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Haematopinus ludwigi nov. spec. from *Sus verrucosus*, Philippines, and Neotype Designation for *Haematopinus breviculus* Fahrenholz from *Taurotragus oryx pattersonianus*, Uganda (Haematopinidae, Anoplura)

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With 14 Figures and 4 Tables (Eingegangen am 25. Oktober 1973)

Abstract

Female and male of *Haematopinus ludwigi* nov. spec. are described and illustrated from specimens taken off a Wild Pig, *Sus verrucosus*, from Luzon, Philippines. The relationship of the suid-infesting species of the genus *Haematopinus* is discussed.

The female of *Haematopinus breviculus* Fahrenholz, 1939, is redescribed and illustrated from 3 ♀♀ taken off an Eland, *Taurotragus oryx pattersonianus*, in Uganda. A neotype is designated.

Tables of measurements and head-indices of suid-infesting and of several bovid-infesting species are also given.

Introduction

There are five species of the genus *Haematopinus* known to infest the family Suidae; three of them occur in the Ethiopian region, one polytypic species (*H. apri* parasitic on *Sus scrofa* ssp.) in the Palearctic, and another polytypic species (*H. suis*) in the Oriental region, host-specific on members of the group *Sus scrofa* "*cristatus-vittatus*" and allies, and now found world wide on domestic pigs of nearly all breads and on feral domestic pigs.

The morphological terminology used in this paper is that of Kim (1966) and Weisser and Kim (1973). The terminology of the Systematics Association Committee for Descriptive Biological Terminology (1962) is followed to describe the shape of certain structures. The morphology of *H. ludwigi* nov. spec. was compared with all known *Haematopinus* species, namely those of the Oriental region (Ferris 1933, Fahrenholz 1939 a, Johnson 1962, Weisser and Kim 1972).

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Haematopinus ludwigi nov. spec.
(Figs. 1—9)

In the course of an extensive examination and revision of material in the major collections of the world, specimens taken off a "Wild Pig" from Luzon, Philippines, and deposited in the Ferris Collection (now at the University of California, Berkeley) proved to belong to a new and distinct taxon. Additional material from three different lots was found later in the United States National Museum (Natural History). The host-louse relationship of Suidae and *Haema-*

topinus appears to be an old-established one and it is not surprising to find on a Wild Pig, not belonging to the *Sus scrofa* species-group, an entirely new species of *Haematopinus*.

Type data: Holotype ♀, allotype ♂, shortly after final molting and only weakly sclerotized; paratypes two second instars, collected off a Wild Pig, Mt. Makiling, Luzon, P. I. These specimens are mounted on two slides and deposited in the Ferris Collection, Department of Entomology, Berkeley, Cal. Data on other paratypes elsewhere in this paper.

Diagnosis: *Haematopinus ludwigi* nov. spec. is the most slender of the suid-infesting Anoplura. As in the African species (*H. latus, H. phacochoeri, H. meinertzhageni*) paratergal plates are found on segment 2 (which is apparent segment 1) to segment 8. *H. ludwigi* is distinguished by its lesser size, the absence of the for African taxa characteristic sub-marginal semi-lunar tergites, the weakness of the median tergites, and the shorter and broader shape of the thoracic sternal plate (Fig. 8); the male differs from the males of *latus, phacochoeri, meinertzhageni* by having the pseudopenis symmetrical, broad, and not acutely pointed, the basal apodeme short (Fig. 6), and a somewhat differently shaped subgenital plate (Figs. 9, I—III). On the other hand, the genitalia of the male *ludwigi* are similar to those of *suis* and *apri* (Figs. 5, 6). Both sexes differ from *suis* and *apri* by the relatively short head (see head-indices in Tab. 2), the presence of paratergites on segment 2 as mentioned above, the deep incision between abdominal segments 6 and 7, the specific shape of the thoracic sternal plate (Fig. 8 A—Y), and the abdominal chaetotaxy of the adults.

Description: Female: General appearance and chaetotaxy as in Fig. 1. Total body length (TBL) 3.36—4.32 mm ($n = 17$). Head (Fig. 2) somewhat longer (HL) than wide (HW); HW measured immediately posterior to the ocular lobes at the level of the first DMHS (dorsal marginal head seta); head index ♀ (HL : HW · 10) $\bar{x} = 15.5$ (Tab. 2). Antennae 5-segmented, long (AnL) and thin, length equal to HW or a little longer.

Thorax: Sclerotization of the mesothoracic and metathoracic pleural phragma not reaching the notal pit; pleurae well-defined; sternal plate broader than long, enclosing with its anterio-lateral projections the pits of the prothoracic pleural apophyses (Fig. 1); legs long, femora thin, tibio-tarsi and claws comparatively large. Abdomen obovate, lateral margins deeply lobed with the deepest incision between segment 6 and 7; small paratergites present on segment 2 (apparent segment 1); paratergites on segment 3 to 8 large, those on segment 8 borne on conical protuberances extending posteriorly; two pairs of median tergites in decreasing intensity from segment 2 to 7; clasp-like tergite of the terminal segments dorsomedially connected through a sclerotized bridge; terminal lobes very short.

Genitalia of ♀: Gonopods elongate with strongly divergent inner margin, fringed with long setae; width between gonopods (WBG) at the level of the vulva = 0.20 mm; median genital plate entirely lacking (Fig. 3).

Male: TBL 2.86—3.41 mm ($n = 13$); general appearance like female, with the abdomen more regularly ovate. Head index ♂ $\bar{x} = 15.1$ (Tab. 2).

Genitalia of ♂ (Fig. 6): Pseudopenis symmetrical and broad (the pseudopenis is sometimes also referred to as parameres; this term is not incorrect, if one considers strictly the anatomical position; however, in order to differentiate between apically fused and apically separated parameral sclerites, the term 'pseudopenis' has commonly been in use for the fused structure); wall of endotheca with rough

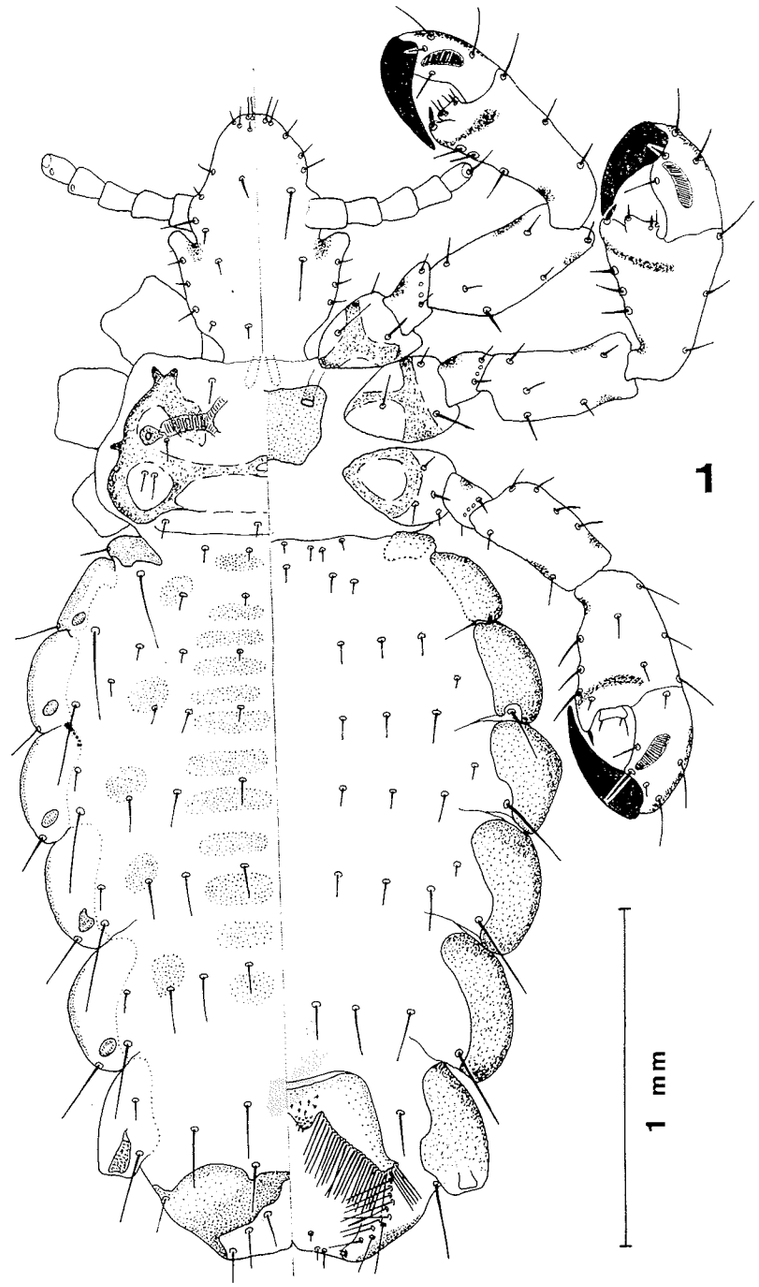


Fig. 1. *Haematopinus ludwigi* n. spec., ♀; left side — dorsal view, right — ventral; antennal chaetotaxy and legs on left side omitted

hooks and scale-like squamose surface structure; basal apodeme short and broad. subgenital plate as in Figure 4 and 9, II.

Second nymphal stage: TBL 2.33 mm. Both specimens at hand agree in their external morphology almost completely with the comparable stages of *H. suis*, except the presence of the characteristic pair of paratergites on segment 2 (apparent segment 1). Illustration and a detailed description are considered to be needless in these circumstances.

Discussion: *Haematopinus ludwigi* nov. spec. is the sixth species of Anoplura described from Suidae. They all belong to the genus *Haematopinus* and are characterized by having the pits of the prothoracic pleural apophyses enclosed

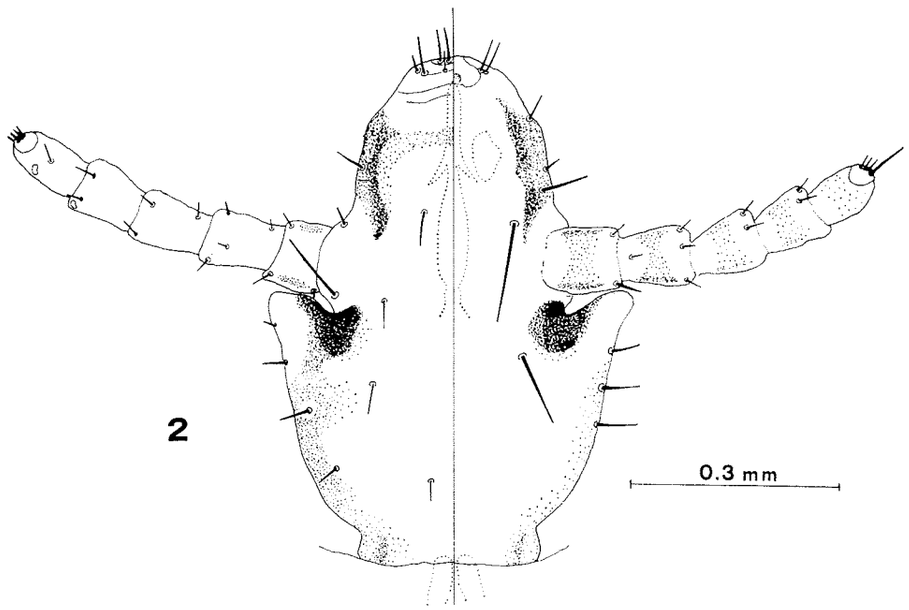
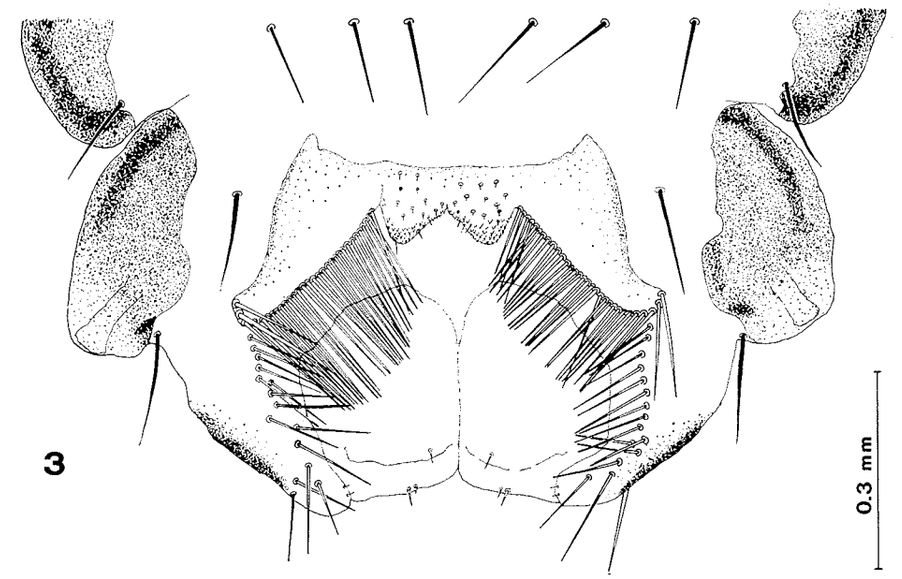
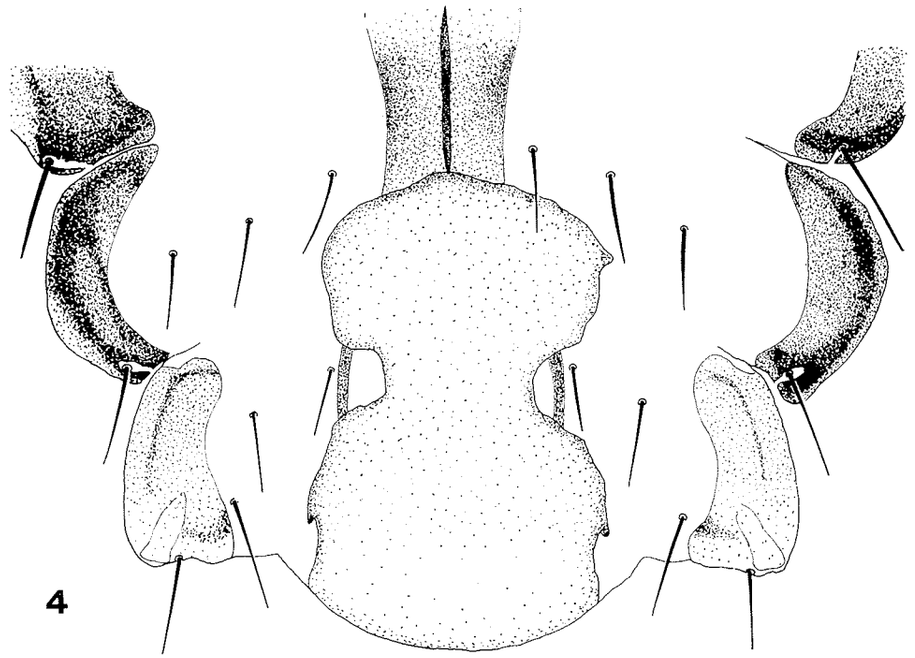


Fig. 2. *Haematopinus ludwigi* n. spec., head of ♀

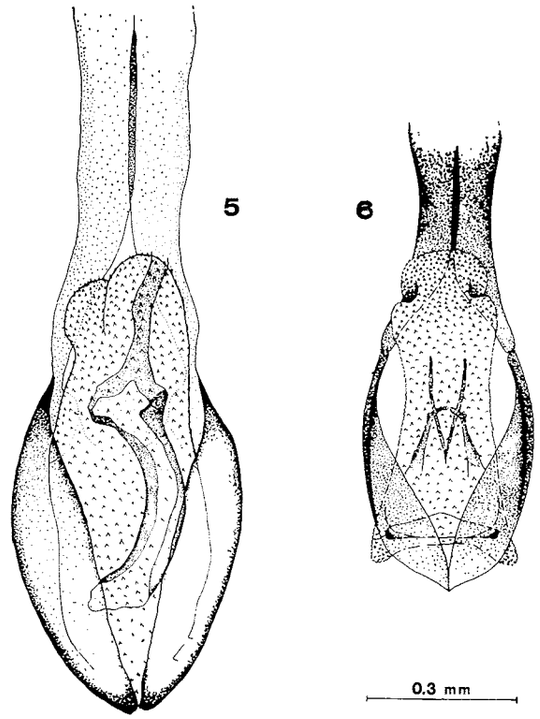
Table 1. Measurements of the adults of *Haematopinus ludwigi* n. sp. (in millimeters)

	Type lot (Luzon)		Lot 2 (Luzon)		Lot 3 (Mindoro)		Lot 4 ("Lab.")	Lot 5 (Borneo)
	♀ ($n = 1$)	♂ ($n = 1$)	♀ ($n = 6$)	♂ ($n = 6$)	♀ ($n = 5$)	♂ (n = 5)	♀ ($n = 8$)	♂ ($n = 1$)
TBL	3.58	3.14	3.3—3.6	2.8—3.1	3.5—3.9	3.1—3.3	4.1—4.4	3.41
HL ($\bar{x}$)	0.78	0.76	0.77	0.74	0.78	0.76	0.79	0.75
HW ($\bar{x}$)	0.49	0.50	0.51	0.50	0.49	0.49	0.53	0.51
AnL ($\bar{x}$)	0.54	0.57	0.51	0.53	0.50	0.51	0.55	0.56
WBG	0.20	—	0.17—0.19	—	0.22—0.23	—	0.20—0.23	—





Figs. 3—4. *Haematopinus ludwigi* n. spec. 3. ♀ genital segments 7—11 with gonopods and ventral chaetotaxy. 4. ♂ subgenital plate and chaetotaxy of segments 7—11



Figs. 5—7. 5. *Haematopinus apri,* ♂ genitalia (dorsal view) with basal apodeme, endotheca, aedeagus and surrounding symmetrical pseudopenis. 6. *H. ludwigi* n. spec., ♂ genitalia (dorsal — corresponding with Fig. 5). 7. *H. ludwigi* n. spec., ♂ abdominal segments 7—11 with dorsal chaetotaxy

by anterio-lateral projections of the sternal plate. Three species, *H. latus, H. phacochoeri,* and *H. meinertzhageni* are specific to the Ethiopian Suidae *Potamochoerus porcus, Phacochoerus aethiopicus,* and *Hylochoerus meinertzhageni,* and are in most morphological details very similar to each other. Two polytypic species, *H. suis* and *H. apri,* are known to infest wild boars of the genus *Sus* in the Oriental and Palearctic region, as well as their domestic and feral descend world wide (cf. Ferris 1933, Fahrenholz 1939 a). The species described herein belongs to yet another, geographically remote host species of the genus *Sus,* the Javan Pig

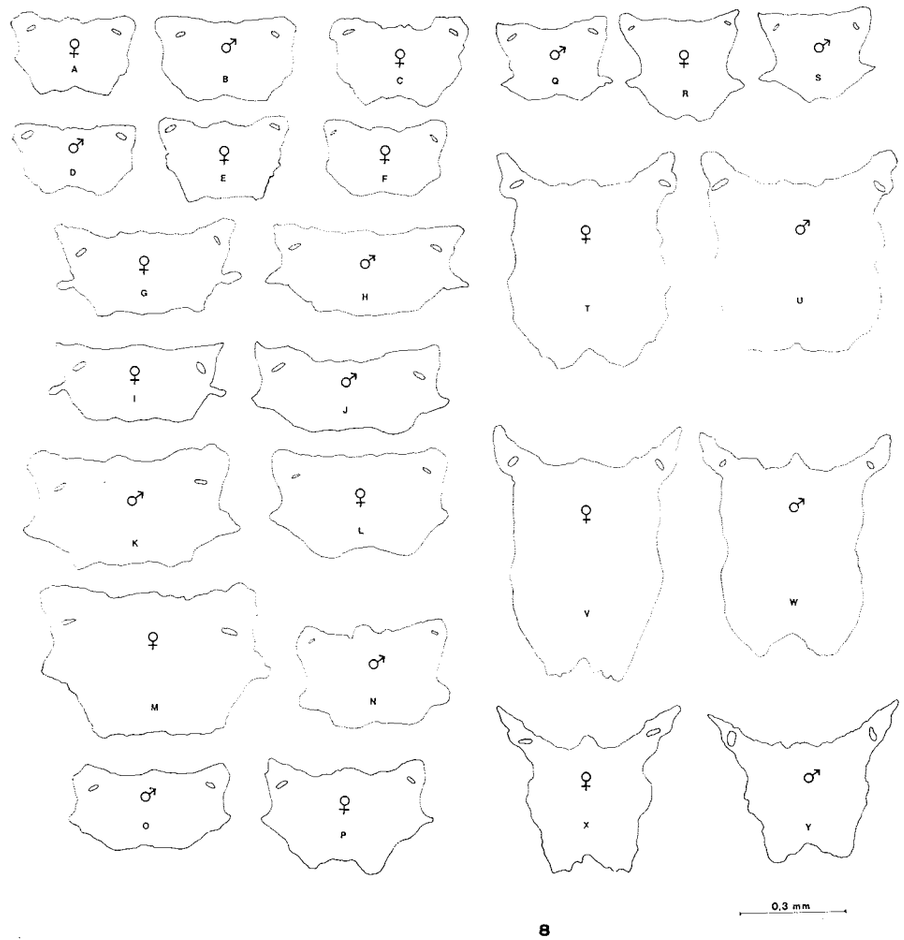


Fig. 8. *Haematopinus,* thoracic sternal plates (drawn to the same scale). A—F, *H. ludwigi* n. spec. A, B, types from Luzon, Philippines. C, from Salabusob Lab., Philippines. D—F, from Mindoro, Philippines. G—P, *H. suis.* G—J, from Nepal. K, M, from India. L, N, from England (domestic pig). O, P, from Papua, New Guinea (domestic pig). Q—S, *H. apri.* Q, R, from Iran. S, from Germany. T, U, *H. phacochoeri* from Tanzania. V, W, *H. meinertzhageni* from Uganda. X, Y, *H. latus* from Nyasaland

Table 2. Head Indices of 4 species of suid-infesting *Haematopinus* (HL : HW · 10)

Haematopinus spec.	Lot No.	Locality	*n*	Head Index ($\bar{x}$) ♀	Head Index ($\bar{x}$) ♂
H. phacochoeri	—	E. Africa	4	13.0	13.9
H. ludwigi n. sp.	Types	Luzon	1	16.0	15.2
H. ludwigi n. sp.	Lot 2	Luzon	6	15.1	14.8
H. ludwigi n. sp.	Lot 3	Mindoro	5	15.9	15.5
H. ludwigi n. sp.	Lot 4	"Lab."	8	15.0	—
H. ludwigi n. sp.	Lot 5	Borneo	1	—	14.7
H. suis	(several)	world-wide	40	20.0	19.3
H. apri	(several)	Europe	40	25.6	24.5

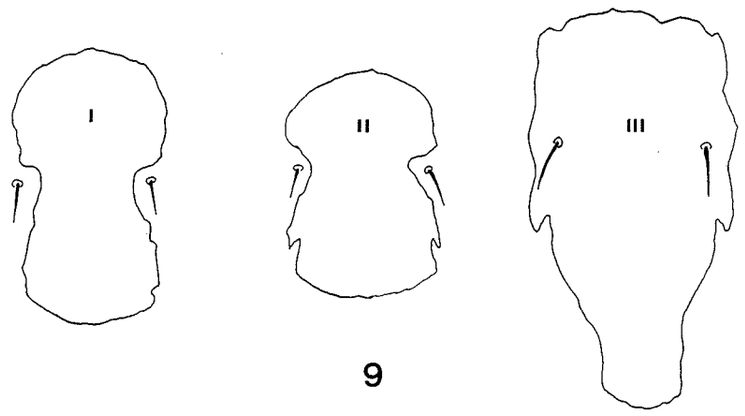


Fig. 9. *Haematopinus*, ♂ subgenital plates (drawn to the same scale). I. *H. suis*. II. *H. ludwigi* n. spec. III. *H. phacochoeri*

of the islands Luzon and Mindoro, Philippines. A single record from *Sus barbatus* (possible misidentification) in Borneo can be attributed to the same new species. As shown above, *H. ludwigi* nov. spec. shares many characteristics with the palearctic and continental oriental species of the suid-infesting *Haematopinus*. Different from this group and rather similar to the morphology of the ethiopian species is predominantly the presence of an additional pair of paratergites on abdominal segment 2, the conspicuously deep incision between segments 6 and 7, and the lateral projections of the posterior part of the male subgenital plate (Fig. 9, II).

Merely on the basis of the external morphology, *H. ludwigi* nov. spec. appears to be a taxon intermediate between the Palearctic-continental Oriental group and the Ethiopian group of *Haematopinus*. However, considering the extreme isolation of the host in the insular Oriental region, this phenomenon cannot be regarded conveniently as a case of intergradation, but must be seen in the context of the evolution and radiation of Suiformes and their Anopluran parasites.

The single ♂ specimen taken off *Sus barbatus* differs from all the other specimens only in the shape of the thoracic sternal plate. As shown in a later paragraph, the distributions of the Bornean and the Javan Pigs are overlapping in certain islands, and the two are doubtlessly closely related forms. *H. ludwigi* nov. spec. is probably another polytypic species and parasitizes pigs of the "*verrucosus-barbatus*" group in the genus *Sus*.

Host: The only native wild pig of Luzon is the Javan Pig, *Sus verrucosus* Müller & Schlegel, 1842 (Suidae, Artiodactyla). Many subspecies are known from various Indo-Pacific islands. *Sus barbatus* Müller, 1839, the Bornean Pig is also a possible host. However, the specific difference of the two taxa is not clearly established, although their separation from the *Sus "scrofa-vittatus"* group is considered to be clear. The term *Sus "verrucosus-barbatus"* group has been used by KELM (1939 a, 1939 b).

Host distribution: *Sus verrucosus* is reported from the islands of Java, Celebes, Basilan, Mindanao, Mindoro, Negros, Panay, Samar, Ceram, Borneo (MOHR 1952, MORRIS 1965), Luzon (MOHR 1952), and (?) Sumatra (KELM 1939 b). *Sus barbatus* is known from Borneo, Java, Sumatra, Palawan, and neighboring smaller islands. *Sus scrofa vittatus* Müller & Schlegel, the Southeast Asian Banded Pig, was originally reported from Sumatra, but has today a more extended distribution due to the introduction by man. Regionally the distribution of these three wild pigs is overlapping in Java, Borneo, (?) Sumatra and possibly certain Philippine islands. Following the report of MOHR (1952), the only wild boar of Luzon is *Sus verrucosus*. *Sus barbatus* has never been found on this islands, but the possibility cannot be excluded that *Sus scrofa vittatus* was introduced to Luzon in more recent times. Furthermore, the presence of feral pigs (former domestic stock of *Sus scrofa* ssp.) on many of the islands is not unlikely. Inasmuch the indication "Wild Pig from Luzon", "Wild Boar", and "Wild Piglet from Mt. Minaloa" as host data is a very general statement. However, since feral pigs and S. E. Asian Banded Pigs are known to be hosts of *Haematopinus suis* ssp. (cf. NEUMANN 1911, FERRIS 1933, HOPKINS 1949), and no species of the Suidae was ever recorded to harbour two forms of Anoplura, *Sus verrucosus* (and possibly *Sus barbatus*, too) must be regarded as the true host of *Haematopinus ludwigi* nov. spec.

Material examined: The type series (1 ♀, 1 ♂, 2 nymphs). The following paratypes in the United States National Museum (Natural History) in Washington, D.C.: 9 ♀♀, 14 ♂♂ ex "Wild Boar", Mt. Province, Luzon, P.I., 23 Sept. 1966, vial 29; 8 ♀♀, 10 ♂♂ ex "Wild Piglet", Mt. Minaloa, Bongabon (Mindoro island) P.I., 2 June 1967, vial 87. Other material in the USNM: 8 ♀♀ ex "Wild Boar", Salabusob Lab., Philippines, 17 Aug. 1967; 1 ♂, 2 nymphs ex *Sus barbatus*, Borneo, Sarawak, Tinjar, Fort Leju, 18 and 21 June 1950, RT B-7818. Examined were all those specimens of the USNM, in the Ferris Collection, and in the collection of the British Museum (Natural History) which were labelled as being collected from "Boars", "Pigs", "Swine", and *Sus* spec. from S.E. Asia and the Indo-Pacific islands, including many specimens off a "Pig", Leyte, Philippines (USNM). With the exception of a few misidentifications and those lots cited above, all the material proved to belong to *Haematopinus suis* ssp.

Haematopinus breviculus Fahrenholz, 1939 (Figs. 10—14)

Haematopinus breviculus Fahrenholz, 1939, Mitteilungen aus dem entomologischen Verein Bremen: 32—35, Figs. 1—3; FERRIS (1951) 87; WERNECK (1952) 205—206.

In the collection of the British Museum (Natural History) a single slide with six specimens was found, labelled *Haematopinus taurotragi* ex *Taurotragus oryx pattersonianus*, Uganda. Although the slide was included in a long row of properly identified material of *taurotragi*, those six specimens had nothing in common with this taxon but host and locality. Instead, they could be identified as *Haematopinus breviculus* Fahrenholz, which, up to now, has been a rather obscure species because of the fact that it was described in a little known German journal and without indication of host, locality, or adequate illustrations. The only type specimen, a female, is missing in the Fahrenholz Collection, and presumed to be lost (Prof. H. W. LUDWIG, 1973, personal communication).

Type data: A single female without indication of neither type host, nor locality. Originally filed under Nr. 3295 in the private collection of FAHRENHOLZ. This collection is presently in care of Dr. REICHMUTH, Museum, Berlin. The type is missing.

A neotype (center female) was selected from a slide with 3 ♀♀ and 3 nymphs in the collection of the BM(NH), London. The slide is labelled: "*H. taurotragi* Cummings; *Taurotragus oryx pattersonianus* Lyddecker, Jie county, Karamoja, Uganda, Oct. 1941, T. W. CHORLEY; Hopkins Collection.

Diagnosis: *H. breviculus* is the smallest of the bovid-infesting species of *Haematopinus*. Distinct from, the otherwise rather similar, *taurotragi* by its much smaller size, the distinctly broader and shorter thoracic sternal plate (Fig. 14 A—J), and the median sclerite between the gonopods shaped like an inverted 'U' (Fig. 12), never shaped like a 'W' as in *taurotragi* (Fig. 13 a, b). Tergites, paratergites, gonopods, width between gonopods (WBG), shape of legs and head much as in *taurotragi* but in relative diminuation. Distinct from *H. eurysternus* by the absence of paratergites on segment 2 (apparent segment 1) and the more elongate and distally curved gonopods (Fig. 13 a). Separable from *H. oryx* Fiedler & Stampa, 1958, the louse of the Gemsbok, *Oryx gazella* (L.), mainly by the shape of the head (Tab. 4), the form of the thoracic sternal plate (Fig. 14 A—D, M, N), and the median genital sclerotization; in *H. oryx* the forehead is more pointed, the sternal plate elongate with a median projection as in most other bovid-infesting species, the median genital plate is nearly square without any additional sclerotized structure comparable with the the inverted 'U" of *breviculus*.

Description of female (male unknown): General appearance and chaetotaxy as in Fig. 10. TBL $\bar{x} = 2.37$ mm ($n = 4$). Head relatively short and stout, length (HL) only little more than width (HW); HW measured at the level of the first seta (DMHS) posterior to the ocular lobes; head index = 13.2; forehead dorsally with a characteristic sclerotized transversal band (Fig. 11). Antennae 5-segmented, the length (AnL) nearly equal HL. Thorax: Sclerotization of the mesothoračic and metathoracic pleural phragma apparently fused to a broad transversal band and surrounding the notal pit; two large dorsolateral projections of the metanotum; sternal plate broader than long (Fig. 14 A—D), never enclosing the prothoracic pleural apophyses; femora short and rounded, tibio-tarsi stout with short claws. Abdomen regularly ovate, apically slightly pointed with conspicuous terminal lobes, lateral margins nearly smooth, paratergites rather small and present only on segments 3 to 8; two pairs of well developed median tergites on segments 2 to 7; strongly sclerotized, circular submarginal tergites on segments 3 to 8; clasp-like tergite of the terminal segments dorsomedially with a wide gap in the middle. Genitalia of ♀ (Figs. 12 and 13): Gonopods elongate and apically curved, with slightly divergent inner margins, these fringed with a dense row of setae; gonopodeal apodemes conspicuously curved and projecting anteriorly into the lumen;

median sclerotization weak and shaped like an inverted 'U'; width between the gonopods (WBG) at the level of the vulva margin = 0.14 mm; posterior margin of the vulva slightly lobed.

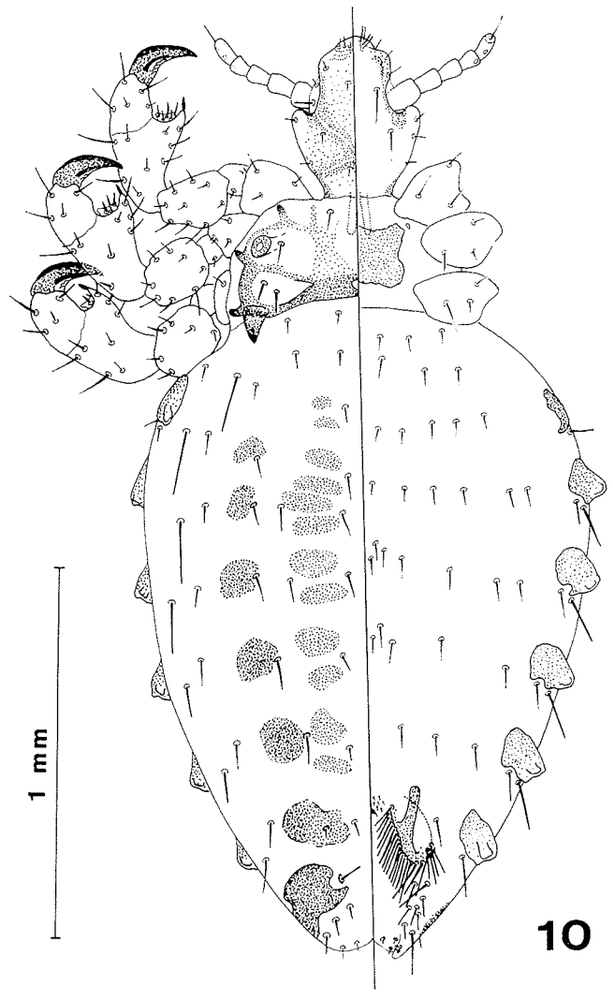


Fig. 10. *Haematopinus breviculus;* left side — dorsal view, right — ventral; antennal chaetotaxy and legs on right side omitted. 10. ♀ total

Second nymphal stage: TBL $\bar{x} = 1.35$ mm. In comparison with the adults head longer with less strongly pronounced ocular lobes; head index = 14.0. Thorax with a conspicuous notal pit and large spiracles. Legs relatively long with large tibiae. Abdomen with faintly sclerotized median and submarginal tergites; paratergites on segments 3 to 8 well developed, those from 5 to 8 projecting,

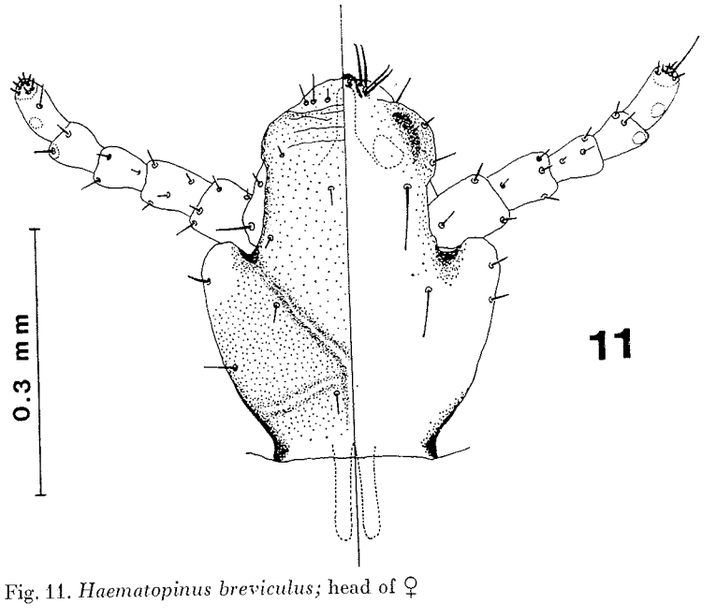


Fig. 11. *Haematopinus breviculus;* head of ♀

Table 3. Measurements of *H. breviculus* and *H. taurotragi* (in mm)

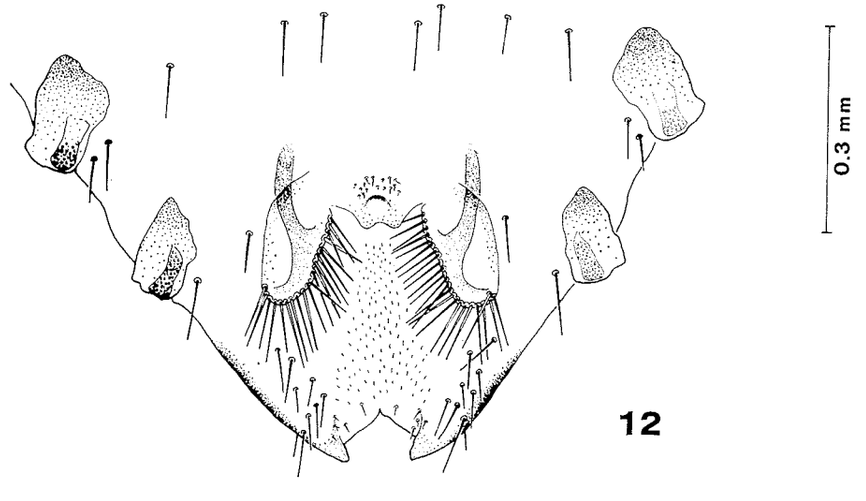
	Haematoninus breviculus			*H. taurotragi*	
	Lost Type ♀ Nr. 3295 (taken from FAHRENHOLZ)	Neotype series Females ($n = 3$) range	($\bar{x}$)	2nd instars ($n = 3$) range	Females of five lots, incl. type ($n = 10$) range ($\bar{x}$)
TBL	2.18	2.38—2.48	(2.43)	1.33—1.37	3.50—4.40 (4.10)
HL	0.46	0.43—0.46	(0.45)	0.42—0.44	0.44—0.56 (0.50)
HW	0.35	0.33—0.36	(0.34)	0.29—0.32	0.32—0.39 (0.34)
AnL	—	0.33—0.34	(0.34)	0.24—0.25	0.37—0.44 (0.40)
WBG	—	0.14	(0.14)	—	0.16—0.19 (0.18)

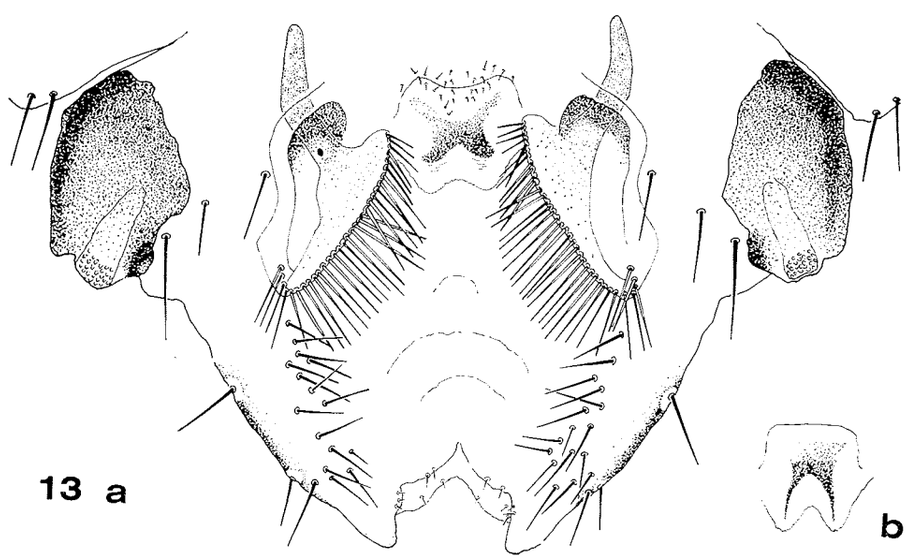
Table 4. Head indices (HL : HW · 10) of 5 species of bovid — infesting *Haematopinus* (adults only)

Species	lots	n	Head Index	($\bar{x}$)
H. breviculus (neotypes-series)		($n = 3$)	—	13.2
H. breviculus (type Nr. 3295)			—	13.1
H. oryx	(1 lot)	($n = 2$)	—	14.2
H. taurotragi	(5 lots)	($n = 10$)	13.7—15.5	14.7
H. eurysternus (including *H. brevipes*)	(5 lots)	($n = 10$)	13.8—15.2	14.6
H. quadripentusus	(5 lots)	($n = 10$)	15.9—16.3	16.1

borne on lateral protuberances, unlike those of the adults. A specific diagnosis is difficult because of the extreme similarity of nymphs of *H. breviculus* and *H. taurotragi.* The main difference is the relatively smaller size. The specimens are in the collection of the BM(NH), London.

Host: The East African Eland, *Taurotragus oryx pattersonianus* Lyddecker, 1906, from Uganda.





Figs. 12—13. 12. *Haematopinus breviculus;* ♀ genital segments 7—11 with gonopods and ventral chaetotaxy. 13 a. *H. taurotragi* (taken off a "Kudu"); ♀ genital segments 8—11 (otherwise corresponding with Fig. 12). 13 b. *H. taurotragi* (taken off an Eland, *Taurotragus oryx pattersonianus*); ♀ median genital sclerite

Host distribution: The type host, *pattersonianus,* ranges from Kenya to the Tana River, and westwards to Rwanda and Uganda. Another subspecies, the Cape Eland, *T. oryx oryx* (Pallas, 1766), is found from Natal and the northern Cape Province to the Zambesi River and northern Southwest Africa; Livingstone's

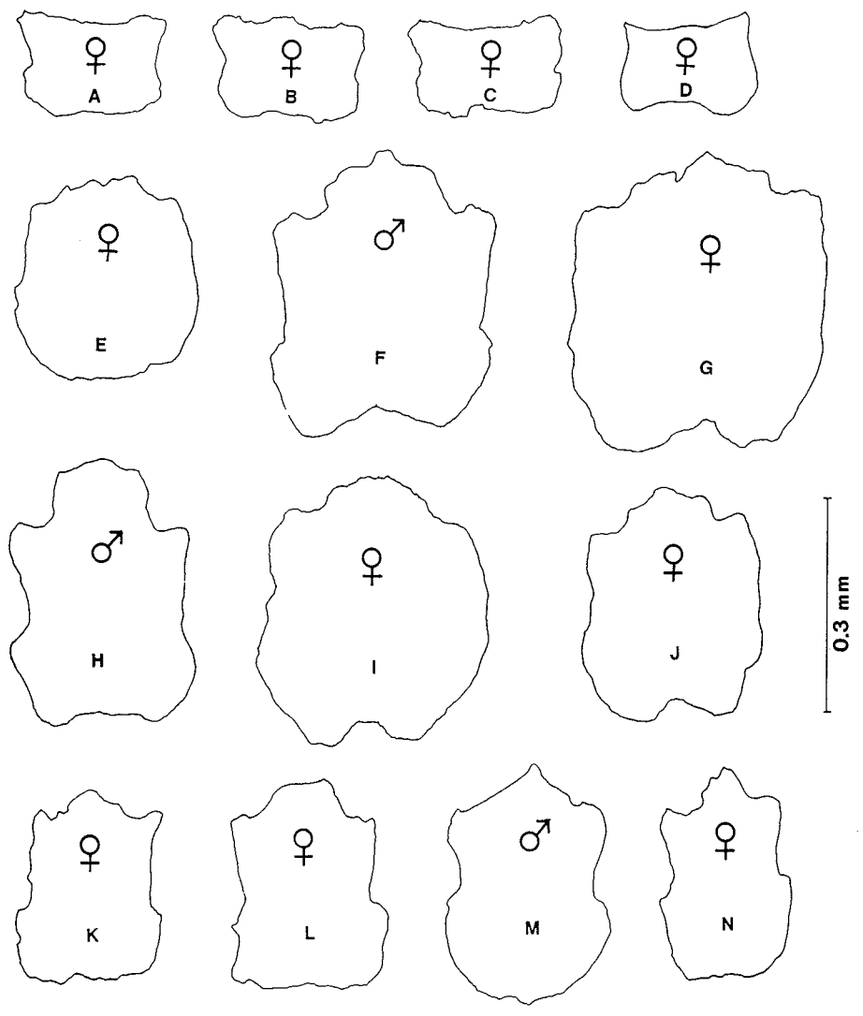


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Fig. 14. *Haematopinus,* thoracic sternal plates (drawn to the same scale). A—D, *H. breviculus.* A—C, neotypes from central Tanzania. D, type ♀ (after FAHRENHOLZ). E—J, *H. taurotragi.* E, ex *Taurotragus oryx pattersonianus,* central Tanzania. F, G, ex *T. oryx oryx,* Natal. H—J, ex "Kudu" (*Tragelaphus s. strepsiceros*). Cape Province. K, L, *H. eurysternus.* M, N, *H. oryx*

Eland, *T. o. livingstonii* (Sclater, 1864), is found in the connecting area between the Zambesi River and central Tanzania (DORST and DANDELOT 1970; for more detailed information see ANSELL 1968).

Material examined: The neotype and the neoparatypes (3 ♀♀, 3 nymphs). The following material of *H. taurotragi* is also in the BM(NH): 3 ♀♀, 3 nymphs ex *T. oryx pattersonianus,* Shinyanga, Tanganyika Territory, IV. 1946 (Hopkins Collection); 2 ♀♀, 4 ♂♂, 1 nymph ex *Boselaphus oreas* (= *T. oryx* ssp.), Eland, Knowsby Menagerie, 1865—8, Pres. by F. MOORE (these are the types and paratypes of *H. taurotragi* Cummings); 3 ♀♀, 2 ♂♂ ex *T. oryx,* Natal, S. Africa, 1921, HILL coll. (used for illustration by FERRIS 1933); 1 ♀, 1 ♂ ex *T. oryx oryx,* Mtabamhlope, Natal. 12. XII. 1920, BEDFORD coll.; 3 ♀♀, 2 ♂♂ ex "Kudu" (*Tragelaphus s. strepsiceros* [Pallas, 1766]), Grahamstown, C.P., S. Africa, 1920, BEDFORD coll. In the Muséum National d'Histoire Naturelle, Paris: 1 nymph (second instar) ex *Taurotragus derbianus* (Gray, 1847), Soulemaka, C.A.R., V. 1965 (type of *H. jeannereti* Paulian & Pajot, 1966, and synonym of *H. taurotragi*).

Notes: *H. breviculus* is in many basic morphological structures similar to *H. taurotragi.* There is, however, a quite distinct difference in total body length and in the shape of the thoracic sternal plate (Fig. 14 A—J). We do not have any information about the ectoparasite ecology and topographical preferences of the two species.

H. breviculus was collected from the East African Eland, *pattersonianus,* in Uganda. *H. taurotragi* came off the same host species in Tanganyika Territory (Tanzania), but also off the Cape Eland, *oryx,* in Natal, and off the Kudu, *Tragelaphus s. strepsiceros,* in the Cape Province, and was recently recorded also from Transvaal (check "Material examined" and Fig. 14).

A second instar taken off a Derby Eland, *Taurotragus derbianus,* in the Central African Republic appears to belong to the, most likely polytypic, species *H. taurotragi.* The adults of *taurotragi* and *breviculus* are quite distinct as shown in Tab. 3 and 4, and in the respective figures. They certainly cannot be seen as extreme forms of one species.

It should be mentioned that the Eland appears to be a rather susceptible host for louse infestation. From the Cape Eland in Transvaal the cattle louse, *H. eurysternus* (described as *H. brevipes* Fiedler & Stampa, 1956. synonym), has been recorded. *Linognathus taurotragus* (Anoplura) is known from *T. oryx* ssp. in various locations in Africa and represented in several collections. The Derby Eland is also said to be host of a "*Linognathus* spec. nov. near *taurotragus*" (Hopkins 1949).

Zusammenfassung

Männchen und Weibchen von *Haematopinus ludwigi* nov. spec. werden beschrieben und abgebildet. Die Läuse wurden auf *Sus verrucosus,* dem Pustelschwein von der philippinischen Insel Luzon gefunden. Die morphologischen Bezichungen zwischen den *Haematopinus*-Arten, welche Schweine befallen, werden diskutiert.

Das Weibchen von *Haematopinus breviculus* Fahrenholz, 1939, wird wiederbeschrieben und abgebildet. Dazu dienen 3 ♀♀, welche auf *Taurotragus oryx pattersonianus,* dem Ostafrikanischen Eland in Uganda gesammelt wurden. Ein Neotypus wird bestimmt.

Tabellen mit Körpermaßen und den Kopfindices der Schweineläuse und einiger Bovidenläuse der Gattung *Haematopinus* sind beigefügt.

References

Ansell, W. F. H.: Smithsonian Institution Prelim. Identification Manual f. African Mammals. Nr. 8 Artiodactyla (excluding genus *Gazella*). Smiths. Inst. Wash. (1968) ii + 207 pp.

Cummings, B. F.: Descriptions of five new species of Anoplura and Mallophaga. Bull. Ent. Res. **5** (1914) 155–177, figs.

Dorst, J., and P. Dandelot: A Field Guide to the Larger Mammals of Africa. London: Collins 1970, 287 pp.

Ellerman, J. R., T. C. S. Morrison-Scott and R. W. Hayman: Southern African Mammals. (A reclassification.) London 1953, 363 pp.

Fahrenholz, H.: Die Läuse der Schweine. Zeitschr. f. Infektionskrankheiten, Parasit. Krankheiten u. Hygiene d. Haustiere **55**, 2 (1939 a) 134–154, figs.

—: Beitr. z. Kenntnis d. Anopluren. IV. Mitt. aus dem zool. Verein Bremen (1939 b) 32–35, figs.

Ferris, G. F.: Contributions toward a Monograph of the Sucking Lice. Part VI. Stanford Univ. Publs. (biol. Sci.) **2** (1933) 425–470, figs.

—: The sucking lice. Mem. Pac. Coast Ent. Soc. **1** (1951) 83–97, figs.

Fiedler, O. G. H., and S. Stampa: New Species of Sucking Lice from South African Game. Onderstepoort J. Vet. Res. **27**, 1 (1956) 63–65, figs.

—, and —: Studies on Sucking Lice (Anoplura) of African Mammals II. New Species of the Genera *Linognathus, Haematopinus,* and *Ratemia.* The Journal of the Egyptian Public Health Assoc. **33**, 5 (1958) 181–183, figs.

Hopkins, G. H. E.: Host-Associations of the Lice of Mammals. Proc. Zool. Soc., London **119** (1949) 521–534.

Johnson, P. T.: Redescription of two Cervid-infesting Anoplura from S. E. Asia. Ent. Soc. Wash. **64**, 2 (1962) 107–108, figs.

Kelm, H.: Zur Systematik der Wildschweine. Z. Tierzücht. u. Züchtungsbiol. **43** (1939 a) 362–369.

—: Ein Pustelschwein von Sumatra. Zool. Anz. **125** (1939 b) 219–224.

Kim, K. C.: The Species of *Enderleinellus* parasitic on Sciurini and Tamiasciurini. J. Parasit. **52** (1966) 988–1024, figs.

Mohr, E.: Wilde Schweine. Die Neue Brehm-Bücherei Wittenberg Lutherstadt: Ziemsen 1952, 156 pp.

Morris, D.: The Mammals. A guide to the living species. London: Hodder & Stoughton Ltd. 1965, 448 pp.

Neumann, L. G.: Notes sur les Pédiculidés. II. Arch. Parasitologie, Paris **14** (1911) 408–410, figs.

Paulian, R., et F. X. Pajot: Anoplures de la Republique Centrafricaine et du Congo (Brazzaville). Bull. de la Soc. Ent. de France **71** (1966) 40–51, figs.

Systematics Association Committee for Descriptive Biological Terminology. Terminology of the simple symmetrical plane shapes. Taxon **11** (1962) 145–146, 245–247.

Weisser, C. F., and K. C. Kim: A New Species of *Haematopinus* from a Philippine Deer, *Cervus nigricans.* Pac. Insects. **14**, 1 (1972) 15–22, figs.

—, —: Rediscovery of *Solenopotes tarandi* (Mjöberg, 1915), with ectoparasites of the Barren Ground Caribou. Parasitol. **66** (1973) 123–132, figs.

Werneck, F. L.: Contribuicao ao conhecimento dos Anopluros. II. Rev. Brasil. Biol. **12**, 2 (1952) 201–210, figs.

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