

**TAXONOMY OF WILD BIRDS' LICE AT THE CAMPUS OF CHITTAGONG
UNIVERSITY, CHATTOGRAM, BANGLADESH**

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Abstract: Lice of five wild bird species, of diversified feeding habits and phylogeny viz., *Sturnus contra*, *Acridotheres tristis*, *A. fuscus*, *Pycnonotus cafer* and *Streptopelia chinensis* – have been investigated between 2014 and 2018 from the Chittagong University Campus and adjoining areas. A total of six lice species, viz., *Menacanthus eurysternus* (Burmeister), *Sturnidoecus sturni* (Clay), *Bruelia zohrae* (Ansari), *Myrsidea kathleenae* (Hellenthal and Price), *Columbicola turturis* (Uchida) and *Nitzschiella lativentris* (Uchida), were identified and described. Among them, five were strictly host specific – *S. sturni* (in *S. contra*), *B. zohrae* (in *A. fuscus*), *M. kathleenae* (in *P. cafer*), *C. turturis* (in *S. chinensis*), and *N. lativentris* (in *S. chinensis*). The remaining species, *M. eurysternus*, had wide specificity – occurring in all the three sturnid species investigated, i.e., *S. contra*, *A. tristis* and *A. fuscus*. Closely related hosts were found to share similar parasite species whereas unrelated host possess completely different lice species. Of the five hosts, three (*S. contra*, *A. fuscus*, and *Streptopelia chinensis*) were found to be infested by two lice species each, whereas, *A. tristis* and *P. cafer* hosted by a single lice species each.

Key words: Lice, wild birds, description, Chittagong University Campus

INTRODUCTION

Parasites are an incredibly diverse assemblage of organisms that infest a diverse assemblage of hosts. Yet, most parasites are specialized and have unique adaptations that allow them to competitively and efficiently exploit a specific host. Again, even highly specialized, host specific, parasites occasionally switch on new host species. Hosts and parasites are, usually, phylogenetically related, i.e., related species and genera of parasites are often restricted to related species and genera of hosts (Kennedy 1975). Also, many of them are often ecologically related (Kennedy 1975), i.e., host species having similar way of life (niche) tend to have similar parasites. Birds are economic and effective source of animal protein, playing a vital role in narrowing down, within the shortest possible time, the animal protein supply gap. They also help in pollination, natural control of pest and insect, and dispersal of vegetation, thus contributing

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Immensely universally to human and animal food and shelter. Birds are susceptible to parasites just as mammals and reptiles are. For most mammalian parasites there is a counterpart in the bird world. Birds can be infested with internal parasites such as worms, and with external parasites like lice and mites (Altman *et al.* 1997). The parasites have been reported to act as vector of many avian and other animal diseases (McClure *et al.* 1971). Birds are unique in harbouring parasites and transmission of diseases to vertebrates including man. Thus, also, have a great medical and veterinary importance.

Both ecto- and endoparasites infest bird. Ectoparasites of birds, in general, live on the skin or penetrate within the skin or even into the air sacs, and some live under the feathers. These ectoparasites consume dead cells of skin and tissue fluids (Urquhart 1987). Most of the ectoparasites feed on fragments of feathers, and other epidermal products of birds. Ewing (1924) stated that some parasites obtain sebum, and possibly serum, by probing into the hair follicles of their hosts.

Ectoparasites like lice cause heavy morbidity by sucking blood. As a result birds' haemoglobin and erythrocyte values get reduced and hyperchronic anemia happens (Jungmann *et al.* 1970). Lice infestation cause weight loss and decrease the egg yield and lameness is associated with heavy lice infestation (El-kifl *et al.* 1973).

Numerous studies have been carried out on the ectoparasites of the avifauna from different zoogeographical regions of the world. Substantial works have also been done in the Indian Subcontinent by workers like Zunker (1928); Qadri (1935, 1936, 1939); Tandan (1952a, b, 1958, 1964); Ansari (1955A, B, C, etc., 1956A, B, C, etc., 1957A, B, etc., 1958); Lakshminarayana (1967, 1968, 1969, 1970); Tandan and Dhanda (1963); Kumar and Tandan (1966, 1968, 1971); Lakshminarayana and Emerson (1971); Kumar *et al.* (1994). But in Bangladesh this branch of research has not been flourished yet. Only three published works have been done by Hari *et al.* (1981), Asmat and Kader (1990), and Asmat and Choudhury (1995). Among them the works of Asmat and Kader (1990), and Asmat and Choudhury (1995) were on nest parasite. One attempt has been made by Begum (2008) (unpublished) on ectoparasites of some birds of the Chittagong University Campus. But morphological description of lice from the wild birds is almost nonexistent among the published works from Bangladesh. Hence, the lice of the five studied birds were described.

MATERIAL AND METHODS

Selected host bird species: Five host species - *Sturnus contra* (Linnaeus, 1758) [Pied Myna], *Achridotheres tristis* (Linnaeus, 1766) [Common Myna], *A. fuscus* (Wagler, 1827) [Jungle Myna], *Pycnonotus cafer* (Linnaeus, 1966) [Red-vented

Bulbul] and *Streptopelia chinensis* (Scopodi, 1768) [Spotted Dove] were selected for the present study. Among the host species *S. contra* and *A. fuscus* are insectivorous. *A. tristis* is primarily insectivorous it they shows some sort of omnivore feeding due to staying close proximity to humans. *P. cafer* is primarily a frugivorous bird, whereas, *S. chinensis* is primarily a granivorous bird.

Site and of host collection: The host animals, mostly injured or rescued birds, were collected form the Chittagong University Campus (CUC) and the adjoining places from 2014 to 2019. A total of 64 host species were collected, among them, 14 were *S. contra*, 14 were *A. tristis*, 12 were *A. fuscus*, 12 were *P. cafer* and 12 were *S. chinensis*.

Collection of the parasites: The host birds were placed in a piece of white paper holding it gently with hands and carefully searching its feather for the parasites. If any lice found that was immobilized by a drop of 70% alcohol then picked it with the tip of a needle or forceps and kept it in the 70% alcohol.

Preparation of the parasites for microscopic study: The collected lice were cleaned and studied as temporary whole mounts in lactophenol. All species of lice required three to five days to be fairly cleared.

Identification of the parasites: Literatures and keys followed for the identification of parasites have been given after the description of each parasite.

Drawings of the parasites: Drawings were made with the help of a Camera Lucida.

Measurements of the parasites: All measurements are in millimeters unless otherwise mentioned; generally given as mean with range in parentheses. Body measurements were taken from the anterior most to posterior most part of the body for both males and females (if available). At least three individuals of each of the sexes were measured when sufficient number was available. All measurements were recorded with the help of an ocular micrometer calibrated and fitted to a binocular research microscope.

Abbreviations: TW, temple width; HL, Head length at midline; HW, head width; PL, prothorax length; PW, prothorax width; PtL, pterothorax length; PtW, pterothorax width; ML, metathorax length; MW, metathorax width; AL, abdominal length; AW, abdominal width; AAW, anterior abdominal width; PAW, posterior width; AWIV, abdomen width at segment IV; LSVII, length of longer inner tergal seta on abdominal segment VII; ANW, female anus width; TL, total length; GL, male genitalia length; and GSW, width of male genital sac sclerite at level of lateral spines. Tergal setal count includes the postspiracular setae and all setae between them.

RESULTS AND DISCUSSION

Host specificity, and relationship of parasites with their hosts' family and food habits All ectoparasites were identified up to species level, these were:

Menacanthus eurysternus (Burmeister), *Sturnidoecus sturni* (Clay), *Bruelia zohrae* (Ansari), *Myrsidea kathleenae* (Hellenthal and Price), *Columbicola turturis* (Uchida) and *Nitzschiella lativentris* (Uchida).

Table 1 Relationship parasites with host family and food habits

Host	Host family	Food habit of host	Parasite
<i>S. contra</i>	Sturnidae	Insectivorous	<i>M. eurysternus</i> , <i>S. sturni</i>
<i>A. tristis</i>	Sturnidae	Omnivorous (Primarily insectivorous)	<i>M. eurysternus</i>
<i>A. fuscus</i>	Sturnidae	Insectivorous	<i>M. eurysternus</i> , <i>B. zohrae</i>
<i>P. cafer</i>	Pycnonotidae	Frugivorous	<i>M. kathleenae</i>
<i>S. chinensis</i>	Columbidae	Grainivorous	<i>C. turturis</i> , <i>N. lativentris</i>

Among them, five were strictly host specific – *S. sturni* (in *S. contra*), *B. zohrae* (in *A. fuscus*), *M. kathleenae* (in *P. cafer*), *C. turturis* (in *S. chinensis*), and *N. lativentris* (in *S. chinensis*) (Table 1). The remaining species, *M. eurysternus*, had wide specificity – occurring in all the three sturnid species investigated, i.e., *S. contra*, *A. tristis* and *A. fuscus* (Table 1). Closely related hosts were found to share similar parasite species whereas unrelated host possess completely different lice species.

Description of parasites

Menacanthus eurysternus (Burmeister)

(Fig.1A -1D; Description based on measurements of three males and three females)

Identification: Based on Price (1977)

Host: *S. contra*, *A. tristis*, and *A. fuscus*

Site of infestation: Body feather

Mallophaga, Parthiraptera, Menoponidae. Head wider than long, widest across temples, with rounded anterior margin and ventral spine like process. Preocular slit present; nodi moderately developed, associated carinae weak. Antennae concealed, with slightly expanded pedicel and undivided terminal segment, third antennal segment wineglass-shaped; antennal grooves present. Maxillary palps present, postpalpal processes present. Pronotal margin of thorax with 12 long, 4 short setae; moderately developed prosternal plate, usually with no setae other than 1+1 anterior to it. Postnotum vertically oblonged. Mesothorax not as sclerotized ring. Abdominal tergites I-II possess short seta, which is lateral to postspiracular seta; very long postspiracular setae on II-VIII, on I somewhat shorter; tergites I-VIII of same lengths, undivided, and no anterior setae present. The shape of anus of females is oval, inner setae absent; sternites VII-VIII not fused.

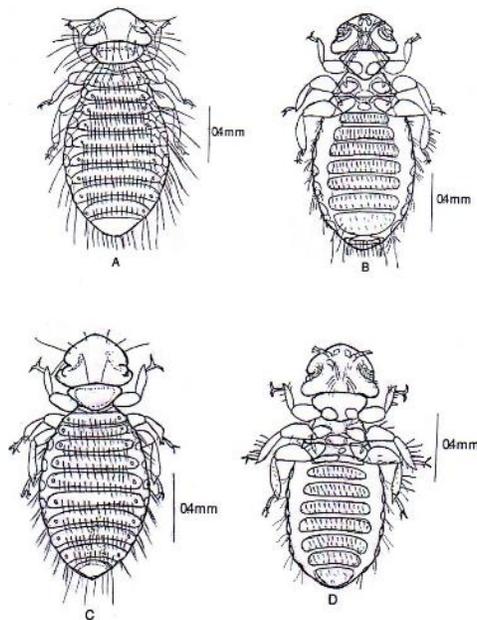


Fig. 1 *M. eurysternus* (A, B - Female dorsal and ventral view, C, D - Male dorsal and ventral view)

Female: TL, 1.82 (1.70-2.07); TW, 0.78 (0.74-.83); HL, 0.32 (0.29-0.34); HW, 0.56 (0.55-0.58); PL, 0.21 (0.20-0.22); PW, 0.43 (0.42-0.44); ML, 0.28 (0.25-0.30); MW, 0.59 (0.58-0.60); AL, 1.01 (0.91-1.20). Tergal setae: I, 18-27; II-V, 23-40; VI, 21-36; VII, 18-33; VIII, 10-17. Sternal setae: I, 2-3; II, 20-35; III-V, 35-75; VI, 32-60; VII, 22-43. Medioposterior margin of subgenital plate from sternite VII is serrated, and with 22-41 setae. No inner setae present in anus but 33-50 ventral and 37-59 dorsal fringe setae present.

Male: TL, 1.54 (1.50-1.58); TW, 0.72 (0.68-0.77); HL, 0.31 (0.28-0.33); HW, 0.55 (0.54-0.56); PL, 0.20 (all similar); PW, 0.41(0.40-0.42); ML, 0.26 (0.23-0.28); MW, 0.57 (0.56-0.58); AL, 0.85 (0.83-0.87). Tergal setae: I, 12-19; II-V, 17-29; VI, 15-24; VII, 13-19; VIII, 8-11. Sternal setae: II, 20-26; III-V, 25-45; VI, 22-29; VII, 23-40.

The species of *Menacanthus* (Neumann) from the birds of Passeriformes are generally restricted in their host distribution (Price 1975). There are 28 species of this genus reported from Passeriformes (Price 1977). However, *Menacanthus eurysternus* (Burmeister) is generally found on multiple passerine families as well as on some hosts apart from the Passeriformes (Price 1975). About over 20 families, 70 genera, and 188 species of passerine birds are hosted by this species along with 3 genera and 5 species of Piciform birds; and questionably 4 other bird orders (Price 1975). There are 36 synonymies for this species

proposed by Price (1975). Hari *et al.* (1981) reported this parasite from only *A. tristis* (Common Myna) from Bangladesh. Ansari (1956A) also reported this parasite from *A. tristis* of Punjab, India. However, in the present work, this parasite has been infested all the three passerine sturnid species (*S. contra*, *A. tristis* and *A. fuscus*).

***Myrsidea kathleenae* (Hellenthal and Price):**

(Fig. 2A– 2D; description based on measurements of one male and three females)

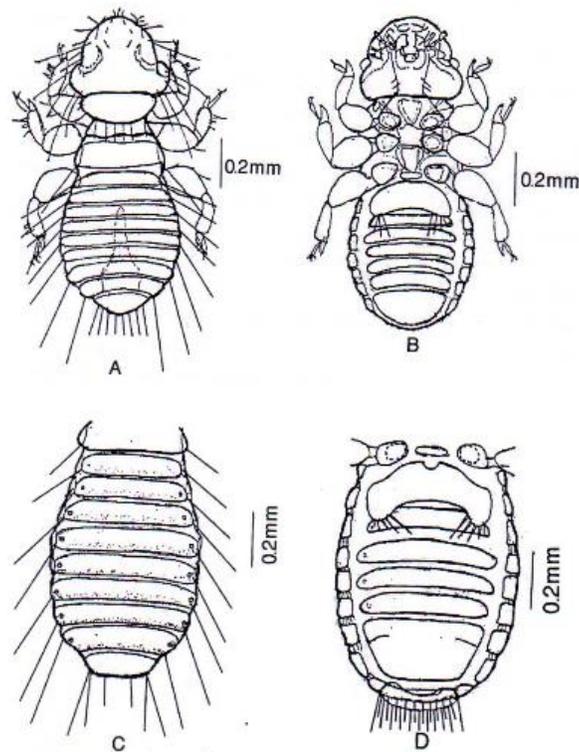


Fig. 2. *M. kathleenae* (A, B - Male dorsal and ventral view, C, D - Female abdomen dorsal and ventral view)

Identification: Based on Hellenthal and Price (2003)

Host: *Pycnonotus cafer*

Site of infestation: Body feather

Mallophaga, Parthiraptera, Menoponidae. Head wider than long, no lateral notch or slit present; inner and occipital setae are, respectively, long and very short; no ventral sclerotized spinous processes present; heavier longer posterior pair of setae present in gula; Well-developed hypopharyngeal sclerites present. Antennae three segmented, concealed, third antennal segment wineglass-

shaped; antennal grooves present. Maxillary palps present. Pronotum present in thorax, each lateral corner of which have 6 long medioposterior marginal setae and 3 short setae; well-defined mesonotum with only two minute medioanterior setae adjacent to postnotum. Well-developed and elongate Prosternal plate, two minute anterior setae present; notum present in mesothorax, strongly sclerotized ring formed by the fusion of pleura and sternum; venter of femur 3 with brush of sparse setae. Undivided tergites formed the abdomen; no anterior tergal or pleural setae present; small sternite I with no setae; each latero-posterior corner enlarged sternite II having aster of 4-5 heavy setae and 17-38 additional slender setae also found elsewhere. The shape of female anus is oval, no inner setae present; fused sternites VII-IX having subgenital plate with lightly serrated posterior margin. Sternites VIII-IX of male subgenital plate is fused; genitalia of characteristic shape, small associated sclerite is present in spinous sac. Males are comparatively smaller than that of females. Other differences are sparser abdominal chaetotaxy, and differences in genitalic features especially at the posterior abdomen. Metanotal or abdominal tergal plate of some female may have further gross enlargement.

Male: TL, 1.42 (1.40-1.43); AWIV, 0.50 (0.48-0.51); HL, 0.305 (0.30-0.31); HW, 0.445 (0.44-0.45). Thorax with PL, 0.14 (0.13-0.15); PW, 0.28 (0.27-0.29); ML, 19 (all similar); MW, 0.41 (0.40-0.42). AWIV, 0.55-0.59; LSVII, 0.13-0.21; TL, 1.28-1.38; GL, 0.40-0.46; GSW, 0.046-0.056. Tergal setae: II, 10-16; III, 15-16; IV, 13-17; V, 13-15; VI, 12-14; VII, 10-13; VIII, 8-9. Sternal setae: III, 10-16; VI, 33-41; V, 35-45; VI, 29-38; VII, 17-21; VIII, 4-5. Genitalia with wide genital sac sclerite.

Female: TL, 1.53 (1.50-1.55); AWIV, 0.613 (0.61-0.62); HL, 0.32 (0.31-0.34); HW, 0.45 (all similar). Thorax with PL, 0.146 (0.14-0.15) PW, 0.29 (all similar); ML, 20 (19-21); MW, 0.42 (0.40-0.43); LSVII, 0.13-0.21. Tergal setae: II, 13-16; III-V, 14-17; VI, 13-16; VII, 12-14; VIII, 10-12. Sternal setae: III, 15-20; IV-V, 33-49; VI, 29-41; VII, 13-22; VIII, 18-23. Anal fringe with 39-44 ventral, 35-43 dorsal setae.

The birds of several orders are infested by *Myrsidea* Waterston, among these, Passeriformes hosted 235 valid species of (e.g., Hellenthal and Price 2003, 2005; Price *et al.* 2003, 2005; Dalglish and Price 2005), Piciformes: Ramphastidae hosted nine (Price *et al.* 2004) and Apodiformes: Trochiidae hosted nine (Dalglish and Price 2003). Within the same host family this parasite have a wider specificity as 40 of these *Myrsidea* species use multiple hosts with one exception (Price *et al.* 2003). The passerine family Pycnonotidae hosted 17 species of this genus (Price *et al.* 2003). Until 2003, *M. pycnonoti* was the only *Myrsidea* species recorded from the passerine host family Pycnonotidae

the original description of which was from *Pycnonotus analis*. The list of host taxa is suspiciously long for this parasite. Later Hellenthal and Price (2003) after his intensive study on the genus *Myrsidea* from bulbul (Passeriformes: Pycnonotidae), described another 16 new species of lice of the genus from the pycnonotid passerine birds. *Myrsidea kathleenae* was first described by Hellenthal and Price (2003) from Red-vented Bulbul (*Pycnonotus cafer*) from South-east Asia. The present species was also collected from Red-vented Bulbul and is still the only recognized *Myrsidea* species from this host. The very wide size and shape of the genital sac sclerite of male distinguish it from other such *Myrsidea* species. The female separation rely on the wide anus and comparatively long inner seta on tergite VII. So far *M. kathleenae* is the sole known *Myrsidea* of *Pycnonotus cafer*.

***Bruelia zohrae* (Ansari)**

(Fig. 3A - 3D; description based on measurements of one male and three females)

Identification: Based on Ansari (1956A)

Host: Acridotheres fuscus

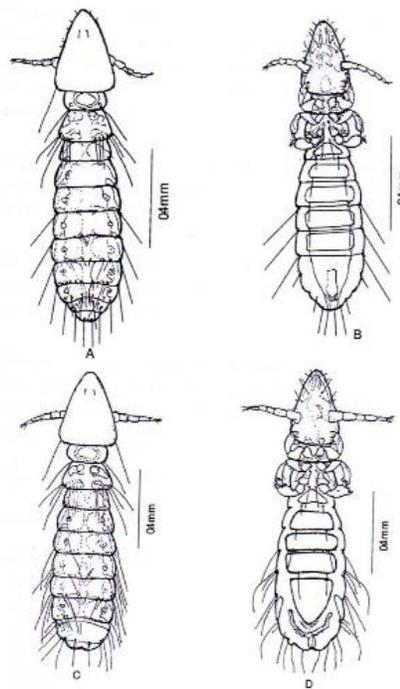


Fig. 3 *B. zohrae* (A, B - Female dorsal and ventral view, C, D - Male dorsal and ventral view)

Site of infestation: Body feather

Mallophaga, Parthiraptera, Philopteridae. Body elongated, dorsoventrally

flattened. Head relatively large, triangular with acutely pointed forehead; HL is longer than HW; dorsal suture well marked. Antennae five segmented, all similar in shape; not concealed, projecting; antennal grooves absent. Maxillary palps absent. Carina at anterior margin of head entire dorsally, marginal carina indented medially and the anterior margin at this point hyaline. Prothorax transverse, with one long dorsal hair in the posterior angle. Pterothorax trapezoidal, broadly angled over abdomen, laterally divergent with six elongated setae on the dorsal posterior margin on each side. Abdomen elliptical, with broadly rounded terminal segment. The dorsal abdominal setae delicate. Segments II-VIII with approximate tergal plates; tergal plates squarish, feebly sclerotized. Sternal plates II-V, transverse, fairly distinct, confined to the middle.

Male: TL, 1.4; HL, 0.37; HW, 0.28; HL/ HW, 1.32; Thorax with PL, 0.11; PW, 0.21; PtL, 0.15; PtW, 0.25. Tergal setae: I, 10-12; II-IV, 0; V, 2; VI, 6-8; VII, 11-12; VIII, 8-10. Sternal setae: I-VI, 2; VII-VIII, 0. Pleural setae: I-III, 0; IV-VI, 4; VII-VIII, 2.

Female: TL, 1.64 (1.6-1.7); HL, 0.39 (0.38-0.40); HW, 0.295 (0.29-0.30); HL/ HW, 1.32 (1.31-1.33); Thorax with PL, 0.13; PW, 0.215 (0.21-0.22); PtL, 0.195 (0.19-0.20) PtW, 0.27 (0.25-0.28). Tergal setae: I, 10-12; II-IV, 0; V-VII, 2; VIII, 4. Sternal setae: I-VI, 2; VII-VIII, 0. Pleural setae: I-II, 0; III, 2; IV-VI, 4; VII, 6; VIII, 4.

***Sturnidoecus sturni* (Clay)**

(Fig. 4A-4B; description; based on measurements of three males and three females)

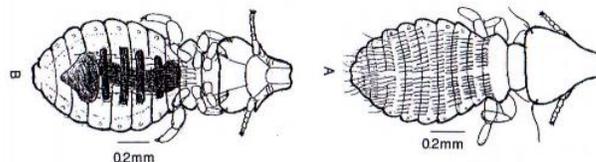


Fig. 4 *S. sturni* (A, B - Female dorsal and ventral view)

Identification: Based on Watt (1970)

Host: *S. contra*, *A. tristis*, and *A. fuscus*

Site of infestation: Body feather

Mallophaga, Parthiraptera, Philopteridae. Body robust, dorsoventrally flattened. Head relatively large and broad; without peg-like setae; mandible present; frontal carina with a posterior transverse branch; dorsal anterior head plate emarginate anteriorly. Antennae five segmented, not concealed, projecting, third

antennal segment not wineglass-shaped; antennal grooves absent. Pterothorax trapezoidal, with markedly diverging lateral margins. Abdomen broad; abdominal pleurites without ventral processes and deeply pigmented; tergites of abdomen divided by median membranous areas.

Male: TL, 1.55 (1.59-1.50); HL, 0.50 (0.48-0.51); HWBA, 0.30 (all similar); HWAA, 0.51 (0.48-0.52). Thorax with PL, 0.145 (0.14-0.15) PW, 0.295 (0.29-0.0.30); PtL, 0.15 (0.14-0.16); PtW, 0.44 (0.43-0.45); AL, 0.79 (0.78-0.80); AW, 0.645 (0.64-0.65).

Female: TL, 2.00 (1.96-2.10); HL, 0.553 (0.55-0.56); HWBA, 0.35 (0.34-0.36); HWAA, 0.56 (0.55-0.58). Thorax with PL, 0.16 (0.15-0.18); PW, 0.31 (0.30-0.32); PtL, 0.203 (0.20-0.21); PtW, 0.50 (0.45-0.52); AL, 1.08 (1.02-1.15); AW, 0.80 (all similar).

***Columbicola turturis* (Uchida)**

(Fig. 5A - 5B; description (Based on measurements of four males and four females)

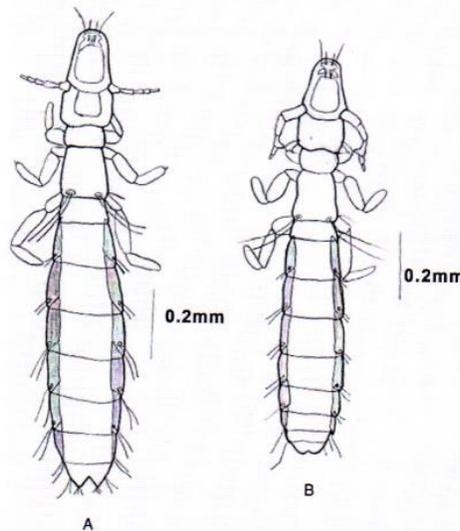


Fig. 5 *C. turturis* (A - Female dorsal view, B - Male dorsal view)

Identification: Identification is based on Adams *et al.* (2005)

Host: *Streptopelia chinensis*

Site of infestation: Quill feathers of wings and tail

Mallophaga, Parthiraptera, Philopteridae. Body elongated, with distinctly indented anterior head margin. Head longer than broad. Dorsoanterior head plate bilobed, associated with a pair of anterior medial and broad setae. Posterior marginal head setae (PMHS) thick, spike-like, shorter than anterior

marginal head setae. Antennae five segmented. Two long setae are present on each side of margin of metanotum. Tergites II-IX of the abdominal are divided medially. Very clear sexual dimorphism occur; the females are bigger than the males; an enlarged antennal scape and pronounced spur (assistant in copulation) on the third antennal segment is present in males. Vent of females bifurcated and apex of the terminalia bears two short setae; pleura more thickened. Male mesosome with deep anterior grooves; posterior edge of mesosome elongated. Numerous distinct lateral setae are present in the female subgenital plate anterior portion of which is broad, which is situated near midline with slight lateral expansion.

Male: TL, 2.39 (2.32-2.48); HL, 0.57(0.55-0.59); HW, 0.265 (0.26-0.27); HL/HW, 2.14 (2.11-2.19). Thorax with PL, 0.15 (all similar); PW, 0.22 (0.20-0.23); ML, 0.27 (0.25-0.28); MW, 0.28 (0.26-0.29). Genitalia as in Figure 22; GW, 0.099 (0.098-0.100); mesosome with deep anterior groove, with 1 large, 2 small pores of each side.

Female: TL, 2.62 (2.35-2.76); HL, 0.61 (0.60-0.64); HW, 0.285 (0.28-0.29); HL/HW, 2.16 (2.12-2.21). Thorax with PL, 0.165 (0.16-0.17); PW, 0.225 (0.22-0.23); ML, 0.28 (0.27-0.30); MW, 0.29 (0.28-0.30). Ventral terminalia as in Figure 23; subgenital plate groove broad with irregular lateral edges, 4-7 setae on each side.

With 77 valid recognized species, *Columbicola* Ewing (Phthiraptera: Ischnocera: Philopteridae) is one of the largest species containing genera of chewing lice (Adams *et al.* 2005). Pigeon and doves (Columbiformes) are the only host of these parasites; generally the body shape of most of these parasites is long and slender, this body shape enable the lice to escape from preening by inserting themselves between the barbs of the large quill feathers (Nelson and Murry 1971; Clayton 1991). Many species of this genus are strictly host specific of genus or even species level. However, some species of *Columbicola* show a wider specificity – occurring in multiple host genera. Phoresis might be a reason for this wide specificity (Keirans 1975; Clayton *et al.* 2004).

Hopkins and Clay (1952), in their checklist of chewing lice, proposed the present framework of taxonomy of *Columbicola*. Later, Tendeiro (1965) formulated the first key to *Columbicola* species of the world. On the basis of chaetotaxy, body shape, internal sclerotization, and genitalic structure he divided the genus into 9 species groups; later Tendeiro (1984) a tenth species group has been added. About 40% of the known species of the genus has been described by him (Tendeiro 1984). Metanotal setal patterns and tenuous features of genitalia were the key characters of initial descriptions by Tendeiro (1965) of species group for *Columbicola* (Tendeiro 1984). Clayton and Price

(1999) later reviewed entire New World Species of the genus *Columbicola*. Five new species were described by them and they also remarked on the probable species groups. Clayton and Price (1999) formulated the first English key to a large group of the genus – the New World species. Adams *et al.* (2005) examined all the Old World species in their review. They confirmed, and keyed 77 valid species. They classified the Old World *Columbicola* into nineteen species groups, many of which match the species complexes described by Tendeiro (1984). Their consideration was solely based on louse morphology, without paying attention on the host associations. Key features were structure of the dorsoanterior head plate, the metanotal chaetotaxy, and structure and chaetotaxy of both male and female genitalia. Uchida (1917) first described *Columbicola turturis*. Due to its superficial similarity with *C. columbae* Adams *et al.* (2005) placed it into *columbae* species group but separated by difference in genitalia structure, HL/HW (Head length/Head width) ratio, and HL. Hari *et al.* (1981) recorded it on *Streptopelia chinensis* from Bangladesh for the first time. In the present study this species has been recorded from wing and tail feathers of *S. chinensis*.

***Nitzschiella lativentris* Uchida**

(Fig. 6A - 6D; description (Based on measurements of four males and four females)

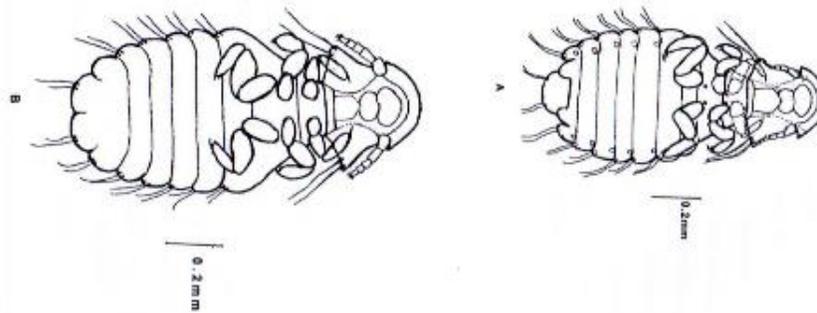


Fig. 6. *N. lativentris* (A - Male ventral view, B - Female ventral view)

Identification: Identification is based on Hari *et al* (1981)

Host: *Streptopelia chinensis*

Site of infestation: Quill feathers of wings and tail

Mallophaga, Parthiraptera, Philopteridae. Body robust, dorsoventrally flattened. Head semicircular, relatively large and broad; wider than long; temple fully angular and bears 2+2 long setae. Antennae five segmented, gradually shorter and stouter distally; third antennal segment not wineglass-shaped; not

concealed, projecting; antennal grooves absent. Maxillary palps absent. Thorax with prothorax and pterothorax; prothorax narrower. Anterior abdomen broader than posterior. Female terminalia bluntly pointed and provided with smaller number on setae. Legs with well-developed claws.

Female: TL, 1.55 (1.50-1.58); HL, 0.40 (0.38-0.41); HW, 0.46 (all similar). Thorax with PL, 0.15 (0.12-0.16); PW, 0.28 (all similar); PtL, 0.206 (0.20-0.21); PtW, 0.49 (0.47-0.51); AL, 0.84 (0.81-0.86); AAW, 0.68 (0.67-0.69); PAW, 0.57 (0.56-0.58).

Male: TL, 1.34 (1.30-1.38); HL, 0.373 (0.37-0.38); HW, 0.40 (0.39-0.42). Thorax with PL, 0.12 (0.10-0.13); PW, 0.25 (0.23-0.27); PtL, 0.156 (0.15-16); PtW, 0.406 (0.40-0.41); AL, 0.70 (0.69-0.71); AAW, 0.64 (0.62-0.66); PAW, 0.523 (0.52-0.53). From Bangladesh this parasite was previously reported by Hari *et al.* (1981) but from a different host.

CONCLUSION

The study revealed that ectoparasites fauna, especially, the lice of wild birds have some connection with their hosts' food habits and phylogeny. Further study is needed to have concrete statement on this.

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