

Studies on the Danish Psychodidae (Diptera Nematocera)

by

B. Overgaard Nielsen
Zoological Museum, Copenhagen.

Content:

Introduction	p. 127
Material and methods	p. 128
Preparation	p. 131
List of localities	p. 131
Records of the Danish <i>Psychodidae</i>	p. 132
Subfamily <i>Sycoracinae</i>	p. 132
Genus <i>Sycorax</i> Haliday	p. 132
Subfamily <i>Trichomyiinae</i>	p. 133
Genus <i>Trichomyia</i> Haliday	p. 133
Subfamily <i>Psychodinae</i>	p. 133
Genus <i>Clytocybus</i> Eaton	p. 133
Genus <i>Pericoma</i> Walker	p. 134
Subgenus <i>Ulomyia</i> Walker	p. 136
Genus <i>Telmatoscopus</i> Eaton	p. 137
Subgenus <i>Mormia</i> Enderlein	p. 139
Subgenus <i>Panimerus</i> Eaton	p. 140
Subgenus <i>Peripsychoda</i> Enderlein	p. 141
Genus <i>Psychoda</i> Latreille	p. 142
Subgenus <i>Philosepedon</i> Eaton	p. 146
Subgenus <i>Threticus</i> Eaton	p. 146
Discussion	p. 146
Acknowledgements	p. 149
List of species	p. 149
Literature	p. 150

In several European countries the Psychodid fauna is rather well-known. The British Psychodids were treated by Eaton in several works, later by Tonnoir (1940), Satchell (1947 a & b, 1949), and Freeman (1950, 1953). In Belgium they were studied by Tonnoir (1919 a & b, 1920, 1922 a & b), in Holland by Barendrecht (1934), in Germany in several works by Feuerborn and by Jung (1953, 1956). In Sweden investigations on the Psychodids were started by Berdén (1952, 1954) but owing to his premature death no further publications appeared.

In Denmark, however, this highly interesting family has been much neglected and since the work of Späreck (1920) no

special investigations on the Psychodids have been carried out. Thomsen and Hammer (1936), Berg (1938, 1948), Anthon (1943) and Wesenberg-Lund (1943) give some information on the Psychodids but this is, for the most part, without reference to species. Berg (1938) mentions a larva which closely agrees with *Pericoma canescens* (Meigen), but this identification was based on descriptions and figures by Miall and Walker (1895) who, as pointed out by Satchell (1949), erroneously described the larva of *Pericoma neglecta* Eaton as *Pericoma canescens* (Meigen).

Tonnoir (1922 a) in his synopsis on the European species of *Psychoda* briefly refers to *Psychoda (Philosepedon) humeralis* Meigen and *Psychoda (Threticus) lucifuga* (Walker) from Denmark.

Apart from these sporadic notes, the Psychodid fauna of Denmark is unknown; thus the purpose of the present paper is to increase the amount of knowledge in this field, without, of course, claiming to be exhaustive. In this connection the subject will need to be studied at greater length.

Material and methods.

The material on which the present study is based was obtained from various sources.

The author's collection: The bulk of the material was collected by the author and amounts to about 8000 imagines and 200-300 larvae. Most of the adults were collected by means of a sweep net and an aspirator. Sweeping is a very simple and efficient method of collecting *Psychodidae* in huge numbers from vegetation, but great care must be taken, as it is a well-known fact that these insects are very fragile and are easily damaged by rough treatment. The tip of the antennae are particularly weak, especially within the genus *Psychoda*, where the antennae offer important taxonomical characters. A special sweep net was used, consisting of a bag of fine muslin enclosed in and protected by an open-bottomed canvas sleeve fastened to a solid ring. After a few sweeps through the vegetation, the contents of the net were examined and the Psychodids quickly removed by means of the aspirator. In this way large numbers of undamaged specimens were obtained.

Large numbers of adults were collected by means of the aspirator or by tubing them off the vegetation. The same methods were applied to indoor species.

The possibility of collecting Psychodids by means of a light trap has not yet been employed, although a few specimens were collected quite accidentally at various sources of light. The remaining adults of the author's collection were reared.

The adults were killed off by vapours of ethyl acetate and preserved in alcohol (70 %).

As regards the larvae, samples of mud, dung, decaying vegetable matter (e. g. leaves, apples, seaweed, and various plant material washed ashore along lakes), moss cushions from springs and brooks were collected and sorted by hand or by a flotation method (7 % aqueous magnesium sulphate). For the extraction of larvae the Baermann funnel modified by C. Overgaard (1948) proved to be very efficient and time saving; funnels of 12 cm diameter were used.

The larvae were killed off in hot water and preserved in alcohol (70 %).

Rearing caused no difficulties; the larvae were kept in Petri dishes or flatbottomed tubes containing a little of the natural breeding medium of the different species.

In addition to the author's own collection, he is indebted to the following who have been of great help in providing valuable material: Bent Christensen, Zoological Laboratory, University of Copenhagen (for larvae extracted by the modified Baermann funnel), stud. mag. Birger Jensen (for a particularly large number of *Psychoda* species taken at light, mostly from the protected area at Strødam, Hillerød), cand. mag. Leif Lyneborg, Zoological Museum, Copenhagen (for adults collected in Southern Jutland), stud. mag. Axel Michelsen (for material of indoor species) and Professor, Dr. Mathias Thomsen, Director of the Zoological Laboratory, Royal Veterinary and Agricultural College (for Psychodids collected at light at Arrenakke, Northern Zealand).

In addition cand. mag. Jens Thorup, Freshwater Biological Laboratory, University of Copenhagen, Hillerød, permitted the author to use material from his collection of larvae from various springs. This material which comprised about 250 slides was identified by Mr. Thorup and checked by the author.

The collections of the Zoological Museum, Copenhagen: A collection of Psychodids (about 200 pinned specimens) kept in the Zoological Museum, Copenhagen, was placed at the author's disposal. A few specimens in this collection were identi-

fied by Tonnoir and the rest by Berdén and the author. Owing to the death of Berdén no publications on the Danish Psychodids

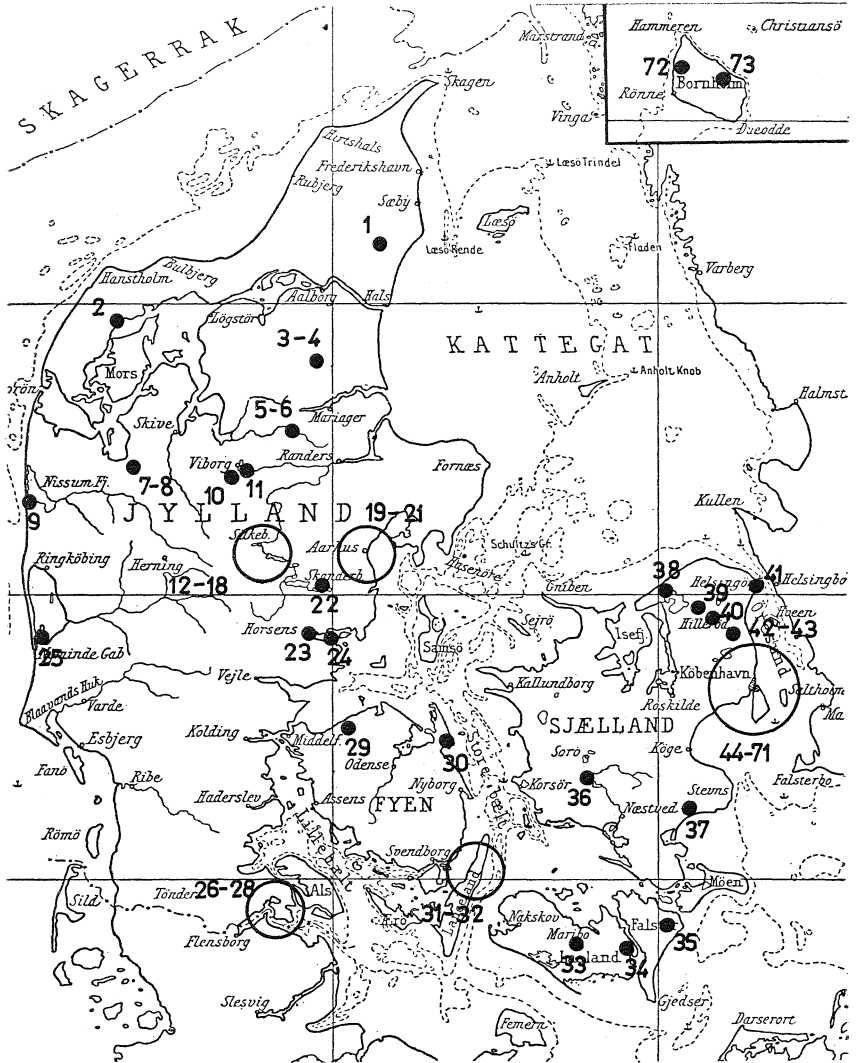


Fig. 1. See text p. 131.

based on this material appeared, and the author is pleased to publish it here along with his own collections. All specimens were examined by the author and the identifications checked.

The collection of the Zoological Museum comprises the material of Staeger and Westermann; the remainder was collected by F. Søgaard Andersen, A. F. Bruun, W. Buch, J. Edelmann, P. Esben-Petersen, N. Haarløv, H. J. Hansen, H. Hjortaa, P. Johnsen, W. Lundbeck, F. Madsen, A. Michelsen, S. L. Tuxen, W. Wüstnei and Bente Zimsen.

All the specimens collected by Staeger are without date and locality. In all probability they were collected in the vicinity of Copenhagen (Staeger 1838/39).

A very small collection of Psychodids (mostly larvae) stored in alcohol is kept in the Zoological Museum. This material was collected by H. Anthon, J. P. Kryger, H. Lemche, R. Spärck, H. P. S. Sønderup and S. L. Tuxen and was identified by R. Spärck and the author.

Preparation

The larvae and adults were treated according to Jung (1956). The adults were dissected and mounted in Canada balsam under two 15 × 15 mm coverslips on the same slide. Head, thorax and wings under one, abdomen with the genitalia under the other. The dissection was performed by means of two fine needles made of tungsten wire and pointed by dipping in molten NaNO₂.

It was impossible to make slides of all specimens collected but approximately 700 were sorted out and mounted.

The identification was chiefly based on the papers by Freeman (1950) and Jung (1956).

The author's collection will later be presented to the Zoological Museum, Copenhagen.

List of localities

Map, fig. 1 p. 130.

Jutland:	7. Flyndersø *)
1. Allerup Bakker	8. Hellesø *)
2. Thisted (S. L. Tuxen)	9. Nissum fjord *
3. Ravnkilde *)	10. Hald (W. Lundbeck, H. J. Hansen)
4. Kousbæk *)	11. Rindsholm
5. "Idasminde", Sdr. Onsild	12. Funder
(Birger Jensen)	13. Silkeborg
6. Tjele (Birger Jensen) *)	14. Laven

*) localities in which the author has collected.

- | | |
|-------------------------------------|--------------------------------------------------|
| 15. Tvillum | 42. Eskemose skov *) |
| 16. Sminge | 43. Nebbegaard plantage *) |
| 17. Kathrinedal | 44. Søndersø *) |
| 18. Vorvadsbro | 45. Zoologisk have, København *) |
| 19. Aarhus (H. J. Hansen) | 46. Kagsmosen *) |
| 20. Stjære | 47. Christianshavns vold *) |
| 21. Marselisborg | 48. Herlev *) |
| 22. Skanderborg | 49. Botanisk Laboratorium *) |
| 23. Horsens (H. J. Hansen) | 50. Egmont H. Petersens Kollegium
(Michelsen) |
| 24. Vorsø (S. L. Tuxen) | 51. Jonstrup vang *) |
| 25. Tipperne (F. Søgaaard Andersen) | 52. Ll. Sejdam *) |
| 26. Hønsnap skov (Lyneborg) | 53. Lyngby sø *) |
| 27. Søgaaard skov (Lyneborg) | 54. Værebros Å *) |
| 28. Rinkenæs skov (Lyneborg) | 55. Kobberdammene *) |
| | 56. Hvidovre (F. Madsen) |
| The Islands: | 57. Rødovre (W. Buch) |
| Funen: | 58. Lyngby (Hjortaa) |
| 29. Gyldensten mose (Michelsen) | 59. Bagsværd (Edelmann) |
| 30. Maale, Hindsholm (Lemche) | 60. Hellerup (W. Lundbeck) |
| Langeland: | 61. København (H. J. Hansen) |
| 31. Tranekær (W. Lundbeck) | 62. Folehaven v. Rungsted (Haarløv) |
| 32. Strandby (W. Lundbeck) | 63. Ørholm (W. Lundbeck) |
| Lolland: | 64. Nørre Fæled *) |
| 33. Maribo (H. P. S. Sønderup) | 65. Avedøre (Bent Christensen) |
| 34. Sundby storskov (Berdén) | 66. Klokkekilde, Slagslunde *) |
| Falster: | 67. Hørsholm (Bent Christensen) |
| 35. Vejringe | 68. Ermelunden (Kryger) |
| Zealand: | 69. Gartnerimosen *) |
| 36. Suserup (Bruun, Zimsen) | 70. Mølleåen (Badstrup sø—Furesø) *) |
| 37. Lilleå, Faxe (Anthon) | 71. Mølleåen (Furesø—Øresund) *) |
| 38. Arrenakke (M. Thomsen) | |
| 39. Strødam (Birger Jensen) | Bornholm: |
| 40. Hillerød (S. L. Tuxen) | 72. Blykobbe (Esben-Petersen) |
| 41. Helsingør *) | 73. Randkløve (P. Johnsen) |

In the preceding list the numbers 70—71 comprise 23 localities distributed along the river Mølleå as shown in fig. 2 p. 133.

Records of the Danish Psychodidae.

In the following the *Psychodidae* hitherto recorded from Denmark are listed in systematical order.

Subfamily *Sycoracinae*

Genus *Sycorax* Haliday

This genus is represented by a few larvae in the author's collection. All of them came from moss cushions from a spring

in Eskemose skov 19th March 1960. The larvae must be referred to *Sycorax tonnoiri* Jung or *Sycorax feuerborni* Jung, which according to Jung (1956) cannot be distinguished.

Subfamily *Trichomyinae*

Genus *Trichomyia* Haliday

Only one European species:

Trichomyia urbica Curtis

In the collections of the Zoological Museum, Copenhagen: 2 ♂♂ without date and locality, 1 ♂ date and locality unknown (from Staeger's collection). Central part of Zealand 1 ♂, date unknown. Hellerup 1 ♂, 1 ♀ 21st July 1902.

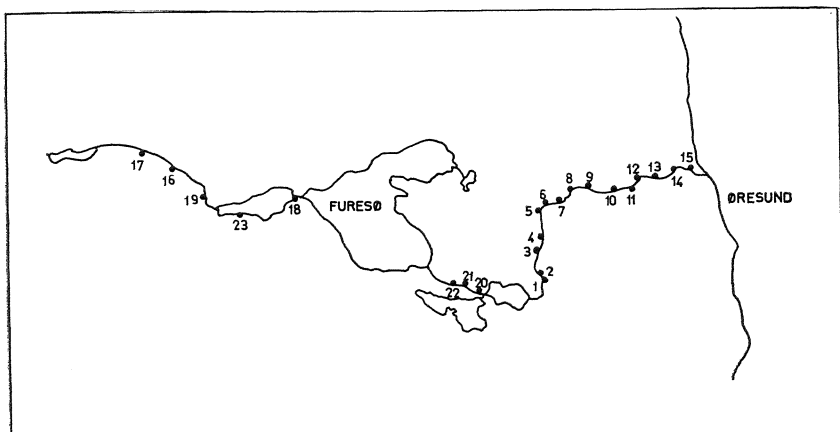


Fig. 2. See text p. 132.

The author has not found *T. urbica* himself, nor was it especially sought after, thus at present almost nothing is known about the occurrence and distribution of this species in Denmark, except that it is probably rare. In Belgium it seems to be very rare (Tonnoir 1919 a) and in Holland it is definitely a rare species (Barendrecht 1934). The distribution of *T. urbica* in Britain was recorded by Freeman (1950).

Subfamily *Psychodinae*

Genus *Clytocerus* Eaton

4 European species known, 2 species recorded from Denmark.

Clytocerus ocellaris (Meigen)

In the collections of the Zoological Museum: 5 ♂♂, 8 ♀♀ without date and locality (from Staeger's collection). Zealand 1 ♀ Sept. 1819 (from Wester-

mann's collection). Falster: Vejringe 2 ♂♂, 2nd Aug. 1910. In the author's collection: Jutland, Hellesø 4 ♂♂, 2 ♀♀, 14th July 1960. Zealand: Strødam 1 ♀, 15th Aug. 1960. Søndersø 1 ♂, 1 ♀, 5th July 1960. Ll. Sejdam 1 ♂, 5th July 1960. Jonstrup vang 1 ♀, July 1960. Kobberdammene 1 ♀, 8th Aug. 1960. Eskemose skov 2 ♂♂ 11th Aug. 1960. Mølleåen at Fuglevad 1 ♂, 22nd July 1960, Mølleåen at Ørholm 1 ♂, 3 ♀♀ 26th July 1960, Mølleåen at Hestetang Huse 1 ♀, 31st July 1960. Fiskebæk 1 ♂, 2nd Aug. 1960. Farum sø 4 ♂♂, 1 ♀, 15th Aug. 1960. Lyngby sø 1 ♂, 1 ♀, 4th Aug. 1960.

Clytocerus ocellaris is a very common species in Zealand and, most probably, all over the country.

Clytocerus rivosus (Tonnoir)

In the author's collection: Zealand: Mølleåen at Brede Skolesti 1 ♂, 22nd July 1960. Mølleåen at Ørholm 1 ♂, 25th July 1960. Mølleåen at Stampen 2 ♂♂, 29th July 1960. Mølleåen at Mathildebro 1 ♂, 29th July 1960.

This species is hitherto recorded from Zealand only.

Genus **Pericoma** Walker

Subgenus **Pericoma** s. str.

Pericoma palustris (Meigen)

In the collections of the Zoological Museum: Folehaven at Rungsted 4 ♂♂, 3 ♀♀, 9th May 1943. In the author's collection: Eskemose skov 1 ♂, reared May 1960.

Pericoma cubitospinosa Jung

This species is represented by a few larvae collected in a spring at Virklund, Silkeborg (Jutland), July 1960.

Pericoma mutua Eaton

In the collections of the Zoological Museum: Zealand: 1 ♂ labelled Zealand, Sep. 1819 (from Westermann's collection). Jutland: Aarhus 6 ♂♂, 3 ♀♀ without date. Hald 1 ♂, 6 ♀♀, 28th June 1910. Tvilum 1 ♂, 2 ♀♀, 26th June 1910. Funder 1 ♂, 1 ♀, 19th June 1910. Funder 2 ♂♂, 1 ♀, 17th June 1912. Laven 1 ♂, 7th July 1912. In the author's collection: Jutland: Ravnkilde 8 ♂♂, 1 ♀, 10th July 1960. Kousbæk about 150 specimens (♂♂ and ♀♀), 11th July 1960. Hønsnap skov 2 ♂♂, 2 ♀♀, 28th June 1960. Zealand: Eskemose skov 2 ♂♂, 3rd July 1960. Mølleåen at Ørholm several specimens (♂♂ and ♀♀), 26th July 1960. The larvae were abundant in moss cushions from springs at Tjele, Jutland and Nebbegaard plantage, Zealand.

Pericoma compta Eaton

In the collections of the Zoological Museum: 2 ♂♂ without date and locality (from Staeger's collection). Zealand 1 ♂, Aug. 1831 (from Westermann's collection).

Pericoma nubila (Meigen) (= *trivialis* Eaton)

A very common species, distributed all over the country. In the collections of the Zoological Museum: 4 ♂♂ without date and locality (from Stae-

ger's collection). Zealand: 1 ♂, 1 ♀, without date labelled Zealand (from Westermann's collection). The following localities can also be given: København, Lyngby mose, Suserup. Falster: Vejringe. Langeland: Tranekær. Bornholm: Blykobbe. Funen: Gyldensten mose. Jutland: Horsens, Marselisborg, Stjære bakker, Allerup bakker, Vorvadsbro, Sminge, Kathrinedal, Hald, Funder. In the author's collection: Zealand: Strødam, Værebros Å, Eskemose skov, Ll. Sejdum, Kobberdammene, Fiskebæk, Lyngby Åmose and Louisekilde. Mølleåen at the following localities: Sorgenfri, Fuglevad, Ørholm, Stampen, Rådvad, Mathildebro, Rødebro, Hestetang Huse and Farum sø. Jutland: Rinkenæs skov, Søgård skov, Hellesø.

The larvae were abundant in moss cushions from a spring at Eskemose skov and a few specimens were collected from a spring at Lilleå, Faxe.

Pericoma pulchra Eaton

In the author's collection: Jutland: Ravnkilde 2 ♂♂, 10th July 1960. Zealand: Mølleåen at Ørholm 2 ♂♂, 26th July 1960 (at a spring).

Further discussion in connection with *P. nigricauda* Tonnoir.

Pericoma nigricauda Tonnoir

In the collections of the Zoological Museum: Zealand: Lyngby mose 2 ♂♂, 28th July 1911 (A. Tonnoir det.).

In the author's collection: Zealand: Strødam 2 ♂♂, 1 ♀ 7th Aug. 1960, Strødam 2 ♀♀, 12th Aug. 1960, Kobberdammene 2 ♂♂, 8th Aug. 1960, Eskemose skov 1 ♀, 11th Aug. 1960, Mølleåen at various localities: Sorgenfri 1 ♀, 22nd July 1960, Fuglevad 1 ♀, 22nd July 1960, Brede skolesti 1 ♂, 1 ♀, 22nd July 1960, Ørholm 2 ♂♂, 1 ♀, 25th July 1960, Ørholm 3 ♂♂, 2 ♀♀, 26th July 1960, Stampen 1 ♂, 1 ♀, 26th July 1960, Stampen several specimens 29th July 1960, Rådvad 3 ♂♂, 3 ♀♀, 29th July 1960, Mathildebro 1 ♀, 29th July 1960, Rødebro 1 ♀, 29th July 1960, Hestetang Huse 1 ♂, 1 ♀, 31st July 1960, Farum sø several specimens (♂♂ and ♀♀), 2nd Aug. 1960, Lyngby Åmose 1 ♂, 1 ♀, 4th Aug. 1960, Farum sø 1 ♂, 15th Aug. 1960.

This species is very closely related to *P. pulchra* Eaton and no doubt the two species are often confused.

Tonnoir (1919 a) describes the vestiture of the wings, especially the placing of the white markings. Further, he attaches importance to the position of the wing forks as a character distinguishing *P. nigricauda* from *P. pulchra*. In *P. pulchra* the anterior (r_2+r_3) and the posterior (m_1+m_2) forks are stated to be at the same level while in *P. nigricauda* the posterior fork is located closer to the wing root than is the anterior one. However, this serves no useful purpose as a distinguishing character since the two species are alike in this respect. Also in *P. pulchra* the posterior fork is basal to the anterior as described and figured by Jung (1956).

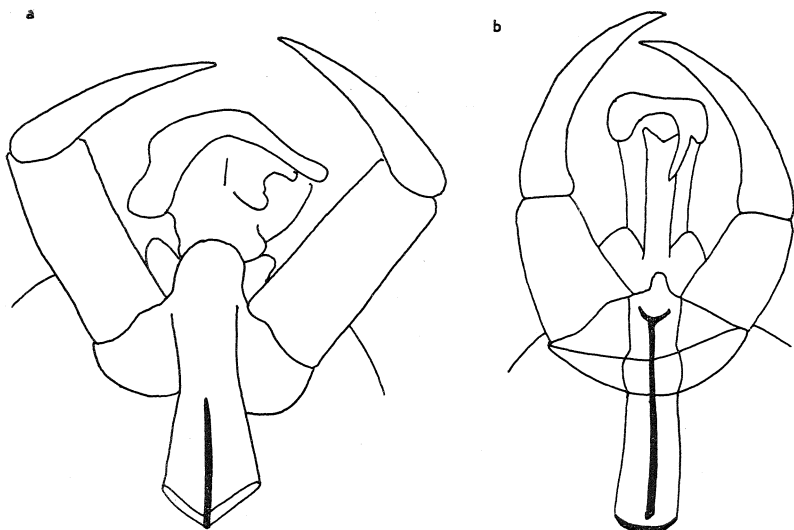


Fig. 3. Coxites and styles of a. *Pericoma pulchra* Eaton and b. *P. nigricauda* Tonnoir.

Reliable identification of these two species can be based on the structure of the male hypopygium and the female subgenital plate. In *P. nigricauda* as well as in *P. pulchra* the aedeagus is asymmetrical and very complicated, but they are nevertheless, strikingly different. The structure of the style and coxite of the two species as in fig. 3.

Number of retinacula: *P. pulchra* 8—12 and *P. nigricauda* 7—8.

Pericoma blandula Eaton

In the author's collection: Jutland: Ravnkilde 7 ♂♂, 7 ♀♀, 10th July 1960.

Pericoma canescens (Meigen)

In the collections of the Zoological Museum: Central part of Zealand 2 ♂♂, 1 ♀ without date.

Pericoma stammeri Jung

This species is represented by a few larvae collected in Rold kilde (Jan. 1957 and Oct. 1959).

Pericoma trifasciata (Meigen)

This species is represented by a single larva collected from a spring at Suserup, Zealand, Sept. 1960.

Subgenus **Ulomyia** Walker

Hitherto only one species recorded from Denmark.



Fig. 4. From the spring Ravnkilde, Jutland.

Pericoma (Ulomyia) fuliginosa (Meigen)

A common species.

In the collections of the Zoological Museum: 1 ♂, 3 ♀♀, without date and locality (from Staeger's collection). The following localities can also be given. Jutland: Rindsholm, Laven, Funder, Hald. Zealand: Suserup. Bornholm: Randkløve. In the author's collection: Jutland: Ravnkilde. Zealand: Eskemose skov, Mølleåen at: Fuglevad, Ørholm, Stampen, Mathildebro, Hestetang Huse. The larvae were abundant in mud from a spring in Nebbegaard plantage (Apr. 1960) and from Klokkekilde, Slagslunde (Apr. 1960).

Genus **Telmatoscopus** Eaton

The genus *Telmatoscopus* Eaton includes 4 subgenera (*Telmatoscopus* s. str., *Mormia* Enderlein, *Panimerus* Eaton and *Peripsychoda* Enderlein). According to Jung (1956) 30 European species belonging to these 4 subgenera are sufficiently characterized.

Subgenus **Telmatoscopus** s. str.

Telmatoscopus fraterculus (Eaton)

In the collections of the Zoological Museum: 1 ♂ without date and locality (from Staeger's collection). In the author's collection: Rinkenæs skov, Southern Jutland 1 ♂, 25th June 1960.

Telmatoscopus labeculosus (Eaton)

Only a single specimen recorded: In the author's collection: Flyndersø, Jutland, 1 ♂, 13th Juli 1960, swept in vegetation by the lake.

Telmatoscopus ustulatus (Walker)

In the collections of the Zoological Museum: Tipperne, Western Jutland 1 ♂, 17th Aug. 1946. In the author's collection: Zealand: Strødam 2 ♂♂, 1 ♀, 15th Aug. 1960 swept by a pond. Mølleåen at Rødebro 1 ♂, 29th July 1960.

Telmatoscopus consors (Eaton)

In the author's collection: Koberdammene 2 ♂♂, 8th Aug. 1960, swept in the vegetation by a pond. Mølleåen at Brede skolesti 1 ♂, 22nd July 1960.

Telmatoscopus decipiens (Eaton)

In the collections of the Zoological Museum: Zealand: Suserup 1 ♂, 20th July 1917. In the author's collection: Zealand: Mølleåen at Mathildebro 2 ♀♀, 29th July 1960, Mølleåen at Ørholm (at a spring) 1 ♂, 26th July 1960. Eskemose skov 1 ♀, May 1960 (reared). Sjælsø 2 ♂♂, 1 ♀, May 1960 (reared). Eskemose skov 1 ♂, 2 ♀♀ 3rd July 1960. Eskemose skov 1 ♂, 1 ♀, 11th Aug. 1960.

The larvae were abundant in moss cushions from a spring with calcium rich water (Eskemose skov).

Telmatoscopus soleatus (Walker)

In the author's collection: Zealand: Mølleåen at Ørholm 1 ♀, 26th July 1960, from a spring. Eskemose skov 1 ♀, 3rd July 1960.

Telmatoscopus longicornis (Tonnoir)

In the author's collection: Zealand: Jonstrup vang 3 ♂♂, 1 ♀, May 1960 (reared). Lyngby Åmose 2 ♂♂, 2 ♀♀, 16th June 1960. Værebro å 1 ♀, 27th June 1960. Jonstrup vang 1 ♂, 1 ♀, 18th June 1960. Søndersø 2 ♂♂, 2 ♀♀, 5th July 1960 (in a reed swamp). Jonstrup vang 4 ♀♀, 5th July 1960 from various small ponds. Koberdammene 1 ♀, 8th July 1960. Farum sø 1 ♀, 15th July 1960. Larvae: Jonstrup vang in very moist, decaying vegetable matter, Apr. 1960.

Larvae belonging to *T. soleatus* or *T. longicornis* (according to Jung (1956) the larvae of these two species are indistinguishable): Eskemose skov March 1960, Gartnerimosen May 1960 and Lille Sejdam Nov. 1960.

Telmatoscopus albomaculatus (Wahlgren)

In the collections of the Zoological Museum: 1 ♂ without date and locality (from Staeger's collection). In the author's collection: Nissum fjord, Western Jutland 18th July 1960; about 150 specimens were swept from inside the extensive reed swamp, fig. 5. In this locality *T. albomaculatus* was the only species present. Barendrecht (1934) supposes *T. albomaculatus* to be rare and only locally abundant in Holland. The situation may be similar in Denmark.



Fig. 5. The reed swamp at Nissum fjord.

Telmatoscopus similis Tonnoir

In the author's collection: Zealand: Christianshavns vold 3 ♂♂, 3 ♀♀, 5th July 1960.

Subgenus **Mormia** Enderlein

Hitherto only a single species recorded from Denmark:

Telmatoscopus (Mormia) eatoni Tonnoir

In the author's collection: Sønder sø 2 ♂♂, 2 ♀♀, 5th July 1960. These specimens were swept among dense vegetation dominated by *Urtica dioeca* L.

The larva and breeding site of this species are unknown.

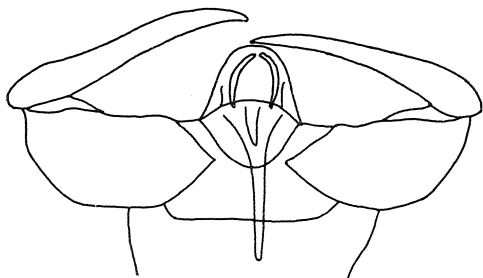


Fig. 6

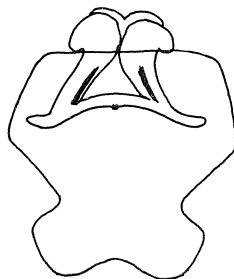


Fig. 7.

Fig. 6—7. *Telmatoscopus (Mormia) eatoni* Tonnoir. Coxites and styles (fig. 6) and female subgenital plate (fig. 7).

Telmatoscopus (Mormia) eatoni was described by Tonnoir (1940) from some greatly damaged specimens collected by Eaton. Tonnoir's (1940) figure 7 b shows coxites and styles with aedeagus, but since the drawing is not quite adequate, the structures are shown here, fig. 6.

Female subgenital plate, not figured by Tonnoir, is shown in fig. 7.

Subgenus **Panimerus** Eaton.

2 species recorded from Denmark:

Telmatoscopus (Panimerus) albifacies Tonnoir

In the author's collection: Jutland: Rinkenæs skov 1 ♂, 25th June 1960. Zealand: Sjælsø 1 ♂, 1 ♀, 25th May 1960, reared from decaying plant material. Eskemose skov 2 ♂♂, 3 ♀♀ 3rd July 1960. Søndersø 1 ♀, 5th July 1960, from a reed swamp. Mølleåen at Fuglevad 1 ♂, 1 ♀ 22nd July 1960. Mølleåen at Ørholm 1 ♂, 2 ♀♀, 25th July 1960. Mølleåen at Stampen 1 ♀, 26th July 1960. Farum sø, 1 ♂, 3 ♀♀, 2nd Aug. 1960. Eskemose skov 1 ♀, 11th Aug. 1960.

Larvae were collected at Lille Sejdam, Nov. 1960.

Telmatoscopus (Panimerus) maynei Tonnoir

Hitherto only a single specimen recorded from Denmark. In the author's collection: Zealand: Eskemose skov 1 ♂, 11th Aug. 1960.

Tonnoir (1920) describes the species but gives no figures. In addition to other distinctive characters the male differs from all other European species of the subgenus *Panimerus* in the structure of the hypopygium. Tonnoir (1920) describes it as follows: "premier article des forceps cylindro-conique et court; article terminal comme tordu sur lui-même dès sa base, coudé vers l'intérieur et se terminant en pointe mousse. Appendices inférieurs courts à peine plus longs que le 9^e sternite, droits, cylindriques, leur extrémité atténuée mais obtuse, garnis sur leur face dorsale, sauf à la base, d'environ 24 spinules droites.

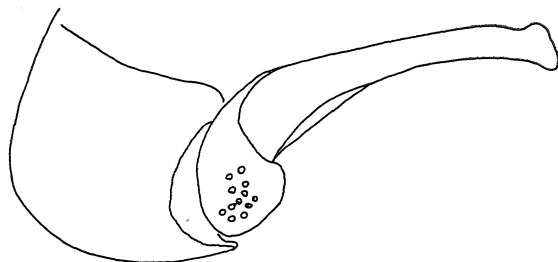


Fig. 8. *Telmatoscopus (Panimerus) maynei* (Tonnoir), right coxite and style of the male.

Pénis court et obtus flanqué de gonapophyses longues, minces et aiguës.”

According to this description the cerci are covered by about 24 retinacula; in the Danish specimen, however, about 40 retinacula are present.

Coxite and style of the Danish specimen as in fig. 8.

Apart from the number of retinacula Tonnoir's (1920) description applies to the author's specimen in every respect.

Subgenus **Peripsychoda** Enderlein

The two species *Telmatoscopus (Peripsychoda) auriculatus* (Curtis) and *Telm. (Peripsychoda) fuscus* (Macquart) are often confused. According to Tonnoir (1940) and Freeman (1950) females of the two species are indistinguishable, hence they have been supposed to be a single species with dimorphic males. Jung (1956), however, regards *Telm. (Perips.) auriculatus* and *Telm. (Perips.) fuscus* as genuine but closely related species. Jung (1956) describes male and female of *Telm. (Perips.) auriculatus* but only the male of *Telm. (Perips.) fuscus*.

Telmatoscopus (Peripsychoda) auriculatus (Curtis)

Occurrence in Denmark: A very common species occurring all over the country.

In the collections of the Zoological Museum: 1 ♂, 2 ♀♀ without date and locality (from Staeger's collection). 1 ♀, Zealand, Sept. 1819, 1 ♂, 1 ♀, Zealand (all from Westermann's collection). Further the following localities can be given: Zealand: Ørholm, Suserup, Falster: Vejringe. Bornholm: Blykobbe. Langeland: Tranekær. Funen: Odense, Gyldensten mose. Jutland: Skanderborg. In the author's collection: Zealand: Herlev, Lyngby sø, Lyngby Åmose, Værebros å, Lille Sejdam, Eskemose skov, Søndersø, Mølleåen at various localities: Sorgenfri, Fuglevad, Brede skolesti, Ørholm, Stampen, Mathildebro and Hestetang Huse. Jutland: Søgaard skov, Hønssnap skov, Ravnkilde and Hellesø.

According to Jung (1956) the larvae of *Telm. (Perips.) auriculatus* and *Telm. (Perips.) fuscus* are indistinguishable. Larvae of *Telm. (Perips.) auriculatus* or *Telm. (Perips.) fuscus* were collected at Lyngby sø and from springs in Nebbegaard plantage and at Slagslunde.

Telmatoscopus (Peripsychoda) fuscus (Macquart)

In the collections of the Zoological Museum (confused with *Telm. (Perips.) auriculatus*): Zealand: Suserup 2 ♂♂ 20th July 1917. In the author's collection: Jutland: Ravnkilde 2 ♂♂, 10th July 1960. Zealand: Eskemose skov 3 ♂♂, 3rd July 1960.

This species is seemingly rare in Denmark.

At Ravnkilde and Eskemose skov some females were collected, showing very close resemblance to the females of *Telm. (Perips.) auriculatus* but with a different structure of the subgenital plate, fig. 9. In these localities males of *Telm. (Perips.) fuscus* were collected and the aforementioned females could possibly belong to this species.

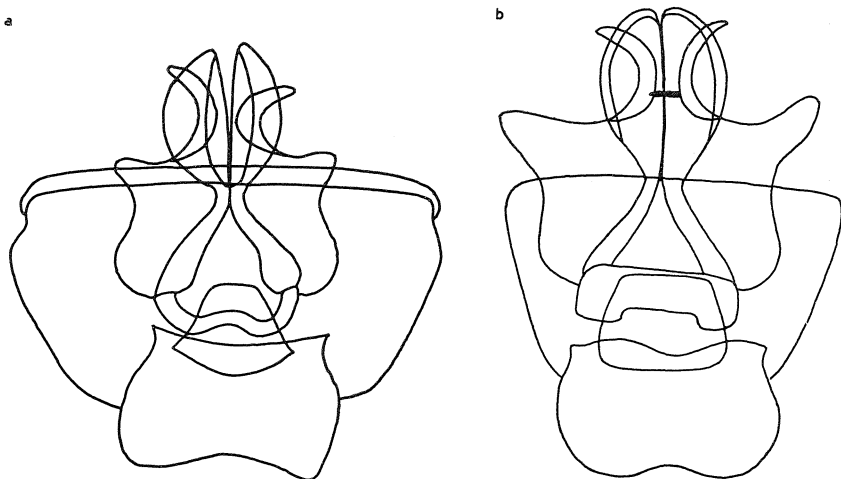


Fig. 9. Female subgenital plates of a. *Telm. (Perips.) auriculatus* (Curtis) and b. *Telm. (Perips.) fuscus* (Macquart)?

Genus *Psychoda* Latreille

The genus *Psychoda* consists of the three subgenera *Psychoda* s. str., *Philosepedon* Eaton and *Threticus* Eaton. According to Jung (1956) 19 European species of the genus *Psychoda* are known, but among this number *Psychoda lativentris* Berdén (Berdén 1952) is not included. In the present work 18 species of *Psychoda* are recorded from Denmark; among the 20 European species known so far only *Ps. surcoufi* Tonn. and *Ps. pusilla* Tonn. have not been found in Denmark.

Psychoda alternata Say

Occurrence in Denmark: It is a very common indoor species occurring in bath-rooms, toilets and urinals. It has been recorded from sewage bacteria beds and from various other outdoor localities. *Ps. alternata* is common all over the country.

At the river Mølleå the species occurred in huge numbers where the water was polluted by sewage effluents.

Psychoda lativentris Berdén

This species has been confused with *Ps. alternata* Say; the two species can, however, be distinguished by examination of the female subgenital plate and the apex of labium (Berdén 1952). Male unknown, the species is possibly parthenogenetic (Berdén 1952).

Occurrence in Denmark: Lolland: Sundby Storskov 1 ♀, 5th Aug. 1950 (Berdén 1952).

In the collections of the Zoological Museum, Copenhagen: 1 ♀ without date and locality (from Staeger's collection), det. Berdén. Jutland: Vorsk in Horsens fjord, 1 ♀ 1931. Funen: Maale, Hindsholm 1 ♀, 10th Aug. 1936, on the beach. In the author's collection: Zealand: Strødam, 1 ♀, 12th Aug. 1960 at light. Mølleåen at Stampen 2 ♀♀, 26th July 1960 and Søndersø 1 ♀, 5th July 1960. The last mentioned specimen was swept in a reed swamp. *Ps. lativentris* Berdén is likely to occur all over the country.

Biological notes: *Ps. lativentris* Berdén was taken together with *Ps. alternata* Say, *Ps. severini* Tonn. and *Ps. erminea* Eaton at Stampen, where the river Mølleå is heavily polluted by sewage effluents (fig. 10); in Scania, Sweden, it was collected together with *Ps. alternata* Say under similar conditions (Berdén 1952)

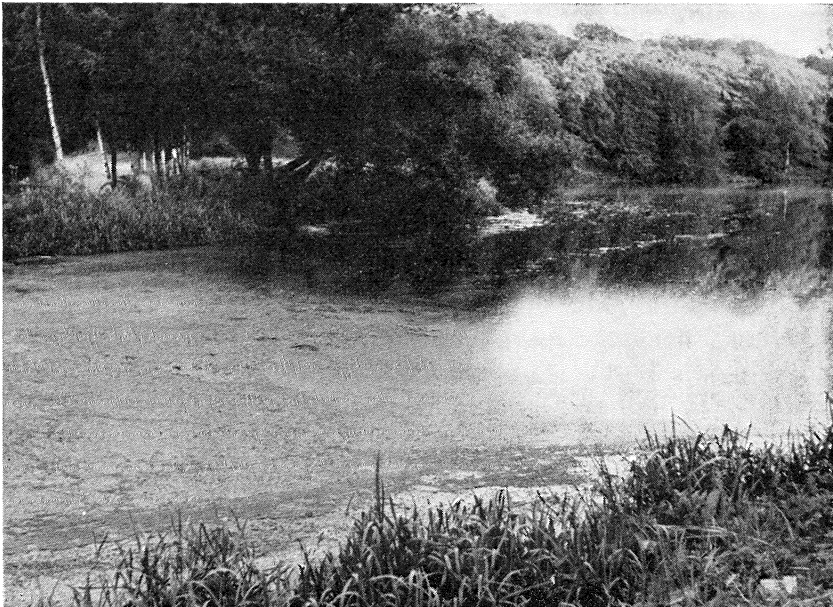


Fig. 10. Mølleåen at Stampen.

but in general no special preference for sewage is noticed. The larva is unknown.

Psychoda phalaenoides Linnaeus

Occurrence in Denmark: In the collections of the Zoological Museum: 4 ♂♂, 4 ♀♀ without date and locality (from Staeger's collection). In the author's collection: Jutland: Idasminde, Sdr. Onsild, several specimens at light, Sept. 1960. Zealand: Strødam several specimens at light, July, Aug. and Sept. 1960. Arrenakke several specimens at light, 24th Sept. 1960. Mølleåen at Fuglevad 22nd July 1960, several specimens swept in the vegetation. Botanical Laboratory, University of Copenhagen 4 ♀♀, 24th Sept. 1960. In the last-mentioned case the species was bred from horse-dung or mushrooms. According to Satchell (1947) dung is the only breeding material recorded.

Psychoda crassipennis Tonnoir

Only a single specimen recorded. In the author's collection: Zealand: Strødam, 1 ♀ 24th Sept. 1960 at light.

Psychoda albipennis Zetterstedt

In the collections of the Zoological Museum: Tipperne, Western Jutland 1 ♂, 12th Aug. 1946. In the author's collection: Zealand: Strødam 2 ♂♂, 31st July 1960, 2 ♂♂, 12th Aug. 1960 and 1 ♂, 1 ♀, 24th Sept. 1960 all specimens taken at light. Arrenakke 2 ♂♂, 24th Sept. 1960 at light. Herlev 1 ♂, 26th Nov. 1960 at light.

Psychoda severini Tonnoir

The two subspecies *severini* Tonn. and *parthenogenetica* Tonn. are morphologically indistinguishable (Jung 1956).

Although this species is very common and is distributed all over the country, it is not represented in the collections of the Zoological Museum. In the author's collection: Zealand: Strødam Aug.-Sept., several specimens at light. Several specimens swept in the vegetation in various localities along the river Mølleå (Brede, Stampen, Rødebro and Farum lake), at Christianshavns vold and at Søndersø (Urtica-vegetation). Jutland: Idasminde, Sdr. Onsild Sept. 1960, in a bath-room. Hellesø 14th July 1960, in a reed swamp.

This species is common in the sewage bacteria beds (e. g. Hillerød and Kagsmoseværket, Herlev). The larva was found in cow-dung, decaying leaves, rotting apples and in a blackbird's nest. In Jan. 1961 huge numbers of larvae were found at Avedøre in decaying seaweed and in a mixture of seaweed, leaves and poultry dung.

Psychoda brevicornis Tonnoir

Only a single specimen recorded. In the author's collection: Zealand: Strødam 1 ♀, 31st July 1960.

Psychoda setigera Tonnoir

In the collections of the Zoological Museum: Tipperne, Western Jutland 1 ♂, 22nd May 1946. In the author's collection: Zealand: Arrenakke 1 ♂,

1 ♀, 24th Sep. 1960. Strødam 2 ♂♂, 31st July 1960 and 1 ♂, 18th Aug. 1960 at light.

Psychoda trinodulosa Tonnoir

In the author's collection: Zealand: Arrenakke 2 ♂♂, 2 ♀♀, 24th Sept. 1960 at light. Strødam 1 ♀, 31st July 1960, 2 ♂♂, 2 ♀♀, 18th Aug. 1960 and 2 ♂♂, 24th Sept. 1960 all these specimens were taken at light. Botanical Laboratory, University of Copenhagen 1 ♀, Sept. 1960. This specimen was possibly reared from horse-dung or mushrooms. Mølleåen at Lyngby lake 1 ♀, 4th Aug. 1960. Mølleåen at Farum lake 1 ♂, 2nd Aug. 1960 in a bog. Jutland: "Idasminde", Sdr. Onsild 1 ♀, 18th Sept. 1960 at light.

Psychoda grisescens Tonnoir

Only one specimen recorded hitherto. In the author's collection: Zealand: Strødam 1 ♀, 24th Sept. 1960 at light.

Psychoda minuta Banks (= *spretta* Tonnoir)

Only one specimen recorded hitherto. In the author's collection: Zealand: Mølleåen at Farum lake 1 ♀, 2nd Aug. 1960.

Psychoda cinerea Banks (= *compar* Eaton)

It is a very common indoor species all over the country, and is represented by several specimens in the collections of the Zoological Museum as well as in the author's collection. The larvae were found throughout the year in drains and waste pipes. The species has also been taken out of doors.

Psychoda gemina Eaton

Only a single specimen recorded. In the author's collection: Zealand: Mølleåen at Farum lake 1 ♂, 2nd Aug. 1960 in a bog.

Psychoda lobata Tonnoir

Only known from a single locality. In the author's collection: Lyngby lake 3 ♀♀, 4th Aug. 1960. According to Satchell (1947a) the larval habitat of *Ps. lobata* is unknown.

Psychoda obscura Tonnoir

The imago of this species has not been recorded hitherto, but the larva was rather common in moss cushions from springs in Northern Zealand (Eskemose skov and Nebbegaard plantage).

Psychoda erminea Eaton

Only a few localities on Zealand: Strødam 1 ♂, 25th Aug. 1960, swept from the vegetation by a pond. Mølleåen at Brede skolesti 4 ♂♂, 22nd July 1960 swept in a reed swamp. Mølleåen at Stampen 2 ♂♂, 1 ♀, 26th July 1960, in this latter locality heavy pollution by sewage. Mølleåen at Farum sø 1 ♀, 15th Aug. 1960.

The larva is unknown.

Subgenus **Philosepedon** Eaton*Psychoda (Philosepedon) humeralis* Meigen

In the collections of the Zoological Museum: 1 ♂, 2 ♀♀, without date and locality (from Staeger's collection). Zealand: Suserup 1 ♂, 21st July 1917. Ermelunden 10th Jan. 1919, larvae from *Helix pomatia* L. (the material underlying the description of the larva by Spärck (1920)). Lolland: Maribo 1 ♂ reared from a snail, 7th May 1941. Langeland: Strandby 6 ♂♂, 9 ♀♀, reared March 1918.

In the author's collection: Strødam 1 ♀, 12th Aug. 1960 at light. Mølleåen at Ørholm 1 ♂, 26th July 1960. The author has reared this species several times from *Helix pomatia* L., *Helicella caperata* Mont., *Helicigona arbustorum* (L.), *Cepaea hortensis* (Müller) and *Cepaea nemoralis* (L.). The snails were collected in various localities in the vicinity of Copenhagen (Søndersø, Jonstrup vang, Dyrehaven and Herlev) and at Tjele, Jutland.

No doubt the species is common and widely distributed in Denmark.

Subgenus **Threticus** Eaton*Psychoda (Threticus) lucifuga* (Walker)

In the author's collection: Zealand: Eskemose skov 1 ♂, 11th Aug. 1960. Mølleåen at Ørholm 1 ♀, 26th July 1960, at a spring.

The larvae were abundant in moss cushions and mud from the vicinity of springs (Eskemoseskov 19th March 1960 and Nebbegaard plantage 24th April 1960) and in a spring at Tjele, Jutland 30th March 1960.

Discussion.

In the following it is intended to make a few remarks on the material and on some of the species recorded.

The collections at the river Mølleå:

At Mølleåen, material was collected in 23 localities and 23 different species were recorded, Table I. During the collecting period *Pericoma nigricauda* Tonn. seemed to be one of the most abundant species, since it occurred in 16 localities along the river, while the closely related species, *P. pulchra* Eaton was only recorded from a single locality, i. e. a small spring at Ørholm, loc. No. 8, Tab. I.

According to Satchell (1949) the larva and pupa of *P. pulchra* occurs in springs and clear streams, where the larvae are found underneath stones and leaves. Satchell (1949) regards the dorsoventral flattening, the development of lateral processes and other structural peculiarities as being an adaptation which

Table I.
The collections at the river Mølleå.

Species:	Locality No.																						
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
<i>Pericoma mutua</i>								×															
<i>Pericoma nubila</i>	×	×	×		×	×	×		×	×	×	×	×	×	×	×	×	×	×	×	×	×	×
<i>Pericoma pulchra</i>								×															
<i>Pericoma nigricauda</i>	×		×	×	×	×	×			×		×	×	×	×	×	×		×	×			×
<i>P. (Ulm.) fuliginosa</i>			×					×		×				×			×						
<i>Telmatoscopus ustulatus</i>																×							
<i>Telm. decipiens</i>								×						×									
<i>Telm. soleatus</i>								×															
<i>Telm. (Pan.) albifacies</i>				×		×				×									×				
<i>Telm. (Perips.) auricul.</i>			×		×				×	×	×												
<i>Clytocyclus ocellaris</i>			×			×	×	×		×			×			×		×	×	×	×	×	×
<i>Clytocyclus rivosus</i>				×	×							×	×										
<i>Psychoda phalaenoides</i>			×																				
<i>Ps. alternata</i>					×	×				×	×									×			
<i>Ps. lativentris</i>											×	×											
<i>Ps. severini</i>				×							×	×							×				
<i>Ps. erminea</i>				×							×	×			×					×			
<i>Ps. minuta</i>												×	×										×
<i>Ps. gemina</i>																			×				
<i>Ps. trinodulosa</i>																			×		×		
<i>Ps. lobata</i>																				×		×	
<i>Ps. (Phil.) humeralis</i>						×														×		×	
<i>Ps. (Thr.) lucifuga</i>								×															

facilitates closer contact between the larva and its substratum. According to Crisp & Lloyd (1954) the larvae of *P. pulchra* were collected in a patch of woodland mud.

In Denmark *P. pulchra* was only collected from springs (Ravnkilde and Ørholm), while *P. nigricauda* occurs in a variety of habitats. This might indicate that the breeding site of *P. pulchra* is in springs or rather fast flowing brooks, while *P. nigricauda* is able to breed in a variety of habitats e. g. mud flats.

The halobiontic species:

Feuerborn (1926) regards *Telmatoscopus similis* and *T. ustulatus* as true halobiontic species; the larvae of which are associated with significantly saline habitats and the occasional occurrence of these species far from the coast is presumed to be quite accidental.

In Holland *T. ustulatus* and *T. similis* occur in brackish habitats as well as in less saline ones "which although not quite fresh are the purest freshwater localities in the province of Noord Holland" (Barendrecht 1934). According to this Barendrecht proposed to call *T. ustulatus* and *T. similis* euryhaline species instead of halobiontics.

In Denmark *T. similis* was found in a single locality, i. e. the moat of Christianshavn which is a locality with brackish water connected to the Harbour of Copenhagen. In August 1941 the salinity was 15.5 ‰ (Smidt 1944). According to Smidt (1944) Psychodid larvae were collected here, but they were not identified.

T. ustulatus was recorded from 3 localities: Tipperne, Western Jutland, a brackish-water locality, Strødam, and Mølleåen at Rødebro, the last two are typical freshwater localities. The locality last mentioned is only about 1 km away from the Sound, and the sole specimen collected here could presumably be a straggler from the neighbouring seashore, while the occurrence at Strødam (2 ♂♂, 1 ♀ swept at a pond) is likely to be genuine.

The dung-breeding Psychoda species:

In the material from Strødam and Arrenakke a number of dung-breeding Psychoda species were recorded. According to Satchell (1947b) the Psychodid fauna of pasture land was dominated by *Ps. phalaenoides*, which together with three other ex-

clusively dung-breeding species, *Ps. setigera*, *Ps. trinodulosa* and *Ps. brevicornis* amounted to 80 % of the pasture land fauna. In the material from Arrenakke three of the exclusively dung-breeding species were recorded (*Ps. phalaenoides*, *Ps. setigera* and *Ps. trinodulosa*) and from Strødam all four species in question.

In this material of dung-breeders several specimens were carrying larval stages of *Rhabditis*. Bovien (1937) observed two kinds of larvae: a short- and a long-tailed type, the former was described as *Rhabditis dubia* n. sp., the latter was not identified. The occurrence of *Rhabditis* on Psychoda species was also observed by Satchell (1947b) and a culture was identified as *Rh. curvicaudata* Schneider.

Several of the dung-breeding Psychoda in the author's material were carrying the early stages of Gamasid mites, a feature which is also known in many other insects.

Acknowledgements.

This work was carried out at the Zoological Laboratory, University of Copenhagen and the author is grateful to: Professor, Dr. R. Späreck, the Director of the Laboratory, for providing excellent working conditions; Dr. S. L. Tuxen, Head of the Entomological Department, Zoological Museum, Copenhagen, for placing the collections of the Museum at the author's disposal and cand. mag. Jens Thorup, Freshwater Biological Laboratory, Hillerød, who permitted the use of his valuable collection of larvae.

The following have supplied valuable material for the present study: mag. scient. Bent Christensen, stud. mag. Birger Jensen, cand. mag. Leif Lyneborg, stud. mag. Axel Michelsen and Professor, Dr. Math. Thomsen. The author wishes to express his sincere appreciation to all these persons for all the invaluable aid he has been given and is further indebted to "Japetus Steenstrup's legat" for a grant in support of this study.

List of species hitherto recorded from Denmark.

Subfamily <i>Sycoracinae</i>	Genus <i>Pericoma</i> Walker
Genus <i>Sycorax</i> Haliday	Subgenus <i>Pericoma</i> s. str.
<i>Sycorax</i> sp. (<i>S. feuerborni</i> Jung or <i>S. tonnoiri</i> Jung)	<i>Pericoma palustris</i> (Meigen)
Subfamily <i>Trichomyiinae</i>	<i>Pericoma cubitospinosa</i> Jung
Genus <i>Trichomyia</i> Haliday	<i>Pericoma mutua</i> Eaton
<i>Trichomyia urbica</i> Curtis	<i>Pericoma compta</i> Eaton
Subfamily <i>Psychodinae</i>	<i>Pericoma nubila</i> (Meigen)
Genus <i>Clytocerus</i> Eaton	<i>Pericoma pulchra</i> (Eaton)
<i>Clytocerus ocellaris</i> (Meigen)	<i>Pericoma nigricauda</i> Tonnoir
<i>Clytocerus rivosus</i> (Tonnoir)	<i>Pericoma blandula</i> Eaton
	<i>Pericoma trifasciata</i> (Meigen)

<i>Pericoma canescens</i> (Meigen)	<i>Telmatoscopus (Peripsychoda) auriculatus</i> (Curtis)
<i>Pericoma stammeri</i> Jung	<i>Telmatoscopus (Peripsychoda) fuscus</i> (Macquart)
Subgenus <i>Ulomyia</i> Walker	Genus <i>Psychoda</i> Latreille
<i>Pericoma (Ulomyia) fuliginosa</i> (Meigen)	<i>Psychoda alternata</i> Say
Genus <i>Telmatoscopus</i> Eaton	<i>Psychoda lativentris</i> Berdén
Subgenus <i>Telmatoscopus</i> s. str.	<i>Psychoda phalaenoides</i> Linnaeus
<i>Telmatoscopus fraterculus</i> (Eaton)	<i>Psychoda crassipennis</i> Tonnoir
<i>Telmatoscopus labeculosus</i> (Eaton)	<i>Psychoda albipennis</i> Zetterstedt
<i>Telmatoscopus ustulatus</i> (Walker)	<i>Psychoda severini</i> Tonnoir
<i>Telmatoscopus consors</i> (Eaton)	<i>Psychoda brevicornis</i> Tonnoir
<i>Telmatoscopus decipiens</i> (Eaton)	<i>Psychoda setigera</i> Tonnoir
<i>Telmatoscopus soleatus</i> (Walker)	<i>Psychoda trinodulosa</i> Tonnoir
<i>Telmatoscopus longicornis</i> (Tonnoir)	<i>Psychoda grisescens</i> Tonnoir
<i>Telmatoscopus albomaculatus</i> (Wahlgren)	<i>Psychoda minuta</i> Banks
<i>Telmatoscopus similis</i> Tonnoir	<i>Psychoda cinerea</i> Banks
Subgenus <i>Mormia</i> Enderlein	<i>Psychoda gemina</i> Eaton
<i>Telmatoscopus (Mormia) eatoni</i> Tonnoir	<i>Psychoda lobata</i> Tonnoir
Subgenus <i>Panimerus</i> Eaton	<i>Psychoda obscura</i> Tonnoir
<i>Telmatoscopus (Panimerus) albifacies</i> (Tonnoir)	<i>Psychoda erminea</i> Eaton
<i>Telmatoscopus (Panimerus) maynei</i> (Tonnoir)	Subgenus <i>Philosepedon</i> Eaton
Subgenus <i>Peripsychoda</i> Enderlein	<i>Psychoda (Philosepedon) humeralis</i> Meigen
	Subgenus <i>Threticus</i> Eaton
	<i>Psychoda (Threticus) lucifuga</i> (Walker)

Literature.

- Anthon, H. (1943): Der Kopfbau der Larven einiger nematoceren Dipterenfamilien. *Spolia Zool. Mus. Haun.* **3**.
- Barendrecht, G. (1934): Preliminary notes on Dutch Psychodidae. *Ent. Ber.* **9**, 78—80.
- Berg, K. (1938): Studies on the bottom animals of Esrom lake. *D. Kgl. Danske Vid. Selsk. Skrift., Afd. Naturv. Math., 9. Række, VII.*
- Berg, K. et al. (1948): Biological Studies on the River Suså. *Fol. Linn. Scand.* No. **4**.
- Berdén, S. (1952): Taxonomical notes on Psychodidae I. *Psychoda lativentris* n. sp. a species hitherto confused with *alternata* Say. *Opusc. Ent.* **17**, 110—12.
- (1954): Taxonomical notes on Psychodidae II. Four new species of *Pericoma* from Fennoscandia. *Opusc. Ent.* **19**, 33—39.
- Bovien, P. (1937): Some types of association between Nematodes and Insects. *Vid. Medd.* **101**, 1—114.
- Crisp, G. & LLOYD, LL. (1954): The community of Insects in a Patch of Woodland Mud. *Trans. R. ent. Soc. Lond.* **105**, 269—313.

- Eaton, A. E. (1893): A synopsis of British Psychodidae. *Ent. Mon. Mag.* **29**, 5—8.
- (1894): A synopsis of British Psychodidae. *Ent. Mon. Mag.* **30**, 22—28.
- (1895): A synopsis of British Psychodidae (and supplement). *Ent. Mon. Mag.* **31**, 208—13, 245—50.
- (1896): A synopsis of British Psychodidae (and supplement). *Ent. Mon. Mag.* **32**, 70—76, 127—31, 202—11.
- (1897): A synopsis of British Psychodidae (and supplement). *Ent. Mon. Mag.* **33**, 114—25.
- (1898): A synopsis of British Psychodidae (and supplement). *Ent. Mon. Mag.* **34**, 117—25, 154—58.
- (1904): New Genera of European Psychodidae. *Ent. Mon. Mag.* **40**, 55—59.
- Feuerborn, H. J. (1923): Die Larven der Psychodiden oder Schmetterlingsmücken. Ein Beitrag zur Ökologie des Feuchten. *Verh. int. Ver. Limn. Kiel* **1**, 181—213.
- (1926): Halobionte Psychodiden. *Mitt. geogr. Ges. Naturh. Mus. Lübeck*, **2**.
- Freeman, P. (1950): Psychodidae. In: Coe, R. L., Freeman, P. and Mattingly, P. F.: *Handbooks for the Identification of British Insects. Diptera 2. Nematocera. Vol. IX.*
- (1953): Two new species of Psychodidae from Britain. *Proc. R. Ent. Soc. Lond. (B)* **22**, 3—4, 69—71.
- Jung, H. F. (1953): Einige neue mitteleuropäische Psychodiden. *Zool. Anz.* **152**, 16—31.
- (1956): Beiträge zur Biologie, Morphologie und Systematik der europäischen Psychodiden. *Dtsch. Ent. Zeit. N. F. Bd. 3, Hft. 2—4*, 97—257.
- Miall, L. C. & Walker, N. (1895): The life-history of *Pericoma canescens*. *Trans. Ent. Soc. Lond.* 1895, 141—153.
- Overgaard, C. (1948): An apparatus for quantitative extraction of Nematodes and Rotifers from soil and moss. *Natura Jutlandica* **1**, 271—278.
- Satchell, G. H. (1947a): The larvae of the British species of Psychoda. *Parasitology* **38**, 51—69.
- (1947b): The ecology of the British species of Psychoda. *Ann. Appl. Biol.* **34**, 611—21.
- (1949): The early stages of the British species of Psychoda. *Trans. R. Ent. Soc. Lond.* **100**, 411—47.
- Smidt, E. B. L. (1944): Biological studies on the Invertebrate fauna of the harbour of Copenhagen. *Vid. Medd. Da. Nat. For.* **107**.
- Späreck, R. (1920): Om Larven til *Philosepedon humeralis* Meig. *Ent. Medd.* **13**, 120—27.
- Stæger, C. (1838/39): Systematisk Fortegnelse over de i Danmark hidtil fundne Diptera I. *Naturhist. Tidsskr.* **2**.
- Thomsen, M. & Hammer, O. (1936): The breeding media of some common flies. *Bull. Ent. Res.* Vol. **27**.
- Tonnoir, A. (1919a): Contribution à l'étude des Psychodidae de Belgique. *Ann. Soc. Ent. Belg.* **59**, 8—17.
- (1919b): Contribution à l'étude des Psychodidae de Belgique. *Ann. Soc. Ent. Belg.* **59**, 136—40.

- Tonnoir, A. (1920): Contribution à l'étude des Psychodidae de Belgique. Ann. Soc. Ent. Belg. 60, 180—87.
- (1922 a): Synopsis des espèces européennes du genre Psychoda. Ann. Soc. Ent. Belg. 62, 49—88.
- (1922 b): Nouvelle contribution à l'étude des Psychodidae et description de dix espèces nouvelles d'Europe. Ann. Soc. Ent. Belg. 62, 153—81.
- (1940): A synopsis of the British Psychodidae with descriptions of new species. Trans. Soc. Brit. Ent. 7, 21—64.
- Wesenberg-Lund, C. (1943): Biologie der Süßwasserinsekten.

Anmeldelse.

Alf Bakke: **Skogsinsekter**. Oslo 1961 (Aschehougs Forlag). 172 pp. Ill. Pris: Kr. 26.45; ib. Kr. 32.60.

Bogen er skrevet af den for få år siden udnævnte forstentomolog ved Det Norske Skogsforsøksvesen. Den beskæftiger sig næsten udelukkende med det, undertitlen angiver, nemlig "skadeinsekter på skogen i Norge." Den er i hovedsagen beregnet som en mindre hånd- og opslagsbog for skovejere og praktikere, men indeholder også adskilligt for den entomologisk interesserede.

Der er lagt særlig vægt på at hjælpe til en bestemmelse af insekterne ved hjælp af værttræer og skadebillede m. m., og bogen er derfor inddelt "på tværs", nemlig hverken efter insekt- eller værttræs-systematik, men efter de steder eller dele af træerne, insekterne opholder sig på (i): blomster og kogler, unge planter i skoven, nåle og blade o. s. v. Hvert af disse kapitler begynder med en ret omfangsrig nøgle efter ovennævnte princip. Bogen indledes med en række korte kapitler om insekternes bygning og levevis, deres betydning i skoven og bekæmpelse. Da der omtales et betydeligt antal arter, skønsvis godt 200, bliver der kun plads til en ret kort omtale af de enkelte efter skemaet: udseende, levevis, betydning i Norge, evt. bekæmpelse samt udbredelse i Norge.

Der er mange illustrationer, ganske overvejende fotografier, hvoraf nogle er fortrinlige, andre på det jævne.

For en dansk læser er det særligt afsnittet om insekter på kogler og frø, der er udbytterigt og afspejler forfatterens store specialkendskab til disse arter. Endvidere byder bogen for et betydeligt antal arter på ikke tidligere publiceret angivelse af udbredelsen. Hertil kommer, at den for mange træarter, særlig gran og fyr er en meget brugbar "nøgle", anvendelig også i Danmark.

Det må fremhæves, at den er skrevet på et letlæseligt norsk, og det bør måske bemærkes, at hver omtalt art foruden det nyeste systematiske navn er forsynet med norsk navn. Dette har givetvis krævet "dåb" af talrige arter, en procedure forfatteren stort set synes at være sluppet heldigt fra, og som læserne sikkert vil have glæde af ved fremtidige udgaver, som stabiliserende element.

B. Beier Petersen.
