

Some New Ischnoceran Mallophaga in the Zoological Survey Department, Karachi

Muhammad Atiqur Rahman Ansari

Institute of Hygiene and Preventive Medicine, Lahore

The group of Mallophaga has been much neglected in Indo-Pakistan. There are about 2500 bird-forms in the subcontinent, of these only very few bird-hosts have been examined and a few species of lice recorded. Zoological Survey Department, Karachi, recently collected Mallophagan insects from a dozen different species of birds not examined before. The author has examined this valuable collection and has recorded fresh information on the distribution of several forms.

Introduction

The Mallophaga are a group of obligate ecto-parasitic insects living both on birds and mammals. There are some important factors which govern the survival of a species on a particular host. These factors are of economic importance when the insect concerned is confined to an animal of economic value. The Mallophagan parasites of domestic animals, farm animals, pets and poultry birds are of special interest.

The Mallophagan parasites have been shown to possess strong dietary requirements which limit them to particular host. Each species so far described is restricted to one particular host-species or related host-species and completes its life-cycle from egg to egg on the true host-form only. In general, the relationship of the Mallophaga reflects those of their host.

Most bird-groups have several species, representing several genera, of Mallophaga parasitic upon them. It is of considerable interest to know that some of these show a strong 'seat of infection' preference. The superfamily ISCHNOCERA, in particular, beautifully demonstrates the multiplicity of forms and each species is restricted to definite ecological niche on the body of the host. The host distribution of the Mallophaga is synonym with the geographical distribution of the free-living animals. In general, the Mallo-

phaga of related hosts are themselves related and therefore valuable evidence on the phylogeny of their hosts. Some factors, viz., discontinuous distribution excessive convergent and parallel evolution, operating on the parasite during evolution, however obscure the initial relationship between the host and the parasite. In such cases a reliable evolution of phylogenetic relationship is nearly impossible.

Recent researches have now revealed that these obligatory parasites are not at all innocent commensals. Apart from physical annoyance and direct injury to the plumage, they transmit pathogenic organisms from one host individual to the other. These facts have elevated the importance of these parasites.

Although an extensive study of these parasites has been made in America and Europe, our knowledge of these parasites from Indo-Pakistan subcontinent is very feeble indeed. The Zoological Survey Department, Karachi, recently started a general survey of Pakistan birds to build up their reserve collection. At the suggestion of Dr. A. R. Ranjha, a collection of Mallophaga was also made. We are thankful to Dr. Ranjha and his staff for the excellently preserved collection and affording us opportunity to study this collection.

It is very difficult to define the character or characters of specific or subspecific importance in Mallophaga. All the genera present special problems of their own. Many forms are minute and differences, which in themselves seem small, would become apparent, were the insects bigger in size. It will probably be more convenient if extensive collection of louse genus from one host group is studied. Unfortunately there is paucity

of collection. Inadequacy is also conspicuous in most important Natural History Museums of the world. Although several hundred species of Mallophaga have been described, we come across very few communications dealing with one host group.

There are about twenty-five hundred species and subspecies of birds in Indo-Pakistan. Of these, only about two hundred bird-hosts have been examined for louse and a few species of Phthiraptera recorded. The present communication is an additional contribution to this knowledge and a step towards a monographic revision which is most desirable at a later date.

All the measurements given under each species were taken along the mid-line. The length of the pre-antennal region represents the distance between the front and the point passing through the posterior margin of *conus*. The length beyond the *conus* represents hind-head. The width is the maximum transverse measurement of the part concerned. The index (cephalic, preantennal and hind-head) is the ratio of the length to the breadth. All the camera lucida drawings were made from the microscope slides. The male genitalia when dissected and mounted, naturally do not retain their original appearance, because the cover slip flattens them to some extent, and should be borne in mind while interpreting drawings.

All the specimens including *holotype* (male), *allotype* (female) and *Paratypes* (other males and females from the same lot) are in the collection of Zoological Survey Department, Karachi. Instances not relating to such cases are indicated in the text.

Systematic Account

1. *Alcedoecus annularis* Ansari

Alcedoecus annularis Ansari 1955 Proc. VII Pak. Sci. Conf., Bahawalpur, p. 45.

Type-host:—The White-breasted King-fisher (*Halcyon s. smyrnensis*) (Linn): ALCEDINIDAE.

Male (*Holotype*) 1.51 × 0.56 mm. Head 0.46 × 0.27 mm. (cephalic index 1 : 0.58).

Preantennal region 0.19 × 0.32 mm. (index 1 : 1.68). Hind-head 0.27 × 0.27 mm. (index 1 : 1). Dorsal anterior plate shield-shaped, considerably pulled backwards so as to reach as far as the mandibles. Ventral anterior plate reduced, reniform. Prothorax 0.09 × 0.29 mm., lateral margin straight, posterior margin rounded, postero-lateral angle with a heavy seta, posterior margin with a moderately long median seta on each side. Pterothorax 0.19 × 0.43 mm., four sided, laterally diverging, posterior margin sinuous, postero-lateral angle distinctly lobed or rounded, with three sub-equal long setae, posterior margin with three long setae on each side. Abdomen 0.77 × 0.56 mm. Tergal plates interrupted in the middle, so as to leave one-third of the middle area feebly sclerotised. Tergal plates II-VIII separated medianly, pleurites narrow with recurved re-entrant heads. Male genitalia well developed; basal plate long feebly sclerotised mesosome shield-shaped, with tubular penis protruding in the middle; parameres well built, short sickle-shaped.

Female (*Allotype*) 1.81 × 0.66 mm. Head 0.25 × 0.35 mm. (cephalic index 1 : 1.40). Preantennal region 0.25 × 0.35 mm. (index 1 : 1.40). Hind-head 0.27 × 0.52 mm. (index 1 : 1.82). Prothorax 0.09 × 0.31 mm. Pterothorax 0.19 × 0.17 mm. Abdomen 1.01 × 0.66 mm. segment II wider anteriorly and narrow posteriorly; tergal plates II-VII rectangular, interrupted in the middle, II with 3 elongate setae beset in clear median area; III with 4-5 such setae; IV-VI with one post-spiracular seta and 3-4 median setae; VII with 3 setae in the middle; VIII entire with 2 postero-lateral setae. Pleural plates well developed, V with 2, VI-VII with 3, VIII with 4, IX with 2+1 and X-XI with one seta.

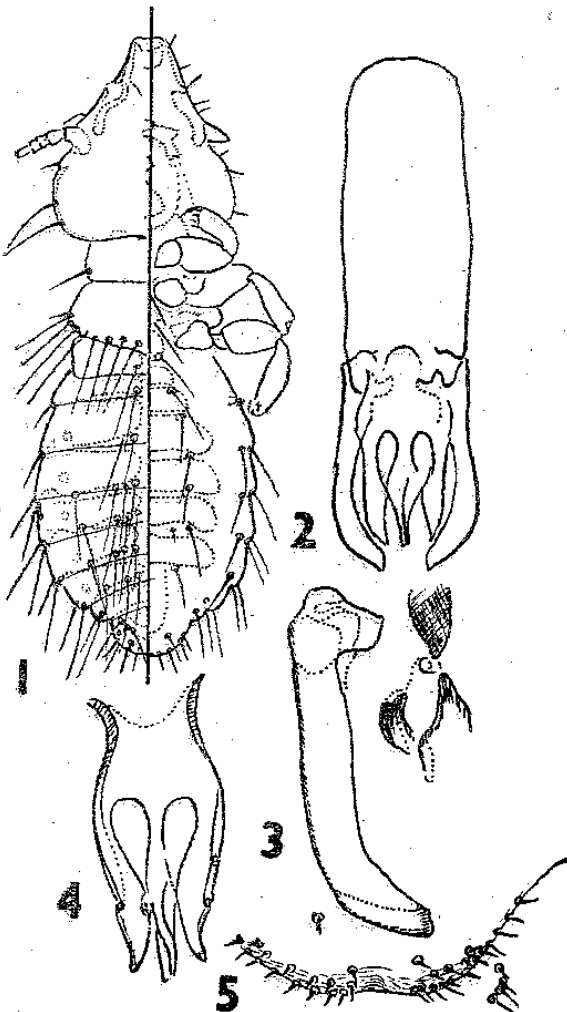
Holotype and *Allotype* (Lyallpur 17.2. 1928, Ansari collection). *Paratype* (one female) Jati, District Tatta, 17-11-1953 collected by M/s. Siddiqi and Hasan, in Zool. Surv. Collection. All from the White-breasted Kingfisher (*Halcyon s. smyrnensis*) (Linn.).

2. *Alcedoeffula machera* Ansari (Text-figs. 1—5)

Alcedoeffula machera Ansari 1955, Proc. VII, Pak. Sci. Conf., Bahawalpur, p. 46.

Type-host:—The Indian Pied King-fisher (*Ceryle rudis leucomelanura* Reichenb), ALCEDINIDAE.

Male (Holotype) 1.54 × 0.55 mm. Head 0.44 × 0.42 mm. (cephalic index 1 : 0.95). Pre-antennal region 0.19 × 0.29 mm. (index 1 : 1.52). Hind head 0.25 × 0.42 mm. (index 1 : 1.68) Prothorax 0.15 × 0.24 mm., postero-lateral angle with an elongate seta. Pterothorax 0.21 × 0.35 mm., trapezoidal, with very prominent posterior angle, postero-lateral angle with one short and one long seta followed by 3+3 long setae along the posterior margin. Abdomen 0.74 × 0.55 mm., segment II straight



Alcedoeffula machera (1) dorsal and ventral aspects of male, (2) male genital armature, (3) parameres, (4) mesosome, (5) vulvar plate showing chaetotaxy.

laterally, posterior margin with minute posterior angulation, III-VII with slight lateral convexity, VIII narrow in the middle, IX concave posteriorly. Tergal plates II-VIII approximate, not distinctly separated, IX and X-XI entire. Tergal plate II bare, III-VII with two long median setae on each side, VIII with one, IX with 3, X+XI with 2+3 short setae, IV-VII with one long post-spiracular seta. Ventral setae confined in the middle. Male genitalia well developed, 0.0315 mm. long basal plate 0.0192 mm. long, anterior width 0.0062 mm., posterior width 0.0092 mm.; Parameres 0.0118 mm. long, nearly straight to about three-quarters when they bend inwards, proximal heads simple as shown in the figure, endomeres closely bound together with the penis and other structures as to form an elongate compact plate, posteriorly reaching as far as the tip of the parameres, 0.0112 × 0.052 mm.; penis spindle-shaped, projecting between the lobes of the endomeres.

Female (Allotype) more or less similar to male, 1.75 × 0.58 mm. Head 0.49 × 0.42 mm. (cephalic index 1 : 0.86). Pre-antennal region 0.23 × 0.33 mm. (index 1 : 1.43). Hind-head 0.26 × 0.46 mm. (index 1 : 1.77). Prothorax 0.12 × 0.25 mm. Pterothorax 0.19 × 0.39 mm. Abdomen 0.95 × 0.58 mm., subgenital plate well developed, furnished with 16-17 heavy marginal setae and 3 other as shown in the figure.

Holotype (male), Allotype (female) and Paratypes (one male and two females) from the Indian Pied King-fisher (*Ceryle rudis leucomelanura* Reichenb) collected by M/s. Siddiqi and Hasan from Shujawal (District Tatta, Sind), 13-11-1953.

3. *Bruelia dicruri* Ansari

(Text-figs. 6—10)

Bruelia dicruri Ansari 1955, Proc. VII, Pak. Sci. Conf., Bahawalpur, p. 53.

Type-host:—The Black Drongo (*Dicrurus macrocerus* Vieillot): DICRURIDAE.

Male (Holotype) 1.35 × 0.37 mm. Head conical 0.34 × 0.31 mm. (cephalic index 1 : 0.91) Pre-antennal region 0.15 × 0.23 mm. (index 1 : 1.53), marginal carina interrupted in front anterior margin at this point hyaline, dorsal anterior plate

quadrate. Hind-head 0.19×0.31 mm. (index 1: 1.63), marginal carina well developed and narrow. Prothorax 0.08×0.19 with a short seta in the postero-lateral angle. Pterothorax 0.11×0.27 mm. more or less trapezoidal, posterior margin rounded, with 6 long, subequal setae. Abdomen 0.82×0.37 mm. tergal plates feeble, paratergal plates slightly strong; II-VII with one tergo-central seta on each side, IV and VII-VIII with one tergo-lateral seta, V and VI with 2 subequal setae, IX with 4 short setae.; sternal plates simple with one long seta on each side: pleural plates rod like, II and III bare, others with 1-3 setae as shown in figure. Male genital armature 0.0175 mm. long, basal plate 0.0145 mm. long, anterior width 0.0075 mm. and

posterior width 0.0067 mm., parameres short and simple, 0.0045 mm. long; mesosome 0.0055×0.0067 mm., simple.

Holotype (male) from the Black Drongo (*Dicrurus macrocercus*) (Vieillot) shot in Jati (District Tatta, Sind), M/s. Siddiqi and Hasan 17-11-1953.

4. *Bruelia meinertzhageni* Ansari

Bruelia meinertzhageni Ansari 1954, *Bull. Nat. Hist. Mus., London* (in press).

Type-host:—The Indian Tree Pie (*Dendrocitta rufa vagabunda*), CORVIDAE.

This species is very similar to *B. glandarii* (Denny) from which it differs in bigger size, dorsal abdominal chaetotaxy in male and genital armature. It was described from specimens obtained from Indian Tree Pie shot in Nepal, Burma and Daccan. Fresh specimens before us are from *Dendrocitta vagabunda pollida* Blyth shot in Jati (District Tatta, Sind) M/s. Siddiqi and Hasan, 16-11-1953.

5. *Bruelia pakistanaise* Ansari

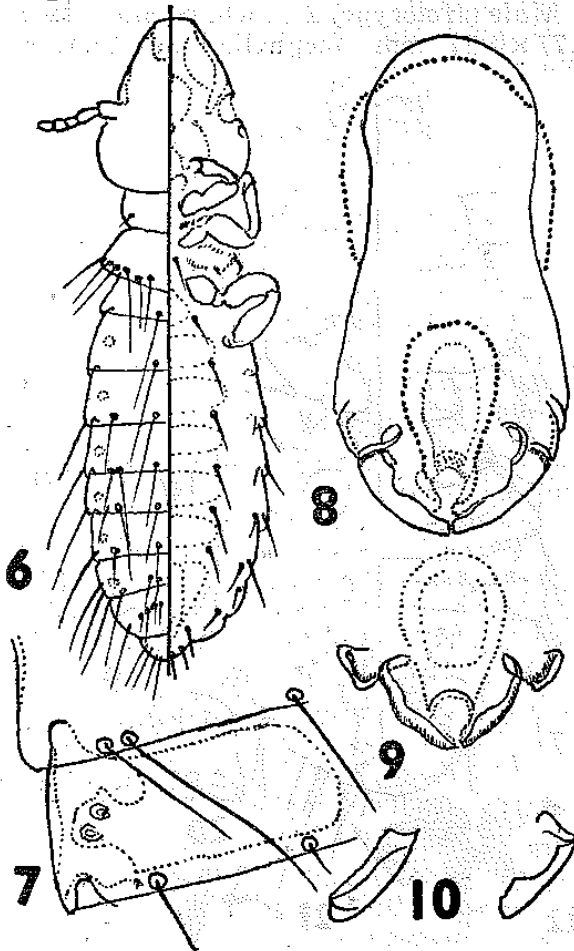
(Text-figs. 11-16)

Bruelia pakistanaise Ansari 1955, *Proc. VII Pak. Sci. Conf., Bahawalpur*, p. 52.

Type-host:—*Lanius vittatus* Valche, LANIIDAE.

It is delicate and feeble louse, resembling *B. deficiens* (Piaget) from *Cyanopica cyanus cooki* Bonapart, and it is very difficult to distinguish the two from superficial examination. The shape of the head, a segment to segment examination of the abdomen will show apparent differences warranting it to be considered a distinct form.

Male (Holotype) 1.50×0.31 mm. Head 0.35×0.26 mm. (cephalic index 1: 0.74), thimble-shaped. Pre-antennal region 0.18×0.21 mm. (index 1: 1.16), marginal carina indented in the middle, frontal margin at this point hyaline. Hind-head 0.17×0.26 mm. (index 1: 1.53). Prothorax 0.10×0.17 mm. Pterothorax 0.14×0.24 mm., trapezoidal with a small posterior angulation, postero-lateral margin with 5-6 long, subequal setae. Abdomen 0.91×0.31 mm., tergal plates well formed, feebly sclerotised, dorsal chaetotaxy sparse, II-IV bare, V with one spiracular seta, VI-VIII with one short and a long spiracular seta, IX with three subequal



Bruelia dicruri (6) dorsal and ventral aspects of male, (7) portion of the tergal plate showing pleural plate, (8) male genital armature (9) mesosome, (10) paramere.

setae, X+XI with 2 such setae; sternal plates well pigmented, II-VI with one postero-lateral seta on each side, pleural plates rod like, II-III bare and others with 1-2 long setae. Male genitalia very delicate, of the type seen in *B. deficiens* (Piaget), 0.0187 mm. long, basal plate elongate and spatulate, 0.0130 mm. long, anterior width 0.0052 mm., posterior width 0.0062 mm., parameres 0.0057 mm. long, very fragile structures as shown in the figure, mesosome 0.0052 × 0.0032 mm., complex.

Female (Allotype) very similar to the male, 1.78 × 0.36 mm. Head 0.38 × 0.28 mm., (cephalic index 1: 0.74). Pre-

antennal region 0.19 × 0.24 mm. (index 1: 1.26). Hind-head 0.19 × 0.28 mm. (index 1: 1.47). Abdomen 1.13 × 0.36 mm., dorsal chaetotaxy showing sexual differences, VI-VII with one spiracular seta, subgenital plate conical, placed on the arched vulvar flap, vulvar plate with 5-6 fragile marginal setae.

Holotype (male), Allotype (female) and Paratypes (5 females and 10 males) from *Lanius vittatus* Valche shot in Karachi, M/s. Siddiqi and Hasan, 26-4-1954.

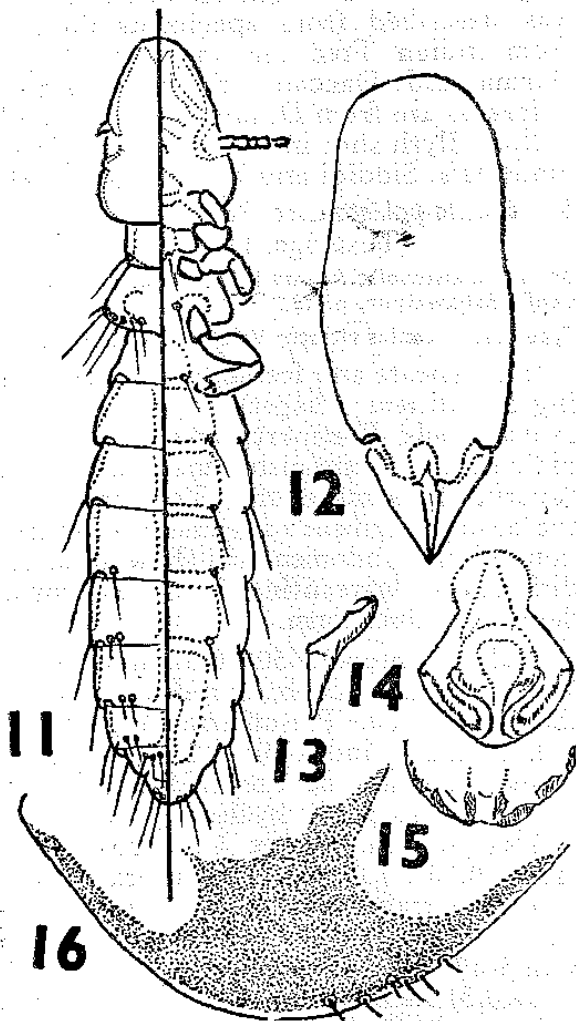
6. *Craspedorrhynchus ranjhae* Ansari

(Text-figs. 17-22)

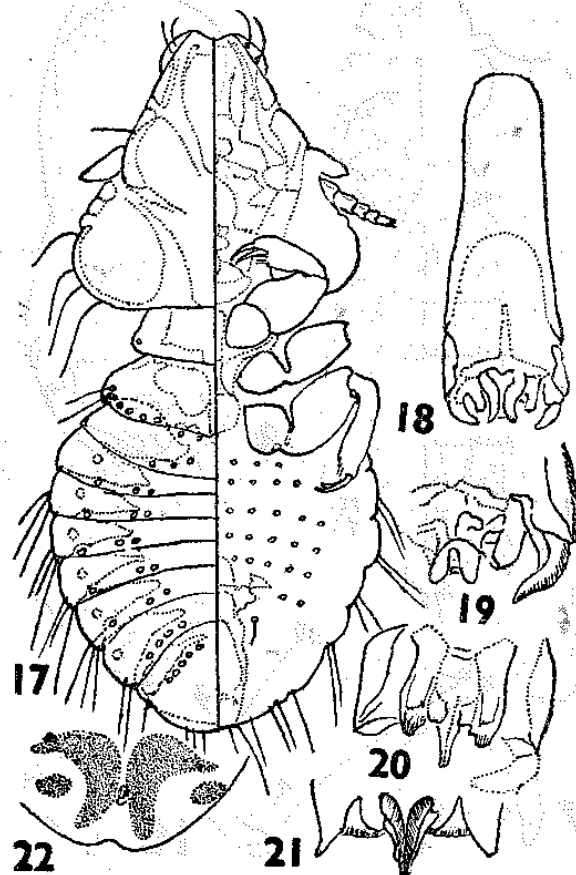
Craspedorrhynchus ranjhae Ansari 1955, *Proc. VII, Ann. Pak. Sci. Conf., Bahawalpur*, p. 49.

Type-host:—The Booted Eagle (*Hieraaetus ponnatus*) (Gmel): FALCONIDAE.

Male (Holotype) 2.11 × 0.98 mm. Head 0.77 × 0.84 mm. (cephalic index 1: 1.09).



Bruelia pakistanaise (11) dorsal and ventral aspects of male, (12) male genital armature, (13) paramere, (14-15) two views of mesosome (16) vulvar plate showing chaetotaxy.



Craspedorrhynchus ranjhae (17) dorsal and ventral aspects of male, (18) male genital armature, (19) terminal portion of the male genitalia showing details (19-21), (terminal subgenital plate in female).

Preantennal region 0.41×0.41 mm. (index 1: 1), forehead narrow, dorsal pre-antennal suture posterior to the middle line, dorsal anterior plate narrow in front, broadest in the middle and regularly sloping down to the posterior angulation, anterior hyaline margin flattened. Hind head 0.36×0.84 mm. (index 1: 2.33), post marginal carina and transverse carina merge into the preantennal nodus, Post-antenna suture well marked, temporal carina well developed. Prothorax 0.22×0.48 mm., lateral sides diverging considerably. Pterothorax 0.22×0.61 mm., strongly diverging laterally, posterolateral angle rounded, posterior margin rounded with a row of elongate setae. Abdomen 0.91×0.98 mm., more or less rotundate, tergal plates triangular, confined marginally, each beset with a posterior row of long setae. Male genitalia well developed, of the pattern shown by Clay (1938), 0.0565 mm. long; basal plate occupies major portion, 0.0410 mm. long, narrow anteriorly, (0.012 mm.) and wide posteriorly (0.0188 mm.), mesosome 0.0091 mm. long and 0.013 mm. wide.

Female (Allotype) more or less similar to male, 2.70×1.10 mm. Head 0.89×0.84 mm. (cephalic index 1: 0.94), Preantennal region 0.47×0.57 mm. (index 1: 1.21). Hind head 0.42×0.84 mm. (index 1: 2). Prothorax 0.28×0.52 mm. Pterothorax 0.22×0.70 mm. Abdomen 1.32×1.10 mm., subgenital plate as shown in the figure.

Holotype (male), *Allotype (female)* and *Paratypes* (3-males and 3-females) collected from Booted Eagle [*Hieraaetus pennatus* (Gmelin)] shot in Shujawal (District Tatta, Sind) M/s. Siddiqi and Hasan, 15-11-1953.

7. *Craspedorrhynchus triangularis* (Rudow)

Docophorus triangularis Rudow 1869, Beitr. Kennin, Malloph, 10.

Type-host:—The Short-toed Eagle [*Circaetus gallicus* (Gmelin)]: FALCONIDAE.

This is one of the most familiar species. Two males and two females before us were collected from the type-host shot in Sakrand (District Nawabshah, Sind), Mr. Siddiqi 6-12-1951.

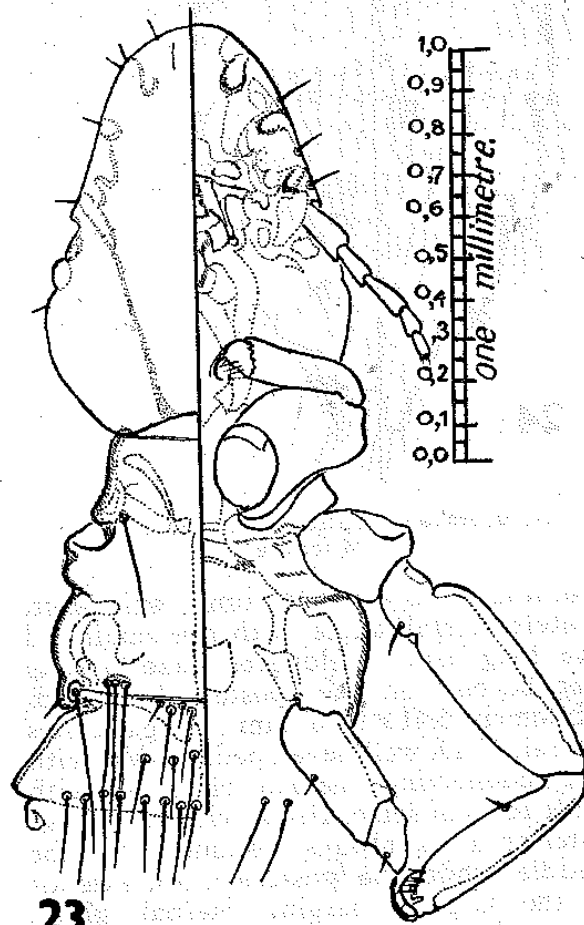
8. *Falcolipeurus yasminae* Sp. Nov.

(Text-figs. 23, 24)

Type-host:—The Booted Eagle [*Hieraaetus pennatus* (Gmelin)]: FALCONIDAE.

About seventeen species of *Falcolipeurus* Bedford are now recognised (Hopkins et Clay 1952). The specimens before us from the Booted Eagle do not resemble them.

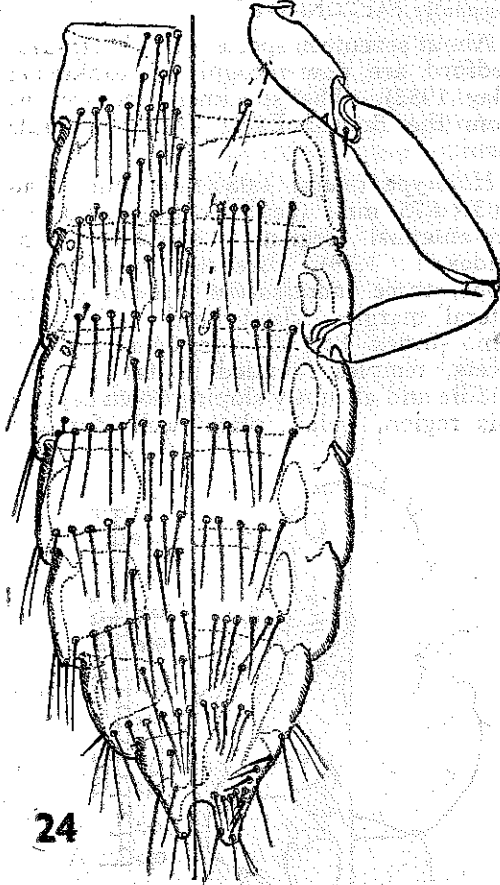
Holotype (male) 4.08×0.96 mm. Head 1.03×0.75 mm. (cephalic index 1: 0.73). Pre-antennal region 0.46×0.64 mm. (index 1: 1.39), forehead rounded in front, three incassation present on the lateral margin. Hind head 0.57×0.75 mm. (index 1: 1.32), eyes consist of two facets, temples rounded as far as the middle and abruptly sloping down beyond this region, gular plate well formed.



23

Falcolipeurus yasminae (23) dorsal and ventral aspects of head and thorax of female

Prothorax 0.30×0.56 mm., sides slightly diverging with a solitary elongate posterior seta near postero-lateral angle.



24

(24) dorsal and ventral aspects of abdomen of female

Pterothorax 0.43×0.75 mm., well built, postero-lateral angle with one small and one long seta, 3 elongate setae arising just beyond on the posterior margin. Abdomen 2.41×0.96 mm., tergal plates lateral, II-IX well developed, II-VI with inter-connecting median plate, II with three rows of setae, III-IX with two rows, anterior rows always confined to the middle while the posterior row extends to the lateral margin. Sternal plates brief, lateral ovate blotches distinct, sternal chaetotaxy weak as shown in the figure, sub-genital plate triangular. Ter-

minial segment bilobed, profusely hairy on ventral aspect.

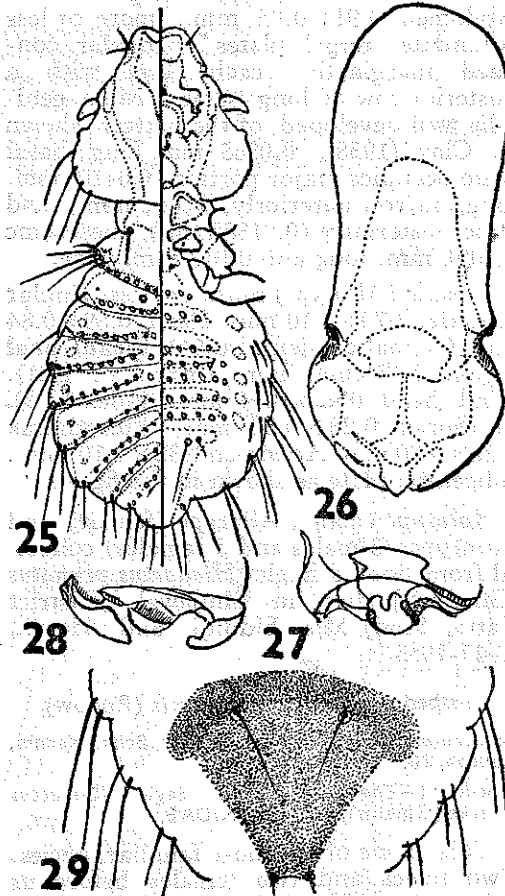
Material examined: One male (mutilated) and three females from the Booted Eagle (*Hieraaetus pennatus* (Gmelin)) shot in Shujawal (District Tatta, Sind), M/s. Siddiqi and Hasan 15-11-1953. *Type female* (second specimen on the slide).

9. *Philopterus bijae* Ansari
(Text-figs. 25-29)

Philopterus bijae Ansari 1955, *Ind. Jour. Ent.*, (in press).

Type-host:—The Rufous-backed Shrike *Lanius schach erythronotus* (Vigors): LANIIDAE.

This species was described from the Rufous-backed Shrike shot in Lyallpur.



Philopterus bijae (25) dorsal and ventral aspects of male, (26) male genital armature, (27-28) terminal aspects of male genitalia showing details (29) subgenital plate of female.

Since then further material (5 males, 11 females and 4 nymphs) has been obtained from the typehost shot in Karachi (Hasan; 26-4-1955) and Jatti (District Tatta, Sind, M/s. Hasan and Siddiqi, 16-11-1953).

Male as shown in the figure, 1.56×0.53 mm. Head 0.49×0.49 mm. (cephalic index 1: 1). Preantennal region 0.21×0.31 mm. (index 1: 1.47), concave in front, clypeal signature well developed. Hind head 0.28×0.49 mm. (index 1: 1.75), gular plate, temporal carina and occipital carina well developed. Prothorax 0.15×0.26 mm., postero-lateral angle rounded, with a single elongate posterior seta. Pterothorax 0.18×0.35 mm., more or less trapezoidal in shape, latero-posterior angle and posterior margin beset with 10-11 long setae. Abdomen 0.74×0.53 mm., II-V:II tergites triangular, always considerably varying in outline; II, III, V & VI with seven posterior setae, IV with 8, VII and VIII with 6 and IX with 2 setae; sternal plates composed of two component parts, the middle portion oblong and the lateral reduced to form rounded incassations; chaetotaxy as shown in the figure; subgenital plate elongated. Male genital armature as shown in the figure.

Female similar to male, but varies considerably in size, 1.72×0.66 mm. Head 0.52×0.49 mm. (cephalic index 1: 0.94). Pre-antennal region 0.25×0.37 mm. (index 1: 1.48), Hind-head 0.27×0.49 mm. (index 1: 1.81). Prothorax 0.13×0.31 mm., Pterothorax 0.18×0.42 mm. Abdomen 0.87×0.66 mm., subgenital plate conical, with one elongate seta on each side beset on the anterior lobe.

10. *Philopterus extraneus* (Piaget)

Docophorus extraneus Piaget 1885 *Peculines Supplement* 3, pl. I, fig. 4.

Type-host:—The Jungle crow (*Corvus m. macrorhynchus* Wagler), CORVIDAE.

This is one of the old known species of louse. The specimens before us were collected from the type-host shot in Harbang (District Chittagong, East Pakistan), Mr. Siddiqi 4-3-1954.

11. *Philopterus fuscicollis* (Burmeister).

Docophorus fuscicollis Burmeister 1838 *Handbuch Ent.*, 2: 425.

Type-host:—The Great Grey Shrike (*Lanius e. excubitor* Linn.), LANIIDAE.

We obtained several specimens of this species from the Indian Great Grey Shrike (*Lanius excubitor lahtora* (Sykes)) shot in Lyallpur and Shujawal (District Tatta, Sind), M/s. Siddiqi and Hasan, 14-11-1953.

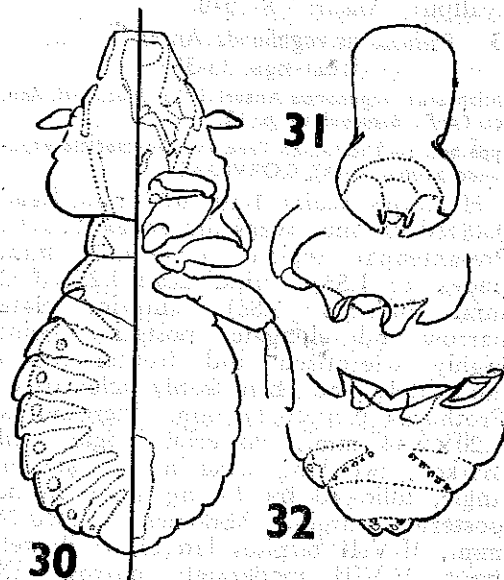
12. *Philopterus kalkalichi* Ansari

(Text-figs. 30-32)

Philopterus kalkalichi Ansari 1955, *Proc. VII Ann. Sci. Conf.*, Bahawalpur, p. 58.

Type-host:—The Black Drongo *Dicrurus m. macrocercus* (Vieillot), DICRURIDAE.

Holotype (male) 1.33×0.52 mm. Head 0.40×0.37 mm. (cephalic index 1: 0.92). Preantennal region 0.20×0.25 mm. (index 1: 1.25), clypeal region sinuate, clypeal signature (anterior plate) heavily sclerotised and pigmented posteriorly and concave anteriorly. Hind head 0.20×0.37 mm. (index 1: 1.85), occipital carina and temporal carina well developed. Prothorax 0.09×0.16 mm., slightly diverging sides, a solitary posterior seta near the posterior angle. Pterothorax 0.16×0.29



Philopterus kalkalichi (30) dorsal and ventral aspects of male, (31) male genital armature (32) last abdominal segment of female.

mm. trapezoidal, median posterior angle obtuse latero-posterior angle with two long setae on each side followed by 7-8 long setae on the posterior margin. Thoracic sternites well developed, with three long setae. Abdomen 0.63×0.52 mm., tergal plates II-VIII lateral, well developed, II more or less quadrangular, III-VI triangular and squat, VII and VIII triangular, elongate, IX entire, X+XI quadrangular, segments II-VIII each with a row of 5-8 elongate setae on each side, IX with one set on each side of the middle line, ventrum as in other species, subgenital plate irregular. Male genital armature as in the figure.

Female (Allotype) very similar to male, 1.66×0.52 mm. Head 0.45×0.37 mm. (cephalic index 1: 0.82). Preantennal region 0.24×0.28 mm. (index 1: 1.17). Hind head 0.21×0.37 mm. (index 1: 1.76). Prothorax 0.10×0.16 mm. Pterothorax 0.19×0.34 mm. Abdomen 0.92×0.52 mm., subgenital plate as in the figure.

Holotype (male), Allotype (female), Paratypes (3 females) from the Black Drongo (*Dicrurus macrocercus* (Vieillot)), shot in Jatti (District Tatta, Sind), M/s. Hasan and Siddiqi 17-11-1953 and Lyallpur, Ansari 5-8-1940.

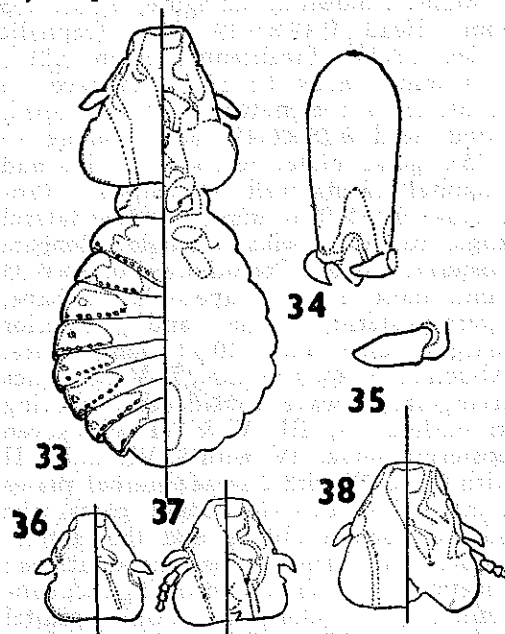
13. *Philopterus vagabunda* Ansari
(Text-figs. 33-38)

Philopterus vagabunda Ansari 1955, Proc. VII, Ann. Sci. Conf., Bahawalpur, p. 52.

Type-host:—The Indian Tree Pie (*Dendrocitta vagabunda pallida* Blyth), CORVIDAE.

Holotype (male) 1.59×0.71 mm. Head 0.48×0.52 mm. (cephalic index 1: 1.1). Pre-antennal region 0.20×0.37 mm. (index 1: 1.85). Hind head 0.28×0.52 mm. (index 1: 1.86), anterior plate narrow and elongate, posterior point highly sclerotised and frontal region moderately and then feebly sclerotised. Prothorax 0.20×0.29 mm. Pterothorax 0.20×0.44 mm., posterior angle well marked, two long setae in the posterior angle, followed by 7 long setae on the posterior margin. Abdomen 0.71×0.71 mm., II-VIII tergites lateral, II-IV well built, V-VIII moderately narrow, IX entire, each segment with a row of 6-7 setae on each side of the middle line, IX with 4 setae and X+XI with one seta

on each side. Male genitalia as in figure. It has been shown that the head width in the nymphal instars of Ischnoceran Mallophaga present a very constant ratio of growth. The width calculated on Dyer's principle approximates sufficiently



Philopterus vagabunda (33) dorsal and ventral aspects of male, (34) male genital armature (35) paramere (36) head of I instar nymph, (37) head of II instar nymph, (38) head of III instar nymph.

closely to the observed measurements, to preclude the possibility of an ecdysis having been overlooked. The Bodenheimer's law is applicable to growth in body length and in Ischnocera there also occurs one latent division between I and II instars (Ansari 1954). We had eight nymphs of *P. vagabunda* in our collection. The results obtained are given below.

Measurements (in mm.)

Body (length \times breadth)	Head (length \times breadth)
0.87×0.34	0.30×0.30
0.87×0.37	0.32×0.30
.....
1.14×0.47	0.37×0.39
1.16×0.55	0.44×0.43
.....
1.27×0.52	0.48×0.49
1.27×0.52	0.48×0.35
1.33×0.61	0.45×0.46
1.39×0.66	0.48×0.41
.....
1.59×0.71	0.48×0.52

January 1956

(1) Growth of nymphal instars of *P. vagabunda* and Dyar's Principle :

Observed and calculated Head widths of instars

I	II	III	Adult
$0.30 \times 1.27 = 0.381$	$0.381 \times 1.27 = 0.484$	$0.484 \times 1.27 = 0.61$	
...	0.39	$0.495 \times 1.27 = 0.629$	
...	0.43	$0.546 \times 1.27 = 0.639$	
...	...	0.49	0.622
...	...	0.46	0.584
...	...	0.41	0.521
...	0.520

(2) Growth of nymphal instars of *P. vagabunda* and Przibram-Mergusar's Principle as modified by Bodenheimer.

(i) Observed and calculated body lengths of instars

III	II	I
$1.39 \div 1.26 = 1.11$	$1.11 \div 1.26 = 0.88$	
$1.33 \div 1.26 = 1.06$	$1.06 \div 1.26 = 0.84$	
$1.27 \div 1.26 = 1.01$	$1.01 \div 1.26 = 0.82$	
...	1.16	0.92
...	1.14	0.90
...	...	0.87

(ii) Observed and calculated body-widths of instars

III	II	I
$0.66 \div 1.26 = 0.52$	$0.52 \div 1.26 = 0.41$	
$0.61 \div 1.26 = 0.48$	$0.48 \div 1.26 = 0.38$	
$0.52 \div 1.26 = 0.41$	$0.41 \div 1.26 = 0.32$	
...	0.55	0.43
...	0.47	0.37
...	...	0.37

(iii) Observed and calculated head-widths of instars

III	II	I
$0.41 \div 1.26 = 0.32$	$0.32 \div 1.26 = 0.25$	
$0.46 \div 1.26 = 0.36$	$0.36 \div 1.26 = 0.29$	
$0.49 \div 1.26 = 0.39$	$0.39 \div 1.26 = 0.31$	
...	0.43	0.34
...	0.39	0.31
...	...	0.31

These observations suggest that the amount of growth achieved after each moult in these parasites is fairly regulat-

ed. The application of Dyar's principle and Przibram-Mergusar's principle as modified by Bodenheimer gives interesting results.

14. *Philopterus vittuti* Ansari

(Text-fig.-39)

Philopterus vittuti Ansari 1955, Proc. VII Ann. Sci. Conf., Bahawalpur, p. 52.

Type-host:—The Shrike (*Lanius vittatus* Valche), LANIIDAE.

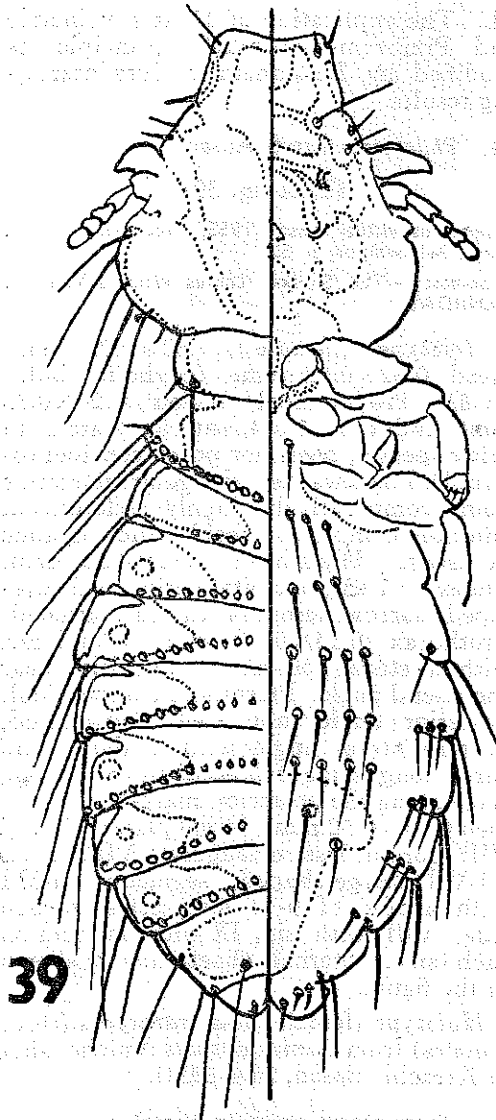
Holotype (female) 1.82 × 0.72 mm. Head 0.52 × 0.52 mm. (cephalic index 1: 1). Pre-antennal region 0.20 × 0.33 mm. (index 1: 1.65), anterior plate as in other species, posterior point considerably pulled backwards, triangular, posterior point comparatively highly sclerotised, anterior component feeble and hyaline in front. Hind-head 0.32 × 0.52 mm. (index 1: 1.63), occipital carina well developed, narrow, temporal carina flattened. Prothorax 0.15 × 0.31 mm. transverse, with a strong posterior seta arising near the lateral angle. Pterothorax trapezoidal, posterior angle not well demarcated, postero lateral angle with a short and three long setae followed by 8-9 long setae along the posterior margin. Abdomen 0.93 × 0.52 mm., tergal plates II and VIII more or less rectangular, VIII brief, III-VII wedge-shaped, segments II-VII with a row of 9-12 long setae on each side, VIII with six, IX with one seta on each side. Sternal chaetotaxy as shown in the figure.

Holotype (female) and *paratypes* (three females) from *Lanius vittatus* Valche shot in Karachi (Hasan, 26-4-1954).

15. *Sturnidoecus chendola* Ansari

Sturnidoecus chendola Ansari 1955 Ind. Jour. Ent. (in press).

This species was described from specimens collected from the Frankline's Indian Crested Lark (*Galerida cristata chendola* Frankline) shot in Lyallpur. Further specimens of this interesting species were collected from the type-host killed in Shujawal (District Tatta, Sind), M/s. Hasan and Siddiqi, 13-11-1953.



Philopterus vittuti (39) dorsal and ventral aspects of female.

Stragglings and Contamination

The extent to which carelessness in the collection of these obligatory parasites may vitiate our records is not often realised by routine collectors and, therefore, mislabelling, contamination and straggling has been frequently experienced in Mallophaga. The contamina-

tion is divided into two groups according to whether it took place before or after the death of the host. The *ante-mortem* cases usually occur in zoological gardens (domestication), where artificial approximation of different hosts is possible. Instances of *post-mortem* contamination are exceedingly common and occur when a few lice are shaken out of one skin on to the other. Failures to clean the work benches thoroughly between the examination of two different hosts is common source of post-mortem contamination. During the present studies we came across two instances of erroneous records.-

1. *Columbicola*:—The genus *Columbicola*, parasitic only on pigeons, is recognised by two pairs of fleshy, porrect spines, beset in the anterior clypeal region. The forwardly directed spines are longer while those held erect are shorter. We have one specimen of this genus collected from *Merops orientalis* Latham, shot in Nawabshah (Sind) by Mr. Qutubuddin (23-10-1953). There seems no doubt that it is a straggler from some species of pigeon. It is not possible for us to determine the species of pigeon with any certainty.

2. *Craspedorrhynchus*:—This genus occurs on several genera of Accipitres and is distinguished from the true *Philopterus* by the prolongation of the antennal and internal bands (pulvinus and ventral carina) of the head to a point some distance beyond the anterior margin of dorsal anterior plate, by the absence of a second trabecular tubercle and by the characters of male genital armature. One female specimen from the Indian Tree Pie (*Dendrocitta vagabunda pallida* Blyth) was found mixed up in 12 specimens of *Philopterus vagabunda*. This specimen was collected by M/s. Siddiqi et Hasan on 16-11-1953.

These two instances emphasise the chances of contamination during routine collection of these parasites and call for careful vigilance during collection campaigns. The lice usually do not leave the defunct host. If collection, quickly after shooting, is not possible, the following precautions to minimise the chances of straggling should be observed. For de-

tails of collection technique, the reader interested cannot do better than to read Hopkins (1949) and Ansari (1951).

Precautions to be observed during collection of Phthirapteran parasites:—

1. Each animal should be separately wrapped in a paper bag or placed in linen sack and its opening fastened with a string.

2. Separate dissecting and skinning boards should be used for each animal

and all chances of contamination in the laboratory should be minimised.

3. The laboratory tables should be properly cleaned soon after and before the study of the other host is taken up.

4. Jars used for fumigation should be cleaned every time another animal is taken up for study.

5. It is always advisable to use a new sheet of paper for collection of lice from the jar.

Host Parasite Index

Host	PARASITE
1. <i>Ceryle rudis leucomelanura</i> Reichenb : Alcedinidae	<i>Alcedoffula machera</i> sp. nov.
2. <i>Circaetus gallicus</i> (Gmelin) : Falconidae	<i>Craspedorrhynchus triangularis</i> (Rudow).
3. <i>Corvus macrorhynchus</i> Wagler : Corvidae	<i>Philoaterus extraneus</i> (Piaget)
4. <i>Dendrocitta vagabunda pallida</i> Blyth: Corvidae	<i>Bruelia meinertzhageni</i> Ansari <i>Philoaterus vagabunda</i> Ansari
5. <i>Dicrurus macrocercus</i> (Vieillot) : Dicruridae	<i>Bruelia dicruri</i> Ansari <i>Philoaterus kalkalichi</i> Ansari
6. <i>Galerida cristata chendoola</i> Frankline : Alaudidae	<i>Sturnidoecus chendoola</i> Ansari
7. <i>Halcyon s. smyrnensis</i> (Linn.) : Alcedinidae	<i>Alcedoecus annularis</i> Ansari
8. <i>Hieraaetus pennatus</i> (Gmelin) : Falconidae	<i>Craspedorrhynchus ranjhae</i> Ansari <i>Falcolipeurus yasminae</i> Ansari
9. <i>Lanius excubitor lahtora</i> (Sykes) : Laniidae	<i>Philoaterus fuscicollis</i> (Burmeister)
10. <i>Lanius schach erythronotus</i> (Vigors) : Laniidae	<i>Philoaterus bijae</i> Ansari
11. <i>Lanius vittatus</i> Valche : Laniidae	<i>Bruelia pakistanaise</i> Ansari <i>Philoaterus vittuti</i> Ansari

Parasite Host Index

1. <i>Alcedoecus annularis</i> Ansari	<i>Halcyon s. smyrnensis</i> (Linn.) : Alcedinidae.
2. <i>Alcedoffula machera</i> Ansari	<i>Ceryle rudis leucomolanura</i> Reichenb : Alcedinidae.
3. <i>Bruelia meinertzhageni</i> Ansari	<i>Dendrocitta vagabunda pallida</i> Blyth : Corvidae.
4. <i>Bruelia dicruri</i> Ansari	<i>Dicrurus macrocercus</i> (Vieillot) : Dicruridae.
5. <i>Bruelia pakistanaise</i> Ansari	<i>Lanius vittatus</i> Valche : Laniidae.
6. <i>Craspedorrhynchus ranjhae</i> Ansari	<i>Hieraaetus pennatus</i> (Gmelin) : Falconidae.
7. <i>Craspedorrhynchus triangularis</i> (Rudow)	<i>Circaetus gallicus</i> (Gmelin) : Falconidae.
8. <i>Falcolipeurus yasminae</i> Ansari	<i>Hieraaetus pennatus</i> (Gmelin) : Falconidae.
9. <i>Philoaterus bijae</i> Ansari	<i>Lanius schach erythronotus</i> (Vigors) : Laniidae.
10. <i>Philoaterus extraneus</i> (Piaget)	<i>Corvus macrorhynchus</i> Wagler : Corvidae.
11. <i>Philoaterus fuscicollis</i> (Burm.)	<i>Lanius excubitor lahtora</i> (Sykes) : Laniidae.
12. <i>Philoaterus kalkalichi</i> Ansari	<i>Dicrurus macrocercus</i> (Vieillot) : Dicruridae.
13. <i>Philoaterus vagabunda</i> Ansari	<i>Dendrocitta vagabunda pallida</i> Blyth : Corvidae.
14. <i>Philoaterus vittuti</i> Ansari	<i>Lanius vittatus</i> Valche : Laniidae.
15. <i>Sturnidoecus chendoola</i> Ansari	<i>Galerida cristata chendoola</i> Frankline : Alaudidae.

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