

LII.—MALLOPHAGAN PARASITES FROM INDIAN BIRDS.  
PART IV\*. SPECIES BELONGING TO THE GENERA  
*PHILOPTERUS*, *CAPRAIELLA* AND *PECTINOPYGUS*  
(SUPERFAMILY ISCHNOCERA).

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THIS paper deals with four species of bird-lice, of which those belonging to the genus *Philopterus* are new while the two already known species, *Capraïella subcuspidata* (Burmeister), 1838, and *Pectinopygus* (*Philichthyophaga*) *acutofasciatus* (Piaget), 1880, have been re-described and figured to enable their specific identification, as no adequate accounts of these are available.

I wish to express my thanks to Dr. M. B. Lal for taking personal interest in my work ; to Miss Theresa Clay, British Museum (Nat. Hist.), for not only placing at my disposal such pertinent species as were required for comparison during this study but also her extensive knowledge of this suborder ; and to Mr. G. H. E. Hopkins for helpful suggestions.

Family *Philopteridae* Burmesiter.

Genus *PHILOPTERUS* Nitzsch, 1818.

*Philopterus sclerotifrons*, sp. n. (Figs. 1-7.)

This species differs from the typical species of *Philopterus* in having the hyaline margin of the head thickened anteriorly, and the extreme reduction of the functional components of the male genitalia so much so that the parameres appear to have completely degenerated.

*Material examined*.—Four males and three females, from two Indian Purple Sunbirds, *Cinnyris a. asiatica* (Latham), brought living to the laboratory by a professional bird catcher on 27. xii. 50.

*Type material*.—Holotype male and allotype female, mounted on slides nos. 622 and 623 respectively. The types and all the paratypes have been presented to the British Museum (Natural History).

*Description of male*.—General characters, shape and chaetotaxy of head as shown in fig. 1 a. The hyaline margin of the head has a median indentation, the anterior margin of which is thickened and lightly pigmented (fig. 2). Coni fairly prominent (fig. 1 b). The dorsal anterior plate is prolonged posteriorly into a point ; sclerotized and pigmented uniformly, fig. 3 b. Cephalic index of the four individuals examined are 0.87, 0.87, 0.89 and 0.90. In Tables III and IV the measurements of the breadth of the head and C.I. of four males and three females are given.

\* The first three parts in this series have appeared in 'The Annals and Magazine of Natural History', as follows:—

Part I., ser. 12, vol. iv, pp. 802-813 (1951).

Part II., ser. 12, vol. v, pp. 299-304 (1952).

Part III., ser. 12, vol. v, pp. 460-465 (1952).

Thorax as shown in fig. 1 *a*. Prosternal plate present, the flattened part of which has slightly thickened sides (fig. 4 *a*).

Abdomen as shown in fig. 1 *a*. Short and rounded, widest at segment V. Tergites and sternites moderately sclerotized. Tergal plates II–VIII interrupted medially, while the plate on the composite segment IX and X is continuous from pleurite to pleurite. Terminal segment (XI) bilobed, bearing a feebly-pigmented, dorsally-placed plate on each lobe. Sternal

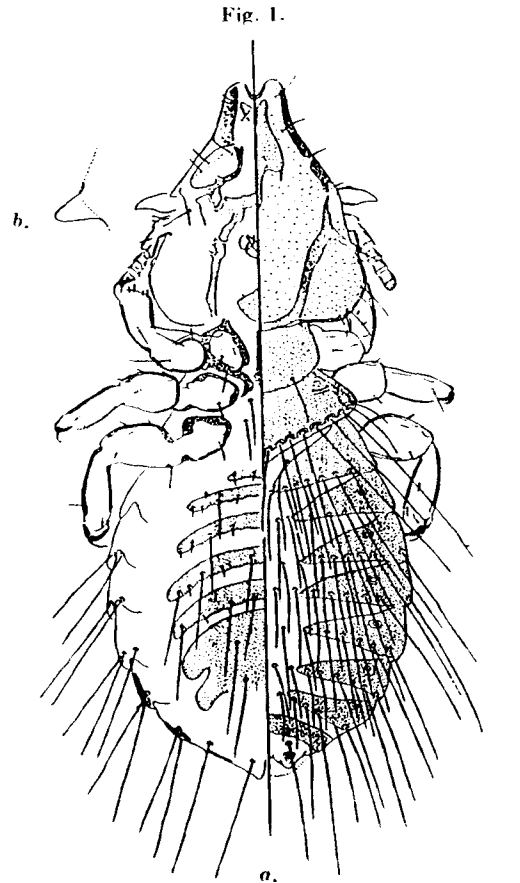


Fig. 1. *Philopterus sclerotifrons*, sp. n. *a*. Male. *b*. Female.

plates in segments II–VI in the form of median thickenings (fig. 1 *a*). The subgenital plate and chaetotaxy of the terminal segments as shown in fig. 1 *a*. Some of the setae on the venter are reduced and spine-like.

Male genitalia extremely characteristic. The basal plate is long and the functional components of the genitalia reduced; parameres hardly recognizable, endomera small (fig. 5).

*Description of female.*—General characters, shape and chaetotaxy of

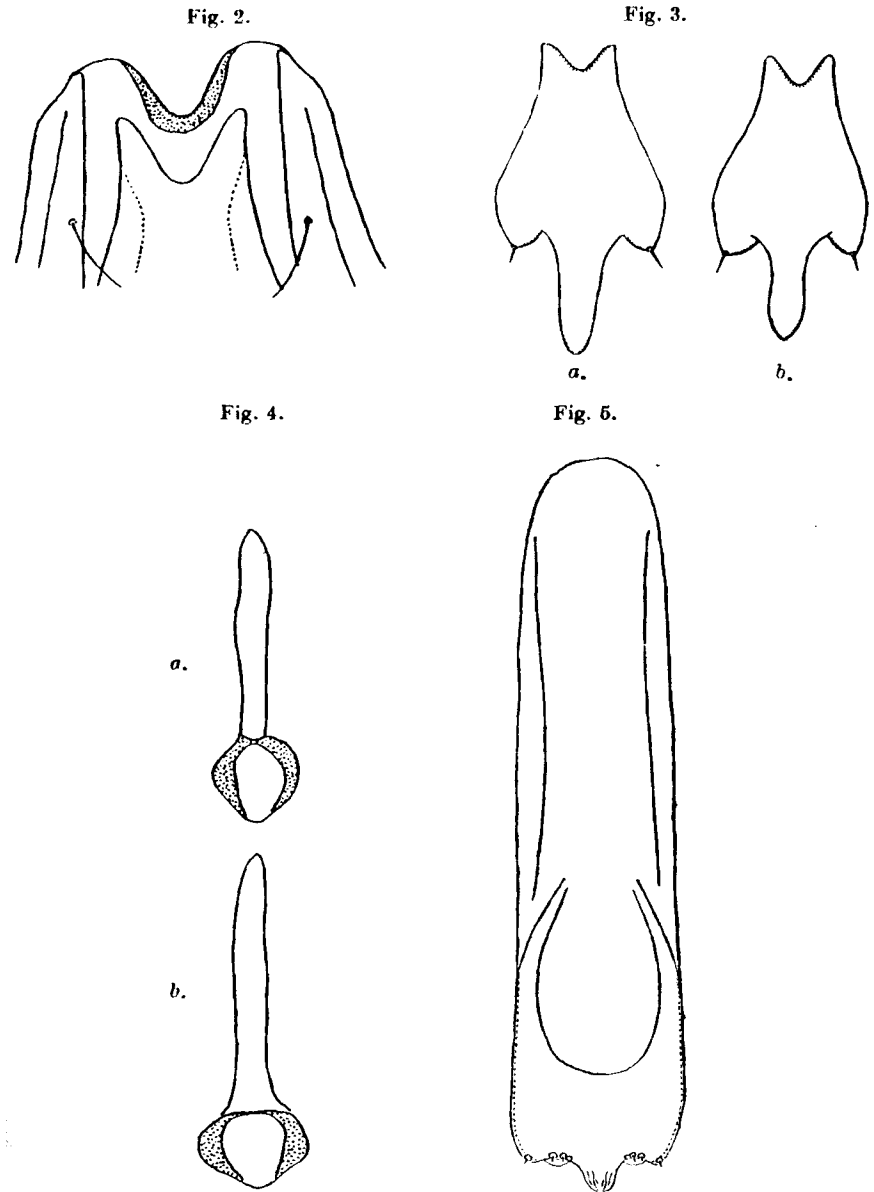


Fig. 2.—*Philopterus sclerotifrons*. Male head showing thickened hyaline margin.  
 Fig. 3.—*Philopterus sclerotifrons*. Anterior dorsal plates. *a*. Female. *b*. Male.  
 Fig. 4.—*Philopterus sclerotifrons*. Prosternal plates. *a*. Male. *b*. Female.  
 Fig. 5.—*Philopterus sclerotifrons*. Male genitalia.

head, and dorsal anterior plate as shown in figs. 6 and 3 *a* respectively. C.I. of all the three individuals was 0.89; breadth across the temples given in Table III. Thorax as in male, except for small differences in measurements. Prosternal plate as shown in fig. 4 *b*.

Abdomen rounded, more elongate than in male, widest at segment V. Tergal plates as in male; sternal plates in segments III-VI in the form

Fig. 6.

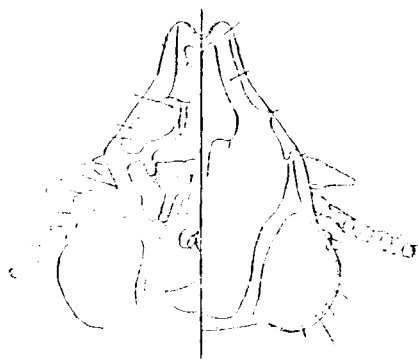
*Philopterus sclerotifrons*. Female head.

Fig. 7.

*Philopterus sclerotifrons*. Terminal segments of female abdomen.

of small lateral thickenings on each side of the mid-line. Abdominal chaetotaxy as in male with some of the setae on the venter modified and spine-like. Terminal segments of the abdomen and the genital region as shown in fig. 7.

Body-measurements (in millimetres) as given in Table I,

I am grateful to Mr. G. H. E. Hopkins for suggesting the name *sclerotifrons* for this species to denote the characteristic thickening of the anterior margin of the head.

*Philopterus excisus microsomaticus*, ssp. n. (Figs. 8-12.)

The species, described by Schrank in 'Fauna Boica' (1803, p. 193), from the Hausschwalbe, *Delichon u. urbica* (Linn.), as *Pediculus hirundinis*, was undoubtedly a species of *Philopterus* and has been included by Hopkins & Clay (1952) in this genus. However, the name is preoccupied by *Pediculus hirundinis* Linn. 1761 (= *Dennyus hirundinis*, vide Clay & Hopkins, 1950, p. 267). *Ped. hirundinis* Schrank, 1803 was re-named *Philopterus excisus* by Nitzsch (1818, p. 290), and Hopkins & Clay have rightly considered as valid this name assigned by Nitzsch for the species of *Philopterus* from the House Martin, *Delichon u. urbica*.

In 1871 (p. 134) the name *Docophorus hirundinis* was used by Piaget for the philopterid species from *Hirundo rustica* Linn. and *Delichon urbica*, but besides being preoccupied by *hirundinis* Schrank, Piaget's

TABLE I.

	Male.		Female.	
	Length.	Breadth.	Length.	Breadth.
Head .....	0.376-0.408	0.340-0.356	0.436-0.448	0.392-0.400
Prothorax .....	0.092-0.108	0.188-0.200	0.104-0.112	0.216-0.224
Pterothorax .....	0.128-0.134	0.288-0.300	0.152-0.160	0.344
Abdomen .....	0.472-0.512	0.456-0.492	0.700-0.728	0.528-0.584
Total .....	1.083-1.130		1.397-1.428	
C.I. ....	0.87, 0.89, 0.90 0.87		0.89 0.89 0.89	

species is composite, as the populations from the two hosts on critical examination have proved to be distinct subspecies. Since the species from *D. u. urbica* already has a name, that from *H. r. rustica*, being distinct and recognizable, is here described.

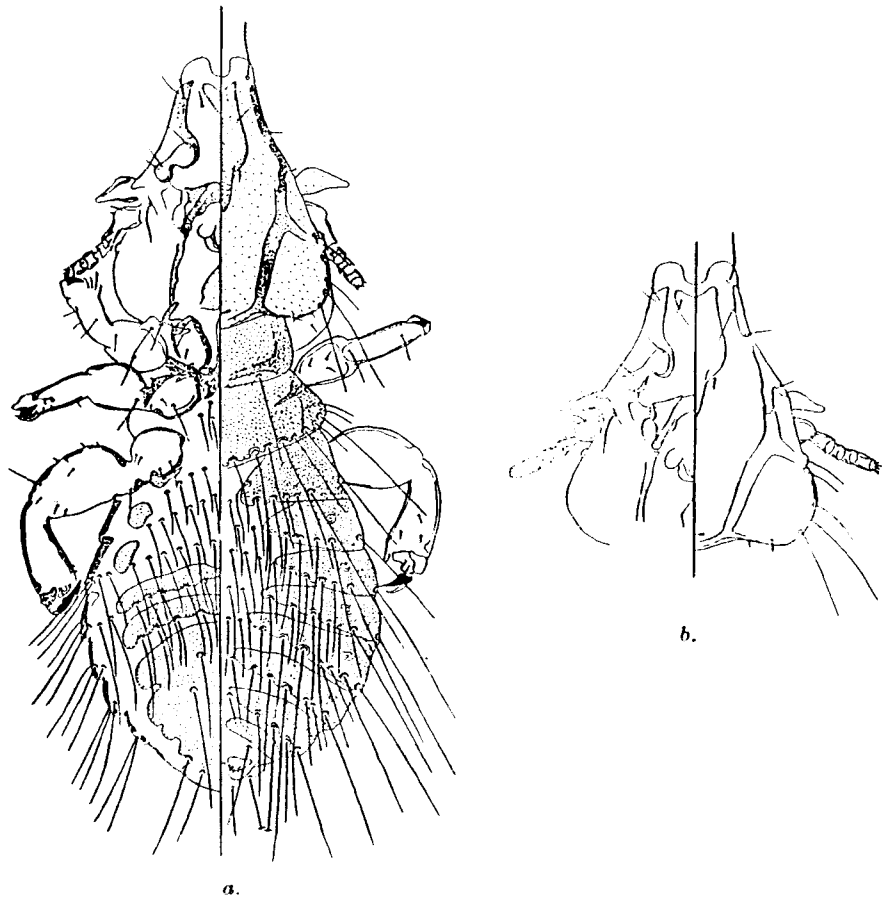
An examination of a fairly large series of the new subspecies described here has shown that it is closely related to *Philopterus e. excisus* Nitzsch, 1818, from which it is distinguished by its less robust form; all the body-measurements of *microsomaticus* are smaller than the corresponding ones of *excisus*. The breadth of the head across the temples in both the sexes is considerably less in *microsomaticus*, while the temples in *excisus* are more rounded and expanded; but the difference in the length of the head is not as great as in its width, with the result that there is a marked difference in the cephalic index of the two forms (Table IV). Both thorax and abdomen are smaller in *microsomaticus* than in *excisus*.

It is rarely that individuals of the two subspecies have overlapping body-measurements.

The male genitalia are very similar and the differences of small magnitude; the same being true of the female genital region.

*Material examined*.—Sixteen males and twenty females from the Common Swallow, *Hirundo r. rustica* Linn., from France (Ushant),

Fig. 8.



a. *Philopterus excisus microsomaticus*, ssp. n. Male. b. *Philopterus e. excisus*. Male head.

England (Suffolk, Norfolk and Somerset), and three males and four females from *Hirundo rustica* Linn. from Lucknow.

*Type-material*.—Holotype male and allotype female, mounted on slide no. 3395, Meinertzhagen collection.

A well-sclerotized and deeply-pigmented species.

*Description of male*.—General characters, shape and chaetotaxy of head as shown in fig. 8 a. Anterior hyaline margin of the head with a

median indentation. Coni prominent. The dorsal anterior plate is prolonged posteriorly into a point; sclerotized and pigmented uniformly (fig. 9 a). C.I. 0.82-0.87. Tables III and IV give the breadth-measurements across the temples and the cephalic index of both sexes, together with the number of specimens examined of this species and of *P. e. excisus*.

Thorax as shown in fig. 8 a. Prosternal plate present.

Fig. 10.

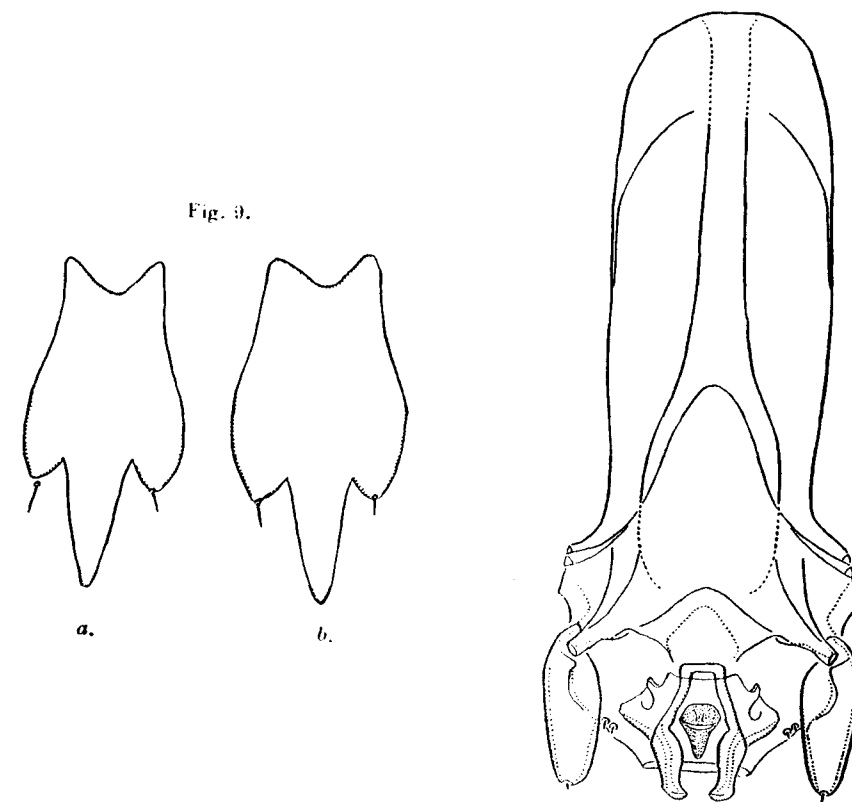


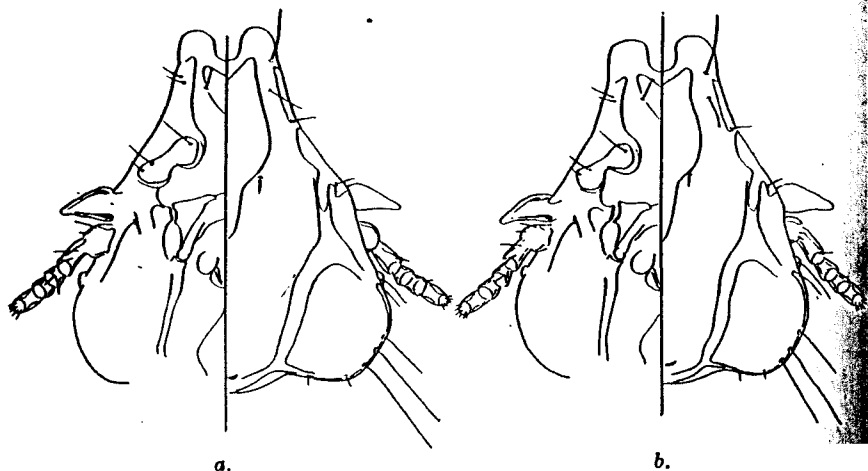
Fig. 9.—Anterior dorsal plates, males. a. *P. e. microsomaticus*. b. *P. e. excisus*.  
Fig. 10.—*Philopterus e. microsomaticus*. Male genitalia.

Abdomen rounded (fig. 8 a), widest at segment V. Segment II with tergal plates approximate; III-VIII with tergal plates separated widely medianly. The composite segment IX and X with fused transverse plate which is occasionally interrupted medianly. Terminal (XI) segment bilobed, with a distinct tergal plate on each lobe. Sternal plates in segments II-IV in the form of small lateral thickenings each side of the mid-line; those on segments V and VI in the form of transverse median plates. The subgenital plate and the abdominal chaetotaxy as shown in fig. 8 a.

Male genitalia as shown in fig. 10; this figure has been drawn from the specimen collected at Lucknow.

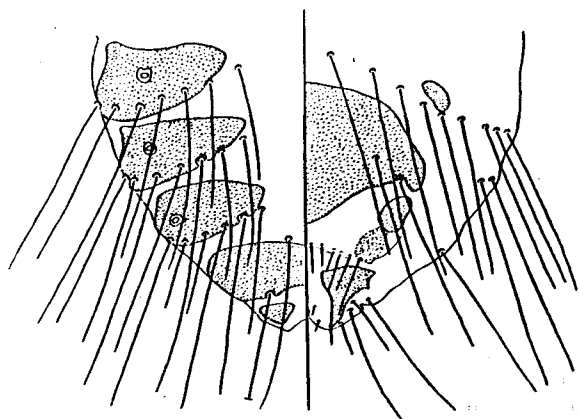
**Description of female.**—Head almost similar in shape to that of male but is slightly larger in size (fig. 11 b). C.I. 0.83-0.90. Anterior dorsal plate as in male.

Fig. 11.



Female heads. a. *Philopterus e. excisus*. b. *P. e. microsomaticus*.

Fig. 12.



*Philopterus e. microsomaticus*. Terminal segments of female abdomen.

Thorax and abdomen slightly larger in size than in male; the abdomen is slightly more elongate. Tergal plates as in male; sternal plates on segments II-VI in the form of small lateral thickenings each side of the mid-line. Abdominal chaetotaxy almost as in male. The genital segments and genital region as shown in fig. 12.

Figures 8 b, 9 b and 11 a are of the male head, anterior dorsal plate and the female head respectively of *P. e. excisus*, given for comparison with similar parts of *P. e. microsomaticus*.

Various body-measurements (in millimetres) as given in Table II. The name *microsomaticus* has been given to this form because of its smaller size compared to that of the closely-related *P. e. excisus* Nitzsch, 1818.

TABLE II.

	Male.		Female.	
	Length.	Breadth.	Length.	Breadth.
Head .....	0.420-0.448	0.352-0.384	0.456-0.488	0.392-0.420
Prothorax .....	0.088-0.116	0.298-0.240	0.096-0.116	0.228-0.264
Pterothorax .....	0.120-0.148	0.296-0.348	0.144-0.168	0.344-0.380
Abdomen .....	0.516-0.560	0.464-0.532	0.684-0.784	0.560-0.608
Total .....	1.147-0.240		1.365-1.522	
C.I. ....	0.82-0.87		0.83-0.90	

TABLE III.

Breadth, in mm., of head at temple of species of *Philopterus* with number of specimens.

	Males.										
	0.34	0.35	0.36	0.37	0.38	0.39	0.40	0.41	0.42	0.43	0.44
<i>Philopterus e. excisus</i> .....	1	3									
<i>P. e. microsomaticus</i> (European forms) ..	—	2	5	3	3						
(Indian forms) ..	—	1	1	1							
<i>Capraiella subcuspidata</i> .....	—	—	—	—	—	—	1	5	1	1	1

	Females.											
	0.38	0.39	0.40	0.41	0.42	0.43	0.44	0.45	0.46	0.47	0.48	0.49
<i>Philopterus e. excisus</i> .....		1	2									
<i>P. e. microsomaticus</i> (European forms) ..	2	5	6	4	1	—	1					
(Indian forms) ..	—	—	—	—	2	—	3	3	3	1	—	1

*Capraiella subcuspidata* (Burmeister), 1838. (Figs. 13-16.)

**Material examined.**—Eleven males and thirteen females off the Indian bird *Obracia b. benghalensis* Linn., collected in December, 1946, and January, 1947, from birds brought living to the laboratory, and five males

TABLE IV.  
Cephalic index of species of *Philoaterus* with number of specimens.

	Males.											
	0.82	0.83	0.84	0.85	0.86	0.87	0.88	0.89	0.90	0.91	0.92	0.93
<i>sclerotifrons</i> ..	—	—	—	—	—	2	—	1	1			
<i>microsomaticus</i>	1	3	3	3	1	1	—	—	—	—	—	—
<i>excisus</i> .....	—	—	—	—	1	—	2	2	1	2		
	Females.											
	0.82	0.83	0.84	0.85	0.86	0.87	0.88	0.89	0.90	0.91	0.92	0.93
<i>sclerotifrons</i> ..	—	—	—	—	—	—	—	3	—	—	—	—
<i>microsomaticus</i>	—	4	4	3	5	1	1	—	1	—	—	—
<i>excisus</i> .....	—	—	—	—	—	—	1	1	1	2	2	3

Fig. 13.

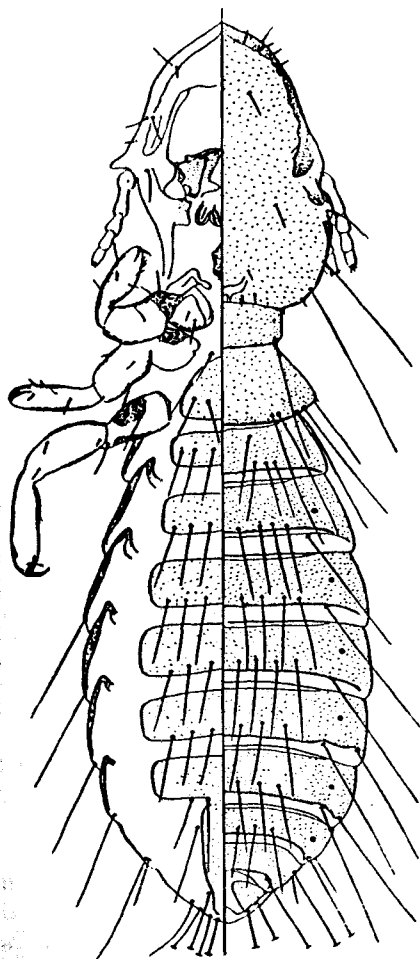
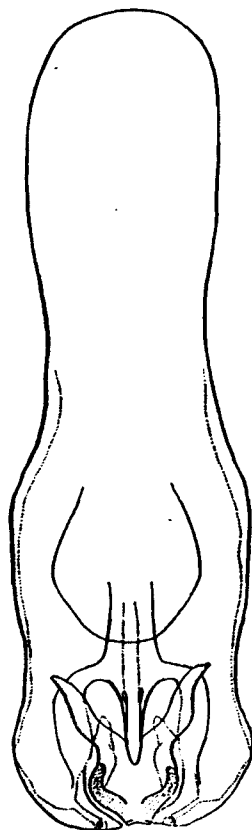
Fig. 13.—*Capraiella subcuspidata* (Burm.) Male.

Fig. 14.

Fig. 14.—*Capraiella subcuspidata*. Male genitalia.

and ten females off *Coracias g. garrulus* Linn., from Estonia, August, 1934 (Meinertzhagen collection, slide no. 1380).

*Description of male.*—General characters of head and chaetotaxy as shown in fig. 13. The head is acuminate and the temples only slightly swollen. C.I. 0.77–0.80. Pharyngeal gland and sclerite, a feeble gular plate and fairly well-developed conus present. Antennae alike in the two sexes.

Prothorax small with parallel sides; pterothorax large with strongly divergent sides. Median metasternal plate present. Thoracic chaetotaxy as shown in fig. 13.

Abdomen elongate, about twice as long as wide, being widest at segment V. Segment II small. Tergal plates in segments II–X continuous across the segment, that on segment XI in the form of a dorsally-

Fig. 15.

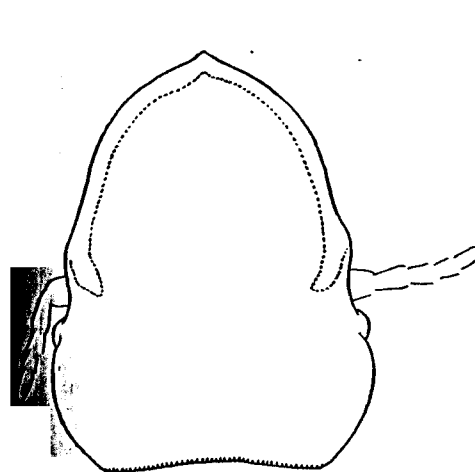
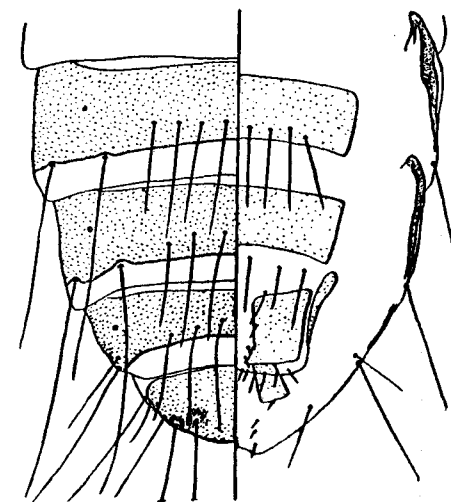
Fig. 15.—*Capraiella subcuspidata*. Female head.

Fig. 16.

Fig. 16.—*Capraiella subcuspidata*. Terminal segments of female abdomen.

placed thickening on each side of the mid-line. Segments II–VI with wide median sternal plates. Subgenital plate as shown in fig. 13. Sclerites narrow and characteristic.

Male genitalia as shown in fig. 14; the basal plate is long and narrow in its proximal half.

*Description of female.*—General characters, shape and chaetotaxy, both of head and thorax, as in male, only these parts are slightly larger in size. Head as shown in fig. 15. C.I. 0.78–0.80.

Abdomen also as in male with the arrangement of tergal plates similar in segments II–VIII, while those on the terminal segments are continuous across the segment. Sternal plates in segments II–VII in the form

of wide median plates; the subgenital plate and the genital region as shown in fig. 16. The lip of the vulva has 4-6 fine setae on each side of the mid-line.

The abdominal chaetotaxy in both the sexes is fairly constant and is given in Table V, together with the normal variations.

Body-measurements (in millimetres) as given in Table VI.

TABLE V.  
Abdominal chaetotaxy.

	Male.			Female.		
	T.	S.	P.	T.	S.	P.
II .....	8-9	4-5	0,0	8-9	3-4	0,0
III .....	10	6	0,0	9-10	6	0,0
IV .....	10	5-6	1,1	10	6	1,1
V .....	10	5-6	1,1	9-10	6-7	1,1
VI .....	8	5-6	2,2	9-10	6-7	2,2
VII .....	8-9	4	2,2	9-10	6-7	2,2
VIII .....	6	2	4,4	6	fig.	4,4
IX & X .....	2	fig.	fig.	fig.	fig.	fig.

TABLE VI.

	Male.		Female.	
	Length.	Breadth.	Length.	Breadth.
Head .....	0.556-0.588	0.441-0.470	0.629-0.650	0.498-0.515
Prothorax .....	0.089-0.114	0.253-0.286	0.098-0.122	0.282-0.290
Pterothorax .....	0.122-0.188	0.388-0.433	0.155-0.196	0.449-0.466
Abdomen .....	0.973-1.067	0.572-0.646	0.303-1.397	0.662-0.707
Total .....	1.758-1.891		2.221-2.339	
C.I. ....	0.77, 0.78, 0.79, 0.80 0.78 0.80		0.78, 0.79, 0.80 0.79, 0.80 0.80	

Genus PECTINOPYGUS Mjöberg, 1910.

*Pectinopygus acutofasciatus* (Piaget), 1880. (Figs. 17-22.)

*Material examined.*—Eleven males and thirteen females off the Snake Bird, *Anhinga melanogaster* Pennant, from Lucknow, collected on 2. ix. 47 and 8. ix. 48.

Well sclerotized and pigmented form.

*Description of male.*—Slender and elongate. General characters, shape and chaetotaxy of head as shown in fig. 17. The anterior hyaline margin forms a narrow rim almost in contact with the anterior dorsal plate. C.I. 0.75-0.82. Ocular spots distinct. Coni and gular plate fairly well developed. Antennae slightly dimorphic in the two sexes, the difference being in the shape of the first segment, which is stouter in the female antenna (fig. 18).

Prothorax with slightly divergent sides. Pterothorax with a slight indication of the meso- meta-thoracic junction. Metasternal plate

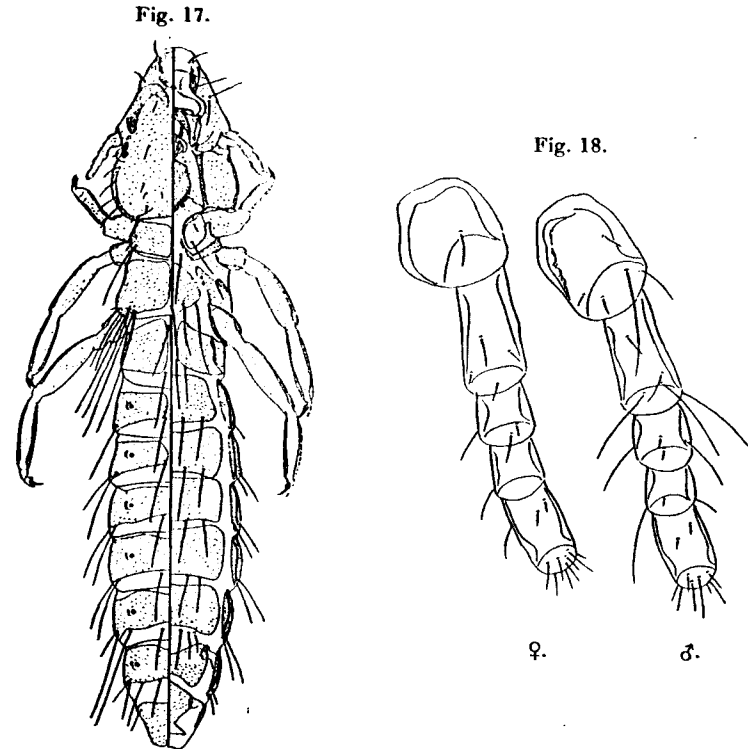


Fig. 17.—*Pectinopygus acutofasciatus* (Piaget). Male (setae not shown on legs).  
Fig. 18.—*Pectinopygus acutofasciatus*. Male and female antenna.

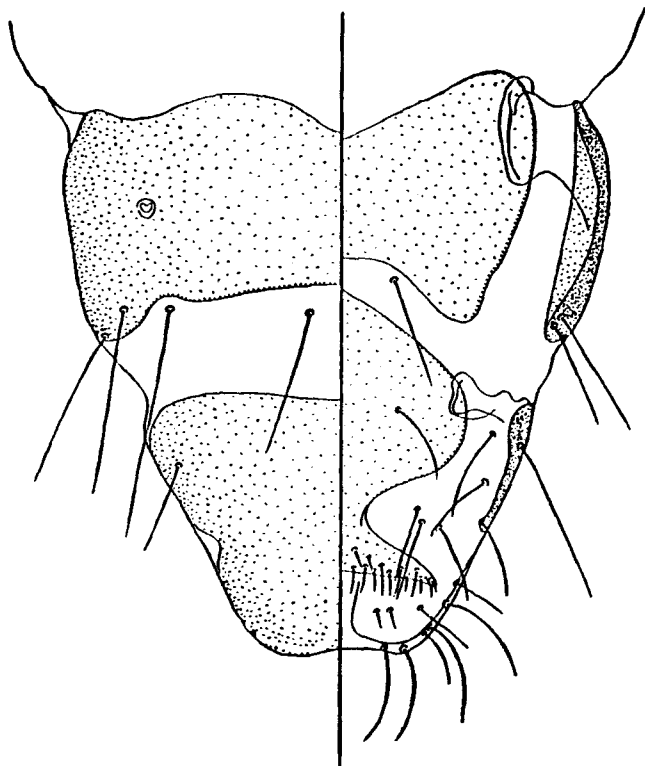
present; pointed posteriorly. The chaetotaxy of the thorax is fairly constant, the slight variation encountered being in the number of setae on the posterolateral margin of the metasternal plate: there may be either two or three setae on each side of the mid-line.

Abdomen elongate, approximately three times as long as broad, being broadest in segment IV or V. Tergal plates in segments II-IV separated medianly, but continuous in segments V-X (XI). Sternal plate in segment II separated medianly; segments III-VIII with wide

median sternites. Subgenital plate and chaetotaxy of the terminal segments as shown in fig. 19.

Male genitalia characteristic (fig. 20). There is an extremely long basal plate, blade-like proximally, narrow in the middle and slightly expanded distally. The proximal part is uniformly sclerotized and is broader than the distal expansion, which has heavily sclerotized sides. To the distal end of the basal plate extremely fine, needle-like, tapering parameres are attached. Of the remaining structures those delineable

Fig. 19.



*Pectinopygus acutofasciatus*. Terminal segments of male abdomen.

are two fine bars which probably represent the eversible sclerotized parts of the preputial sac.

*Description of female*.—Considerably stouter than male. Head and antennae as shown in figs. 21 and 18 respectively.

General characters, shape and chaetotaxy of thorax as in male, except that it is slightly larger in size.

Abdomen elongate, about twice as long as broad, being broadest in segment V. Tergal plates separate widely medianly in all the segments except the last (XI), which has a median tergal plate; feeble, median

Fig. 20.



*Pectinopygus acutofasciatus*. Male genitalia.

TABLE VII.

	Male.		Female.	
	Length.	Breadth.	Length.	Breadth.
Head .....	0.468-0.500	0.372-0.400	0.488-0.528	0.452-0.464
Prothorax .....	0.120-0.128	0.288-0.308	0.132-0.152	0.336-0.344
Pterothorax .....	0.176-0.192	0.352-0.384	0.188-0.208	0.440-0.456
Total .....	2.009-2.174		2.135-2.512	
C.I. ....	0.75, 0.76, 0.77, 0.80, 0.82 0.80 0.80		0.86, 0.87, 0.89, 0.92 0.86, 0.87	



Fig. 21.

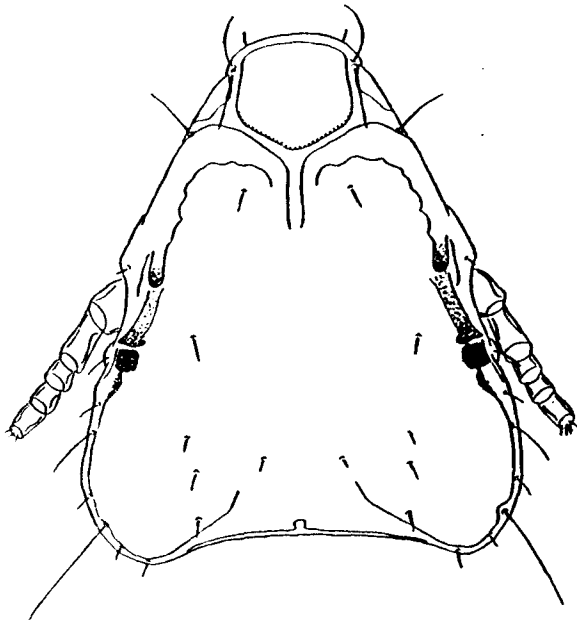
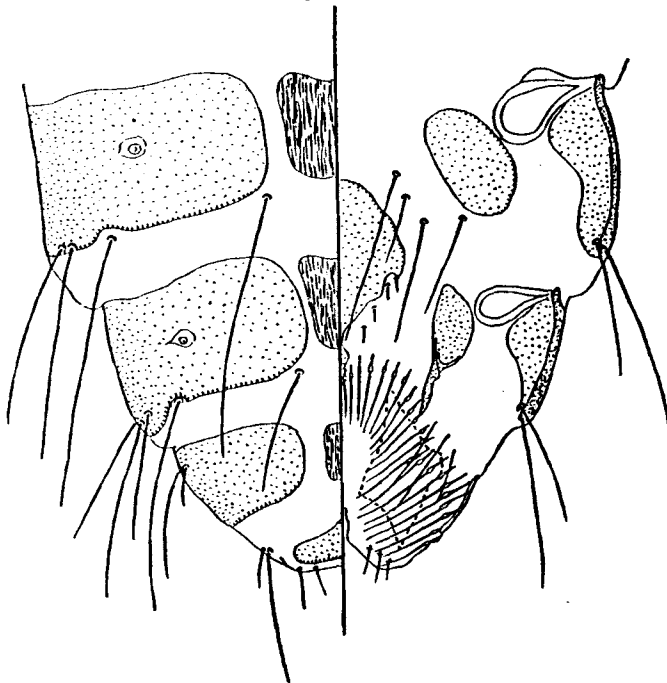
*Pectinopygus acutofasciatus*. Female head, dorsal.

Fig. 22.

*Pectinopygus acutofasciatus*. Terminal segments of female abdomen.

secondary sclerotizations in segments II-X. Segments II-VIII with sternal plates in the form of laterally-placed ovoid or kidney-shaped thickenings on each side of the mid-line. The subgenital plate and chaetotaxy of the terminal segments as shown in fig. 22.

Body-measurements of both the sexes (in millimetres) as given in Table VII.

## CORRECTIONS.

This opportunity is taken to rectify the mistakes which have appeared in the previous papers in this series.

1. The new species of *Rallicola* described in Part I and named *clayi*, in honour of Miss Theresa Clay, should, in accordance with the International Rules of Zoological Nomenclature, have been called *clayae*. The mistake made on account of lack of familiarity with the International Rules of Zoological Nomenclature is corrected and the species should henceforth be known as *Rallicola clayae* Tandon, 1951.

2. In Part II the name of the species as it appears in the legends of the figures is *Pectinopygus (P.) mukundi*, whereas the species was named *makundi* after Dr. Makund Behari Lal. This mistake was inadvertently made by the author.

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