E.L. & S.K.).

***Meligramma triangulifera* (Zetterstedt, 1843)**
Godeliai, 12 05–15 09 2008, 7♀♀ (E.L. & S.K.); Pamedinčiai, 07 07–25 08 2008, 1♂, 4♀♀ (E.L. & S.K.).

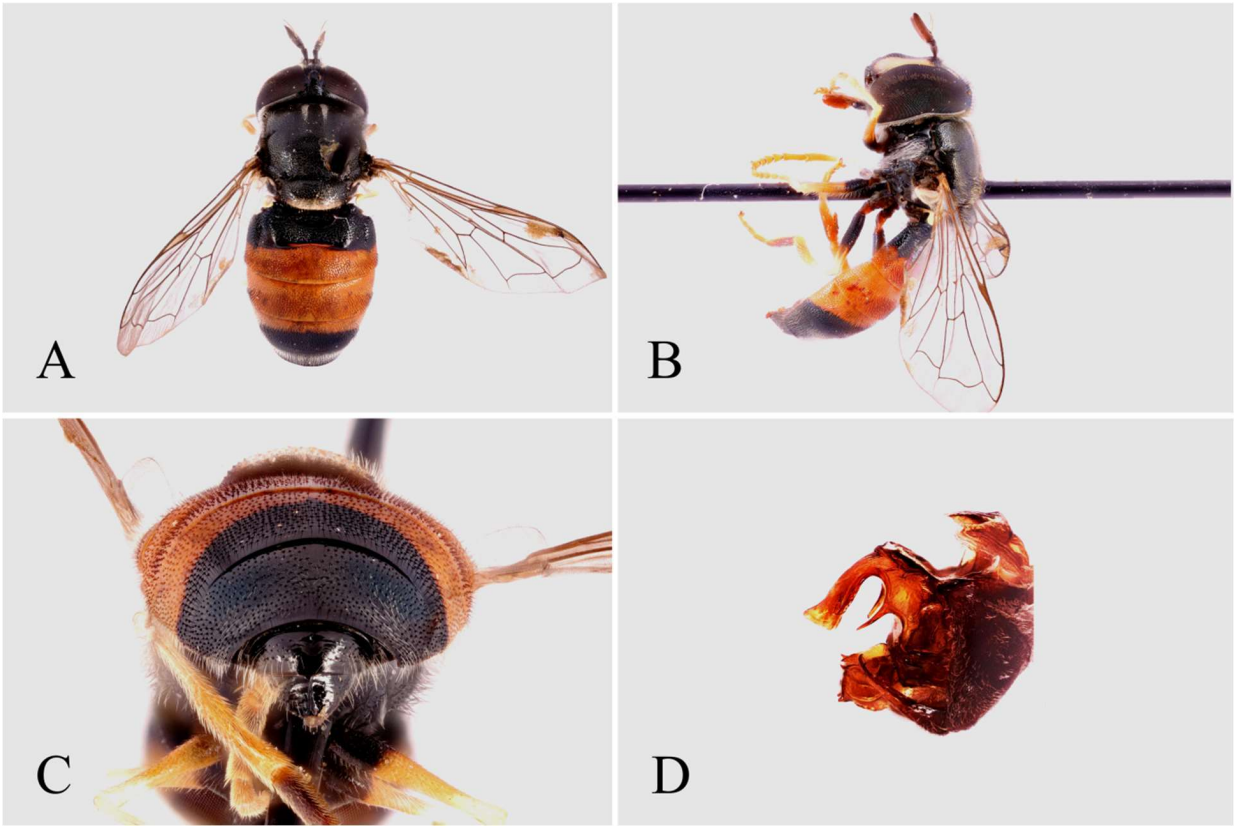

Fig. 4 [A–D]. *Paragus finitimus*, dry-pinned specimens from the Žemaitija National Park: A, B – dorsal and lateral views of the female body; C – dorsal view of the apex of female abdomen; D – lateral view of the male genitalia (photos by E. Lutovinovas).

***Meliscaeva cinctella* (Zetterstedt, 1843)**

Dvarviečiai, 21 08–22 09 2023, 3♂♂, 2♀♀ (E.L. & G.S.); Getaučiai, 24 08 2023, 1♂, 1♀ (E.L. & G.S.); Godeliai, 14 07–01 09 2008, 10♂♂, 21♀♀ (E.L. & S.K.); Pamedinčiai, 14 07–01 09 2008, 8♂♂, 11♀♀ (E.L. & S.K.).

****Paragus finitimus* Goeldlin, 1971**

Godeliai, 26 05–04 08 2008, 3♂♂, 2♀♀ (E.L. & S.K.; Fig. 4 [A–D]).

Note: first record for the territory of Lithuania (Pakalniškis *et al.*, 2006).

Diagnosis. This species belongs to the *P. bicolor* (Fabricius) group and resembles *P. bicolor* (Fabricius) and *P. flammeus* Goeldlin by the extensive red pattern of abdomen including side margins of median tergites, but more similar to the last species, because of the absence of bands of silverish dust on these tergites; male could be reliably differentiated by the presence of long tooth at the border between hypandrium and lingula, and female, by tergite 7 bearing a distinct depression (Veen, 2004; Sorokina, 2007; Vujić *et al.*, 2008; Bartsch *et al.*, 2009a).

***Paragus haemorrhous* Meigen, 1822**

Godeliai, 14–21 07 2008, 1♂ (E.L. & S.K.).

***Parasyrphus annulatus* (Zetterstedt, 1838)**

Dvarviečiai, 26 06 2023, 1♀ (E.L. & G.S.).

***Parasyrphus lineolus* (Zetterstedt, 1843)**

Dvarviečiai, 24 06 2023, 1♀ (E.L. & G.S.); Godeliai, 21 07–04 08 2008, 2♀♀ (E.L. & S.K.).

***Platycheirus albimanus* (Fabricius, 1781)**

Dvarviečiai, 22 05 2023, 1♀ (E.L. & G.S.); Pamedinčiai, 18–25 08 2008, 1♀ (E.L. & S.K.).

***Platycheirus angustatus* (Zetterstedt, 1843)**

Getaučiai, 23 06 2023, 1♂ (E.L. & G.S.); Godeliai, 05–19 05 2008, 1♂, 2♀♀ (E.L. & S.K.); Pamedinčiai, 01 06–04 08 2008, 2♂♂, 2♀♀ (E.L. & S.K.).

***Platycheirus clypeatus* (Meigen, 1822)**

Pamedinčiai, 14 07–04 08 2008, 2♀♀ (E.L. & S.K.).

***Platycheirus europaeus* Goeldlin, Maibach & Speight, 1990**

Dvarviečiai, 20 07 2023, 1♀ (E.L. & G.S.); Pamedinčiai, 21 07–04 08 2008, 3♂♂, 2♀♀ (E.L. & S.K.).

***Platycheirus occultus* Goeldlin, Maibach & Speight, 1990**

Godeliai, 14 07–04 08 2008, 2♀♀ (E.L. & S.K.); Pamedinčiai, 14 07–04 08 2008, 3♂♂, 3♀♀ (E.L. & S.K.).

***Platycheirus peltatus* (Meigen, 1822)**

Pamedinčiai, 14 07–15 09 2008, 2♂♂, 1♀ (E.L. & S.K.).

***Pyrophaena granditarsus* (Forster, 1771)**

Dvarviečiai, 23 08 2023, 1♂ (E.L. & G.S.).

***Pyrophaena rosarum* (Fabricius, 1787)**

Dvarviečiai, 21–23 08 2023, 3♀♀ (E.L. & G.S.).

***Scaeva selenitica* (Meigen, 1822)**

Dvarviečiai, 26 06 2023, 1♂ (E.L. & G.S.); Godeliai, 14–21 07 2008, 1♂ (E.L. & S.K.); Pamedinčiai, 16–23 06 2008, 1♀ (E.L. & S.K.).

***Sphaerophoria scripta* (Linnaeus, 1758)**

Beržoras, 22 08 1983, 1♀ (S.P.); Dvarviečiai, 22 09 2023, 2♀♀ (E.L. & G.S.); Getaučiai, 24 08–23 09 2023, 3♀♀ (E.L. & G.S.); Godeliai, 12 05–04 08 2008, 3♂♂,

5♀♀ (E.L. & S.K.); Pamedinčiai, 09 06–15 09 2008, 1♂, 6♀♀ (E.L. & S.K.); Stirbaičiai, 23 08 1983, 2♀♀ (S.P.).

***Sphaerophoria taeniata* (Meigen, 1822)**

Dvarviečiai, 21–22 05 2023, 7♂♂, 4♀♀ (E.L. & G.S.); Godeliai, 19 05–04 08 2008, 2♂♂, 3♀♀ (E.L. & S.K.).

***Sphaerophoria virgata* Goeldlin, 1974**

Godeliai, 21 07–04 08 2008, 2♂♂ (E.L. & S.K.).

***Syrphus ribesii* (Linnaeus, 1758)**

Dvarviečiai, 24 06–21 08 2023, 3♂♂, 1♀ (E.L. & G.S.); Getaučiai, 21 07–22 08 2023, 1♂, 1♀ (E.L. & G.S.); Godeliai, 12 05–25 08 2008, 3♀♀ (E.L. & S.K.); Pamedinčiai, 09 06–25 08 2008, 2♀♀ (E.L. & S.K.); Plateliai, 21 09 2022, 1♀ (photo J. Motiejūnaitė).

***Syrphus torvus* Osten Sacken, 1875**

Dvarviečiai, 21 05–22 09 2023, 4♀♀ (E.L. & G.S.); Getaučiai, 23 06 2023, 1♀ (E.L. & G.S.); Godeliai, 23 06–04 08 2008, 5♂♂, 5♀♀ (E.L. & S.K.); Pamedinčiai, 26 05–21 07 2008, 1♂, 1♀ (E.L. & S.K.).

***Syrphus vitripennis* Meigen, 1822**

Dvarviečiai, 24 06–21 08 2023, 1♂, 2♀♀ (E.L. & G.S.); Getaučiai, 23 06–24 08 2023, 2♂♂, 1♀ (E.L. & G.S.); Godeliai, 12 05–01 09 2008, 1♂, 1♀ (E.L. & S.K.) Pamedinčiai, 19 05–01 09 2008, 2♂♂, 2♀♀ (E.L. & S.K.).

***Xanthandrus comtus* (Harris, 1780)**

Dvarviečiai, 21–23 08 2023, 2♀♀ (E.L. & G.S.).

Discussion

We present a checklist of 120 species of hoverflies from the Žemaitija National Park, including those species mentioned in the literature and not rejected in the course of this study. There are six species previously published from the study area (Podėnas & Pakalniškis, 2000; Lutovinovas, 2012; Steenis *et al.*, 2020) either confirmed or rejected based on the studied material herewith. Altogether, two misidentifications were detected in the published material and these species were excluded from the checklist (*Brachyopa dorsata* and *Leucozona inopinata*). Even 116 species (96.6 % of this checklist) are recorded in the Žemaitija National Park for the first time. We believe that this checklist reveals more than a half of the actual fauna of hoverflies that can be found in the studied territory. This is just the first comprehensive source on this large family of Diptera from the Žemaitija National Park and additional studies may help to enrich the knowledge about hoverflies from this state-protected area.

The largest abundance of hoverflies was noted in the subfamily Syrphinae, but we did not distinguish a considerable difference between the most numerous species of this subfamily: *Melanostoma scalare* (94♂♀), *Melanostoma mellinum* (80♂♀), *Episyrphus balteatus* (68♂♀), *Meliscaeva cinctella* (57♂♀); each species of this group was considerably more abundant than other common species: *Sphaerophoria scripta* (23♂♀), *Baccha elongata* (19♂♀), *Syrphus torvus* (17♂♀), *Eupeodes corollae* (16♂♀), *Sphaerophoria taeniata* (16♂♀). However, the vast majority of specimens of the most abundant *M. scalare* (79♂♀) were registered in the sole locality (Pamedinčiai), so we may assign this species to the locally abundant one, which is not true for other abundant species

in this group. In the subfamily Milesiinae, on the other hand, we distinguished a considerable difference of abundance between only one species, *Xylota segnis* (75♂♀), and other common species: *Helophilus pendulus* (24♂♀), *Cheilosia pagana* (18♂♀), *Sericomyia silentis* (17♂♀), *Eristalis nemorum* (16♂♀). However, nearly all specimens of the most abundant *X. segnis* (71♂♀) were registered in the sole locality (Getaučiai), so we may assign this species to the next one locally abundant (Fig. 5 [B]). Therefore, it is also possible that some of the species which are not considered abundant in our study may become such species if additional localities were studied. Besides of the common species, we registered numerous single specimens of the sparse species, indicating that the number of collected species may increase to a certain extent if more samples were studied.

Fig. 5 [A–B]. Abundant hoverflies from the Žemaitija National Park: A –*Melanostoma mellinum* often feeding in groups (photo J. Motiejūnaitė); B – Pan trap with its daily catch, showing a considerable amount of *Xylota segnis* (photo E. Lutovinovas).

Larger part of material was obtained by Malaise traps (507♂♀), which are highly productive and commonly applied method for collecting the hoverflies for scientific purposes (Ouin *et al.*, 2006; Birtele & Hardersen, 2012; Bessat *et al.*, 2019). Smaller part was obtained by the combination of two other methods, Entomological net and Pan traps (402♂♀). This difference could be partly explained by the fact that Malaise traps constantly collected the material and other two methods were applied only the few days each month. The ratio of collected material obtained by different methods differed for different subfamilies: Malaise traps were less productive for the largest subfamily Milesiinae (MT=82♂♀ vs. EN+PT=287♂♀), they had almost the same productivity for

the subfamily Pipizinae (MT=13♂♀ vs. EN+PT=10♂♀) and were considerably more productive only for the subfamily Syrphinae (MT=412♂♀ vs. EN+PT=105♂♀). Therefore, the most abundant species of the subfamily Syrphinae considered in the course of this study largely depends on the result from only the few stations where Malaise traps were located and less dependent on the whole variety of the habitats, where the abundance and composition of these species more varies. Should also be noted that none of these methods captured specimens of the subfamily Microdontinae, which are associated with ant nests and they are easier obtained by rearing.

This study revealed two new species of hoverflies for the fauna of Lithuania (*Pipiza accola* and *Paragus finitimus*), thus supplementing the list of hoverflies in our country up to 290 species (Lutovinovas, 2007; 2012; Lutovinovas & Kinduris, 2013; 2015; Lutovinovas & Venckus, 2015; Petrašiūnas, 2016; Lutovinovas & Pūtys, 2019; 2022; Lutovinovas *et al.*, 2023). The hoverflies registered in the Žemaitija National Park accounts for less than half of the national list (41.4 %). This result is slightly lower than the one achieved in the Viešvilė State Strict Nature Reserve (Lutovinovas *et al.*, 2023) and much lower compared to some other studies, where, depending on the complexity of investigation, more than half of the countrywide species (59.4–62.8 %) were recorded (Mazánek *et al.*, 2005; Romig, 2008; Żóralski & Kowalczyk, 2015). Therefore, further studies on the fauna, which would include more research stations and more diverse habitats, could supplement the list of hoverflies of the Žemaitija National Park with dozens of additional species.

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References

Bandzienė V., Bezaras V., Brazdeikytė A., Jankauskienė M., Kuprelytė A., Kvederienė S., Norvaišas G., Norvaišienė N., Matevičiūtė G., Mickūnas E., Mockus A., Sidabras S., Simutis V., Vyšniauskas S. 2001. *Žemaitijos nacionalinis parkas*, 38 pp. Žemaitijos NP leidykla, Klaipėda.

Bartsch H., Binkiewicz E., Rådén A., Nasibov E. 2009a. *Nationalnyckeln till Sveriges flora och fauna. Tvåvingar: Blomflugor: Syrphidae. Vol. 1. Diptera: Syrphidae: Syrphinae*, 406 pp. ArtDatabanken, SLU, Uppsala.

Bartsch H., Binkiewicz E., Klintbjer A., Rådén A., Nasibov E. 2009b. *Nationalnyckeln till Sveriges flora och fauna. Tvåvingar: Blomflugor: Syrphidae. Vol. 2. Diptera: Syrphidae: Eristalinae & Microdontinae*, 478 pp. ArtDatabanken, SLU, Uppsala.

Bessat M., Castella E., Speight M.C.D., Fleury D., Delabays N. 2019. Biodiversité fonctionnelle en paysage agricole: étude floristique et syrphidologique de Surfaces de Promotion de la Biodiversité (SPB). *Biotechnologie, Agronomie, Société et Environnement* 23(4): 226–244.

Birtele D., Hardersen S. 2012. Analysis of vertical stratification of Syrphidae (Diptera) in an oak-hornbeam forest in northern Italy. *Ecologicl Research* 27: 755–763.

Gilbert F. 2005. Syrphid aphidophagous predators in a food-web context. *European*

Journal of Entomology 102(3): 325–333.
Grim T. 2006. An exceptionally high diversity of hoverflies (Syrphidae) in the food of the reed warbler (*Acrocephalus scirpaceus*). *Biologia (Bratislava)* 61(2): 235–239.
Haslett J.R. 1989. Adult feeding by holometabolous insects: pollen and nectar as complementary nutrient source for *Rhingia campestris* (Diptera: Syrphidae). *Oecologia* 81(3): 361–363.
Kirstukas M., Barauskas R., Baškytė R. 2004. *Lietuvos gamta. Saugomos teritorijos*, 384 pp. Lututė, Kaunas.
Lutovinovas E. 2007. Brachycerous fly (Diptera) species new for the Lithuanian fauna. *New and Rare for Lithuania Insect Species* 19: 56–62.
Lutovinovas E. 2012. New additions to the hoverfly fauna of Lithuania (Diptera: Syrphidae). *New and Rare for Lithuania Insect Species* 24: 39–42.
Lutovinovas E., Kinduris R. 2013. *Temnostoma sericomyiaeforme* (Portschinsky, 1887) – new to the fauna of Lithuania (Diptera: Syrphidae). *New and Rare for Lithuania Insect Species* 25: 66–68.
Lutovinovas E., Kinduris R. 2015. *Temnostoma carens* Gaunitz, 1936 – new to the fauna of Lithuania (Diptera: Syrphidae). *New and Rare for Lithuania Insect Species* 27: 96–99.
Lutovinovas E., Venckus O. 2015. *Volucella zonaria* (Poda, 1761) – new to the fauna of Lithuania (Diptera: Syrphidae). *New and Rare for Lithuania Insect Species* 27: 100–104.
Lutovinovas E., Pūtys Ž. 2019. *Callicera aenea* (Fabricius, 1781) – new to the fauna of Lithuania (Diptera: Syrphidae). *Bulletin of the Lithuanian Entomological Society* 3(31): 114–117.
Lutovinovas E., Pūtys Ž. 2022. *Psilota atra* (Loew, 1817) – new to the fauna of Lithuania (Diptera: Syrphidae). *Bulletin of the Lithuanian Entomological Society* 6(34): 97–101.
Lutovinovas E., Uselis V., Palekaitė-Vakarė R. 2023. The hoverflies (Diptera: Syrphidae) of the Viešvilė State Strict Nature Reserve, Western Lithuania. *Bulletin of the Lithuanian Entomological Society* 7(35): 75–98.
Mazánek L., Vujić A., Gregor T., Barták M., Kubík Š. 2005. Syrphidae. In Barták M., Kubík Š. (eds.). *Diptera of Podyjí National Park and its Environs*, pp. 197–229. Česká zemědělská univerzita v Praze, Praha.
Ouin A., Sarthou J.-P., Bouyjou B., Deconchat M., Lacombe J.-P., Monteil C. 2006. The species-area relationship in the hoverfly (Diptera: Syrphidae) communities of forest fragments in southern France. *Ecography* 29: 183–190.
Pakalniškis S., Bernotienė R., Lutovinovas E., Petrašiūnas A., Podėnas S., Rimšaitė J., Sæther O.A., Spungis V. 2006. Checklist of Lithuanian Diptera. *New and Rare for Lithuania Insect Species* 18: 16–154.
Pape T., Blagoderov V., Mostovski M.B. 2011. Order Diptera Linnaeus, 1758. In Zhang, Z.-Q. (ed.). Animal biodiversity: an outline of higher-level classification and survey of taxonomic richness. *Zootaxa* 3148(1): 222–229.
Petrašiūnas A. 2016. New data on Syrphidae (Diptera) in Lithuania. *New and Rare for Lithuania Insect Species* 28: 83–93.
Podėnas S., Pakalniškis S. 2000. Supplement to the Diptera Fauna of Lithuania. *Acta Zoologica Lituanica* 10(3): 20–26.
Romig T. 2008. Syrphidae. In Ziegler J. (ed.). *Diptera Stelviana. A dipterological perspective on a changing alpine landscape. Volume 1. Studia dipterologica.*

Supplement 16: 308–319. Amplyx-Verlag, Halle.
Schmid U. 1999. Records of hoverflies on the Mediterranean Sea (Diptera, Syrphidae). *Volucella* 4: 167–170.
Sorokina V.S. 2007. Hoverflies of the genus *Paragus* Latr. (Diptera, Syrphidae) of Russia and adjacent countries. *Entomological Review* 89(3): 351–366.
Soszyński B., Mielczarek E., Tofilski A. 2013. *Dasysyrphus neovenustus* sp.n. (Diptera: Syrphidae) a new species in the *venustus* group. *Pololish Journal of Entomology* 82(4): 353–363.
Speight M.C.D. 2017. *Pipiza accola* Violovitsh (Diptera, Syrphidae) in France and its recognition. *Dipterists Digest* 24(2): 147–151.
Speight M.C.D. 2020. Species accounts of European Syrphidae (Diptera). In Speight M.C.D., Castella E., Sarthou J.-P., Vanappelghem C. (eds.). *Syrph the Net, the database of European Syrphidae (Diptera). Volume 104*, 314 pp. Syrph the Net publications, Dublin.
Ssymank A., Gilbert F. 1993. Anemophilous pollen in the diet of syrphid flies with special reference to the leaf feeding strategy occurring in Xylotini (Diptera: Syrphidae). *Deutsche entomologische Zeitschrift*: 40(2): 245–258.
Steenis J. van, Lucas J.A.W. 2011. Revision of the West-Palaearctic species of *Pipizella* Rondani, 1856 (Diptera, Syrphidae). *Dipterists Digest* 18: 127–180.
Steenis J. van, Zuijen M.P. van, Bot S., Ent L.-J. van der, Barkalov A., Eck A. van, Fleury J., Földesi R., Heimburg H., Hadrava J., Koch B., Lutovinovas E., Mazanek L., Meutter F. Van de, Mielczarek Ł., Palmer C.J., Popov G.V., Radenković S., Reemer M., Ssymank A.M., Steenis W. van, Tóth S., Vujić A., Wakkie B. 2020. Faunistical overview of the European species of the genera *Brachyopa* Meigen, 1822 and *Hammerschmidtia* Schummel, 1834 (Diptera: Syrphidae). *Bonn zoological Bulletin* 69 (2): 309–366.
Veen M.P. van 2004. *Hoverflies of Northwest Europe: identification keys to the Syrphidae*, 256 pp. KNNV Publishing, Utrecht.
Vujić A., Ståhls G., Rojo S., Radenković S., Šimić S. 2008. Systematics and phylogeny of Paragini (Diptera: Syrphidae) based on molecular and morphological characters. *Zoological Journal of the Linnean Society* 152: 507–536.
Vujić A., Ståhls G., Ačanski J., Bartsch H., Bygebjerg R., Stefanović A. 2013. Systematics of Pipizini and taxonomy of European *Pipiza* Fallén: molecular and morphological evidence (Diptera, Syrphidae). *Zoologica Scripta* 42(3): 288–305.
Żóralski R., Kowalczyk J.K. 2015. Syrphidae (Diptera) Trójmiejskiego Parku Krajobrazowego i terenów przyległych. *Parki Narodowe i Rezerwaty Przyrody* 34(1): 25–80.

Žemaitijos nacionalinio parko žiedmusės (Diptera: Syrphidae), Šiaurės-Vakarų Lietuva

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Santrauka

Iš viso 120 žiedmusių rūšių yra įtrauktos į Žemaitijos nacionalinio parko rūšių sąrašą. Pateiktos šešios anksčiau skelbtos rūšys, kurios šiame leidinyje arba patvirtintos arba paneigtos, remiantis ištirta kolekcine medžiaga. Iš anksčiau skelbtų žiedmusių rūšių pašalintos dvi rūšys, kurioms yra nustatyti klaidingi apibūdinimai (*Brachyopa dorsata*, *Leucozona inopinata*). Tuo tarpu, 116 žiedmusių rūšių (96.6 % šio sąrašo rūšių) yra pirmą kartą paminėtos Žemaitijos nacionalinio parko teritorijoje. Aptartos dažniausios tyrimų mėginiuose aptiktos rūšys, iš kurių labai išsiskyrė gausios rūšys, nes kitų rūšių skaitlingumas buvo smarkiai mažesnis. Gausios rūšys sugrupuotos į visur gausias (*Melanostoma mellinum*, *Episyrphus balteatus*, *Meliscaeva cinctella*) ir lokaliai gausias (*Melanostoma scalare*, *Xylota segnis*). Taip pat palygintas skirtingų medžiagos rinkimo metodų produktyvumas, kuris nebuvo vienodas skirtingiems žiedmusių pošeimiams, o tai įtakojo rūšių gausumo vertinimus. Pateikti duomenys apie dvi naujas Lietuvos faunos žiedmusių rūšis (*Pipiza accola*, *Paragus finitimus*), o jų diagnostiniai požymiai yra vizualizuoti nuotraukose ir aptarti. Manome, kad šis žiedmusių rūšių sąrašas atskleidžia daugiau nei pusę tikrosios žiedmusių faunos, kurią galime sutikti tiriamoje teritorijoje.

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