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On the occurrence of *Beris strobli* Dušek & Rozkošný, 1968 and *Beris hauseri* Stuke, 2004 in Belgium (Diptera : Stratiomyidae)

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Abstract

In 2004 STUKE proved that *Beris strobli* Dušek & Rozkošný, 1968 (Diptera : Stratiomyidae) is in fact a complex of three species. Two of these species occur in Europe : *Beris strobli* and *Beris hauseri* Stuke, 2004. The third species *Beris latifacies* Nagatomi & Tanaka, 1972 is until now only known from Japan. The former Belgian checklist of Stratiomyidae (POLLET & GROOTAERT, 1991) mentions only *B. strobli*. We recently found *B. hauseri* near Brugge. Consequently we checked all specimens formerly labelled as *B. strobli* in some private collections and in the collection of the Royal Belgian Institute of Natural Sciences (RBINS). We found that most specimens are *B. hauseri*. For some older female specimens identification was not possible as the genital furca could not be prepared, however for these specimens the colour of the legs suggests that they are also *B. hauseri*. As a consequence there are no remaining records of *B. strobli* known for Belgium. We suggest to add *B. hauseri* to and remove *B. strobli* from the Belgian checklist.

Keywords : Stratiomyidae, *Beris strobli, Beris hauseri*, species new for Belgium.

Samenvatting

In 2004 toonde STUKE aan dat *Beris strobli* Dušek & Rozkošný, 1968 (Diptera : Stratiomyidae) eigenlijk een complex is van drie soorten. Twee van deze soorten komen voor in Europe : *Beris strobli* en *Beris hauseri* Stuke, 2004. De derde soort *Beris latifacies* Nagatomi & Tanaka, 1972 is tot op heden enkel gekend van Japan. De Belgische soortenlijst van POLLET & GROOTAERT (1991) vermeldt enkel *B. strobli*. Recent vonden we *B. hauseri* nabij Brugge en daarom hebben we alle specimens herbekeken die vroeger gelabeld werden als *Beris strobli*, in zowel enkele private collecties als in de collectie van het Koninklijk Belgisch Instituut voor natuurwetenschappen (KBIN). We vonden dat de meeste specimens *B. hauseri* zijn. Enkele oudere vrouwelijk specimens konden niet met zekerheid geïdentificeerd worden omdat het niet mogelijk was om de genitaal furca te prepareren. Voor deze specimens duidt de kleur van de poten echter ook op *B. hauseri*. Bijgevolg zijn er geen records van *B. strobli* meer gekend voor België. We suggereren daarom om *B. hauseri* toe te voegen aan de Belgische checklist en *B. strobli* te verwijderen van deze lijst.

Résumé

En 2004, STUKE a montré que *Beris strobli* Dušek & Rozkošný, 1968 (Diptera : Stratiomyidae) est en fait un complexe de 3 espèces. Deux de ces espèces occupent l'Europe : *Beris strobli* et *Beris hauseri* Stuke, 2004. La troisième espèce *Beris latifacies* Nagatomi & Tanaka, 1972 est connue à ce jour uniquement du Japon. La liste des espèces belges de POLLET & GROOTAERT (1991) contient uniquement *B. strobli*. Ayant trouvé récemment *Beris hauseri* près de Bruges, nous avons vérifié tous les spécimens mentionnés comme *B. strobli* dans quelques collections privées, ainsi que dans celle de l'Institut royal des Sciences naturelles de Belgique (IRSNB). Il en ressort que la plupart de ces

spécimens sont en réalité des *B. hauseri* et non des *B. strobli*. Certains vieux spécimens femelles n'étaient plus identifiables au moyen de la furca génitale devenue impréparable, cependant, la couleur de leurs ailes suggèrent qu'ils appartiennent aussi à l'espèce *B. hauseri*. Ceci a pour conséquence qu'il ne reste plus de données de *B. strobli* pour la Belgique. Dès lors, nous suggérons de modifier la liste des espèces belges en ajoutant *B. hauseri* et en supprimant *B. strobli*.

Introduction

The genus *Beris* Latreille, 1802 (Stratiomyidae) includes small to medium sized, somewhat elongated flies. They are characterised by small, one-segmented palpi and usually six spines on the scutellum. They have a dark head, a black or metallic green thorax and a black or orange abdomen. Some of the species have darkened wings (STUBBS & DRAKE, 2001 ; BRUGGE, 2002 ; FALCK, 2007). Larval *Beris* are terrestrial and live in moist leaf litter, decaying vegetation and moss (FALCK, 2007) and within feeding tunnels of *Cheilosia* Meigen, 1822 larvae (STUKE, personal communication).

The genus *Beris* contains worldwide 33 species, of which 12 species occur in Europe (WOODLEY, 2001). The Belgian checklist contains six species (POLLET & GROOTAERT, 1991). One of these is *Beris strobli* Dušek & Rozkošný, 1968. However, STUKE (2004) has recently shown that *Beris strobli* of Dušek & Rozkošný is in fact a complex of three species. Two of these species occur in Europe: Beris strobli and Beris hauseri Stuke, 2004. The third species Beris latifacies Nagatomi & Tanaka, 1972 is until now only known from Japan.

The males of *B. strobli* and *B. hauseri* have a shining metallic black thorax, infuscated blackish wings, a dark abdomen and antennae that are not thickened. The main characteristics to distinguish both species are the colour of the legs and the shape of the genitalia. In *B. hauseri* basitarsus 1 is basally more or less lightened and tibia 1 is at least one quarter yellow or light brown at base (contrasting with the apical part of the tibia). In *B. strobli* basitarsus 1 is usually uniform dark brown and tibia 1 is completely dark brown or black, sometimes with a lighter cuticle near the junction of femur and tibia (STUKE, 2004). The genitalia are shown in the paper of STUKE (2004).

Females of *B. hauseri* and *B. strobli* have more or less dark hind legs. They are also characterised by a broad frons, just like *Beris chalybata* (Forster, 1771). According to STUKE (2004) the distinction between the females of these three species is quite difficult. In *B. hauseri* basitarsus 1 is basally yellow like the adjacent tibia and at the tip dark brown like the rest of the tarsus. The species has mostly obscurely darkened femora. The darkening is most obvious at the tip of the hind femora. *B. chalybata* has completely yellow femora and tibia. Basitarsus 1 contrasts also basally with the adjacent tibia. In *B. strobli* the darkening of the legs is more obvious. Especially the brown hind tibia and the completely brown hind tarsi distinguish this species from the two others. However the colour of the legs is less reliable than it is for the males and certain identification is probably only possible after preparation of the genital furca (STUKE, 2004). The shape of the furca of the three species is shown in STUKE (2004).

Recently we discovered *B. hauseri* near Bruges and this encouraged us to review the occurrence of *B. hauseri* and *B. strobli* in Belgium.

Material and Methods

We checked all material formerly labelled as *B. strobli* in some private collections and in the collection of the Royal Belgian Institute of Natural Sciences (RBINS). For both, males and females, genitalia were studied if possible.

Results

Male specimens of *Beris hauseri*

Sint-Pieters-Woluwe, Stockel, 26.V.1918, 1♂, leg. unreadable, coll. RBINS, det. C. Martens ; Merelbeke, Schelderode, 23.V.1939, 1♂, leg. M. Goetghebuer, coll. RBINS, det. C. Martens ; Auderghem, Sonian Forest, Sentier des Trois-Fontaines, 14.V.1943, 1♂, leg. R. Tollet, coll. RBINS, det. C. Martens ; Sonian Forest, 19.V.1946, 1♂, leg. A. Collart, coll. RBINS, det. C. Martens ; Bierbeek, Meerdaalwoud, Pruikenmakers, 9.V.1998, 1♂, leg. & coll. J. Menten, det. C. Martens ; Habay, 23.V.1999, 1♂, leg., coll. & det. K. Verhoeyen ;

Bierbeek, Meerdaalwoud, Warande, 19.V.2004, 1♂, leg. & coll. J. Menten, det. C. Martens ; Bierbeek, Meerdaalwoud, Mollendaalbos, 20.V.2004, 1♂, leg. & coll. J. Menten, det. C. Martens ; Bierbeek, Meerdaalwoud, Warande, 16.V.2008, 1♂, leg. & coll. J. Menten, det. C. Martens ; Zoersel, Zoerselbos, 18.V.2008, 1♂, leg. & coll. J. Menten, det. C. Martens ; Brugge, Tillegembos, 17.V.2012, 1♂, leg. C. Martens & W. Jans, coll. & det. C. Martens.

Female specimens of *Beris hauseri*

Bierbeek, Meerdaalwoud, Pruikenmakers, 1.V.2007, 1♀, leg. & coll. J. Menten, det. C. Martens ; Bierbeek, Meerdaalwoud, Warande, 3.VI.2008, 1♀, leg. & coll. J. Menten, det. C. Martens.

Other material (females of which genital furca could not be assessed)

Mons, VII.1907, 1♀, leg. A. Guilliaume, coll. RBINS ; Berlare, Overmeire, 24.V.1944, 1♀, leg. M. Goetghebuer, coll. RBINS ; Ellezelles, Forest, 26.V.1957, 1♀, leg M. Bequaert, coll. RBINS ; Rochefort, Han-sur-Lesse, 9.V.1959, 1♀, leg. M. Bequaert, coll. RBINS ; Lasne, Ohain, 21.V.1965, 1♀, leg. J. Verbeke, coll. RBINS.

Identification and corresponding problems

All studied male specimens turned out to be *B. hauseri*. For the specimen of 23.V.1939 (Merelbeke, Schelderode) the genitalia are missing, thus identification occurred on the basis of the colour of the legs. For all other male specimens genitalia were studied.

Two of the above-mentioned female specimens are obviously *B. hauseri*. The shape of the basis of the furca corresponds to the drawing by STUKE (2004).

For the female specimens that are more than 45 years old we were unable to prepare the genital furca. According to STUKE (2004) identification of such females is not possible. Therefore we assessed the colour of the legs and we compared with recent female specimens of *B. hauseri* and *B. chalybata*, of which we could prepare the furca. We found that :

- All the studied female specimens of *B. chalybata* have completely yellow femora and tibia and most specimens have basitarsus 1 completely brown and clearly contrasting with the adjacent tibia, as described by STUKE (2004). However in some specimens the basis of basitarsus 1 is yellowish and hardly contrasting with the adjacent tibia.
- The female *B. hauseri* of 2007, of which the identification is assured by the shape of the furca (see above), has fore femora that are partly indistinctly brown, fore tibia that are yellow and hind tibia and femora that are partly light brown. The basitarsi of the fore legs are yellow with a brown tip.
- The female *B. hauseri* of 2008, of which the identification is assured by the shape of the furca (see above), has largely brown femora and tibia and the basitarsi of the fore legs are yellow with a brown tip.
- The colour of the legs of the female specimens enumerated under 'Other material' is quite variable. At least the hind legs have some brown colouration on the femur and tibia. However, the extend and the darkness of the brown parts is very variable. In some specimens all femora and tibia are clearly largely brown, in other specimens the darkening is less extensive and more obscure. However the femora and tibia are never completely yellow as in *B. chalybata*. Basitarsus 1 is always clearly yellow with a brown tip. Basitarsus 3 is yellow, unlike in *B. strobli* (STUKE, 2004). The combination of these colour characteristics form an indication for *B. hauseri*.

Description of collection dates, localities and habitats

The collection of RBINS contains four males of *B. hauseri* and five females that are probably also *B. hauseri*, all dating from the period 1907-1965. The private collections of C. Martens, K. Verhoeyen and J. Menten contain in total seven males and two females of *B. hauseri*, collected between 1998 and 2012. All male specimens were collected between 9 and 26 May. All females were collected between 1 May and 3 June, with the exception of one of the uncertain females that was collected in July (day unknown).

The species is most frequently recorded in the 'Meerdaalwoud'. Four male specimens and two female specimens were collected there between 1998 and 2008, on six different occasions. The 'Meerdaalwoud' is one of the largest forests (ca. 1320 ha) in Flanders and is a remnant of the ancient Charcoal Forest, which covered central Belgium in Gallo-Roman times (BOSSUYT *et al.*, 1999).

The 'Meerdaalwoud' is a mixed woodland, that is situated on loam and sandy soils between 35 and 102 m above sea level. The 'Meerdaalwoud' is situated east of the valley of the river Dyle and south of Leuven. In all cases, the specimens were collected by sweeping through herbaceous vegetation in areas of moist, ancient oak-forest on loamy soils. One male was collected in the forest reserve 'Pruikenmakers', two in a nearby area of the 'Mollendaalbos', and one in the valley of a small woodland brook, the 'Warande'. All locations are within a 1 km radius from each other. This area is rich in Diptera characteristic for ancient forest, such as the Syrphidae *Myolepta vara* (Panzer, 1798), *Sphiximorpha subsessilis* (Illiger in Rossi, 1807) and *Ferdinandea cuprea* (Scopoli, 1763).

Two of the male *B. hauseri* are collected in the Sonian Forest in the 1940's. This forest is also part of the scattered remains of the ancient Charcoal Forest. It is the largest beech (*Fagus sylvatica* L.) forest of Belgium. The Sonian Forest stretches out over a surface of over 4000 hectares and is situated right next to the centre of Brussels. The underground mainly consists of loam. One male specimen was collected in Stockel a quarter of Sint-Pieters-Woluwe that consists mainly of residential areas with lots of greenery and that borders the Sonian Forest.

The remaining four male specimens were obtained at four completely different locations. One specimen is from the municipality of Schelderode (Merelbeke). No details about the location are available. Schelderode is situated south of Ghent, along the river Scheldt. The underground consists of sand-loam soils, sandy soils and in the valley clay soils.

Another male specimen was collected at Marbehan (Habay), in the Ardennes. The specimen was acquired by sweeping through the vegetation (with lots of Apiaceae) along a non-paved road leading from the village to mixed woods bordering a small river. Along the road there was a grassy border, lined with shrubs and small trees. The surrounding area consists of forest with coniferous and broad-leaved species.

One male specimen was collected at the 'Zoerselbos'. This is an old woodland complex consisting of a mixture of deciduous and pine forests, wet meadows and moist heaths. It is situated in the southern Campine area of the province Antwerp. The area is known to be wooded since the middle ages and was part of the 'Hooidonk' domain of the abbay of Sint-Bernard located in Hemiksem. Even though the 'Zoerselbos' is located in the sandy and dry Campine region, the forest itself is mainly located on poorly drained soils on a sandy loam underground. *B. hauseri* was collected by sweeping through the vegetation along a woodland path in the moist oak-forest.

The last male was collected at the castle grounds of 'Tillegem', near Brugge. The domain is situated on the gradient of the sand ridge of Sint-Andries to the valley of the 'Kerkebeek'. The specimen was collected by sweeping a net through the vegetation of an artificial, meandering ditch situated in an orchard. This ditch is partially fed by seepage and the vegetation contains species such as *Juncus effusus* L., *Scirpus sylvaticus* L., *Equisetum palustre* L., *Lysimachia vulgaris* L., *Ranunculus repens* L., *Lotus pedunculatus* CAV., *Cirsium palustre* (L.) SCOP., *Cardamine pratensis* L. and *Salix sp.* L. The surrounding area consists of birch-oak forest, beech forest, ash-elm forest, deciduous plantations, coniferous plantations, pastures and heathland relics.

For the five oldest female specimens (for which identification is uncertain) only the name of the municipality is given on the labels. These municipalities are scattered over the country. Overmeire (Berlare) is situated east of Ghent, along the river Scheldt. It is situated in a sandy region, but along the actual and fossil meanders of the river Scheldt there are clay and peat soils. The fossil meanders are characterised by a lot of popular plantations on wet soils and alluvial forests.

Ellezelles is situated near Ronse, in the 'Pays des Collines'. The label of the specimen mentions that it was collected in forest. In the municipality of Ellezelles there are some scattered small forests and in the south-west of the municipality there are two larger forests that lie partly within the territory of Ellezelles : 'Bois d'Hubermont' and 'Bois Lefebvre'. Both lie on hills. The tops of the hills are covered with sand. Lower on the hills sand and clay layers alternate and in the valleys alluvial deposits occur. Different types of deciduous forest alternate on the hills.

Mons is situated in the region south of the 'Pays des Collines' and is characterised by a very diverse underground and very diverse biotopes. There are no details available about this collection location. Lasne (Ohain) is situated south of Brussels, not far from the Sonian Forest. Han-sur-Lesse (Rochefort) is situated south of Namur, in the Calestienne region where chalk rich soils predominate.

Discussion and Conclusions

We checked all available specimens formerly identified as *B. strobli*. All male specimens are obviously *B. hauseri*. Also the female specimens that were collected in 2007 and 2008 are *B. hauseri*. The older female specimens could not be identified with certainty, but based on the colour of the legs they are probably also *B. hauseri*. Thus there are no confirmed records of *B. strobli* in Belgium and we propose to delete this species from the Belgian checklist (POLLET & GROOTAERT, 1991). *Beris hauseri* should be added to this list.

STUKE (2004) states that *B. strobli* is widely distributed in central Europe and at least in central Europe it is a mid altitude species, while *B. hauseri* is a holarctic species that occurs also in lowland. If *B. strobli* occurs in Belgium, it's distribution will probably be restricted to the most elevated part of the country, namely the Hautes Fagnes. According to STUKE (2004) the larvae of *B. strobli* possibly develop in *Petasites hybridus* (L.) Gaertn., B. Mey & Scherb., as is known for a number of other *Beris* species. He advises to check *Petasites* growing in wooded areas, close to smaller or broader rivers, in the Hautes Fagnes (STUKE, personal communication).

FALCK (2007) reviewed the occurrence of the two species in Norway. He found that *B. hauseri* is distributed over most of the country, while there are no records of *B. strobli*. From the Netherlands only *B. hauseri* is known (STUKE, 2004). In fact the identification of *B. strobli* auctores should be checked everywhere, as ROZKOŠNÝ (1982) mixed *B. strobli* and *B. hauseri* (STUKE, personal communication).

The collection locations of *Beris hauseri* in Belgium are scattered over the country. All specimens with detailed collection location on the label are collected in or close to forests, especially old oak and beech forests. But there is no obvious biogeographical pattern in the distribution. We did not detect a relation with the composition of the substrate.

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