New Species of Chewing Lice (Phthiraptera: Amblycera, Ischnocera) of Common Myna *Acridotheres tristis* (Passeriformes: Sturnidae) from Pakistan

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Chewing lice (Phthiraptera) are obligatory parasites of birds and mammals. Little attention has been given to chewing lice species in Pakistan; hence this is a contribution towards the chewing lice fauna of the country. In the present work, two new species of chewing lice were recovered from common and native bird *Acridotheres tristis* (Common Myna) (Passeriformes: Sturnidae) in Sindh, Pakistan. During the examination of 80 birds of *A. tristis*, 65 birds produced two new species of chewing lice, belonging to genus *Myrsidea* (Amblycera: Menoponidae) and genus *Sturnidoecus* (Ischnocera: Philopteridae); however, all birds were prevalent to chewing lice of genus *Brueelia* and *Menacanthus*. The new species are described in detail, illustrated and compared with their closest allied species found on birds of family Sturnidae.

Key words: *Myrsidea, Sturnidoecus* new species, common myna, Pakistan.

INTRODUCTION

Pakistan has a tremendous variety of birds, indicating a potential for a large diversity of chewing lice (Phthiraptera: Amblycera and Ischnocera). Despite the fact, data concerned with chewing lice fauna of Pakistan is scarce and incomplete (Ansari, 1955a-b; 1956a-b; 1968; Lakshminarayana, 1979; Sychra et al., 2006; Naz et al., 2009; 2010; 2011; 2012; 2016; Naz and Rizvi, 2018).

There are more than 391 species of passerine birds in Pakistan, including nine species of mynas and starlings (Passeriformes: Sturnidae). Of these only three species of myna and two species of starlings are resident in Sindh (Salim Ali and Ripley, 1989; Robert, 1991).

Chewing lice of myna birds in Pakistan have not previously been studied taxonomically, apart from Ansari (1957; 1968), who contributed to our knowledge of the genus *Sturnidoecus* (Philopteridae). There are six species of chewing lice known to parasitize common myna around the world, including two species of the genus *Myrsidea*, *M. invadens* (Kellogg and Chapman, 1902) and *M. chilchil* Ansari, 1951 which he described with *M. lyallpurensis*, and two species of the genus *Sturnidoecus*, *S. bannoo* Ansari, 1955a,b and *S. capensis* (Giebel, 1874), which was described from *A. tristis* by Ansari (1968) with its synonym *S. fragilis* have yet been recovered (Tandan and Clay, 1971; Price et al., 2003; Price and Dalgleish, 2006; Gustafsson and Bush, 2017).

During the examination of common myna in the Sindh region, two new species of the genus *Myrsidea* and genus *Sturnidoecus* were collected. The previously known species of chewing lice from common myna were not reported from Sindh province but only from the Punjab (Ansari, 1951; 1955a-b; 1968). Many of the samples of chewing lice recovered during the present study, that are yet to be identified may represent previously known species, all of which would constitute new records for Pakistan.

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MATERIAL AND METHODS

Live common mynas were trapped from different localities of Sindh, Pakistan, brought to the Advanced Parasitology Research (APR) Laboratory at Department of Zoology, University of Sindh, Jamshoro during 2015-2017. After extraction of lice from their feathers, these birds were released. In total, 80 birds of common myna were examined for chewing lice by using a fumigation chamber, which was adapted from Lakshinarayana (1980) and Clayton and Drown (2001), modified with plastic jars containing plastic bags with a piece of chloroform filled cotton in it. It gave as maximum number of lice from the whole body except head. The lice from head feathers were collected by hand-picking method using soft brush and fine forcep, while the beak of the bird was tied with squash tape to prevent any damage. The lice were permanently mounted in Canada balsam following the method of Palma (1978) and Naz (2008). The male genitalia were dissected out under stereo microscope using fine insect pins and were mounted in Canada balsam with the same method by Palma (1978). Drawings were made with Olympus drawing tube attachment and photographs were taken through Nikon microscopic digital camera (P7000). Measurements were taken in millimeters (mm) by using ocular micrometer (Table 1-2). The terminology used for the chaetotaxy and identification of chewing lice species was followed in Clay (1969) and Marshall (2003) for amblyceran species and Clay (1951; 1975) and Smith (2001). The holotype and paratypes were deposited in the Museum Collection of APR Laboratory, Department of Zoology, University of Sindh, Jamshoro-Pakistan.

RESULTS

In the present study of chewing lice from mynas of Pakistan, total 80 birds of common myna were examined in which 65 birds were found infested with two new species, *Myrsidea ahmedalii* sp.n. and *Sturnidoecus tristisae* sp.n. however other specimens of genus *Brueelia* and *Menacanthus* were also recovered (Table 3); all examined birds were infested with 100% prevalence for overall specimens of chewing lice.

*Myrsidea ahmedalii* species novum (Figure 1-2, 5-17; Table 1)

Phthiraptera: Amblycera: Menoponidae

Head:

Smoothly rounded anterior, broadly convex; preocular notch well defined; antennal grooves moderately shallow but completely hide the antennae; tentorial bridge transverse; temples short and expanded, slightly quadrate in shape; DHS (dorsal head seta) 8 much shorter than DHS 9, DHS 10 slightly shorter than DHS 11, DHS 14 short microseta, DHS 15 normal, fine longer than DHS 16; occipital DHS 21 much longer than DHS 22, DHS 23 absent; temporal DHS 24, DHS 25 microsetae, DHS 26, 27 fine, normal fine setae, distant alveoli; DHS 28 short, DHS 29 longer than DHS 30; maxillary palp short (Figure 5); gular plate (Figure 6) highly sclerotized, with medial weak patches, very long macrosetae, along with 4 lateral gular setae present; hypopharynx (Figure 7) very well developed; antennae (Figure 8) very short, usually invisible; ocular comb developed, flat; sub ocular setae present.

Thorax:

Pronotal anterior seta present in female and absent in male; lateral three stout thorn like setae present, posterolateral to posterior marginal setae six in number, seta 1 macroseta seta 2 short and spinous, seta 3 and 6 normal at posterior margin; prosternal plate (Figure 9) very well developed, with evident anterior and lateral margins, anterior setae present on the plate; posterior margin thick sclerotized, blunt; mesonotum evident, fused with mesopleuron, episternum and mesosternum to form a ring around mesothorax (Figure 10); anterior mesonotal setae present; metanotum not enlarged; posterior slightly convex, bearing 10-12 latero-posterior spiniform marginal setae; metasternal plate (Figure 11) well developed, large, with 2 median and 4 lateral setae; femur III with very thin and small brush of microsetae on its venter.

Male Abdomen:

Relatively narrow and oval, all tergites similar, undivided, equal in length; tergite I bears 7 pairs of setae, tergite II: 9 pairs, tergite III: 10 pairs, tergite IV: 8 pairs, tergite V: 8 pairs, tergite VI: 5 pairs, VII: 5, tergite VIII: 5 pairs of setae; post spiracle setae fine normal on tergite II-III, short on tergite IV and V, long on tergite VI-VIII; sternite II large, expanded, bearing 3+1 fine stout, thick, robust setae at lateral corners (all male specimens with symmetrical arrangement of lateral stout setae), with 12 alternatively long and short fine intermediate to median posterior marginal setae; sternite III-VI bearing thin setal brushes (Figure 12).

Female Abdomen:

Wide and oblong (Figure 13), tergite depressed at median, tergite I complete, tergite II-IV intermediate to median deeply convex, tergites V-VIII similar, equal; tergite I-VIII bear 11 pairs of setae, 12 pairs of setae; 10 pairs of setae, 8 pairs of setae; 11 pairs of setae, 9 pairs of setae, 7 pairs of setae and 4 pairs of setae respectively; XI- X fused; post spiracle setae fine normal on tergite III-IV, short on tergite V-VI, very long on tergite VII and VIII; sternite II: large, expanded, bearing 4+1 stout, thick, robust setae at lateral corners (one specimen showed asymmetrical arrangement of 4+1, 1+3) (Figure 14a-b), with 12 long and short, alternatively fine, intermediate to median posterior marginal setae; sternite III-VI bearing thin setal brushes.

New Species of Chewing Lice (Phthiraptera: Amblycera, Ischnocera) of Common Myna *Acridotheres tristis* (Passeriformes: Sturnidae) from Pakistan
Male Terminalia:

Broadly convex; sub genital plate broad flat broadly convex at posterior, bearing 17-18 normal median to posterior and posterolateral setae (Figure 15a-b).

Female Terminalia:

Peculiar in chaetotaxy; sub genital plate with serrated posterior margin, bearing 28 median to posterior and posterolateral setae, scattered; vulva thick and broad fringed with 12-14 oblique bunches of thin setae; dorsal anal fringe bearing 12 fine setae (Figure 16a-b).

Male Genitalia:

Expanded upward to abdominal segment (Figure 17); basal apodeme long, narrow, spatula like; parameres short, tapering posteriorly and curved outward; endomeral plate slightly convex; mesomeral sclerites developed; genital sac weakly developed, genital sac sclerite elongated, cylindrical, anteriorly broader with wavy margin, rounded posteriorly with laterally arms hooks like and posterior arm membranous.

Material Examined

Holotype 1♂, on *Acridotheres tristis* (Linnaeus); Paratypes: 2♂, 7♀, on *Acridotheres tristis* (L); Sindh province, Pakistan; 20-vi-2016; leg. Bughio, S.; deposited in Museum collection of APR Lab., Department of Zoology, University of Sindh, Jamshoro.

Etymology

The epithet of the present species of the genus *Myrsidea* has been given after first author’s father, Late Dr. Ahmed Ali (1960—2016) in memorizing his thankless efforts and support to the author to go through Pakistani chewing lice and his encouragement.

*Sturnidoecus tristisae* species novum (Figure 3-4, 18-24; Table 2)

Phthiraptera: Ischnocera: Philopteridae

Thorax:

Anterior setae absent; prothoracic letero-posterior setae one pair, arranging 1+1 normal; rhombic sclerite very small, weekly sclerotized; posterior region smoothly convex; pterothoax lateral margins highly divergent, laterally extended corners; trichoid, thick, thorn like seta present at lateral edges. posterior margin slightly convex; bearing evenly arranged 22-24 long, fine marginal setae; pteronotum undivided, proepimeron expanded, unfused, mesofurcal pit absent; meso-metasternal plate present; second sternal plate absent; ventral meso-metasternal marginal setae present; prothoracic, mesothoracic and metathoracic legs sterno-coxal in articulation.

Male Abdomen:

Laterly highly convex; six pairs of spiracles present; atria of spiracles small; median to submedian setal row present on tergite II; tergite II not deeply embedded within tergite III; posterior marginal setae on tergite II:14,III-IV:15-16, V:18, VII: 12, VIII: 6, XI: 9; 2 pair of letero-posterior marginal setae on III-IX; sternites bearing one pair of marginal setae; sub genital plate cone shape, without setae (Figure 21).

Female Abdomen:

Broad at middle narrow at anterior and posteriorly oval; six pairs of spiracles present with small atria; median to submedian setal row present on tergite II; Tergite II not deeply embedded within tergite III; posterior marginal setae on tergite II:17, III:16,IV-VI:20, VII: 17, VIII: 16, XI: 9 and 2 pair of letero-posterior marginal setea on III-IX; sternites bearing one pair of marginal setae (Figure 22).

Female Terminalia:

Posterior margin slightly concave; bearing 2 pair of very short microsetae; tergite IX and X completely fused broad bearing 7 pair of latero-posterior long setae; sub genital plate (Figure 23) roughly triangular; laterally five thorn like seta present; vulva bears 18 marginal to sub marginal short thorn like setae.

Male Genitalia:

Basal apodeme anteriorly broad and wide, posteriorly slightly narrow, having thick struts; endomeral plate wide, expanded laterally, covering half length of mesosomal plate; mesosomal plate relatively elongated as compared to the other species of the *pasteris*-group, narrow medi ally and widened anteriorly with slightly depressed anterior margin and gradually narrow towards posterior, 2 pairs of small spinous stout setae at lateral margins of mesosome present and 3 pairs of peg like microsetae present on median mesosomal complex in oblique lines; parameres elongated, curved inwardly, smoothly tapered posteriorly in to pointed ends furnished with a micropit and a microsetae at subterminal position (Figure 24).
Material Examined

Holotype 1♂, on Acridotheres tristis (L.); Paratypes 5♂, 7♀, on Acridotheres tristis (L); Sindh Province, Pakistan; 14-iii-2017; leg. Bughio, S.; deposited in Museum collection of APR Lab., Department of Zoology, University of Sindh, Jamshoro.

Etymology

The epithet name of present new species of genus Sturnidoecus is given on its type host species Acridotheres tristis from which it was recovered during present study.

DISCUSSION

The species Myrsidea ahmedalii sp.n.is closely related to M. invadens (Kellogg and Chapman, 1902) and M. chilchil Ansari, 1951 in having general body features, but it is different from the same species in having gular plate highly sclerotized with medially week patches; abdominal sternite II consist of thick, stout, lateral spines in 3+1 and 4+1 arrangement at lateral corner of abdominal sternite II in male; pronotum bears three stout thorn like lateral setae, posteriorly 3, 6 normal setae; metanotum bears 10-12 lateroposterior marginal setae; post spiracle setae in female fine normal on tergite III-IV, short on tergite V-VI, very long on tergite VII and VIII; in male post spiracle setae fine normal on tergite II-III; short on tergite IV and V, long on tergite VI-VIII; basal apodeme long, narrow, spatula like; slightly convex; genital sac weakly developed; genital sac sclerite developed; elongated, cylindrical; anteriorly broader wavy margin; rounded posteriorly with laterally hooks like projections in M. ahmedalii sp.n.; whereas in M. invadens gular plate medially sclerotized; margin of pronotum with one short two long setae on each side; metanotum with 4 marginal setae, 3 short and one very long; all abdominal tergites of both male and female equal and undivided, without anterior setae; post spiracle setae in both male and female extremely long on tergites II, IV and VIII, very long on tergite I and VII, long on III ,V and VI; abdominal sternite II with thorn like setae in 2+1, 1+2 arrangement in both male and female individuals of M. invadens.

The present species is also clearly dissimilar with M. chilchil in general body shape and chaetotaxy which is thicker in later species than the present new species (Ansari, 1951). In M. chilchil Ansari, 1951 the differences are found in hypopharynx slightly reduced, but in M. ahmedalii it is very well developed; in the male genitalia the ventral arm with pointed apex in M. chilchil whereas the ventral arm with rounded apex in M. ahmedalii; in M. chilchil metanotum enlarged with 5-6 lateroposterior marginal setae while in M. ahmedalii metanotum is not enlarged, however containing 10-12 lateroposterior marginal setae. All abdominal tergites are equal in both male female; post spiracle setae short and long alternate on tergite II-VI and long on tergite VII and VIII in both genders. The differences in morphometry are given in Table 1.

The species Sturnidoecus tristis sp.n. fall in the S. pastoris-complex group (Gustafsson and Bush, 2017) and was closely related to S. borobodur (Mey, 1989), S. peguensis (Mey, 1989), S. bannoo Ansari, 1955 and S. capensis (Giebel, 1874) in having general body features, but it is evidently different from these species in having preantennal region anteriorly narrow, projected, with thick hyaline margin, anteriorly concave, gradually become wider at preantennal region, premarginal carina moderately sclerotized, dorsal anterior plate anteriorly deeply concave, laterally slightly convex; gular plate short and cordate shaped; female subgenital plate roughly triangular with 5 microsetae on lateral margins, vulva bearing 18 marginal to submarginal very short microsetae; male abdomen highly convex, posterior marginal setae on tergite also variable in number and attachment; endomeral plate elongated along the half length of parameres; morphometry is compared in Table 2.

In S. bannoo the differences with the present species appeared in preantennal region broad, hyaline margin thick and flat, gular plate tomb shape, abdomen generally oval to oblong in shape; female terminalia slightly convex laterally, bearing 3 pairs of setae, sub genital plate funnel shaped laterally with one pair of short setae, vulva bears 5 pairs of marginal setae; endomeral plate elongated along with equal length of parameres.

S. borobodur differentiates with the present species in anteriorly more narrow, projected with thick hyaline margin, anteriorly slightly concave; premarginal carina highly sclerotized; dorsal anterior plate concave, latterly rectangular in shape; gular plate short, tomb shaped; abdomen slightly convex; female terminalia with posterior margin highly convex, bearing one pair of fine setae and one pair of microsetae, vulva bearing 23 marginal to submarginal short microsetae; subgenital plate anteriorly broad posteriorly pointed, bearing 6 microsetae on lateral margins; male subgenital plate pear shaped; basal apodeme broader anteriorly and narrower posteriorly; endomeral plate elongated approximately equal length of parameres.

The present species of genus Sturnidoecus differs with S. peguensis in anterior margin of head narrow, projected with thick hyaline margin, anteriorly slightly concave; premarginal carina highly sclerotized; dorsal anterior plate deeply concave laterally and rectangular in shape; gular plate short, irregularly cordate shaped; male subgenital plate half tooth-shaped; female terminalia bears two pairs of very short microsetae at posterior margin and 7 pairs of long setae at lateroposterior margins; subgenital plate roughly triangular, laterally bearing 5 microsetae; vulva...
bearing 21 marginal to submarginal short microsetae; basal apodeme broad; endomeral plate elongated, in equal length of parameres. Mynas are most frequent resident birds in Sindh, Pakistan; its population is wide spread over hilly areas to plains of Indus (Mahabal, 1991; Choudhry, 1998). Presently it is first study of chewing lice on Myna in Sindh region. During present investigation 80 birds Acridotheres tristis were examined from Hyderabad Sindh. In the present work Mynah birds have been observed to be infested by four genera of two families: Menoponidae (Suborder: Amblycera) and Philopteridae (Suborder: Ischnocera). These genera include Brueelia Kèler, 1936, Menacanthus Neumann, 1912, Myrsieida Waterston, 1915 and Sturnidoecus Eichler, 1944. Menacanthus is represented by only one species, i.e. M. eurysternus (Burmeister, 1938), Myrsieida is reported by only one species i.e., M. invadens and genus Sturnidoecus is reported previously by two species including S. banno Ansari, 1951 and S. capensis (Giebel, 1874), however it has been observed that the, chewing lice of this bird have not been studied so far, except that Aslam et. al. (2015) have reported a Myrsieida species which they misidentified as M. invadens but it is not evident in their work and the microphotograph is also not describing the same species evidently. The clear identifying character in M. invadens is having dark lateral bands in abdomen in both genders as seen in Kellogg and Chapman (1902) and Eduardo and Villa (2011).

CONCLUSION

This is the first study of taxonomy of chewing lice from mynas in Sindh region; there is no significant work has been done from any of bird species of Family Sturnidae, except that Ansari (1968) has reported from Pakistan but only from Punjab province (Lyallpur, now known as Faislabad). He published data on the genus Sturnidoecus but only one species of Myrsieida from common myna, which he named as M. lyulfilledus, that species was later synonymized with M. chilchil by Price et al. (2003). In the present both new species were compared with their closed allies on the basis of important morphological characters mainly including chaetotaxy, male and female terminalia, male genitalia and morphometry, which evidently separate the two species from previously known species of Myrsieida and Sturnidoecus found on mynas, hence described as M. ahmedalii sp.n. and S. tristis sp.n. It is the first record of myna chewing lice from this region and making new locality records for both species of chewing lice on common mynas, A. tristis from Sindh province, Pakistan.

REFERENCES


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APPENDIX

Table 1. Comparative morphometry of *Myrsidea ahmedalii* sp.n. with closely related species found on common myna. All measurements are in millimeters (mm).

<table>
<thead>
<tr>
<th>Body Parts</th>
<th><em>Myrsidea ahmedalii</em> sp.n.</th>
<th><em>Myrsidea invadens</em> (Kellogg &amp; Chapman, 1902)</th>
<th><em>Myrsidea chilchil</em> Ansari, 1947</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>♂</td>
<td>♀</td>
<td>♂</td>
</tr>
<tr>
<td>Total length</td>
<td>1.55</td>
<td>1.97</td>
<td>1.195</td>
</tr>
<tr>
<td>Head length</td>
<td>0.31</td>
<td>0.36</td>
<td>0.301</td>
</tr>
<tr>
<td>Preocular width</td>
<td>0.16</td>
<td>0.175</td>
<td>-</td>
</tr>
<tr>
<td>Temporal width</td>
<td>0.25</td>
<td>0.255</td>
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<tr>
<td>Prothorax length</td>
<td>0.16</td>
<td>0.21</td>
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<tr>
<td>Prothorax width</td>
<td>0.31</td>
<td>0.35</td>
<td>0.234</td>
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<td>Metathorax length</td>
<td>0.2</td>
<td>0.25</td>
<td>-</td>
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<tr>
<td>Metathorax width</td>
<td>0.405</td>
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<td>Abdominal length</td>
<td>0.9</td>
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<td>Genitalia length</td>
<td>0.512</td>
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<td>Genitalia width</td>
<td>0.02</td>
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<tr>
<td>Head Index</td>
<td>0.806</td>
<td>0.708</td>
<td>1.428</td>
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Table 2. Comparative morphometry of *Sturnidoecus tristisae* sp.n. with closely related species found on other species of myna. All measurements are in millimeters (mm).

<table>
<thead>
<tr>
<th>Body Parts</th>
<th><em>Sturnidoecus tristisae</em> sp.n.</th>
<th><em>Sturnidoecus boroboudor</em> (Mey, 1989)</th>
<th><em>Sturnidoecus penguensis</em> (Mey, 1989)</th>
<th><em>Sturnidoecus bannoo Ansari, 1955</em></th>
<th><em>Sturnidoecus capensis</em> (Giebel, 1778)</th>
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<td>♂</td>
<td>♂</td>
<td>♂</td>
<td>♂</td>
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<tr>
<td>Total length</td>
<td>1.66 (1.61-1.69)</td>
<td>3.777 (2.22-5.33)</td>
<td>1.56</td>
<td>1.86-1.93</td>
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<td>Head length</td>
<td>0.555 (0.556-0.565)</td>
<td>0.602 (0.582-0.622)</td>
<td>0.56</td>
<td>0.59-0.61</td>
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<td>Preantennal width</td>
<td>0.315 (0.30-0.33)</td>
<td>0.362 (0.333-0.391)</td>
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<td>Temporal width</td>
<td>0.555 (0.5-0.56)</td>
<td>0.56 (0.52-0.6)</td>
<td>0.52</td>
<td>0.57-0.58</td>
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<td>Prothorax length</td>
<td>0.1315 (0.13-0.133)</td>
<td>0.153 (0.13-0.177)</td>
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<td>Prothorax width</td>
<td>0.315 (0.30-0.33)</td>
<td>0.323 (0.313-0.333)</td>
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<td>0.33-0.35</td>
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<td>Pterothorax length</td>
<td>0.16 (0.15-0.17)</td>
<td>0.211 (0.2-0.222)</td>
<td>-</td>
<td>-</td>
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<tr>
<td>Pterothorax width</td>
<td>0.31 (0.25-0.43)</td>
<td>0.538 (0.521-0.555)</td>
<td>0.49</td>
<td>0.51-0.52</td>
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<tr>
<td>Abdominal length</td>
<td>0.86 (0.84-0.88)</td>
<td>1.214 (1.146-1.288)</td>
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<tr>
<td>Genitalia length</td>
<td>0.41 (0.4-0.42)</td>
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<td>-</td>
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<tr>
<td>Head Index</td>
<td>1.005</td>
<td>0.935</td>
<td>1.08</td>
<td>1.02</td>
<td>1.04</td>
</tr>
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</table>

Table 3. Over-all abundance of chewing lice species collected from common myna *A. tristis*, during the present work.

<table>
<thead>
<tr>
<th>Chewing lice species</th>
<th>Abundance of chewing lice</th>
<th>Number of birds infested with each species</th>
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<tbody>
<tr>
<td>Brueelia sp. 1</td>
<td>146</td>
<td>40</td>
</tr>
<tr>
<td>Brueelia sp. 2</td>
<td>263</td>
<td>65</td>
</tr>
<tr>
<td>Brueelia chayanh</td>
<td>193</td>
<td>76</td>
</tr>
<tr>
<td>Menacanthus eurysternus</td>
<td>210</td>
<td>80</td>
</tr>
<tr>
<td>Myrsidea ahmedalii</td>
<td>44</td>
<td>35</td>
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<tr>
<td>Sturnidoecus tristisae</td>
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<tr>
<td>Sturnidoecus species</td>
<td>14</td>
<td>08</td>
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</tbody>
</table>
FIGURES

Legends of the Illustrations:
Figure 1. *Myrsidea ahmedalii* sp.n. Male at 10×10.
Figure 2. *Myrsidea ahmedalii* sp.n. Female at 10×10.
Figure 3. *Sturnidoecus tristisae* sp.n. Male at 10×10.
Figure 4. *Sturnidoecus tristisae* sp.n. Female at 10×10.
Figure 12-14. *Myrsidea ahmedalii* sp.n. 12. Male abdomen dorsum; 13. Female abdomen dorsum showing shape and arrangement of tergites and their setae; 14. Sternite II with lateral thorn like setae in male abdomen, a. left, b. right showing asymmetry in their number and position.
Figure 15-16. *Myrsidea ahmedalii* sp.n. 15. Male terminalia a. dorsum, b. ventrum; 16. Female terminalia a. dorsum, b. ventrum.
Figure 17. *Myrsidea ahmedalii* sp.n. Male genitalia complete armature.
Figure 23-24. *Sturnidoecus tristisae* sp.n. 23. Female terminalia ventrum; 24. Male genitalia a. complete armature, b. mesomere enlarged. c. paramere.
New Species of Chewing Lice (Phthiraptera: Amblycera, Ischnocera) of Common Myna *Acridotheres tristis* (Passeriformes: Sturnidae) from Pakistan
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Bughio et al. 102
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Figure 15

Figure 16
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