

Parasites of animals in the Netherlands, supplement nr. 4
General survey of the occurrence of four species of the genus
Ornithomyia (Diptera: Hippoboscidae)

by

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Introduction and acknowledgements.

This survey is based on material compiled in the institute for Veterinary Parasitology, Utrecht, up to 1st January 1969 (see also VAN DEN BROEK 1965, 1968, VAN DEN BROEK & VAN ECK, in press). Several ornithologists and bird-watchers have carefully collected and labelled the Hippoboscid flies and have sent them to Utrecht. I am very much obliged to each of them.

Material.

The flies were identified by means of the keys provided by LECLERCQ (1962), HILL c.s. (1964) and THEODOR & OLDROYD (1964). The present records are based for the greater part on accidental catches of wandering and migrating birds. During the past few years, a more systematic search of birds' nests, nest-boxes and nestlings was carried out, especially on Vlieland. The latter records yield more valuable information than the former about habitats and breeding places of the various fly species. All records obtained thus far are summarized in the host list (table 1). This list can be compared to a similar table given by HILL, c.s. (1964) for the Fennoscandian records. The data obtained on Vlieland are included, but these will also be presented more detailed elsewhere (VAN DEN BROEK & VAN ECK, in press). A presentation of infection percentages of certain species of flies on birds or in nests would give an impression of frequency and distribution of these species in different localities. It is impossible, however, to compose such a table. In the first place, reliable numbers of un-infected birds cannot be given by the collectors, and secondly, flies often escape as soon as their hosts are handled. The records compiled in table 1 are therefore not presented quantitatively.

Material in other collections.

Specimens of various species of *Ornithomyia* are also kept in the State Museum of Natural History at Leiden, and in the Zoological Museum of the University of Amsterdam, Department of Entomology. For the purpose of the present study, these collections were inspected superficially only. A few years ago, both collections were examined and studied by MAA.

The kind cooperation of the heads of the sections Diptera in both museums is gratefully acknowledged.

Geographic distribution.

Records from neighbouring countries can be useful in connection with data on the distribution of a species in the Netherlands. Recent publications on this subject could be found only from the British Isles (HILL, 1962 a and b, HILL

1963 and many publications cited there), from Belgium (LECLERCQ, 1962), from Iceland, Finland and the Scandinavian countries (HILL c.s., 1964). Comparable recent papers from France and Germany have not been found. The notes on distribution in surrounding countries are based on the references mentioned above, which are not repeated.

Survey of species.

Ornithomyia biloba Dufour, 1827.

Collected twice in nests of *Hirundo rustica*, Ouderkerk aan den IJssel (Zuid Holland province): 24 August 1964 (1 specimen, identification confirmed by H. OLDROYD, London) and 14 June 1967 (3 specimens). Two specimens of this little known species are in the Museum of Natural History, Leiden, one collected at Meyendel (near the Hague) in 1943, one "from swallow" with no further data. In Amsterdam there are three samples, two from *Hirundo rustica* (both Amsterdam), one from nest of swallow (Zwammerdam). The total number of specimens in this collection is nine.

Distribution in surrounding countries.

This species, which occurs almost exclusively on *Hirundo rustica*, seems to reach the Northern limit of its distribution area in the Netherlands. Nothing is known, however, about the frequency of its occurrence here in the nests of its main host. It seems to be rather common in Belgium, and has occasionally been collected in Southern Sweden (3 specimens) and on the British Isles (no numbers mentioned).

Ornithomyia avicularia (Linnaeus, 1758).

Very common, probably endemic in the whole country in suitable habitats ("woodland", see HILL, 1962 b). Found in nests on the North Sea Islands of Vlieland and Terschelling, in the dune area near the Hague (1 specimen), and on the Veluwe; on various birds on Vlieland, near the Hague (Meyendel), near Amsterdam (Eempolder), in the centre (De Bilt), in the Eastern part (Veluwe, Dalfsen) and in the Southern part (North Brabant) of the country. Thus far, it has been the only species found on Falconiformes, Columbiformes and Corvidae in the Utrecht collection.

Puparia have been found in nest boxes inhabited by smaller passerines: *Parus major* in Vlieland, *Fidecula hypoleuca*, *Parus ater*, *P. major* and *Phoenicurus phoenicurus* on the Veluwe. The adult flies seem to prefer larger birds as their hosts, but probably the nest boxes are somehow attractive for larvipositing females. The collected number of puparia of *O. avicularia* in nests on the Veluwe is much larger than that of *O. fringillina*.

First records in breeding season: 2 June 1966, Huizen-N.H., 2 June 1968, Vlieland, both times on *Turdus merula*. Last record in autumn: 8 October 1965, Huizen-N.H., on *Sturnus vulgaris*.

Many specimens of this species are present in the museum collections both of Leiden and Amsterdam.

Distribution in surrounding countries: common in Europe, Asia and Africa in regions with a temperate climate (details given by LECLERCQ, 1962). There are frequent records from Belgium, from Great Britain except Scotland, from Denmark and Southern Scandinavia.

Table 1. Host list of *Ornithomyia* spp. in the Netherlands, all records up till 1st January 1969. b = *O. biloba*; a = *O. avicularia*; c = *O. chloropus*; f = *O. fringillina*; n = in nest on bird. Puparia not included.

			b	a	c	f		
Falconiformes	Accipitridae	<i>Accipiter nisus</i>		+				
	Falconidae	<i>Falco tinnunculus</i>		+				
Charadriiformes	Charadriidae	<i>Pluvialis apricaria</i>				+		
	Haematopidae	<i>Haematopus ostralegus</i>		+	+			
	Scolopacidae	<i>Numenius arquata</i>				+		
		<i>Tringa totanus</i>				+		
Columbiformes	Laridae	<i>Larus ridibundus</i>		+				
	Columbidae	<i>Columba livia domestica</i>		+				
		<i>Columba palumbus</i>			n			
Strigiformes	Strigidae	<i>Streptopelia decaocto</i>		n+				
		<i>Asio otus</i>		+				
		<i>Asio flammeus</i>				+		
Passeriformes	Picidae	<i>Picus viridis</i>		+				
		<i>Jynx torquilla</i>		n		n		
	Hirundinidae	<i>Hirundo rustica</i>	n	+				
	Motacillidae	<i>Anthus trivialis</i>				+	+	
		<i>Anthus pratensis</i>				+		
		<i>Motacilla alba</i>				+	+	
		<i>Motacilla flava</i>				+	+	
	Troglodytidae	<i>Troglodytes troglodytes</i>				+		
	Prunellidae	<i>Prunella modularis</i>				+		
	Turdidae	<i>Turdus pilaris</i>				+		
		<i>Turdus philomelos</i>			n+	n+		
		<i>Turdus iliacus</i>				+		
		<i>Turdus torquatus</i>		+				
		<i>Turdus merula</i>		+	+			
		<i>Phoenicurus phoenicurus</i>				n	+	
		<i>Eritbacus rubecula</i>				+	+	
		Sylviidae	<i>Locustella luscinioides</i>				+	+
			<i>Acrocephalus scirpaceus</i>				+	
			<i>Hippolais icterina</i>				+	
	<i>Sylvia borin</i>					+	+	
<i>Sylvia communis</i>					+	+		
<i>Phylloscopus trochilus</i>						+		
<i>Phylloscopus collybita</i>						+		
Muscicapidae	<i>Regulus regulus</i>					+		
	<i>Muscicapa striata</i>				+			
Paridae	<i>Fidicula hypoleuca</i>				+			
	<i>Parus major</i>		n+	n+	n+			
	<i>Parus caeruleus</i>					+		
	<i>Parus palustris</i>					+		
	<i>Aegithalos caudatus</i>					+		
	<i>Panurus biarmicus</i>		+			+		
Embreziidae	<i>Embrezia schoeniclus</i>				+	+		
	<i>Calcarius lapponicus</i>				+			

		a	c	f
Fringillidae	<i>Chloris chloris</i>	+		
	<i>Carduelis flammea cabaret</i>	n	n+	n
	<i>Loxia curvirostra</i>		+	
	<i>Fringilla coelebs</i>			+
	<i>Fringilla montifringilla</i>		+	
Ploceidae	<i>Passer domesticus</i>	+	+	+
Sturnidae	<i>Sturnus vulgaris</i>	+	n+	
Corvidae	<i>Corvus corone</i>	+		
	<i>Corvus monedula</i>	+		
	<i>Nucifraga caryocatactes</i>	+		

Ornithomyia chloropus Bergroth, 1901.

Endemic on the North Sea Isle of Vlieland, presumably also on other North Sea islands (VAN DEN BROEK, 1968).

Thus far, hosts on Vlieland were only Charadriiformes and Passeriformes. Flies have been found in nests, on pulli, fledgelings and migrants. There is one record from Terschelling (nest of *Parus major*, 7 July 1967). Puparia have been found in nest boxes on Vlieland.

First records in breeding season: 5 June 1966 and 5 June 1967, both times in nests of *Parus major*. Last record in autumn: 2 November 1968, on *Turdus pilaris*. (All records from Vlieland. See also VAN DEN BROEK and VAN ECK, in press).

From the mainland there are a few records, very probably all from migrants:

1 ♀ from *Calcarinus lapponicus*, Wassenaar, 29 Sept. 1960

1 ♂ from *Emberiza schoeniclus*, Nijkerk, 15 Sept. 1964

1 ♀ from *Anthus trivialis*, Meyendel, 28 Aug. 1966

1 ♂ from *Asio flammeus*, Meyendel, 4 Oct. 1968

In the collection of the Museum of Natural History, Leiden, there is one single specimen of this species, caught at Loosduinen (near the Hague) by PERDECK in 1932 (host not mentioned).

All these localities lie on the migration routes of many birds which migrate from Scandinavia and North East Europe.

Distribution in surrounding countries.

The five scattered specimens reported from the mainland have probably been transported by migrants from the breeding area of the fly which seems to be determined by a rather rough climate: Scotland, Northern England, Wales, Ireland, Iceland, Scandinavia, possibly the German North Sea Islands. There are four records of this species from Belgium, all from the province of Liège, which obviously also concern flies transported on migrating hosts.

Ornithomyia fringillina Curtis, 1836.

Although no specimens are present in the Natural History Museum, Leiden, this species is considered to be common in the Netherlands. It is endemic at any rate in the dune area near the Hague and in woods on the Veluwe, where puparia have been found. Some puparia were also found on Vlieland after the breeding seasons of 1967 (VAN DEN BROEK & VAN ECK, in press) and of 1968. The species has been found exclusively on Passeriformes in this country, the largest host being the white wagtail, *Motacilla alba* (mean length,

including long tail, 18 cm), the smallest host the goldcrest, *Regulus regulus* (mean length 9 cm). It occurred in nearly all collecting centres: Vlieland, Huizen-N.H., and environments, Meyendel, Aalsmeer, the Veluwe. In all these localities *O. avicularia* was also found, except in Aalsmeer where only small passerines were inspected. *O. fringillina* occurred on nestlings (Vlieland, Aalsmeer, Veluwe), juveniles (all centres) and migrants (many records). These data show that the species will be widespread over the country in suitable habitats, defined as "hedgerow" by HILL (1962): the dunes, hedges and reedlands in the polders of the West and Middle parts, light woods in the South and East parts. For the North and North West parts no records are available yet, as no collectors have operated here, except on Vlieland, where the species seems to occur in varying numbers in successive years (VAN DEN BROEK & VAN ECK, in press).

First records in breeding season: 3 July 1967, on *Parus major*, Vlieland, and 11 July 1965, on *Jynx torquilla*, Veluwe, in both cases in nests. Although no specimens of *O. fringillina* have as yet been caught before the first of July, it must be assumed that, at least in the sheltered part of the woods, they have hatched long before that date. HILL (1963) observed the first specimens in Lincolnshire (England) in the second half of June. The fact that this fly is smaller and less conspicuous than *O. avicularia* is probably one of the reasons why far less specimens of *O. fringillina* are collected by bird investigators.

Two specimens are in the collection of the Entomological Museum, Amsterdam. One of these was bred by P. RÜSCHKAMP from a puparium found in decaying wood of a willow in Exaten (Limburg).

Distribution in surrounding countries.

Common in the Southern part of the British Isles, about up to the July isotherm of 61° F. Several records from East Belgium, which nearly all date from October and apparently are from migrants. Recorded in small numbers from Denmark, Southern Sweden and Southern Finland. In Germany less frequent than *O. avicularia* (EICHLER, 1937).

Mixed infections.

It is generally assumed that the occurrence of more than one species of *Ornithomyia* on a single host specimen is an exception (BEQUAERT, 1953, HILL, 1962b). This holds good as far as *O. biloba* is concerned. The present observations, however, include an unexpectedly high number of mixed infections by the other three species in nests and on juveniles. The majority of these cases come from Vlieland: 20 from nest boxes and 3 from juveniles (respectively 40.8% and 8.0% of the total number of records from these host categories). A striking case was that of a juvenile *Turdus merula*, apparently ill, which harboured 10 male and 11 female specimens of *O. avicularia*, together with 2 male and 3 female specimens of *O. chloropus*. This bird was caught on 4 July 1967, in the "top" season for both fly species. Two more cases of mixed infection were found in nest boxes on the Veluwe (VAN DEN BROEK, 1968). Moreover it has been noticed several times that puparia of two species occurred in the same nest.

The majority of the examined migrants and adults harboured only a single fly each. Apparently, the hosts, as they grow up, acquire more experience in successfully destroying the parasites (HILL, 1963). As most data from the literature apply to migrants, the conviction was gradually established that the different species of *Ornithomyia* would keep apart very strictly. HILL (1962b) has contributed much to the knowledge of host and habitat preference of these species. The data presented in this survey are for a good deal in agreement with HILL's hypotheses. However, they do not quite support his conclusion that these species, „although partly sympatric, do not experience interspecific competition”.

Summary

Four species of the genus *Ornithomyia* are endemic in the Netherlands: *O. biloba* Dufour, *O. avicularia* (L.), *O. chloropus* Bergroth, *O. fringillina* Curtis. General conclusions about distribution and frequency of these species are based on records, compiled in the Institute for Veterinary Parasitology, University of Utrecht.

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Wanderversammling deutscher Entomologen. De elfde "Wanderversammling" zal van 16—20 september 1970 te Halle (D.D.R.) plaats vinden. Thema's: problemen van de systematische entomologie, vraagstukken betreffende de oecologische entomologie, symposia over Thysanoptera, Microlepidoptera, parasitische Hymenoptera (vooral Ichneumonidae) en vraagstukken betreffende honingdauw. Aanmelden voor 15 juni. De Redactie heeft voor gegadigden 1 programma en 1 gemeenschappelijk aanmeldingsformulier.