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Notes on Species of Trichodectidae with Descriptions of New Genera and Species.

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Most of the material reported on in this paper from Procaviidae was collected by Mr. Gordon B. Thompson and the writer of skins in the British Museum, and the numbers recorded between brackets after their hosts refer to the numbers of the skins in the museum. For permission to examine the skins I am deeply indebted to Mr. Martin A. C. Hinton, F.R.S.

I also wish to express my thanks to the following for sending me material:—Mr. Gordon B. Thompson of the British Museum; Mr. G. H. E. Hopkins for species from Uganda and Kenya Colony, and Dr. G. Martinaglia for material collected off animals in the Zoological Gardens, Johannesburg. To Mr. G. B. Thompson I am further indebted for kindly sending me copies of both Gervais' and Rudow's original descriptions and tracings of their drawings of species described by them found on goats.

Genus Procavicola Bedford.

Procavicola univirgata (Neumann).

Previous records.—From "*Hyrax*" sp., Congo (Neumann, 1913); *Dendrohyrax* sp., Berlin Museum (Stobbe, 1913); *D. adolfi-friederici*, Belgian Congo (Ferris, 1930); *D. arborea*, Port St. Johns, Cape Province (Bedford, 1932).

Additional records.—*Dendrohyrax arborea*, Port Alfred, Cape Province, 1933 (coll. R. F. Lawrence); *D. adolfi-friederici*, Mount Muhavura, south-west of Kigezi, Uganda, 9th Sept., 1929 (Brit. Mus. No. 30.8.1.54); *D. crawshayi*, Kinangop, Kenya Colony (Brit. Mus. No. 3.4.4.4.); *D. scheelei*, Ukeke District, Tanganyika Territory, 8th Dec., 1910 (Brit. Mus. No. 11.4.23.2); *D. stuhlmanni*, Burumba, Ankole, Uganda, Aug., 1903 (Brit. Mus. No. 4.2.6.32); *D. bocagei*, Benguella, Anboim District, Angola, 27th April, 1934 (coll. K. Jordan) and *D. angolensis*, Congulu, Amboim District, Angola (coll. K. Jordan).

Procavicola neumanni (Stobbe).

Previous records.—From *Dendrohyrax* sp., Berlin Museum (Stobbe, 1913); as *Trichodectes sternatus* from *Dendrohyrax adolfi-friederici*, Belgian Congo (Ferris, 1930); *D. arborea*, Port St. Johns, Cape Province (Bedford, 1932).

Additional records.—Dendrohyrax arborea, Port Alfred, Cape Province, 1933 (coll. R. F. Lawrence); *D. adolfi-friederici*, between Masisi and Labutsi (Brit. Mus. No. 28.1.30.29); *D. crawshayi*, Kinangop, Kenya Colony (Brit. Mus. No. 3.4.4.4) and Tuthu, Kenya Colony (Brit. Mus. No. 3.4.4.6); *D. scheelei*, Ukeke District, Tanganyika Territory, 8th Dec., 1910 (Brit. Mus. No. 11.4.23.2); *D. stuhlmanni*, Burumba, Ankole, Uganda, Aug., 1903 (Brit. Mus. No. 4.2.6.33).

NOTE.—I think there can be no doubt that all the above specimens refer to *P. neumanni*. Stobbe in describing this species merely stated that it differed from *Trichodectes univirgatus* Neu. in the absence of processes on the posterior margin of the temples. The only other known species found on *Dendrohyrax* which could be confused with it are *P. congoensis* (Ferris), *P. angolensis* nov. sp. and *P. baculata* (Ferris), all of which are, *inter alia*, much smaller.

Procavicola congoensis (Ferris).

Previous records.—Types from *Dendrohyrax adolfi-friederici*, Belgian Congo; also females from *D. validus*, Mt. Kilimanjaro, but these were probably *P. baculata* (Ferris) (Ferris, 1930).

Additional records.—D. adolfi-friederici, Mt. Muhavura, south-west of Kigizi, Uganda, 9th Sept., 1929 (Brit. Mus. No. 30.8.1.54); *D. stuhlmanni*, Burumba, Ankole, Uganda, Aug., 1903 (Brit. Mus. No. 4.2.6.33).

NOTES.—The basal plate of the male genitalia varies in length both in this species and *P. baculata*. In Ferris' figure of the type of *P. congoensis* it is shown extending to the apex of the second abdominal segment; in the specimens from *D. adolfi-friederici* from Uganda it extends to the apex of the first segment, and in the specimens from *D. stuhlmanni* it extends to the apex of the metathorax. This species is closely related to the three following, and I have been unable to find specific characters for separating the females and those of *P. angolensis* nov. sp., except that the lobe on the inner face of the gonopophysis appears to be larger in *P. congoensis*.

Procavicola angolensis nov. sp.

(Figs. 1 and 2).

Males and females taken off *Dendrohyrax bocagei*, Benguella, Amboim District, Angola, 27th April, 1934 (coll. K. Jordan), and *D. angolensis*, Congulu, Amboim District Angola (coll. K. Jordan). The holotype, a male, and allotype from *D. bocagei* will be deposited in the British Museum collection.

NOTES.—This species is very closely related to *P. congoensis*, of which Ferris (1930) has given excellent figures, also to *P. jordani* nov. sp., and *P. baculata* (Ferris). The male can be distinguished from both *P. congoensis* and *P. baculata* by the presence of two median transverse plates instead of only one on tergites IV to VI, and also by the male genitalia. The endomeres are fused except at

their extreme apices where they are bilobed, and their latero-anterior angles are sharply pointed, whereas in both *P. congoensis* and *P. baculata* they are separated and rounded at their latero-anterior angles. The pseudopenis also differs in being more widely rounded at its apex. The basal plate is long, extending to the first abdominal segment. Preputial sac with numerous minute spines. The female, as stated above, very closely resembles that of *P. congoensis*. Both these can, however, be distinguished from the females of *P. jordani* and *P. baculata* in having two separate plates on the apical tergite, whereas in *P. jordani* and *P. baculata* these plates are united in front (compare Figs. 2, 4 and 5).

Male: Length 1·13 mm., head 0·29 × 0·26.

Female: Length 1·17 mm., head 0·29 × 0·26.

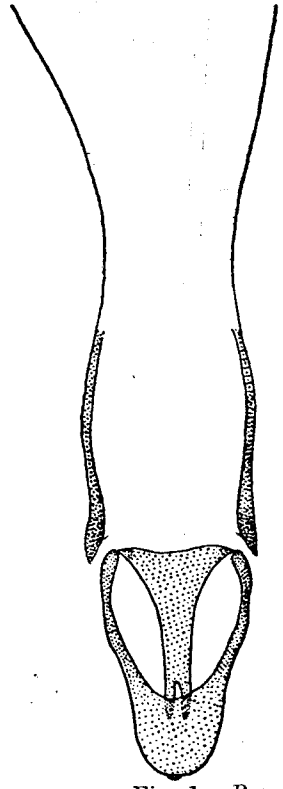


Fig. 1.—*Procavicola angolensis* nov. sp., male genitalia.

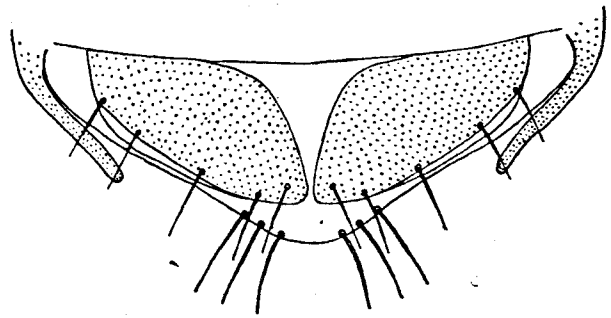


Fig. 2.—*Procavicola angolensis* nov. sp., apical tergite of female.

Procavicola jordani nov. sp.

(Figs. 3 and 4).

Males and females taken off *Dendrohyrax angolensis*, Congulu, Amboim District, Angola (coll. K. Jordan).

The holotype, a male, and allotype will be deposited in the British Museum collection.

NOTES.—This species is closely related to the two foregoing species, and also to *P. baculata*. The distinctive features in the male appear to be the presence of a narrow transverse sclerite between each of the hind coxae and the sclerotic bar on sternite i, and in the male genitalia, and in the female the apical tergite and apical sternites.

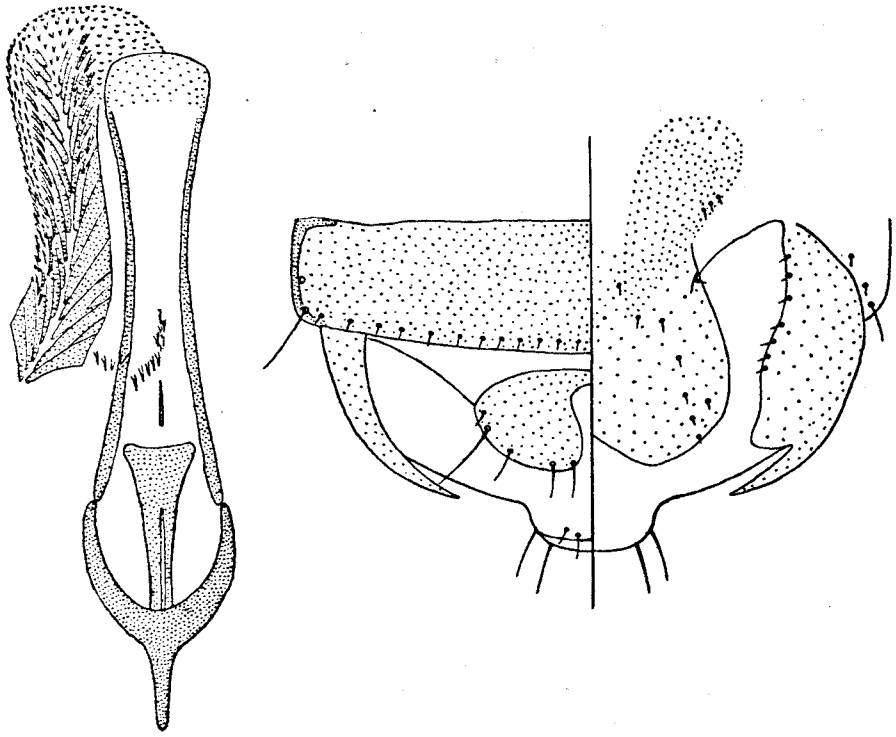


Fig. 3.—*Procavicola jordani* nov. sp., male genitalia.

Fig. 4.—*Procavicola jordani* nov. sp., apical tergites and sternites of female.

Male genitalia (Fig. 3)—The endomeres resemble *P. angolensis* except that they are situated further forward and have the latero-anterior angles rounded; above them is a minute elongated sclerite which is absent in the other species. The pseudopenis resembles that of *P. baculata* in being narrow at the apex. The basal plate is short and narrow, extending to the fifth segment. The most conspicuous feature, however, is the presence of numerous largish teeth on the preputial sac.

In the female the plates on the apical tergite are united in front as in *P. baculata*, but they are much smaller than in that species, and the apical sternites are very distinct (see Fig. 4).

Male: Length 1·15-1·2 mm., head 0·31 × 0·27.

Female: Length 1·26 mm., head 0·33 × 0·29.

Procavicola baculata (Ferris).

(Fig. 5).

Previous record.—From *Dendrohyrax validus*, Mt. Kilimanjaro (Ferris, 1930).

Additional records.—*Dendrohyrax validus*, Kilimanjaro, 30th October, 1884 (Brit. Mus. No. 85.1.17.8); and *D. neumanni*, Tambatu, Zanzibar (Brit. Mus. No. 13.10.28.5).

NOTES.—In the males from *D. validus* the basal plate of the genitalia extends into the metathorax, whereas in the males from *D. neumanni* the basal plate is slightly wider and also shorter, extending only to the third abdominal segment. No importance can be attached to this difference, however, in view of the fact that the basal plate also varies in length in males of *P. congoensis*. As stated above, this species is closely related to the three foregoing species.

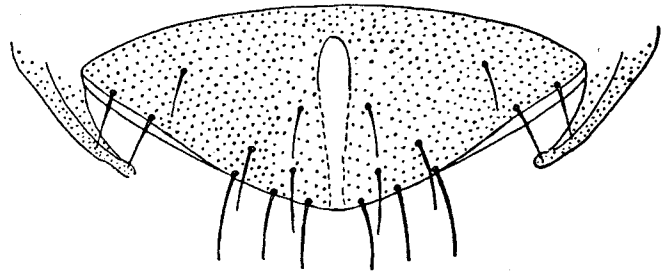


Fig. 5.—*Procavicola baculata* (Ferris), apical tergite of female.

Genus DASYONYX Bedford.

In 1932 the writer included seven species in this genus. Two more are described below, bringing the total number of described species to nine.

Dasyonyx validus Bedford.

Previous records.—Described as *Trichodetes lindfieldi* from *Dendrohyrax adolfi-friederici*, Belgian Congo, and from *D. validus*, Mt. Kilimanjaro (Ferris, 1930).

Additional records.—Males from *Dendrohyrax arborea*, Port Alfred, Cape Province, 1933 (coll. R. F. Lawrence), and males and females from *Dendrohyrax scheelei*, Ukeke District, Tanganyika Territory, 8th December, 1910 (Brit. Mus. No. 11.4.23.2.).

Dasyonyx dendrohyracis (Ferris).

Previous record.—From *Dendrohyrax validus*, Mt. Kilimanjaro (Ferris, 1930).

Additional record.—Males have been taken off the same host species, Kilimanjaro, 30th October, 1884 (Brit. Mus. No. 85.1.17.8).

Dasyonyx windhuki nov. sp.

(Figs. 6 and 7).

Males and females from *Procavia windhuki*, Naukluft, 1,300-1,500 m., South-West Africa, 10th December, 1933 (coll. K. Jordan), and from *Procavia* sp., Otjosongomha, Waterberg, South-West Africa (coll. K. Jordan).

Holotype, a male, and allotype from *P. windhuki* will be deposited in the British Museum collection.

This species is closely related to *D. ovalis* Bedford, described from specimens taken off *Procavia coombsi*, Weltevreden, Parys, Orange Free State. Both males and females of *D. ovalis* possess a small process on the posterior margin of each temple; these being absent in *D. windhuki*. The males can also be distinguished by the male genitalia; in *D. windhuki* they are smaller, and the arms of the pseudo-penis are shorter.

Male: Length 1·1 to 1·17 mm., head 0·22 × 0·29.

Female: Length 1·26 mm., head 0·26 × 0·33.

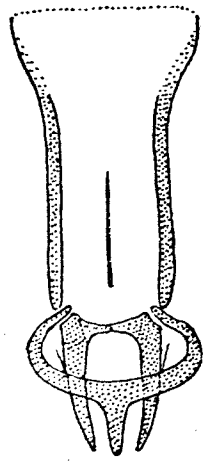


Fig. 6.—*Dasyonyx windhuki* nov. sp., male genitalia.

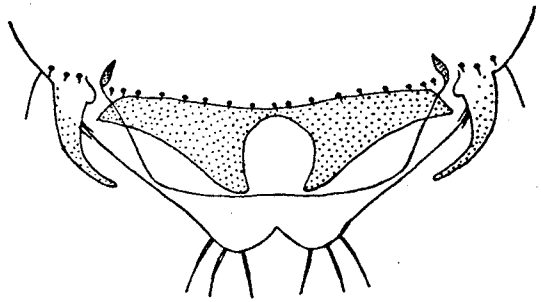


Fig. 7.—*Dasyonyx windhuki* nov. sp., apical sternite of female.

Dasyonyx nairobiensis nov. sp.

(Figs. 8 and 9).

Males and females from *Procavia mackinderi zelotes*, Nyong, Nr. Nairobi, Kenya Colony. *Holotype* a male.

This species is very closely related to *D. transvaalsensis* Bedford recorded from *Procavia coombsi* and *Heterohyrax granti* in the Transvaal.

The female can be distinguished by the shape of the two transverse sclerites on sternite viii (Fig. 7), and the two triangular sclerites on the apical tergite are slightly larger.

The males can be distinguished by the genitalia and the presence of two transverse sclerites on tergites iii-vii, whereas in *D. transvaalensis* there is only one transverse sclerite on tergite vii; these sclerites also differ slightly in shape in these two species.

The genitalia are larger than those of *D. transvaalensis* and the endomeres are of a different shape and united in front by two small sclerites; immediately above these is a small longitudinal sclerite which is likewise absent in the genitalia of *D. transvaalensis*. Preputial sac with numerous minute spines.

Male: Length 1·4 mm., head 0·28-0·31 × 0·35-0·36.

Female: Length 1·59-1·62 mm., head 0·29-0·31 × 0·38-0·4.

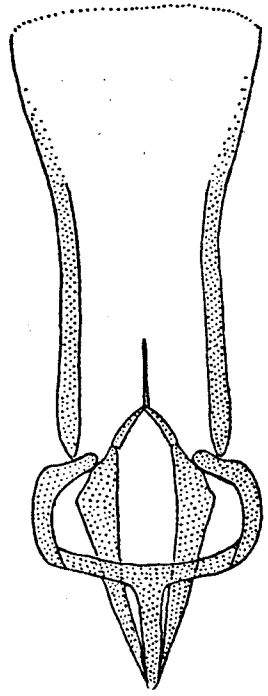


Fig. 8.—*Dasyonyx nairobiensis* nov. sp., male genitalia.

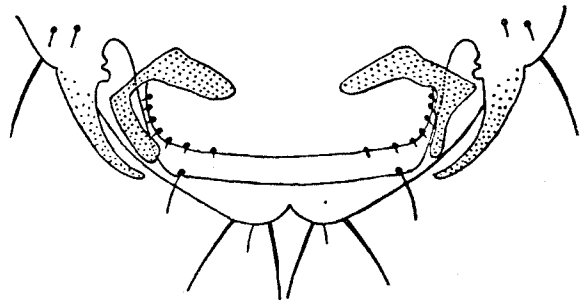


Fig. 9.—*Dasyonyx nairobiensis* nov. sp., apical sternite of female.

Genus PROCAVIPHILUS Bedford.

Procaviphilus granulatus (Ferris).

Previous records.—Females from *Dendrohyrax adolfi-friederici*, Belgian Congo (Ferris, 1930), and *D. arborea*, Port St. Johns, Cape Province (Bedford, 1932).

Additional records.—Females from *Dendrohyrax crawshayi* Thos. Solai, Mt. Kenya, Kenya Colony (Brit. Mus. No. 11.4.7.161); *D. scheelei* Matsch, Ukeke District, Tanganyika Territory (Brit. Mus. No. 11.4.23.2), and *D. stuhlmanni* Matsch. Burumba, Ankole, Uganda (Brit. Mus. No. 4.2.6.33).

Procavicola serraticus (Hill).

Previous records.—From *Procavia sp.*, Mtabamblope, Natal (L. Hill, 1922); *Procavia coombsi* Rbts., Rooikrans, Transvaal (Bedford, 1928); *Procavia natalensis* Rbts., Knysna, Cape Province, and *Procavia* sp., Lamberts Bay, Cape Province (Bedford, 1932).

Additional record.—One female from *Procavia windhuki*, Naukluft, 1,300-1,500 m., South-West Africa, 10th December, 1933 (coll. K. Jordan).

Genus Bovicola Ewing.

Bovicola caprae (Gurlt).

Trichodectes climax Nitzsch, *Germar's Magazine Ent.* III, p. 296 (1818), no description.

Trichodectes caprae Gurlt, *Mag. f. ges. Tierheilk.* IX, p. 3, pl. 1. f. 2 (1843).

Trichodectes climax Giebel, *Insecta Epizoa*, p. 58 (1874); Piaget, *Les Pédiculines*, p. 391, pl. 2, f. 1 (1880).

Trichodectes climax var. truncata Piaget, *ibid.*, p. 393 (1880).

In the British Museum collection there are specimens taken off goats as follows: Ilesha, S. Nigeria; Hay, New South Wales; females and males (obviously stragglers) from *Coelogenys paca* (rodent), Georgetown, British Guiana (coll. J. Rodney); Malta (coll. A. Critien), and one female, Artic Region. Also the following in the Piaget collection: Three females and one male from "une chèvre"; males, females and immature forms (types of *T. climax var. truncata*) from "une chèvre de Java"; six females, one male and one immature specimen from *Capra hircus*, and four females and one male off *Capra hircus var. indica.*

Bovicola major (Piaget).

Trichodectes climax var. major Piaget, *Les Pédiculines*, Suppl., pp. 86-87, pl. 9, f. 5 (1885).

Trichodectes painei Kellogg and Nakayama, *Psyche*, xxi, p. 90, f. 1 (1914).

In the Piaget collection (now in the British Museum) there are four females and two males (mounted on two slides) from *Capra angoriensis* labelled *Trichodectes climax*. These are most probably the types of the *var. major* as there are no specimens labelled *var. major* in the collection, and they are from the same host. As they prove to be the same as *B. painei* described by Kellogg and Nakayama, *B. painei* therefore becomes a synonym of *major.*

Harrison (1916) sank *major* as a synonym of *B. limbatus* (Gervais), discussed under *B. crassipes* (Rudow), probably because it was recorded from *Capra angoriensis*, and he was under the impression that Angora goats only harboured one species, but there are two species parasitic on these animals. Moreover, Piaget's figure of the female of *major* agrees with his specimens labelled *T. climax* from *C. angoriensis*, but not with the second species, *B. crassipes*, which is very distinct.

There are also specimens in the British Museum collection taken off a goat, Imboden, Ark. (coll. B. C. Marshall); goat, Ilminster and females without data.

This species is normally parasitic on Angora goats, but I have also taken it off Boer goats along with *B. caprae* Gurlt.

Bovicola crassipes (Rudow).

Trichodectus crassipes Rudow, *Zeit f. ges. Natur.*, XXVII, pp. 111-112, pl. 7, f. 1 (1866).

Trichodectes penicillatus Piaget, *Les Pédiculines*, pp. 406-407, pl. 32, f. 10 (1880).

Trichodectes pilosus Piaget, *ibid*, pp. 395-396, pl. 32, f. 4 (1880), *nec.* Giebel (1874).

Trichodectes hermsi Kellogg and Nakayama, *Psyche*, XXII, p. 34 (1915).

Gervais (*Histoire Naturelle des Insectes Aptères*, 1844, III, pp. 313-314, pl. 48, f. 3, 4) described and figured two species found on Angora goats, namely, *T. climax* and *T. limbatus*. The description and figure of the former are very inaccurate, and do not agree with any of the known species found on goats. For instance, there are no transverse bands on the dorsum of the abdomen in the female, the first segment of the male antenna is much too large, and the trabecula-like processes are very different to the other species. It should therefore be discarded. It is certainly not the same as *T. climax*, recorded without description by Nitzsch in 1818, and also by Giebel (1874) and Piaget (1880). These specimens were all recorded from *Capra hircus* and are *B. caprae* (Linn.). Gervais' *T. limbatus* should likewise be discarded as it is impossible to be certain whether it is the same as *B. major* or *B. crassipes*. Had it been possible to identify *T. climax Gervais* it would have been possible to identify *T. limbatus*.. Gervais states that the body of *T. climax* is larger than that of *T. limbatus*, indicating that the former is the same as *T. crassipes*. Even if it were possible to prove this, the name *T. climax* Gervais could not be used instead of *T. crassipes* as the same name was used earlier by Nitzsch for a different insect.

Rudow's figure of *T. crassipes* is much better, and there can be no doubt that it is the same species as was described later by Piaget as *T. penicillatus* and by Kellogg and Nakayama as *T. hermsi.*

The female and male described and figured by Piaget as *T. pilosus* from a horse likewise proves to be this species. In addition to these there are five females (mounted on two slides) in the Piaget collection (now in the British Museum) labelled *T. pilosus* which prove to be *B. equi*. The types of *B. pilosus* (Piaget) must either have been stragglers or the specimens were incorrectly labelled. The same applies to *B. penicillatus* (Piaget), which is also a synonym of *B. crassipes*, and was described from a female and male (now in the British Museum) reported to have been taken off *Petrogale* (=*Macropus*) *penicillatus*. There are also specimens in the British Museum collection taken off a goat, Imboden, Ark. (coll. B. C. Marshall).

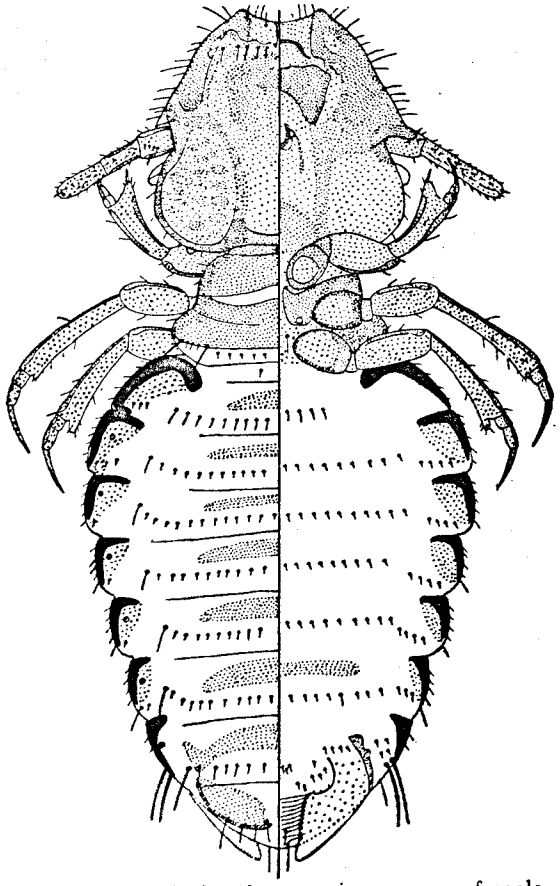


Fig. 10.—*Bovicola thompsoni* nov. sp., female.

Bovicola thompsoni nov. sp.

(Figure 10).

Several females and immature specimens were kindly forwarded by Mr. Gordon B. Thompson of the British Museum taken off *Nemorrhaedus* (=*Capricornis*) *sumatraensis* Bechstein, Barisan, Bukit, Sumatra, July, 1925. The holytype will be deposited in the British Museum collection.

Female.—Total length 2·22 mm., head 0·61 × 0·7 mm. Forehead with the anterior margin concave; temples brown with dark brown spots which are invisible in mounted specimens, and with small processes on the posterior margins. Abdomen pale with brown plates; tergites i-vii each with a median transverse plate and a single row of short setae; on the apical tergite there is a plate with four setae on each side; sternites also with a row of short setae, but transverse plates are absent except on sternite vi; paratregal plates well developed.

B. thompsoni, which is one of the largest species of *Bovicola* known, closely resemble *B. hilli* Bedford, *B. martinaglia* nov. sp. and *B. adenota* nov. sp., but the presence of processes on the temples at once distinguishes it from all other known species of *Bovicola*. Similar processes are anly known to be present in certain species of Trichodectidae parasitic on Procaviidae.

Bovicola hilli Bedford.

Previous record.—From *Kobus ellipsiprymnus* (waterbuck), Umfolozi, Zululand (Bedford, 1934).

Additional record.—Specimens have been received from Mr. G. H. E. Hopkins taken off *Kobus defassus*, Kaiso, Uganda.

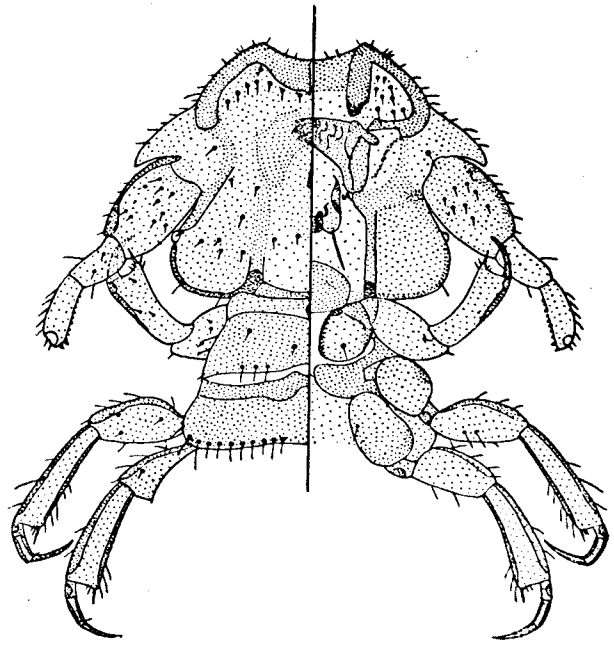


Fig. 11.—*Bovicola martinaglia* nov. sp., head and thorax of male.

Bovicola martinaglia nov. sp.

(Figs. 11-13).

Males and females were sent by Dr. G. Martinaglia taken off *Onotragus leche* in the Zoological Gardens, Johannesburg. *Holotype* a male.

Male.—Total length 1·8 mm.; head 0·42 × 0·43 mm. Forehead with the anterior margin concave; the longitudinal sclerites on the venter terminating in a spinose process in front of the base of each mandible. Antennae with the first joint enlarged; the second joint the shortest, the third with a row of minute spines on the inner margin.

Mid tibiae very slightly longer and narrower than the hind tibiae. Beneath the apex of each hind coxa there is a small transverse sclerite.

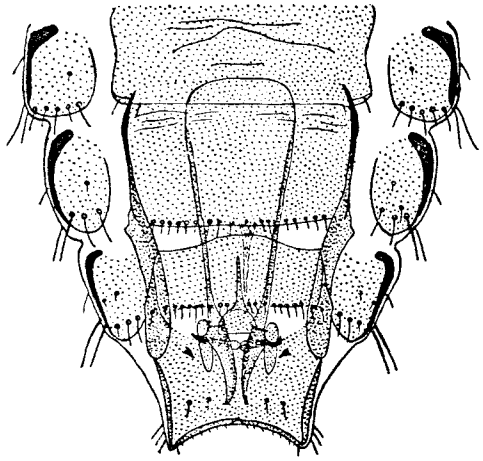


Fig. 12.—*Bovicola martinaglia* nov. sp., apical sternite of male.

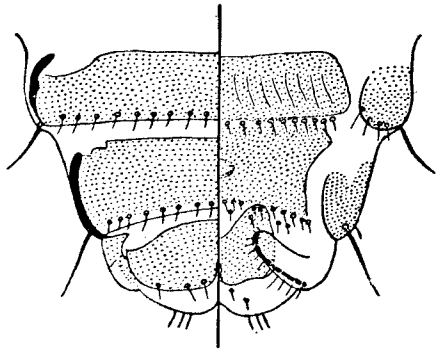


Fig. 13.—*Bovicola martinaglia* nov. sp., apical tergites and sternites of female.

Abdomen with the laterial margins crenelated, broadest at the third and fourth segments; apical segment broad at the apex with the posterior margin concave. Tergites i-vii brown with a single row of short setae, and tergites ii-iv each with lateral intersegmental furrows. Sternites i-vii brown, except for a narrow space between the median bands and paratergal plates; each with a single row of short setae. Paratergal plates well developed. Spiracles large. Genitalia as shown in Fig. 12.

Female.—Total length 1·64 mm.; head 0·38 × 0·43 mm. Differs from the male as follows: The first two antennal segments are small and subequal, the third slightly longer than either the first or second. The median bands on the tergites and sternites are narrower, and the apical abdominal segment (shown in Fig. 13) is of a different shape.

This species is closely related to *B. thompsoni* Bedford, *B. hilli* Bedford, *B. puncta* (Piaget) and *B. adenote* nov. sp. The male can be distinguished by the apical abdominal segment and genitalia, and the female by the shape of the sclerite on the apical sternite and the gonopophyses, which are narrower and have shorter and fewer setae on their inner margins.

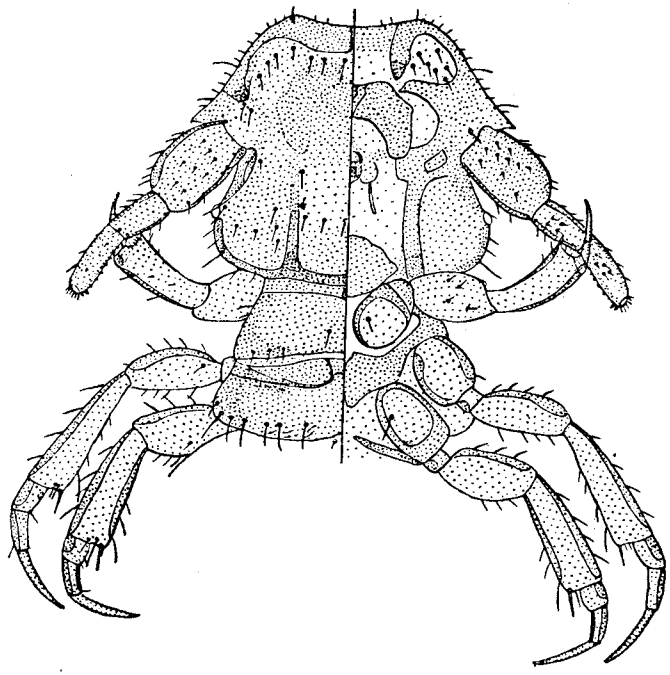


Fig. 14.

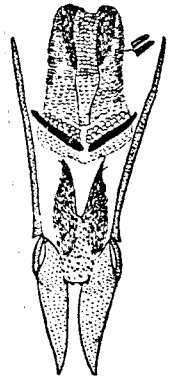


Fig. 15.

Fig. 14.—*Bovicola adenota* nov. sp., head and thorax of male.
Fig. 15.—*Bovicola adenota* nov. sp. male genitalia.

Bovicola adenota nov. sp.
(Figs. 14-17).

Males and females were kindly sent by Mr. G. H. E. Hopkins taken off *Adenota kob*, Kazinga, Uganda. *Holotype* a male.

Male.—Total length 1·85-1·96 mm.; head 0·4-0·42 × 0·42 mm. Forehead with the anterior margin slightly concave, the longitudinal sclerites on the venter terminating in a spinose process in front of the base of each mandible. Antennae with the first joint enlarged, the second joint the shortest, the third with a row of minute spines on the inner margin.

Mid tibiae very slightly longer and narrower than the hind tibiae. Beneath the apex of each hind coxa there is an elongated narrow sclerite. Abdomen elongated, with crenelated lateral margins, broadest at the third segment; apical segment broader in front than behind, with the posterior margin rounded. Tergites and sternites brown with a single row of setae, the former with lateral

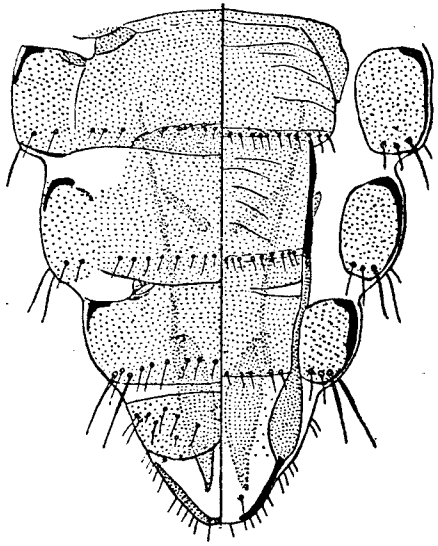


Fig. 16.—*Bovicola adenota* nov. sp., apical tergites and sternites of male.

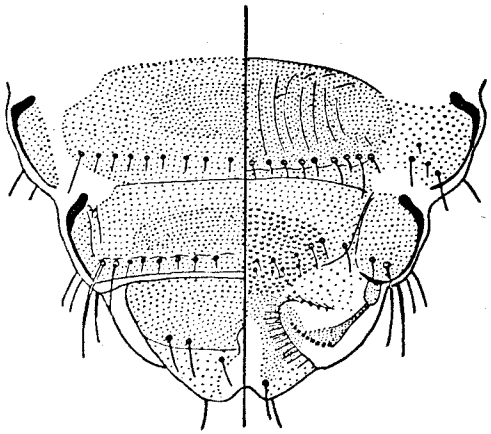


Fig. 17.—*Bovicola adenota* nov. sp., apical tergites and sternites of female.

inter-segmental furrows, these being more developed on tergites ii-v. Paratergal plates well developed. Male genitalia with the parameres short and curved; endomeres larger and elongated; basal plate with two elongated sclerites near the middle; preputial sac with numerous small spines.

Female.—Total length 1·83-1·87 mm., head 0·43×0·47 mm. Differs from the male as follows: The first two antennal segments are short and subequal, the third very slightly longer than either the first or second; the sclerites beneath the hind coxae are much shorter, and the bands on the abdomen are smaller.

This species is closely related to the three foregoing species from which it can be distinguished by the shape of the forehead, the anterior of which is less concave. Other distinguishing characters are to be found in the male genitalia, and the apical abdominal segments of the female.

Genus Damalinia Mjöberg.

Damalinia forficula (Piaget).

Trichodectes forficula Piaget, *Les Pédiculines*, pp. 400-402, pl. 32, f. 7 (1880).

Previous record.—From *Cervus porcinus*, Zoological Gardens, Rotterdam.

Additional record.—Specimens have been received from Dr. G. Martinaglia who took them off *Cervus axis* in the Zoological Gardens, Johannesburg. The host came from Calcutta, India.

Damalinia hopkinsi nov. sp.

(Figs. 18 and 19).

Two males received from Mr. G. H. E. Hopkins taken off an eland (*Taurotragus oryx pattersonianus*) at Gayaza, Uganda, 25th July, 1934.

Male.—Total length 2·15-2·2 mm.; head 0·28×0·26 mm. Forehead with a V-shaped notch in front. Antennae with the first segment long and broad, the second and third subequal. Mid tibiae slightly longer and narrower than the hind tibiae. Abdomen elongated, with crenellated lateral margins, widest at the third segment, and ending posteriorly in two long chitinous lobes. Tergites i-iii each with a single brown median sclerite, the first two more chitinous on the median portion of their posterior margins, where they project backwards on each side of the middle, forming two short spines. Tergites iv-vii each with two median sclerites. Paratergal plates well developed. Prothoracic and abdominal spiracles large, present on abdominal segments ii-vii. Genitalia with the basal plate long and narrow; parameres very small; preputial sac with numerous minute teeth.

This species is closest to *D. forficula* (Piaget) and *D. theileri* Bedford from which the male can be distinguished by the posterior margins of tergites i-ii, the genitalia, and the apical abdominal segment. *D. theileri* is a much larger species.

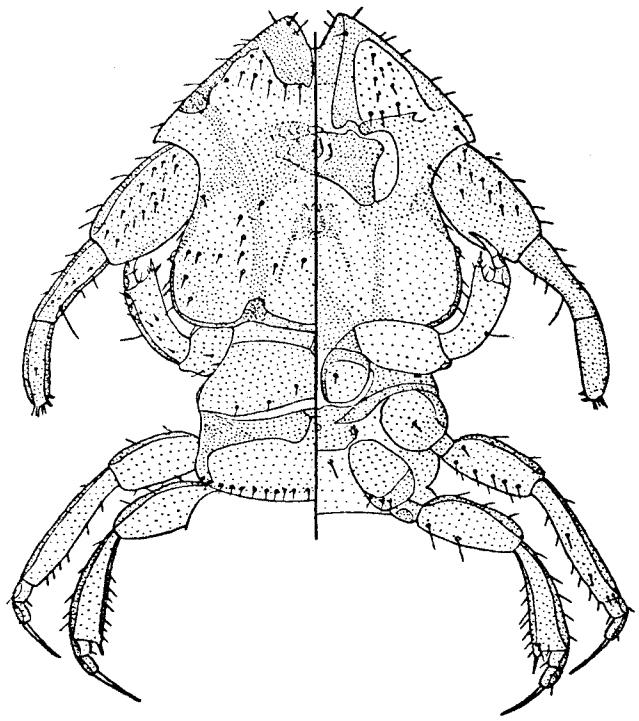


Fig. 18.—*Damalinia hopkinsi* nov. sp., head and thorax of male.

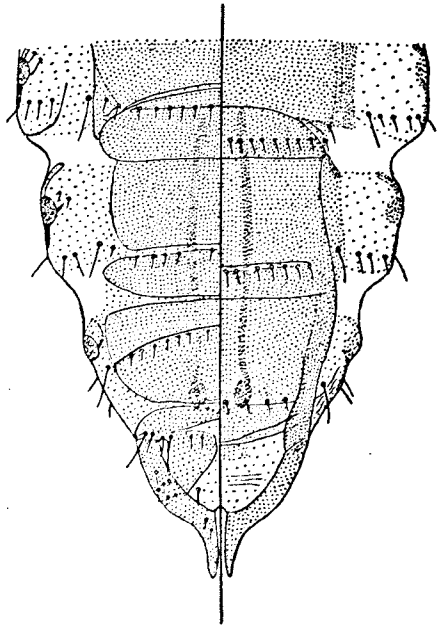


Fig. 19.—*Damalinia hopkinsi* nov. sp., apical tergites and sternites of male.

Genus TRICHODECTES Nitzsch.

Trichodectes ovalis Bedford.

Trichodectes ovalis Bedford, *Repts. Dir. Vet. Educ. & Res., Un. S. Afr.*, XIII-XIV, p. 841, pl. 1, f. 1, 3; pl. 6, f. 13 (1928).

Previous records.—From *Poecilogale albinucha*, Onderstepoort (Bedford, 1928) and *Ictonyx striatus*, South-West Africa and Natal (Bedford, 1929).

Additional record.—Specimens received from Mr. G. H. E. Hopkins taken off *Ictonyx striatus*, Mt. Sabinia, Kigezi, Uganda, 24th November, 1934.

In view of the fact that *T. ovalis* has been found three times on *Ictonyx striatus* and a new species on *Poecilogale doggeti*, I feel convinced that the host from which the type specimens of *ovalis* were collected was misidentified by the writer.

Trichodectes ugandensis nov. sp.

(Figs. 20 and 21).

Two females and one male kindly sent by Mr. G. H. E. Hopkins taken off *Poecilogale doggetti* Thos., Mt. Sabinia, Kigezi, Uganda, 23rd November, 1934. *Holotype* the male.

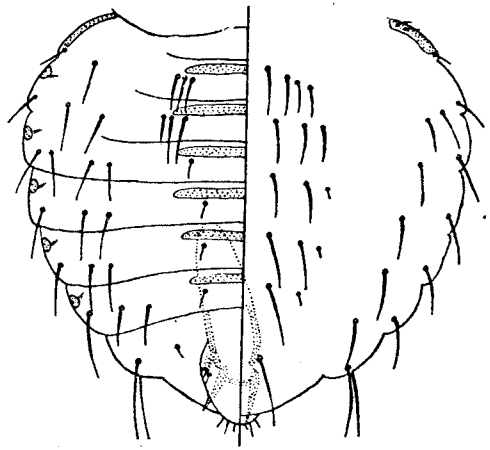


Fig. 20.—*Trichodectes ugandensis nov. sp.*, abdomen of male.

This species is very closely related to *T. ovalis* Bedford, from which it mainly differs in the chaetotaxy of the abdomen, the shape of the sclerites on the apical tergites in the female, and male genitalia.

Male.—Total length 1·03 mm., head 0·31 × 0·36 mm. Forehead slightly rounded in front with a shallow median notch; the lateral sclerites project backwards for a short distance in front where they are separated by a clear space, and terminated in a short spinose process in front of the antennae. In front of each eye there is a dark spot. Temples rounded, with a narrow marginal sclerite. Occipital sclerites dark at their bases where they are connected by a narrow sclerite. Antennae with the segments sub-sequal in length, the first segment with four short setae on the dorsum near the apex.

Prothorax broader than long, with a single seta on each side of neson, and two short ones on each lateral margin. Pterothorax ler than prothorax, with three setae at each latero-anterior in.

Legs short, the coxae widely separated, especially the mid and coxae; between the fore and mid coxae there is a narrow sclerite ı broadens posteriorly between the mid coxae.

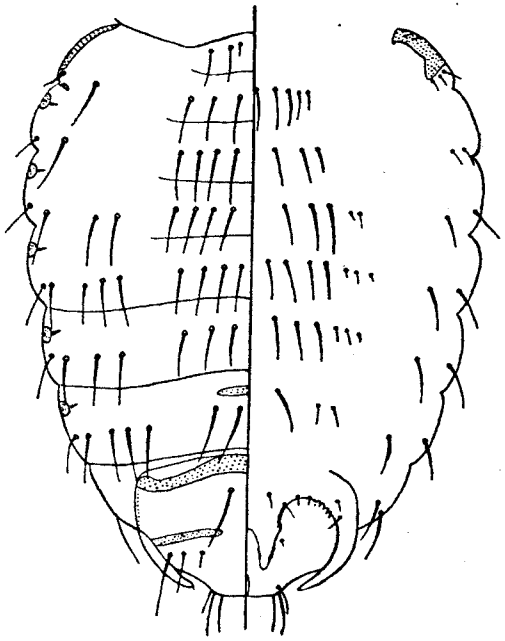


Fig. 21.—*Trichodectes ugandensis nov. sp.*, abdomen of female.

bdomen oval, slightly wider at the third segment than long. es i-vi each with a narrow, median, transverse sclerite; beneath teral margins of the first two sclerites there are three well-ped setae, and beneath the remaining four sclerites there is one seta on each side. Sternite i with a median transverse row ht setae and three on each side; sternites ii-v with six median the lateral ones short except on the third, and two on each sternite vi with four median setae and two on each side, and e vii with two median setae. Paratergal plates absent, except first segment. Spiracles large, present on the prothorax and inal segments ii-vi.

male.—Total length 1·36 mm.; head 0·35 × 0·42 mm. Head he male. Antennae slightly narrow, the apical segment longer ither the first or second segments. Pro- and ptero-thorax as male, except the latter has one or two setae on each side of son.

Abdomen elliptical, without sclerites, except for an inconspicuous median one on the sixth tergite, a narrow transverse sclerite in the middle of the seventh, and a short transverse one on each side of the eighth tergite. Tergites i-v each with a median row of six to eight setae and from one to five on each side; tergite vi with four median setae and five on each side, and tergite vii with two median setae. Sternite i with a median row of ten setae; sternite ii with six; sternite iii with six long and two short on each side; sternite iv with eight long and three short on each side; sternite v with six long and three short on each side; sternite vi with two long and two short on each side, and sternite vii with two short setae.

Both the males and females of this new species can be distinguished from those of *T. ovalis* by the setae on the abdomen being less numerous both on the dorsum and venter. In the female of *T. ovalis* the transverse sclerite on tergite vii is stright, and on tergite viii there is a single median transverse sclerite.

In addition to both *T. ovalis* and *T. ugandensis* the following species also have the lateral sclerites on the forehead terminating posteriorly in spinose processes: *T. canis* (Degeer), *T. potus* Werneck, *T. melis* (Fabr.), *T. vosseleri* Stobbe, *T. octomaculatus* Paine, *T. barbarae* Neu., *T. galictidis* Werneck, *T. mustelae* (Schrank) and *T. pallidus* Piaget (synonym *T. nasuatis* Osborn). Similar processes are also present on the venter of the head at the bases of the trabecula-like processes in the majority of the above species.

Trichodectes galictidis Werneck.

Trichodectes mephitidis Neumann, *Archiv. Parasit*, XV, p. 618, f. 10 (1911), *nec* Packard, 1872.

Trichodectes galictidis Werneck, *Mem. Instit. Oswaldo Cruz*, XXVIII, i, p. 162, t.f. 1-5 (1934).

Previous records.—From *Galictis quiqui*, Chili and *Helictis emeretti* (Neumann, 1911); also from *Galictis vittata*, Brasil (Werneck, 1934).

Additional record.—Specimens kindly sent by Mr. L. H. Dunn taken off *Grisonia canaster* (Nelson), Pacora, Panama.

Genus Lorisicola nov.

Small species. Head much broader than long; forehead short, with a very narrow, shallow notch in front; sclerites on lateral margins with a backward projecting spinose process midway between the anterior margin and trabecula-like processes. A pair of similar processes on verter of head in front of the mandibles. Pharyngeal sclerite present. Pterothorax very broad, winged at the antero-lateral margins. Abdomen with paratergal plates, those on the third segment the largest and lobed as in species of *Procavicola* found on rock rabbits. Tergites and sternites with narrow median transverse bands. Spiracles present on abdominal segments ii to vii. Genital plate of female with two backward-projecting spines on each side. Gonopophyses of female narrow, with a few short setae on inner margins. Male with large genital plate; genitalia with parameres forming a pseudo-penis.

Species found on Asiatic lemurs belonging to the sub-family Lorisinae.

Genotype.—Trichodectes mjöbergi Stobbe.

Trichodectes abnormis Ewing, described from a male taken off *Lemur rufus*, Madagascar, appears to be very distinct, and cannot be included in this genus.

Lorisicola mjöbergi (Stobbe).

Trichodectes mjöbergi Stobbe, *Sitz-Ber. Ges. nat. Freunde*, p. 379, f. 8 (1913).

Trichodectes brachycephalus Ewing, *Proc. Ent. Soc. Wash.*, XXXII, vii, p. 120 (1930).

Previous records.—Both sexes from *Nycticebus broncanus*, North *Borneo* (Stobbe), and a male off *Nycticebus coucang*, Johor Lama, Malay Peninsula (Ewing).

Additional record.—Both sexes from *Nycticebus buku*, West Coast, Sumatra (sent by Mr. G. B. Thompson).

Genus Cebidicola nov.

Large species. Head slightly broader than long; forehead elongated, sub-triangular, with a deep notch in front; sclerites on lateral margins united in front where they broaden out behind the notch, with (*armatus*) or without (*subarmatus*) backward projecting processes anteriorly and posteriorly. Pharyngeal sclerite present. Abdomen with paratergal plates and narrow, median, transverse bands. Spiracles present on abdominal segments ii-vii. Gonopophyses of female broad, with numerous setae on their inner margins. Male genitalia with the parameres projecting outwards, then backwards and inwards, but not forming a pseudo-penis.

Species found on American spider monkeys.

Genotype.—Trichodectes armatus Neumann.

Trichodectes subarmatus Neumann must also be included in this genus.

Genus Felicola Ewing.

Felicola Ewing, A Manual of External Parasites, pp. 122, 192 (1929).

Suricatoecus Bedford, *Parasit*, XXIV.

Felicola cooleyi Bedford.

Previous record.—From *Suricata suricatta hamiltoni*, Pretoria District, Transvaal.

Additional record.—Specimens received from Mr. G. H. E. Hopkins taken off *Mungos mungo colonus*, Uganda.

The types are not as well developed as are the specimens from *M. mungo colonus*, which prove to be typical *Felicola*. *Suricatoecus* must, therefore, be sunk as a synonym of *Felicola*.

Felicola zeylonica nov. sp.
(Figs. 22 and 23).

Males and females received from Mr. Gordon B. Thompson taken off *Herpestes vitticollis*, Gammaduwa, Mousakande, Ceylon (coll. W. W. A. Phillips). The holotype, a male, and allotype will be deposited in the British Museum collection.

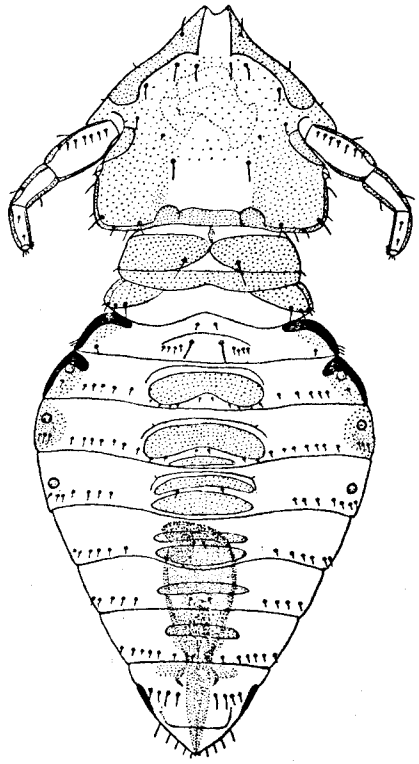


Fig. 22.

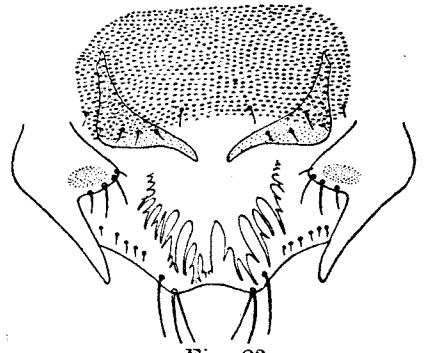


Fig. 23.

Fig. 22.—*Felicola zeylonica* nov. sp., male.
Fig. 23.—*Felicola zeylonica* nov. sp., apical sternites of female.

Male.—Total length 1·62 mm.; head 0·47 × 0·5 mm. Head and thorax of usual form, similar to *F. rammei* (Stobbe). Abdomen gradually tapering to a point posteriorly from the third segment. Tergite i without a median transverse band, with two setae in the middle, and four shorter ones on each side of them. Tergites ii and vi to viii each with a median transverse band; on tergites iii to v the bands are duplicated. Sternites with indistinct median bands; sternite viii with a small sclerite on each lateral margin. Paratergal plates present on segments i to iii. Spiracles large, present on segments ii to v. Genitalia with the parameres short, narrow and curved; endomeres elongated; preputial sac with numerous minute and narrow, elongated spines.

Female.—Total length 1·78 mm.; head 0·54 × 0·57 mm. Head and thorax as in the male. Antennae with the first segment slightly shorter than the second, which is equal to the third segment.

Abdomen oval, widest at the third segment. Tergite i with six setae in the middle. Tergites ii to vii each with a long, median transverse band and a transverse row of minute setae; tergite viii with a basal transverse band which projects backwards to a point in the middle and broadens out on each side; on the posterior margin there is a row of nine to ten setae. Sternites iii to vi each with a transverse row of short setae; apical sternites as in Fig. 23. Paratergal plates present on segments i to v.

This species is closely related to *F. rammei* (Stobbe), from which the male can be distinguished, *inter alia*, by the presence of two median bands on the third tergite, the basal band on the eighth tergite is short and does not extend to the lateral margins, the lateral plates on the eighth sternite, these being absent in *rammei*, and the parameres are much shorter. The female can be distinguished from that of *rammei* in possessing a triangular sclerite on each side of the meson above the gonopophyses.

Felicola subrostrata (Nitzsch).

Previous records.—From domestic cats in Europe, America and South Africa.

Additional record.—One female sent by Mr. G. B. Thompson taken off a wild cat, *Felis silvestris grampis* (Miller), Dundonnell, Wester Ross, Scotland.

Felicola hopkinsi nov. sp.

(Figs. 24-26).

One male and one female were received from Mr. G. H. E. Hopkins taken off *Nandinia binotata arborae*, Kampala, Uganda, 13th September, 1933. *Holotype* the male.

Male.—Total length 1·13 mm.; head 0·31 × 0·31 mm. Head similar in shape to other species found on genets. Antennae with the first segment about as long as the second and slightly broader.

Prothorax with very large spiracles, and one minute seta on each side of the meson. Pterothorax with three minute seta on the lateral angles.

Abdomen gradually tapering to a point from the third segment. Tergite i with a thick seta on each side of the meson and a small sclerite above it; tergites ii to iv each with a median transverse band, one minute seta on each side of the meson, and three or four lateral to these; tergite v with two median transverse bands, a pair of admedian setae between them, and three on each side; tergites vi and vii each with one median band, two admedian setae, and four

or five on each side. Apical tergite elongated, with a longitudinal band on each side of the meson, and several setae at the apex. Sternites without bands. Paratergal plates present on segments i to iii. Spiracles absent. Genitalia with the basal plate short, parameres united, forming a loop; endomeres very long and slender.

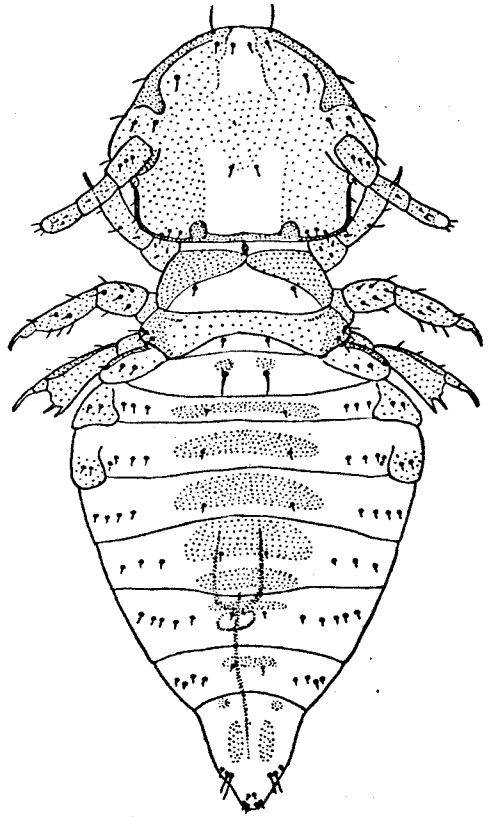


Fig. 24.—*Felicola hopkinsi* nov. sp., male.

Female.—Total length 1·38 mm.; head 0·35 × 0·36 mm. Head, antennae and thorax as in the male. Abdomen elongated oval. Tergites i to vii each with a median transverse band terminating in a narrow up-curved point, except those on the basal segments. Sternites without bands, except for a small one on the sixth sternite. Apical sternite with a bi-lobed sclerite between the gonopophyses.

F. hopkinsi resembles *F. acuticeps* (Neumann) (synonym *F. genetta* (Bedford), which is also parasitic on genets, in the shape of the head. The male of *F. hopkinsi* can be distinguished by the bands on the tergites, the apical abdominal segment being long and pointed, and the male genitalia, which are very distinct. The female can be distinguished by the plate on the apical sternite.

Specimens of *F. acuticeps* were received from Mr. G. H. E. Hopkins taken off *Genetta tigrina stuhlmanni*, Kigowa, Uganda.

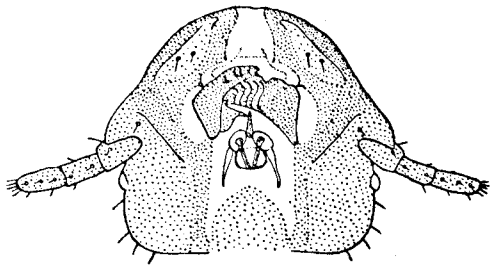


Fig. 25.—*Felicola hopkinsi* nov. sp., venter of head of female.

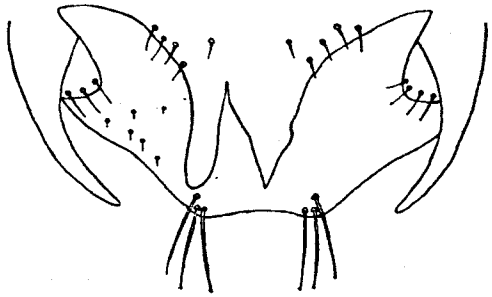


Fig. 26.—*Felicola hopkinsi* nov. sp., apical sternite of female.

HOST LIST OF THE SPECIES OF TRICHODECTIDAE FOUND ON PROCAVIIDAE.

Dendrohyrax adolfi-friederici Brauer. Belgian Congo, Uganda.
Eurytrichodectes paradoxus Stobbe.
Procavicola univirgata (Neu.).
Procavicola neumanni (Stobbe).
Procavicola congoensis (Ferris).
Dasyonyx validus Bedford.
Procaviphilus granulatus (Ferris).

Dendrohyrax arborea (A. Smith). South Coast of Cape Province.
Procavicola univirgata (Neu.).
Procavicola neumanni (Stobbe).
Dasyonyx validus Bedford.
Procaviphilus granulatus (Ferris).

Dendrohyrax bocagei (Gray). South West Africa.
Procavicola univirgata (Neu.).
Procavicola angolensis nov. sp.

Dendrohyrax angolensis. Angola.
Procavicola univirgata (Neu.).
Procavicola angolensis nov. sp.

Dendrohyrax crawshayi Thos. Kenya Colony.
Procavicola univirgata (Neu.).
Procavicola neumanni (Stobbe).
Procaviphilus granulatus (Ferris).

Dendrohyrax neumanni Matsch. Zanzibar.
Procavicola baculata (Ferris).

Dendrohyrax scheelei Matsch. Tanganyika Territory.
Procavicola univirgata (Neu.).
Procavicola neumanni (Stobbe).
Dasyonyx validus Bedford.
Procaviphilus granulatus (Ferris).

Dendrohyrax stuhlmanni Matsch. Uganda.
Procavicola univirgata (Neu.).
Procavicola neumanni (Stobbe).
Procavicola congoensis (Ferris).
Procaviphilus granulatus (Ferris).

Dendrohyrax validus True. Kilimanjaro.
Procavicola congoensis (Ferris).
Procavicola baculata (Ferris).
Dasyonyx validus Bedford.
Dasyonyx dendrohyracis (Ferris).

Dendrohyrax sp. Locality?
Eurytrichodectes paradoxus Stobbe.
Procavicola univirgata (Neu.).
Procavicola neumanni (Stobbe).

Heterohyrax brucei bakeri (Gray). Uganda.
Procavicola sp. Recorded as *P. sternata* (Bedford).
Procaviphilus ferrisi Bedford.

Heterohyrax granti Wroughton. Northern Transvaal.
Procavicola lindfieldi (Hill).
Procavicola heterohyracis Bedford.
Dasyonyx transvaalensis Bedford.
Procaviphilus sclerotis Bedford.

Heterohyrax pumila rudolfi (Thomas). Kenya Colony.
Procaviphilus ferrisi Bedford.

Heterohyrax ruddi (Wroughton). Northern Transvaal, Portuguese East Africa.
Procavicola lindfieldi (Hill).
Procavicola emarginata Bedford.
Dasyonyx oculatus (Bedford).
Procaviphilus robertsi (Bedford).

Procavia coombsi Roberts. Transvaal, Orange Free State.
Procavicola pretoriensis Bedford.
Dasyonyx ovalis Bedford.
Dasyonyx transvaalensis Bedford.
Procaviphilus serraticus (Hill).

Procavia mackinderi zelotes. Kenya Colony.
Dasyonyx nairobiensis nov. sp.

Procavia natalensis Roberts. Pigg's Peak, Swaziland; Deepdale. Natal; Grahamstown and Knysna, Cape Province.
Procavicola lindfieldi (Hill).
Procavicola natalensis Bedford.
Procaviphilus serraticus (Hill).

Procavia waterbergensis Brauer. South West Africa.
Dasyonyx waterbergensis Bedford.

Procavia windhuki. South West Africa.
Dasyonyx jordani nov. sp.
Procaviphilus serraticus (Hill).

Procavia sp. South West Africa.
Dasyonyx jordani nov. sp.

Procavia sp. Mtabamhlope, Natal.
Procavicola lindfieldi (Hill).
Procavicola sternata (Bedford).

Procavia sp. Mount Fletcher, Cape Province.
Procavicola subparva Bedford.

Procavia sp. Lambert's Bay, Cape Province.
Procavicola parva Bedford.
Procaviphilus serraticus (Hill).

Procavia syriacus (Schreber).
Dasyonyx diacanthus (Ehrenberg).

Onderstepoort Journal of Veterinary Science and Animal Industry, Volume 7, Number 1, July, 1936.

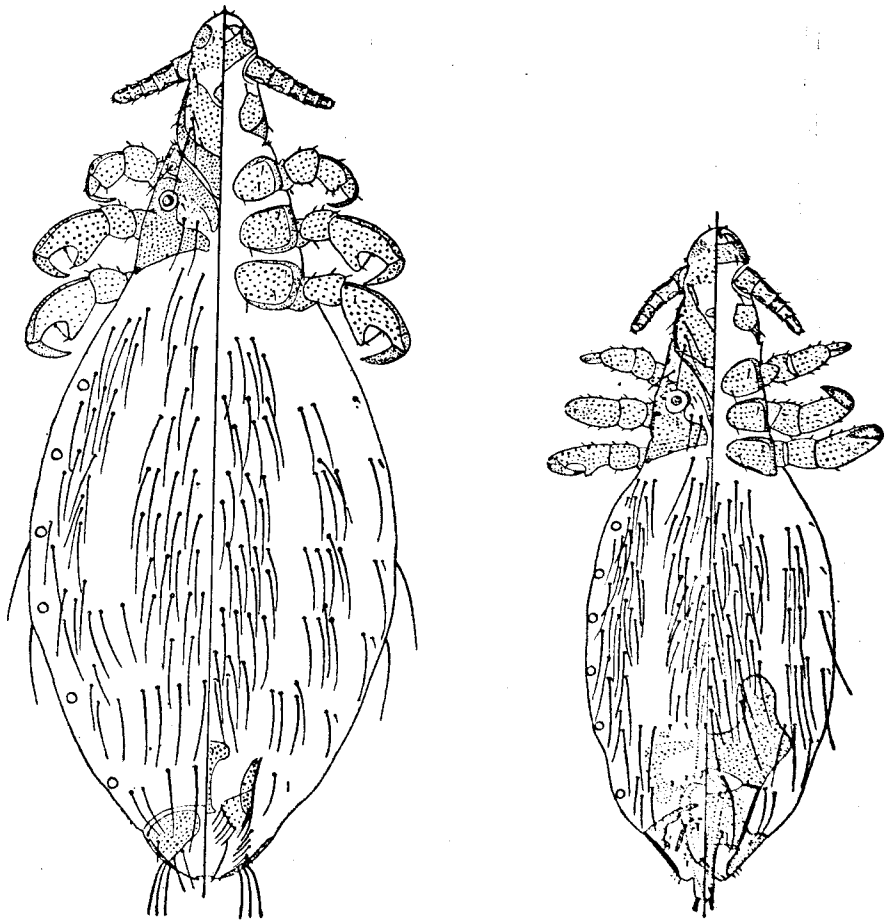
New Species of Linognathus and Polyplax *(Anoplura).*

By G. A. H. BEDFORD, Section of Parasitology, Onderstepoort.

Linognathus peleus nov. sp.

(FIGS. 1-2.)

MALES and females taken off *Pelea capreolus* (Vaal Rhebok), Naauwpoort, C.P., 26th July, 1922 (coll. Austin Roberts). Holotype a male.



A. B.

Fig. 1.—*Linognathus peleus* nov. sp., female (A) and male (B).