Phoresy of *Cervicola meyeri* (Taschenb.) on *Aedes communis* (Deg.)

(Mallophaga: Ischnocera & Diptera: Culicidae)

B. Overgaard Nielsen

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A case of phoresy between the biting louse *Cervicola meyeri* (Taschenb.) (♀) and the mosquito *Aedes communis* (Deg.) (♀) recorded from Denmark is presented and discussed.

B. Overgaard Nielsen, Institut for Zoologi og Zoofysiologi, Bio 3, Bygning 135, Universitetsparken, DK-8000 Århus C, Denmark.

Introduction

Several species of insects and mites attach themselves temporarily to the bodies of other arthropod species, usually for the purpose of transport only. This interrelationship is known as phoresy. Many ectoparasites practise this habit and above all more than one hundred cases of phoresy involving winged hippoboscid flies (Diptera: Hippoboscidae) and biting lice (Mallophaga) have been recorded (Blagoveschtschenskij, 1959; Eichler, 1963; Büttiker & Cerný, 1974; Keirans, 1975). Very infrequently biting lice have been observed attached to biting flies (*Haematobosca stimulans* (Mg.)),. fleas (e.g. *Paraceras melis* (Walker) and *Chaetopsylla trichosa* Kohaut) and other insects (Rothschild & Clay, 1957; Blagoveschtschenskij, op. cit.; Eichler, op. cit.).

A few cases of phoretic associations between biting lice and mosquitoes (Culicidae) have been recorded, viz. between *Cervicola* species and the culicids *Aedes intrudens* Dyar, *Ae. rusticus* Rossi (Peus, 1933) and *Ae. punctor* (Kirby) (Eichler, 1944; Eichler, 1963). *C. meyeri* is an ectoparasite of roe deer (*Capreolus capreolus* (L.)) (Hopkins & Clay, 1952). This paper reports on a phoretic association between *C. meyeri* and *Ae. communis* (Deg.).

Results and discussion

On June 10th 1986 (hour: 6 p.m.) culicids attracted to man were collected in Trige Wood, a mixed forest NW of Århus, Denmark. Among several mosquitoes collected a female *Ae. communis* carrying a biting louse attached to the proboscis was found (Fig. 1). The biting louse, which was identified as a female *C. meyeri,* held firmly on to the basal half of the culicid labium with its mandibles, facing the base of the proboscis. While alive the attachment of the ectoparasite was presumably further secured by means of the legs.

The position of the biting louse on the proboscis of *Ae. communis* might indicate that the phoretic association was established while the mosquito was searching on the host and not during blood-feeding. In the instances presented by Peus (1933) and Eichler (1944) the biting lice were firmly attached by the mandibles to the base of the culicid stylets, indicating that the mosquitoes were invaded during the act of feeding. In these

Fig. 1. Phoresy between the biting louse *Cervicola meyeri* (Taschenb.) and the mosquito *Aedes communis* (Deg.). Left: Dorsal view, right: Lateral view (Nils Skyberg phot.).

cases the normal resting position of the stylets, i.e. enclosed within the groove of the labium, was prevented by the biting lice. In the actual case all stylets were completely ensheathed in the labium (Fig. 1).

The host of *C. meyeri,* viz. the roe deer, is rather abundant in Trige Wood. The biting louse attached to *Ae. communis* indicates that the mosquito previously visited a roe deer for blood-feeding and the subsequent attraction to man suggests that in Danish woodland this culicid species may feed on a variety of mammalian host.

Observations from Germany (Peus, 1933; Eichler, 1944), Switzerland (Büttiker & Cerný, 1974) and Denmark show that biting lice of deer at least occasionally attach themselves to the body of others insects for the purpose of free passage. In addition to the four cases of phoresy of *C. tibialis* and *C. meyeri* on mosquitoes presented above, Eichler (op.cit., 1963) reports on phoresy of *C. meyeri* on *Haematobosca stimulans* and Büttiker & Cerný (op. cit.) record three cases of phoresy between the latter *Cervicola*-species and the hippoboscid *Lipoptena cervi* (L.). *L. cervi* mainly occurs on roe deer (*C. capreolus*) and red deer (*Cervus elaphus* L.), but it has also been taken from fallow deer (*D. dama*), sika deer (*Cervus nippon* (Temm.)) and reindeer (*Rangifer tarandus* (L.)); finally, stray records from a number of hosts, e.g. badger, dog and man should be mentioned (Johnsen, 1948; Haarløv, 1964; Hutson, 1984). Consequently, a phoretic association between e.g. *C. meyeri* and alate *L. cervi* means that the prospects for reaching a suitable host for the biting louse, viz. a roe deer, are good. Since the host range of woodland mosquitoes is wide, the cases of phoresy between culicid species and biting lice of deer appear less promising, depending on the density of roe deer and other suitable hosts. However, since alate specimens of *L. cervi*

only occur in the period August-December (Haarløv, 1964; Hutson, 1984), a phoretic association restricted to *Cervicola*-species - hippoboscid flies means, that the possibilities of biting lice for transport by winged insects is seasonally limited. Phoresy between *Cervicola* species and *Aedes*-species was observed in late spring - early summer, which is the main activity period of woodland mosquitoes. Thus the relationship between biting lice and mosquitoes at least extends the seasonal range of dispersal by phoresy. However, the role of phoresy in the dispersal of Mallophaga is still a debated question (Hutson, 1984).

Sammendrag

Phoresi mellem pelslusen *Cervicola meyeri* (Taschenb.) (Mallophaga: Ischnocera) og stikmyggen *Aedes communis* (Deg.) (Diptera: Culidae).

Visse insekt- og midearter - f.eks. mange ektoparasitter - kan temporært klamre sig fast til andre insekter og på denne måde lade sig transportere omkring. Fænomenet kaldes phoresi. Fra litteraturen kendes over 400 tilfælde, hvor pels- og fjerlus (Mallophaga) er observeret som passagerer på lusefluer (Hippoboscidae); sjældnere er stikfluer, lopper o.a. insekter blevet benyttet som transportværter, mens stikmyg (Culicidae) kun i ganske få tilfælde er registreret i denne rolle. I sidstnævnte tilfælde drejer det sig om phoresi mellem pelslus af slægten *Cervicola,* der er knyttet til hjorte, samt stikmyggene *Aedes intrudens* Dyar, *Ae. rusticus* Rossi og *Ae. punctor* (Kirby).

Under indsamling af stikmyg i Trige Skov NV for Århus indsamledes 10.6.1986 en hun af *Ae.communis* (Deg.), der på snablen transporterede en hun af pelslusen *C. meyeri* (Fig. 1). Pelslusen, der er ektoparasit på rådyr, havde med kindbakkerne bidt sig fast i stikmyggens underlæbe (labium). Observationen viser, at myggen tidligere har opsøgt et rådyr for at suge blod. Phoresi mellem denne pelslus-art og *Ae. punctor* samt stikfluen (*Haematobosca stimulans* (Mg.)) er observeret i Tyskland, mens hjortelusefluen *Lipoptena cervi* (L.) er registreret som transportvært i Schweiz. Stikmyggene er mindre værtspecifikke end hjortelusefluerne, hvilket teoretisk gør førstnævnte mindre egnede som transportværter. Da vingede hjortelusefluer - der oven i købet blot er temporært vingede - kun optræder om efteråret, mens stikmyg findes det meste af sommeren med højsæson i maj-juni, vil partnerskabet med myggene i det mindste udvide hjortepelslusenes potentielle spredningsperiode. Den spredningsøkologiske betydning af phoresi mellem pelslus og andre insekter er dog stadig omdebatteret.

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