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

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KEY WORDS
Ceratopogonini, dunes, faunistics, inventory

Entomologische Berichten 79 (4): 143-146

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-soorten-jaar’). 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


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. 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).
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 coeloconica 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.
and tree holes (Alwin & Szadziewski 2012). Larvae of Ceratopogonini are encountered among mats of aquatic vegetation in contrast to larvae of other 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.

Acknowledgments

Many thanks to Niels Jan Dek for collecting the species and sending the material to me. I would like to thank Dr. Herman de Jong for his comments on the first draft of this manuscript. Many thanks to Yvonne van Dam for making the pictures of the specimen, Casper Zuyderduyn for providing me with a picture of Ganzenhoek, and Martijn Kos for helping me with the Dutch abstract.
References

Accepted: March 16, 2019

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.

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