

Three species of moth flies (Diptera: Psychodidae) new for the Netherlands

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KEY WORDS

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New records and annotated genital illustrations are presented of three species of Psychodidae not previously recorded in the Netherlands, namely *Panimerus goetghebueri* (Tonnoir, 1919), *Seoda ambigua* (Eaton, 1893) and *Seoda schlitzensis* (Wagner, 1975). The distribution of each species based on the literature is briefly discussed. Adding these species to previous checklists of Psychodidae species from the Netherlands gives a total fauna of 57 species. Because few entomologists in the Netherlands study Psychodidae, more species are expected.

Introduction

Moth flies, members of the family Psychodidae, are small nematoceros flies which are readily recognizable by their characteristic habitus (Withers 1989) (figure 1). Their most important synapomorphies include the antennae with ascoids, hyaline sensory/secretory organs, and the wing venation, with 4-5 R veins, 4 M veins and 1-2 Cu veins (figure 2). The group is distributed worldwide with approximately 3000 described species. New species are continuously described (e.g. Beran et al. 2010, Kvifte et al. 2013, Omelková & Ježek 2012, Salmela et al. 2012, Wagner & Kvifte 2015).

The immatures can be found in stagnant waters, in running waters, on mud banks, in decomposing organic material, in rotten wood, on dung, and in higher fungi. Furthermore, a few species can breed in sewage filters, where they, if present in large numbers, can become a nuisance to workers. Perhaps the most notorious breeding place of some moth flies is in toilets and bathrooms, where larvae of for example *Clogmia albipunctata* (Williston, 1893) and some *Psychoda* species graze on bacteria accumulating in not optimally working sewer systems. However, due to their secretive behaviour and small size, the ecology and biology of moth flies is little known, except for the medically important subfamily Phlebotominae (not present in the Netherlands).

The family is divided into six extant subfamilies, namely Bruchomyiinae, Horaiellinae, Phlebotominae, Psychodinae, Sycoracinae and Trichomyiinae. The Dutch Psychodidae belong to three of the six subfamilies, namely Psychodinae, Sycoracinae and Trichomyiinae. The Sycoracinae in the Netherlands are thus far only known from a photograph taken in Giethoorn, Overijssel, which cannot be identified with certainty, but is likely to be *Sycorax silacea* Haliday, 1839 (Boumans 2011). Most species of Psychodidae in the Netherlands belong to the subfamily Psychodinae.

The first checklist of the Dutch Psychodidae was published by Barendrecht (1934) and included 34 species. The subsequent checklist reported 48 species (Wagner & Beuk 2002). Recent

faunistic work by Boumans (2009a, 2009b, 2011) and Cuppen (2009) resulted in five additional species to the Dutch fauna. A new species to science was described by Omelková & Ježek (2012), based on material collected in the Netherlands. The website www.nederlandsesoorten.nl reports 52 established species (on 9.i.2017), considering the status of two species added by Boumans (2009b, 2011) as not yet verified.

In this article we add three new species to the Dutch Psychodidae fauna: *Panimerus goetghebueri* (Tonnoir, 1919), *Seoda ambigua* (Eaton, 1893) and *Seoda schlitzensis* (Wagner, 1975), bringing the total number of species in the Netherlands to 57.

Taxonomy

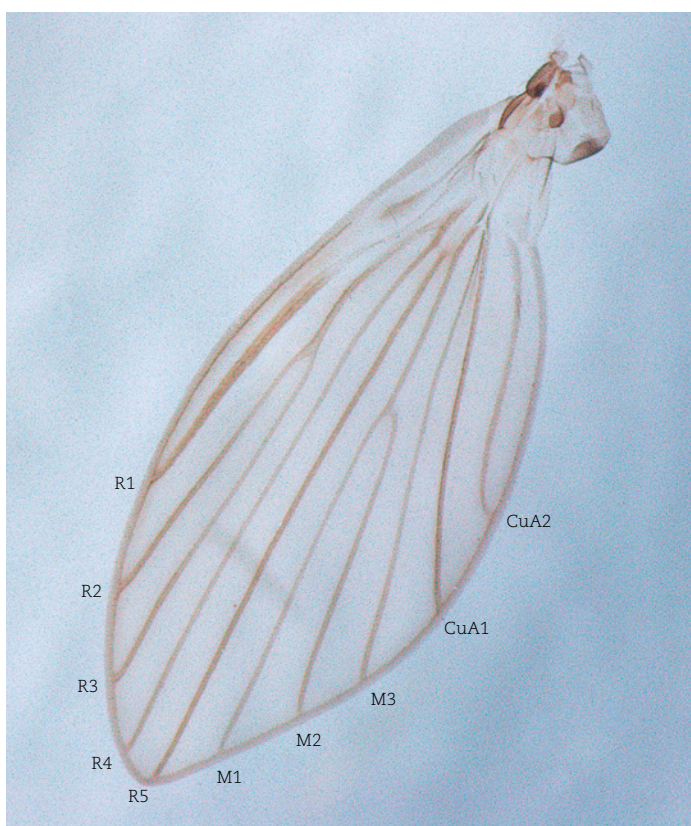
The genera *Seoda* and *Panimerus* belong to the subfamily Psychodinae. Classification of this subfamily at the tribal level has been historically subject of different interpretations, making the study of this family troublesome for non-specialists. In the recent literature, the species have mostly been placed together within the genus *Telmatoscopus* in the tribes Pericomaini (as Pericomini by Enderlein 1935), Psychodini (Enderlein 1937), *Telmatoscopini* (Vaillant 1971), Paramormiini (Ježek 1984) and Mormiini (Vaillant 1990). Most authors currently follow Ježek (1984) in placing this assemblage in Paramormiini (e.g. Duckhouse 1987, Quate 1996, Curler & Courtney 2009, Salmela et al. 2014). Recently, however, this tribe has been suggested to be paraphyletic (Espindola et al. 2012, Kvifte 2014). More study is needed to accurately classify the diversity of Psychodinae.

The nomenclature and taxonomy of *Telmatoscopus* was revised by Kvifte (2014), reinstating the genus *Seoda* for some species previously treated as *Telmatoscopus* by other authors. This was due to these species being structurally quite different from *Telmatoscopus advena* (Eaton, 1893), which was designated as the type species of *Telmatoscopus* by Quate (1965). Three other invalid type species designations for *Telmatoscopus* exist, which has caused some of the confusion.



1. Habitus of *Seoda similis*. Photo: Weia Reinboud

1. Habitus van *Seoda similis*.



2. Wing of *Seoda ambigua*. Photo: Pasquale Ciliberti
2. Vleugel van *Seoda ambigua*.

Material and methods

The *Seoda* specimens recorded in this publication were collected with hand nets. *Seoda ambigua* was collected in the dunes of Meijendel in Wassenaar (province of Zuid-Holland), while *Seoda schlitzensis* was collected on the side of a ditch just outside the town of Hazerswoude (province of Zuid-Holland). The *Panimerus goetghebuerei* specimen was collected in a Malaise trap run by the Stichting Het Zeeuwse Landschap at St. Philipsland (province of Zeeland), in the reed belt of an old duck hunting ground.

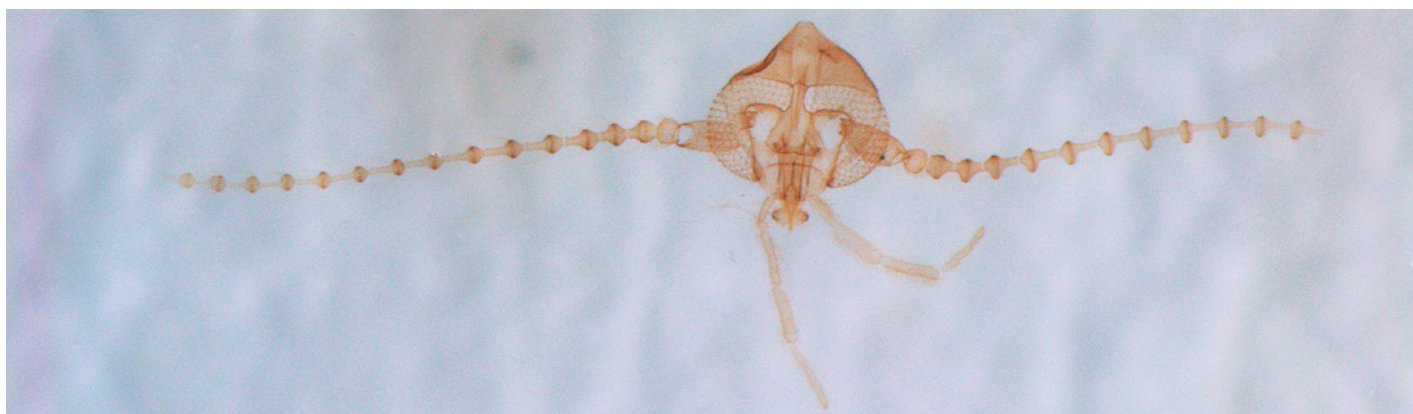
Specimens were preserved in alcohol and subsequently mounted on microscope slides in euparal. Prior to dissection, legs of some specimens were removed and submitted for DNA barcoding by the German Barcode of Life project at the Alexander Koenig Research Museum (ZMFK). However none of the specimens were successful sequenced.

Voucher material is in the following collections: PC: private collection of the first author; ZMUB: Natural History Collections, University Museum of Bergen, Bergen, Norway. Identifications were performed using Vaillant (1971, 1972), Wagner (1975) and Withers (1989). Nomenclature follows Kvifte (2014) and Salmela et al. (2014).

New species for the Netherlands

Panimerus goetghebuerei (Tonnoir, 1919)

First record from the Netherlands (figure 4): 25.vi.2008, Noordweg 51, St. Philipsland (province of Zeeland), 51°6'47.278 N 4°13'7.125 E, 1 male, ZMUB. *Panimerus goetghebuerei* was described



3. Head of *Seoda ambigua*. Note that the entire specimen was cleared in KOH 10% in order to study the genitalia. Photo: Pasquale Ciliberti
3. Kop van *Seoda ambigua*. Dit exemplaar is in 10% KOH opgeweekt om de genitaliën te bestuderen.



4. Localities of *Panimerus goetghebuerei* (dot), *Seoda ambigua* (square) and *S. schlitzensis* (triangle) in the Netherlands.

4. Vindplaatsen in Nederland van *Panimerus goetghebuerei* (cirkel), *Seoda ambigua* (vierkant) en *S. schlitzensis* (driehoek) in Nederland.

from Belgium and has subsequently been recorded from Algeria, Czech Republic, Hungary, Tunisia and the United Kingdom (Vailant 1971, Ježek 2003, Afzan & Belqat 2016).

Seoda ambigua (Eaton, 1893)

First record from the Netherlands (figure 4): 9.viii.2013, Vinckenhoek, Meijendel, Wassenaar (province of Zuid-Holland), 52°114 N 4°377 E, 2 males, PC. *Seoda ambigua* was previously recorded from Belgium, Denmark, Ireland and the United Kingdom (Wagner 2004, Withers & O'Connor 1992).

Seoda schlitzensis (Wagner, 1975)

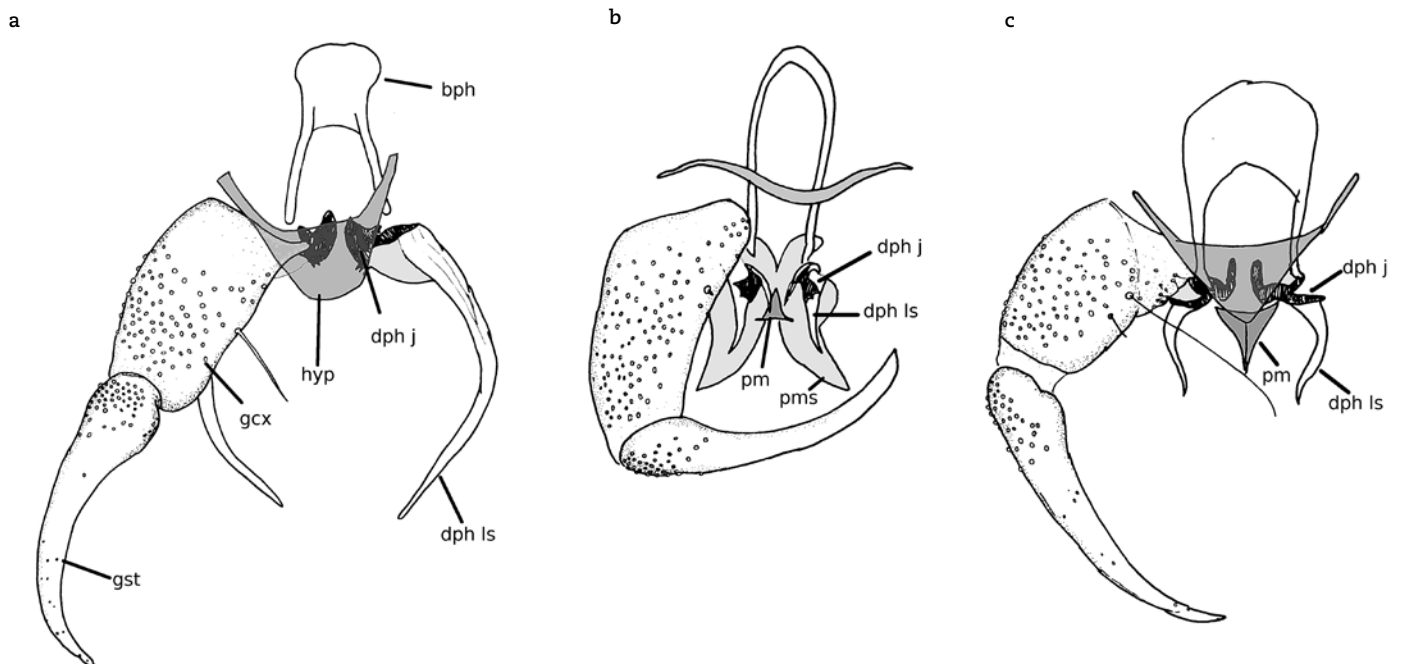
First record from the Netherlands (figure 4): 10.vi.2013, Papenpad, Hazerswoude (province of Zuid Holland), 52°114 N 4°611 E, 1 male, PC. This is the first record of *Seoda schlitzensis* since its original description, which was based on specimens from Germany (Wagner 1975).

Identification

Members of the subfamily Psychodinae are characterized by having two veins between the two forked veins R_{2+3} en M_{1+2} (figure 2) and the presence of an eye bridge (figure 3). The tribe Paramormiini, in the sense of Ježek (1984) and Duckhouse (1987), can be recognized on the combination of flagellomeres with necks (figure 3), ascoids of flagellomeres with branches all pointing in the same direction, palp segment 4 with reduced sclerotization, and wing vein R_{2+3} not arising from R4 (figure 2).

The genera *Panimerus* and *Seoda* share many characters, including the clypeus fused with the frons, flagellomeres with a pair of mostly digitiform ascoids and rings of smaller filiforms ones, R_5 terminating below the wing apex (figure 2), basiphallus broadly U-shaped without a medial keel, and each distiphallomere composed of two lateral stylets (figure 5).

Adult male *Panimerus* are easily separated from *Seoda* on the



5. Male genitalia in dorsal view. (a) *Panimerus goetghebuerei*; (b) *Seoda ambigua*; (c) *Seoda schlitzensis*. Abbreviations: bph - basiphallus; dph j - distiphallallic joint; dph ls - distiphallallic lateral stylet; gcx - gonocoxite; gst - gonostylus; hyp - hypandrium; pm - parameral sclerite; pms - parameral sheath. Drawings: Gunnar Mikalsen Kvifte

5. Mannelijke genitaliën in dorsaal aanzicht. (a) *Panimerus goetghebuerei*; (b) *Seoda ambigua*; (c) *Seoda schlitzensis*. Afkortingen: bph - basifallus; dph j - geleding van distifallusgewricht; dph ls - lateraal stylet van distifallus; gcx - gonocoxiet; gst - gonostylus; hyp - hypandrium; pm - parameraalscleriet; pms - paramerale schede.

presence of corniculi (club-shaped sensory organs of the vertex). Moreover, in all North-European species except one, the pedicel is highly asymmetrical. The absence of clear apomorphies for *Seoda* may suggest the genus to be paraphyletic to *Panimerus*. More data are needed to establish their inter-relationships with confidence.

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Samenvatting

Drie motmugjes (Diptera: Psychodidae) nieuw voor Nederland

Motmugjes (Psychodidae) zijn als groep gemakkelijk te herkennen aan hun karakteristieke habitus. Identificatie op soortniveau is echter veel lastiger vanwege hun geringe grootte en de noodzaak om details van antennen en mannelijke genitaliën te bestuderen. In dit artikel worden drie voor Nederland nieuwe soorten vermeld. Het betreft een soort van het genus *Panimerus* en twee soorten van het genus *Seoda*. Ze behoren alle tot de subfamilie Psychodinae. *Panimerus goetghebuerei* is verzameld in Zeeland met een Malaiseval. *Seoda ambigua* en *S. schlitzensis* zijn verzameld met een handnet nabij Leiden. De mannelijke genitaliën worden afgebeeld en de verspreiding van de soorten wordt kort besproken.



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