Stilobezzia lutacea, a new predaceous midge for the Netherlands (Diptera: Ceratopogonidae)

Pasquale Ciliberti

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In the year 2018, an extensive inventory was performed in the Dutch national parc 'Hollandse Duinen'. The collected invertebrates were identified by several experts. Among the Nematocera a new species for the Netherlands was discovered; *Stilobezzia lutacea*, of which one male specimen was collected. *Stilobezzia lutacea* belongs to the family Ceratopogonidae, the biting midges, and is classified in the tribe Ceratopogonini. The Ceratopogonidae are one of the poorest studied groups of Diptera in the Netherlands. Females of *S. lutacea* feed mainly on Chironomidae and the larvae are aquatic or semi-aquatic. This new species brings the Ceratopogonidae fauna in the Netherlands to 111 and the total number of *Stilobezzia* species to four.

Introduction

In the year 2018, Dunea (the company that produces drinking water in the province Zuid-Holland), EIS (European Invertebrate Survey), Staatsbosbeheer (State Forestry Service) and Waarneming.nl (an online platform to register nature observations) organized and coordinated a '5000 species year' ('5000-soortenjaar'). The main goal of this project was to make a complete inventory of all organisms present in the national parc 'Hollandse Duinen'. This park is situated in the province of Zuid-Holland, along the coast of the North Sea. Typical landscape elements of the nature reserve include dunes, beaches, peat meadows, woods and estates. Particular attention was given to collecting invertebrates, using various trapping methods. In addition, individual entomologists were given permission to collect in the Park with their own methods. I was asked to identify specimens of the Diptera families Ceratopogonidae and Psychodidae. Among the Ceratopogonidae, a single male specimen of a new species for the Netherlands was found: *Stilobezzia lutacea* Edwards, 1926.

The Ceratopogonidae is a fascinating and diverse family of Nematoceran flies. Beside the medically important genus *Culicoides* Latreille,1809, this family has been relatively neglected by Dutch dipterists. According to the Dutch checklist, 110 species of Ceratopogonidae are present in the Netherlands (Knoz & Beuk 2016). However, this figure probably underestimates the Dutch fauna, because the Ceratopogonidae are poorly studied and higher numbers of species are known to occur in neighbouring countries.

The specimen of *S. lutacea* was collected by Niels Jan Dek with a handnet in Ganzenhoek, a small area of nature reserve Meijendel, which is part of national parc 'Hollandse Duinen' and is near the town of Wassenaar. Meijendel is the largest continuous area of coastal sand dunes in the province of Zuid-Holland. Ganzenhoek (figure 1) is characterized by having different types of landscapes, varying from pine forest to a more open wet dune area. The pines were planted to prevent sand movement by the wind. The area is rich in water, having many small ephemeral ponds and one larger pond called the Ganzenhoekplas, making it an ideal habitat for Nematoceran flies.

Material and methods

Material Province of Zuid-Holland, Meijendel, Ganzenhoek (AC 84.9-464.1), 16.vi.2018, 1 ♂, collected with a hand net, leg. N.J. Dek, det. & coll. P. Ciliberti.

I received the material in ethanol 70%. Unfortunately most of the specimens received had broken antennae, including the specimen of *S. lutacea* (figure 2). For identification, I mounted the specimen in Euparal on a glass slide. Prior to mounting, I carefully removed the wings and the head of the insect. I placed the head, facing upward (figure 2), and one of the wings (as flat as possible) (figure 3) on two separate drops of Euparal. The remaining part of the insect was cooked for about seven minutes in 10% KOH, *au bain-marie*. After that, I dehydrated the specimen in three successive steps, using three Petri dishes containing respectively 30% ethanol, 70% ethanol and 100% ethanol. Each dehydration step lasted about ten minutes. Afterwards, I removed the thorax with the legs and I carefully placed it on a drop of Euparal (figure 4). The same was done with the abdomen, taking care to place it ventrally in order to study the shape of the aedaegus and the parameres (figure 5). The glass slides was dried in a stove at 40 °C for 24 hours. The next day, I placed a drop of Euparal on the four body parts and covered them with a round cover slip. The glass slide was again dried in the stove at 40 °C for 24 hours. Identification to genus level was done using Boorman (1997). Identification to species level was established by comparing the genitalia to the original description and illustration published by Edwards (1926) (figure 6).

1. Typical landscape of Ganzenhoek with a pond, low dune vegetation and forest. Foto: Casper Zuyderduyn
1. Karakteristiek landschap van Ganzenhoek met een poel, lage duinvegetatie en bos.

2. Head of *Stilobezzia lutacea*. Note that the flagellomeres are broken off. Foto: Yvonne van Dam
2. Kop van *Stilobezzia lutacea* met gebroken flagellomeren.

3. Wing of *Stilobezzia lutacea*. Foto: Yvonne van Dam
3. Vleugel van *Stilobezzia lutacea*.

Identification

The subfamily Ceratopogoninae can be identified by the absence of an empodium and the shape of the radial cells (figure 3). Members of the Ceratopogoninae have two radial cells (sometimes the radial cells are obsolete). *Stilobezzia* can be identified by the M fork that is distal to the crossvein r-m, the presence of two radial cells with the first one rhomboid in shape and much shorter than the second one (figure 3), the number of palpal segments (figure 2), absence of sensilla coeloconica (peg-like sense organs from deep pits) (Urbanek *et al.* 2014) on the third antennal segment, and the shape of the fourth tarsomere (figure 7).

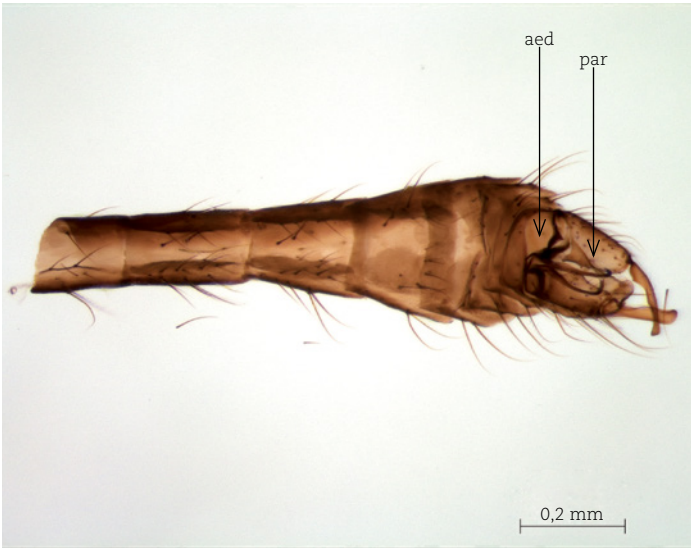
Stilobezzia has five palpal segments, with the third one having a small sensory pit (figure 2). The fourth tarsomere of *Stilobezzia* is cordiform (figure 7). The presence or absence of the sensilla coleoconica in the specimen that I studied could not be verified because the antennae were missing, but the combination of the other characters made the identification of the genus unquestionable.

The body of *Stilobezzia* is rather slender and the fore femora are unarmed (figure 4). *Stilobezzia lutacea* can be recognized by the shape of the parameres which are separately curved and bifid at the apex (figure 5). The other species of the genus known from Northern Europe have much thicker parameres.

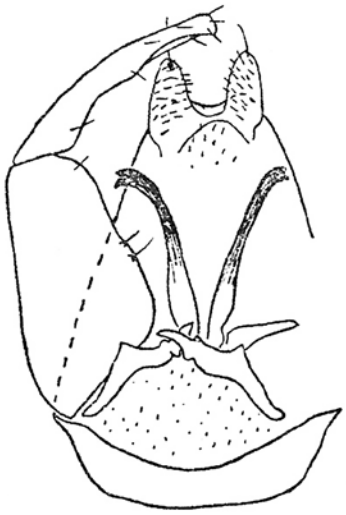
Notes on biology and distribution

The genus *Stilobezzia* is placed in the subfamily Ceratopogoninae, tribe Ceratopogonini (Wirth & Grogan 1988). Members of this tribe are predaceous on soft bodied insects. Females of Ceratopogonini have been observed entering the swarms of small Chironomidae and Ephemeroptera to feed. According to Wirth & Grogan (1988), males of many genera within Ceratopogonini also enter prey swarms in order to mate and are consumed by the females during copulation. Females of *Stilobezzia* feed mainly on midges of the family Chironomidae (Wirth & Spinelli 1992). Larvae of *Stilobezzia* are aquatic or semi-aquatic and can be found in small ponds, lakes, rice fields, rock pools

4. Thorax and legs of *Stilobezzia lutacea*. Note that the thorax and the legs were cleared in 10% KOH. Foto: Yvonne van Dam
4. Thorax en poten van *Stiolobezzia lutacea*. De thorax en de poten zijn in 10% KOH opgehelderd.



5. Male genitalia of *Stilobezzia lutacea*. The abdomen was cleared in 10% KOH. Abbreviations: aed=aedeagus, par=parameres. Foto: Yvonne van Dam
5. Mannelijke genitaliën van *Stilobezzia lutacea*. Het abdomen was in 10% KOH opgehelderd. Afkortingen: aed=aedeagus, par=parameren.



6. Illustration of male genitalia of *Stilobezzia lutacea* by Edwards (1926).
6. Tekening van de mannelijke genitaliën van *Stilobezia lutacea* door Edwards (1926).

7. Shape of the fourth tarsomere of *Stilobezzia lutacea*. Foto: Yvonne van Dam
7. Vorm van de vierde tarsomeer van *Stilobezzia lutacea*.

and tree holes (Alwin & Szadziewski 2012). Larvae of Ceratopogonini are encountered among mats of aquatic vegetation in contrast to larvae of others tribes of the Ceratopogoninae, which prefer the more open waters of streams and ponds (Wirth & Grogan 1988).

Stilobezzia lutacea is known from France, Great Britain, Germany and Ireland (Szadziewski *et al.* 2013). This probably does not reflect the true distribution of this species. The limited knowledge of the Ceratopogonidae is due to their small size, which makes them go unnoticed, and the fact that identifications to the species level are time consuming. Moreover, as far as I know, there is no comprehensive key covering the family for Europe, adding another barrier to the study of this intriguing family.

Adding *S. lutacea* brings the number of Ceratopogonidae species known in the Netherlands to 111 and the total number of *Stilobezzia* species to four.

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References

Alwin A & Szadziewski R 2012. Biting midges of the genus *Stilobezzia* Kieffer, 1911 in Poland (Diptera: Ceratopogonidae). Polish Journal of Entomology 81: 365-382.

Boorman J 1997. Biting midges (Ceratopogonidae). In: Contributions to a Manual of Palaearctic Diptera, Volume 2 (Papp L & Darvas B eds): 349-368. Science Herald.

Edwards FW 1926. On the British biting midges (Diptera, Ceratopogonidae). Transactions of the Royal Entomological Society 74: 389-426.

Knoz J & Beuk PLTh 2016. Family Ceratopogonidae. In: Checklist of the Diptera of the Netherlands (Beuk PLTh ed). Available on www.diptera-info.nl/news.php?fam=Ceratopogonidae [accessed on December 19, 2018].

Szadziewski R, Borkent A & Dominiak P 2013. Fauna Europea: Ceratopogonidae. In: Fauna Europea: Nematocera version 2.6.2 (De Jong H ed). Available on: www.faunaeur.org [accessed December 19, 2018].

Urbanek A, Piotrowicz M, Szadziewski R & Gilka W 2014. Sensilla coeloconica ringed by microtrichia in host seeking biting midges. Medical and Veterinary Entomology 28: 355-363

Wirth WW & Grogan WL Jr 1988. The predaceous midges of the world (Diptera: Ceratopogonidae; Tribe Ceratopogonini). Flora & Fauna Handbook 4. E.J. Brill.

Wirth WW & Spinelli GR 1992. American predaceous midges of the subgenus *Eukraiohelea* of *Stilobezzia* (Diptera: Ceratopogonidae). Florida Entomologist 75: 342-349.

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Samenvatting

***Stilobezzia lutacea*, een nieuwe knut voor Nederland (Diptera: Ceratopogonidae)**

In 2018 hebben Dunea, EIS Kenniscentrum Insecten, Staatsbosbeheer en Waarneming.nl het 5000-soortenjaar georganiseerd in het Nationaal Park Hollandse Duinen. Ik heb exemplaren van de families Psychodidae (motmuggen) en Ceratopogonidae (knutjes) geïdentificeerd. Tussen de Ceratopogonidae, bevond zich een nieuwe soort voor Nederland. Het betreft een mannetje *Stilobezzia lutacea* dat werd gesleept uit de vegetatie rondom een poel in Ganzenhoek (Meijendel). Het exemplaar werd op een objectglas geprepareerd en de genitaliën vergeleken met de tekening in de oorspronkelijk publicatie. *Stilobezzia lutacea* is een rover die voornamelijk kleine dansmuggen eet. De larven zijn aquatisch of semi-aquatisch.

Pasquale Ciliberti
Naturalis Biodiversity Center
Leiden, the Netherlands
pasquale.ciliberti@naturalis.nl