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NEW SPECIES OF SUCKING LICE FROM SOUTH AFRICAN GAME.

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During the course of a study on Anoplura material in the Onderstepoort collection, several specimens of the genus *Linognathus* were found which seemed to be incorrectly classified. A comparison with the respective types confirmed the suspicion and showed that these forms represent five distinct and so far undescribed species. Furthermore, a new species of *Haematopinus* collected recently off Eland, is also described in this paper. The types of all six new species are in the Onderstepoort collection.

1. *LINOGNATHUS ALBIFRONTIS* sp. nov.

Record.

Females taken off a Blesbuck, *Damaliscus albitrons* (Burchell) from the Orange Free State Game Reserve (= Somerville Game Reserve), Winburg District, collected by R. du Toit, Onderstepoort on 8th August, 1938. Types: 2 females.

Female.

(Fig. 1).—Length 2.0 to 2.1 mm., width 0.9 to 0.93 mm.

Head: Elongate, about 0.64 by 0.28 mm. Antennae of normal length set forward of the middle of the head. Preantennal region triangular and acutely pointed of the middle of the head. Preantennal region triangular and acutely pointed with straight lateral margins. Six short setae are situated on the ventral surface in front of the antennae (Fig. 2). Postantennal region with lateral margins slightly convex, occipital region constricted into a slight but distinct "neck". Sclerotic structures consist of a transverse band on the venter of the preantennal region and a dented band along either side of the postantennal part which is divided posteriorly into a crescent-like dorsal branch and a knob-like ventral process. Pharyngeal funnel long and narrow about 83 by 46 μ . Pharynx with brushes. Mouth parts almost reach the posterior margin of the thorax. *Thorax* considerably shorter than head and of usual shape, about 0.47 mm. wide. Very slender sternal plate present.

Abdomen: Elongate oval with short and thin setae, arranged in a pattern as in *L. africanus* Kellogg and Paine. Spiracles very small between 15 and 22 μ in diameter. Terminal lobes of medium size, bearing several setae of medium length along the posterior margin.

Genitalia (Fig. 3).—Gonopods small and triangular, posterior end pointed, with a long sclerotic band, slightly S-shaped, which is between 110 and 155 μ in length. Mesal margin bearing about 10 setae. Males still unknown.

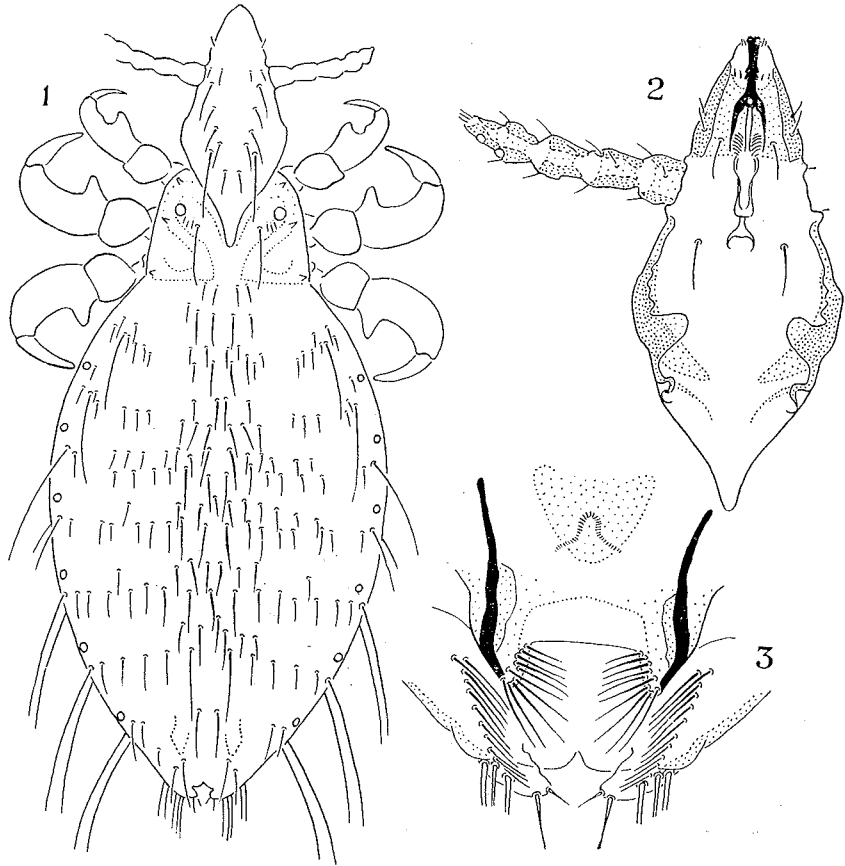
Note.

This species is very similar to *L. damaliscus* Bedford, which was recorded from the Bontbok, *Damaliscus pygargus* (Pallas), in its natural habitat, as well as from the Blesbuck in a zoological garden. As the hosts of the two *Linognathus* species are very closely related, it can be expected that their parasites may also

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show a close relationship, which possibly enables them to survive on the non-specific host when transplantation takes place in captivity. With this in mind it seems obvious from the present field records that the Bontbok is the natural host of *L. damaliscus*, and the Blesbuck that of *L. albifrontis*.



Linognathus albifrontis sp. nov. (Figs. 1-3).

1. Dorsal aspect of female.
2. Ventral aspect of head.
3. Genitalia of female.

The females of *L. damaliscus* can be distinguished from those of *L. albifrontis* by the following characters: Head proximally and distally is conspicuously convex in *L. damaliscus*, which is apparently also the smaller species (between 1.6 and 1.8 mm. long). The shape of the head distally is rather sharply parabolic and bears eight short bristles arranged in an anteriorly open crescent on the ventral surface in front of the antennae. Pharyngeal funnel short and wide (65 by 59 μ). Thorax comparatively narrower. Spiracles are longer than in *L. albifrontis* measuring between 25 and 31 μ in diameter. Gonopods rounded posteriorly with a sclerotic band, which is slightly bent and measures only between 75 and 85 μ in length.

2. *LINOGNATHUS ANTIDORCITIS* sp. nov.*Record.*

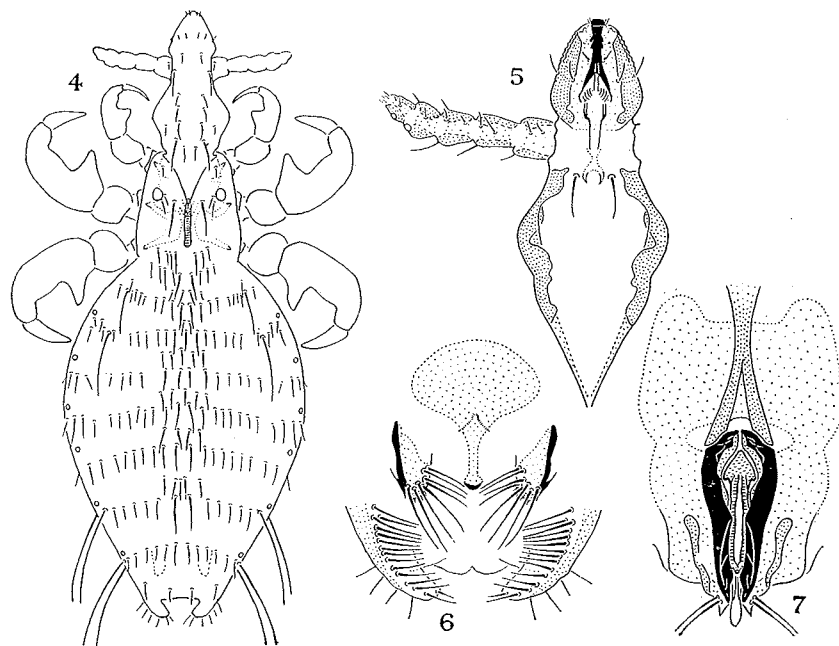
Females and males taken off a Springbuck, *Antidorcas marsupialis marsupialis* (Zimmermann) from the Northern Transvaal, collected by G. A. H. Bedford on 25th July, 1930. Types: 1 female and 2 males.

Female.

(Fig. 4).—Length 2.1 mm., width 0.85 mm.

Head: Elongate and curved, 0.66 mm. long and 0.26 mm. wide, with antennae of normal length set forward of the middle. Preantennal region parabolic, bearing minute tubercles along the anterior part of the lateral margin (Fig. 5). It is strongly inflated, extending laterally beyond the base of the antennae. Ventrally, it has a transverse row of four setae at the middle and two single setae further distally. There is a transverse row of six setae in the middle of the dorsum and two single setae right in front of the antennae. Postantennal region is strongly and angularly convex laterally with rather short and stout setae. Sclerotic structures consist of a very broad transverse band on the venter of the preantennal region and an undulating band along the sides of the postantennal region. Pharyngeal funnel triangular in shape with posterior ends slightly curved medially. Pharynx with brushes. Mouth parts long, extending well into the thorax.

Thorax.—Very narrow with stout bristles not projecting beyond the hind margin. A long and slender sternal plate is present. Second and third pair of claws are very large.



Linognathus antidorcitis sp. nov. (Figs. 4-7).

- 4 Dorsal aspect of female.
- 5 Ventral aspect of head.
- 6 Genitalia of female.
- 7 Genitalia of male.

Abdomen.—Elongate oval with short bristles in an unbroken row on each segment. Setae along the middle line thicker and slightly longer than those of the rest of the row. One very long seta on either side of segments 2 and 3, and two on segments 7 and 8. Segment 9 with only four short setae on the dorsal surface. Terminal lobes of medium size with a number of very short bristles. Spiracles very small.

Genitalia. (Fig. 6).—Gonopods small and triangular in shape, rounded posteriorly, with a thin sclerotic, lateral band. Mesal margin bearing about eight setae, not arranged in rows, as well as a row of minute bristle-like processes along the posterior margin. The genital plate consists of an irregular horizontal oval which posteriorly extends into a long bottle neck.

Male.

Length 1.55 to 1.60 mm., width 0.6 mm.

In general very similar to the female.

Genitalia (Fig. 7).—Genital plate of usual pattern. Basal plate short, posterior end very wide and split into two branches. Parameres very large and slightly longer than the basal plate, with a pointed expansion at the middle of their inner margin. Their distal ends are rather straight and pointed, whereas the proximal portions are roughly semi-circular in shape, consisting of a strongly chitinised marginal part and a narrow, translucent inner section. The endomerale piece is made up of two narrow, parallel bars ending proximally in a flat plate, shaped like an arrow head. Pseudopenis comparatively short.

Note.

L. antidorcitis is the third species of sucking louse collected off the South African Springbuck.

3. *LINOGNATHUS RAPHICERI* sp. n.

Record.

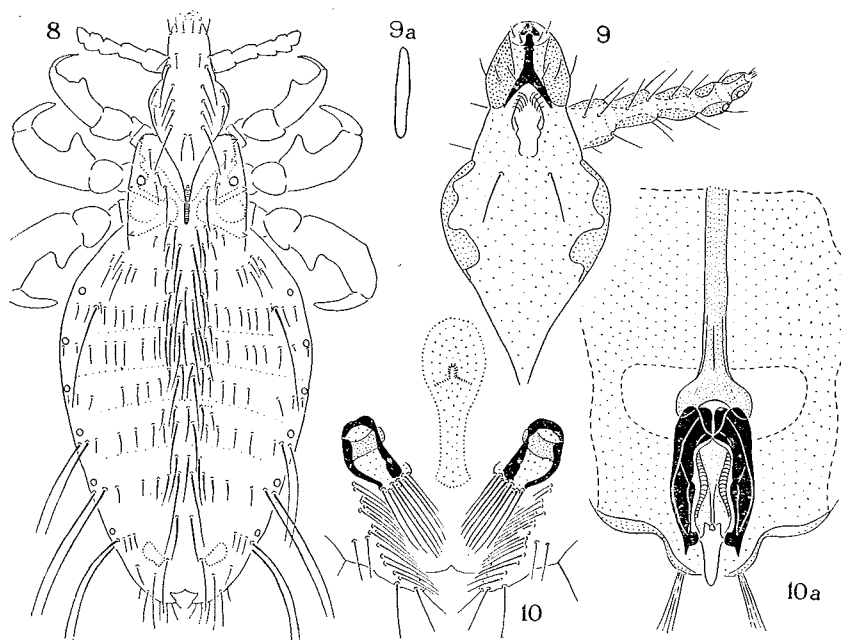
Females and males taken off a Karoo Steenbuck, *Rhaphicerus campestris fulvorubescens* Desmoulin, from the Graaff Reinet district, Cape Province, collected by S. Stampa on 30th September, 1954 (types); females off a Transvaal Steenbuck, probably subsp. *capricornis* Thomas & Schwann, from the Rustenburg district in Western Transvaal, collected by W. Powell on 29th September, 1917; and off an Impala, *Aepyceros melampus melampus* (Lichtenstein), collected at the same locality on 3rd October, 1917. Types: 2 females and 1 male.

Female.

(Fig. 8).—Length 1.60 to 1.95 mm.; width 0.65 to 0.80 mm.

Head fairly slender and curved, about 0.5 by 0.23 mm., deeply inserted into the thorax. Antennae of normal length set well forward of the middle. Preantennal region parabolic, postantennal portion smoothly convex. Bristles on the head fairly long. Besides a ring of eight short setae around the mouth, there is a row of six longish setae at the middle of the preantennal region on the dorsal as well as on the ventral surface (Fig. 9), followed dorsally by another row of four setae at the antennal base. The head shows uniform sclerotisation with a darker band along the lateral margins. Pharyngeal funnel triangular, pharynx with brushes. Mouth parts reach to the posterior end of the thorax.

Thorax considerably shorter than head. Sternal plate small and slender (Fig. 8 and 9a).



Linognathus raphiceri sp. nov. (Figs. 8-10a).

8. Dorsal aspect of female.

9. Ventral aspect of head.

9a. Sternal plate.

10. Genitalia of female.

10a. Genitalia of male.

Abdomen oviform in shape with setae arranged in the normal pattern; those along the middle line rather long and thick. A very long bristle is situated on either side of segment 3 and two similar bristles laterally on each of segments 6 to 8. Bristles on the ninth segment rather inconspicuous and thin. Terminal lobes small with short setae. Spiracles small.

Genitalia (Fig. 10).—Gonopods small and divergent, with irregular sclerotic structures, formed like loops. The straight posterior margins with a double row of about nine rather long setae. Genital plate spatulate, measuring 0.2 by 0.075 mm.

Male

Length 1.35 to 1.40 mm., width 0.45 to 0.58 mm. Features as in the female.

Genitalia (Fig. 10a).—Genital plate almost rectangular; basal plate consists of a narrow stem and of a wide terminal shaped like a crescent. Parameres expanded mesally on its proximal extremities, distal ends provided with a blunt hook and a thorn-like process. Endomerale piece fairly large, somewhat of the form of an hour glass with its lateral margins heavily sclerotised. Pseudopenis rather short and broad.

Note.

Bedford (1918, 1927) recorded the female specimens from the Rustenburg area as belonging to *L. tibialis* (Piaget) and *L. tibialis* var. *euchore* Waterstone. The examination of the respective types, however, showed that this form is a distinct species.

4. *LINOGNATHUS REDUNCAE* sp. nov.

Record.

Females and males taken off a Mountain Reedbuck, *Redunca fulvorufula* (Afzelius) from the Graaff Reinet district, Cape Province, collected by S. Stampa on 14th July, 1954, and from Mfongosi, Zululand, Natal. Types 10 females and 10 males.

Female.

(Fig. 11)—Length 2.0 to 2.7 mm., width 0.7 to 1.0 mm.

Head slender and well curved, deeply inserted into the thorax. Antennae fairly long, up to 0.35 mm. set forward of the middle. Preantennal region shaped like a bell, postantennal region smoothly rounded. Bristles fairly long and arranged as in *L. fahrenheiti* Paine. Sclerotic areas consist of a ventrolateral band in the preantennal region and a wide band along the lateral margin of the postantennal region with a blunt hooklike branch directed medially. The proximal ends of the bands merge dorsally. Two irregular sclerotic areas are situated dorsally between the lateral bands. (Fig. 12.) Pharyngeal funnel long and rather triangular. Pharynx with brushes. Mouth parts not extending beyond the posterior end of head.

Thorax considerably shorter than head; the posterior lateral angles on either side possess a pointed triangular lobe, about 50 μ in length (Fig. 13). Sternal plate small and slender.

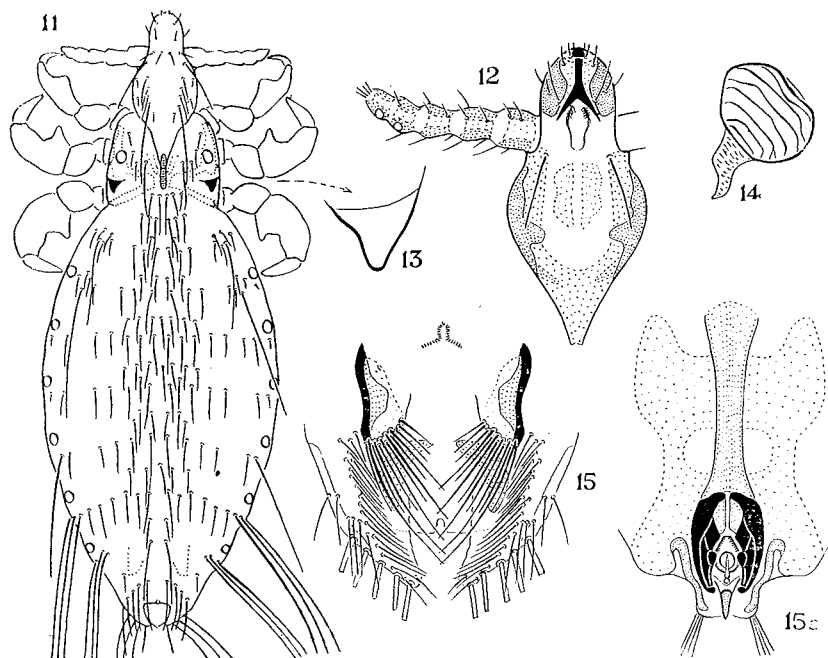
Abdomen elongate oval. Bristles rather long, mainly along the middle line and arranged in the normal way. Segments 2, 3 and 6 with a long seta on either side, segments 7 and 8 bear three similar setae each. Terminal lobes large and prominent with long bristles along the posterior margin. Spiracles (Fig. 14) of medium size, about 38 μ in diameter and more or less oval in section.

Genitalia (Fig. 15)—Gonopods fairly large and posteriorly rounded. The sclerotic band along the lateral margin shows a curve on its proximal and distal extremities; a fairly broad, trapezoid sclerotisation medially. Mesal margin bears two rows of about 13 setae. The setae of the upper and inner row are considerably longer than those at the margin. A pair of crescent-shaped sclerotic areas present between the gonopods and the apical lobes. Median genital plate absent.

Male.

Length 1.6 to 1.9 mm., width 0.60 to 0.66 mm. General features as in the female.

Genitalia (Fig. 15a). Genital plate of normal shape with the posterior end divided into three lobes; basal plate rather wide. Parameres short and broad, with posterior ends bent dorsally. The outline is smoothly convex and the inner margin possesses two broad expansions at the middle followed anteriorly by a translucent plate. Endomerai piece in form of a ring, the proximal part of which is considerably thicker. Pseudopenis long with a strongly chitinized pointed end.



Linognathus reduncae sp. nov. (Figs. 11-15).

- 11. Dorsal aspect of female.
- 12. Ventral aspect of head.
- 13. Thoracic lobe.
- 14. Spiracle.
- 15. Genitalia of female.
- 15a. Genitalia of male.

Note.

Specimens of this species collected at Mfongosi, Zululand, were recorded by Ferris (1916, 1932a., 1951a) as belonging to *L. fahrenholzi* Paine, which was taken off the Common Reedbuck, *Redunca arundinum arundinum* (Boddaert) in Nyassaland. An examination of the type material showed beyond doubt that the sucking lice of the two Reedbuck belong to two closely related, but distinct species, the characters of which has been merged by Ferris (1932a) in his re-description of *L. fahrenholzi*. The illustrations given by him in Fig. 225 feature clearly the louse of the Mountain Reedbuck. His description of the male refers unmistakably to this new species, as the male of *L. fahrenholzi* is still unknown.

The females of *L. fahrenholzi* differ from *L. reduncae* in the following characters: Head slightly more pointed. Antennae longer and thinner. The free lobe on the posterior lateral angles of the thorax considerably shorter, about 32 μ long. The abdomen possesses spiracles of nearly twice the size (68 μ) and of an entirely different structure. The setae on the abdomen fewer in number but slightly longer. There is no long bristle on either side of segment 6, and segment 7 carries laterally only two such setae. Gonopods longer, gently curved at the inner side and pointed at the end. Marginal sclerotic band curved only in the distal extremity, possessing only a narrow chitinized strip along the inside. Setae on the mesal margin consist of one row of about nine.

5. LINOGNATHUS TRAGELAPHI sp. nov.

Record.

Females and males taken off a South African Bushbuck, *Tragelaphus scriptus sylvaticus* Spareman, at Onderstepoort, Pretoria district, Transvaal, in July 1930. Types 2 females and 2 males.

Female.

(Fig. 16)—Length 2 mm., width 0·8 mm.

Head relatively small and short; antennae fairly long (0·25 mm.) set forward off the middle. Upper surface of the antennal joints bears many longish setae (Fig. 19). Preantennal region broadly rounded and semi-circular in shape, armed with minute but conspicuous tubercles (Fig. 17 and 18). The postantennal region has its greatest lateral extension a short distance behind the antennae and tapers from this point towards the posterior end. Bristles medium-sized and arranged as in *L. limnotragi* Cummings. The ventral and dorsal surfaces of the head well chitinized with an irregular pattern. A dark band covers the ventral and lateral sides of the preantennal region with a second narrow band along the sides of the postantennal region. Pharyngeal funnel short and triangular; small brushes are present. Mouth parts extend to the posterior end of the head.

Thorax slightly shorter than head; second and third claw rather large. Sternal plate absent.

Abdomen elongate oval without any sign of segmentation. The bristles follow the normal pattern and are long and rather thick along the middle, becoming shorter and thinner towards the lateral margins. One long seta on either side of segment 3, as well as two very long bristles on segments 7 and 8. Terminal lobes of medium size with fairly long bristles on the posterior margin and a row of short setae on the ventral side. A pair of small sclerotic spots occurs between the lobes. Spiracles (Fig. 20) medium in size, about 38μ in diameter and more or less oval in section.

Genitalia (Fig. 21)—Gonopods elongate, roughly oval in shape, with about nine setae of different lengths along the mesal margin. The lateral sclerotic bands possess a curved extension on the inner side. Median genital plate, measuring 0·26 by 0·075 mm., rhomboid in shape with a narrow posterior extension, expanded distally.

Male.

Length 1·3 mm., width 0·5 mm. Features as in the female.

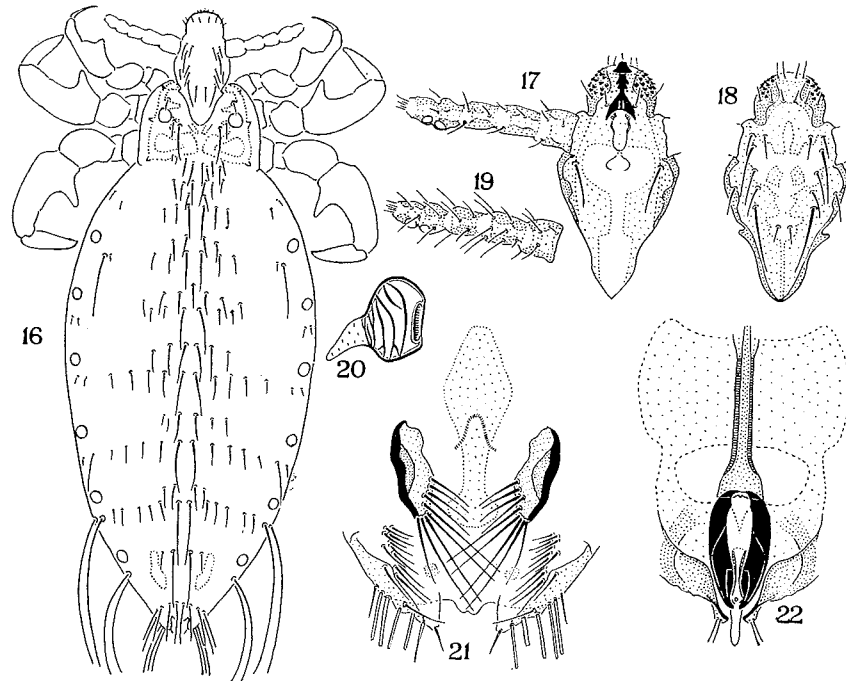
Genitalia (Fig. 22)—Genital plate of normal pattern, but rather short and wide (0·35 by 0·26 mm.). Parameres oval with a smooth inner margin. Endomerall piece apparently lacking; pseudopenis long.

Note.

The specimens off the South African Bushbuck were recorded by Ferris (1932b, 1951b) as belonging to *L. limnotragi* Cummings, the types of which were collected from a Western Sitatunga, *Limnotragus spekei gratus* (P. L. Sclater), caught in the Congo region. The comparative study of the material from both animals, however, showed that the parasites of the two buck are by no means identical and can be distinguished by a number of constant characters in both sexes.

The differentiating characters in *L. limnotragi* are as follows:—

Female.—Length 1·8 mm., width 1·0 mm. Head very broad, with the preantennal region almost rectangular. Postantennal region with nearly parallel margins. Sclerotic pattern restricted to a wide band along the lateral margins. Pharyngeal funnel large and bluntly parabolic.



Linognathus tragelaphi sp. nov. (Figs. 16-22).

- 16. Dorsal aspect of female.
- 17. Ventral aspect of head.
- 18. Dorsal aspect of head.
- 19. Dorsal side of antenna.
- 20. Spiracle.
- 21. Genitalia of female.
- 22. Genitalia of male.

Antennae longer (0.38 mm.). Claws very large. Abdomen very much broader and segmentation clearly defined. Bristles generally longer and confined to the middle line of the dorsum. Spiracles also larger, 51μ in diameter, and conical in section. Genitalia of remarkably large dimensions. The median genital plate, measuring 0.35 by 0.1 mm., is formed like the sole of a shoe with a strongly convex posterior end. Gonopods distinctly triangular and more pointed, carrying a row of about 13 strong setae on the inner margin.

Male.—Length 1.5 mm., width 0.5 mm. Genitalia distinguished by a long genital plate (0.45 by 0.26 mm.). Parameres also considerably longer, proximally flattened, with a pointed expansion at the inner margin.

6. HAEMATOPINUS BREVIPES sp. nov.

Record.

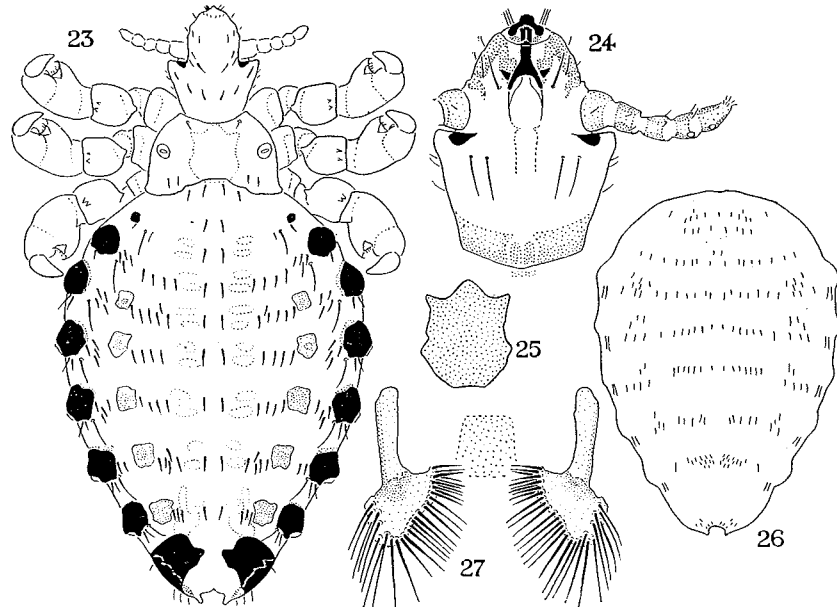
Females taken off a Cape Eland, *Taurotragus oryx oryx* (Pallas), from Mopane, Northern Transvaal, collected by N. J. van der Merwe on 31st August, 1953. Types 6 females.

Female.

(Fig. 23)—Length 2·3 to 3·2 mm.

Head short and broad, measuring about 0·65 by 0·45 mm., uniformly pigmented except for the postantennal angles, which are rather short and pointed. Lateral margins of postantennal region straight and slightly tapering; occipital region not constricted into a "neck". Pharyngeal funnel short and wide (Fig. 24).

Thorax heavily pigmented and considerably shorter than head. Sternal plate slightly longer than wide, with the anterior angles and the median point of the anterior margin produced (Fig. 25). Legs stout and heavy with very short and thick claws; tibial pads very small.



Haematopinus brevipes sp. nov. (Figs. 23-26).

23. Dorsal aspect of female.

24. Ventral aspect of head.

25. Sternal plate.

26. Ventral side of abdomen.

27. Genitalia of female.

Abdomen oviform, rather pale and membranous, carrying short and thick setae as indicated in Fig. 23 and 26. Tracheal trunk thin and inconspicuous. Sclerotic areas of the cuticle fairly restricted. Paratergites small but strongly pigmented, forming conical tubercles; except for those on segment 2, which are restricted to minute plates. Tergites with two pairs of small and indistinct median plates, followed laterally by a more strongly pigmented submarginal plate, absent on the first three segments.

Genitalia (Fig 27)—Gonopods short and thick, carrying a row of fairly stout setae around the strongly convex posterior margin. Wall of the vagina with a median, quadrate sclerotisation.

Male still unknown.

Note.

H. brevipes is the second species of this genus recorded from the Eland. It is similar to *H. taurotragi* Cummings and *H. eurysternus* (Nitzsch), which differ from this new species in the following characters:—

H. taurotragi is a considerably larger species. The head is relatively broader and of a different shape. Postantennal angles rounded, hind head convex and occipital region constricted into a "neck". Claws longer. Tergal plates and paratergites considerably larger and more conspicuous. Gonopods longer, with a greater number of long and thin setae. A heavily chitinised, W-shaped pattern occurs on the quadrate median plate of the vaginal wall.

H. eurysternus is also a larger species but with a relatively narrower head, which has the same shape as in the former species. Preantennal region longer. The pharyngeal funnel is very long and narrow. Legs and claws also considerably longer. Sclerotic areas on the abdomen more extended and pronounced. Tracheal trunks very thick. Gonopods longer.

ACKNOWLEDGMENT.

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