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ISCHNOCERA (MALLOPHAGA) INFESTING PARROTS (PSITTACIFORMES) I.

GENERA *NEOPSITTACONIRMUS* CONCI, 1942, AND *PSITTACONIRMUS*
HARRISON, 1915

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ABSTRACT

This paper deals with the species of the genera Neopsittaconirmus Conci, 1942, and Psittaconirmus Harrison, 1915, found on Psittaciformes; a new form of Neopsittaconirmus found on Falconiformes is also described. A list of the genera up to now erected for the species of Ischnocera found on parrots and a key to the genera accepted as valid by the A. are given. Lectotypes for Neopsittaconirmus circumfasciatus, N. interruptofasciatus, N. femoratus, N. albidus and N. piageti and Psittaconirmus australis and P. launceloti, and neotypes for N. taschenbergi (= circumfasciatus), N. strepsiceros and N. anodis are selected. The following new species and new subspecies are described: Neopsittaconirmus clayae, N. andrettae, N. hoogstraali, N. wardi, N. jobiensis, N. meinertzhageni, N. elbeli, N. emersoni, N. abnormis, N. africanus, N. lybartota difficilis, N. g. gracilis, N. gracilis inexpectatus, Psittaconirmus comis, P. n. neumanni and P. neumanni concii. Nirmus trinotus, formerly included in Neopsittaconirmus, is here considered as incertae sedis; Lipeurus albus, L. capreolus and Lipeurus eos, formerly included in Neopsittaconirmus, and L. forficuloides, included in Psittaconirmus, are considered species inquirendae.

INTRODUCTION

The present series, initiated with "A new genus and two new species of parrot Mallophaga (Phlopterae) from New Guinea" (1971), is mainly, an attempt at characterizing the Ischnoceran genera found on Psittaciformes. In the course of the work I had the opportunity of a) selecting lectotypes for several species of Piaget and Harrison: b) finding the true type-hosts of species described from materials collected on more than one host-species; c) finding the most probable type-hosts

of species whose original record was highly improbable; d) describing or figuring the opposite sex of the species whose description had been based on one sex alone; e) describing neotypes for species whose types have been lost or destroyed; f) describing some new species; g) discussing the systematic situation of several species, and h) discussing the host-parasite relationships, the geographic distribution of both hosts and Mallophaga, and, when possible, the probable evolution of the group.

Unfortunately the materials at hand did not permit a satisfactory solution of all problems, not only because they were at times numerically insufficient, but also because many specimens were collected on museum skins or zoo birds. Otherwise, the number of parrot species from which Ischnoceran Mallophaga are known is relatively small compared to the number of species of the Order. I believe, however, that, in spite of such deficiencies, the results will be useful for a better understanding of the systematics of the Mallophaga, and may serve as a starting point for a future revision of the biting-lice of Psittaciformes.

MATERIAL AND METHODS

The great majority of specimens recorded in this paper and in the future papers of this series belong to the Museu de Zoologia da Universidade de São Paulo, to the British Museum (Natural History) — including the Piaget, Harrison and Meinertzhagen Collections — to the Field Museum of Natural History and to the K. C. Emerson Collection, Arlington, Virginia, USA.

Unless otherwise stated, the descriptions, figures and measurements are from specimens mounted in Canada balsam or, in a few instances, in creosotum. In the latter case the specimens, after study, were also mounted in balsam. Drawings were made with an O. P. L. camera lucida.

When changes are made in the name of the host recorded in the original description of the Mallophaga, they are put inside parentheses, followed by the updated name according to Peters' Check List of Birds of the World (1937); in some cases I have followed the host names in Hopkins and Clay's Check List of the Genera & Species of Mallophaga (1952). The same has been done, when necessary, with the host names on the labels. Subspecific names not mentioned in the original description or in the label are within brackets; the subspecific assignments have been based on the locality of the host specimen.

The morphological nomenclature of the head of the Mallophaga and of its setae is based on Clay (1951), and that of the abdominal setae on Kéler (1938).

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To Prof. Dr. A. Brizard, Laboratoire de Parasitologie de l'École Nationale de Vétérinaire, Toulouse, I am grateful for permission to search for the specimens of parrot Ischnocera described by Neumann¹.

THE GENERA OF ISCHNOCERA

The following genera have been erected to receive the species of Ischnoceran Mallophaga found on psittacids:

Psittaconirmus Harrison, 1915. Type species: *Psittaconirmus australis* Harrison, 1915.

Paragoniocotes Cummings, 1916. Type species: *Paragoniocotes gripecephalus* Cummings, 1916.

Echinophlopterus Ewing, 1927. Type species: *Echinophlopterus chapini* Ewing, 1927.

Dimorphia Carriker, 1940. Type species: *Dimorphia mirabilis* Carriker, 1940.

Forficuloecus Conci, 1941. Type species: *Phlopterus forficula* (Piaget, 1871).

Psittoecus Conci, 1942. Type species: *Phlopterus waterstoni* Fresca, 1923.

Neopsittaconirmus Conci, 1942. Type species: *Neopsittaconirmus borgioli* Conci, 1942.

Uncifrons Guimarães, 1942. Type species: *Phlopterus waterstoni* Fresca, 1923.

(1) Besides the *Amblycera* included in Neumann's 1890 and 1891 papers, I found specimens of *Menopon spinimentum*, *Menopon imbricatum* and *Lipeurus radiatus*; with Piaget Collection labels I found specimens of *Boopia grandis*, *Acidoproctus maximus*, *Onichophorus fallax* and *Menopon mesoleucum* Nitzsch. All these specimens were kept in drawer n.º 125 of the slide collection of that laboratory. Unfortunately I did not find any of the parrot *Ischnocera* described or dealt with in Neumann's papers.

- Psittacicola* Guimarães, 1942. Type species: *Esthiopterum kea* (Kellogg, 1907).
- Psittaciphagus* Eichler, 1943. Type species: *Philopterus waterstoni* Fresca, 1923.
- Pflegeriella* Eichler, 1943. Type species: *Lipeurus circumfasciatus* Piaget, 1880.
- Epipsittacus* Carriker, 1944, Nomen novum for *Dimorphia* Carriker, 1940, nec Malloch, 1922.
- Avipediculus* Eichler, 1952. Type species: *Goniodes fasciatus* Piaget, 1880.
- Mausolus* Eichler, 1952. Type species: *Paragoniocotes grandis* Guimarães, 1947.
- Theresiella* Guimarães, 1971. Type species: *Theresiella hitchcocki* Guimarães, 1971.

Since *Dimorphia* Carriker, 1940, is preoccupied by *Dimorphia* Malloch, 1922 the name *Epipsittacus* was proposed to replace it. *Uncifrons* and *Psittaciphagus* are objective synonyms of *Psittoecus*, as all the three genera have the same type species, *P. waterstoni*. The validity of the other genera will be discussed in the groups I take as valid.

The following key serves to identify the genera I accept:

1. Nirmoid or philopteroid species. Margin of pre-antennal region forceps-like. Posterior margin of vulva without spine-like setae; however, ordinary setae may be present 2
- Margin of pre-antennal region rounded, not forceps-like. Posterior edge of vulva with spine-like setae 6
2. Nirmoid species. Anterior plate not clearly demarcated; its posterior margin rounded, anterior margin deeply emarginated. Temporal margin with one long seta on each side. Male antenna with segment I longer than the two next ones together; segment III with a hook. All tergal plates of male but first entire. Median region of posterior margin of tergal plate of segment VIII of male produced backward. Female with the first seven tergal plates longitudinally divided. Vulva apparently divided in two lobes. Last segment of female surrounded laterally by the penultimate in dorsal view *Psittaconirmus*
- Philopteroid species. Anterior plate clearly outlined; its anterior margin either slightly emarginated or produced forward; the posterior margin \perp rounded. Temporal margin with one or two long or medium-sized setae. Last segment of female not surrounded by the penultimate 3
3. Antennae dimorphic: segment I of male longer than the two next ones together. Tergal plates of male but first entire. Female with the first seven tergal plates longitudinally divided; latero-posterior corners of segment II produced ventrally into a very long tapering process lying on the two following segments. Terminal segment

- of male with a triangular dorsal process pointing forward
 *Theresiella*
 Antennae monomorphic (with the possible exception of one species).
 Anterior plate wider than long or longer than wide, but pointed
 posteriorly. Tergal plate of at least the seven first segments
 longitudinally divided. Latero-posterior corners of segment II of
 female and terminal segment of male normal 4
4. Pale species. Preantennal region much shorter than the post-antennal
 region. Anterior dorsal plate wider than long with lateral margin
 fused with the integument of the head. Conus bent backward
 over the first antennal segment. Post-antennal suture absent.
 Antennae monomorphic (one species seems to show a slight
 dimorphism). Temporal margin with m.t.s. 3 and m.t.s. 5 long.
 Two laterotergal setae at least on each side of segments IV to VI.
 Tergal plate abdominal segment VIII reduced to two small ones
 on each side in female; absent in male. Anterior sternites with
 spine-like setae *Psittoecus*
 Normal species. Preantennal region as long as or longer than the
 post-antennal. Anterior dorsal plate longer than wide, not fused
 with the integument of the head. Conus not bent backward over
 the 1st antennal segment. Post-antennal suture present. Antennae
 monomorphic. At least m.t.s. 4 long. One tergo-lateral seta on
 each side of segments III to IV. Anterior sternites with or
 without spine-like setae 5
5. Preantennal region longer than post-antennal; m.t.s. 1 behind the eye;
 m.t.s. 3 and m.t.s. 4, or only m.t.s. 4, long. 7/8 setae regularly
 distributed on each side of the posterior margin of the ptero-
 thorax. Setae of latero-posterior corners of abdomen present from
 segment IV back. Anterior sternites without spine-like setae ...
 *Forficuloecus*
 Preantennal region as long as or longer than the post-antennal; m.t.s. 1
 on the eye, m.t.s. 2 and m.t.s. 4 long or medium sized. Five setae
 on each side of posterior margin of pterothorax, 3 of them more
 or less closely grouped on the margin and 2 on the latero-posterior
 corner. Setae of latero-posterior corners of abdomen present from
 segment II or III back. Anterior sternites with or without spine-
 like setae *Echinophilopterus*
6. Preantennal region with a guttate ("Biguttati" of Piaget) sclerotiza-
 tion on each side. Antennae with or without sexual dimorphism.
 When dimorphic, the male shows segments II and III elongate,
 either one generally longer than the first. Female with or without
 a group of ventral setae on each side of posterior edge of vulva
 (when present — only one species — it has a different position
 than in *Echinophilopterus* or *Psittaconirmus*). All tergal plates
 but first entire in the male and in the female
 *Neopsittaconirmus*
 Preantennal region without guttate sclerotization. Antennae with or
 without sexual dimorphism. When dimorphic, the male has a
 stout first segment and, generally, a small hook on the distal end

of segment V. Female with a group of four setae, three stout and one thinner and longer, on each side of posterior edge of vulva. Tergal plate divided or not in the male; always divided in the female (with exception of the penultimate tergum)
 *Paragoniocotes*

Neopsittaconirmus Conci, 1942

Neopsittaconirmus Conci, 1942, 74 (4): 37.

Psittacicola Guimarães, 1942, 2, n.º 4: 80.

Pflegeriella Eichler, 1943, 11: 114.

Hopkins & Clay (1952) are right in placing *Psittacicola* and *Pflegeriella* in the synonymy of *Neopsittaconirmus*. The three genera have been erected for the "Lipeuri Biguttati" of Piaget. Although they have different type species I believe they must be included in the same genus. The type species of *Pflegeriella*, *Lipeurus circumfasciatus* Piaget, is very close to *N. borgioli* Conci, type species of *Neopsittaconirmus*, from which it differs chiefly in the disposition of the tergo-pleural setae and in some details of the mesosome. *Lipeurus kea* Kellogg, type species of *Psittacicola*, belongs in a different evolutionary line, being at the extreme of the range of variation of the genus, not only in the chaetotaxy and in the structure of mesosome, but also in the disposition of the carinae of the head; even so I believe it should be included in Conci's genus. I intend to return to the matter in a future paper. The priority of *Neopsittaconirmus* is out of doubt; although Conci's paper bears on the cover two different dates (May 20, 1942, and June 2, 1942), it was published before Guimarães' (November 28, 1942) and Eichler's (1943).

The species included in the genus have the following characters in common:

Elongate forms. Anterior region of head rounded, entire, sometimes with a narrow hyaline margin. Dorsal anterior plate absent. Gular plate present. Marginal carina generally complete, narrow or wide; nearly always the ventral carinae touch the guttate processes. The latter, although sometimes very little sclerotized, are always present. Temporal margin rounded, and with only one seta of medium length (the 4th); the others are much shorter. Antennae sexually dimorphic or not. Tergal plate of first eight abdominal segments entire in males and females. Posterior margin of the 8th tergite generally with a row of setae; 9th tergite hyaline. Male genital aperture dorsal. Last segment of female not surrounded by the penultimate. Posterior margin of vulva entire, with some spine-like setae. Sternal plate of male abdomen entire or apparently longitudinally split. The genital armature of the males varies in shape, but in the great majority of the species it is composed of the same pieces. The chaetotaxy of the head and of the prothorax are practically identical with those of *Psittaconirmus*. The prothorax has a spine-like seta and a sensory one on each of the latero posterior corners and a group of 4/5 setae on each side of the posterior margin, sometimes assembled

in two pairs. The chaetotaxy of the abdomen varies in the several species. The chaetotaxy of the first seven abdominal segments may show sexual dimorphism or not; the tergo-central setae are usually longer in the male.

Type species of the genus: *Neopsittaconirmus borgioli* Conci, 1942.

The group is not so homogeneous as *Psittaconirmus*. The species show sometimes conspicuous differences in size, in the sexual dimorphism of the antennae, in the shape and chaetotaxy of the abdomen, and in the shape of the vulva and of the male genitalia.

The males of *N. gracilis* and *N. anodis* represent the extremes of the range of variation of a large number of characters.

I'll try to analyze these variations among the species now studied.

Size. The smallest of the forms studied is *N. gracilis inexpectatus*, ssp. n.; the male is 1.320 mm long and the female 1.720 mm. Several species approach the maximum length, found in *N. anodis*: male 1.910 mm, female 2.300 mm. All species are elongate, with the exception of *N. anodis*, which is stout.

Shape of the head. The differences in head shape are chiefly in the preantennal region. Most species have the region rounded, but the curvature is somewhat variable from species to species (figs. 6, 19, 37, 69, 88, 130). In *N. anodis*, however, the region is more funnel-shaped than in other species; such a shape is correlated with the situation of the marginal and ventral carinae, as seen in figs. 88 and 130.

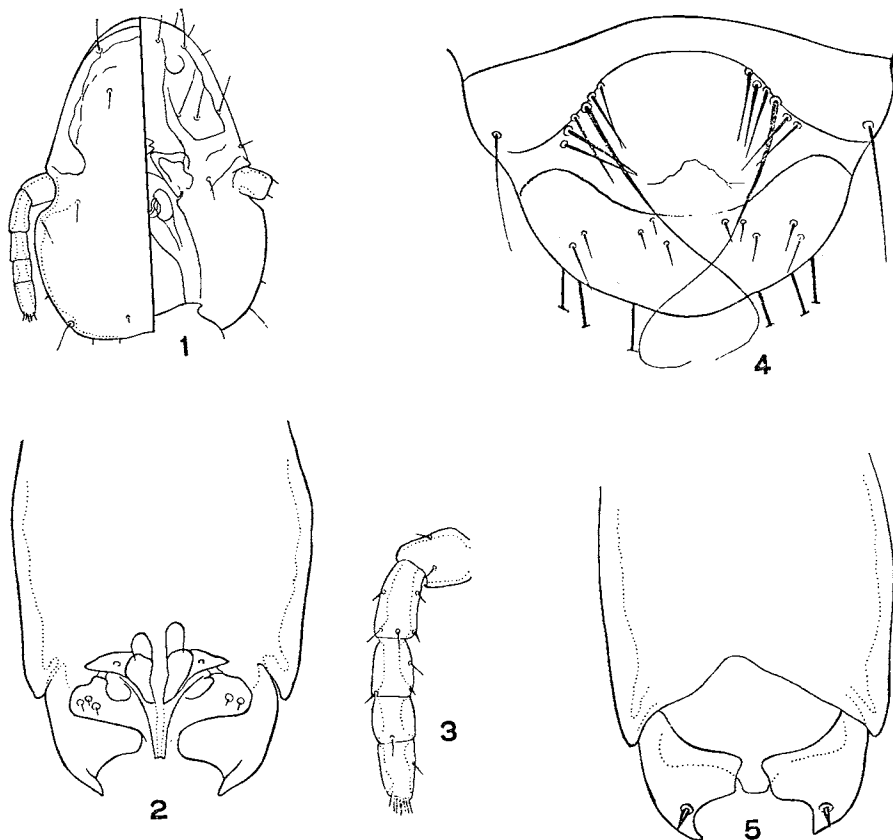
Sexual dimorphism in the antennae. Every degree of sexual dimorphism may be found in the antennae. These may present: a) no dimorphism (figs. 3, 92); b) slight dimorphism due the enlargement of the first segment and a lengthening of the next one, and to the presence of two verrucose processes on the 3rd segment of the male (figs. 21 and 68); c) strong dimorphism, due either to an exaggeration of the characters indicated above (figs. 15 and 21) or to a great lengthening of the segments of the male antenna (fig. 131).

Shape of the abdomen. Only *N. anodis* (figs. 127 and 128), probably due to its stout shape, has a spatulate abdomen, wider than that of other species, clearly elongate.

Chaetotaxy of the abdomen. The chaetotaxy of the seven first tergites, although showing some similarities, is not always the same in every species or even in both sexes of a same species. Most of the species studied show in both sexes a small or medium long tergo-central seta on either side of tergites I to VII; a short or long tergo-lateral seta may be present on tergite IV only (figs. 84, 85, 100, 101), on tergites II to IV (figs. 49, 50) on tergites III and IV (figs. 17, 18, 26, 34, 35), on tergites III, IV and VI (fig. 67) or on tergites III to VI (fig. 11). In *N. kea* the tergo-lateral setae are absent and the tergo-central ones are long. In *anodis* and in a species of *Neopsittaconirmus* found on a zoo specimen of *Polytelis anthopeplus*, the chaetotaxy differs in the sexes; in the females of those species the setae are distributed as in the other forms, but the tergo-laterals differ in length: they are long in *anodis*

and very short in the louse from *Polytelis*. The male of *N. anodis* has two tergo-central setae, one of them very small, on each side of tergites I to V; it also has 6 or more medium long setae on tergites VI and VII. The male *Neopsittaconirmus* from *Polytelis anthopeplus* has a small seta on tergites I, II and VII, and two unequal setae, on tergites III to VI. The tergo-lateral setae have the same distribution in both sexes of both species, but in the form from *Polytelis* the setae of the male are longer than those of the female. The posterior margin of male tergite III is nearly always fringed by a row of setae, forming a continuous semicircle with the median setae shorter than the others (figs. 8, 14, 110). Sometimes such median setae are not present, and the semicircle is reduced to two rows of setae (figs. 4, 82). There are species in which the more lateral setae of the semicircle are spine-like (fig. 110) or such a semicircle is practically absent due the reduced number of setae (figs. 90, 93).

Shape of the vulva. Most species have the vulva elongate, with margins converging gradually toward midline, ending, posteriorly, in a



Neopsittaconirmus sp. from *Polytelis anthopeplus* (Zoo): 1, head of male; 2, male genitalia, ventral; 3, antenna of male; 4, last abdominal segments of male, dorsal; 5, male genitalia, dorsal.

very acute angle (figs. 25, 42, 48); in only one of the species the angle is less acute (fig. 16). In two African species the vulva is wider and its outline is different: the anterior lips are divergent and the posterior margin rounded (fig. 77) or even flat (fig. 113). In *N. anodis* all the genital complex is broader than long and the posterior margin of the vulva is broadly rounded. This species shows on either side of the vulva, at the level of the VIII apparent segment, several setae with close set trichobotria. In all species the margin of the vulva shows spine-like setae — variable in number in the several species — and small and fine setae on the internal surface.

Male genitalia. Although all species adhere to the same general structure, the shape of the male genitalia is somewhat variable in the group. The length of the basal apodeme varies from just as long (*N. g. inexpectatus*) to twice as long (*N. kea*) as its width. The latero-posterior corners of the apodeme may appear simple, rounded (figs. 22, 39, 45) or with a toothlike projection (fig. 97), sometimes rather conspicuous (fig. 117). The parameres are variable not only as to the shape but also as to the length. In some species they are of middle length tapering slightly (figs. 9, 23, 59), or abruptly (figs. 5, 97) toward the apex, and curving first inward and then outward. In *N. meinertzhageni* (fig. 73) the external margin is slightly curved inward and convergent toward the midline; its internal margins are parallel to the external margins on the basal $3/5$, then they curve backward and meet the external margin, forming a rounded angle. The parameres of the *Neopsittacornirmus* from *Polytelis anthopeplus* (fig. 5) and of *N. gracilis* (figs. 97, 99) are very short, and of peculiar shape. Those of *N. anodis* (fig. 132) are short (a little more than half the length of the mesosome), narrow, slightly curved inward, and with truncated apical extremity. The mesosome also varies in shape and structure. In dorsal view one sees generally a simple plate, elongate, tapering or not at the posterior end, rounded (figs. 13, 45), oval (fig. 133) or transverse (fig. 53), sometimes with a median more sclerotized longitudinal area. Ventrally it is not simple. It is composed of the endomeral and penian complexes. The endomeral complex varies from a single plate, without differentiated areas (figs. 104, 109) or with distinct lateral sclerotizations reaching two sclerotized plates — one on each side of the penian complex — which may be true endomeres (figs. 2, 28, 44). The penian complex is, generally, a calyx-like structure; the length of the penis is somewhat variable (fig. 10, 31, 44, 116). In one species (fig. 73) the basis of the penis is an octagonal plate, longer than wide, with the latero-posterior corners more sclerotized. In *N. anodis* (fig. 132) the mesosome is an elongate oval plate, closely joined to the penis.

The characters attributed to the genus and the considerations on the variation of such characters are based on the study of species — several of them not yet described — collected on the following host species, belonging to the subfamilies Kakatoeinae, Nestorinae and Psittacinae, totalling 16 genera and 37 species or subspecies: *Kakatoe g. galerita*, *Kakatoe sulphurea*, *Kakatoe roseicapilla*, *Calyptrorhynchus funereus*, *Calyptrorhynchus baudinii*, *Calyptrorhynchus magnificus naso*, *Probosciger*

aterrimus stenolophus, *Probosciger aterrimus* subsp., *Nestor notabilis*, *Nestor meridionalis*, *Psittacus e. erythacus*, *Coracopsis vasa*, *Coracopsis nigra*, *Psittichas fulgidus*, *Psittacula eupatria nipalensis*, *Psittacula krameri borealis*, *Psittacula krameri manillensis*, *Psittacula derbyana*, *Polytelis anthopeplus*, *Lorius r. roratus*, *Lorius roratus pectoralis*, *Lorius* sp., *Alisterus s. scapularis*, *Alisterus scapularis* subsp., *Geoffroyus geoffroyi jobiensis*, *Geoffroyus geoffroyi aruensis*, *Poicephalus gulielmi massaicus*, *Poicephalus rufiventris*, *Tanygnathus lucionensis paraguayensis*, *Tanygnathus megalorhynchos djampeae*, *Tanygnathus m. megalorhynchos*, *Tanygnathus megalorhynchos sumbensis*, *Tanygnathus m. mulleri*, *Platycercus elegans*, *Platycercus c. caledonicus*, *Prosopieia personata* and *Prosopieia tabuensis splendens*.

***Neopsittaconirmus borgioli* Conci, 1942**

(Figs. 6 to 10)

Type host: *Calyptorhynchus funereus* (Shaw)

Neopsittaconirmus borgioli Conci, 1942, 74: 38, figs. 1 to 4; Hopkins & Clay, 1952: 237.

The original description and figure of this species were based on a single female collected on a skin. This may throw some doubt on the true identity of the host, since the characterization of the females of several species of *Neopsittaconirmus* is difficult and accidental contamination of museum skins is common. However, of all known species this is the only one showing tergo-lateral setae on tergites II to IV and the posterior margin of the vulva somewhat rounded. Even a *Neopsittaconirmus*, without any doubt a new form, found on *Calyptorhynchus magnificus naso*, has tergo-lateral setae on tergites III and IV.

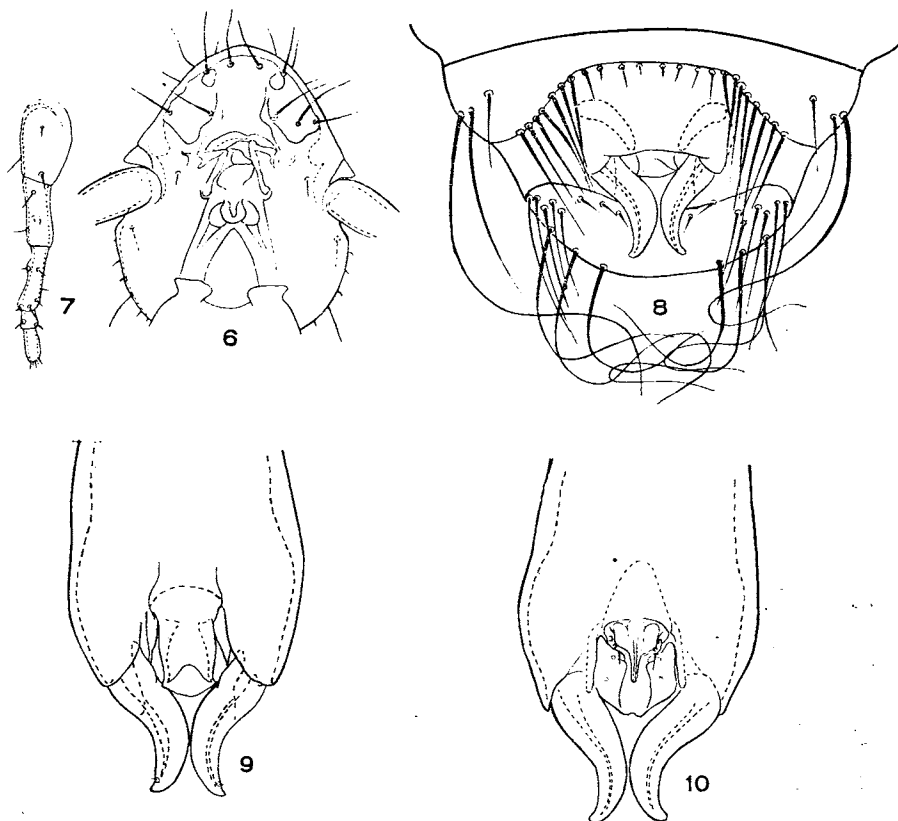
The specimens examined agree well with the type except as for the length. None of the females in hand reaches the length of the type specimen (2.290 mm), since the largest in our samples is only 2.260 mm long. There is great variation in length among the females examined, the smallest being only 2.090 mm long.

Male with the preantennal region more funnel-shaped than the female, clavi better developed and antennae of different shape. The antennae of the female are filiform, the length of the segments in the following order: II and III the longest, subequal; I and V subequal; IV the shortest. In the male antennal segment I is long and stout, but a little longer than II and III, that are of the same length; V is shorter than I, II, and III, and IV shorter than V; III has two verrucous structures, one on the basal half, and V has one on the apical articulation. On every one of these structures is found a very short seta.

Prothorax, pterothorax and legs as in the female. Sternal plate nearly twice as long as wide and lozenge-shaped.

Abdomen shorter than in the female. The chaetotaxy of tergites I to VII identical with that of the female, that is, on either side of the abdomen there is a tergo-central seta on tergite I to VII (these setae are much shorter in the females) and one tergo-lateral seta, very long, on tergites II to IV; tergite VII (fig. 8) with the posterior margin, widely emarginated, fringed with a row of setae longer at sides; the median setae of the row are very short; tergite IX hyaline with two longitudinal bands convergent toward the midline, but widely separated. Sternal plates clearer than the tergal ones, and, with exception of the last, interrupted on the midline. In the female the plates are reduced to small ovoid spots at the sides of sternites.

Male genitalia (figs. 9, 10) with the basal apodeme nearly twice as long as wide, hyaline on the anterior half and slightly widened on the posterior half; parameres short, curved toward the midline but with the distal extremities turned to the side. The mesosome is somewhat simple; in dorsal view it is as long as wide (1:1). Penial complex appearing as a bell shaped flower whose petiole, thin and turned backward, is the penis.



Neopsittaconirmus borgioli: 6, head of male, ventral; 7, antenna of male; 8, last abdominal segments of male, dorsal; 9, male genitalia, dorsal; 10, male genitalia, ventral.

Measurements of male in mm

	Length	Width
Total	1.860	—
Head	.500	.410
Prothorax	.130	.280
Pterothorax	.230	.390
Abdomen	1.000	.490

The specimens from *Calyptorhynchus baudinii* show the tergal bands duller on the sides and near the posterior margin.

N. borgioli is characterized chiefly by the tergo-lateral setae on segments II to IV and by the shape of the genitalia of the male.

Examined material: Holotype female found on *Calyptorhynchus funereus* (Shaw), Australia, slide n.º 561, Prof. Cesare Conci Collection, Genova, Italy. Three males and 5 females (n.º 15812, Meinertzhagen Collection, B. Museum) from *Calyptorhynchus funereus*, South Australia; 2 males and 1 female (Harrison Collection, B. Museum), from identical host, south coast of Australia; 2 males and 3 females (Harrison Collection, B. Museum) from *Calyptorhynchus baudinii* Lear, West Australia.

***Neopsittaconirmus circumfasciatus* (Piaget, 1880)**

(Figs. 11 to 16)

Type-host: *Polytelis anthopeplus* (Lear) (?)

Lipeurus circumfasciatus Piaget, 1880: 301, pl. 24, fig. 6; Taschenberg, 1882, 44: 115; Neumann, 1890, 24: 64 (in part); Kellogg, 1908: 38 (in part).

Esthiopterum circumfasciatum; Harrison, 1916, 9 (1): 132

Neopsittaconirmus circumfasciatus; Guimarães, 1942, 2: 80

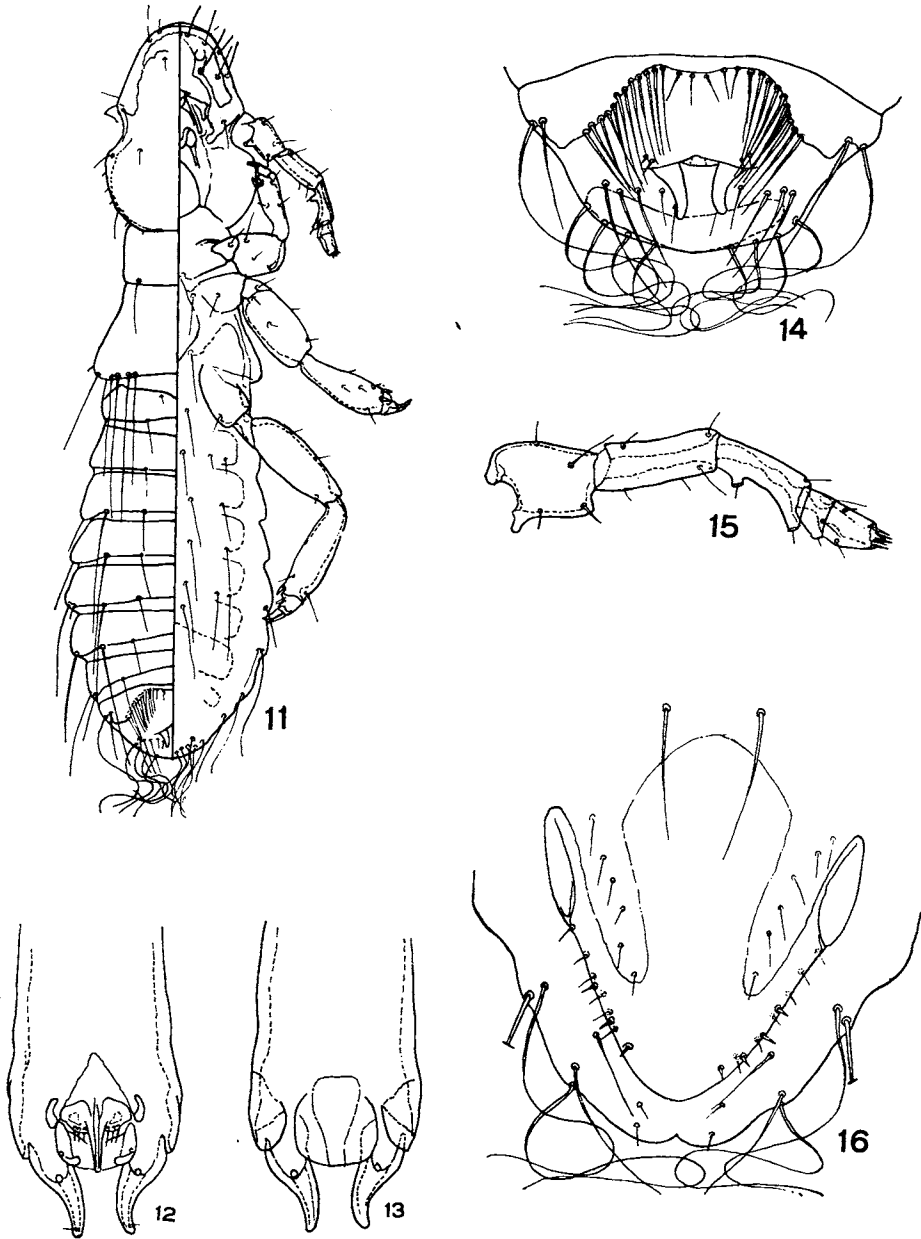
Pflegeriella circumfasciata; Eichler, 1943, 11: 114

Neopsittaconirmus circumfasciatus; Hopkins & Clay, 1952: 237.

The original description of this species is based on males and females found on *Platycercus melanura* (now *Polytelis anthopeplus*). The origin of the specimens studied is not very satisfactory, and the following factors induce me to doubt the true identity of the host of *N. circumfasciatus*:

- Piaget's specimens were, very probably, collected on skins at the Leiden Museum;
- Among the specimens on which Piaget based his description, today in the British Museum (N. History), there are more than one species of *Neopsittaconirmus* (some females are not, positively, *N. circumfasciatus*);
- Specimens collected on zoo individuals of *Alisterus s. scapularis* (Meinertzhagen Collection, 1937, and Harrison Collection, 1911) are, without any doubt, *N. circumfasciatus*;
- Specimens collected on *Polytelis anthopeplus*, also from a zoo (Harrison Collection) belong to a species of *Neopsittaconirmus* entirely different from *circumfasciatus* (figs. 1 to 5);

- e) The only specimens collected on a freshly shot bird, *Alisterus chloropterus* subsp. from New Guinea, belong to *N. circumfasciatus* or are, at least, very near it.



Neopsittaconirmus circumfasciatus from *Polytelis anthopeplus*: 11, male; 12, male genitalia, ventral; 13, male genitalia, dorsal; 14, last abdominal segments of male, dorsal; 15, antenna of male; 16, terminal segments of female, ventral.

So it is probable that the true host of *N. circumfasciatus* is a species of parrot belonging to the genus *Alisterus* and not *Polytelis anthopeplus*.

Male (figs. 11 to 15). Ventral carina interrupted on the midline (at least ventrally) and fused with the internal margin of the ventral carina, which is little sclerotized. Antenna long and with warty process on segment III and on the distal end of IV.

The setae on either side of the posterior margin of the pterothorax are distributed in groups of two setae.

Abdomen with the following chaetotaxy: tergites I to VII with one tergo-central seta of medium length on each side; III to VI with one long tergo-lateral. Posterior margin of tergite VIII widely excavated and fringed with a row of setae, the most lateral the longest. Sclerites clearer than the tergites and, with exception of the last one, interrupted on the midline.

Genitalia of male (figs. 12, 13) with the basal apodeme with the length a little more than twice the width and with bands running at posterior half of the lateral margins; parameres slightly curved toward the midline and then turned backward; mesosome, in dorsal view, orbicular, with a median longitudinal duller band; in ventral view this piece shows lateral conspicuous bands with the distal end prominent and turned over the venter; the apical extremity of the penis reaches the posterior margin of the mesosome.

Female (fig. 16). Similar to the male, but with smaller con, antennae filiform, smaller tergo-central setae, sternal plate reduced to small lateral and ovoid spots; the shape and chaetotaxy of the last abdominal segments are different too.

Measurements in mm

	Length		Width	
	♂	♀	♂	♀
Total	1.730	2.120	—	—
Head	.470	.490	.360	.380
Prothorax	.140	.140	.270	.270
Pterothorax	.190	.190	.410	.420
Abdomen	.920	1.280	.500	.530

By the type of male genitalia this species is close to *N. borgioli*. The following characters, however, are enough to separate them: *circumfasciatus* is small in every measurement, the head is relatively longer, the setae of the posterior margin of pterothorax are grouped by twos; tergo-lateral setae are found on the tergites III to VI (II to IV in *borgioli*) and the longer setae on the posterior margin of tergite VIII of the male are more numerous. The genitalia, although of the same

general shape, differ in both species chiefly in the shape of the mesosome and in the length of the penis, much longer in *circumfasciatus*.

Examined material: Lectotype male (here designated), in Leiden Museum; paralectotypes 4 males and 2 females from *Polytelis anthopeplus* (Lear), all belonging to the Piaget Collection in the British Museum (N. History). Two males and 4 females (Meinertzhagen Collection n.º 10620), and 2 males and 2 females (Harrison Collection), all from *Alisterus s. scapularis* (Lichtenstein), from Australia, in the British Museum (N. History); and 5 males and 4 females, from *Alisterus chloropterus* subsp., Lower Watut, New Guinea, H. Clissold 1.IV.1962 (H. C. 92), in the K. C. Emerson Collection.

***Neopsittaconirmus interruptofasciatus* (Piaget, 1880)**

(Figs. 17 to 25)

Type-host: *Lorius r. roratus* (P. L. S. Müller)

Lipeurus interruptofasciatus Piaget, 1880: 302, pl. 24, fig. 7; Taschenberg, 1882: 114; Kellogg, 1908: 40.

Lipeurus circumfasciatus Taschenberg, 1882, nec Piaget, 1880, 44: 115 and 117, pl. 13, fig. 3.

Esthiopterum interruptofasciatus; Harrison, 1916, 9: 136.

Neopsittaconirmus interruptofasciatus; Conci, 1942, 74: 37; Hopkins & Clay, 1952: 238.

Psittacicola interruptofasciatum; Guimarães, 1942, 2:80.

Pflegeriella taschenbergi Eichler, 1943, 11: 115.

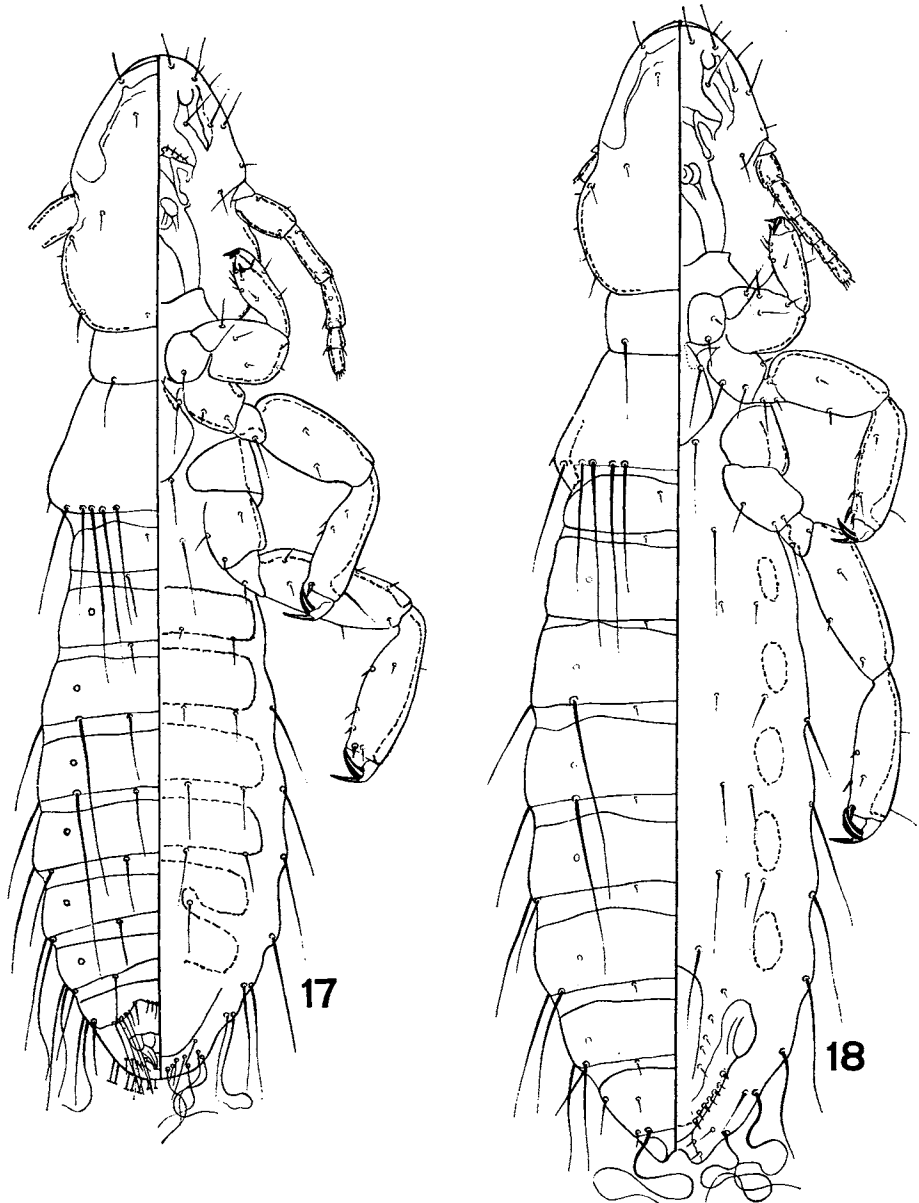
Neopsittaconirmus taschenbergi; Hopkins & Clay, 1952: 238.

Piaget described males and females of this species from *Eclectus sinensis* [now *Lorius roratus pectoralis* (P. L. S. Müller)] and *Eclectus puniceus (cardinalis)* [now *Lorius r. roratus* (P. L. S. Müller)].

In 1882, Taschenberg suggested that *circumfasciatus*, *interruptofasciatus* and *femoratus* might be only varieties of a single species, and redescribed under the name *circumfasciatus* specimens, found, among others hosts, on *Eclectus linnei* (now *Lorius roratus pectoralis*) and *Eclectus polychlorus* (now *Lorius r. roratus*), although calling attention to some differences between his description and that of Piaget.

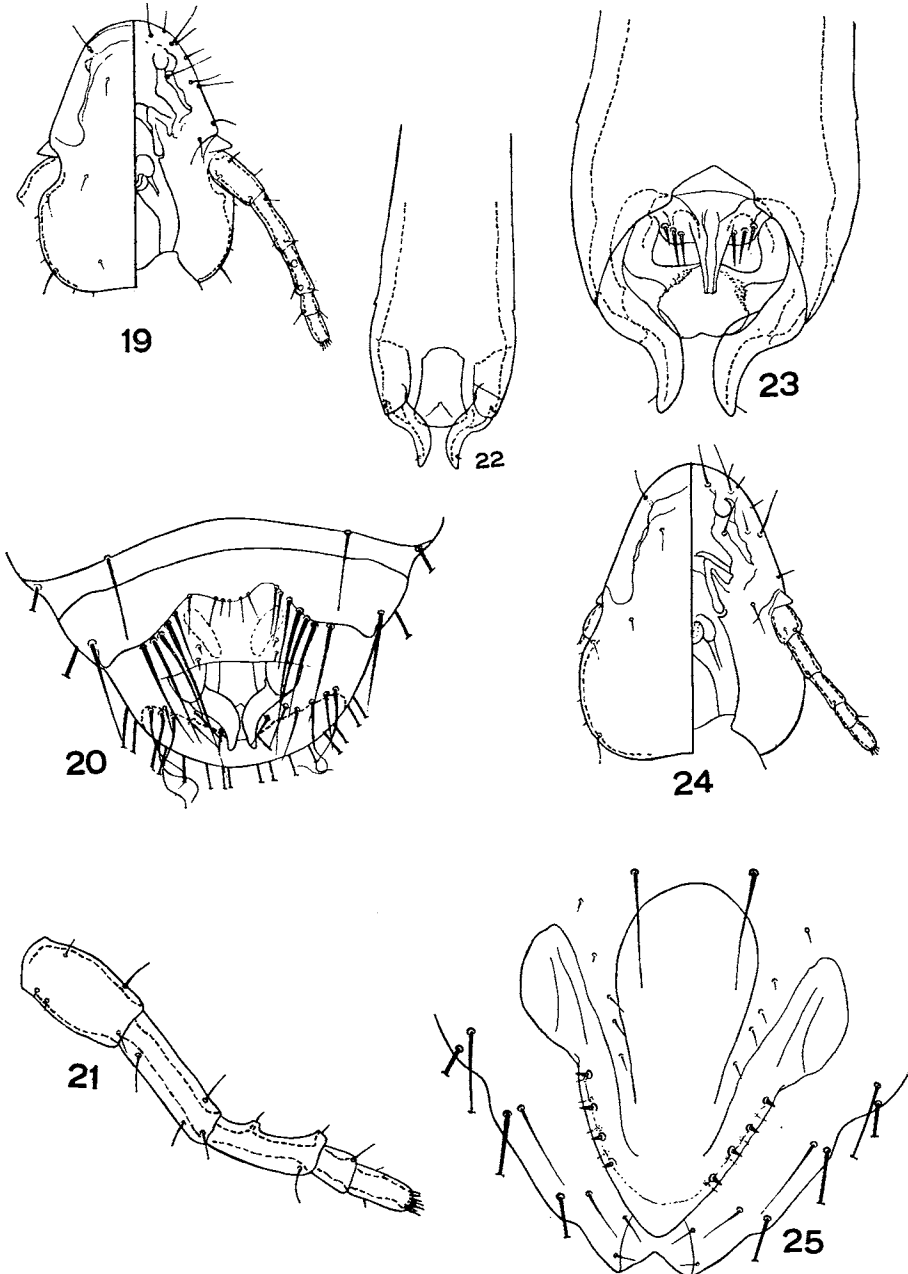
Probably based on these facts, Eichler, in 1943, named *taschenbergi* the specimens described by Taschenberg as *circumfasciatus* and chose *Eclectus linnei* (now *Lorius roratus pectoralis*) as its type-host. Accordingly, *Lorius r. roratus* becomes type host of Piaget's species, so that I select male specimen n.º 895, of the Piaget Collection, British Museum (Natural History), collected on *Lorius r. roratus* as lectotype of *N. interruptofasciatus* (Piaget, 1880).

A comparison of the lectotype of *N. interruptofasciatus* with specimens of *Neopsittaconirmus* found on *Lorius roratus pectoralis* shows that they belong to the same species. As the Taschenberg specimens were destroyed during the Second World War I selected as neotypes of *Neopsittaconirmus taschenbergi* the couple now described and figured.



Neopsittaconirmus interruptofasciatus (neotypes of *taschenbergi*): 17, male; 18, female.

Male (fig. 17). Head as in fig. 19; marginal carena entire; guttate process well outlined. Coni small, but conspicuous. Antennae long, with verrucous process on segment III and on the apical portion of IV.



Neopsittaconirmus interruptofasciatus: 19, head of male; 20, last abdominal segments of male, dorsal; 21, antenna of male; 22, male genitalia, dorsal; 23, male genitalia, ventral; 24, head of female; 25, terminal segments of female abdomen, ventral.

Setae of either side of posterior margin of pterothorax practically equidistant.

Abdomen with the following chaetotaxy: tergites I to VII with a medium length tergo-central seta variable in length; III and IV with a long tergo-lateral seta. Posterior margin of VIII (fig. 20) widely excavate, but with a small rounded projection at midline, and fringed with a row of setae, the most lateral longest. Sternites clearer than the tergites and apparently entire.

Male genitalia (figs. 22, 23) with basal apodeme twice as long as wide; parameres curved toward the midline; lateral sclerotizations of mesosome very evident and with the distal end showing two points, one anterior and another posterior; near the anterior point the sclerotizations are finely tooth like. Penis with the base wide and with the distal end not reaching the posterior margins of the mesosome.

Female (figs. 18, 24, 25). Coni smaller than in the male; antennae filiform; tergo-central setae much shorter and thinner; sternal plates reduced to small and lateral ovoid plates; chaetotaxy and shape of the last abdominal segments quite different than in the male. Genital region as in fig. 25.

Measurements of neotypes in mm

	Length		Width	
	♂	♀	♂	♀
Total	1.890	2.170	—	—
Head	.500	.510	.370	.400
Prothorax	.110	.110	.270	.280
Pterothorax	.240	.240	.400	.420
Abdomen	1.050	1.330	.470	.540

This species is easily separated from the previous ones by the presence of tergo-lateral setae only in segments III and VI, by the lesser number of setae, by the median rounded projection on the posterior margin of tergite VIII, by having the posterior margin of the vulva thinner and, chiefly, by the male genitalia, as can be seen from figs. 22 and 23.

Material examined: Lectotype (here selected) a male n.º 895A and Paralectotypes 1 male and 2 females from *Lorius r. roratus* (Piaget Collection) in the British Museum (N. History). Neotype male and Neallotype female (here selected), and 28 males and 58 females of *Neopsittaconirmus taschenbergi* (Eichler), from *Lorius roratus pectoralis* (P. L. S. Müller) from New Guinea (Meinertzhagen Collection n.º 13.467), in the British Museum (N. History). In the K. C. Emerson Collection I found 4 males and 4 females collected on *Trichoglossus haematod* subsp. from Vogelkop, Neth. New Guinea, L. W. Quate col., 16 January, 1962 (BBM-NG 764). Emerson, however, advised me (in litt.) that it is quite probable that there was some mistake about the latter host.

Neopsittaconirmus lybartota

With basis on the male genitalia *N. lybartota* must be placed near *N. interruptofasciatus*, *N. clayae*, sp. n., and *N. andrettae* sp. n., and among those species it is closest to the first named. However, it is smaller in every measurement, the penis is much longer and the sexual dimorphism of antennae is not so conspicuous. In this last character *lybartota* is nearer *N. andrettae*, sp. n., but the antennae are still less dimorphic. The male genitalia, chiefly the structure of the endomere and of the penian complex, are different enough to separate them.

N. lybartota is composed of two subspecies.

Neopsittaconirmus l. lybartota (Ansari, 1947)

(Figs. 26 to 29)

Type host: *Psittacula krameri borealis* (Neumann)

Psittaconirmus lybartota Ansari, 1947, 13: 275, fig. 7.

Neopsittaconirmus lybartota; Hopkins & Clay, 1952: 238.

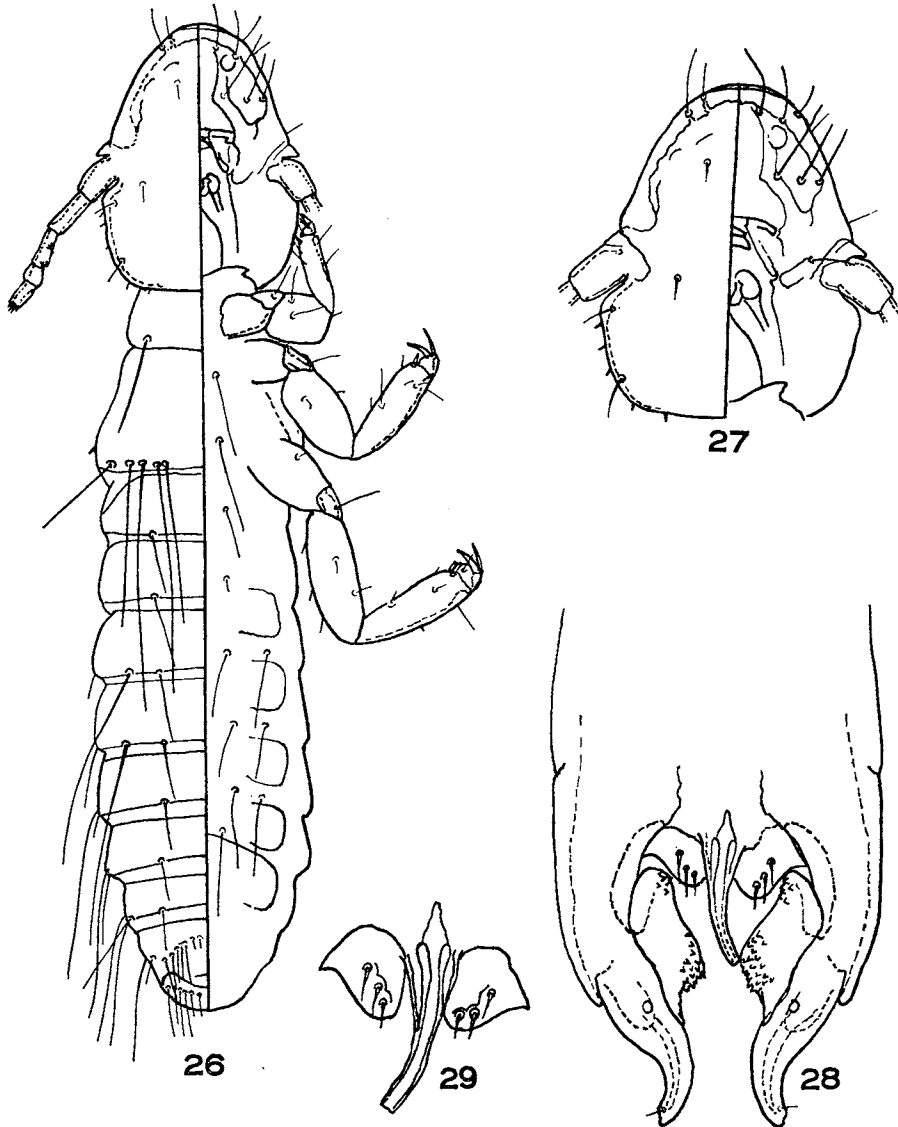
The original description of this species was based on males and females collected, according to Ansari, on *Psittacula krameri manillensis*, from Lyallpur (Punjab, Pakistan), but Hopkins & Clay (1952) give *Psittacula krameri borealis* as its true host, since this subspecies and not *manillensis* occurs in Punjab. The distribution of the birds is, really, in accordance with Peters (1937, p. 243).

The specimens I examined were collected on a parrot identified as *Psittacula krameri borealis*, from Oating, Assam, India. Unfortunately, the original description and figures are very poor, especially those of the male. So, I identified the specimens as *N. lybartota* based only on the identity of the host and even so with caution, since Ansari figured the female with tergo-lateral setae on tergites III to V, and our specimens have these setae on tergites III and IV. Ansari says that the row on the posterior margin of tergite VIII is interrupted on the midline, and our specimens have 3/4 small setae in the region. The measurements of our specimens are larger than those given by Ansari, but it is necessary to consider that the specimens now studied are mounted in polyvinyl alcohol.

Measurements in mm

	Length		Width	
	♂	♀	♂	♀
Total	1.590	1.980	—	—
Head	.420	.450	.320	.340
Prothorax	.110	.120	.230	.250
Pterothorax	.190	.200	.340	.380
Abdomen	.860	1.200	.360	.440

Material examined: 2 males, 2 females and immature specimens collected on *Psittacula krameri borealis*, from Oating, Assam, India, 4.II.1952, Meinertzhagen Collection n.º 19.911, in the British Museum (N. History).



Neopsittaconirmus l. lybartota: 26, male; 27, head of male; 28, male genitalia, ventral; 29, penian complex.

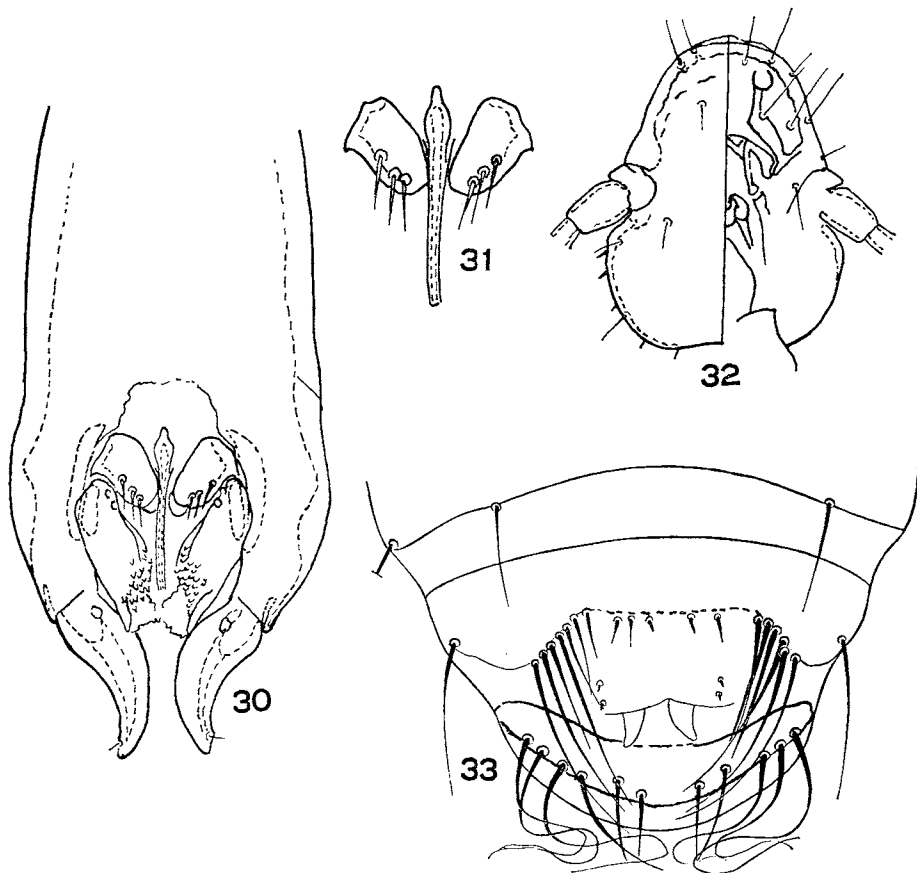
***Neopsittaconirmus lybartota difficilis*, subsp. n.**

(Figs. 30 to 33)

Type host: *Psittacula alexandri fasciata* (P.L.S. Müller)

The head of this subspecies is not so oval, chiefly in the male, as in the nominal subspecies; the tergo-lateral setae are present on tergites III to VI (*l. lybartota* shows these setae on tergites III and IV); the width of the penis is near half that of *l. lybartota*, giving the impression that the penis in *lybartota difficilis* is much longer than in *l. lybartota*.

The differences in the shape of the head and the smaller size of the front might be due to the different methods of mounting, since the specimens of *l. lybartota* are mounted in polyvinyl alcohol and the specimens of *lybartota difficilis*, in balsam. Other differences can be explained only if one considers the specimens belonging to different taxonomic entities. One fact that persuaded me to consider the *Neopsittaconirmus*



Neopsittaconirmus lybartota difficilis, subsp. n.: 30, male genitalia, ventral; 31, penial complex; 32, head of male; 33, last abdominal segments of male, dorsal.

found on *Psittacula alexandri fasciata* as a different taxon from *lybartota* was that it was possible to correct the identification of a host based only on the difference between the lice: the slide with the specimens from Upper Burma was labeled as if they had been collected on *Psittacula krameri borealis*, which is the host of *N. l. lybartota*. As these specimens agree with the ones from *Psittacula alexandri fasciata*, I asked Dr. H. S. Fuller, who collected the specimens, for a confirmation of the identity of the host. Dr. Fuller answered me that Dr. K. E. Stager, of Los Angeles County Museum, would be able to clear up the question, since the individual parrot should be at that Museum. Dr. Stager replied that, really, the parrot is *Psittacula alexandri fasciata* and not *Psittacula krameri* as identified in the field.

Besides the type specimens I examined 2 males and 4 females collected on *Psittacula himalayana finschii* (Hume), from Pang Nam Un, Ban Yun, Nam, Thailand, which seem to me to belong to the subspecies now described. However, as one male shows the penis much shorter than in the specimens collected on *Psittacula alexandri fasciata*, I prefer not to consider them as paratypes.

Measurements of types in mm

	Length		Width	
	♂	♀	♂	♀
Total	1.420	1.790	—	—
Head	.390	.440	.300	.340
Prothorax	.100	.110	.210	.230
Pterothorax	.160	.170	.310	.340
Abdomen	.780	1.100	.340	.410

Type material: Holotype male and Allotype female, collected on *Psittacula alexandri fasciata* (P. L. S. Müller), from Pang Nam Un, Ban Yun, Nam, Thailand, R. E. Elbel and H. G. Deigman, Jan. 22, 1953, in the United States National Museum; Paratypes, specimens collected on type host: 2 males with the same indication above; 3 males and 3 females with the same indication above, Jan. 19, 1952, and 3 males and 3 females from Khlong, Khlung, Kamphaeng Phet, Thailand, R. E. Elbel and H. G. Deigman col., April 22, 1952, in the Collection of Ectoparasites of the Museu de Zoologia da Universidade de São Paulo; 2 males and 1 female from Si Than, Wang Saphung, Loei, Thailand, R. E. Elbel col., Jan. 11, 1954; 1 male and 3 female with the same indication Jan. 12, 1954; 3 females, from Ban Nong Wai, Na Phung, Dan Sai, Loei, Thailand, R. E. Elbel col., Nov. 18, 1954; 1 female from Saen Kao, Chiang Rai, Thailand, R. E. Elbel and H. G. Deigman col., Febr. 14, 1953; 2 females from Khao Oerawan Mt., Lop Buri, Thailand, R. E. Elbel col., July 29, 1953; 9 males and 11 females from Phu Lomho Mt., Kok Sathon, Dan Sai, Loei, Thailand, R. E. Elbel col., Febr. 16-19, 1955; 2 males and 2 females from Phum Phan Mt., Sakon Nakhon, Thailand, R. E. Elbel and B. Lekagul

col., June, 21, 1954; 4 females and 1 male from Thali, Loei, Thailand, Elbel and Lakagul col., Dec. 5, 1953; 11 males and 11 females from Muangkluand and Thungkha, Kapoe, Ramong, Thailand, Wanit Songprakob col., Dec. 22, 1962, Jan. 5, 1963 and Jan. 30, 1963, and 2 males and 3 females from Phum Phan Mt., Sakon Nakhon, Thailand, R. E. Elbel and B. Lekagul col., June 21, 1954 in the Collection of R. E. Elbel and of K. C. Emerson; 2 males and 1 female from Myitkyina (12 miles East), Upper Burma, H. S. Fuller col., Jan. 21, 1945, in the British Museum (N. History).

***Neopsittaconirmus femoratus* (Piaget, 1880)**

Type host: *Lorius* sp.

Lipeurus femoratus Piaget, 1880: 675, pl. 56, fig. 4; Taschenberg, 1882, 44: 115; Kellogg, 1908: 39.

Esthiopterum femoratum; Harrison, 1916, 9: 134.

Neopsittaconirmus femoratus; Conci, 1942, 74: 37; Hopkins & Clay, 1952: 238.

Psittacicola femoratum; Guimarães, 1942, 2: 81.

The only specimen belonging to Piaget's Collection in the British Museum (N. History), a female n.^o 812, labeled as *Lipeurus femoratus* and collected on *Eclectus* sp. (now *Lorius* sp.) is here designated as lectotype.

It is quite probable that this species is no more than a synonym of *interruptofasciatus*, since the females of both species are, practically, undistinguishable. Only a comparative study of both sexes of the *Neopsittaconirmus* found on every species of *Lorius* may clear up its true situation.

Piaget says that the host of his species came from the Celebes, but according to Peters (1937) no species of *Lorius* (= *Eclectus*) has been recorded from those islands.

***Neopsittaconirmus clayae*, sp. n.**

(Figs. 34 to 42)

Type host: *Probosciger aterrimus stenolophus* (van Oort)

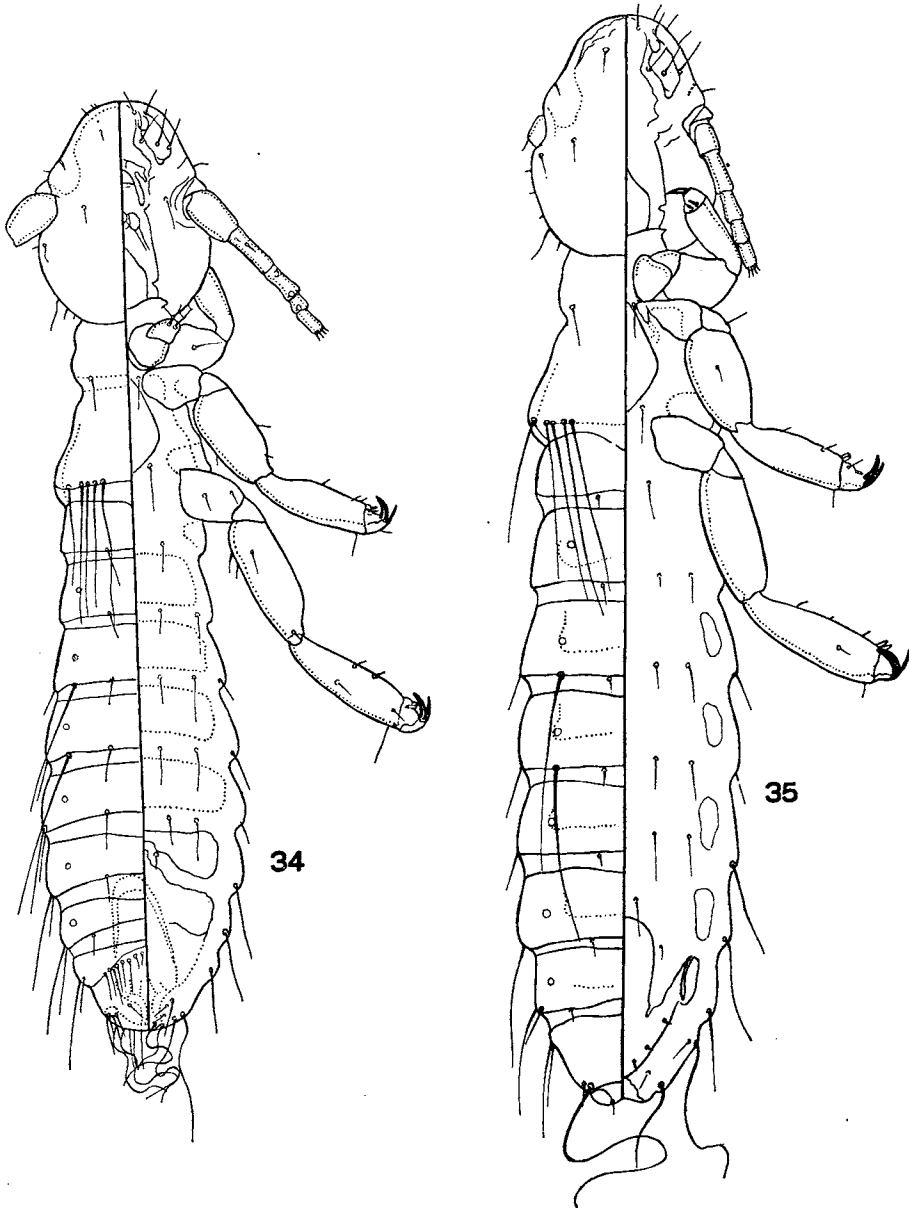
Dark species with every band clearly delimited.

Male (figs. 34, 36 to 40). Head with the preantennal region shorter than the posantennal; guttate sclerotizations quite evident. Coni conspicuous. Antennae long: segment I longer than the two last together, but only longer than the II or the III, which are subequal in length; segment IV is the shortest; segment III shows two warts, one on the basal half and another at the distal end.

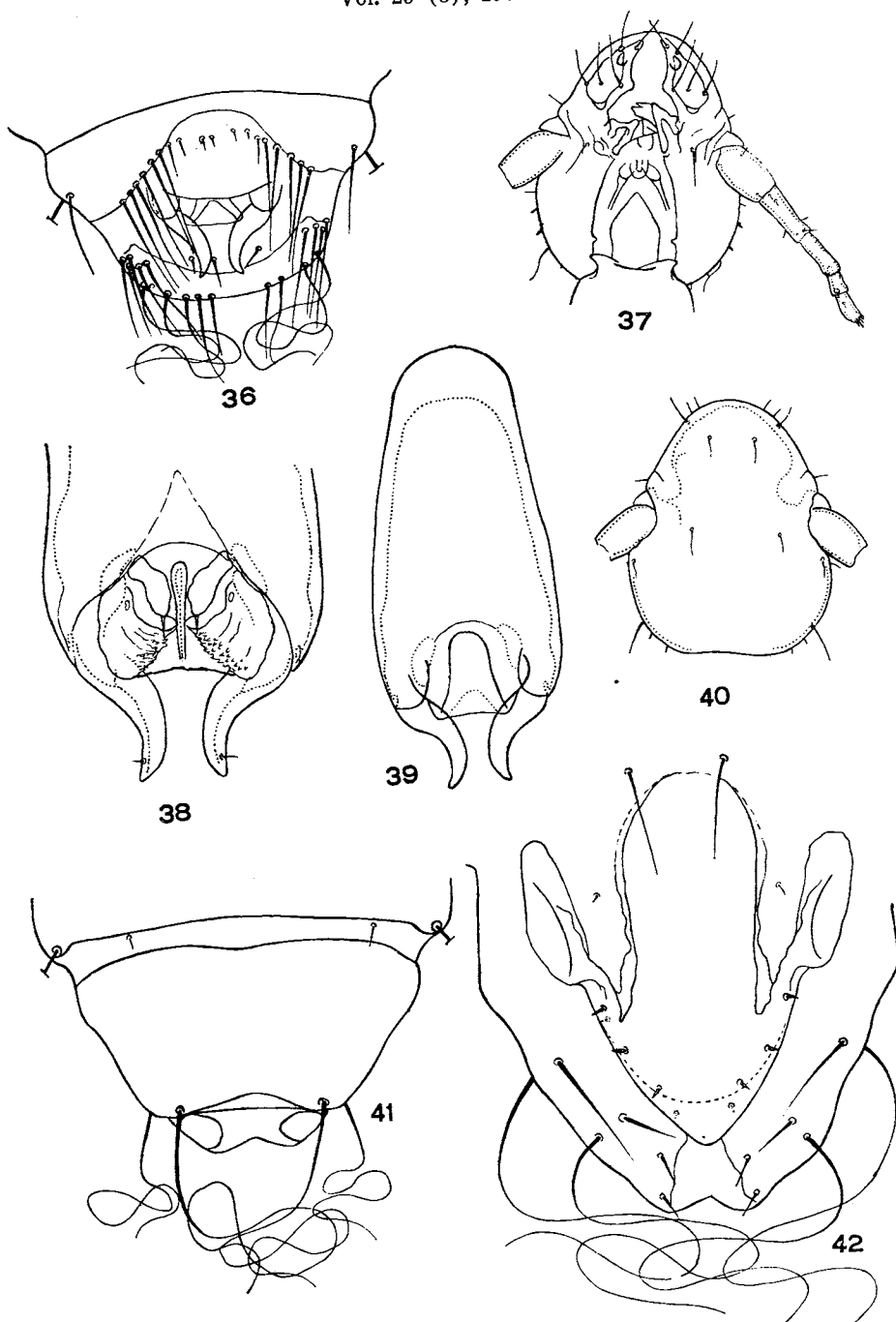
Pterothorax with the lateral margins slightly divergent.

Abdomen with the following chaetotaxy: tergites I to VII with a tergo central seta of medium length in either side; III and IV with

a tergo lateral long seta; VIII with the characteristic group of setae of posterior margin, the more central setae of this group behind posterior margin of the sclerotized zone of the tergite (fig. 36); apical tergite with a group of 4/5 setae on either side and more 4/5 on the posterior



Neopsittaconirmus clayae, sp. n.: 34, male; 35, female.



Neopsittaconirmus clayae, sp. n.: 36, last abdominal segments of male, dorsal; 37, head of male, ventral; 38, male genitalia, ventral; 39, male genitalia, dorsal; 40, head of male, dorsal; 41, last abdominal segments of female, dorsal; 42, terminal segments of female abdomen, ventral.

margin. Sternal plates apparently entire, but clearer than the tergal ones; sternal plate of segments VI and VIII fused longitudinally on the midline.

Male genitalia (figs. 38, 39). Basal apodeme extending near $3/4$ of the total length of genitalia, with the lateral margins slightly divergent and strengthened by sclerotized marginal bands; parameres curved inward and tapering backward; in dorsal view the mesosome shows a sclerotized central zone, campanuliform, with the posterior margin hyaline. The endomerall complex in ventral view is shown in fig. 39.

Female (figs. 35, 41, 42). Head similar to the male, the conia, however, are smaller and the antennae filiform; segment II is the longest and IV the shortest. Abdomen longer than in the male and with the same chaetotaxy on tergites I to VII (2 females have another tergo lateral seta on one of the sides of the 5th tergites); the tergo central setae are, however, much shorter than in the male. Sternal plates of segments II to VI reduced to small lateral spots. Genital plate and vulva as in fig. 42.

Measurements of types in mm

	Length		Width	
	♂	♀	♂	♀
Total	1.710	2.010	—	—
Head	.410	.440	.330	.370
Prothorax	.120	.120	.210	.230
Pterothorax	.190	.200	.310	.370
Abdomen	.990	1.250	.400	.470

This species is near *N. interruptofasciatus* in the sexual dimorphism of the antennae, the chaetotaxy and the shape of the male genitalia. However, several characters separate clearly the two species. *N. clayae*, is smaller in every measurement, the preantennal region is shorter than the postantennal (longer in *N. interruptofasciatus*); the margins of the preantennal and temporal regions are more rounded, and several carinae of head, thorax and abdomen darker. The male genitalia and the posterior margin of tergite VIII, although keeping the same general shape in both species are sufficiently different, as one can see comparing figs. 23 and 38.

Type material: Holotype male, Allotype female (slide n.º 13.491A) and 3 females Paratypes (13.491) from *Probosciger aterrimus stenolophus* (van Oort), from New Guinea, Meinertzhagen Collection, and 1 male and 1 female Paratypes, from *Probosciger aterrimus* subsp., Harrison Collection, in the British Museum (N. History); 1 male and 1 female,

Paratypes, from *Probosciger aterrimus* probably subsp. *goliath* (Kuhl), from Vogelkop, Neth. New Guinea, L. W. Quate col., January, 14, 1962, in K. C. Emerson Collection (BBM-NG 739).

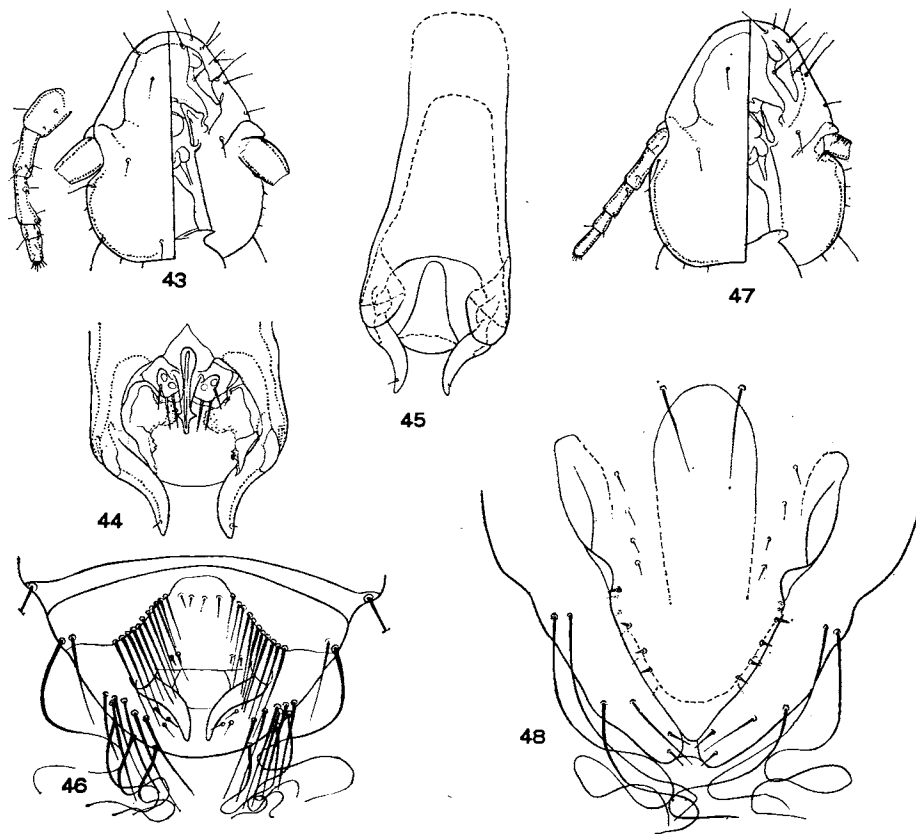
***Neopsittaconirmus andrettae*, sp. n.**

(Figs. 43 to 48)

Type host: *Tanygnathus m. megalorynchos* (Boddaert)

Male (figs. 43-46). Head as in fig. 43. Guttate incrassations evident. Antennae long; segment III with two verrucous process.

Abdomen twice as long as wide; tergites I to VII with a tergo central seta of median length on either side; tergites I to IV with a long tergo lateral seta; tergite VIII with the characteristic row of setae on the posterior margin (fig. 46).



Neopsittaconirmus andrettae, sp. n.: 43, male head and antenna; 44, male genitalia, ventral; 45, male genitalia, dorsal; 46, last abdominal segments of male, dorsal; 47, head of female; 48, terminal segments of female abdomen, ventral.

Male genitalia as in figs. 44, 45; penis short, not reaching the posterior margin of mesosome, and showing a small triangular and acute process on either side of posterior half.

Female (figs. 47, 48). Similar to the male, but with the conis smaller, antennae filiform and abdomen longer. The chaetotaxy of tergites I to VII is identical to the male; the tergo-central setae are, however, much smaller. Genital plate and vulva as shown in fig. 48.

Measurements of types in mm

	Length		Width	
	♂	♀	♂	♀
Total	1.560	2.040	—	—
Head	.440	.480	.340	.380
Prothorax	.120	.130	.240	.260
Pterothorax	.190	.210	.330	.380
Abdomen	.820	1.230	.410	.510

In chaetotaxy, shape of antennae and male genitalia, this new species is near *N. interruptofasciatus* and *N. clayae*. However, it differs from both in the shape of several pieces of the male genitalia and in the shape of the vulva, which is acute posteriorly.

Type material: Holotype male, Allotype female (slide n.º 10.913A), and Paratypes, 4 males and 6 females (n.º 10.913), collected on *Tanygnathus m. megalorynchos* (Boddaert), from Waigeu Is., New Guinea, in the British Museum (N. History).

***Neopsittaconirmus hoogstraali*, sp. n.**

(Figs. 49 - 55)

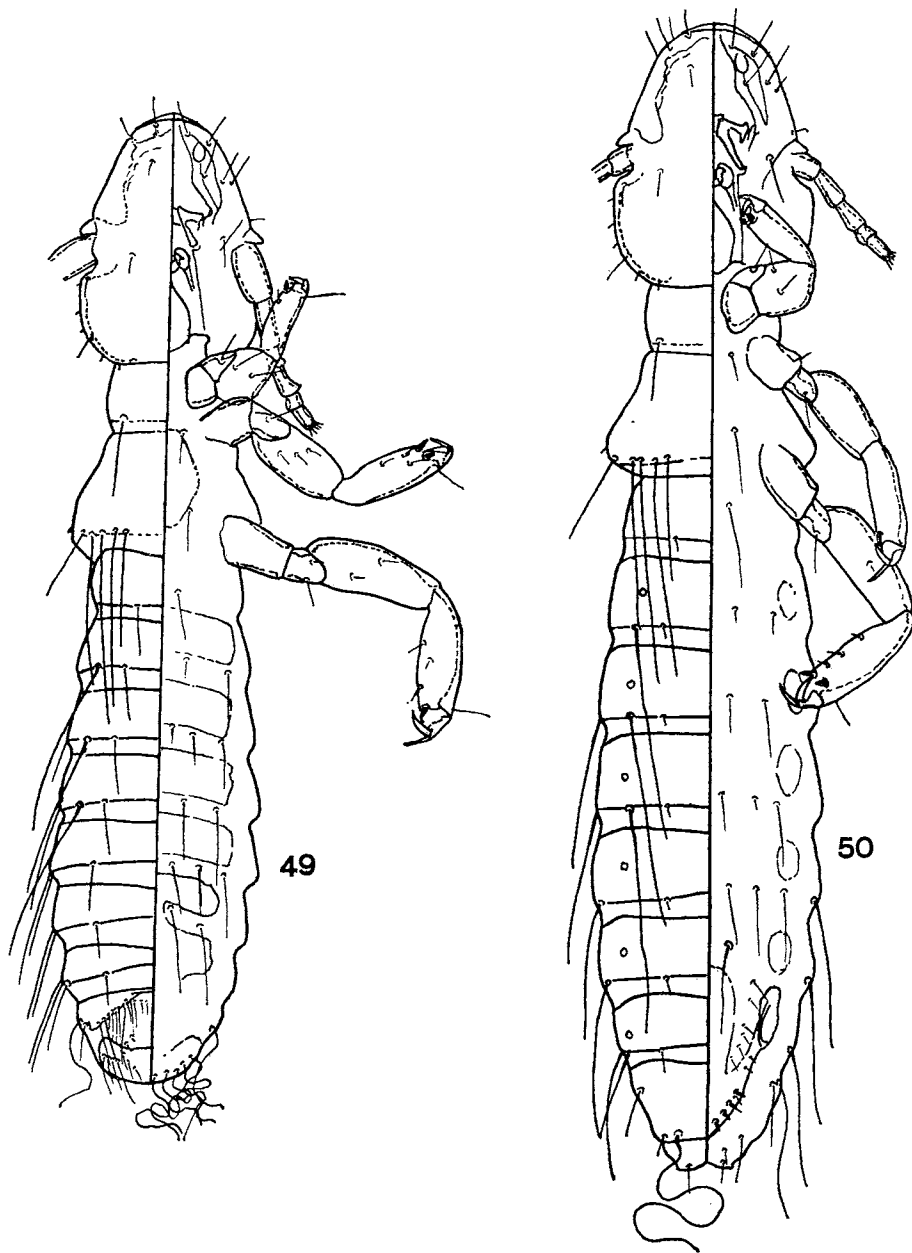
Type host: *Tanygnathus lucionensis paraguenus* Hachisuka

Male (fig. 49). Head as in fig. 52; carinae and guttate incrustations evident; marginal carina, in ventral view, interrupted on the midline and fused with the internal margin of the ventral carina. Antenna with segment I a little longer than II and III; these segments with the same length; segment III with two verrucous processes.

Thorax similar to the other species.

Abdomen with a tergo central seta of median length on either side of tergites I to VII; tergites II to IV with a long tergo lateral seta on each side; tergite VIII with the characteristic row of setae on the posterior margin (fig. 51), the median setae placed posteriorly to the posterior sclerotized area of the tergite, sternal plates apparently entire.

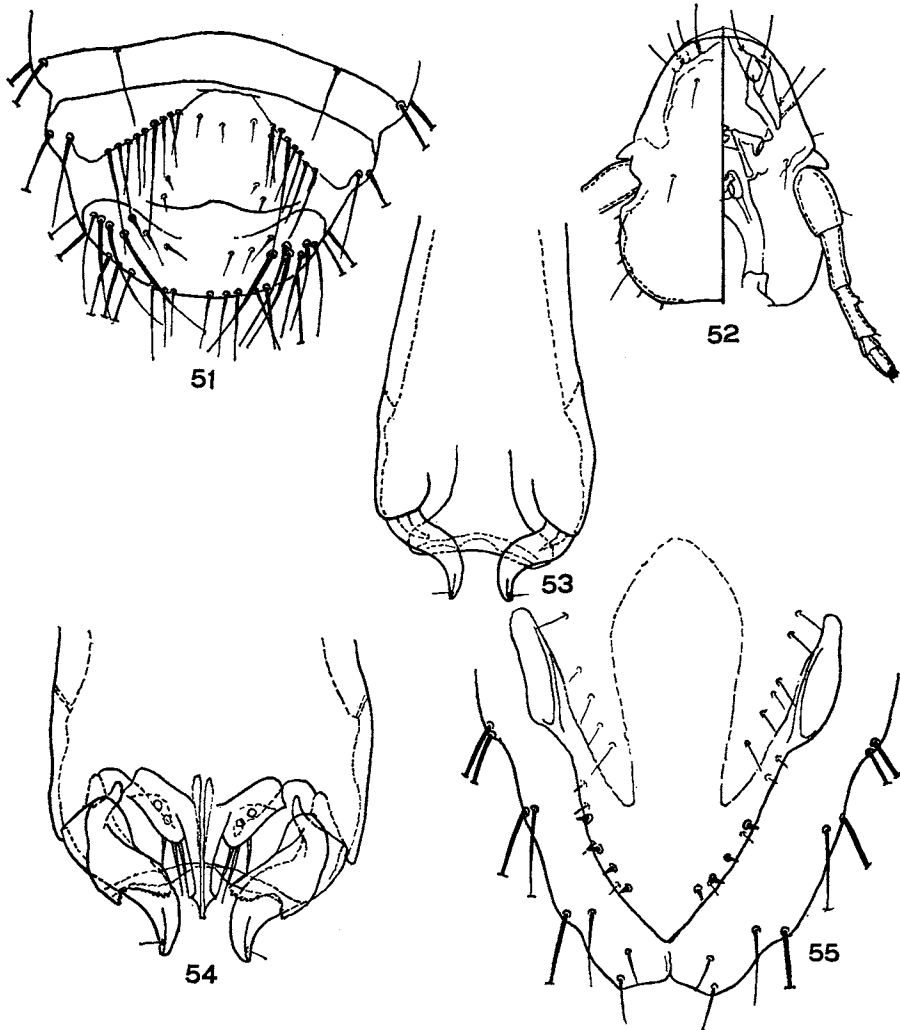
Male genitalia (figs. 53, 54). Basal apodeme with the lateral margins slightly divergent; parameres curved toward midline, but with



Neopsittaconirmus hoogstraali, sp. n.: 49, male; 50, female.

the posterior turned backward; lateral sclerotization of endomeral complex quite conspicuous; its posterior margin slightly concave and serrated; penis with a small cuneiform projection on either side near the posterior end; dorsally the mesosome shows a median campanuliform sclerotization.

Female (fig. 50) similar to the male, but with smaller conii, filiform antennae, and longer abdomen. The chaetotaxy is as in the male, but with the tergo-central setae smaller. Genital plate and vulva as in fig. 55.



Neopsittaconirmus hoogstraali, sp. n.: 51, last abdominal segments of male, dorsal; 52, head of male; 53; male genitalia, dorsal; 54, male genitalia, ventral; 55, terminal segments of female abdomen, ventral.

Measurements of types in mm

	Length		Width	
	♂	♀	♂	♀
Total	1.670	1.970	—	—
Head	.410	.440	.310	.340
Prothorax	.140	.130	.220	.250
Pterothorax	.180	.190	.340	.370
Abdomen	.930	1.210	.360	.410

This species is close to *N. andrettae*, in the shape of the penis and of the last abdominal segments of the male. The tergo lateral setae are found, however, on tergites II to III (in *N. andrettae*, on tergites III and IV); the male genitalia, both in dorsal and ventral view, also different as one can see in figs. 44 and 54.

Type material: Holotype male and Allotype female, and Paratypes, 5 males and 5 females collected on *Tanygnathus lucionensis paraguensis* Hachisuka, from San Pedro, Culion, Calamian Group, Philippines, H. Hoogstraal col., March, 27, 1947; 8 males and 3 females, same species host, from Puerto Princesa, Palawan Isl., Philippines, H. Hoogstraal and F. G. Werner col., March, 9 1947; 1 male from *Centropus bengalensis javanensis* (probably contamination), 4 males and 1 female, without host, from Puerto Princesa, Palawan Is., Philippines., H. Hoogstraal col., April 9, 1947, in the Field Museum of Natural History, Chicago, Ill., USA; 2 males, 1 female with the same data and 1 male and 1 female with the same indications of the Holotype, in the Museu de Zoologia da Universidade de São Paulo; 3 males and 2 females, collected on same species host as the Holotype, from Palawan Isl., Philippines, September 3, 1947, and 3 females and 2 males collected on *Tanygnathus lucionensis* subsp., from Balabac Isl., Philippines, Max Thompson col., April 3 and 20, 1962, in Emerson Collection, Arlington, Virginia, USA.

***Neopsittaconirmus wardi*, sp. n.**

(Figs. 56-62)

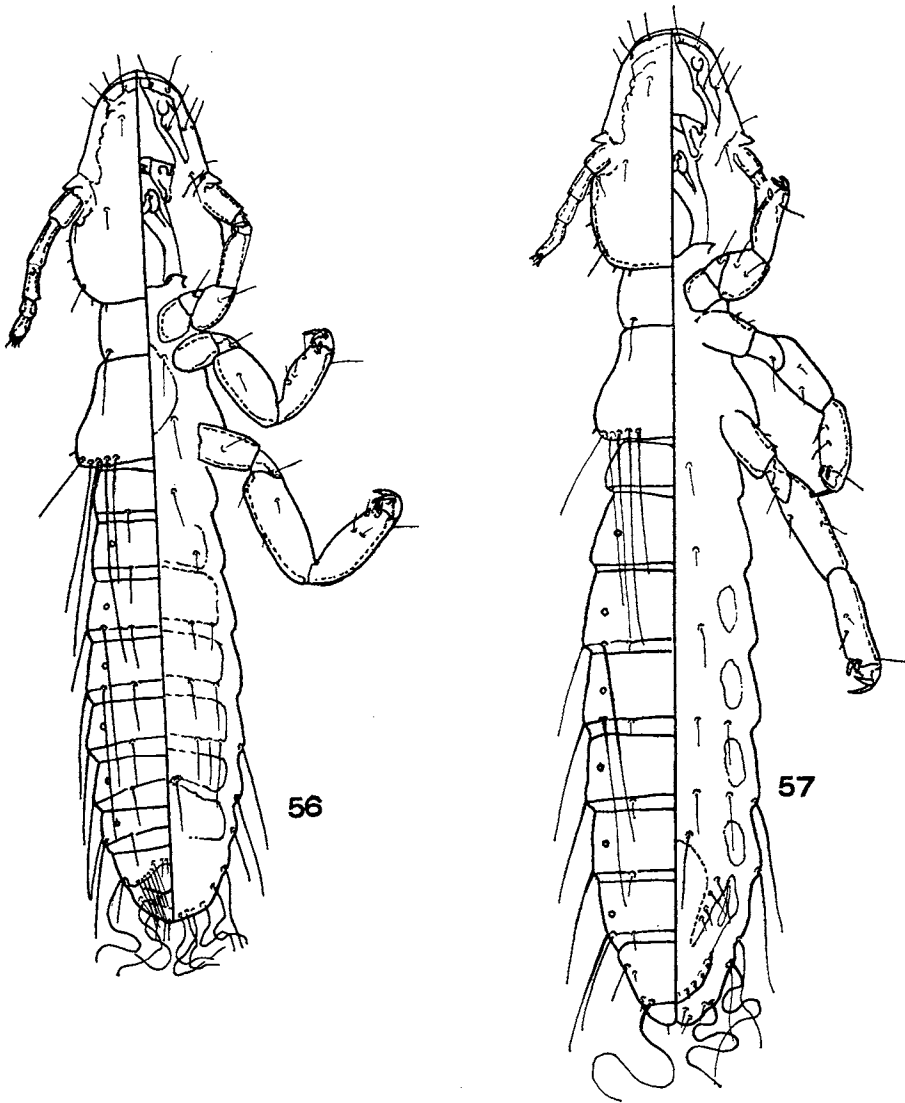
Type host: *Prioniturus discurus platenae* W. Blasius

This species is similar to *N. hoogstraali*, and, although smaller in every measurement, its facies looks more elongate. Tergo-lateral setae only on tergites III and IV; sclerotized band of tergite VIII of male (fig. 61) longer than in *N. hoogstraali*, in the median region; the setae of this region are distributed on the posterior margin of sclerotized band and not posterior to it as in *N. hoogstraali*.

The genitalia of *N. wardi* (figs. 59, 60) although of the same general shape as in *N. hoogstraali*, differ in several details. The basal apodeme

is narrower and has nearly parallel margins; the parameres have the distal extremity slightly turned sideways; the penis is simple (without the lateral projection as in *N. hoogstraali*, or *andrettae*); the lateral sclerotization of the mesosome is also different in both species, and the projection of the internal margin is not so conspicuous in *N. wardi*.

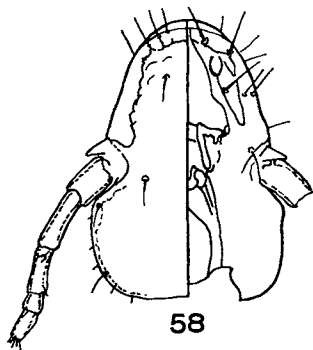
Genitalia of female as in fig. 62.



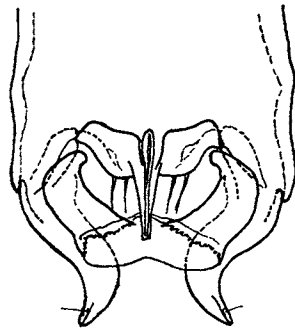
Neopsittaconirmus wardi, sp. n.: 56, male; 57, female.

Measurements of types in mm

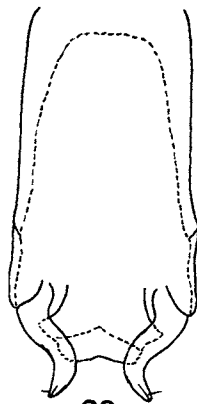
	Length		Width	
	♂	♀	♂	♀
Total	1.510	1.770	—	—
Head	.380	.410	.270	.290
Prothorax	.120	.120	.190	.190
Pterothorax	.170	.180	.280	.300
Abdomen	.830	1.060	.380	.320



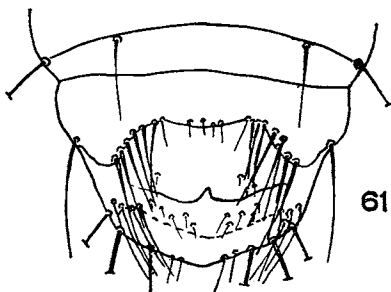
58



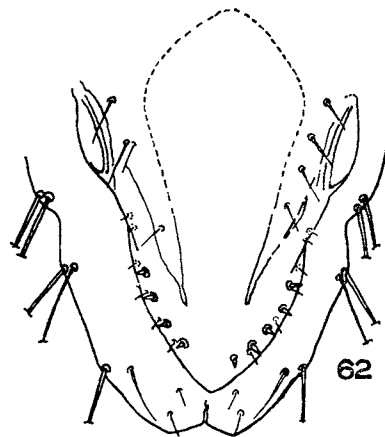
59



60



61



62

Neopsittaconirmus wardi, sp. n.: 58, head of male; 59, male genitalia, ventral; 60, male genitalia, dorsal; 61, last abdominal segments of male, dorsal; 62, terminal segments of female abdomen, ventral.

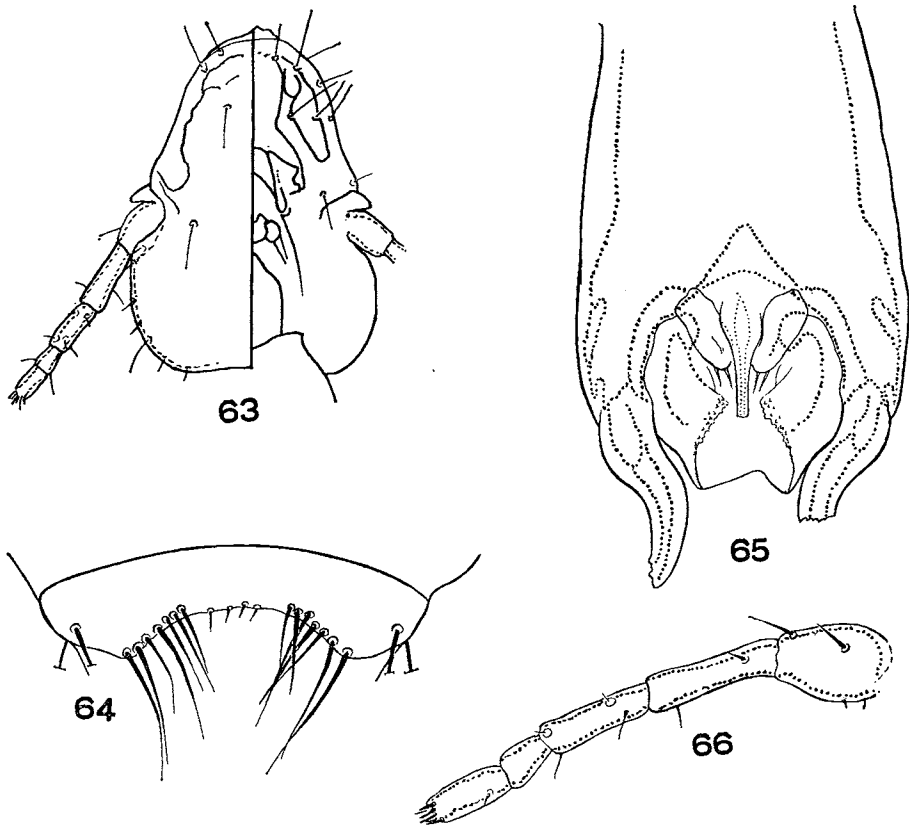
Type material: Holotype male, Allotype female, and Paratypes 1 male and 2 females, collected on *Prioniturus discurus platenae* W. Blasius, from San Pedro, Culion Is., Calamianes Group, Philippines, H. Hoogstraal col., March 27, 1947, in Field Museum of Natural History; 1 male and 1 female with the same data in the Museu de Zoologia da Universidade de São Paulo; and 1 male and 1 female, from the same host species, Aborlan, Palawan Is., Philippines, February 1965, in K. C. Emerson Collection.

***Neopsittaconirmus jobiensis*, sp. n.**

(Figs. 63-66)

Type host: *Geoffroyus geoffroyi jobiensis* (A. B. Meyer)

Male head as in fig. 63; the irregular outline of the anterior margin of the head is, very probably, no more than an accident of mounting. Carinae wide; guttate incassations conspicuous; coni small. The sexual



Neopsittaconirmus jobiensis, sp. n.: 63, head of male; 64, VIII abdominal segment of male; 65, male genitalia, ventral; 66, antenna of male.

dimorphism of the antennae should not be as in the preceding species, since in the specimens examined (all males) they are relatively short; segment II is the longest and as long as the two last ones together; segments I and III subequal; segment III shows two small verrucous processes.

Abdomen more than twice as long as wide; tergites I to VII with a tergo-central seta of medium length on either side; tergites III and IV with a long tergo lateral seta; tergite VIII with the posterior margin slightly concave, with the characteristic row of setae (fig. 65).

Male genitalia as in fig. 64.

Female unknown.

Measurements of the holotype in mm

Total	1.560	—
Head	.420	.300
Prothorax	.100	.220
Pterothorax	.190	.310
Abdomen	.850	.330

In chaetotaxy and shape of genitalia this species is close to *N. interruptofasciatus*, *N. clayae*, *N. andrettae* and *N. lybartota*; closest perhaps to the latter, from which it differs in some structures of the male genitalia, as shown in the figures.

Type material: Holotype male slide n.º 13.471A and Paratypes 3 males collected on *Geoffroyus geoffroyi jobiensis* (A. B. Meyer), from Jobi Is. (Japen Is.), New Guinea, Meinertzhagen Collection, in the British Museum (Natural History).

***Neopsittaconirmus chandabani* (Ansari, 1947)**

(Figs. 67, 68, 70-72)

Type host: *Psittacula eupatria nipalensis* (Hodgson)

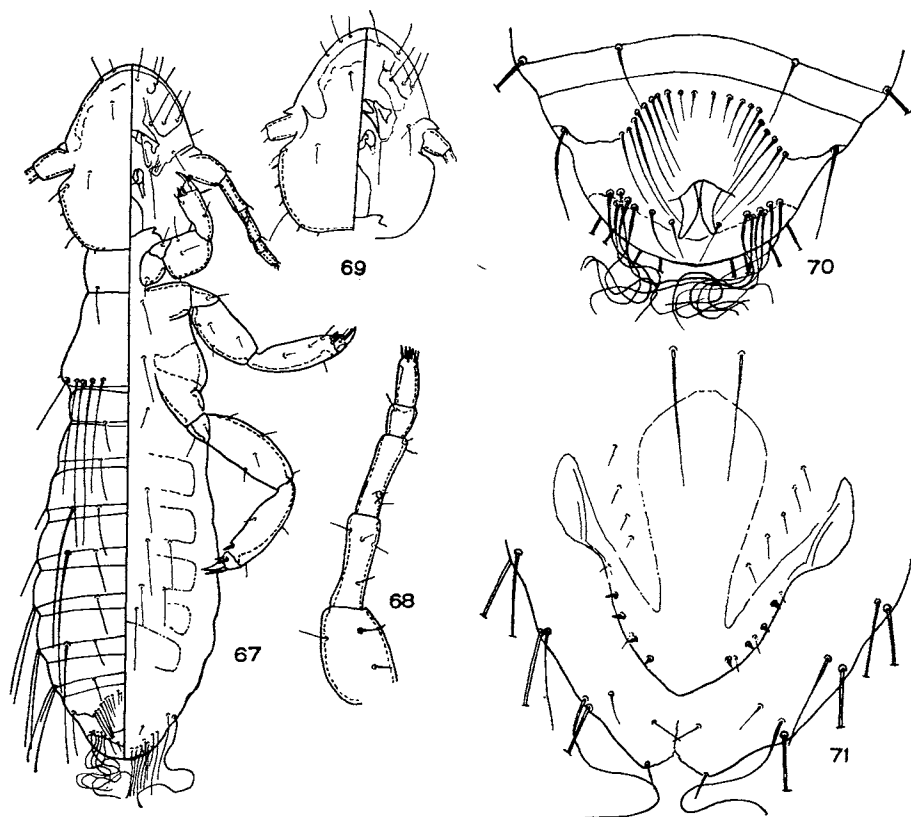
Psittaconirmus chandabani Ansari, 1947, 13: 273, fig. 6.
Neopsittaconirmus chandabani; Hopkins & Clay, 1952: 237.

This species was described from males and females collected on *Psittacula eupatria nipalensis*, from Lyallpur, Punjab, Pakistan.

It is quite characteristic, and easily separated from the species anteriorly treated by the distribution of the tergo lateral setae and the shape of the male genitalia.

This species and the two following ones are the only ones having long tergo lateral setae on tergites III, IV and VI. In the other species up to now such setae are either absent or have a different distribution.

The penial complex is not calyculate as in the other species; its base is a plate roughly octagonal, longer than wide, having on the posterior margin, which is slightly concave, the penis; the length of the penis is a little more than one half of the length of said plate. The endomerteral complex has the same general shape of the previous species, but with different lateral sclerotization. Parameres strongly turned inward and then backward.



Neopsittaconirmus chandabani: 67, male; 68, antenna of male; 70, last abdominal segments of male, dorsal; 71, terminal segment of female, ventral. *Neopsittaconirmus elbeli*, sp. n.: 69, head of male.

As in *N. lybartota*, the antennae are little dimorphic.

The tergal setae of most posterior segments of the abdomen are grouped on each side of the midline and the sternal ones are rather numerous (12 to 16 on each side).

The seven anterior abdominal segments of the female have the same chaetotaxy as in the abdominal segments of male; the tergo central setae are, however, much smaller. The vulva (fig. 71) is relatively shorter than in other species and the angle of the posterior margin not so well marked.

Measurements in mm

	Length		Width	
	♂	♀	♂	♀
Total	1.750	2.080	—	—
Head	.450	.490	.360	.380
Prothorax	.120	.130	.240	.250
Pterothorax	.200	.200	.370	.400
Abdomen	.980	1.260	.420	.490

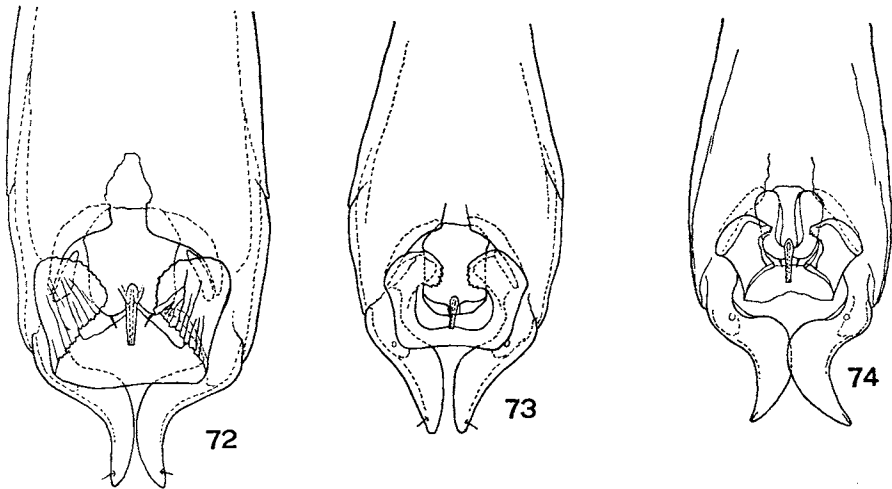
Specimens examined: Holotype female and Allotype male; Paratypes, 12 males and 31 females collected on *Psittacula eupatria nipalensis* from Peshawar, Pakistan, n.^o 9425-26, March 1937, Meinertzhagen Collection, British Museum (N. History). Only two males and 6 females are mounted on slides.

***Neopsittaconirmus meinertzhageni*, sp. n.**

(Fig. 73)

Type host: *Psittacula eupatria nipalensis* (Hogson)

Male: Preantennal region a little longer than post-antennal; marginal carina narrow. Antennae slightly dimorphic: segment I thick and as long as III; segment II a little longer than I and III; segment V shorter than I, II and III and longer than IV; segment III with two little verrucous processes.



Male genitalia, ventral: 72, *Neopsittaconirmus chandabani*; 73, *N. meinertzhageni*, sp. n.; 74, *N. elbeli*, sp. n.

Setae of either side of posterior margin of pterothorax equidistant.

Abdomen. Segments I to VII with a tergo-central seta of medium length on either side; III, IV, and VI with a long tergo-lateral seta; posterior margin of tergite VIII with 14 to 20 setae; last segment with 7-8 setae on either side of the dorsal surface, and 16-20 setae, including the marginal, on the ventral surface. Sternal plates very pale on the midline, giving the impression, with the exception of the last one, of being longitudinally interrupted.

Male genitalia (fig. 73). Basal apodeme a little less than twice as long as wide and slightly narrowed toward the anterior apex; parameres curved toward the midline; their internal margin somewhat parallel to the external one in the anterior half, then they turn backward narrowing gradually. Lateral incassation of the endomeral complex conspicuous only anteriorly, since posteriorly it becomes fused with the band on the posterior margin of the complex. Base of penian complex shaped as a roughly octagonal plate, longer than wide, and sclerotized in the posterior margin; penis short, at most as long as half the width of the octagonal plate.

Female. Similar to the male, but larger; the conis are smaller, the antennae filiform, the tergo-central setae very small, the sternal plates reduced to small ovoid lateral spots; the chaetotaxy and shape of the last abdominal segment are also different. Posterior margin of vulva not so long and posterior angle not so sharp as in the previous species.

Measurements of types in mm

	Length		Width	
	♂	♀	♂	♀
Total	1.630	2.010	—	—
Head	.420	.450	.330	.350
Prothorax	.110	.110	.230	.240
Pterothorax	.190	.200	.340	.370
Abdomen	.910	1.250	.410	.480

Without any doubt *N. meinertzhageni* is very near *N. chandabani*. Excepting the proportions of the antennal segments, the width of the carinae of the head, and shape of the male genitalia, both species are practically identical.

In *N. meinertzhageni*, antennal segments I and III are nearly of the same length, although shorter than segment II; in *N. chandabani* segments I and II are nearly of the same length and longer than III.

The carinae of the head are a little wider in *meinertzhageni*.

The male genitalia differ in the shape of the basal apodeme, parameres, and endomeral complex. The anterior margin of the basal apodeme

in *N. meinertzhageni* is apparently straight (it is difficult to be sure due to the slight sclerotization of the region) and the lateral margins are slightly divergent, at least on the anterior two thirds of its length; in *N. chandabani* the anterior margin of the basal apodeme is rounded and the lateral margins nearly parallel. The parameres of *N. meinertzhageni*, are shorter and much less curved inward than in *N. chandabani*.

Type material: Holotype male, Allotype female (n.° 9364a) and Paratypes (n.° 9364), 5 males and 14 females collected on *Psittacula eupatria nipalensis*, from Nepal (near Katmandu), March 1937, Meinertzhagen Collection, in the British Museum (N. History).

There is no doubt as to the hosts of *N. chandabani* and *N. meinertzhageni*: they have the same host subspecies, *Psittacula eupatria nipalensis*, although in different areas of its distribution. It is possible that at one time the same individuals of this parrot had closely related sympatric species of *Neopsittaconirmus*. Now, however, the two species of biting lice occur only in different widely separated areas of the distribution of the host, which is quite unusual. If, at any time, one could prove that the host is subspecifically different, this would mean that the Mallophaga differentiated more quickly than their host.

***Neopsittaconirmus elbeli*, sp. n.**

(Figs. 69, 74)

Type host: *Psittacula eupatria siamensis* (Kloss)

This species constitutes with *chandabani* and *meinertzhageni*, a homogeneous group characterized by the general shape, by a relatively slight sexual dimorphism of the antennae, by the chaetotaxy of the abdomen and by the shape of the male and female genitalia.

The differences between *N. elbeli* and the two others above referred are few, but I believe they are sufficient to justify considering them as good species.

N. elbeli is smaller than *chandabani* and *meinertzhageni*, the preantennal region is shorter and the carinae of the region are somewhat larger. The anterior ventral seta 3 (a.v.s. 3) is located more anteriorly, nearly at the level of the anterior dorsal seta; in the other two species a.v.s. 3 is more posterior and, accordingly, the distance between the two setae is much larger. Such a difference is really conspicuous in the males of the three species.

It is exactly in the male genitalia, in which some intermediate characters between *chandabani* and *meinertzhageni* are found, that the specific characters are more conspicuous. The basal apodeme of *elbeli* is similar to that of *meinertzhageni*. The parameres, however, although wider on the middle, are similar to those of *chandabani*. The outline of the penial complex is far less octagonal than in the two other species and the penis length is intermediate between *chandabani* and *meinertzhageni*. The endo-

meral complex shows the lateral margins more convergent; posterior margin of the lateral sclerotization distinct, although not saw-like as in *chandabani*.

Measurements of types in mm

	Length		Width	
	♂	♀	♂	♀
Total	1.460	1.840	—	—
Head	.390	.440	.300	.340
Prothorax	.090	.100	.210	.240
Pterothorax	.170	.180	.300	.360
Abdomen	.810	1.120	.340	.410

Type material: Holotype male and Allotype female, found on *Psittacula eupatria siamensis* (Kloss), from Ban Non Tao Lek, Ban Kaeung, Chaiyaphum, Phu Khieo, Thailand, R. E. Elbel col., 16.XII.1952, in the United States National Museum, Washington.

***Neopsittaconirmus pallipes* (Piaget, 1885) (?)**

(Fig. 75)

Type-host: *Prosopeia tabuensis splendens* (Peale)

Lipeurus pallipes Piaget, 1885: 56, pl. 6, fig. 3.

Lipeurus pallipes; Neumann, 1890, 24: 64.

Lipeurus pallipes; Kellogg, 1908: 43.

Esthiopterum pallipes; Harrison, 1916, 9: 139.

Neopsittaconirmus pallipes; Conci, 1942, 74: 37, Hopkins & Clay, 1952: 238.

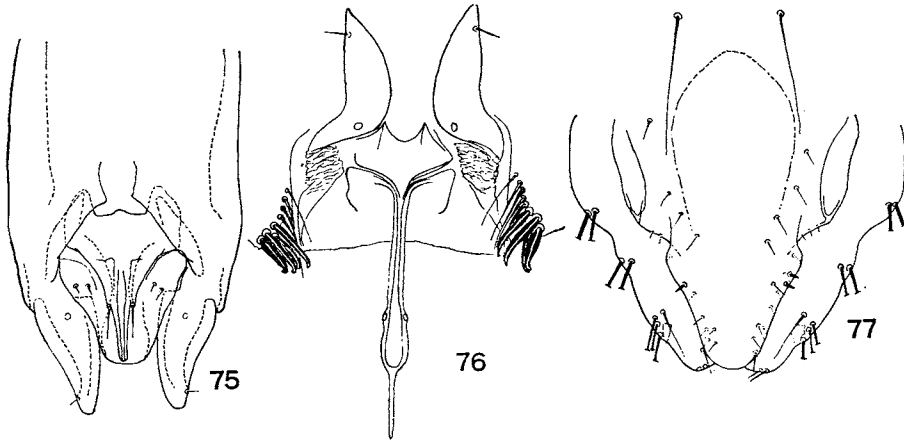
The original description, based on a female collected on *Platycercus splendens* [now *Prosopeia tabuensis splendens* (Peale)], from Fidji Is., leaves no doubt that the species belongs to *Neopsittaconirmus*.

Neumann (1890) says he found two females of this species on *Coracopsis comorensis* [(now *Coracopsis vasa comorensis* (Peters))], but such a record is probably a mistake.

Unfortunately I did not study specimens of *Neopsittaconirmus* found on the type host. However, I had in my hands a couple collected on *Prosopeia personata*, also from the Fidji Is., and the female fits as well as possible the description and figure given by Piaget. This leads me to consider the specimens to belong if not to *N. pallipes* at least to a species very close to Piaget's.

The genitalia of the male of this couple (fig. 75), although having the same general outline of other species of the genus, is really rather

different in detail. The parameres are shorter and wider, their width being one half of the length; they are slightly tapering backward and very little curved inward. Endomeral plate also tapering backward, with the



Neopsittaconirmus pallipes: 75, male genitalia, ventral. *N. albidus*: 76, detail of male genitalia and of chaetotaxy of posterior margin of segment VIII. *N. piageti*: 77, terminal segment of female, ventral.

posterior margin rounded, and slightly sclerotized even at the sides; in dorsal view it shows a median and longitudinal band darker than in other species. The penial complex is long and strong, and differently from other species, it is constituted by one piece, since the base of the penis is fused with the penis.

Posterior margin of tergite VIII widely concave and with the characteristic row of setae; the tergo lateral setae are present only on tergites III and IV in either sex.

***Neopsittaconirmus emersoni*, sp. n.**

(Figs. 78-83)

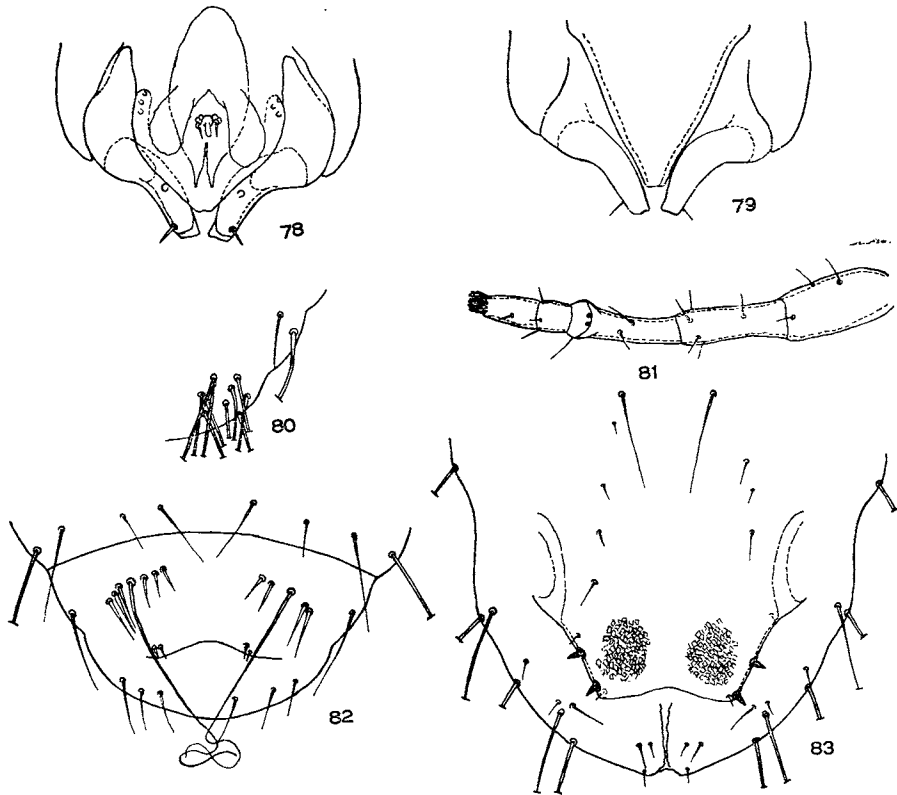
Type host: *Kakatoe haematuropygia* (P. L. S. Müller)

This species is entirely hyaline, with exception of parts of mandibles and claws which are slightly sclerotized.

As the specimens studied are already mounted in balsam I am not able to decide if the clearness of the specimens is really a characteristic of the species. However, the presence of another entirely hyaline species on the same host species, although belonging to a different genus (*Psittococcus*), makes me believe that this condition is a characteristic of this *Neopsittaconirmus*. Such a character and the transparency due to the previous process of mounting make it very difficult to draw and properly describe the specimens.

Male (figs. 78-82). Head with post and preantennal region practically of the same length; marginal carina wide; ventral carinae slightly outlined; guttate process very slightly outlined; ventral sub-marginal seta (v.s.m.s. 1) longer than in the other species. Coni small and triangular. First three antennal segments subequal in length; segment III slightly broadened at the distal extremity and with a small hook.

Pterothorax with only three long and one spine-like setae on either side of posterior margin (the holotype has four setae, one of which is quite smaller than the others, on one side).



Neopsittaconirmus emersoni, sp. n.: 78, male genitalia, ventral; 79, male genitalia, dorsal; 80, detail of last abdominal segment of male, ventral; 81, male antenna; 82, last abdominal segments of male, dorsal; 83, terminal segment of female, ventral.

Abdomen a little more than twice as long as wide at the level of the posterior margin of segment V. Tergo-lateral setae on segments II to VI; posterior margin of segment VII with, on each side, three setae nearly as long as the tergo-central setae; posterior margin of tergite VIII with five to six setae on either side, two of these setae much longer than the others.

Male genitalia with the basal apodeme short and wide; parameres very short, curved toward the midline and with bifid distal end; in dorsal view the mesosome is conical, with the apex truncate and turned back; penis very short.

Female similar to the male. The v.s.m.s. 1, however, is smaller and the antennae filiform. Abdomen longer than in the male, with the tergo central setae short; the posterior margin of segment VII is bare. Posterior margin of vulva truncate posteriorly and slightly concave; lateral margins convergent backward and having, each one, a pair of spine-like setae (fig. 83).

Measurements of types in mm

	Length		Width	
	♂	♀	♂	♀
Total	1.790	2.060	—	—
Head	.450	.450	.330	.330
Prothorax	.110	.120	.220	.220
Pterothorax	.220	.210	.350	.370
Abdomen	1.000	1.280	.440	.460

N. emersoni is a very characteristic species.

The absence of clearly demarked carinae and zones of sclerotization, the shape of male antennae, the chaetotaxy of pterothorax (3 long setae and a spine-like seta on either side) the presence of tergo-lateral setae on segments II to VI and the shape of genitalia of male and female, distinguish this species from all other up to now known. It is possible or even probable it is one of those species found on Psittaciformes of the genus *Kakatoe* (*albidus*, *capreolus* and *eos*), but it is not possible to say even if those species belong to the genus *Neopsittaconirmus*.

Type material: Holotype male and Allotype female (slide n.º 184.634) and Paratypes, 3 females (slide n.º 184.634), collected on *Kakatoe haematuropygia* (P. L. S. Müller), from San Pedro, Culion, Calamianes Is., Philippines, H. Hoogstraal col., 27.III.1947, in the Field Museum of Natural History; 4 males and 3 females, same data, in the K. C. Emerson Collection; and 1 male and 1 female in the Museu de Zoologia da Universidade de São Paulo.

***Neopsittaconirmus albidus* (Piaget, 1880)**

(Fig. 77)

Type host: *Coracopsis vasa* subsp.

Lipeurus albidus Piaget, 1880: 300, pl. 24, fig. 5 (in part); Taschenberg, 1882: 44: 114 (in part); Kellogg, 1908, 37 (in part).
Esthiopterum albidum; Harrison, 1916, 130 (in part).

Neopsittaconirmus albidus; Conci, 1942, 73: 37 (in part); Hopkins & Clay, 1952: 237.

Psittacicola albida; Guimarães, 1942, 2: 80 (in part).

Pflegeriella piageti Eichler, 1943, 11: 115.

The discussion on this species will be done together with the following species, *N. piageti*.

***Neopsittaconirmus piageti* (Eichler, 1943)**

(Fig. 76)

Type host: *Coracopsis nigra* subsp.

Lipeurus albidus Piaget, 1880: 300, pl. 24, fig. 5 (in part); Taschenberg, 1882, 44: 114 (in part).

Esthiopterum albidum; Harrison 1916, 9: 130 (in part).

Neopsittaconirmus albidus; Conci, 1942, 74: 37 (in part); Hopkins & Clay, 1942: 238.

Psittacacula albida; Guimarães, 1942, 2: 80 (in part).

Pflegeriella piageti Eichler, 1943, 11: 115.

Piaget described *N. albidus* based on males and females found on *Coracopsis vasa* and *Coracopsis nigra*.

In the description (p. 300) and in the explanation of fig. 5 (pl. 24), Piaget changed the sexes of the specimens of *N. albidus*: fig. 5b, said by Piaget to be the last abdominal segment of the female, is evidently the last abdominal segment of the male, and conversely fig. 5c, is, in fact, the last abdominal segment of the female in ventral view. Moreover, referring to the "females" found on *Coracopsis nigra*, Piaget says they have the last abdominal segment "habituellement plus large (comme la fig. 5b)". However, as we see some lines above, fig. 5b represents the terminal segments of a male, and not of a female. But based on Piaget's statement, Eichler named *piageti* the specimens found by the former on *Coracopsis nigra*.

In the Piaget Collection in the British Museum (N. History) there is only one pair of syntypes labeled as *Lipeurus albidus*: the female found on *Coracopsis vasa* and the male found on *Coracopsis nigra*. I select the female (slide n.º 788) as Lectotype of *Neopsittaconirmus albidus* (Piaget, 1880), and the male (slide 787) as Lectotype of *Neopsittaconirmus piageti* (Eichler, 1943).

Only a comparison of more materials of both sexes collected on those two species of *Coracopsis* can clear up the question of the relationships between *N. albidus* and *N. piageti*. A female found on *Coracopsis n. nigra*, from Madagascar (slide n.º 13.483, Meinertzhagen Collection) is practically identical to the Lectotype of *N. albidus*.

Without doubt the *Neopsittaconirmus* found on *Coracopsis* are different from the other *Neopsittaconirmus* so far known. It looks like the African species in chaetotaxy; as in the African species the tergo-lateral setae are present only on either side of segment IV and are of the same length as in *N. gracilis*, sp. n., and *N. abnormis*, sp. n. The shape of the vulva (fig. 83), although characteristic, is more or less intermediary between that of *N. africanus*, sp. n. and the species which show it long and tapering backward. The male genitalia, although in poor condition, seem to be very different from the other species of the genus, but the chaetotaxy of segment VIII shows the same type of spine-like setae as in *N. africanus*, sp. n.

Even the study of a pair belonging to the Emerson Collection, collected on *Coracopsis v. vasa*, from Bemandy, Ft. Dauphin Distr., Madagascar, H. Hoogstraal col., 26.XII.1948, which I identified as *Neopsittaconirmus albidus* Piaget, does not allow me to reach a firmer conclusion, due the poor condition of the specimens. Even so, a drawing of the male genitalia and of the setae of the posterior margin of segment VIII is given. As one can see in the drawing (fig. 76) the posterior end of the genitalia is folded and in bad condition for study.

Neopsittaconirmus gracilis, sp. n.

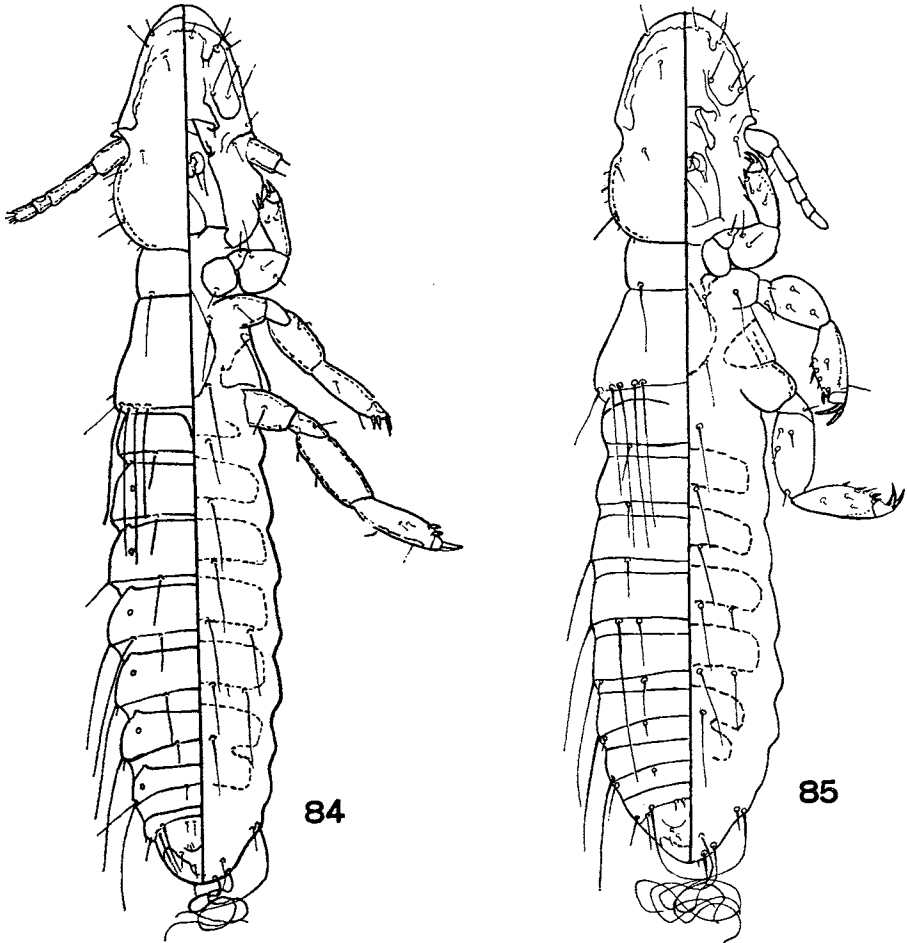
This species comprises two subspecies, which show the following characters in common.

Male. Preantennal region longer than the posantennal; ventral carinae apparently not reaching the guttate sclerotizations; clavi very small; sexual dimorphism of antennae also very small.

Abdomen more than twice as long as wide. Tergites I to VII with a tergo-central seta; the tergo-central setae of tergites VI and VII shorter than the anterior ones. Only tergite IV with a long tergo-lateral seta on either side. Latero-posterior corners with a median length seta on segment III, another longer on IV, one long and one short on segments V, VI and VII; on the last there is also a sensillum seta; VIII with three setae of different length. Posterior margin of tergite VIII slightly concave and fringed by a small number of setae: two pairs of small setae central and two other, larger, lateral. Tergite IX hyaline, with three very small setae on either side; terminal segment with a small seta and two other, longer, on either side of posterior margin; two or three small discal setae on dorsal surface, and a long one, but shorter than the setae of posterior margins, on the ventral surface. Abdominal sternites apparently entire with, at least, a pair of sterno central setae on segments I to VI.

Male genitalia. Basal apodeme short, a little longer than wide, with a tooth-like backward projection on each of the latero-posterior corners (in dorsal view); parameres short, converging toward the midline, their lateral margin slightly concave and the medial one nearly straight;

mesosomal complex simple with the lateral margins rounded; penis short and wide, having on the base two plates more sclerotized than the remainder of the mesosome.

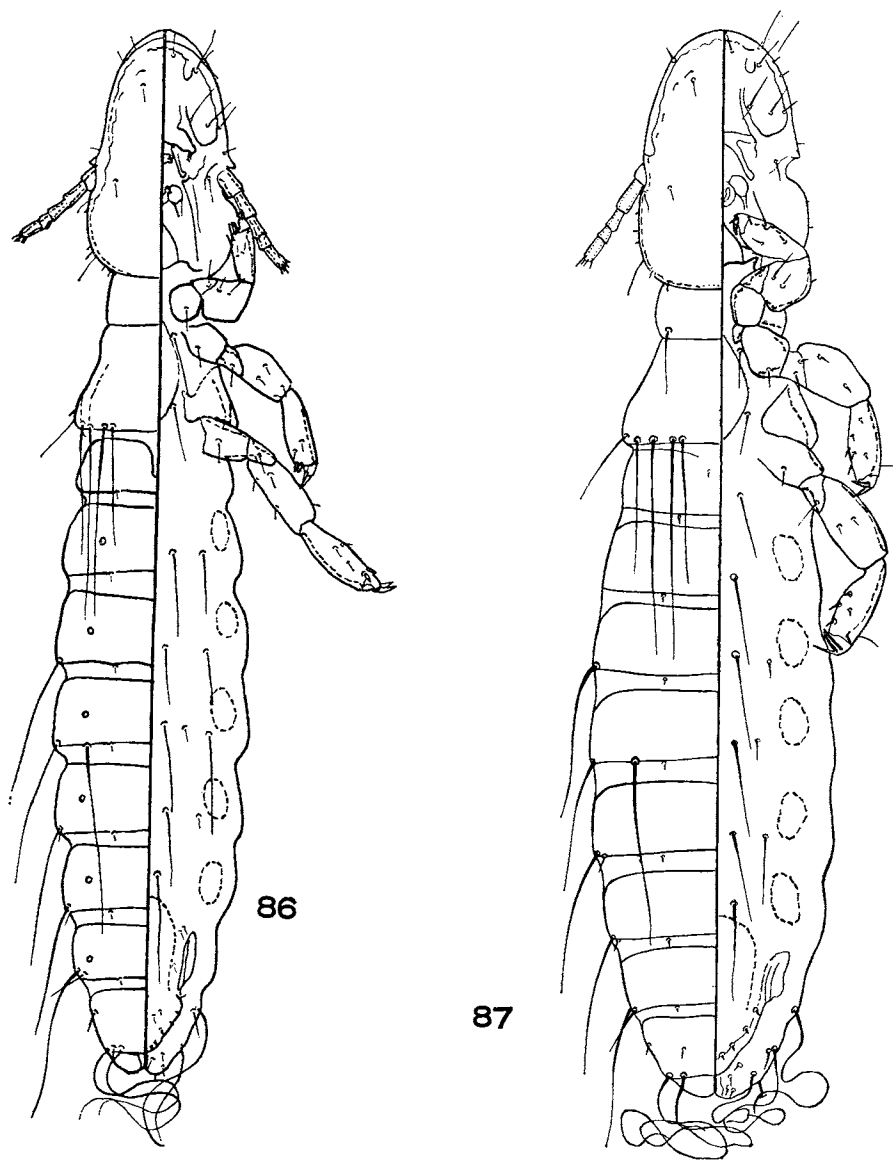


Males: 84, *Neopsittaconirmus g. gracilis*, subsp. n.; 85, *N. gracilis inexpectatus*, subsp. n.

Female similar to the male; its abdomen, however, is longer. Chaetotaxy of the seven anterior tergites as in the male, but tergo-central setae much smaller and those of latero-posterior corner of segment III much longer.

Vulva posteriorly angulous and with some spine-like setae on the lateral margins. This species is different from those previously described because it is smaller, the preantennal region is distinctly longer than the post-antennal, sexual dimorphism of antennae is nearly absent, the number of setae on the posterior margin of tergite VIII is smaller, and by the shape of male genitalia. The presence of tergo-lateral setae only

on segment IV places it with *piageti*, *strepsiceros* and *africanus*, sp. n., but the shape of vulva and male genitalia is sufficient to separate it from the above cited species. The much longer tergo-lateral setae of tergite IV also distinguish it from the last two species. The tooth-like process of the latero-posterior corners of the basal apodeme of the new species shows some similarity with those found on *africanus*, sp. n.; the shape of the parameres and mesosome are, however, entirely different.



Females: 86, *Neopsittaconirmus g. gracilis*, subsp. n.: 87, *N. gracilis inexpectatus*, subsp. n.

***Neopsittaconirmus gracilis gracilis*, subsp. n.**

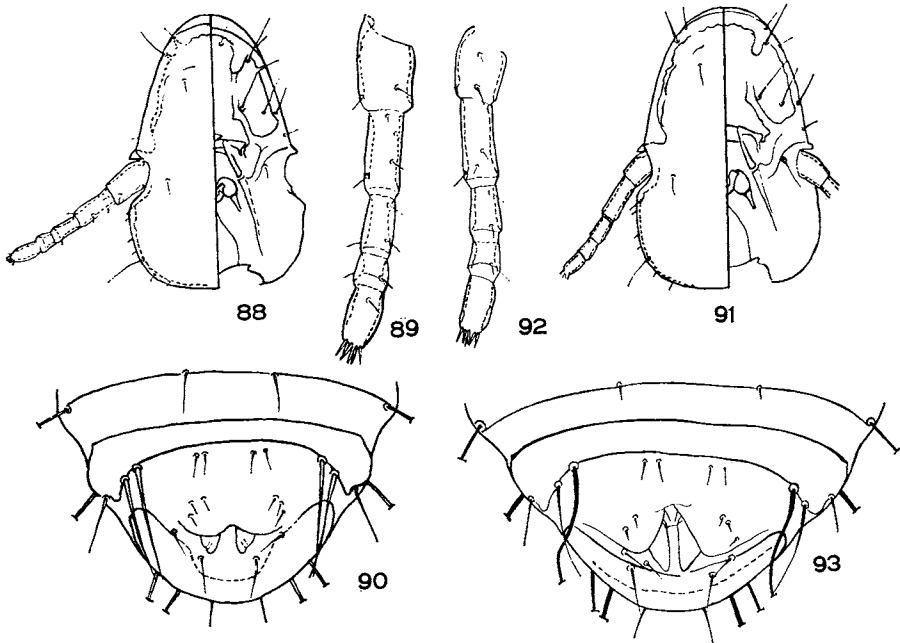
(Figs. 84, 86, 88-90, 94, 96-97)

Type host: *Agapornis personata* Reichenow

This subspecies is characterized by its elongate facies; by the great development of the hyaline region of the anterior margin of the head and by the funnel-shaped preantennal region. The first abdominal tergal plate is nearly split along the midline and the more lateral setae of the posterior margin of tergite VIII of male are relatively short and of similar length.

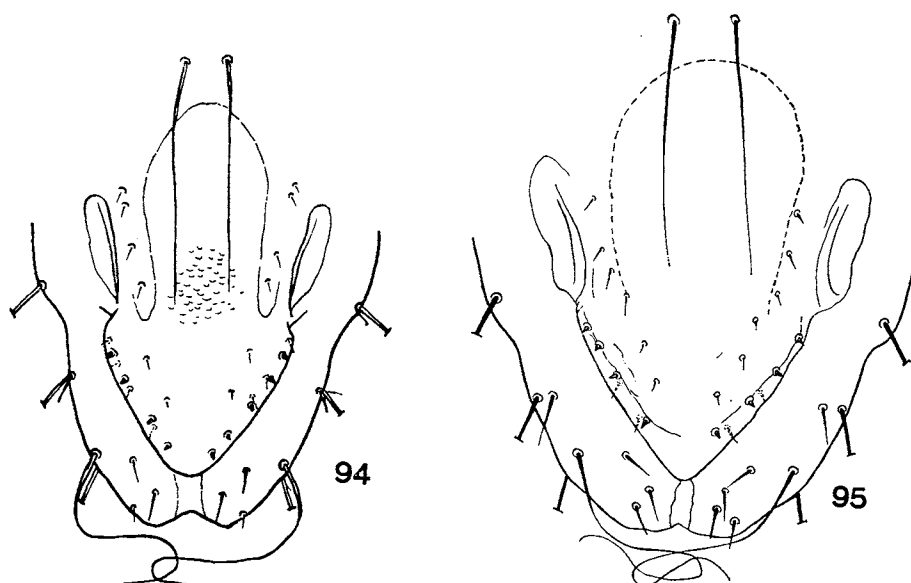
Measurements of types in mm

	Length		Width	
	♂	♀	♂	♀
Total	1.390	1.710	—	—
Head	.380	.410	.240	.250
Prothorax	.090	.090	.170	.180
Pterothorax	.150	.170	.250	.280
Abdomen	.760	1.050	.280	.320



Neopsittaconirmus g. gracilis, subsp. n.: 88, head of male; 89, antenna of male; 90, last abdominal segments of male, dorsal. *N. gracilis inexpectatus*, subsp. n.: 91, head of male; 92, antenna of male; 93, last abdominal segments of male, dorsal.

Type material: Holotype male, Allotype female and Paratype female, collected on *Agapornis personata*, from Dodoma, Tanzania (Tanganyika), in the British Museum (Natural History) (Meinertzhagen Collection ns. 20594a, 20594b, and 20594).



Terminal segment of female abdomen, ventral: 94, *Neopsittaconirmus g. gracilis*, subsp. n.; 95, *N. gracilis inexpectatus*, subsp. n.

***Neopsittaconirmus gracilis inexpectatus*, subsp. n.**

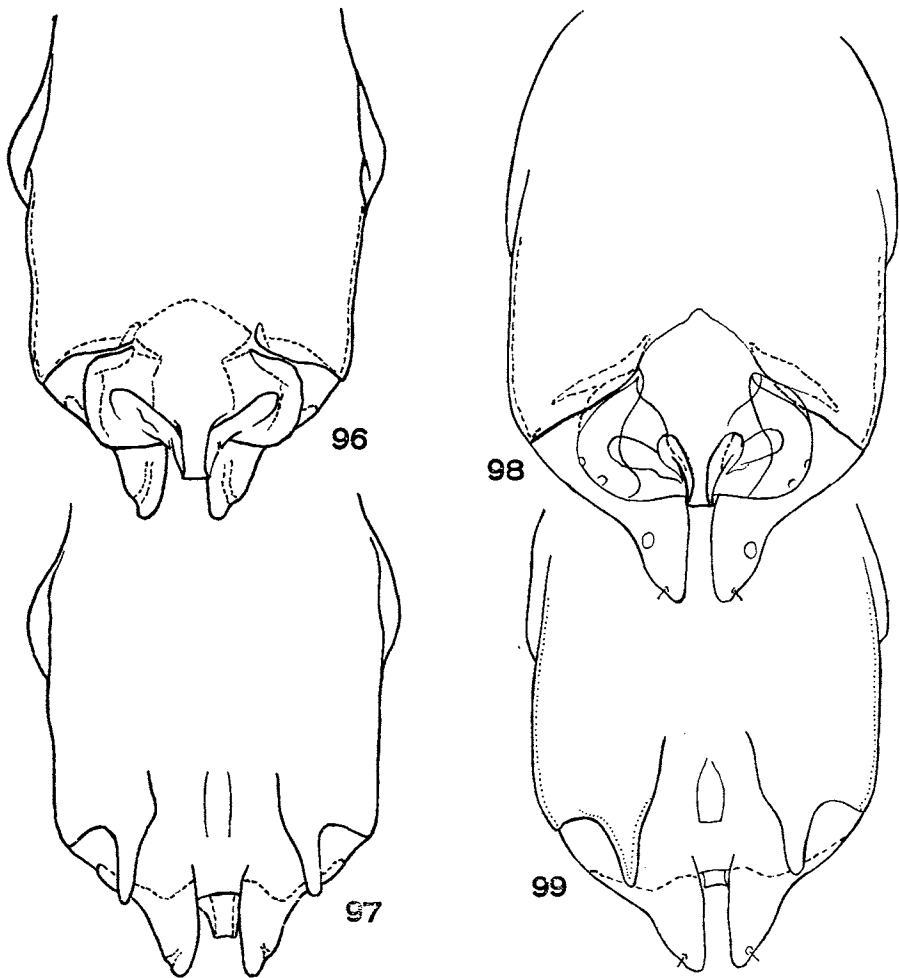
(Figs. 85, 87, 91-93, 95, 98, 99)

Type host: *Polihhiërax semitorquatus castanonotus* (Heuglin)

This subspecies is stouter than the nominal subspecies, that is, the relation length-width of head, thorax and abdomen are always smaller than in *N. g. gracilis*, subsp. n.; the hyaline region is only a small band and the preantennal region is more rounded. The lengths of the more lateral setae of the posterior margin of tergite VIII are very different, that is, one of them is three or four times as long as the other. It was not possible to check whether the tergal plate of the 1st tergite is like in the nominal subspecies, but it seems that the anterior margin of the tergal plate is only shallowly concave on the midline. The male genitalia, although practically identical in both subspecies, show some slight differences in the mesosome.

Measurements of types in mm

	Length		Width	
	♂	♀	♂	♀
Total	1.320	1.720	—	—
Head	.360	.410	.260	.290
Prothorax	.080	.090	.190	.210
Pterothorax	.140	.170	.280	.340
Abdomen	.710	1.050	.300	.410



Genitalia of males. *Neopsittaconirmus g. gracilis*, subsp. n.: 96, ventral; 97, dorsal. *N. gracilis inexpectatus*, subsp. n.: 98, ventral; 99, dorsal.

Type material: Holotype male and Allotype female (slide n.º 18.547a), and Paratypes 10 males and 21 females (slides ns. 18.547), collected on *Polihierax semitorquatus castanonotus*, from Buramo, Somaliland, February 1949, in the Meinertzhagen Collection, British Museum (N. History). Dr. Clay advises me that she has in the collection *Neopsittaconirmus* collected on four other type host specimens: 18489 and 18555, with the same data as the types; 18479, from Deragodlet, and 18689, from Hargeisa, all localities in Somaliland and also taken in February, 1949.

Remarks. The presence of *Neopsittaconirmus* on *Polihierax semitorquatus castanonotus*, a falconiform of the family Falconidae, subfamily Polihieracinae, seems to me a typical case of secondary infestation. The subfamily Polihieracinae is composed of five genera occurring in Central and South America (*Gampsonyx*), Argentine (*Spizapteryx*), Southeastern Asia to Philippines (*Microhierax*), Burma and south (*Neohierax*), and Africa, from, Ethiopia and Somalia (Somaliland) to Lesotho (Basutoland) (*Polihierax*). According to Clay (1955) at least two of these genera have a curious biting-lice fauna. *Gampsonyx* and *Neohierax* have species of *Degeeriella*, typical of Falconiformes; *Spizapteryx* has no Mallophaga known, *Microhierax* has, at least, three species of *Falcolius*, which is very near to if not the same as *Colilipeurus* — a genus found only on Coliiformes, which is a small order of doubtful affinities occurring only in the Ethiopian Region, and *Polihierax* is parasitized by the subspecies of *Neopsittaconirmus* now described.

According to Dr. Clay's paper the *Neopsittaconirmus* were taken on *Polihierax* under conditions which preclude any possibility of contamination. Of eleven specimens of *Polihierax* examined, five specimens from three different localities in Somaliland furnished 56 specimens of *Neopsittaconirmus*; the other six had no Mallophaga. Mr. John G. William, of the Coryndon Museum, Nairobi, wrote Miss Clay that (in litt.) "in British Somaliland the parrot *Poicephalus rufiventris* roosts in the nests of the buffalo weaver and that *Polihierax semitorquatus* takes over the old nests of this weaver for nesting purposes". This would explain very clearly the occurrence of *Neopsittaconirmus* on *Polihierax* as a case of natural straggling or of a parrot parasite permanently established on the hawk. However, the two species of *Neopsittaconirmus*, *abnormis*, sp. n., and chiefly *africanus*, sp. n., found on species of *Poicephalus* are of different types from the subspecies found on *Polihierax*. So, although the distribution of some species overlaps that of *Polihierax*, species of the genus *Poicephalus* might be excluded as primary hosts of the biting-lice from which *Neopsittaconirmus gracilis inexpectatus*, subsp. n., evolved. The same may be said of the *Neopsittaconirmus* found on other African parrot genera, *Psittacus*, *Psittacula* and *Coracopsis* (species of this last genus occur only in Madagascar and adjacent islands). It is true that *N. abnormis*, sp. n. shows several characters that bring it near *inexpectatus*. Without doubt, however, the latter form is so near *gracilis*, that it would be difficult to consider it more than a subspecies of it. As we have already seen, *g. gracilis* is found on *Agapornis personata*. It is known that no species of *Agap-*

pornis occurs in the localities from where the *Polihierax* with *Neopsittaconirmus* come, or in any other region of Somalia. However two subspecies of *Agapornis taranta* overlap partially the distribution of *Polihierax semitorquatus castanonotus* in Ethiopia, and *Agapornis personata* (type-host of *gracilis*) has possibly some contact with *Polihierax s. semitorquatus* in Tanzania (Tanganyika). So, two alternatives may be presented to explain the presence of a form of *Neopsittaconirmus* on *Polihierax semitorquatus castanonotus*; a) the primary host of *inexpectatus* is *Agapornis taranta* (no Mallophaga is known from this parrot) from which the *Neopsittaconirmus* transferred to and spread over the population of *Polihierax*, reaching the north of Somalia, and b) *Polihierax* acquired its *Neopsittaconirmus* from *Agapornis personata*, and the louse evolved into a different form on its new host species. In any case, to clear up this very interesting situation it is necessary to study the *Neopsittaconirmus* occurring on the forms of *Agapornis* and in different regions of the distribution of *Polihierax*. Anyway, it seems that the hawks belonging to the subfamily Polihieracinae are quite receptive to Mallophaga from other groups of birds, since *Microhierax* has another species of louse belonging to the Amblycera, which does not belong to any genera typical of Falconiformes (Clay, 1955).

***Neopsittaconirmus abnormis*, sp. n.**

(Figs. 100-107)

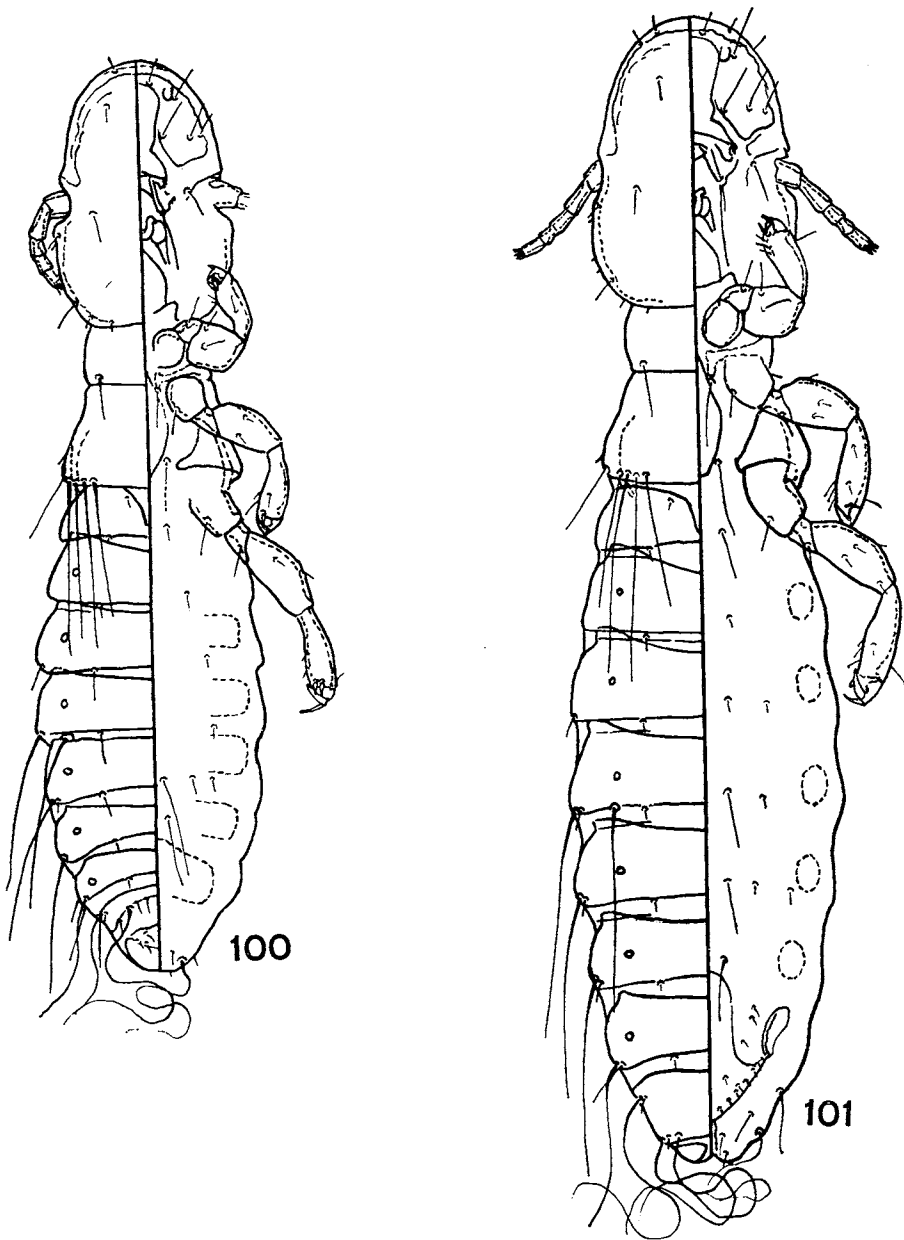
Type host: *Poicephalus meyeri* probably subsp. *transvaalensis*

Male (fig. 100). Head as in fig. 102.

Ventral carina little sclerotized, apparently not reaching the marginal one. Antennae without sexual dimorphism; segment I the largest, segments III and IV subequal and shorter than V.

Pterothorax slightly wider than long, the four setae on each side of the posterior margin equidistant.

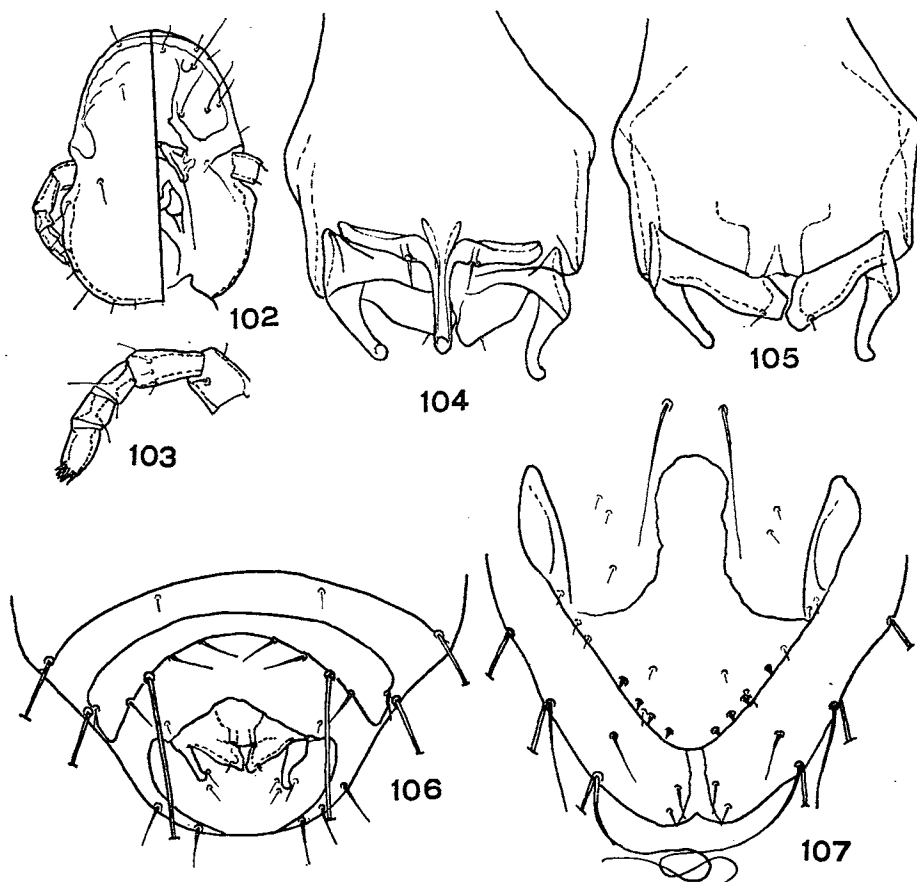
Abdomen twice as long as wide. Tergal plate I with a deep longitudinal incision on the midline, almost divided in two; tergites I to VII with a short tergo-central seta on each side, those of tergites III to V longest; only tergite IV with a tergo-lateral seta much longer than the tergo-central ones. Latero-posterior corners with a medium long seta on segment III, a long one on IV, a long and a very short on V to VII; on the latter a sensillum; segment VIII with three setae, one short, one medium and one long. Posterior margin of tergite VIII (fig. 108) with four setae on either side, three short and one very long. Terminal segment with three short discal setae on either side of the midline and two or three, also short, on the posterior margin. Sternal surface with very few setae; sternal plates very poorly outlined, especially on the midline; sternal surface of the last segment with two setae, one short and one long, on either side of the midline.



Neopsittaconirmus abnormis, sp. n.: 100, male; 101, female.

Male genitalia (figs. 104, 105) short, basal apodeme with the anterior half not sclerotized and with the lateral margins divergent; distal half with the lateral margins parallel and with sclerotized bands; parameres showing clearly two pieces; penis nearly as long as the parameres.

Female (fig. 101) similar to the male, having, however, the abdomen longer. The chaetotaxy of the first seven tergites as in the male; the tergo-lateral setae are still smaller. Genital plate and vulva as in fig. 107.



Neopsittaconirmus abnormis, sp. n.: 102, head of male; 103, antenna of male; 104, male genitalia, ventral; 105, male genitalia, dorsal; 106, last abdominal segments of male, dorsal; 107, terminal segment of female abdomen, ventral.

Measurements of the type in mm

	Length		Width	
	♂	♀	♂	♀
Total	1.310	1.640	—	—
Head	.370	.420	.270	.300
Prothorax	.085	.090	.200	.220
Pterothorax	.140	.160	.270	.310
Abdomen	.690	.970	.340	.400

In the chaetotaxy of the tergites, the absence of sexual dimorphism of the antennae and the size of the specimens, this species is somewhat similar to *N. gracilis*. The shape of the male genitalia, however, is quite different. With exception of the basal apodeme, that shows some similarity with that of *gracilis*, every other piece of the genitalia is clearly different. The anterior margin of the head is rounded as in *gracilis*, and the posantennal region is, at least, of the same length as the preantennal one. The length of the setae of the posterior margin of tergite VIII also distinguishes *N. abnormis* from *N. gracilis*. As we saw, in *N. g. gracilis* the two more lateral setae of the region are short and of the same length. In *N. gracilis inexpectatus* one of the setae is three to four times longer than the other. In *abnormis* one of these setae is several times longer than the other, and the smaller one is as long as the tergo-central setae. In the proportions of the several parts of the body, shape of anterior margin of head, and small development of hyaline margin of the anterior margin of the head, *N. abnormis* is, at least superficially, more related to *N. gracilis inexpectatus*. It is really strange that *N. abnormis*, found on a parrot of the genus *Poicephalus* be much more related to the forms found on *Agapornis* and *Polihierax* than to the species found on other species of *Poicephalus* (such as *N. africanus*, sp. n.), especially those on *Poicephalus meyeri neavei*, not more than subspecifically different from the host of *N. abnormis*.

Type material: Holotype male, Allotype female and Paratypes 8 females, from *Poicephalus meyeri* probably *transvaalensis* Neumann, from Debeete, Botswana (Bechuanaland), in the British Museum (Natural History).

***Neopsittaconirmus strepsiceros* (Nitzsch, 1866)**

(Figs. 108-113)

Type host: *Psittacus e. erythacus* L.

Lipeurus strepsiceros Nitzsch, 1866, 27: 118; Giebel, 1867, 28: 379; Giebel, 1874: 215; Gurlt, 1878, 44: 179; Piaget, 1880: 303; Taschenberg, 1882, 44: 115, pl. 3, figs. 12, 12a; Kellogg, 1908: 44.

Esthiopterum strepsiceros; Harrison, 1916, 9 (1): 142.

Neopsittaconirmus strepsiceros; Conci, 1942, 74: 37; Hopkins & Clay, 1952: 238.

Psittacicola strepsicera; Guimarães, 1942, 2: 80.

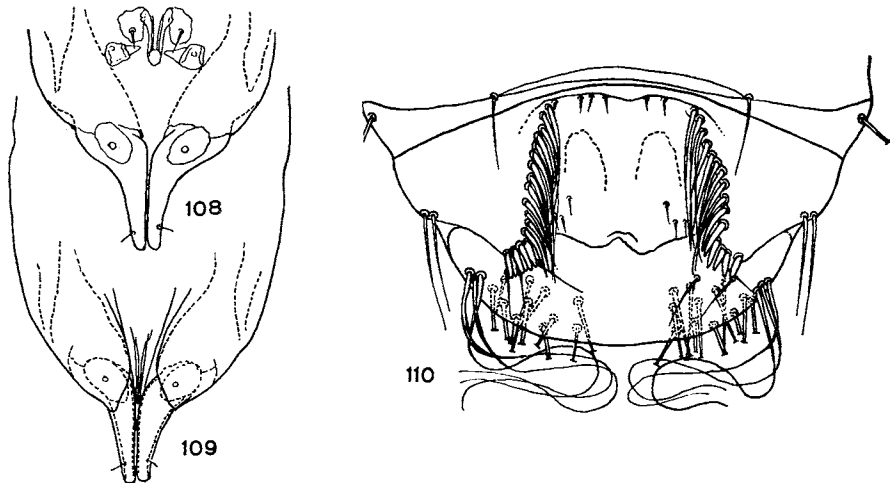
Besides the original description, the two other ones (Giebel, 1874 and Taschenberg, 1882) were based on the typical series of specimens. Since this material was destroyed during the 1939-1945 war, selection of neotypes is obviously necessary.

Male. Head as in fig. 112; preantennal region slightly funnel-shaped; post-antennal region somewhat larger than the preantennal, chiefly at the level of the eyes. Antennae long with verrucous process

conspicuous, chiefly the proximal end of segment III. Coni small and slightly curved.

Setae on the posterior margin of the pterothorax equidistant.

Abdomen with the tergal plate slightly narrower toward the median line; tergo-central setae very short; tergo lateral setae also very short and present only on segment IV. Posterior margin of segment VIII (fig. 110) deeply concave so that its median region is only a very narrow



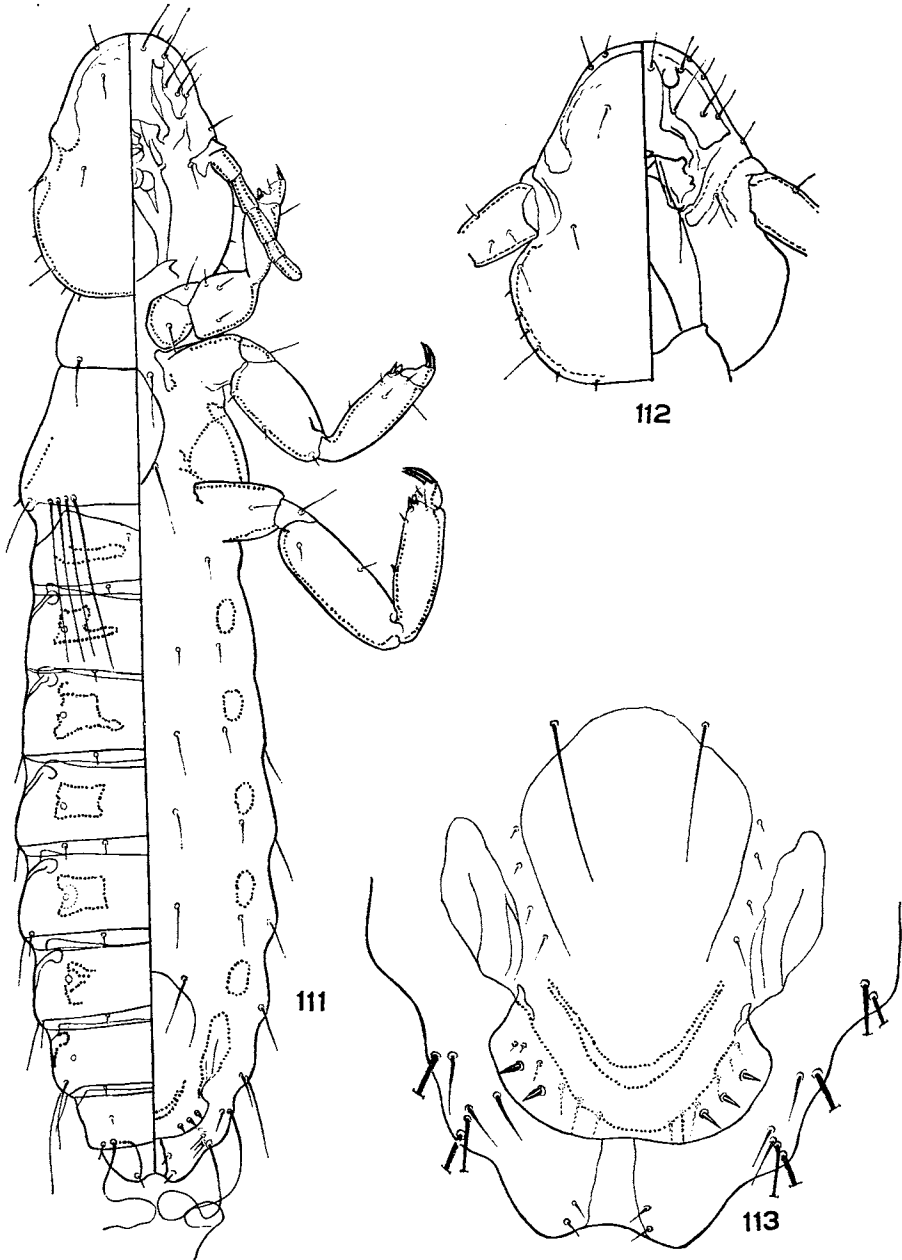
Neopsittaconirmus strepsiceros: 108, male genitalia, ventral; 109, male genitalia, dorsal; 110, last abdominal segments of male, dorsal.

band; the setae on the lateral edge of the concavity are long and strong (more than 10 on each side), the more lateral ones are spine-like setae and the median ones are very short, contrasting very clearly with the laterals. Terminal segment with five or six tergal setae on either side, the more lateral ones much longer. On the sternal face this segment shows 11 to 12 setae, including those of posterior margin. The sternal plates seem interrupted on the midline or, at least, they are more sclerotized on the sides.

Male genitalia (fig. 108-109), with the basal apodeme once and one half as long as wide, with the lateral margins slightly convex; parameres short, their length nearly half the width of the basal apodeme, slightly curved toward the midline; penial complex short; endomerical plates wider than long, with tapering internal extremity. Dorsally the mesosome is cuneiform, with the tapering apices looking backward, and with a somewhat sclerotized median band.

Female (figs. 111, 113). Differs from the male in having the preantennal region more rounded, and the post-antennal narrower at the level of the eyes, so that the contrast between the two regions is less marked; the conic are smaller, not curved backward, the antennae filiform. The abdomen is longer and the tergo-central and tergo-lateral

setae very small, clearly shorter than in the male. Vulva with the posterior margin widely rounded but slightly re-entrant in the middle and paralleled by 5 or 6 spine-like setae (fig. 113).



Neopsittaconirmus strepsiceros: 111, female; 112, head of male; 113, terminal segment of female abdomen, ventral.

Measurements of the neotypes in mm

	Length		Width	
	♂	♀	♂	♀
Total	1.720	2.120	—	—
Head	.470	.480	.400	.380
Prothorax	.130	.130	.300	.300
Pterothorax	.240	.250	.410	.440
Abdomen	.870	1.260	.410	.500

This species is distinguished from the preceding ones by the presence of a very short seta on both sides of the posterior margin of tergite IV, by the more pronounced sexual dimorphism in the antennae, and by the shape of the male and female genitalia.

Type material. Neotype male and Neallotype female on *Psittacus e. erythacus*, respectively from Uganda and Cameroon, in the British Museum (Natural History).

***Neopsittaconirmus africanus*, sp. n.**

(Figs. 114-122)

Type host: *Poicephalus c. cryptoxanthus* (Peters)

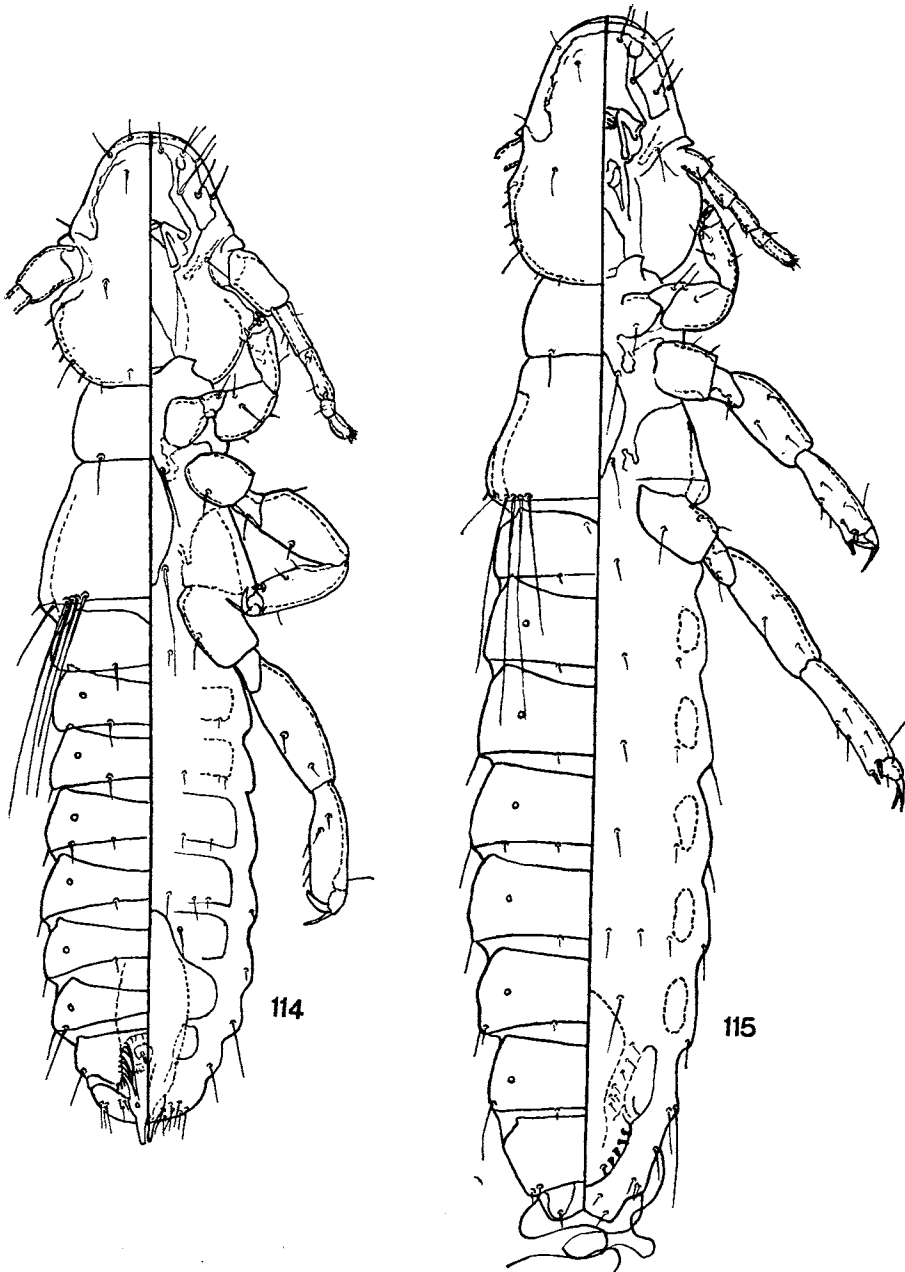
This species is similar to *N. strepsiceros* in the shape of body and chaetotaxy. The male and female genitalia are, however, sufficiently different that the two may be considered as separate species.

The basal apodeme is longer than in *strepsiceros* and nearly twice as long as wide; its lateral margins are not so convex as in *N. strepsiceros*; in dorsal view the basal apodeme has the distal end with two tapering projections, somewhat curved, reaching beyond the basal half of the parameres; these are longer than in *N. strepsiceros*, and longer than half the width of the basal apodeme. The penial complex and the endomerall plates are similar in *N. strepsiceros*, but the penis seems shorter in the new species. The median sclerotization of the mesosome (in dorsal view) is longer and more sclerotized than in *N. strepsiceros*.

The genitalia of the female differs chiefly in the shape of the genital plate and in the outline of the posterior margin of the vulva. The genital plate of the new species is longer and narrower than in *strepsiceros* and the reticulate structure of the distal half of the plate is much more conspicuous, since such a structure is very faint in *strepsiceros*. The free margin of the vulva (posterior margin) is ellipsoid in *africanus*, sp. n., and paralleled by 8 to 11 spine-like setae.

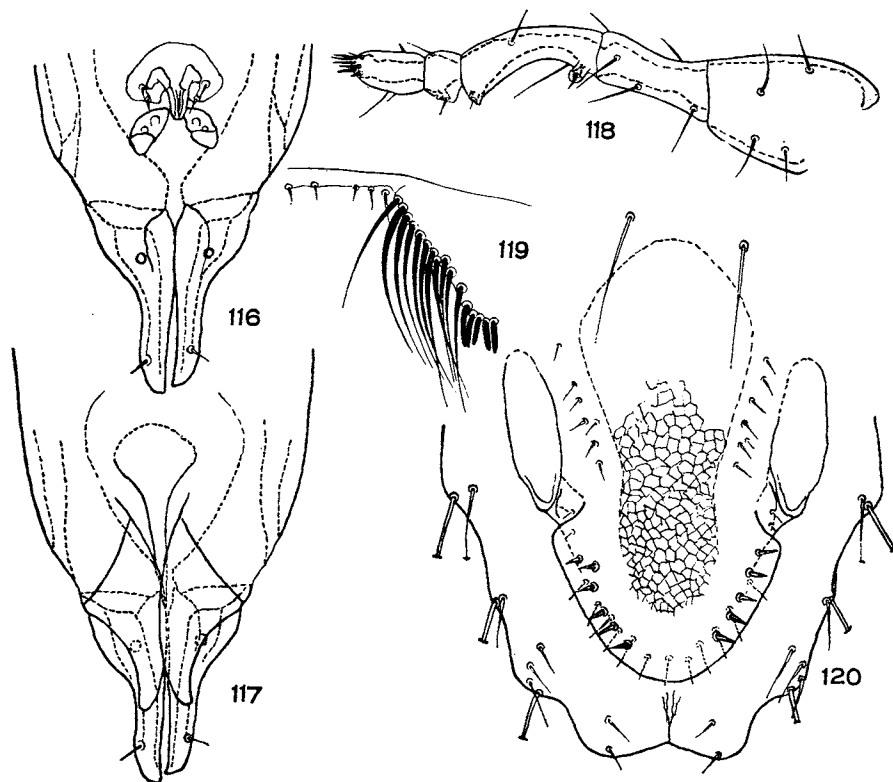
The free margin of vulva of the females of *africanus*, found on *Poicephalus gulielmi massaicus* (fig. 122) is somewhat less ellipsoidal than in the specimens from the type-host (fig. 120) and from *Poicephalus*

meyeri neavei. Such a difference could induce me to consider those specimens as a subspecies of *africanus*. I believe, however, that at present it is better to leave them in the same taxon since besides the natural



Neopsittaconirmus africanus, sp. n.: 114, male; 115, female.

variation in populations from different hosts, the females found on *Poicephalus rufiventris* are intermediate between the specimens from *Poicephalus cryptoxanthus* and *Poicephalus meyeri neavei* and those from *Poicephalus gulielmi massaicus*.

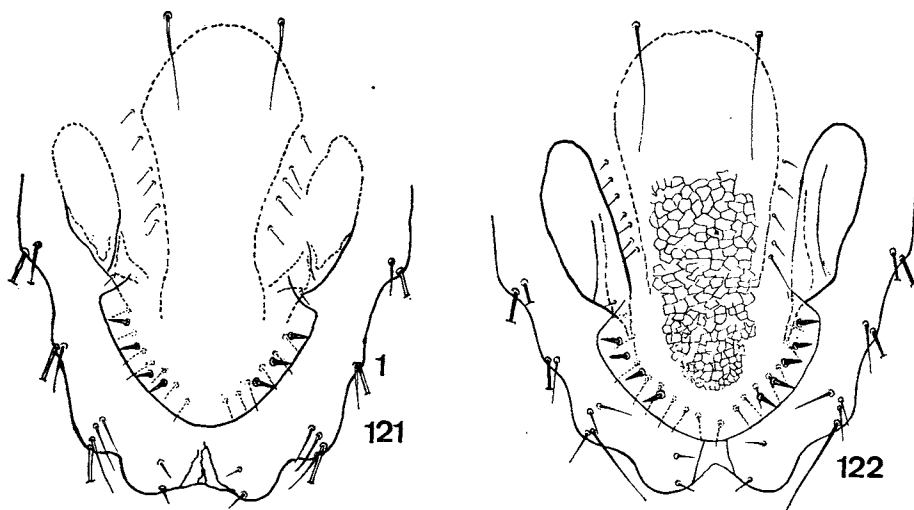


Neopsittaconirmus africanus, sp. n.: 116, male genitalia, ventral; 117, male genitalia, dorsal; 118, antenna of male; 119, detail of segment VIII of male; 120, terminal segment of female abdomen, ventral (figs. 118 and 119 from *Poicephalus gulielmi massaicus*; figs. 116, 117 and 120 from *Poicephalus c. cryptoxanthus*).

Measurements of types in mm

	Length		Width	
	♂	♀	♂	♀
Total	1.850	2.260	—	—
Head	.470	.490	.380	.370
Prothorax	.130	.140	.310	.310
Pterothorax	.260	.260	.420	.440
Abdomen	.990	1.360	.420	.470

Type material: Holotype male, Allotype female and Paratypes 5 females from *Poicephalus c. cryptoxanthus* (Peters) from Mabelikwa, Transvaal, Republic of South Africa, F. Zumpt col., 16.I.1957, in the British Museum (Natural History). I examined two more males and seven females found on *Poicephalus gulielmi massaicus* (Fischer & Reichnow), from Kenya (Meinertzhagen Collection), one male and five females found on *Poicephalus r. rufiventris* (Rüppell), from Somalia (Somaliland) (Meinertzhagen Collection n.º 18.656), belonging to the British Museum (Natural History); one male and one female, found on *Poicephalus meyeri neavei* (C.H.B. Grant), respectively from Kiamalwa, Kalule-Nord, Katanga (3.III.1949) and from Kaziba (alt. 1140 m), Katanga (20.I.1948), Republique Démocratique du Congo, collected by the Mission G. F. de Witte, belonging to the Institut des Parcs Nationaux du Congo, Brussels, Belgium.



Neopsittaconirmus africanus, sp. n.: 121, terminal segment of female abdomen, ventral (from *Poicephalus rufiventris*); 122, terminal segment of female abdomen, ventral (from *P. gulielmi massaicus*).

Neopsittaconirmus kea (Kellogg, 1907)

(Figs. 123-126)

Type-host: *Nestor notabilis* Gould

Lipeurus circumfasciatus var. *kea* Kellogg, 1907, 14: 122; Kellogg, 1908: 38.

Lipeurus kea; Harrison, 1916, 9: 136

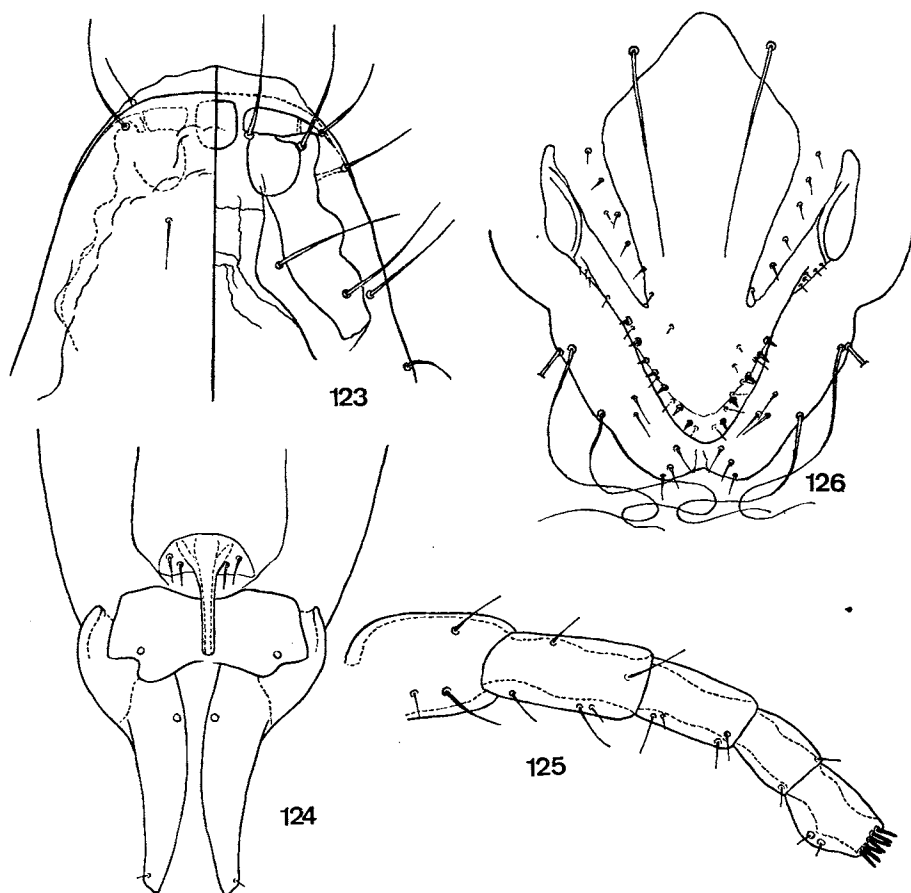
Neopsittaconirmus kea; Conci, 1942, 74: 37; Hopkins & Clay, 1952: 238

Psittacicola kea; Guimarães, 1942, 2: 81, figs. 1-5.

This is one of most conspicuous species of the genus *Neopsittaconirmus*, distinguished from all other species by several peculiar characters.

Differently from the other species of the genus, the marginal carina shows, in ventral view, two small interruptions on the anterior region, and the median portion is a small quadrangular plate, longer than wide, and with rounded angles.

The type of sexual dimorphism of the antennae is also different from that found in other species. The antennal segments are stouter and longer in the male; the two verrucous processes of segment III, found



Neopsittaconirmus kea: 123, pre-antennal region of female head; 124, male genitalia, ventral; 125, male antenna; 126, terminal segment of female abdomen, ventral.

in several species of *Neopsittaconirmus*, are reduced to only one, placed near the distal end of the segment; there is also a similar process at the distal end of the 4th — as in *N. strepsiceros* and *africanus* — and the last segment has the ventral margin produced, sometimes giving the antennae the shape figured by Guimarães in 1942.

This is the only species of *Neopsittaconirmus* with five setae on each side of the posterior margin of the pterothorax and in which the tergo-lateral setae of the abdomen are entirely absent; the tergo-central setae, however, are much longer than in the other species.

The other characters are as in the remaining species.

The carinae of the head are conspicuous, the edge of the marginal carina being somewhat sinuous. The tergal bands of the abdomen are blackish on the sides; the posterior margin of tergal plate VII is deeply re-entrant and fringed by several setae.

Male genitalia (fig. 124) with basal apodeme slightly more than twice as long as wide, the lateral margins paralleled by somewhat sclerotized bands along their posterior two thirds. Parameres shorter than the maximum width of the basal apodeme, wider at the base, narrowing toward the apex, truncated; endomerale plate more than twice as long as wide, with a concavity on each latero-posterior angle. Penis relatively long and narrow, with semilunar basis.

The drawings of this species and the description of the male genitalia were based on only one specimen in good condition, found on *Nestor meridionalis*. The male specimen found on *Nestor notabilis* (type host of *N. kea*), not in good condition, has the parameres ending in a point and not truncate as in the specimen described. The specimen is also larger (1.950 mm) than the one found on *Nestor meridionalis*.

Measurements of a couple found on *Nestor meridionalis*

	Length		Width	
	♂	♀	♂	♀
Total	1.720	2.210	—	—
Head	.540	.560	.380	.420
Prothorax	.110	.120	.270	.300
Pterothorax	.240	.260	.380	.450
Abdomen	.830	1.270	.470	.520

Material examined: 1 male and 2 females found on *Nestor notabilis* and 1 male found on *Nestor meridionalis*, from New Zealand, in the Museu de Zoologia da Universidade de São Paulo (Brasil); 3 females found on *Nestor meridionalis*, from New Zealand (Harrison Collection), in the British Museum (Natural History).

***Neopsittaconirmus anodis* (Neumann, 1891)**

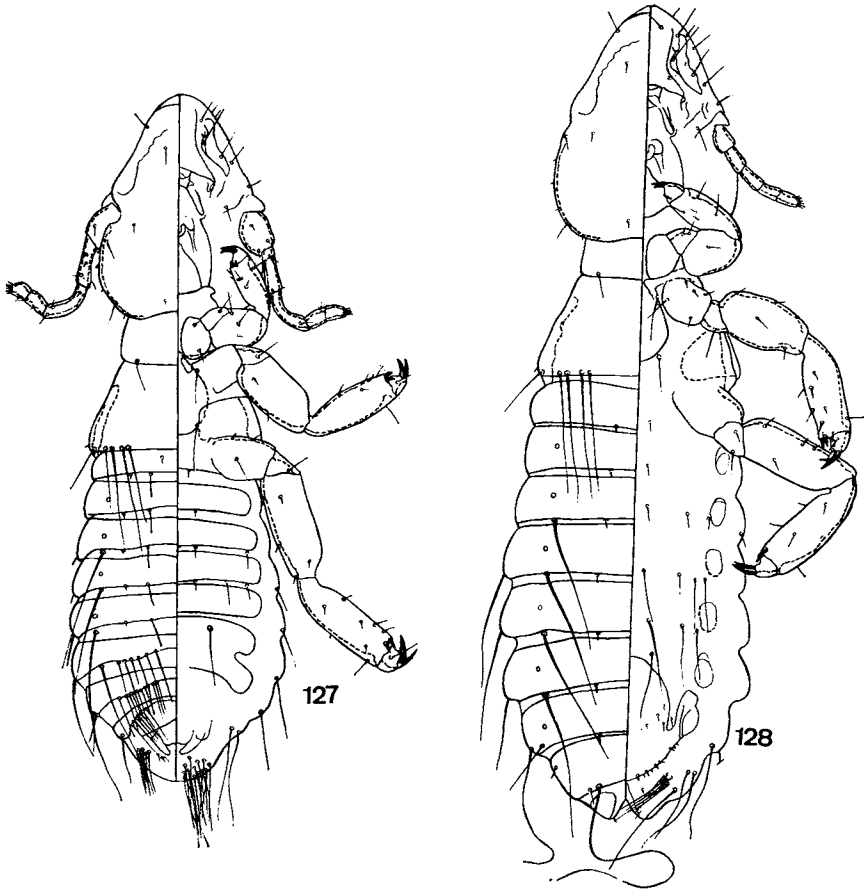
(Figs. 127-134)

Type-host: *Psittirichas fulgidus* (Lesson)

Lipeurus strepsiceros var. *anodis* Neumann, 1891, 25: 86, figs. 3a, 3b;
Conci, 1942: 37.

Neopsittaconirmus anodis; Hopkins & Clay, 1952: 237.

Probably because it had been described as a variety of *strepsiceros* this species was not included in Kellogg's (1908) and Harrison's (1916) lists of Mallophaga of the World.



Neopsittaconirmus anodis: 127, male; 128, female.

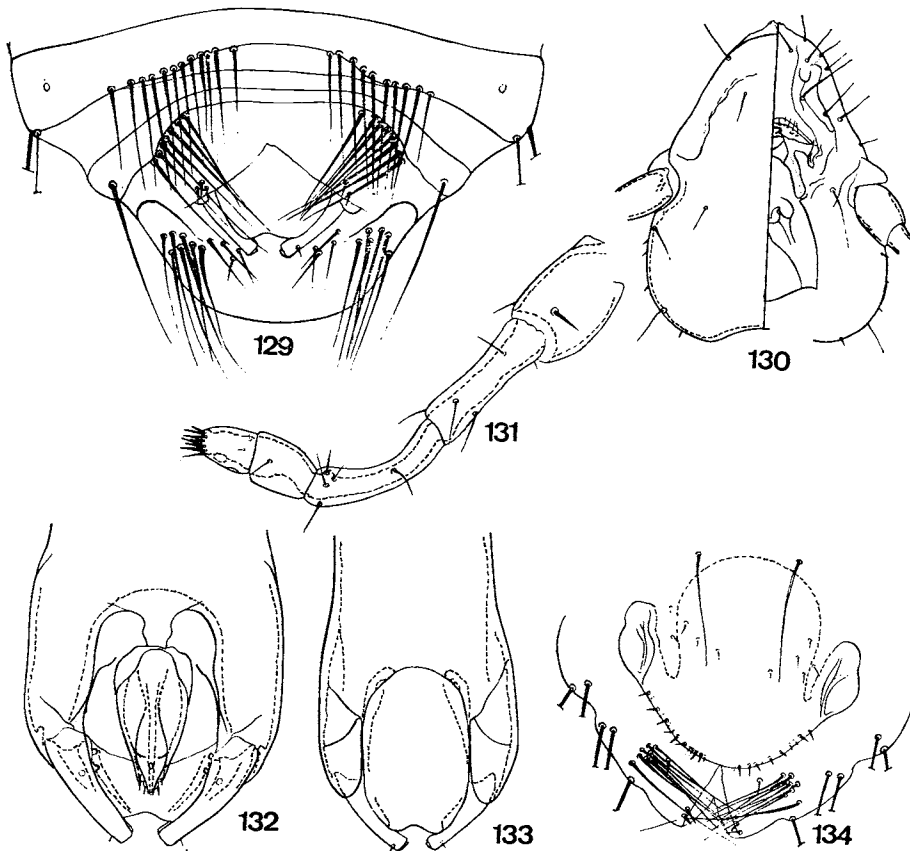
Neumann's description and figures, based chiefly on the antenna, leave no doubt about our identification. In fact, the male antenna of *anodis* is very characteristic, differing from all other species.

Male (fig. 127). Head with the preantennal region slightly funnel-shaped, and with the anterior margin paralleled by a wide hyaline margin; marginal carina wide and clearly outlined, and apparently interrupted between the ventral carinae; guttate sclerotization small and not very conspicuous. Coni relatively large. Antennae (fig. 131) long, without the process found in other species: segment I stouter than the following, although shorter than segments II and III; the latter about of the

same length; segment III strongly curved; segment IV longer than V and slightly widened toward the apex.

Pterothorax with 4 setae grouped two by two on each side of the posterior margin.

Abdomen not quite twice as long as wide; tergal bands blackish on the sides, the bands on the first five segments of the same length, those on segments VI to VIII shorter than the anterior ones, and gradually decreasing; sternal plate entire; the two posterior sternal plates fused.



Neopsittaconirmus anodis: 129, last abdominal segments of male; 130, head of male; 131, antenna of male; 132, male genitalia, ventral; 133, male genitalia, dorsal; 134, terminal segment of female abdomen, ventral.

Chaetotaxy of each side of the tergal face as follows: segments III to VI with a long tergo-lateral seta; I to V with a medium length tergo-central seta and one or two very small setae between the tergo-central setae and the lateral margin of the segment or between the tergo-central and the tergo-lateral setae; segment VI with 3 to 6 setae between the

midline and the tergo-lateral seta, VII with 10-12 setae; posterior margin of tergal plate VIII (fig. 129) broadly concave, with 6-10 medium setae on either side of the mid-line, which is bare. Terminal segment with 8-10 setae on the dorsal aspect, the laterals grouped, and 15-20 setae on the midline of the ventral surface.

Male genitalia (figs. 132, 133), with the basal apodeme slightly widened posteriorly, with latero-posterior angles rounded in dorsal view; parameres half as long as the width of the basal apodeme, converging toward the middle, slightly arcuate, truncate. In dorsal view the mesosome is an ellipsoid plate, once and a half as long as wide, with slightly concave posterior margin; penian complex pyriform; penis fusiform.

Female (fig. 128). Head, thorax and legs similar to the male; the conia are smaller and the antennae filiform. One very small tergo-central seta on each side of segments III to VII; one long tergo-lateral seta on each side of segments III to VI. Genital plate short and wide; posterior margin of vulva broadly rounded, fringed by 14-20 setae, some of which are spine-like. On each side, behind the vulva, a patch of setae.

Measurements of neotypes (in mm)

	Length		Width	
	♂	♀	♂	♀
Total	1.910	2.180	—	—
Head	.590	.630	.440	.490
Prothorax	.140	.140	.320	.340
Pterothorax	.230	.240	.500	.540
Abdomen	.950	1.180	.580	.710

Neopsittaconirmus anodis is distinguished from all other species of the genus by the following characters: a) facies stouter; b) guttate process little developed; c) type of sexual dimorphism of antennae; d) chaetotaxy of the tergal face of male abdomen; e) shape of male genitalia; f) shape of female genitalia; and g) presence of a group of setae on either side of posvulval region.

Type material: Neotype male, Neallotype female (slide n.º 13.361a) and Paratypes 13 males and 18 females from *Psittrichas fulgidus* (Lesson), from New Guinea, Meinertzhagen Collection, in the British Museum (Natural History).

Neopsittaconirmus paleornis (Eichler, 1943)

Type-host: *Psittacula derbyana* (Fraser)

Pflegeriella paleornis Eichler, 1943, 11: 114.

Neopsittaconirmus paleornis; Hopkins & Clay, 1952: 238.

Eichler's description of this species is too deficient, and I had no specimens from the type-host. However, the inclusion of the species in a genus based on Piaget's group "Lipeuri Biguttati" together with *circumfasciatus*, *albidus*, *piageti* and *taschenbergi* (*interruptofasciatus*), leaves no doubt that the species belongs to *Neopsittaconirmus*.

Species inquirendae

The following species are considered *species inquirendae* because it is not possible to identify them based on the original descriptions, the only records known (*albus* and *capreolus*), or because the description was based on immature specimens (*eos*). I suppose that Hopkins and Clay (1952) included them in the genus *Neopsittaconirmus* by inferential reasons, that is, because they were described as *Lipeurus* or *Nirmus* and psittacid species were said to be their hosts. I don't see, however, any inconvenience in that, in the future, the names given to them be used for lipeuroid Mallophaga found on the respective host species.

Lipeurus albus Le Souëf & Bullen, 1902

Type host: *Kakatoe g. galerita* (Latham)

Lipeurus albus Le Souëf & Bullen, 1902: 157, fig. 4; Kellogg, 1908: 37; Johnston & Harrison, 1912, 24: 8.
Esthiopterum album; Harrison, 1916, 9: 130.
Neopsittaconirmus albus; Hopkins & Clay, 1952: 237.

This species was described from specimens collected, according to the authors, on *Cacotua galerita* (sic), from Australia. Hopkins and Clay (1952) assume that the host is the nominal form.

It is, really, possible that it may be a *Neopsittaconirmus*. The original description doesn't allow one to be sure of the exact generic position, but the figure of Le Souëf and Bullen and the host suggest the possibility. Harrison (1916) considers *Lipeurus albus* a synonym of *Lipeurus capreolus*, attributing the same host species to both species of Mallophaga.

Lipeurus capreolus Gervais, 1844

Type host: *Kakatoe sulphurea* (Gmelin)

Philopterus (Lipeurus) capreolus Gervais, 1844, 3: 353.
Lipeurus capreolus; Giebel, 1874: 244; Gurlt, 1878, 44: 179; Piaget, 1880: 352; Kellogg, 1908, 66: 38; Conci, 1942, 74: 37.
Esthiopterum capreolum; Harrison, 1916, 9 (1): 132.
Neopsittaconirmus capreolus; Hopkins & Clay, 1952: 237.

The loss of the Mallophaga described by Gervais (Werneck, 1950, Os malófagos de mamíferos, Parte II, 63) makes impossible the identifi-

cation of this species, in its author's *sensu*. The original description of *L. capreolus* does not permit even to make suppositions about its generic position and Gervais' statement that the posterior rings of the abdomen are not entire throw still more doubt on the inclusion of the species in *Neopsittaconirmus*.

Lipeurus eos Giebel, 1874

Type host: *Kakatoe roseicapilla* (Vieillot)

Nirmus tenuis Rudow, 1870, 35: 471; Conci, 1942, 74: 38; Clay & Hopkins, 1955, 53: 60.

Nirmus eos Giebel, 1874: 181 (*nomen novum* for *Nirmus tenuis* Rudow, 1870, *nec* Burmeister, 1838); Gurlt, 1878, 44: 179; Piaget, 1880: 137; Kellogg, 1908, 66: 24.

Degeeriella eos; Johnston & Harrison, 1912, 24: 8; Harrison, 1916, 9 (1): 112.

Neopsittaconirmus eos; Hopkins & Clay, 1952: 238.

Upon examining the only specimen found among Rudow's material, Clay and Hopkins (1955) say it is a nymph of first or second instar, with the marginal and ventral carinae entire, impossible to identify even generically. Really, the shape of the carinae not only does not permit to put it in *Neopsittaconirmus* but, also, does not exclude it from the genus, since the shape of the carinae, as described by Hopkins and Clay, is also found in immature specimens of *Neopsittaconirmus*.

Species incertae sedis

Nirmus trinoton Piaget, 1890

Nirmus trinoton Piaget, 1890, 33: 227, pl. 8, fig. 5; Conci, 1942, 74: 38.

Nirmus trinotum; Kellogg, 1908, 66: 30.

Degeeriella trinota; Harrison, 1916, 9: 125.

Neopsittaconirmus trinotum; Hopkins & Clay, 1952: 238.

Without doubt the species described by Piaget under the name *Nirmus trinoton* does not belong to the genus *Neopsittaconirmus*, and very probably the host recorded, *Macrocercus macao* (= *Ara macao*), is not the true host of the louse.

It is possible that the inclusion of this species in the genus *Neopsittaconirmus* by Hopkins and Clay (1952), is due the presence in the British Museum (Natural History) of a male belonging to the Piaget Collection labelled as *Nirmus trinoton*. The specimen is, really, a *Neopsittaconirmus*, identical to the one found on Nestoriinae (*Neopsittaconirmus kea*), and completely different from the description and figure of Piaget.

If such a specimen is accepted as the type of *Nirmus trinoton*, one would have the absurd situation of the type of a species being in total disagreement with the original description and figure. Furthermore, the latter permit the identification of *Nirmus trinoton* or, at least, its generic placement.

Psittaconirmus Harrison, 1915

Psittaconirmus Harrison, 1915, 7: 402.

This is a very homogeneous ensemble of species, which differ in the proportions of the several parts of the body, in the shape of the head, in the structure of the genitalia, male and female, and in the color of the tergal plates.

They show in common the following characters:

Elongate forms. Margin of preantennal region with an oval emargination, partially surrounded by a more sclerotized rounded zone. Dorsal anterior plate present, but not clearly demarcated by the dorsal preantennal suture and, in some specimens, apparently fused posteriorly, on the midline, with the head integument; its posterior margin rounded, the anterior emarginated. Gular plate present. Marginal carina narrow, slightly sclerotized, not reaching the ventral carina anteriorly. Temporal margin rounded, with one long seta, the fourth, on each side. Paratergal plate present. Segment I of male antenna longer than the next two together; segment III with a hook. Tergal plate entire, present on segments II-V. First seven tergal plates of female divided along the midline. Sternal plates reduced to two small plates, very little evident, on each side. Median regions of the posterior margin of tergite VIII produced backward and fringed with a row of setae; tergite IX hyaline. Genital aperture of male dorsal. Vulva divided in two lobes, its posterior margin without setae or spine-like setae; on the inner surface of each lobe there are, however, some fine setae. The chaetotaxy, also homogeneous throughout the group, is as follows (see Clay, 1951). Head: d.sm.s., a.d.s., ps.s., pn.s., o.s., pt.s., pc.s., a.v.s. (1,2,3), a.s. (1,2,3), v.sm. (1,2), m.t.s. (1,2,3,4,5,6). Thorax: one seta on each latero-posterior angle of the prothorax; pterothorax with a spine-like seta and a sensillum on each latero-posterior corner; one group of 2-3 tergo-lateral and one of 2-3 tergo-central setae. Male with one more seta between the tergo-central group and the midline. Abdomen, male: one tergo-central seta, sometimes very short, on each side of the segments I-VII, one tergo-lateral on each side of segments V-VI or V-VII, and at least 2 pleural setae (latero-posterior corner) on each side of segments I-VIII; 1-2 fine setae on each side of the midline on segments I-V; 1-2 short setae on the posterior margin of each tergum, between the tergo-central and the lateral corner of the tergite. Female with one tergo-central seta on segments I-VII, at least 2 pleurals on segments I-VII, one anterior and another posterior, and 2 tergo-centrals on segment VIII; 2-3 sternals on segments I-V; a group of 3 setae, one long and 2 short on each side of the vulva,

on the level of segment VIII, and a group of numerous short and strong setae, on each side of the posterior margin of the abdomen, between segments VIII and IX.

Type species: *Psittaconirmus australis* Harrison, 1915.

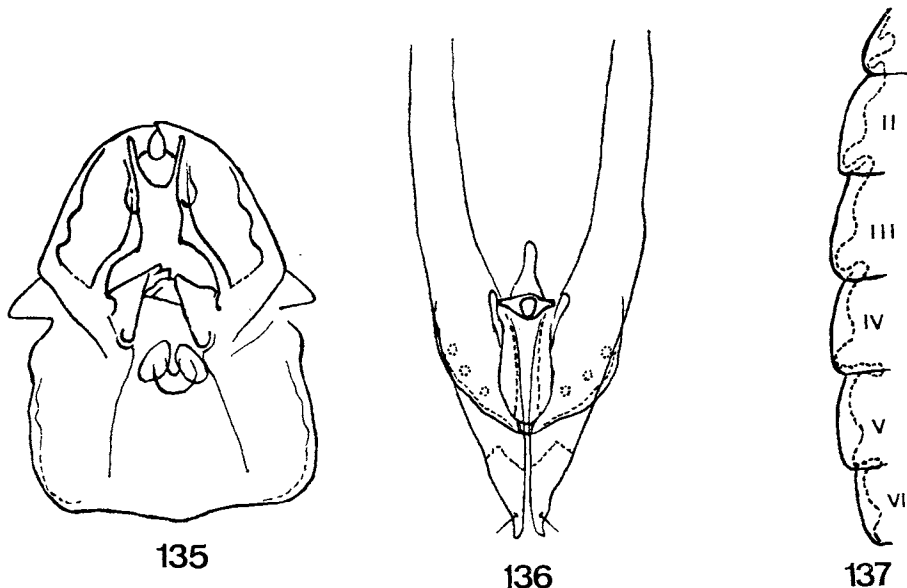
The above combination of characters, distinguishing this genus from all other known Ischnocera, has been seen in the specimens collected on the following hosts, all but one belonging to the subfamily Loriinae, sensu Peters, 1937: *Glossopsitta porphyrocephala* (1 ♂ 3 ♀), *Trichoglossus haematod molucanus* (3 ♀), *Trichoglossus haematod massena* (3 ♀), *Trichoglossus ornatus* (1 ♂), *Trichoglossus rubiginosus* (2 ♂ 3 ♀), *Domicella lory salvadorii* (4 ♂ 5 ♀), *Domicella hypoinochroa* subsp. (1 ♀), *Eos b. bornea* (2 ♂ 3 ♀), *Chalcopsitta cardinalis* (1 ♂ 3 ♀), *Pseudeos fuscata* subsp. (2 ♀), *Psitteuteles versicolor* (2 ♂ 6 ♀), *Vini australis* (1 ♂ 1 ♀) and *Tanygnathus m. mulleri* (1 ♀). The present finding of this female on *Tanygnathus* and the record by Neumann (1890) of a couple of *Psittaconirmus* on *Psephotus v. varius*, also a Psittacinae, are probably due to a mistake in labelling or the specimens may be stragglers, since all other records of *Psittaconirmus* have been from Loriinae.

***Psittaconirmus australis* Harrison, 1915**

(Figs. 135-137)

Type-host: *Glossopsitta porphyrocephala* (Dietrichsen)

Psittaconirmus australis Harrison, 1915, 7: 403, pl. 26, fig. 7, pl. 27, figs. 12, 13; Harrison, 1916, 9: 126; Hopkins & Clay, 1952: 306.



Psittaconirmus australis: 135, head of male, ventral; 136, male genitalia, ventral; 137, pleural sclerotization of male abdomen, segments I to VI.

All specimens recorded by Harrison (p. 405, 1 ♂ 3 ♀) as belonging to this species are in the British Museum (Natural History). In spite of his having indicated (p. 406) that the types of the species described in the paper would be deposited in the Australian Museum, Sydney, New South Wales, no example labelled as *Psittaconirmus australis* has any indication that it would be chosen as type specimen. Accordingly, male n.º 610, of the collection of the British Museum (Natural History) in now selected as Lectotype. Unfortunately the male is not in good condition to be redescribed, but I believe the original description and the drawings given in this paper, based on that male, are enough to make the species recognizable.

Without any doubt *australis* is the smallest species of *Psittaconirmus* so far known, and the male genitalia is quite characteristic. However, it is convenient to note that, due to the condition of the specimen, the drawing cannot be considered a faithful characterization of the species.

The measurements of the Lectotype fit well those given by Harrison, and are the following (in mm):

	Length	Width
Total	1.350	—
Head	.390	.280
Prothorax	.100	.220
Pterothorax	.170	.350
Abdomen	.690	.360

The Lectotype and a female specimen are from *Glossopsitta porphyrocephala* (Dietrichsen) (*Glossopsittacus porphyrocephalus* Dietrichsen, after Harrison).

Psittaconirmus launzeloti Eichler, 1943

Type-host: *Trichoglossus haematod molucanus* (Gmelin)

Psittaconirmus australis Harrison, 1915, 7: 403, text fig. 3, pl. 27, fig. 14 (part.).

Psittaconirmus launzeloti Eichler, 1943, 141 (3/4): 60; Hopkins & Clay, 1952: 306.

Based on the information of Harrison (1915, p. 405) that the two females found on *Trichoglossus novae-hollandiae* [now *Trichoglossus haematod molucanus* (Gmelin), after Hopkins & Clay] show some differences from the female found on *Glossopsitta porphyrocephala* (type-host of *australis*), Eichler named them *P. launzeloti*. As the two females are in the collection of the British Museum (Natural History), I select specimen n.º 609 as Lectotype of *P. launzeloti* Eichler, 1943.

Actually, as already pointed by Harrison, the females found on *Trichoglossus haematod molucanus* seem to be different from the female of *P. australis*, but only a comparison of the males found on the host species can clear up the situation of *P. launzeloti*. A male found on *Trichoglossus ornatus* (L.), from Celebes is, without any doubt, different

from the male of *P. australis*. It is possible that *P. launceloti* is the same species as *P. harrisoni* (Uchida), but in the absence of males it is not possible to clear up the question.

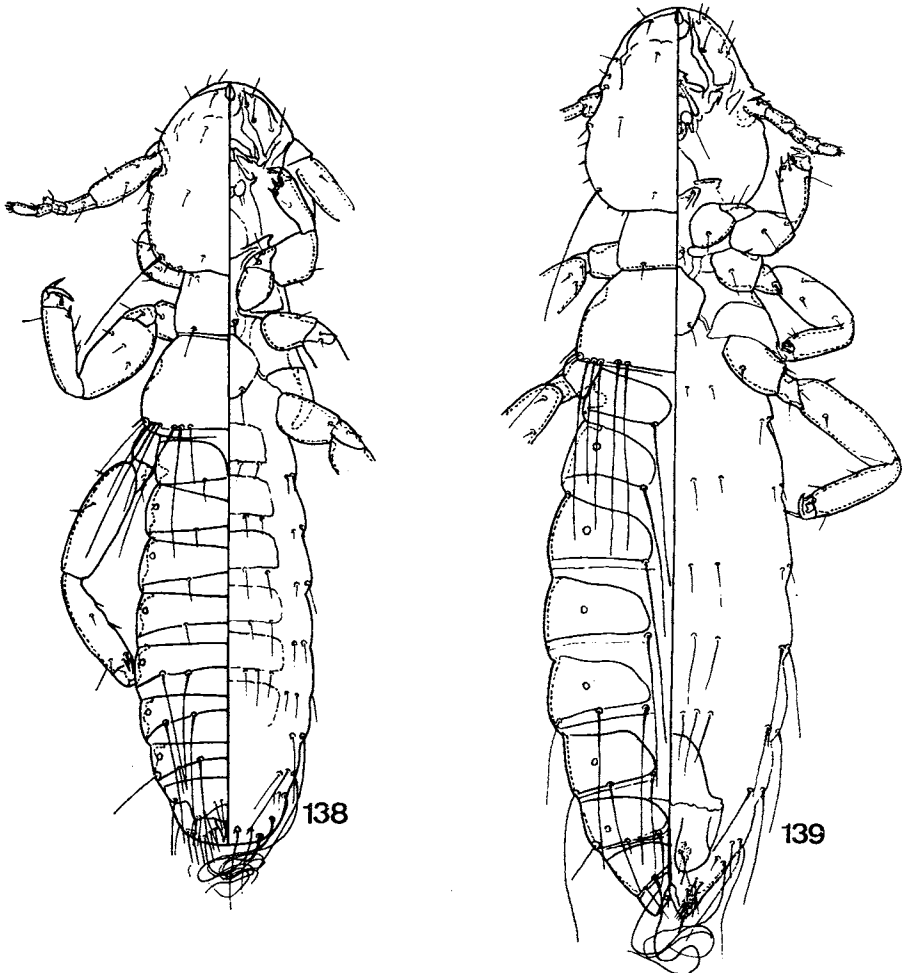
Besides the specimens in the British Museum (Natural History) collection I examined 2 females found on a specimen of the type-host species kept in a cage in Adelaide (South Australia), belonging to the South Australian Museum (two slides n.º 151).

***Psittaconirmus harrisoni* Uchida, 1918**

(Figs. 138-141)

Type-host *Trichoglossus rubiginosus* (Bonaparte)

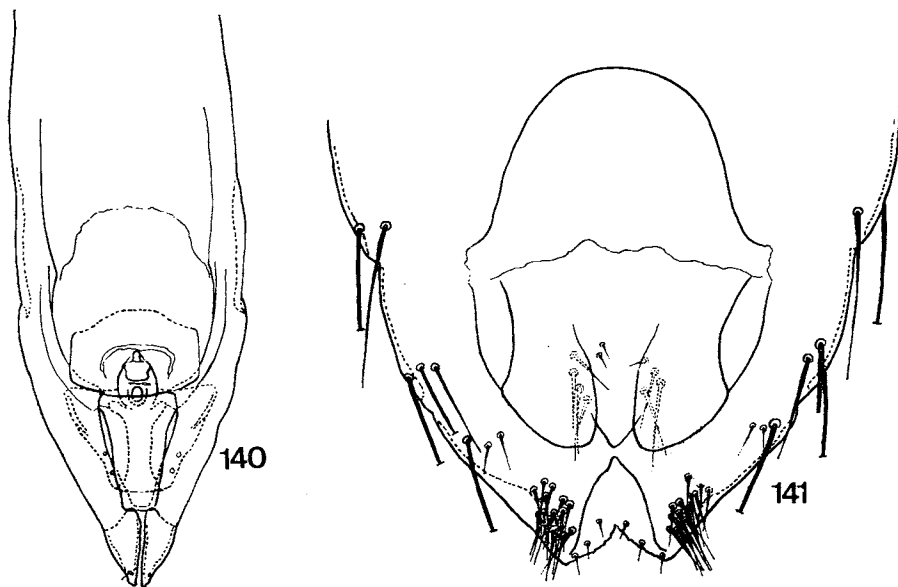
Psittaconirmus harrisoni Uchida, 1918, 9: 484, fig. 1; Hopkins & Clay, 1952: 306.



Psittaconirmus harrisoni: 138, male; 139, female.

Uchida based the description of his species on a single female specimen found on *Eos rubiginosa* (now *Trichoglossus rubiginosus*) from Ponapé Island (Carolines).

Almost every difference pointed by the author of the species was based on those listed by Harrison between the true *australis* and the females found on "*Trichoglossus novae-hollandiae*"; at the end of his discussion Uchida says: "The specimens which Mr. Harrison obtained



Psittaconirmus harrisoni: 140, male genitalia, ventral; 141, terminal segment of female abdomen, ventral.

from Bluebellied lorikeet, *Trichoglossus novae-hollandiae*, closely resemble the present species as regards the size of body, the shape of head, the chaetotaxy of metathorax, and the colour of body marking. They were provisionally assigned by him to *P. australis*, but are, in my opinion probably identical with the present new species".

If Uchida's assertion is right, then *P. launzeloti* Eichler, 1943, would be a synonym of *P. harrisoni* Uchida, 1918. Without doubt, the male of *P. harrisoni*, now recorded and figured for the first time, is quite different from the male of *P. australis*, but only a comparison between the male of *Psittaconirmus* found on *Trichoglossus haematod molucanus* with the one of *P. harrisoni* may clear up the situation of *P. launzeloti*.

I examined 2 ♂ and 3 ♀ collected on *Trichoglossus rubiginosus*, from Ponapé, E. Carolines, Sept. 13, 1947, L. P. Richards coll., belonging to K. C. Emerson Coll. (Lot 48-3928).

The measurements in mm of the specimens studied are the following:

	Length		Width	
	♂	♀	♂	♀
Total	1.740	2.200	—	—
Head	.450	.500	.390	.430
Prothorax	.210	.220	.280	.300
Pterothorax	.240	.270	.450	.510
Abdomen	.950	1.260	.430	.580
Total	1.820	2.200	—	—
Head	.460	.490	.400	.430
Prothorax	.220	.220	.270	.290
Pterothorax	.250	.290	.440	.490
Abdomen	.960	1.270	.430	.590

Psittaconirmus neumanni, sp. n.

This species is composed of two subspecies. As it is still customary in the systematics of Mallophaga, categories within species groups are based only on the degree of morphological differentiation between the entities studied, and their presence or not on the same host form.

Psittaconirmus neumanni neumanni, subsp. n.

(Figs. 142-148)

Type-host: *Domicella lory salvadorii* (A. B. Meyer)

Specimens examined: 4 males and 5 females (n.º 13.492) in the Meinerthzagen Collection of the British Museum (Natural History), from the type-host.

Male (figs. 142-144, 148). Anterior dorsal plate (signature) with lateral and posterior margins rounded and with the limits only slightly outlined. Conus triangular and much shorter than antennal segment I; hook of antennal segment III with bifid extremity.

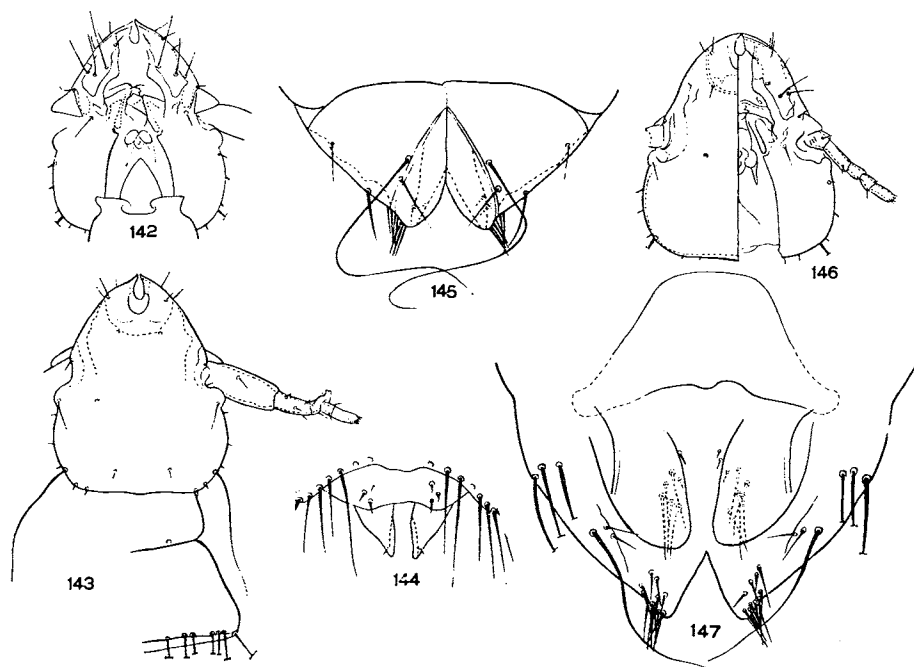
Prothorax nearly quadrangular, with the latero posterior corners rounded and with one seta on either side of the posterior margin, at some distance from the latero-posterior corners. Pterothorax with the lateral margins divergent; on either side of the posterior margin, groups of one, two and three setae, besides the sensory one on the latero-posterior corners.

Abdomen a little longer than the thorax and head together. Projection of the posterior margin of the 8th tergite relatively wide and fringed with 8-9 setae of different length on either side of midline.

Genitalia as in fig. 148.

Female figs. 145-147). Head as in the male, but with the margin of the preantennal region more rounded. Conus smaller than in the male; antenna filiform.

Abdomen larger than in the male. Genital plate (fig. 147) outlined as a napoleonic hat. Each lobe of vulva showing, medially, a group of 4-5 fine and medium length setae.



Psittaconirmus n. neumanni, subsp. n.: 142, head of male, ventral; 143, head of male, dorsal; 144, partial view of segments VIII and IX of male, dorsal; 145, last abdominal segments of female, dorsal; 146, head of female; 147, terminal segment of female abdomen, ventral.

Measurements of types in mm

	Length		Width	
	♂	♀	♂	♀
Total	1.620	2.030	—	—
Head	.470	.480	.400	.410
Prothorax	.110	.120	.280	.300
Pterothorax	.230	.230	.440	.460
Abdomen	.820	1.130	—	.540

Holotype male, Allotype female (slide n.º 13.492A, Meinertzhagen Collection), and Paratypes 3 ♂ 4 ♀ from *Domicella lory salvadorii* (A. B. Meyer), in the British Museum (Natural History).

It is possible that the male found on *Lorius cyanauchen* (now *Domicella lory cyanauchen*), and identified in 1891 by Neumann as *Psittaconirmus forficuloides* belongs, actually, to this species, but unfortunately it is not possible to know if this supposition is correct (see comments on *P. forficuloides*).

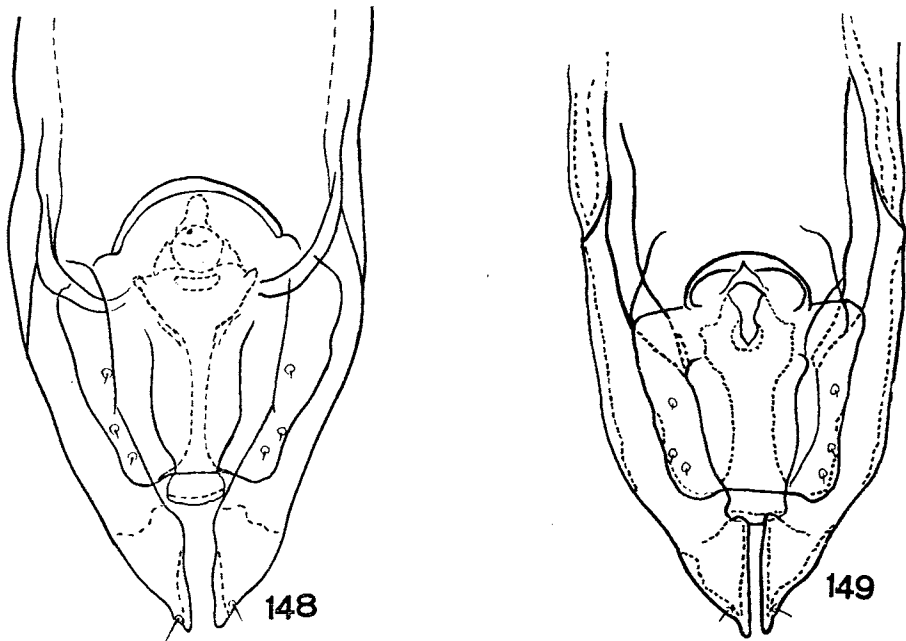
The new species is nearer *P. australis* Harrison, but is stronger, its head is relatively wider, and the male genitalia, though showing the same general shape, is different, chiefly in the structures of the endomeral plate.

***Psittaconirmus neumanni concii*, subsp. n.**

(Figs. 149)

Type-host: *Eos b. bornea* (L.)

Specimens examined: 2 ♂ 3 ♀ from the type host and 1 ♂ 2 ♀ from identical host, without locality.



Genitalia of males. *Psittaconirmus n. neumanni*, subsp. n.: 148; ventral. *Psittaconirmus neumanni concii*, subsp. n.: 149, ventral.

Very near the nominal subspecies, from which it differs in some details of the mesosome. The more conspicuous differential character is the median sclerotized band of the mesosome, much wider in this subspecies. The females are practically undistinguishable.

Measurements of types in mm

	Length		Width	
	♂	♀	♂	♀
Total	1.700	1.830	—	—
Head	.450	.460	.380	.380
Prothorax	.110	.110	.250	.250
Pterothorax	.210	.200	.410	.410
Abdomen	.920	1.060	.460	.480

Holotype male, Allotype female, found on the type host species from Amboina (slide n.º 3671A, Meinertzhagen Collection), and Paratypes 2 ♀ in the British Museum (Natural History), 1 ♂ 2 ♀ in the Istituto di Zoologia dell'Università de Genova, Italy.

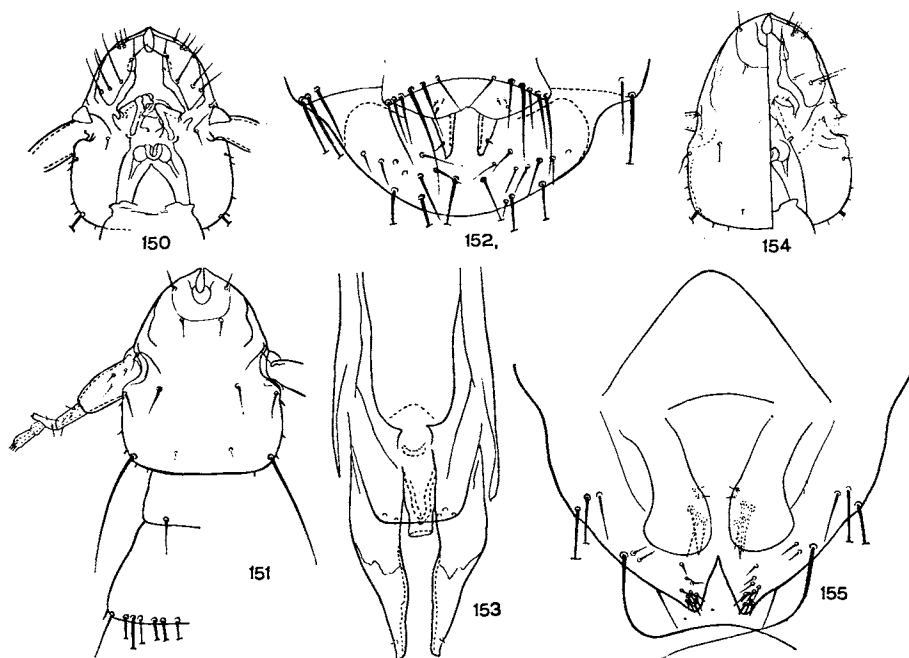
Psittaconirmus comis, sp. n.

(Figs. 150-155)

Type-host: *Psitteuteles versicolor* (Lear)

Specimens examined: 2 ♂ 6 ♀ collected on the type-host.

Male (figs. 150-153). In this species the preantennal region of male is more rounded than in the previous species and the posterior margin of tergite VIII is narrower and bears a smaller number of



Psittaconirmus comis, sp. n.: 150, head of male, ventral; 151, head of male, dorsal; 152, last abdominal segments of male, dorsal; 153, male genitalia; 154, head of female; 155, terminal segment of female abdomen, ventral.

setae. The genitalia of both species are quite different: the basal apodeme of this species is longer and narrower than in *Psittaconirmus neumanni*; the parameres taper toward the distal extremity and have internal margins nearly parallel; the mesosome, though in not good condition in the two males and having a structure not easy to understand, differs much from that of *P. neumanni*.

Female (figs. 154, 155). It is a bit smaller than the preceding species. The head is much narrower, chiefly at the temporal level; the conia are smaller and the vulva, although with the same general shape as that of *P. australis* or *neumanni*, shows some differences as one can see in the figures.

Measurements of types in mm

	Length		Width	
	♂	♀	♂	♀
Total	1.610	1.860	—	—
Head	.430	.450	.345	.345
Prothorax	.110	.100	.180	.160
Pterothorax	.200	.200	.390	.380
Abdomen	.880	1.120	—	.470

Holotype male, Allotype female (slide n.º 8000A, Meinertzhagen Collection), and Paratypes 1 ♂ 5 ♀, found on *Psitteuteles versicolor* (Lear), from Australia in the British Museum (Natural History).

Species inquirendae

Psittaconirmus forficuloides (Neumann, 1890)

Lipeurus forficuloides Neumann, 1890, 24: 65.

?*Lipeurus forficuloides*; Neumann, 1891, 25: 87, fig. 4 (part.).

Esthiopterum forficuloides; Harrison, 1916, 9: 134.

Psittaconirmus forficuloides; Conci, 1942: 37; Hopkins & Clay, 1952: 306.

The original description of this species was based on a pair, in very poor condition, found on *Platycercus multicolor* (now *Psephotus v. varius* Clark), from New South Wales. In the following year (1891, p. 87, fig. 4), Neumann completed the description of the species, then based on two males found, respectively, on *Lorius cyanauchen* [now *Domicella lory cyanauchen* (S. Müller)], from New Guinea, and on *Trichoglossus haematodus* (now *Trichoglossus haematod* subsp.) from Yule Is. (New Guinea). Besides the differences pointed by Neumann between the specimens originally described and those described in 1891, the great taxonomic differences among the hosts also suggest that Neumann had at hand more than one species of *Psittaconirmus*. It is even

quite probable that *Psephotus v. varius* is not the true host of *P. forficuloides*, since every other record of species of the genus has been on birds included in the subfamily Psittacinae. Unhappily, it seems that the great majority of the Neumann Collection of Mallophaga, deposited at the École Vétérinaire de Toulouse, is lost, which makes it still more difficult to clarify the true situation of this species. Even so, I prefer to consider *Psittaconirmus forficuloides* (Neumann, 1890) as *species inquirenda* until it is proved that *Psephotus v. varius* really is not parasitized by specimens of *Psittaconirmus* and that Neumann's collection is, in fact, lost.

REFERENCES

ANSARI, M.A.R.

1947. Mallophaga (Ischnocera) infesting birds in Punjab (India). *Proc. nat. Inst. Sci. India* 13(6):255-303, 12 figs.

CARRIKER JR., M. A.

1940. Studies in Neotropical Mallophaga. Part II. New genera and species. *Lloydia* 3:281-300, 3 pl.
 1944. Studies in neotropical Mallophaga. (III) (Tinamidae N.º 2). *Proc. U. S. nat. Mus.* 95:91-233, 29 figs.

CLAY, T.

1951. An introduction to a classification of the Avian Ischnocera (Mallophaga). Part I. *Trans. R. ent. Soc. London* 102(2):171-194, 1 plate, 26 figs.
 1955. Revisions of the genera of Mallophaga. *Colilipeurus* Bedford and a new genus. *Ibidem* 107:169-186, 51 text-figs., 1 pl.

CLAY, T. & G. H. E. HOPKINS

1955. Note on the Rudow collection of Mallophaga at Hamburg. *Mitt. zool. Staatsinst. Hamburg* 58:49-73.

CONCI, C.

1941. Nuovi generi di Mallofagi. Nota preliminarina. *Boll. Soc. ent. Ital.* 73(8):126-127.
 1942. I Mallofagi degli Psittaciformes. *Ibidem* 74(4):33-41, 10 figs.

CUMMINGS, B. F.

1916. New species of lice. *Ann. Mag. nat. Hist.* (8), 17:94-107.

EICHLER, W.

1943. Notulae mallophagologicae. IX. *Oedicnemiceps* nov. gen. und andere interessante Federlinge von bemerkenswerten Wirten. *Zool. Anz.* 137(3/4): 57-61.
 1943. Notulae mallophagologicae. VII. Neue Gattungen und Arten von Papageiefederlingen. *Mitt. Dtsch. ent. Ges.* 11(7/10):113-116.
 1952. Notulae mallophagologicae. XXVI. *Rhombiceps* n. g. und andere neue Federlingsgattungen. *Zool. Anz.* 149(3/4)74-78, 3 figs.

EWING, H. E.

1927. Descriptions of new genera and species of Mallophaga, together with keys to some related genera of Menoponidae and Philopteridae. *J. Wash. Acad. Sci.* 73(4):86-96.

GERVAIS, FR. L. P.

1844. *Dicères épizoïques. Ricins.* In C. A. Walckenaer et P. Gervais, *Histoire naturelle des insectes*, 4 vols. and Atlas with 52 pl., Roret, Paris (Mallophaga in vol. 3, pp. 307-361, Atlas p. 23, pl. 48 and 49).

GIEBEL, C. G. A.

1866. Die im Zoologischen Museum der Universität Halle aufgestellten Epizoen nebst Beobachtungen über dieselben. *Z. ges. Naturwiss.* 28:353-397.
 1874. *Insecta Epizoa. Die auf Säugethieren und Vögelschmarotzenden Insecten nach Chr. L. Nitzsch's Nachlass bearbeitet.* 16 + 308 pp., 20 pl. O. Wigand, Leipzig.

GUIMARÃES, L. R.

1942. Dois novos gêneros de malófagos de psitacídeos exóticos. *Pap. Avulsos Dep. Zool. S. Paulo* 2(4):79-95, 11 figs.
 1971. A new genus and two new species of parrot Mallophaga (Philopteridae) from New Guinea. *Papéis Avulsos Zool., S. Paulo*, 24(17):213-220, 6 figs.

GURLT, E. F.

1878. Neues Verzeichnis der Tiere auf welchen Schmarotzer-insekten leben. *Arch. Naturg.* 44(1):162-210.

HARRISON, L

1915. On a new family and five new genera of Mallophaga. *Parasit.* 7(4):388-407, 2 pl.
1916. The genera and species of Mallophaga. *Ibidem* 9(1):1-156.

HOPKINS, G. H. E. & T. CLAY

1952. *A check list of the genera & species of Mallophaga.* 352 pp. British Museum, London.

JOHNSTON, T. H. & L. HARRISON

1912. A census of Australian Mallophaga. *Proc. R. Soc. Queensland* 24:1-15.

KÉLER, S.

1938. Baustoffe zu einer Monographie der Mallophagen. 1. Teil: Überfamilie der Trichodectoidea. *Nova Acta Leop. (N. F.)* 5:385-467, 40 figs.

KELLOGG, V. L.

1907. The Mallophagan parasites of the kea. *Psyche* 14:122-123.
1908. Mallophaga. In Wytzman's *Genera Insectorum*, fasc. 66:1-86, 3 pl.

LESOUÉF, S. A. and. H. BULLEN

1902. Description of some Mallophaga from australian birds. *Vict. Nat.* 18:155-158, 10 figs.

NEUMANN, G.

1890. Contribution a l'étude des Ricinidae des oiseaux de la famille des Psittacidae. *Bull. Soc. Hist. Nat. Toulouse* 24:55-69.
1891. Notes sur quelques Ricinidae d'origine exotique. *Ibidem* 25:83-93, 1 pl.

NITZSCH, G. L.

1866. Die Federlinge der Sing-, Schrei-, Kletter- und Taubenvögel. *Z. ges. Naturwiss.* 27(2):115-122.

PETERS, J. L.

1937. *Check-List of Birds of the World*, vol. 3, XIV + 311. Harvard University Press, Cambridge, Mass.

PIAGET, E.

1880. *Les Pédiculines. Essai monographique.* XXXIX + 714 pp., 56 pl., E. J. Brill, Leiden.
1885. *Les Pédiculines. Essai monographique.* Suppl., XVI + 200 pp., 16 pl., E. J. Brill, Leiden.
1890. Quelques Pédiculines nouvelles. *Tijdschr. Ent.* 33:223-259, pl. 8-10.

RUDOW, F.

1870. Beobachtungen über die Lebensweise und der Bau der Mallophagen oder Pelzfresser sowie Beschreibung neuer Arten. *Z. ges. Naturwiss.* 35 n. s., (6):449-487.

TASCHENBERG, O.

1882. Die Mallophagen, mit besonderer Berücksichtigung der von Dr. Meyer gesammelten Arten systematisch bearbeitet. *N. Acta Acad. Leop.* 44(1):1-244, 7 pl.

UCHIDA, S.

1918. Mallophaga from Birds of the Ponapé I. (Carolines) and the Palau Is. (Micronesia). *Annot. zool. Jap.* 9(4):481-493, 2 figs.

