

NEW DATA ON THE GENUS *VILLA* LIOY IN THE FAUNA OF LITHUANIA (DIPTERA: BOMBYLIIDAE)

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Introduction

The genus *Villa* Lioy consists of medium to large bee-flies, bearing a short proboscis, distinctly thickened costal vein at the wing base, and usually the well developed patagium, made of dense scales (Greathead & Evenhuis, 1997). Fluffy hairs and groups of scales that compose bright and black bands on the abdominal tergites have diagnostic value (Stubbs & Drake, 2001), but these characters are easily destroyed after contact with fingers, or liquids, and also old specimens sometimes lose these characters in the nature, in these cases the genital features of males may be used for the identification (François, 1969). The females have got a sand chamber, composed by one of the terminal sternites. The chamber is used for filling with sand, dust, or other fine particles, butting abdominal tip to the ground at flight, to prevent the eggs from sticking together, and then deposit separate substrate-particle coated eggs while hovering (Yeates & Greathead, 1997). The larvae of *Villa spp.* parasitize the larvae of moths and some other insects, dwelling in the ground, but the host species are poorly known; several of the species are connected with very specific habitats, like sand dunes, or raised bogs, which seem to indicate the same in the host species (Bartsch & Kronstedt, 2007).

The genus is amongst the largest genera in the family, represented by thirty-five species in the European fauna, but most of the species are restricted to southern latitudes, with only about the quarter of European species recorded in Northern countries, which is also valid for the other genera of this family (Greathead *et al.*, 2013). Only two species were reliably recorded in the Lithuanian fauna so far (Pakalniškis *et al.*, 2006). New data on the Lithuanian fauna of this genus are provided in this publication.

Material and methods

Most of the material was photographed in the nature, and only the small portion was collected. Those species recorded from the photographs are provided in Figure 1 (A–D). The list of Lithuanian bee-flies was compiled from Pakalniškis *et al.* (2006). The taxonomy and general distribution followed Greathead *et al.* (2013), and several supplementary sources (Blöchlinger, 2008; Zaitzev, 2008; Falck, 2009; Smit, 2013; Kahanpää *et al.*, 2014). The few specimens are stored in the entomological collection of Nature Research Centre (Vilnius). Species new to the Lithuanian fauna are marked with an asterisk (*).

List of localities

Locality	Administrative district	Coordinates (LAT, LONG)
Akmeniškiai	Švenčionys distr.	55.26777, 26.14138
Bradeliškės	Vilnius distr.	54.82691, 24.95711
Bukančių Miškas f.	Mažeikiai distr.	56.34100, 22.11594
Dauginiai	Mažeikiai distr.	56.14322, 22.55341
Dautarų Miškas f.	Mažeikiai distr.	56.38661, 21.99852
Dūkštų Ažuolynas f.	Vilnius distr.	54.82686, 24.95650
Karaliaučiaus Miškas f.	Mažeikiai distr.	56.34991, 22.54188
Laižuva	Mažeikiai distr.	56.38905, 22.57947
Lendriškiai	Mažeikiai distr.	56.38944, 22.51650
Maigių Miškas f.	Mažeikiai distr.	56.27841, 22.49136
Neveronys	Kaunas distr.	54.91738, 24.10305
Purvių Miškas f.	Akmenė distr.	56.21736, 22.75219
Šiūpariai	Klaipėda distr.	55.63111, 21.45000
Šventoji	Palanga minic.	56.03266, 21.07261
Zujai	Ukmergė distr.	55.28291, 24.85255
Žalgirio Miškas f.	Mažeikiai distr.	56.12075, 22.19972
Želtiškiai	Anykščiai distr.	55.40000, 25.25305

Species list

Genus *Villa* Lioy, 1864

**Villa cingulata* (Meigen, 1804)

New records: Bradeliškės, 16 06 2018, 1♂ (photo Ž. Pūtys); Bukančių Miškas f., 10 07 2016, 1♀ (photo R. Kinduris); Dauginiai, 22 06 2019, 1♂ (photo R. Kinduris); Dautarų Miškas f., 04 07 2011, 1♂ (photo R. Kinduris); Dūkštų Ažuolynas f., 16 06 2018, 1♂ (photo D. Baužys); 16 06 2018, 1♂1♀ (photos G. Steiblys); Karaliaučiaus Miškas f., 06 07 2014, 1♀; 24 07 2016, 1♂ (both photos R. Kinduris); Laižuva, 19 07 2015, 1♀ (photo R. Kinduris; Fig. 1 [B]); Lendriškiai, 19 07 2015, 2♀ (photos R. Kinduris); Maigių Miškas f., 28 06 2019, 1♂ (photo R. Kinduris); Purvių Miškas f., 20 06 2019, 2♂ (photos R. Kinduris; Fig. 1 [A]); Želtiškiai, 05 07 2009, 1♀ (photo A. Eismantas).

Villa hottentotta (Linnaeus, 1758)

Literature: Lutovinovas *et al.* (2003).

New records: Neveronys, 06 07 2018, 1♀ (photo R. Kinduris); Šiūpariai, 17 07 2008, 2♀ (leg. P. Ivinskis); Zujai, 13 07 2019, 1♀ (photo R. Kinduris); Žalgirio Miškas f., 09 07 2018, 1♀ (photo R. Kinduris; Fig. 1 [C]).

**Villa longicornis* Lyneborg, 1965

New record: Šventoji, 14 06 2017, 1♂ (photo R. Kinduris; Fig. 1 [D]).



Figure 1 (A–D). *Villa* spp., recorded from photos: A – *V. cingulata*, male, B – *V. cingulata*, female, C – *V. hottentotta*, female, and D – *V. longicornis*, male (photos: R. Kinduris).

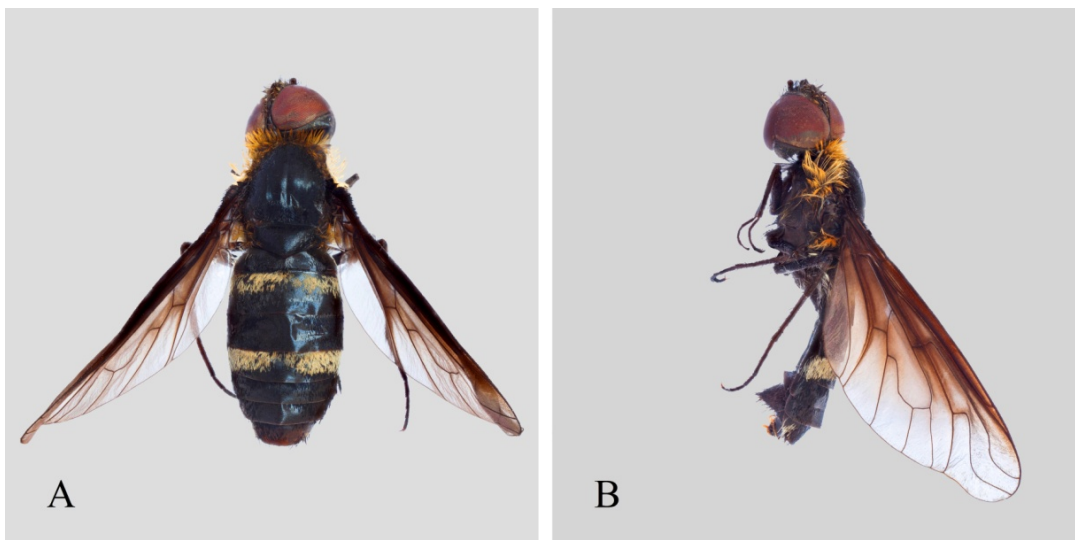


Figure 2 (A–B). *Villa occulta*, pinned specimen from Akmeniškiai (Švenčionys distr.): A – dorsal, and B – lateral views (photos: Ž. Pūtys).

****Villa occulta* (Wiedemann in Meigen, 1820)**

New record: Akmeniškiai, 08 07 1999, 1♀ (leg. S. Pakalniškis; det. as "*Anthrax* sp."; Fig. 2 [A–B]).

?*Villa paniscus* (Rossi, 1790)

Literature: Podėnas & Pakalniškis (2000).

***Villa* sp.**

Literature: Dumčius (2007), as "*Villa cana* (Meigen, 1804)".

Discussion

Based on both, literature and original data of this publication, five species of this genus are treated in the Lithuanian fauna (Pakalniškis *et al.*, 2006). *Villa cingulata* and *V. hottentotta* are both widespread throughout Europe (Greathead *et al.*, 2013); the first species (Fig. 1 [A–B]) was recorded from Akmenė, Anykščiai, Mažeikiai and Vilnius districts, while the second one (Fig. 1 [C]) was detected from Kaunas, Klaipėda, Mažeikiai and Ukmergė districts, with published records from Molėtai district (Lutovinovas *et al.*, 2003), so their occurrence in other parts of our country is also expected. Based on the literature, *V. hottentotta* is more common than the other species of this genus (Blöchlinger, 2008; Falck, 2009). Our records suggested that *V. cingulata* was more numerous than the former species, but the increase of its populations in some countries was recently observed (Gibbs, 2002; Barnett, 2004). *V. longicornis* (Fig. 1 [D]), distributed in Northern Europe (Greathead *et al.*, 2013), was reported from the Baltic coast, from a single specimen, thus it is considered here as rarely observed. Based on the literature, this species is associated with the coastal dunes (Falck, 2009; Smit, 2013), so its occurrence in other parts of our country is not expected. *V. occulta* (Fig. 2 [A–B]), widespread throughout Europe (Greathead *et al.*, 2013), was detected from the eastern part of Lithuania, from a single specimen, thus it is also considered here as rarely observed. Based on the literature, this species is associated with the raised bogs, including those, located in northern Scandinavia (Bartsch & Kronstedt, 2007), so its finding in this part of our country was expected. Members of this species have more intensively infuscated wings than of other species of this genus (Blöchlinger, 2008; Falck, 2009), and that might be the reason, why the specimen with broken antennae of the collection of Nature Research Centre was originally labelled as "*Anthrax* sp."

Villa paniscus was recorded in our country by Podėnas & Pakalniškis (2000), though we did not observe a single specimen of this species. It was previously thought as a widespread species (Greathead *et al.*, 2013), but the problem resulted in a cascade of name changes, and it is now unclear exactly where the species occurs (Smit, 2013; Kahanpää *et al.*, 2014). There are plausible reports of this species only from Switzerland (Blöchlinger, 2008), France (Zaitzev, 2008), southern Norway (Falck, 2009) and Austria (Smit, 2013). Because of this reason, and the absence of verified material, it was excluded from the Finnish species list (Kahanpää *et al.*, 2014). The occurrence of this species in our country is still probable, thus we decided to keep this species in our list (as the doabtful record). On the other hand, we do not agree with Dumčius (2007), who identified *V. cana* in the fauna of Lithuania based on the sole female. This species is distributed in Southern Europe (Greathead *et al.*, 2013), so its occurrence in our country is highly improbable. As the identification of females in this genus may cause difficulties, this record is considered as a misidentification.

Altogether, we have accepted five species of this genus, and three of them are new records for the fauna of Lithuania: *V. cingulata*, *V. longicornis* and *V. occulta* (Pakalniškis *et al.*, 2006). However, there are still at least three more species of this genus which can be found in Northern Europe (Falck, 2009), and their occurrence in Lithuania is very probable. *V. modesta*, one of the few species distributed northwards to Finland (Kahanpää *et al.*, 2014), was considered the second common species after *V. hottentotta* in Norway (Falck, 2009), and even more common in the Netherlands (Smit, 2013); however, this species is associated with the coastal dunes, and this is probably the reason why we did not observe this species in our study. On the other hand, two other species which are expected to supplement our fauna in the future (*V. fasciata* and *V. halteralis*) are rare species associated with the inland habitats (Falck, 2009; Smit, 2013).

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Nauji duomenys apie gentį *Villa* Lioy Lietuvos faunoje (Diptera: Bombyliidae)

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Santrauka

Remiantis literatūra ir mūsų stebėjimais, penkios šios genties rūšys yra patvirtintos Lietuvos faunoje. *Villa cingulata* ir *V. hottentotta* yra dažnos rūšys, rastos daugelyje stebėjimo vietų, todėl manoma, kad šios zvimbeklės yra paplitusios visoje šalies teritorijoje. *V. longicornis* yra reta rūšis, rasta tik pajūrio kopose, ir šie duomenys sutampa su literatūriniais šaltiniais kitose šalyse, todėl likusioje Lietuvos teritorijoje jos rasti nesitikima. *V. occulta* yra reta rūšis, rasta tik rytinėje šalies dalyje; remiantis literatūriniais šaltiniais, ji yra sietina su aukštapelkėmis, todėl yra ieškotina ir kitose vietose. *V. paniscus* nebuvo rasta, bet paminėta literatūroje; ši rūšis yra plačiai paplitusi, todėl tikėtina, kad gyvena Lietuvoje. *V. cana* taip pat nebuvo rasta, bet paminėta literatūroje; ši rūšis yra paplitusi Pietų Europoje, todėl jos stebėjimas laikomas klaidingu. Iš penkių patvirtintų Lietuvoje rūšių, trys jų yra paminėtos pirmą kartą. Dar bent trys rūšys yra tikėtinos rasti mūsų faunoje ateityje.

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