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The willow catkin flies *Egle lyneborgi* Ackland & Griffiths, 2003 and *Egle suwai* Michelsen, 2009 new for Belgium (Diptera: Anthomyiidae)

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Abstract

This paper describes the first records of the anthomyiids *Egle lyneborgi* Ackland & Griffiths, 2003 and *Egle suwai* Michelsen, 2009 for Belgium. In addition a method for abdominal dissection without using aggressive chemicals is explained.

Keywords: Diptera, Anthomyiidae, *Egle*, species new for Belgium, abdominal dissection.

Samenvatting

De eerste Belgische records van de Anthomyiidae *Egle lyneborgi* Ackland & Griffiths, 2003 en *Egle suwai* Michelsen, 2009 worden beschreven. Bovendien wordt een methode uitgelegd voor abdominale dissectie waarin geen gebruik maakt wordt van agressieve chemicaliën.

Résumé

Deux Anthomyiidae, *Egle lyneborgi* Ackland & Griffiths, 2003 et *Egle suwai* Michelsen, 2009, sont décrits pour la première fois de Belgique. En outre, une méthode pour la dissection des abdomens mâles, sans utilisation de produits chimiques agressifs, est expliquée.

Introduction

The fly family 'Anthomyiidae' is considered to be a difficult taxonomic group. There is no up-to-date identification guide for mainland Europe. Formerly HENNIG (1966-1976) gave a key for the Palaearctic region, but many taxonomic changes occurred since. There are good unpublished draft keys by ACKLAND for genera and species, but they consider only the taxa that occur in the UK. VAN ERKELENS (2011) gives a key to the genera occurring in the Netherlands. Other identification data is spread over scientific papers. Moreover identification is often not so easy and usually requires abdominal dissection. As a result there are only few people working on Anthomyiidae.

The genus *Egle* Robineau-Desvoidy, 1830 is a bit an exception to the rule. Just like most Anthomyiidae they are small brownish-black flies. But thanks to their early flight period, their dependence on flowering willows for pollen feeding and the typical head with conspicuously protruding mouthedge and long and slender proboscis and palpi adults can normally be assigned to the genus *Egle* even in the field. *Egle concomitans* (Pandellé, 1900) forms an exception. It doesn't have the protruding mouthedge and it's host plant is poplar. There is one additional European species that has another host plant, i.e. *Egle myricariae* Grossmann, 1998. The host plant of this species is German tamarist, a woody scrub which grows on open ground along montane and subalpine streams (MICHELSEN, 2009).

Although the genus *Egle* as such is normally quite easy recognisable, also for this genus identification to species level is often impossible without abdominal dissection. However since the revision of the

genus *Egle* by MICHELSEN (2009), which gives a key to all known European species and contains good species descriptions and photo's of the terminalia, identification is an achievable job. For our region also the unpublished *Egle* draft key by ACKLAND is very useful. In fact this key contains only the UK species, but up to now with the exception of *Egle concomitans*, all Belgian and Dutch species are included in his work. His drawings form a good complement to the photo's of MICHELSEN (2009) and VAN ERKELENS (2013).

It is interesting to know that *Egle* imagines do not only feed on the flowers of willow, poplar or tamarisk, and in that way play an important role as pollinators, but that their larvae develop also in the seeds of these plants species.

Apart from the typical head, important diagnostic characters for adult *Egle* are a very short antennal postpedicel, an antennal arista with very short pubescence and a hind tibia without an apical posteroventral seta (MICHELSEN, 2009; VAN ERKELENS, 2011).

In 1991 a checklist of the Belgian Anthomyiidae was published (GOSSERIES & ACKLAND, 1991), which listed three species of *Egle*: *Egle brevicornis* (Zetterstedt, 1838), *Egle ciliata* (Walker, 1849) and *Egle parva* Robineau-Desvoidy, 1830. In the spring of 2012 we started sampling adult *Egle* in Belgium and we added three new species to the Belgian checklist: *Egle parvaeformis* Schnabl in Schnabl & Dziedzicki, 1911, *Egle rhinotmeta* (Pandellé, 1900) and *Egle minuta* (Meigen, 1826) (MARTENS & MORTELMANS, 2013). In the current paper we describe the first Belgian records of *Egle lyneborgi* Ackland & Griffiths, 2003 and *Egle suwai* Michelsen, 2009.

Material and methods

Egle lyneborgi was collected by net catches of individuals detected on sight and by sweeping a net through flowering willows. *Egle suwai* was collected with a net after detection on sight on a flowering willow. The specimens of *Egle lyneborgi* were dry set with the exception of the abdomen which is treated in the way explained below and is kept in a micro vial attached to the pin. *Egle suwai* is dry set with the hypopygium pulled out and left on the abdomen. The material is kept in the personal collections of the collectors.

Dissection of male terminalia without using aggressive chemicals

In Anthomyiidae determination it is often difficult or even impossible to examine the shape of the terminalia with sufficient precision if the hypopygium is just pulled out and left on the abdomen. To allow proper dissection traditionally terminalia are first boiled in a test tube with KOH, a method that is not without any danger.

However there is an easy method that uses only household products, alcohol and glycerine and that will do for a lot of Anthomyiidae and for all *Egle*:

- cut half of the abdomen with scissors or pull out the entire abdomen with forceps and keep it apart for further treatment.
- dry set the rest of the fly
- boil some water and fill half of a small tray, egg. a compartment of an ice tray
- add some drops of a liquid laundry detergent
- add a pinch of bleaching powder (egg. Blan Pure White). Not too much, otherwise all colour will disappear from the terminalia!
- stir a little
- drop the (part of the) abdomen in the tray
- wait 24 hours
- put the abdomen in some vinegar for some minutes
- rinse the abdomen in some alcohol
- take a watch glass or a microscope slide with a hollow, add some drops of glycerine and add the abdomen

Fig. 1. Collection site of *Egle lyneborgi.*

Fig. 2. Collection site of *Egle suwai.* This picture is taken in 2013. In the meanwhile the area is largely overgrown by brambles and is currently hardly accessible.

- put the watch glass or the slide under the binocular and, using 2 forceps, you can start to remove the soft tissue and to dissect the hypopygium and sternite 5, which are the most important parts for *Egle* determination.
- when you have finished your determination it is important to preserve all the parts in a micro vial filled with some glycerine and to save this micro vial on the pin used for dry setting the rest of the fly.

If you want to handle more than one specimen at a time, it is important not to mix up the abdomens and the dry set parts of the different flies. For this purpose the use of an ice tray is very suitable. In each of the compartments of the first row of the tray you put a piece of egg. styrofoam which can hold the dry set part of a fly. The second row is used for soaking the corresponding abdomens.

For proper identification of species belonging to some Anthomyiidae genera (egg. *Delia* Robineau-Desvoidy, 1830*, Anthomyia* Meigen, 1803*,* and *Pegomya* Robineau-Desvoidy, 1830) dissection of the aedeagal complex is needed. In these cases boiling of the genitalia in a test tube with KOH is sometimes unavoidable. The same applies when you find it unsatisfactory (egg. for taking pictures) that there is left a little bit of soft tissue that you can't remove with the forceps.

Details of the observations

Egle lyneborgi Ackland & Griffiths, 2003

MATERIAL. Genk, area between 'Zonhovenheide' and 'De Teut', 11.IV.2015, 11♂, leg., det. & coll. C. Martens.

Eleven males of *Egle lyneborgi* were collected in an area, situated in between the nature reserves 'Zonhovenheide' and 'De Teut'. The area is half open and is characterised by small and medium sized willows, pines, birch, common broom, ... (Fig. 1). In the undergrowth common heather was an important species. The vicinity consists mainly of large heathland area's with bog pools and dunes, interspersed by small broke valleys, forests and agricultural area's. The *Egle lyneborgi* specimens were collected in the afternoon under cloudy circumstances with regular outbreaks of light rain, following a morning with heavy rain.

Egle lyneborgi is a holarctic species. In the Palaearctics it has been recorded from Iceland, Norway, Sweden, Finland, Denmark, the British Isles, Spain, Italy (MICHELSEN, 2009) and from the Netherlands (VAN ERKELENS, 2013). In the Nearctics it is widespread in boreal and western parts of North America (MICHELSEN, 2009).

***Egle suwai* Michelsen, 2009**

MATERIAL. Knesselare, Drongengoed forest, Bommelaere-pilkem, abandoned field along the road 'Drongengoedweg', 23.III.2015, 1♂, leg., det. & coll J. Versigghel.

One male *Egle suwai* was collected in an abandoned field crossed by some ditches which are bordered by scattered willows (Fig. 2). During the last years the area was overgrown by brambles and is currently hardly accessible. The vicinity is characterized by a variety of habitats such as deciduous forest, coniferous forest, heathland relics, acid grasslands, pastures and agricultural areas.

Egle suwai is only known from Denmark, Sweden (MICHELSEN, 2009), Britain (ACKLAND, 2013) and the Netherlands (VAN ERKELENS, 2013). But in the past *Egle suwai* has obviously been confused with other species of the *Egle minuta* species group and a wider distribution in Europe and possibly elsewhere can be expected (MICHELSEN, 2009).

Discussion

Interest in the Anthomyiidae genus *Egle* arose only recently in Belgium. Although only three persons paid attention to this group and this only in 2012 and in 2015, the number of Belgian species could be increased from 3 to 8. Most of these species were found in the Nature Area Drongengoed-Maldegemveld (Knesselare and Maldegem), which is more or less the backyard of the collectors. Further sampling in other areas and other ecoregions will surely result in additional species.

In the Netherlands a large sampling campaign was organised in 2011 and 2012. *Egle* specimens were collected by many entomologists throughout the Netherlands and on several types of willows. Eight new *Egle* species could be added to the Dutch checklist, that contained formerly only *Egle ciliata* and *Egle parva*, i.e. *Egle concomitans, Egle lyneborgi, Egle minuta, Egle parvaeformis, Egle rhinotmeta, Egle steini* Schnabl in Schnabl & Dziedzicki, 1911*, Egle subarctica* (Huckett, 1965) and *Egle suwai* (VAN ERKELENS, 2013).

As well in the Netherlands as in Belgium more *Egle* species can be expected. In the Netherlands *Egle brevicornis,* which is on the Belgian checklist, should be found. For Belgium *Egle concomitans*, *Egle subartica* and *Egle steini* can be expected. These species are on the Dutch checklist. In both countries it could be interesting to search for *Egle ignobilis* Michelsen, 2009 and *Egle inermis* (Ackland, 1970) which are present in Denmark. Also *Egle anderssoni* Michelsen, 2009 is possible. This species has been collected mainly in southern Europe, but unexpectedly also near the coast in southern Skåne (Sweden) (MICHELSEN, 2009). As *Egle anderssoni* morphologically resembles *E. brevicornis*, which is mainly found on creeping willow, a low-growing shrub found in coastal sand dune slacks, heathlands and moorlands (Michelsen, 2009), it is possible that this species occurs in the same habitats.

Identification of willow species is often as difficult as identification of *Egle* species. Therefore it would be interesting to collaborate with experts in willow-taxonomy, in order to learn more about the relationship between *Egle* species and willow species.

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