



Two new *Linognathus* (Phthiraptera: Linognathidae) from Roan and Nyala (Bovidae) in southern Africa

by

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Two new species of *Linognathus* Enderlein are illustrated and described from bovid hosts in southern Africa: *L. gonolobatus* spec. nov. from the Roan antelope, *Hippotragus equinus* (Hippotraginae), and *L. angasi* spec. nov. from the Nyala, *Tragelaphus angasi* (Tragelaphinae).

Collections of *Linognathus* submitted for identification from the Kruger National Park and from the Natal Parks Board, South Africa, contained specimens representing two undescribed species: these are described and illustrated. All specimens were mounted in Canada balsam on glass microscope slides. Terminology for chaetotaxy follows that of Weisser & Kim (1973). The terminology of the Systematics Association Committee for Descriptive Biological Terminology (1962) is used to describe the shape of certain structures. A comprehensive review of *Linognathus* Weisser, (in prep.) will deal with supraspecific and possibly subspecific relationships; these are not discussed in detail here. However, the morphological similarity between the two species of *Linognathus* parasitic on Hippotraginae, and the close taxonomic relationship of the three species of *Linognathus* found on Tragelaphinae, is discussed.

Linognathus gonolobatus spec. nov., figs 1 c, d 3. a-c

This species is closely related to *L. hippotragi* Ferris 1932 (p. 373, figs 226, 227) from the Sable antelope, *Hippotragus niger*. The males of *L. gonolobatus* are distinguished by the anteriorly expanded basal apodeme (compare figs 3b and 3d), the female by the large lobes on the inner margin of the gonopods (compare figs 2b and 2d).

Female as in fig. 1, total body length (TBL) 2,27-2,59 mm; TBL male 1,89-2,02 mm. Head shape somewhat variable due to mounting procedure; head index (length/breadth) consequently ranges from 1,78 to 2,14. Thorax much broader than hind-head, with diverging lateral margins; sternal plate narrowly linear. Abdomen elliptic, with typical pattern of setae; one long lateral seta (DLAS) on each of segments II-V, a pair of long marginal setae (MAS) on segments VI-VIII: spiracles

large (40–61 μm). Female genitalia (fig. 2 c, d: gonopods each with a large and conspicuous lobe on inner (mesal) margin, covering part of the vulva margin; a row of 10–12 fairly long marginal setae below the lobe; median genital plate inverted drop-shaped, with posterior point not quite reaching vulval margin; apical lobes strongly forficulate, extending far beyond apex of abdomen. Male genitalia and terminalia (fig. 3b); parameres much shorter than basal apodeme, together forming a broad oval surrounding the broadly ovate endomerall piece and long, pointed pseudo-penis. Basal apodeme anteriorly expanded, posteriorly with a deep incision. Male subgenital plate with broad anterior half, posteriorly narrow and with strongly sclerotized margins. Apex of abdomen terminating in broad and slightly emarginated median lobe.

MATERIAL EXAMINED. Holotype, ♀ ex *Hippotragus equinus* (Desmarest 1804) (Bovidae: Hippotraginae), the Roan antelope, Kruger National Park, SOUTH AFRICA (S. C. J. Joubert, IX, 1973); host animal introduced from Rhodesia, captured at Sihibu in Tjolutjo Tribal Trust Land, south of Wankie National Park. Paratypes, 11 ♀♀, 10 ♂♂, same data as holotype. Host distribution. Rather patchy distribution through Nigeria, Senegal, Cameroun, Chad, Central African Republic, Sudan, Ethiopia

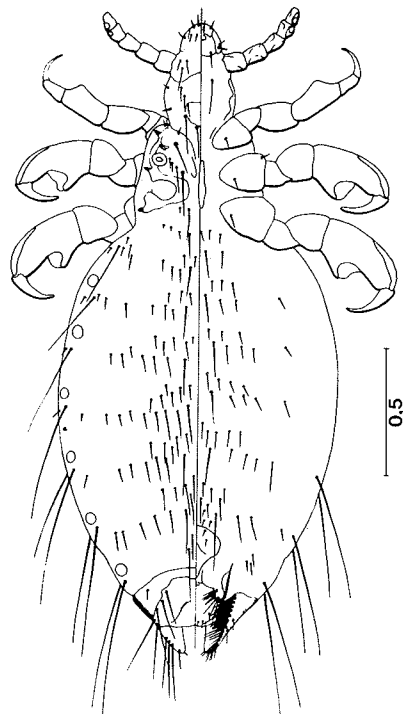


Fig. 1. *Linognathus gonolobatus* spec. nov. ♀ left side dorsal, right side ventral aspect. Scale – mm.

Uganda, Tanzania, Rwanda, Burundi, Kenya, Zambia, Angola, Northern Botswana, Rhodesia, Malawi, Northern and Eastern Transvaal (Ansell 1971).

Unfortunately the type series has suffered some damage through over-treatment in potassium hydroxide, and we are unable to place reliance on certain features such as head shape and general sclerotizations. The lobes of the gonopods, however, are consistent and striking features of the new species; we have therefore incorporated this character into the specific epithet. Roan antelope and Sable antelope, the hosts of *L. gonolobatus* and *L. hippotragi* respectively, are themselves closely related. We conclude therefore that the two morphologically similar lice are descended from the same stock and expect them to occupy similar microhabitats on the bodies of their hosts.

***Linognathus angasi* spec. nov., figs 4, 5c.**

L. angasi bears a close resemblance to two other species, *L. limnotragi* Cummings 1913 (p. 36, fig. 1) which occurs on the Sitatunga, *Tragelaphus spekei*, and *Linognathus panamensis* Ewing 1927 (illustrated by Fiedler & Stampa 1956 p. 63, figs 16–22 as *L. tragelaphi*, synonym, from the Bushbuck, *Tragelaphus scriptus*; see Kim & Weisser 1974). *L. angasi* is distinguished from both *L. limnotragi* and *L. panamensis* by the

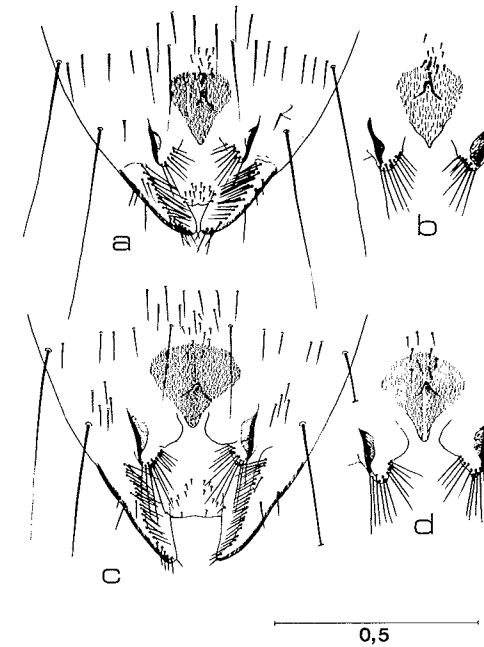


Fig. 2. a–b. *Linognathus hippotragi* Ferris, ♀ genitalia. a. Ventral aspect of segments VII–IX. b. Gonopods and genital plate of a second specimen. c–d. *Linognathus gonolobatus* spec. nov. ♀ genitalia. c. Ventral aspect of segments VII–IX. d. Gonopods and genital plate of a second specimen. Scale – mm.

presence of a broadly linear thoracic sternal plate, and by a pair of moderately developed dorsal protuberances ('free lobes') of the metathorax. Females differ in the medially less constricted, typically shoe-sole shaped genital plate (fig. 4c). Males are separable by the long and slender parameres, the relatively short basal apodeme, and the long and sharply pointed pseudopenis (fig. 5).

Female as in fig. 4a. Rather a small *Linognathus* species. TBL female 1,39–1,61 mm; male 1,21–1,42 mm. Head characterized by a truncate forehead, with strong lateral sclerotizations beset with minute tubercles; postantennal margins slightly convex, convergent posteriorly, deeply retracted into thorax, not forming a "neck"; antennae inserted approximately in the middle of the free part of the head; pharynx with small brushes. Thorax much broader than head, with diverging lateral margins; metathorax with a pair of lateral tubercles; sternal plate broadly linear (fig. 4f). Legs stout, tarsi II and III with distinct hooklike projections and a dorsal sclerite (fig. 4b). Abdomen obovate, with typical arrangement of setae, one long marginal seta (MAS) on either side of segment III, very short MAS on IV & V; medium-sized on VI, a pair of very long MAS on VII & VIII. Female genitalia (fig. 4e): gonopods small, apically angular, with a row of 10–12 setae, mainly along mesal margin; median genital plate in

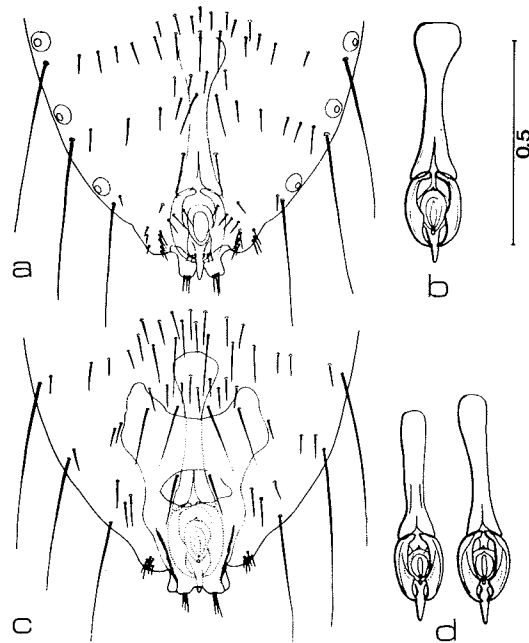


Fig. 3. a – c. *Linognathus gonolobatus* spec. nov. ♂ genitalia and terminalia. a. Dorsal aspect of ♂ terminalia with setae and spiracles of segments VI–VIII. b. Copulatory apparatus with aedeagus, pseudopenis, parameres and basal apodeme. c. Ventral aspect of ♂ terminalia with subgenital plate and setae of segments VI–X. d. *Linognathus hippotrugi* Ferris, ♂ copulatory apparatus of two different specimens. Scale – mm.

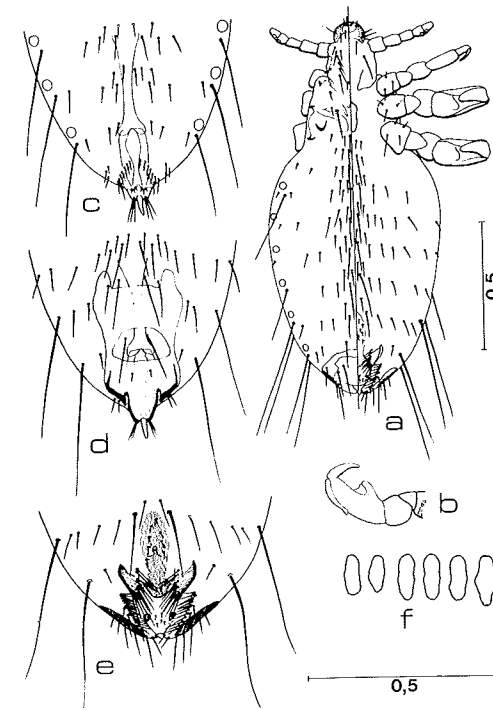


Fig. 4. *Linognathus angasi* spec. nov. a. Female. left dorsal, right side ventral aspect. b. Claw III with hook-like structure typical for this species. c. Dorsal aspect of ♂ terminalia, with setae and spiracles of segments VI–VIII. d. Ventral aspect of ♂ terminalia, with subgenital plate and setae of segments VI–X. e. Ventral aspect of ♀ genitalia with gonopods, genital plate and chaetotaxy of segments VII–IX. f. Shapes of thoracic sternal plates of 6 different specimens. Scale – mm.

shape of shoe-sole, filling almost entirely the space between the gonopods and reaching to the sharply defined vulva margin. Apical lobes forficulate, projecting somewhat beyond the apex; a pair of small sclerites between gonopods and apical lobes. Male genitalia (fig. 4e) and terminalia (fig. 5c): parameres quite long and slender (0,17 mm), the thin basal apodeme comparatively short (0,22 mm); endomerical piece with sclerotized lateral border, located between the posterior half of the parameres; pseudopenis long and thin, with a sharp apical point projecting far beyond tips of parameres. Subgenital plate (fig. 4d) apically sclerotized, with slight paramesal incisions. Median portion of the apex somewhat projecting.

MATERIAL EXAMINED. Holotype, ♀ ex *Tragelaphus angasi* Gray, 1849 (Bovidae; Tragelaphinae), the Nyala, Ndumu Game Reserve, Natal, SOUTH AFRICA (J. A. Ledger, 30.V.1972). Paratypes, 2 ♂♂, 1 ♀, same data, (26.V.1972); 8 ♂♂, same host & locality, (M. E. Keep, 14.XII.1972); 1 ♂, 3 ♀♀ ex *Tragelaphus angasi*, Zululand,

British Museum (Natural History) No. 1956-579. Host distribution. Restricted to southern Africa; northeastern Natal, eastern Transvaal, southeastern Rhodesia, Mozambique, and southern Malawi (Ansell 1971).

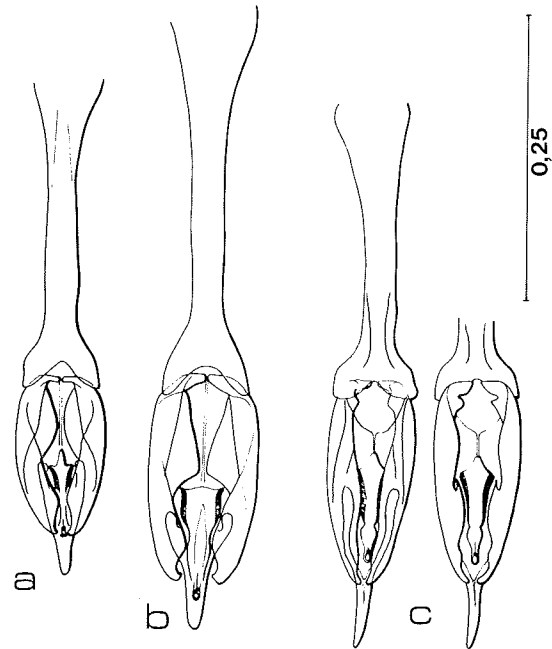


Fig. 5. Male copulatory apparatus. a. *Linognathus panamensis* Ewing. b. *L. limnotragi* Cummings. c. *L. angasi* spec. nov. from two different specimens. Scale - mm.

L. angasi spec. nov. forms together with *L. limnotragi* and *L. panamensis* a trio of closely related lice from related hosts. Ansell (1971) has mentioned that the Nyala may form a superspecies with the Sitatunga. We conclude that the three *Linognathus* species considered here have evolved from a single ancestral form, and would expect their ecology on the respective hosts to be similar. At the time of redescription of *L. panamensis* by Kim & Weisser (1974) little material other than the specimens of Ewing's type series were available for study. Later, during a revision of the Linognathidae (Weisser, in prep.) more material collected off the Bushbuck was examined; the name '*L. tragelaphi*' given by Fiedler & Stampa (1956) proved to be a synonym of *L. panamensis* Ewing 1927. Proper nomenclatorial corrections will follow in the proposed publication of the revision; meanwhile, reference is made to Fiedler & Stampa's (1956) illustrations of the species *L. panamensis* in order to support the diagnosis of *L. angasi*.

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