

The range of prey of *Phaenobremia urticae* Kffr. and *Ph. aphidivora* Rübs. (Diptera, Itonididae)

by

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In view of experiments, carried out in 1950, the conclusion was drawn that *Phaenobremia urticae* Kffr. is not monophagous and that its range of prey includes *Aphis urticae* Gmelin, *Aphis fabae* Scop. and *Chaitophorus populeti* Panzer in the field and *Macrosiphum pisi* Kalt. under experimental conditions (NIJVELDT, 1952).

I succeeded in doing some new experiments with aphid-eating midges in Amsterdam in 1952, the results of which are recorded in this paper.

Larvae of *Ph. urticae* were found among *Aphis pomi* de Geer on apple-leaves in Amsterdam on July 18th 1951. Midges hatched on August 25th (3 ♂♂), 27th (1 ♂), 29th (1 ♀), 31st (1 ♂ and 1 ♀), September 6th (1 ♀), 8th (2 ♀♀) and 11th (2

Larvae of *Ph. aphidivora* were found among *Hyalopterus arundinis* F. on reed near Botshol on September 11th 1949. Midges hatched on September 29th, 1949 (6 ♂♂ and 1 ♀).

Adults of an unknown *Phaenobremia*-species were bred during my experiments with *Ph. urticae* in 1951. The larvae fed on *Aphis urticae* Gmelin in the field (NIJVELDT, 1952). Later on I could identify these midges as *Phaenobremia aphidivora* Rübs.

Miss Barbara STOKES found aphid-eating larvae among *Cavariella pastinacae* L. on *Heracleum persicum* Desf. in Amsterdam on August 12th 1952. Midges hatched on September 2nd (1 ♂) and 3rd (1 ♂) and proved to be *Phaenobremia aphidivora* Rübs.

Alcohol material of *Phaenobremia aphidivora* was sent to me by Ir H. A. VAN HOOFF; the larvae fed on *Brevicoryne brassicae* L. on leaves of red cabbage at Broek op Langendijk in 1952.

On August 21st 1951 the larvae of *Ph. aphidivora* were found by Miss W. DE BROUWER among *Aphis frangulae* Kltb. on leaves of *Cucumis sativus* L. at Naaldwijk (NIJVELDT, 1953). The same year adults emerged from September 11th till October 17th (9 ♂♂ and 14 ♀♀); in 1952 midges emerged from May 17th till June 26th (18 ♂♂ and 4 ♀♀).

On June 6th 1952 I had the disposal of a fertilized female of *Ph. aphidivora*, hatched from the larvae from Naaldwijk and localized it on a leaf of broad bean with a number of *Aphis fabae* Scop. by using an apparatus, described by Ir J. WALRAVE (1951), see figs. 1 and 2. On June 7th I found 20 eggs. After 3 days the larvae hatched and on June 23rd I put the matured larvae in a lamp glass with peat. Two males emerged on July 9th and one male on July 24th 1952.

The same female was brought into another apparatus on an apple-leaf with *Aphis pomi* de Geer on June 9th; the following day 8 eggs were laid; I could find young larvae on June 17th; they were full-grown on June 27th. On July 10th four males emerged.

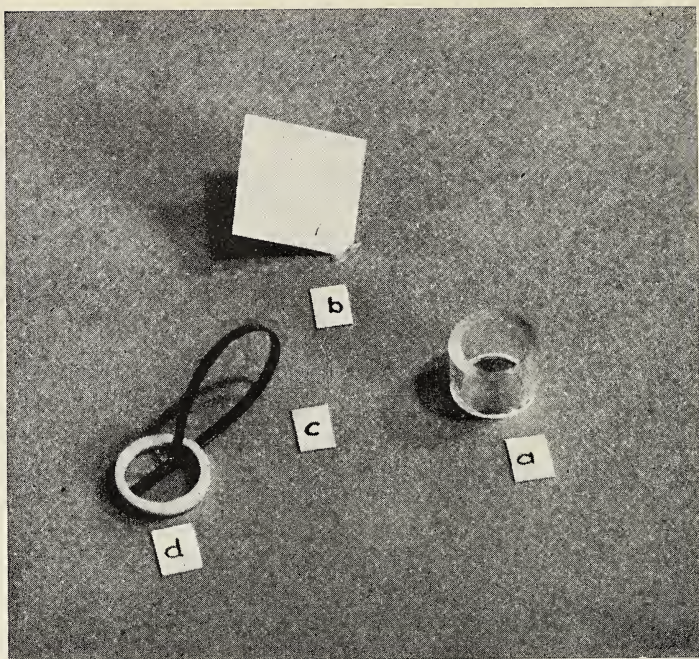


Fig. 1. Localisation cage. a — glass or plastic cylinder; height 10 mm, diameter 12—15 mm; b — coverglass; c — piece of watch spring; d — small plastic ring.
(Photograph *Tijdschr. Plantenz.* 57: 128, 1951).



Fig. 2. Localisation cages fixed on bean-leaves.
(Photograph *Tijdschr. Plantenz.* 57: 128, 1951).

With this female I could do a new experiment on June 10th. It was brought into another apparatus on a leaf of *Populus canescens* Smith with the Aphid *Chaitophorus populeti* Panzer. This happened at nine o'clock in the morning. At three o'clock in the afternoon three eggs had been laid, so oviposition took place by day. On June 11th I found 16 eggs and on June 18th young larvae; matured larvae were put in a lampglass with peat on June 23rd. Midges emerged on July 9th (7 ♂♂) and July 12th (1 ♂).

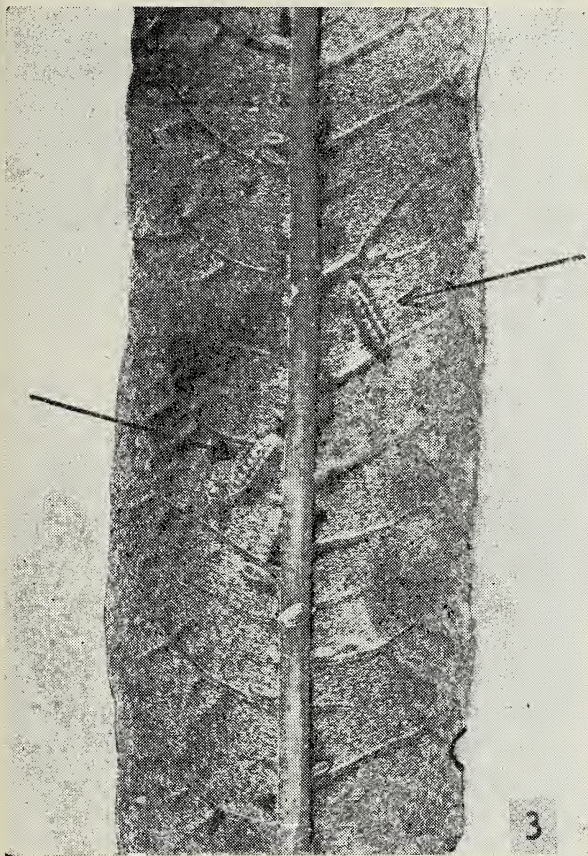


Fig. 3. Two *Phaenobremia*-larvae on their prey.

I used this female again for the last experiment. On June 11th it was brought into a localisation-cage on a strawberry-leaf with the Aphid *Pentatrichopus fragaefolii* Ckll. On June 12th I found 16 eggs, on June 18th larvae. Matured larvae were brought into a lampglass with peat on June 23rd. Midges emerged on July 9th (2 ♂♂) and July 11th (1 ♂). It was a pity that I could not use this female for further experiments because the wings were stuck to the coverglass by condensation.

During these experiments, of which those with *A. fabae*, *A. pomi* and *Ch. populeti* were carried out in the garden and that with *P. fragaefolii* in an unheated greenhouse, the female

laid 60 eggs; adults emerged the same year (1952) and were all males. Full-grown larvae were brought into a lampglass with peat in an unheated greenhouse to enable them to pupate.

These experiments showed that a female of *Ph. aphidivora*, hatched from larvae which fed on *Aphis frangulae* Kaltb., can oviposit on *Aphis fabae*, *A. pomi*, *Chaitophorus populeti* and *Pentatrichopus fragaefolii* under experimental conditions. The larvae could feed and develop successfully on these Aphids.

The following table shows the range of prey of *Ph. urticae* and *Ph. aphidivora* in the Netherlands as far as known.

Range of prey of *Phaenobremia urticariae* Kffr.

in the field
Aphis fabae Scop.
Aphis pomi de Geer
Aphis urticata Gmelin
Chaitophorus populeti Panzer

under experimental conditions
Macrosiphum pisi Kalt.

Range of prey of *Phaenobremia aphidivora* Rübs.

in the field
Aphis frangulae Kalt.
Aphis urticata Gmelin
Brevicoryne brassicae L.
Cavariella pastinacae L.
Hyalopterus arundinis F.

under experimental conditions
Aphis fabae Scop.
Aphis pomi de Geer
Chaitophorus populeti Panzer
Pentatrichopus fragaefolii Ckll.

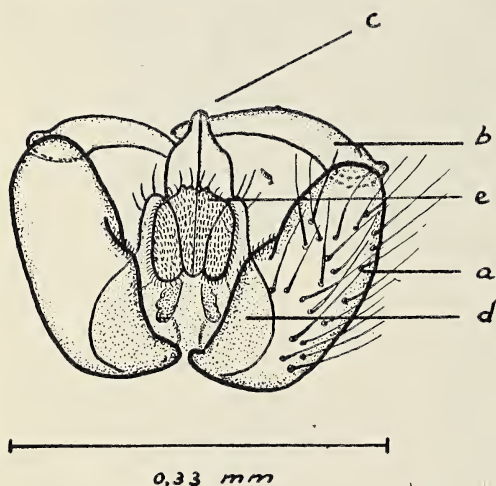


Fig. 4. Male genitalia of *Phaenobremia aphidivora* Rübs. a — basal clasp segment; b — distal clasp segment; c — style; d — dorsal plate; e — ventral plate.

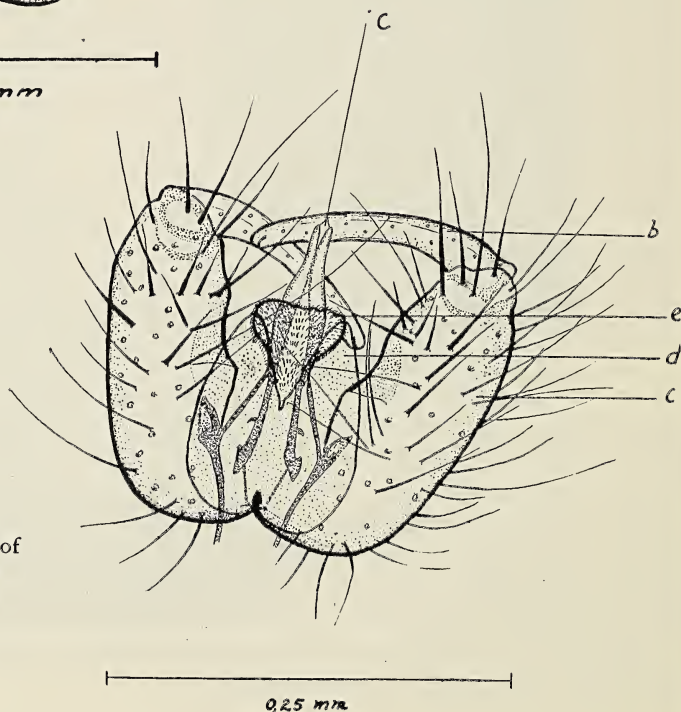


Fig. 5. Male genitalia of *Phaenobremia urticariae* Kffr. For explanation see fig. 4.

My thanks are due to Dr H. J. DE FLUITER for the loan of the blocks of the localisation cages, to Mr. D. HILLE RIS LAMBERS for his identification of *Aphis fabae*, *A. pomi*, *A. urticata*, *Cavariella pastinacae* and *Chaitophorus populeti*; also to Miss W. M. Th. J. DE BROUWER, Miss B. M. STOKES and Ir H. A. VAN HOOFF for delivering me material of *Phaenobremia aphidivora* and to Miss G. MOLENAAR for sending me living specimens of *Pentatrichopus fragaefolii*.

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Amsterdam-O., Entomologisch Laboratorium van het I.P.O., Mauritskade 59a, September 1953. (Present address: Instituut voor Plantenziektenkundig Onderzoek, Binnenhaven 4a, Wageningen).

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Bij het bestuderen van de ontwikkeling van organismen moeten we onderscheid maken tussen de beschrijvende en de physiologische methoden. Allereerst dienen wij te weten wat er gebeurt; daarna, hoe het komt, dat het zo gebeurt. Er zijn talloze onderzoeken, die zich met de beschrijving van de ontwikkeling van allerlei insecten bezig houden, van ei tot imago. Een zeer geschikte leidraad bij de studie hiervan is het boek van JOHANNSEN & BUTT (1941).

PFLUGFELDER heeft zich tot taak gesteld om het bijpassende physiologische boek te schrijven, waarin de proeven en waarnemingen besproken worden, die de oorzaken trachten op te sporen voor de waargenomen verschijnselen.

Voor de gewervelde dieren bestonden dergelijke boeken reeds lang. In het Nederlands kennen we dat van RAVEN in NOORDUYN's Wetenschappelijke Reeks. Wel komt hier een