

PARASITIC MITES OF SURINAM. XII.
DEMODEX MELANOPTERI SP. N. (DEMODICIDAE : TROMBIDIFORMES)
FROM THE MEIBOMIAN GLANDS
OF THE NEOTROPICAL BAT *EPTESICUS MELANOPTERUS*¹

BY

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INTRODUCTION.

Demodicids with unique holdfast mechanisms have recently been described from the Meibomian glands of nearctic voles (NUTTING et al., 1971) and neotropical bats (DESCH, NUTTING & LUKOSCHUS, 1972). These species adaptations include operculate, Y-shaped (NUTTING et al., 1968) or snake-like ova, larval egg-teeth, large clawlike larval or nymphal legs, prominent epimeral scutes, and peculiar fingerlike or winglike dorsal larval or nymphal prominences. *Demodex melanopteri* sp. n., described below, is also an inhabitant of the Meibomian complex. Although the precise position of this species in the Meibomian complex of its hosts, *Eptesicus melanopterus*, has not been determined it apparently survives as discussed below, with only minor structural modifications of the basic plan of the genus.

METHODS.

Mites were expressed from the Meibomian glands at the inferior margins of the eyes of *Eptesicus melanopterus* with watch-maker pincers and mounted in Hoyer's medium. Specimens were studied with phase microscopy and figured with the aid of a Wild-Treffenberg prism. All measurements in the description are in micrometers.

***Demodex melanopteri* sp. nov.**

Description (with characters of the genus) : *Demodex melanopteri* is a large member of the genus, one female measuring 450, with long opisthosoma (3/4-4/5 of total length). The species is highly variable with respect to total length in all stages (Table I).

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Male (holotype) : Total length 419, with opisthosoma 338 and width 40. Five paratypes average length 336 (280-419), with opisthosoma length 272 (225-378), and width 44 (37-50).

TABLE I : Meristic data (average values and range)
for all stages in the life cycle of *Demodex melanopteri* n. sp.
Measurements in micrometers.

	gnathosoma		podosoma		opisthosoma		total body length	penis/vulva length
	length	width	length	width	length	width		
(6) male	16	22	65	44	272	39	336	24
	14-19	19-23	62-75	37-50	225-338	36-41	279-419	22-26
(18) female	16	23	77	38	242	36	325	18
	14-22	17-35	66-112	32-52	171-360	31-54	252-450	13-23
(4) nymph	17	22	69	33	309	33	394	
	14-21	18-24	59-80	28-39	234-365	29-37	315-450	
(4) protonymph	16	20	47	32	299	31	366	
	12-17	18-22	41-52	29-35	257-333	29-32	342-374	
(3) larva	15	18	48	31	247	32	309	
	11-19	16-19	44-54	28-34	220-261	28-36	279-324	
(10) ovum length	222	150-269						
greatest width	41	32-45						

Venter (Fig. 1) : Four pairs of six-segmented legs evenly spaced on podosoma. Gnathosoma trapezoidal, length 16, less than basal width (19-23). Pharyngeal bulb (*pb*) oval shaped. Subgnathosomal setae (*sg*) anterior to pharyngeal bulb. Palps three-segmented, palp tarsi directed ventrally. Palp tarsi with two two-pointed claws and two spines (see detail Fig. 6). Legs about as long as podosomal wide with large coxal plate, triangular trochanter, femur with distinct ventro-posterior spur, very short genu and tibia and tarsus larger than the three preceding segments (Figs. 4, 5). Claws inserted laterally. Dorsal side of claws furrowed with three points on each side (Fig. 3). Legs I and II with bulbous solenidion (*so* in Fig. 4). Chelicerae (Fig. 10) with digitus fixus attached to dorsal side of mouth opening and lanceolate cheliceral digits. Opisthosoma with transverse annulation. Proctodeum absent (see also DESCH, O'DEA & NUTTING, 1971).

Dorsum (Fig. 2) : Gnathosoma with hook-like supracoxal spines (*sc s* in detail of Fig. 7). Podosoma with rectangular dorsal shield back to anterior level of coxae IV. Genital opening in anterior part of dorsal shield. Two pairs of podosomal tubercles (*pt*), anterior at level of genital opening, posterior at level of posterior border of coxae II. Curved stout penis of 26 μ . Two small lateral shields (*ls*) at posterior border of podosoma. Soft parts of idiosoma striated, in longitudinal direction along lateral sides of shield, transversely annulate posterior to level of coxae IV.

Female (allotype) : Length 428, with opisthosoma 327 and width 38 ; 17 paratypes averaged 325 (252-450), with opisthosoma 327 (171-360) and width 38 (32-52).

Venter (Fig. 6) : General shape as male. Genital opening (19 long) longitudinal, behind

coxae IV, distinctly separated from coxae by several striations. Vulval region protuberant. Opisthosoma with transverse annulation. Proctodeum absent.

Dorsum (Fig. 7) : As male, but dorsal shield broader without podosomal tubercles, less sclerotized than in male, with some irregularly folds. Lateral shields as in male.

Egg (Fig. 11) : Long drop-like, with bulbous anterior end and pointed posterior. Total length very variable, average of 10 specimens 222 (150-269), width of bulbous anterior 41 (32-45). Distinct operculate groove (*op*) in all specimens.

Larva : Worm-like with three pairs of unsegmented bilobed legs, each lobe carrying a five-pointed claw. First pair of legs more ventrally situated than the laterally inserted legs II and III. Gnathosoma as in adults, but without subgnathosomal setae, palp tarsi with two two-pointed claws and only one spine. Chelicerae with digitus fixus strongly sclerotized and elongated, forming egg-teeth, cheliceral digits as in adults. Supracoxal setae indistinct. Small round epimeral scutes II and III are present. Venter with longitudinal striation on podosoma, regularly annulate on opisthosoma, dorsum with annulation also on podosoma. Length 279-324, width 28-34.

Protonymph : Similar to larva and with six legs. Total length 366 (342-374) with extremely long opisthosoma 299 (257-333), being 5/6 of total length.

Venter (Fig. 12) : Three pairs of unsegmented bilobed legs inserted laterally. Each lobe carries a five-pointed claw. On legs I two solenidia (*so*) are present, on legs II only one. Gnathosoma with oval shaped pharyngeal bulb. Subgnathosomal setae (*sg*) anterior to pharyngeal bulb. Palps of three segments with two claws on tarsi, one of them three-pointed, and one spine. Chelicerae as in adults, digitus fixus = epistomal spine (*ep sp*) shorter than in larva. Epimeral scutes II and III broad lanceolate with pointed end. Some longitudinal striations on ventral podosoma.

Dorsum (Fig. 13) : Distinct transverse annulations on idiosoma. Supracoxal spines smaller than in adults, but of same shape.

Nymph : Total length 315-450, width 30-39, opisthosoma 234-365. Four pairs of unsegmented bilobed legs inserted laterally.

Venter (Fig. 8) : Gnathosoma as in protonymph, but without epistomal spines. Second segment of palps elongated, palp tarsi with two two-pointed claws and two spines. All legs with two five-pointed claws. Legs I and II with two bulb-shaped solenidia (*so*). Podosoma with some longitudinal striations between the four pairs of broad lanceolate epimeral scutes (*e sc*). Dorsum with transverse annulation as shown in Fig. 9.

Host : *Eptesicus melanopterus* (Jentink, 1904).

Type locality : Meerzorg, Surinam, 3.III.1970 ;

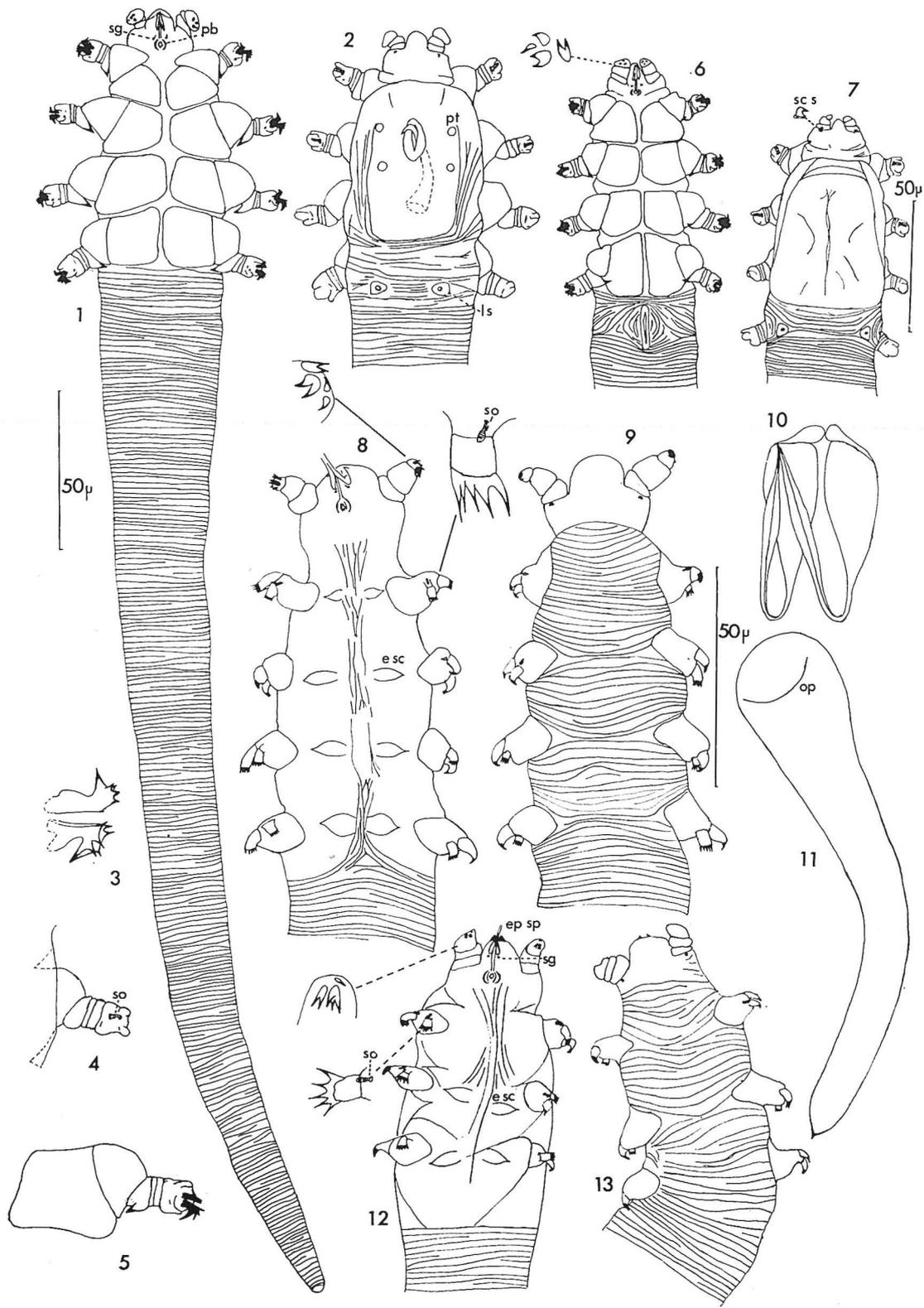
Lelydorp, Surinam, 24.II.1970, 26.II.1970, 27.II.1970.

Types : Holotype and allotype deposited in Rijksmuseum van Natuurlijke Historie, Leiden, The Netherlands, Paratypes in : National Collection of Surinam, Paramaribo, P.O.B. 1911 ;

FIG. 1-13 : *Demodex melanopteri* sp. nov.

1. — Male allotype venter. 2. — Male allotype dorsum. 3. — Tarsal claws. 4. — Leg I dorsally. 5. — Leg I ventrally. 6. — Female (holotype) venter. 7. — Female (allotype) dorsum. 8. — Nymph venter. 9. — Nymph dorsum. 10. — Chelicerae. 11. — Egg. 12. — Protonymph venter. 13. — Protonymph dorsum.

e sc — epimeral scute, ep sp — epistomal spine, ls — lateral shield, op — opercular groove, pb — pharyngeal bulb, pt — podosomal tubercle, sc s — supracoxal spine, sg — subgnathosomal seta, so — solenidium.



U. S. National Museum, Washington, D. C. ; Institut de Médecine Tropicale, Antwerp ; British Museum (Natural History), London ; Zoology Department, Amherst, Mass., U.S.A. ; Zoölogisch Laboratorium, Nijmegen, The Netherlands.

Location in host : *Demodex melanopteri* has only been recovered from the Meibomian complex of the host animals despite expensive examination of skin areas of 7 host specimens. A very short undescribed species of the genus was recovered from the hair follicle complex, but unfortunately the sample is inadequate for species description.

DISCUSSION.

Demodex melanopteri is apparently limited in its distribution in *Eptesicus melanopterus* to the Meibomian complex. It is thus similar in habitat acceptance to *D. gapperi* of the red-backed vole (*Clethrionomys gapperi*) and *D. molossi* and *D. longissimus* from the bats *Molossus molossus* and *Carollia perspicillata* respectively. Compared to these three demodicids, *D. melanopteri* has a more limited series of adaptations to its habitat. These can be listed by stage in the life cycle as :

1. Ovum — flexible shaft with pointed posterior and operculate swollen anterior.
2. Larva and protonymph — egg-teeth and bilobed legs each with well developed five-pointed claws.
3. Nymph — bilobed legs and each with a pair of well developed claws. Palps well developed, possibly as holdfasts.

As in the other species found in the Meibomian complex, *D. melanopteri* is a large species with a remarkably long opisthosoma. The character of the egg-teeth in this species indicates that it is an unusual adaptation of the developing digitus fixus which combined with the operculate ovum would make possible rapid emergence of the larvae. This development would provide a selective advantage for survival against the flow of Meibomian secretions which would tend, otherwise, to sweep the mites from the habitat.

SUMMARY.

Demodex melanopteri sp. n. from the Meibomian glands of the neotropical bat *Eptesicus melanopterus* is described and figured in detail. Morphology of immature stages is compared to other species of genus *Demodex* which are also inhabitants of the Meibomian complex. This new demodicid apparently relies upon the peculiar shape and flexibility of the ovum and the well developed, heavily clawed larval, nymphal and adult legs for maintenance of position in the Meibomian complex. Operculate ova and larval egg teeth probably represent modifications for rapid eclosion of the larvae ; such could be of survival value in this unusual habitat.

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