

VIII.—Anoplura and Mallophaga from Zululand,

by

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WITH PLATES XV and XVI.

THE Curator of the Durban Museum, Mr. E. C. Chubb, has recently sent us for determination a small collection of Anoplura and Mallophaga collected at Mfongosi, Zululand, by Mr. W. E. Jones, who presented them to the Museum. The collection, though including but seven species of ectoparasites, contains three species and one variety that are new, while for the other species, already described, the host and geographic records are of special interest. All of the Anoplura were taken from rodents, and the Mallophaga were all taken from the Hadada Ibis, *Theristicus hagedash*. The determinations and descriptions follow.

MALLOPHAGA.

LIPEURUS CAPITATUS, Piaget.

Males and females of this well-marked form taken from an Hadada Ibis, *Theristicus hagedash*, at Mfongosi, Zululand (Durban Museum). This species was described in 1885 by Piaget (Suppl. p. 63, pl. VI, fig. 9) from specimens from a dried skin of the same host in the Museum of Leyden.

COLPOCEPHALUM SUBPENICILLATUM, Piaget.

Males and females taken from an Hadada Ibis, *Theristicus hagedash*, at Mfongosi, Zululand (Durban Museum). This species also was originally described by Piaget in 1885 (Suppl. p. 123, pl. VIII, fig. 6) from specimens from a skin of the same host in the Museum of Leyden.

LÆMOBOTHRIUM SETIGERUM, Piaget, VAR. AFRICANUM, var. nov.
(Pl. XV, fig. 1).

One female taken from the Hadada Ibis, *Theristicus hagedash*, at Mfongosi, Zululand (Durban Museum). The species *setigerum* was described by Piaget in 1889 (Notes from the Leyden Museum, Vol.

IX, pp. 35-36, pl. II, fig. 2) from *Ibis cayennensis*. This host is a native of South America, ranging from southern Brazil north through Guiana, Ecuador and Colombia to Panama. This *Læmobothrium* is sharply distinguished from other species of its genus by numerous heavy, flattened, spiny setæ on the clypeal margin of the head, as also by the segmental transverse series of numerous strongly pustulated hairs on the dorsum of the abdomen. The specimens which we have in hand from Africa show these characteristic clypeal setæ, but the dorsal abdominal hairs are not at all, or are but slightly, pustulated and are, except for the middle two of each series, much smaller, and of lesser number. The specimens are also plainly different from the species type in numerous other details and should be distinguished by a varietal name.

The variety differs by being markedly smaller, the species type having a length of, female 8.4 mm., male 7.2 mm., while our specimens measure only, female 6.72 mm., and by having the head markings very different, in that the strongly marked sub-parallel occipital bands characteristic of the species type are not present in our specimens, but are replaced by strong diagonal bands running from a point just behind the bases of the mandibles outward to a point midway on the temporal margins. They also show some differences in abdominal leg markings.

In the general character of these differences this variety rather tends to resemble *L. pallidum*, Piaget (name changed later by me to *pallescens* because of the prior use of *pallidum* in the genus). *L. pallescens*, based on a single specimen, was described by Piaget from a dried skin of *Ibis olivacea* in the Museum of Leyden. This ibis is an inhabitant of Africa, the region from which our present specimens come. But according to Piaget's description the *Læmobothrium* from this host shows a curious absence of hairs on head and body. Now as *setigerum* is characterized precisely by its remarkable and conspicuous flattened setæ or spine hairs on the clypeus, and its many distinctly pustulated hairs in transverse segmental series on the dorsum of the abdomen, and as our specimens agree with *setigerum* in these characters, *pallescens* can evidently not be considered in connection with the present specimens, even though it come from a closely related bird in the same geographic region—*unless* we may consider that Piaget's single specimen of *pallescens* had been so badly handled and rubbed that it had lost all of its hairs and setæ. This is, indeed, hardly probable, as the Mallophaga do not readily lose their hairs through mis-handling.

In a collection of African Mallophaga made by Sjöstedt's Swedish Kilimandjaro-Meru Expedition in 1905-06, Kellogg found a *Læmbothrium* species represented by a female, a male and a young specimen, taken from *Theristicus hagedash*, at certain soda lakes in the Kilimandjaro-Meru region. Kellogg attributed these specimens to Piaget's *L. setigerum* (Wiss. Ergb. d. Schwed. Zool. Exp. nach dem Kilimandjaro, dem Meru, U.S.W. 15, Corrodentia, 4, Mall., p. 49, 1908) because of their possession of the characteristic heavy clypeal setæ. We are now inclined to think that they should be referred to the variety which we are at present describing. Unfortunately, as the specimens are in the Royal Museum at Stockholm we cannot at present re-examine them.*

LEMBOTHRIMUM SETIGERUM, Piaget, VAR. CUBENSIS, var. nov.
(Pl. XV, fig. 2).

Two males from *Aramus giganteus holostictus*, Cuba (coll. C. D. Ramsden). Although these specimens do not belong to the Durban Museum collection which is the basis for this paper, they can advantageously be reported on here, because of their interesting relation to the new variety of *L. setigerum*, Piaget, just described. The two specimens from the Cuban *Aramus* possess the characteristic heavy flattened clypeal setæ described by Piaget for *setigerum*, and also possess segmental transverse series of pustulated hairs on the dorsum of the abdomen, but in each of these series there are but two hairs, while in typical *setigerum* there are at least ten in each series. It is an interesting and suggestive series as regards the dorsal abdominal hairs, which these three forms (typical *setigerum* and its varieties, *africanum* and *cubensis*) make. In typical *setigerum* each series is composed of ten or a dozen pustulated hairs of nearly equal size; in *africanum* the middle two of each series are strong and plainly pustulated, the others obviously smaller and degenerating, while in *cubensis* only the middle two of each series are left.

The Cuban specimens agree with the variety *africanum* in not having the strong parallel occipital bands characteristic of the type specimen of *setigerum*, although the shape of the head is more like

* Since sending this paper to press we have received, through the kindness of Dr. Yngve Sjöstedt, of the Stockholm Museum, a specimen of the *Læmbothrium* from *Theristicus hagedash* (Kilimandjaro, Africa) and find it to be identical with the variety *africanum* of *Læmbothrium setigerum* Piaget, which we are describing in this paper.

that of typical *setigerum* than is the shape of the head of *africanum*. The clypeal front of *setigerum* is straight; of variety *africanum*, slightly emarginate; and variety *cubensis*, still more emarginate. The shape of the head of variety *cubensis* is markedly different from that of variety *africanum*, as are also the markings of abdomen and legs. The measurements of the present variety are as follows: Male, body length 6·8 mm., width 1·5 mm.; head, length 1·12 mm., width 1·12 mm.

ANOPLURA.

POLYPLAX OTOMYDIS, Cummings.

Several males and females from *Otomys irroratus*, Mfongosi, Zululand. Described by Cummings in 1912 (Bull. Ent. Research, Vol. III, pp. 395-397, fig. 2) from female specimens from *Otomys irroratus tropicalis*, from Mt. Kenya, British East Africa; and later recorded by Waterston (Annals of the S. Afr. Museum, Vol. X, p. 275, 1914) from *Otomys brantsi luteolus*, from skins in the South African Museum (Cape Town).

Measurement of one of the females gave the following: length 1·36 mm., greatest width ·416 mm., length of head ·24 mm., thorax ·112 mm., abdomen 1·008 mm. These figures are somewhat larger than those given by Cummings for the type female (length 1·125 mm., head ·25 mm., thorax ·075 mm., abdomen 1 mm.) but the agreement is so close in all other particulars that there can be no doubt of the species.

As the male has not been described and differs somewhat from the female we describe it briefly here.

MALE. Length ·912 mm., greatest width ·32 mm., length of head ·224 mm., length of thorax ·096 mm., length of abdomen ·592 mm. Head resembling that of the female except that it is wider at the insertion of the antennæ and narrows more abruptly in front of them. Basal joint of antennæ much thicker than in the female and remaining joints shorter. Abdomen much shorter than in the female. Only the second tergite and second and third sternites are divided into two sclerites each, the others having but one sclerite and one row of hairs each. Ninth segment pointed posteriorly and with the genitalia quite conspicuous.

POLYPLAX JONESI, sp. nov. (Pl. XV, fig. 3, 3a, 3b, 3c, 3d, 3e).

Five females and one immature male from *Saccostomus campestris*, Mfongosi, Zululand (Durban Museum). This species seems to be closest to *P. spinulosus* (Burm.), the wide-spread and well-known louse of rats, which it resembles in the shape of the head and pleuræ, but from which it differs chiefly in the shape of the sternal plate.

Female, length 1.28 mm., greatest width .448 mm., length of head .176 mm., width of head across temples .144 mm., length of thorax .096 mm., length of abdomen 1.008 mm.

Head, in front of the temporal angles, rather square in shape, broadening somewhat in a smooth curve behind the antennæ which are close to the anterior margin. Anterior margin but slightly convex. At the temporal angles the head narrows abruptly to about three-fourths its greatest width and the occiput is then prolonged backward into a sort of short, thick neck, with a convex posterior margin, which is received into the thorax. Anterior margin with six inconspicuous spines, each lateral margin with two short spines a short distance behind the antennæ and three backward pointing spines at the posterior lateral angle, of which the first is the shortest, the second about twice as long and the third quite stout and long, reaching to the posterior margin of the thorax. A transverse row of four minute spines in front of the antennæ and one of six behind the antennæ. Two minute spines close together on the occiput.

Antennæ rather slender, the first joint a little longer than wide, the second about as long as the first but much slenderer, the remaining three joints increasingly smaller.

Underside of the head with a raised median portion that is narrowest posteriorly, and bears on each side a hair-like spine on a line with the posterior margin of the antennæ and another farther in on a line with the anterior margin of the same. Rostrum close to the anterior margin with six short spines about its mouth.

Thorax trapezoidal in shape, widest across posterior margin with a V-shaped incision in the anterior margin, its posterior margin slightly convex and slightly overlapping the abdomen. The greater portion of it is occupied by the mesothorax which bears upon its posterior margin four spines, the outer pair short and stout, the inner pair stout and long reaching to the posterior margin of the second abdominal segment. Sternal plates rather spear-head-shaped, pointed behind and with a short, truncate handle-like portion in front. Anterior and

posterior coxæ approximate, middle coxæ quite widely separated, posterior coxæ each with two spines on its posterior margin.

First pair of legs small with slender claw, second pair similar with broader claw, third pair heavier with broad, heavy claw.

Abdomen elongate-oval with its greatest width near the middle. First segment narrow with two hairs, second segment with two rows of hairs, the first of two, the second of ten; third segment with one sclerite and one row of 14-16 hairs; fourth to seventh segments each with two sclerites and two rows of 12-16 hairs; eighth with one sclerite and one row of hairs; ninth with one row of six hairs of which the inner pair is shortest, the outer longest.

Pleuræ of the first segment small and hook-like, of the second to sixth segments rather broad and quadrangular, with a short tooth-like projection at each posterior angle, that of the dorsal angle being the longer, and with two short, stout spines between these projections. Pleuræ of the seventh and eighth segments small, each bearing two long hairs. On each segment from the third to the seventh inclusive there is a rather long hair on each side, in the membrane between each pleurite and the posterior sclerite of the corresponding segment.

On the ventral side, segment one concealed by the overlapping thorax, segment two with two sclerites, the first with six and the second with eight hairs, segments three to seven with two sclerites and two rows of 12-14 hairs. A hair between each pleurite and the posterior sclerite of the corresponding segment. Segment eight with a short curved row of 8-9 short spines near its centre. Gonapods short with one long and two short spines. A group of three or four slender spines, two long, thick spines and one short, thick spine on each side of the ninth segment. Anterior lip of the vulva one-lobed and fringed.

MALE. Length .912 mm., greatest width .32 mm., length of head .176 mm., width of head .144 mm., length of thorax .096 mm., length of abdomen .64 mm. Head resembling that of female in size and shape, but with the antennal joints much thicker. The third joint with the anterior side prolonged outwardly to a point. Lateral margins of the thorax rather more rounded than in the female. Abdomen much shorter than in the female, and with the secondary segmentation present only in the second tergite and the second and third sternites. The ninth segment is longitudinally divided on the dorsal side into two plates and is pointed posteriorly. Genitalia quite conspicuous.

HOPLOPLEURA INTERMEDIA, sp. nov. (Pl. XVI, figs. 5, 5a, 5b, 5c, 5d).

Nine females from two individuals of *Mus coucha*?, Mfongosi, Zululand (Durban Museum).

This species comes well within the original definition of the genus and takes its place between the other two species previously referred to it, the projections on the pleuræ being much less pronounced than in *H. acanthopus* and more pronounced than in *H. lineata*.

FEMALE. Length 1.12 mm., greatest width .368 mm., length of head .144 mm., thorax .096 mm., abdomen .88 mm. Head somewhat longer than wide, with the antennæ set well back from the anterior margin, which is very convex. Immediately behind the antennæ the head widens abruptly and then becomes slightly smaller again in a smooth, outwardly convex curve. Posterior margin at first nearly at right angles to the temporal margins, then becoming quite convex. Anterior margin with six or eight very inconspicuous spines; a single long backward-pointing spine on each side, placed slightly in from the lateral margin, and about half-way between the antennæ and the occipital margin.

Antennæ five-jointed, the first joint thick, a little longer than wide, the second joint about half as wide and a trifle shorter, the third, fourth and fifth joints successively smaller. Between the fourth and fifth joints there is a small, circular sense organ that extends across the joint between the two segments.

Underside of the head with a raised median portion which is narrowest posteriorly, and is slightly hollowed out on each side to receive the bases of the antennæ. It bears four spines, one long and hair-like on each side just behind, and a shorter one on each side just ahead of the base of the antennæ. Rostrum close to the anterior margin of the head.

Thorax short, with very convex lateral margins, and a shallow broadly V-shaped incision in the anterior margin. Width across anterior and posterior margins about equal. Meso- and meta-thorax sharply separated and of about equal size, the meso-thorax bearing upon its convex posterior margin two widely-separated spines which reach to the abdomen. Central portion of the sternal plate round, with a short, broadly-rounded anterior portion and a much longer, slender, bluntly-pointed posterior portion. First pair of coxæ contiguous for a considerable portion of their length; second pair touching the first, but quite widely-separated from each other; third pair much larger than the others, with a conspicuous hump on the

anterior margin, not touching the middle pair, but approximate to each other. First pair of legs small, with slender claw; second pair slightly larger with a broader claw; third pair large and stout, with a broad, blunt, heavy claw.

Abdomen elongated, with nearly parallel sides. The first segment quite broad, with one sclerite and no hairs; the second with one sclerite and one row of four hairs, of which the outer pair are the longest. The third segment with two sclerites and two rows of hairs, the first of four, the second of six, the outer hairs in each row being the longest. The fourth to seventh segments each with three sclerites, and three rows of four or six peg-like spines. Eighth and ninth segments each with one sclerite, the eighth with no spines, the ninth with four.

Pleuræ of the first segment small and hook-like, of the second rather triangular, the outer angles each prolonged into a single tooth, that of the ventral angle being much the longer, posterior margin with one short spine which is nearest the ventral side. Pleurites of the third segment somewhat triangular and of the fourth, fifth and sixth quadrangular, each with the corners produced into teeth, of about equal length and with a deep median notch which bears a spine, that of the third being much larger than the others, which are very small. Pleuræ of the seventh segment rather quadrangular, but with a much deeper and broader median cleft from which rises a long hair. Pleuræ of the eighth segment small, bearing two long hairs, the dorsal angle only being prolonged into a tooth which extends beyond the end of the body. Pleuræ of each segment overlapping those of the succeeding segment.

On the ventral side, segment one apparently without spines, two with one sclerite and six spines, of which those of the outer pair on each side are longer and stouter than those of the median pair. Segments three to seven each with three sclerites and three rows of spines. The first sclerite of the third segment with six spines of which the outer pair on each side are placed on a broad, flat prominence and are quite large and conspicuous, the other pair being much smaller. The remaining sclerites of this and succeeding segments to, and including, the seventh, each with seven spines, of which the two outer pairs in each case are longer and stouter than the others. Eighth segment with one sclerite, the gonapods rather long and pointed, tipped with three long spines. Ninth segment with a cluster of six spines on each side, of which one is quite stout and long, two of the same length but slenderer, and two short and hair-like. Anterior lip of the vulva one-lobed, fringed.

HOPLOPLEURA ENORMIS, sp. nov. (Pl. XVI, figs. 4, 4a, 4b, 4c, 4d, 4e).

Two males and several females from *Arvicanthus dorsalis*, Mfongosi, Zululand (Durban Museum).

A very striking species, characterized by the enormously prolonged, finger-like projections of the pleuræ. In this character it is approached by *Polyplax quadridentatus* Neum. and *P. precisus* Neum., although the projections are by no means so extremely developed in these two species as in the one at hand. Its generic position is somewhat doubtful. In the tri-partite character of certain of the tergites and sternites of the female, and in certain minor characters which seem to be correlated with this, viz. the presence of a short, blunt projection on the anterior side of the posterior tibiæ and of a pair of very large spines on each side of the third sternite, it agrees very well with the other species previously referred to *Hoplopleura*. The original definition of the genus, however, did not provide for the inclusion of forms with pleurites of the type which our specimens show. We have thought it best, however, to disregard the character of the pleurites, which after all is probably not of great importance, and allow the genus to include all those forms in which the tripartite sternites and tergites are present, and which are not otherwise distinct. This being the case *Polyplax quadridentatus* Neum., *P. longulus* Neum., *P. bidentatus* Neum. and *P. maniculatus* Neum. should probably be transferred to *Hoplopleura*.

FEMALE. Length 1.36 mm., greatest width .348 mm., length of head .208 mm., length of thorax .16 mm., abdomen .99 mm., width of head across temples .144 mm.

Head about one and one-half times as wide as long and projecting considerably in front of the antennæ. Anterior margin very narrow, but slightly convex. Lateral margins nearly parallel for a short distance behind the anterior margin, then diverging slightly just in front of the antennæ, then nearly parallel again until just behind the antennæ when they diverge at right angles to form the rounded temporal angles. Temporal margins not angulated but converging slightly, then becoming nearly parallel again. Occipital margin meeting the temporal margins nearly at right angles, then becoming quite convex. Six inconspicuous spines on the anterior margin and a stout spine on each temporal margin that extends a little beyond the occipital margin. Antennæ rather slender, the first joint about as long as wide, tapering slightly distally, the second joint slightly longer

than the first and much slenderer, the third about half as long as the second, the fourth a trifle shorter than the third and the fifth somewhat longer than the third. A post-axial sense organ extends across the joint between the fourth and fifth. Under-side convex, but without a raised median area and with no spines. Rostrum close to the anterior margin.

Thorax irregularly hexagonal in shape, the anterior margin narrower than the posterior, and with a deep V-shaped notch, which extends as a median furrow to the posterior border of the meso-thorax. Lateral margins laterally convex. Meso- and meta-thorax of about equal size, neither bearing spines. Sternal plate piriform, its anterior margin obtusely pointed, with a short, sharp posterior point. It overlaps the first and second coxæ but little, and the third coxæ not at all. First pair of coxæ approximate, second widely separated, third approximate, much larger than the others and with a conspicuous hump on their anterior margin.

First pair of legs small, claw slender, second pair slightly heavier with broader claw, third pair much larger, the claw broad and blunt and with a short blunt projection on the anterior margin of the tibia.

Abdomen elongated, oval. Segment one narrow, with no hairs. Segment two with two rows of hairs, the first of two hairs widely separated, the second of four in pairs at each posterior lateral angle. Segment three with two sclerites and two rows of four hairs. Segments four to seven each with three sclerites and three rows of four peg-like spines. Segments eight and nine each with one sclerite and four long spines. Pleuræ of the first segment slender and pointed, of the second with two long teeth on the posterior margin, that on the ventral angle being the longer. Pleuræ of the third, fourth and fifth segments each with four, and of the sixth with three, finger-like projections on the posterior margin, that at the dorsal angle on each pleurite being at least twice as long as the others. Pleuræ of the seventh segment with a single long projection at the dorsal angle and two long hairs. Pleuræ of the ninth with a short tooth at the dorsal angle and two long hairs.

On the ventral side, segment one with no spines, segment two with a pair at each side, segments three to seven each with three sclerites and three rows each of seven peg-like spines, except the first sclerite of the third segment, which has a pair of very large spines close together at each side and a small spine on the median line. Segments four to seven each with two long spines, one behind the other, on

each side between the sternites and pleurites. Gonapods short with a serrate posterior margin and two or three short spines. On each side of the ninth segment, near the anterior margin a short, stout, blunt spine and a slender, longer one. Anterior lip of the vulva fringed.

MALE. Length 1.07 mm., greatest width .32 mm., length of head .192 mm., width across temples .136 mm., length of thorax .112 mm., length of abdomen .666 mm. Head, antennæ, thorax and legs like those of the female, except that the somewhat wider basal joint of the antennæ reduces the length of the forehead. Abdomen shorter and slenderer than in the female and with nearly parallel sides. On the dorsal side segment three with two sclerites, the remainder with one. Pleurites as in female, except that they are relatively shorter. Ninth segment truncate with the genitalia projecting beyond it. On the ventral side segments one, two, seven, eight and nine each with one sclerite, three and four with three sclerites and five and six with two. Distribution of the spines, ventrally and dorsally, as in the female except that segment eight has two spines ventrally, and there is but one spine between the sternites and pleurites of the third to seventh segments.

EXPLANATION OF PLATES XV and XVI,

Illustrating paper by Vernon L. Kellogg and G. F. Ferris on
"Mallophaga and Anoplura from Zululand."

PLATE XV.

Laemobothrium setigerum.

Fig. 1.—var. *africanum*, Female.

Fig. 2.—var. *cubensis*, Male.

Polyplax jonesi, sp. nov.

Fig. 3.—Female.

Fig. 3a.—Head of male.

Fig. 3b.—Sternal plate of female.

Fig. 3c.—Pleural plates of female.

Fig. 3d.—Last abdominal segments, ventral aspect of female.

Fig. 3e.—Last abdominal segments, dorsal aspect of male.

PLATE XVI.

Hoplopleura enormis, sp. nov.

Fig. 4.—Female.

Fig. 4a.—Head of male.

Fig. 4b.—Last abdominal segments, ventral aspect, of female.

Fig. 4c.—Last abdominal segments, dorsal aspect, of male.

Fig. 4d.—Pleural plates of female.

Fig. 4e.—Sternal plates of female.

Hoplopleura intermedia, sp. nov.

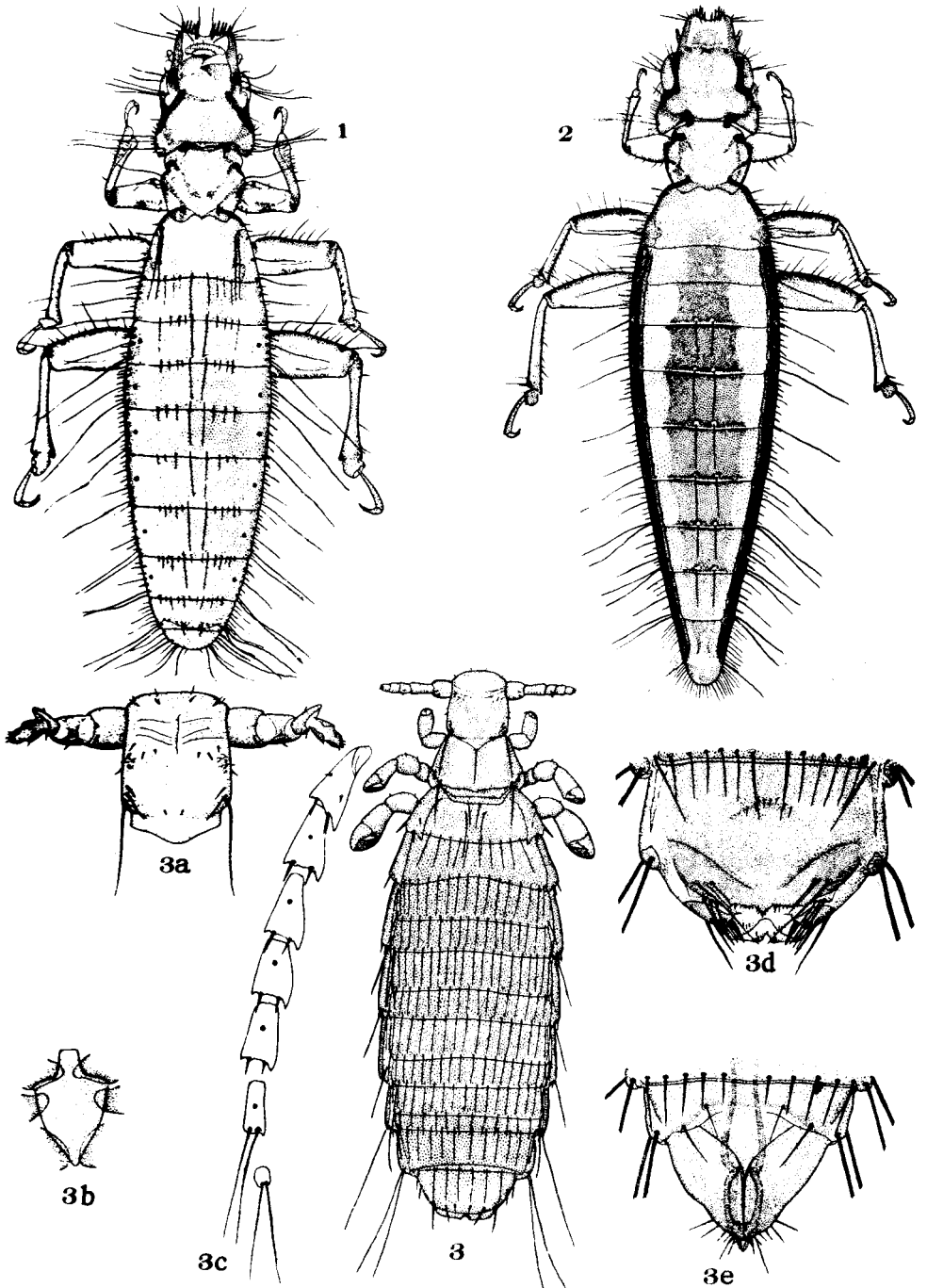
Fig. 5.—Female.

Fig. 5a.—Head of female.

Fig. 5b.—Sternal plate of female.

Fig. 5c.—Last abdominal segments, ventral aspect, of female.

Fig. 5d.—Pleural plates of female.



G. F. Ferris del.

John Singleton & Sons lith.

1 *L. EMOBOTHRIUM SETIGERUM* var. *AFRICANUM*. 2 *L. S.* var. *CUBENSIS*.
3 *POLYPLAX JONESI*.

