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The Rhagionidae or Snipeflies of the Botanical Garden Jean Massart (Brussels-Capital Region, Belgium) with notes on the identity of the rare European species *Archicera avarorum* Szilády, 1934 and *Ptiolina obscura* (Fallén, 1814) (Diptera: Rhagionidae)

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Front cover: *Archicera avarorum* Szilády, 1934, female habitus. © Patrick Grootaert.

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The Rhagionidae or Snipeflies of the Botanical Garden Jean Massart (Brussels-Capital Region, Belgium) with notes on the identity of the rare European species *Archicera avarorum* Szilády, 1934 and *Ptiolina obscura* (Fallén, 1814) (Diptera: Rhagionidae)

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Abstract

A survey of the Botanical Garden Jean Massart situated at the outskirts of the city of Brussels revealed the presence of ten species of the Rhagionidae representing nearly 50% of the species ever recorded in Belgium. *Chrysopilus asiliformis* (Preyssler, 1791) and *Chrysopilus cristatus* (Fabricius, 1775) were the most abundant species. *Rhagio immaculatus* (Meigen, 1804), *R. notatus* (Meigen, 1820) and *R. tringarius* (Linnaeus, 1758) were represented by singletons only. Remarkable is the record of the very rare *Archicera avarorum* Szilády, 1934, known before from only 3 females from Central Europe. The antennae, feeding apparatus and female terminalia are illustrated. The broadly flattened flagellomere distinguishes it from *Spania nigra* Meigen, 1830, but the systematic position or possible synonymy of *Archicera* with the genus *Spania* is not discussed. The records of *Ptiolina obscura* (Fallén, 1814) the Black-fringed Moss-snipefly, also a very rare species in Europe, are also remarkable. The male terminalia of *P. obscura* are illustrated for the first time and a key is provided for the western European species of *Ptiolina*.

Keywords: Botanical garden, Snipeflies, *Archicera*, *Ptiolina*

Introduction

The present study was carried out in the framework of a general survey of the insects and spiders of the Botanical Garden Jean Massart. Although this tiny garden measures only 5 ha and is located at the outskirts of the city of Brussels, it seems to be a hotspot for insects. *Drapetis bruscellensis* Grootaert, 2016, a new hybotid fly species for science was described from the garden and 52 species of fungus gnats were recorded for the first time in Belgium from this botanical garden (KURINA & GROOTAERT, 2016). In addition, many other groups of remarkable insects were reported from the garden in the orders Coleoptera (TROUKENS *et al*, 2016; THOMAES *et al*., 2016; DELBOL, 2017; MOUCHERON *et al*., 2018, 2019; MAQUET, 2018; DRUMONT *et al*., 2018; DRUMONT *et al*., 2020), Hymenoptera (LIBERT, 2019; PAULY, 2019) and Trichoptera (LOCK & DRUMONT, 2017).

In the present paper we analyse and comment the observations of the Rhagionidae or Snipeflies recorded during the first year of the survey. Snipeflies are a small family of flies with approximately 500 species in 16 genera (KERR, 2010). Larvae of most species develop as predators in wood debris and soil, with few exceptions (NAGATOMI, 1982; STUBBS & DRAKE, 2014). Well known are the common large *Rhagio* Fabricius species that are often observed sitting with the head down on low vegetation in moist habitats (STUBBS & DRAKE, 2014). KRIZELJ (1971) made a first comprehensive survey of these flies in Belgium reporting 21

species. This figure excludes the three species of the family Athericidae that were at that time included in the Rhagionidae.

Illustrations are given of the enigmatic and very rare *Archicera avarorum* Szilády, 1934. This monotypical genus and the species were known before from only three females since its description and subject of a recent paper concerning the designation of a neotype for the species by PAPP (2018). The probable synonymy of the genus *Archicera* with the genus *Spania* is not discussed since we do not have additional elements to corroborate their synonymy and therefore, we treat *Archicera* provisionally as a valid genus.

Furthermore, we illustrate the male terminalia of the very rare *Ptiolina obscura* (Fallén, 1814) and provide a provisional key to the western European species based on STUBBS & DRAKE (2014) excluding the boreal and subboreal species.

Material and methods

The flies were collected in the Botanical Garden "Jardin botanique Jean Massart" situated on the outskirts of the city of Brussels in the suburb town of Auderghem at the border of the Sonian Forest. This forest is more than 250 years old and can be considered as a mature forest. The garden is located in a valley and is surrounded by habitations in the West, a motorway in the South, a small lake in the North (Rouge-Cloître) and to the Sonian forest in the East (Fig. 1A). The garden, also a Natura 2000 site, is nearly 5 ha, and was created in 1922 by Jean Massart, a botanist and ecologist *avant la lettre*. It is composed of several "biotopes" (forest, dry grassland, marshland) and thematic collections such as medicinal and aromatic plants, a collection of cultivated plants, an orchard, an arboretum, an evolutionary garden, a wetland and experimental parcels for the students of the Université libre de Bruxelles (ULB). The Garden is now managed by the "Brussels Environment" (BIM, IBGE).

The material was collected with Townes Malaise traps and their placement is indicated in Fig. 1B as MT1 and MT2. The traps were operational from 7th May 2015 to 11th May 2016. Fig. 2 A, B shows the environment around respectively MT1 and MT2. The floristic habitat of these two traps has been evaluated in TAMINIAUX (2018) by recording the plant species composing the herbaceous, shrubby and wooded stratus, occurring in a radius of 5 meters around the position of the Malaise traps. This study reveals a total of 38 species (6 trees, 3 shrubs and 29 herbaceous plants) growing around the MT1, and 49 species (7 trees, 5 shrubs and 37 herbaceous plants) for the MT2. The lists are available in TAMINIAUX (2018). It is also important to note that the MT1 was adjacent to a line of three compost heaps (separated from the trap by a hedge) made up of leaves, tops, roots and soil debris. The MT1 trap and the composts were separated by a fascine of brushwood.

In the present paper only the data of the first year are analysed, giving an idea on the occurrence and activity pattern (Table 1). However, the survey was continued with more Malaise traps in different stations until the middle of 2018 (MT3-MT6). The sample data of the second and third year are still being processed but a few observations of especially the rare species are given in the material examined as additional observations.

The collecting jars were retrieved by Mr. Alain Drumont and Mr. Hugo Raemdonck at about weekly intervals, except for the winter period from November 2015 to February 2016 when they were collected every 2 weeks only. All material was collected in 70% ethyl alcohol, that was partly replaced just after collection so that a 70% ethanol concentration upon storage was guaranteed. The identified material is preserved in glass tubes in 70% ethyl alcohol arranged per species per sample that were numbered accordingly.

All specimens are preserved in the collections of the Royal Belgian Institute of Natural Sciences – RBINS (Brussels, Belgium) and were registered under the following general inventories numbers 33.004 (for the year 2015), 33.177 (for the year 2016), 33.400 (for the year 2017) and 33.645 (for the year 2018).

Fig. 1. A. Location of the Jardin Jean Massart at the outskirts of Brussels. B. Red dot on the left is Malaise trap MT1 (West), on the right side MT2 (East).

Fig. 2. View on the environment around the Malaise traps in the Botanical Garden Jean Massart: A. MT1; B. MT2. © Alain Drumont.

In addition to this material, the collections of the RBINS were examined for the presence of *Ptiolina* Zetterstedt, 1842 and *Spania* Meigen, 1830.

The species were identified using the keys of VAN DER GOOT (1985) and STUBBS & DRAKE (2014). Identification and comparison of data is hampered by the numerous synonyms that have been published. Here we use the names as given in STUBBS & DRAKE (2014) and validated in the Fauna Europaea (accessed in April 2020). The most important name change is that *Chrysopilus auratus* (Fabricius, 1805) used by KRIZELJ (1971), DE BRUYN & GOSSERIES (1991) and VAN DER GOOT (1985) became *C. cristatus* (Fabricius, 1785) and *C. aureus* (Meigen, 1804) became *C. asiliformis* (Preyssler, 1791).

Observations

Table 1. List of Rhagionidae species recorded at the Botanical Garden Jean Massart in the year cycle 2015–2016 in the Malaise traps MT1 and MT2, with the number of males and females per species and the total number of specimens per species.

Species	MT1	MT2	Males	Females	Total
Archicera avarorum	1	2	0	3	3
Chrysopilus asiliformis	154	517	458	213	671
Chrysopilus cristatus	149	126	174	101	275
Ptiolina obscura	4	1	2	3	5
Rhagio immaculatus		1	1	0	1
Rhagio lineola	13	9	9	13	22
Rhagio maculatus	1	1	1	1	2
Rhagio notatus		1	0	1	1
Rhagio scolopaceus	3	5	3	5	8
Rhagio tringarius		1	4	5	1
Number of specimens	**325**	**664**			**989**
Number of species	**7**	**10**			**10**

As shown in Table 1 ten species of Rhagionidae were observed during the first year of collection with the Malaise traps. *Chrysopilus asiliformis* and *C. cristatus* were the dominant species, with *C. asiliformis* the most abundant species. *Rhagio lineola*, *R. maculatus* and *R. scolopaeus* were present in low numbers and *R. immaculatus*, *R. notatus* and *R. tringarius* were represented only by singletons.

Archicera Szilády, 1934

Archicera avarorum Szilády, 1934
(Figs 3–5)

MATERIAL EXAMINED: Belgium, Brussels-Capital Region: Auderghem, Jardin botanique Jean Massart, 2 females, 21–28 May 2015, MT2; 1 female, 13–21 May 2015, MT1.

ADDITIONAL OBSERVATIONS: 2 females, 11–17 May 2017, MT6; 5 females, 11–17 May 2017, MT2; 1 female, 11–17 May 2017, MT5; 2 females, 17–24 May 2017, MT2 (leg. A. Drumont & H. Raemdonck).

Fig. 3. *Archicera avarorum* Szilády, 1934. Female habitus. © Patrick Grootaert.

COMMENTS

A few more specimens of this very rare species were found in the year following the first sampling at the Garden, and thus examined and incorporated in the study. At first this species was confused with *Spania nigra* Meigen, 1830. However, in *S. nigra* the flagellomere or third antennal segment has a rectangular base and bears a much thinner "arista" -like projection at the ventral corner of its apex. In all 13 females examined from the Garden, the entire flagellomere is broad throughout (Fig. 3), also with a rather square base and no other segmentation is visible on the flagellomere. Such morphology of the antenna is typical for *Archicera avarorum,* a species and genus described by SZILÁDY (1934) on the base of two

females. One female was found in Jasenak (Croatia) and another in Spital (Styria, Steirermark, Oberösterreich, Austria). It was originally described as a subgenus of *Ptiolina* and only later considered as a distinct genus. Eventually the genus *Archicera* was considered as a synonym of *Spania* by NAGATOMI (1982) and by KERR (2010) because the shape of the third antennal segment fell into the variability of *Spania* species. Since the two syntypes of *A. avarorum* were destroyed, PAPP (2018) designated a female recently found in Romania as neotype. PAPP did not wish to express himself on the status of *Archicera* and we follow his view and leave the question unanswered. His re-description fits entirely to our specimens and that is why we consider our specimens to be conspecific with *A. avarorum*.

A. avarorum is a variable species. The shape of the flagellomere is slightly variable even on the same specimen (Fig. 4) but it is always broad and flattened. The discal cell has 3 veins on its apex. The third vein generally does not reach the wing margin, which is a generic character for both *Spania* and *Archicera*. However, we found a specimen in which the third vein reaches the wing margin in one wing (Fig. 3) but not on the other wing. In another specimen the discal cell was apically open while there was also a specimen in which the two apical veins of the discal cell arose from the tip of the discal cell in one wing as was illustrated by PAPP (2018) in a *Spania* specimen.

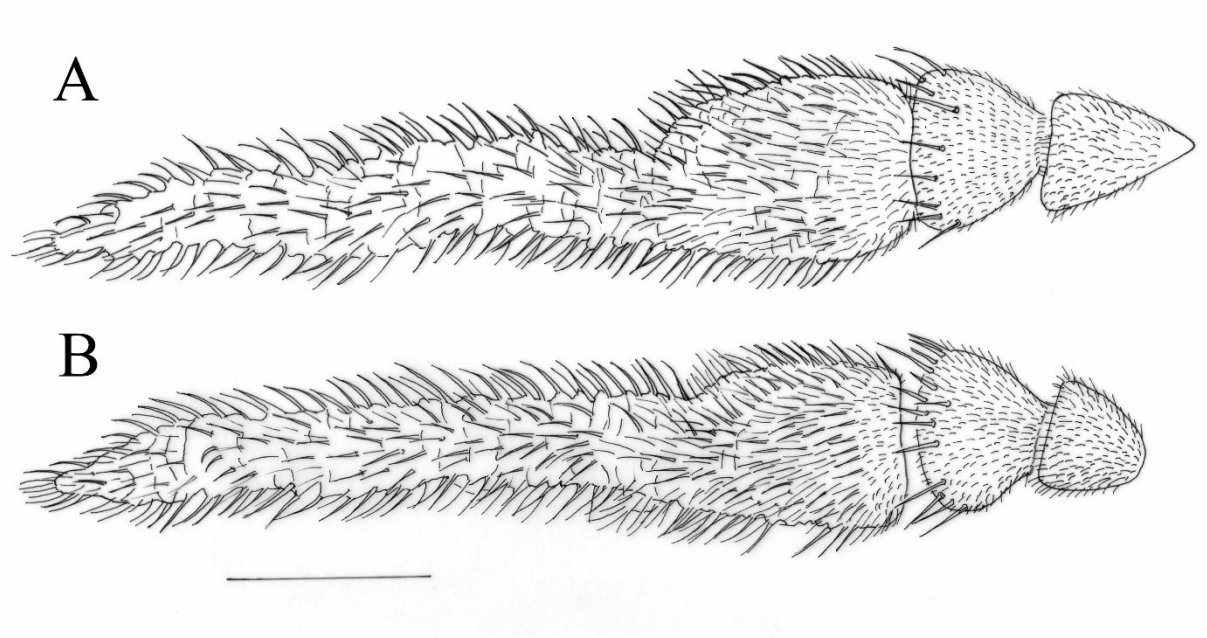

Fig. 4. *Archicera avarorum* Szilády, 1934. Female: A. Antenna of left side; B. Antenna of right side of same specimen. Scale: 0.1 mm. © Patrick Grootaert.

The palp consists apparently of a single segment as no separation of palpomeres was visible (Fig. 5D) The palp is broad with a truncate tip, bearing two small bristles at the tip and a series of long bristles dorsally at the base (Fig. 5D). The proboscis is tubiform and the labellae are large. The pseudotracheae are thin, long and coiled and some might be furcate so that it is not clear if 8 or 9 pseudotracheae are present (Fig. 5D, E). Fig. 5A illustrates the female terminalia in dorsal position while Fig. 5B shows the ventral position.

Chrysopilus Macquart, 1826

Chrysopilus asiliformis (Preyssler, 1791)

Chrysopilus aureus (Meigen, 1804)
Chrysopilus meridionalis Bezzi, 1898
Musca asiliformis Preyssler, 1791
Rhagio aureus Meigen, 1804
Rhagio aurulans Meigen, 1820
Rhagio luridus Meigen, 1820

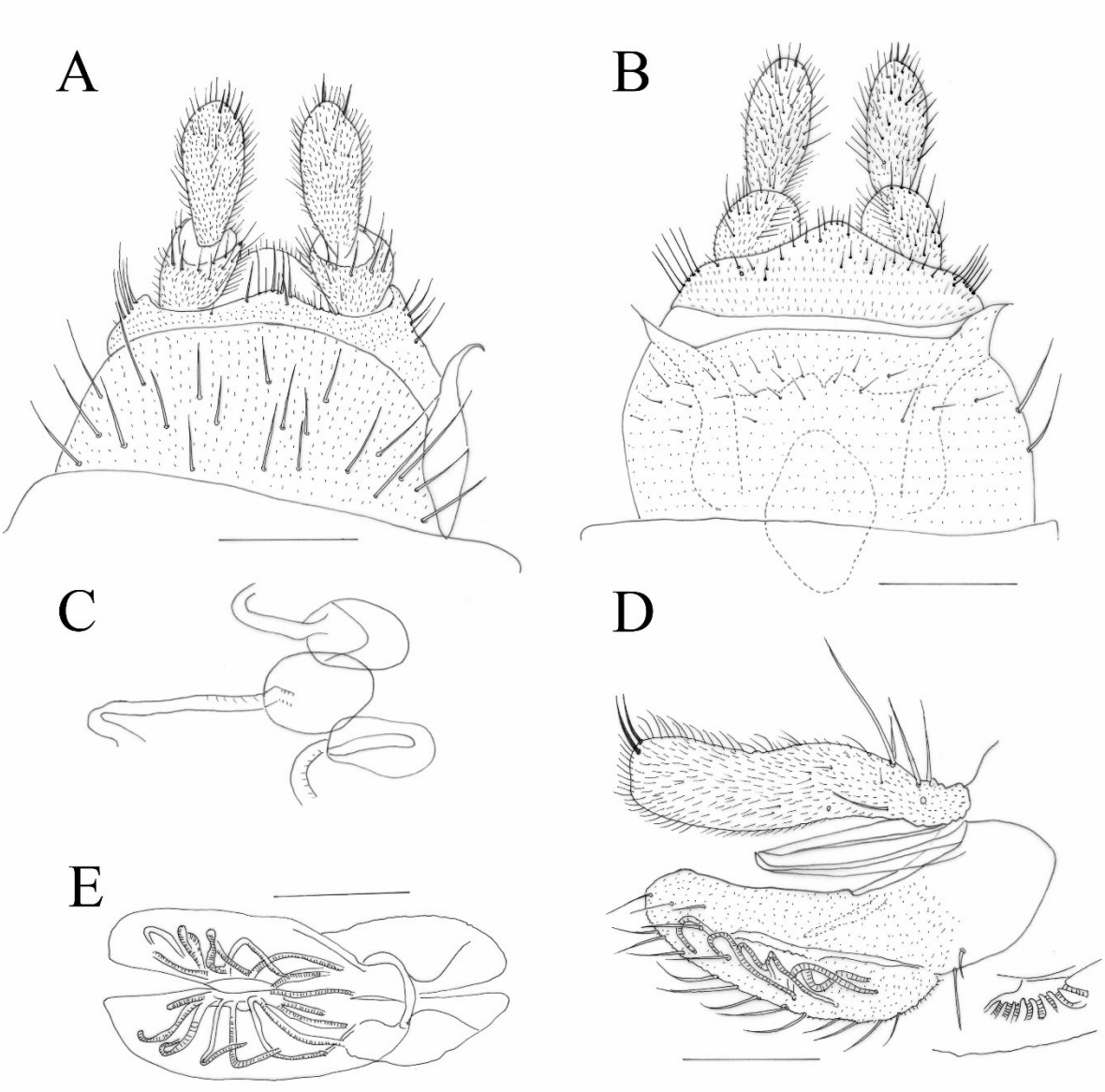

Fig. 5. *Archicera avarorum* Szilády, 1934. Female A. Tip of abdomen, dorsal view; B. Tip of abdomen, ventral view; C. Spermatheca; D. Palpus, proboscis and labella, with detail central tube of pseudotrachaea, lateral view; E. Labellae, ventral view. Scales 0.1 mm. © Patrick Grootaert.

MATERIAL EXAMINED: Belgium, Brussels-Capital Region: Auderghem, Jardin botanique Jean Massart, 1 male, 21–28 May 2015, MT2; 1 male, 5 females, 28 May–4 June 2015, MT1; 2 males, 1 female, 10–17 June 2015, MT1; 4 males, 17–26 June 2015, MT1; 3 males, 7 females, 17–26 June 2015 MT2; 6 males, 2 females, 26 June–1 July 2015, MT1; 22 males, 19 females, 26 June–1 July 2015, MT2; 1 female, 1–8 July 2015, MT1; 59 males, 23 females, 1–8 July

2015, MT1; 5 males, 58 females, 1–8 July 2015, MT2; 19 males, 11 females, 8–15 July 2015, MT1; 53 males, 36 females, 8–15 July 2015, MT2; 6 males, 8 females, 15–22 July 2015, MT1; 38 males, 30 females, 15–22 July 2015, MT2; 2 males, 3 females, 22–30 July 2015, MT1; 17 males, 9 females, 22–30 July 2015, MT2; 1 male, 30 July–6 August 2015, MT1; 5 males, 2 females, 30 July–6 August 2015, MT2; 4 males, 1 female, 6–12 August 2015, MT2 (leg. A. Drumont & H. Raemdonck).

COMMENTS

A total of 671 individuals were collected with respectively 458 males and 213 females or a sex ratio of 68 % males. The details of the flight activity from May to August 2015 can be seen in Fig. 6.

KRIZELJ (1971) observed a similar sex ratio of 70% males for Belgium. In 2015 the first record is a male from 21–28 May 2015 and the latest record was 4 males and 1 female from 6–12 August 2015. The peak activity is in the first week of July 2015 and coincides with that of *C. cristatus* that however started earlier (Fig. 6).

Chrysopilus asiliformis is the most abundant species at the Botanical Garden Jean Massart.

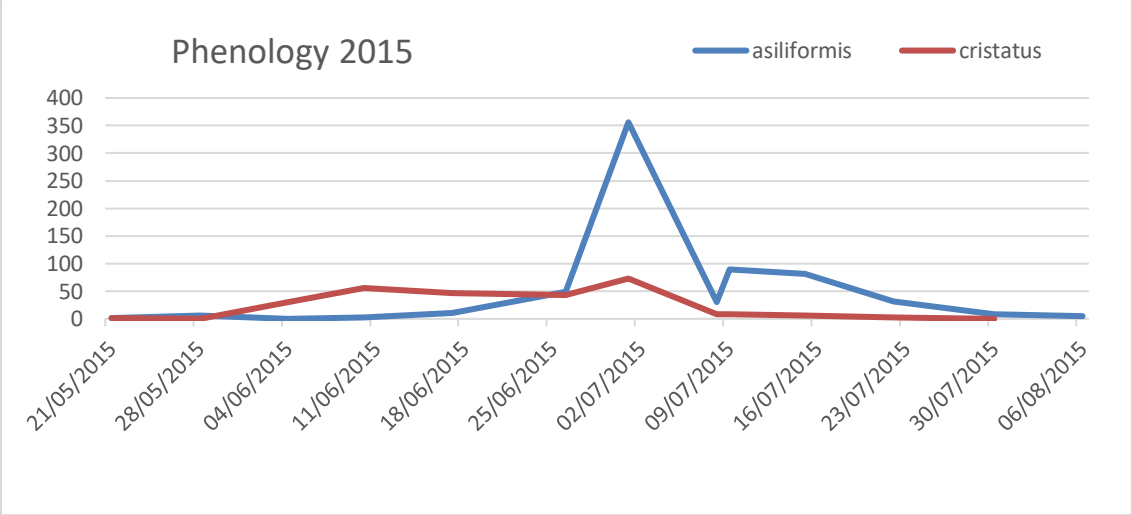

Fig. 6. Phenology of *Chrysopilus asiliformis* (red line) and *C. cristatus* (blue line) the dominant snipeflies at the Botanical Garden Jean Massart during 2015.

***Chrysopilus cristatus* (Fabricius, 1775)**

Chrysopilus auratus (Fabricius, 1805) is a junior synonym

MATERIAL EXAMINED: Belgium, Brussels-Capital Region: Auderghem, Jardin botanique Jean Massart, 1 male, 21–28 May 2015, MT2; 9 males, 1 female, 4–10 June 2015, MT1; 8 males, 12 females, 4–10 June 2015, MT2; 42 males, 14 females, 10–17 June 2015, MT1; 11 males, 9 females, 17–26 June 2015, MT1; 8 males, 19 females, 17–26 June 2015, MT2; 7 males, 7 females, 26 June – 1 July 2015, MT1; 18 males, 11 females, 26 June – 1 July 2015, MT2; 32 males, 5 females, 1–8 July 2015, MT1; 23 males, 13 females, 1–8 July 2015, MT2; 5 males, 3 females, 8–15 July 2015, MT1; 6 males, 2 females, 8–15 July 2015, MT2; 1 male, 1 female, 15–22 July 2015, MT1; 2 males, 2 females, 15–22 July 2015, MT2; 1 male, 1 female, 22–30 July 2015, MT1; 1 female, 22–30 July 2015, MT2 (leg. A. Drumont & H. Raemdonck).

COMMENTS

A total of 275 specimens, composed of 174 males and 101 females with a sex ratio of 63 % males were recorded. The earliest record was 1 male from 21–28 May 2015 and the latest record was 1 female 22–30 July 2015.

Occurrence of other *Chrysopilus* species in Belgium:

Only two species of *Chrysopilus* were found in the Botanical Garden Jean Massart while KRIZELJ (1971) recorded 6 species in Belgium. The following species have not been recorded by us although some of these rare species were recorded previously close to the Botanical Garden by KRIZELJ (1971).

Chrysopilus flaveolus Meigen, apparently a rare species, was recorded from only 4 localities in Belgium (respectively Prov. Oost-Vlaanderen: Oostakker, Brussels-Capital Region: Auderghem (Rouge-Cloître) and Rixensart, and Prov. Luxembourg; Ucimont). Although the species was recorded close to the Garden, it was not found during our survey.

Chrysopilus laetus Zetterstedt is also a rare species recorded from only 8 localities but all over Belgium. Prov. Oost-Vlaanderen: Wetteren; Brussels-Capital Region: Auderghem (Forêt de Soignes), Berg, Watermael-Boitsfort; Prov. Namur: Houet, Yvoir (Houx); Prov. Liège: Angleur (Coloster), Visé, Montagne-St.-Pierre. Although it was recorded close to the Garden, it was not found during our survey.

Chrysopilus nubeculus Fallén is only known by KRIZELJ from 4 sites in the South of Belgium: Prov. Luxembourg: Buzenol, Ethe, Orval and Virton.

Chrysopilus splendidus Meigen is also a rare species but with a wide distribution. KRIZELJ (1971) recorded it from Prov. West-Vlaanderen: De Panne; Prov. Limburg: Remersdael; Brussels-Capital Region: Brussels (La Cambre), Genval, Schaerbeek, Uccle, Watermael-Boitsfort, Woluwe-St.-Pierre and from the Prov. of Luxembourg: Autelbas (Clairefontaine), Izier (Ozo) and Virton. Although it was recorded around Brussels by KRIZELI (op. cit), it was not found in our survey.

Ptiolina Zetterstedt, 1842

Ptiolina obscura (Fallén, 1814)

(Figs 7–8)

MATERIAL EXAMINED: Belgium, Brussels-Capital Region: Auderghem, Jardin botanique Jean Massart, 1 female, 21–28 May 2015, MT2; 1 male, 28 May–4 June 2015, MT1; 1 male, 1 female, 4–10 June 2015, MT1; 1 female, 17–26 June 2015, MT1 (leg. A. Drumont & H. Raemdonck).

ADDITIONAL OBSERVATIONS: 1 female, 3–9 June 2016, MT2; 1 female, 24 May – 1 June 2017, MT2; 1 male, 4 females, 24 May – 1 June 2017, MT4 (leg. A. Drumont & H. Raemdonck).

A few more specimens of this very rare species were found in the years following the first sampling at the Garden, and thus examined and incorporated in the study. The adult flies were active from late May to late June and the flight period was about 1 month. Females were dominant.

COMMENTS

In his survey of the Belgian Rhagionidae KRIZELJ (1971) reports *P. obscura* as the single species occurring in Belgium and he cites it from Dave in the province Namur and from Vieuxville (Sy) in the province Luxembourg. The specimen from Dave that KRIZELJ possibly

saw was a heavily moulded female in the collections of RBINS bearing the label Dave 20.06.77 H. Donckier. Identified and labelled as *Ptiolina nigra*? v.d. Wulp & Gobert det. Coucke rev. However, this very old specimen from 1877 was a female *Symphoromyia immaculata* Meigen, 1804 as could be seen from the large reniform third antennal segment.

The record from Sy that KRIZELJ maybe saw was a female, Sy, (prov. Liège) 24.VI.1933, M. Goetgebuer leg. (coll. RBINS). The following characters were observed: frons with eyes widely separated; squama with pale hairs (probably). Face entirely covered with hairs in middle as well as at sides (half as long as third antennal segment). First antennal segment short, half as long as second segment, the apical fine bristles are a little longer than the first segment. Mesonotum grey dusted lacking stripes. Discal cell long, about 4.5× as long as wide (Fig. 7).

The collections of RBINS harbour also 1 male from Herbeumont (Prov. Luxembourg), 25–8.VI.1952. M. Bequaert leg. (coll. RBINS) that appears to be correctly identified as *P. obscura*.

A male, Lixhe (prov. Liège) 1.VI.1947, M. Bequaert leg. (RBINS), identified as *Ptiolina nigra* was instead a *Symphoromyia immaculata* Meigen, 1804.

Fig. 7. *Ptiolina obscura* (Fallén, 1814), male habitus. © Camille Locatelli.

STUBBS & DRAKE (2014) warn in their key to the species of Britain about the considerable uncertainties in the identification of the species of this genus. Indeed, there is a lot of confusion about a number of characters that have been mixed or misinterpreted such as e.g. the colour of the hairs on the squamae or the presence of bristling or the hairs on the face. In addition, there is a sexual dimorphism between males and females and at least in *P. ptiolina* the discal cell in

males is shorter than in females and cannot be used at the moment to differentiate between species because we are not aware of the characters in all the European species. Finally, there is no comprehensive study of the male terminalia available.

Key to the *Ptiolina* species supposed to occur in Western Europe, excluding the boreal and subboreal species (copied and adapted from STUBBS & DRAKE, 2014)

1. First antennal segment twice as long as second antennal segment (both segments covered in hairs longer than width of segments). Male with face bare centrally, the hairs on the strip bordering the eyes should be ignored; female face with short hairs .....*P. nigra*

- First and second antennal segments more or less equal in length (hairs on face present or absent) 2

2. Face with long hairs centrally (hairs on the wide hairy strip next to the eyes should be ignored). (Hairs on first and second antennal segment moderately long) .....*P. nigrina*

- Face bare centrally (male) or sparsely hairy (female) 3

3. Female frons dull. Squamae in both sexes with a fringe of black hairs (careful since they can appear yellowish in some lights). (Wings darkened) .....*P. obscura*

- Female frons polished. Squamae in both sexed with a fringe of pale hairs ..... *P. nitida*

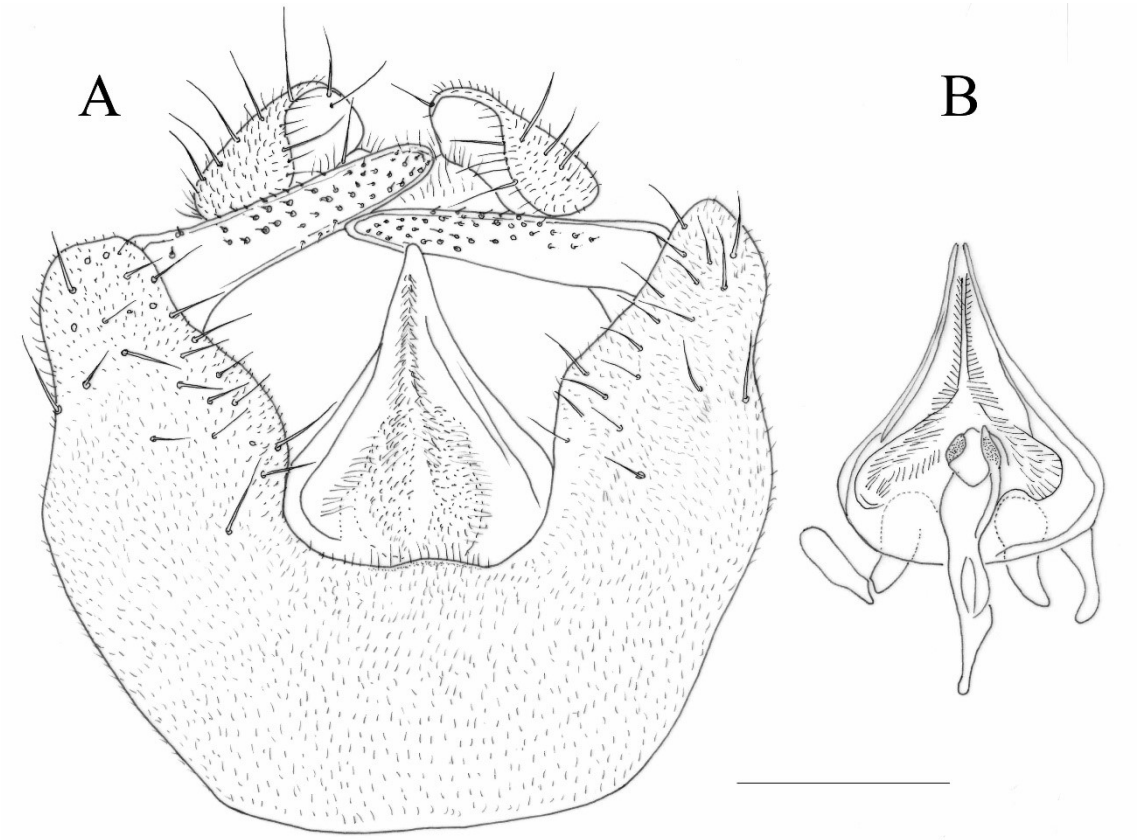

Fig. 8. *Ptiolina obscura* (Fallén, 1814) Male terminalia. A. Ventral view; B. Dorsal view. Scale 0.1 mm. © Patrick Grootaert.

COMMENTS

The identification of *Ptiolina* species remains uncertain because of doubts on the reliability of characters: variability of the colour of the fringe of bristles on the squama from pale to black, length of the discal cell and we could not find illustrations of the male terminalia from the various species. Nevertheless, we presume that all the *Ptiolina* found at the Botanical Garden Jean Massart represent *P. obscura* and the illustration of the male terminalia might provide a further reference to the identification of the species (Fig. 8).

In his key to the Rhagionidae VAN DER GOOT (1985) mentions that no *Ptiolina* species are known from Belgium and that *P. nigrina* Wahlberg is the only species known from the Netherlands. BEUK *et al*. (*in litt*.) doubt this however and state that only *P. obscura* is present in the Netherlands.

In her revision of the northern Palaearctic *Ptiolina,* NARTHCHUK (1995) states that *Ptiolina obscura* (Fallén, 1814) has darkened wings, a black fringe on the wing squamae and the face is bare or with sparse hairs. The two basal segments of the antennae are equal in length, with abundant short bristles but no long hairs. The antennal flagellomere is not longer than 1.5× as long as wide. However, we are not sure about the precise meaning of the latter (third antennal segment). In male all femora and hind tibia have long hairs. It is clear that not all these characters correspond to our specimens. Unfortunately, no illustrations of the male terminalia or other structures are provided and a revision coupled to genetic barcodes is needed to elucidate this problem.

Rhagio Fabricius, 1775

Rhagio immaculatus (Meigen, 1804)

MATERIAL EXAMINED: Belgium, Brussels-Capital Region: Auderghem, Jardin botanique Jean Massart, 1 male, 21–28 May 2015, MT2.

COMMENTS

Singleton only. This seems to be a rather uncommon species according to KRIZELJ (1971) who reported it from only 3 localities limited to the northern half of Belgium: Prov. Oost-Vlaanderen: Overmere; Prov. Limburg: Diepenbeek and Prov. Brabant: Genval. The latter locality is Southeast from the Sonian forest and thus rather close to the Botanical Garden Jean Massart. It was not reported from southern Belgium.

Rhagio lineola Fabricius, 1794

MATERIAL EXAMINED: Belgium, Brussels-Capital Region: Auderghem, Jardin botanique Jean Massart, 1 female, 4–10 June 2015, MT1; 4 males, 17–26 June 2015, MT1; 1 female, 17–26 June 2015, MT2; 1 male, 26 June – 1 July 2015, MT2; 1 male, 2 females, 1–8 July 2015, MT1; 1 male, 3 females, 1–8 July 2015, MT2; 2 females, 8–15 July 2015, MT1; 1 male, 1 female, 8–15 July 2015, MT2; 1 female, 15–22 July 2015, MT1; 1 female, 22–30 July 2015, MT1; 1 male, 22–30 July 2015, MT2; 1 female, 6–12 August 2015, MT1 (leg. A. Drumont & H. Raemdonck).

COMMENTS

With 22 specimens that we recorded, this species seems rather common here in the Garden. KRIZELJ (1971) reports it from 74 localities in Belgium. It has a wide distribution all over Belgium. VAN DER GOOT (1985) says that it is common in not very dry forests all over the Netherlands.

Rhagio maculatus (De Geer, 1776)

MATERIAL EXAMINED: Belgium, Brussels-Capital Region: Auderghem, Jardin botanique Jean Massart, 1 female, 4–10 June 2015, MT2; 1 male, 10–17 June 2015, MT1.

ADDITIONAL OBSERVATIONS: 2 males, 24 May – 1 June 2017, MT1; 4 males, 1 female, 24 May – 1 June 2017, MT2; 2 females, 24 May – 1 June 2017, MT6; 1 male, 17–24 May 2017, MT2; 3 males, 1–8 June 2017, MT2 (leg. A. Drumont & H. Raemdonck).

COMMENTS

KRIZELJ (1971) reports this species from only 10 localities in Belgium. With a single record in the North of Belgium (prov. West-Vlaanderen: Loppem), a record from Mid-Belgium (Brussels-Capital Region: Auderghem) and 8 localities in the southern part of Belgium where it thus seems more common.

Rhagio notatus (Meigen, 1820)

Leptis notatus Meigen, 1820
Rhagio nigricans Szilady, 1934

MATERIAL EXAMINED: Belgium, Brussels-Capital Region: Auderghem, Jardin botanique Jean Massart, 1 female, 4–10 June 2015, MT2 (leg. A. Drumont & H. Raemdonck).

COMMENTS

Only a single female is found in the Garden. According to KRIZELJ (1971) *R. notatus* is a rare species in Belgium with no records from the northern part of the country, known from 2 localities around Brussels (Rouge-Cloître adjacent to the botanical garden Jean Massart and Watermael-Boitsfort) and 4 localities in southern Belgium.

Rhagio scolopaceus (Linnaeus, 1758)

Musca scolopacea Linnaeus, 1758
Rhagio monotropus (Harris, 1780)
Rhagio solitarius (Harris, 1780)
Sylvicola monotropus Harris, 1780
Sylvicola solitarius Harris, 1780
Rhagio haehnlei Lindner, 1923

MATERIAL EXAMINED: Belgium, Brussels-Capital Region: Auderghem, Jardin botanique Jean Massart, 1 female, 13–21 May 2015, MT2; 1 female, 28 May – 4 June 2015, MT1; 1 male, 1 female, 4–10 June 2015, MT2; 1 male, 1 female, 4–10 June 2015, MT1; 1 male, 1 female, 1–8 July 2015, MT2.

ADDITIONAL OBSERVATIONS: 3 males, 7 females, 24 May – 1 June 2017, MT2; 2 males, 5 females, 24 May – 1 June 2017, MT6; 7 females, 24 May – 1 June 2017, MT5; 4 females, 17–24 May 2017, MT2; 3 males, 4 females, 11–17 May 2017, MT2; 2 females, 11–17 May 2017, MT4; 3 females, 1–8 June 2017, MT2; 1 female, 8–15 June 2017, MT2 (leg. A. Drumont & H. Raemdonck).

COMMENTS

Rhagio scolopaeus is common in the Garden and also one of the most common species occurring all over Belgium with 174 localities cited by KRIZELJ (1971). In the Netherlands, it is together with *R. tringarius* the most often recorded *Rhagio*.

Rhagio tringarius (Linnaeus, 1758)

Musca tringarius Linnaeus, 1758
Erax rufus Scopoli, 1763
Sylvicola solivagus Harris, 1780
Musca vermileo Schrank, 1781
Rhagio vanellus Fabricius, 1794
Leptis simplex Meigen, 1838
Leptis punctatus Loew, 1840
Leptis cinerea Zetterstedt, 1842
Leptis ephippium Zetterstedt, 1842
Leptis nigriventris Loew, 1869
Leptis perezii Gobert, 1877
Leptis perrisii Gobert, 1877
Leptis pandellei Gobert, 1877
Leptis cartereaui Gobert, 1877
Leptis goebelii Strobl, 1893
Rhagio tripustulatus Szilady, 1934

MATERIAL EXAMINED: Belgium, Brussels-Capital Region: Auderghem, Jardin botanique Jean Massart, 1 male, 1–9 July 2015, MT2 (leg. A. Drumont & H. Raemdonck).

COMMENTS

Only one specimen of *Rhagio tringarius* was recorded here in the Botanical Garden but according to KRIZELJ (1971) it is one of the most common and widespread species in Belgium. He recorded this species from 93 localities all over Belgium. It is also very common in the Netherlands (VAN DER GOOT, 1985). STUBBS & DRAKE (2014) report this species in marshes and wet meadows and only occasionally in woodlands. Although some small marshland is present at the Botanical Garden Jean Massart, the area is probably not sustainable enough for this species.

General conclusions

During a survey with two Malaise traps in the Botanical Garden Jean Massart we found ten species of Rhagionidae which represent almost half of the known species occurring in Belgium. This confirms the study of KRIZELJ (1971) who already found eleven species in sites in the surroundings of the Botanical Garden Jean Massart i. e. such as Rouge Cloître and the Sonian Forest in Auderghem. Remarkable are the records on the very rare *Ptiolina obscura* (Fallén, 1814) which is a species rare all over Europe. In the garden we found 13 females of *Archicera avarorum* Szilády, 1934, before only known from 3 females in Central Europe. The species *A. avarorum* is new for the Belgian fauna. The enigmatic status of the genus *Archicera* as discussed by KERR (2010) needs further attention.

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