A NEW PHTHIRAPTERA SPECIES (PHILOPTERIDAE) FROM THE RED AVADAVAT *(AMANDAVA AMANDAVA)*

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Abstract

RÉKÁSI, J. & SAXENA, A. K. (2005): A new Phthiraptera species (Philopteridae) from the Red Avadavat *(Amandava amandava)*. *Aquila* 112, p. 87–93.
A new chewing louse species *Brueelia amandavae* sp. n. is described based on 2 males and 3 females collected from *Amandava amandava* (Passeriformes: Estrildidae) captured in Rampur, India. This is the first Ischnoceran louse described from this host.

Key words: Phthiraptera, Ischnocera, Philopteridae, *Brueelia*, new species, chewing lice, Estrildidae, *Amandava amandava*, India.

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Introduction

The chewing louse genus *Brueelia* Keler, 1936 is one of the largest genera of Ischnoceran lice with ca. 260 described species. This genus exhibits a relatively broad host distribution; occurring on at least 41 families of birds in 4 orders. *Brueelia* lice are also amongst the most characteristic species found on passerines (Passeriformes), the largest avian order. They appear to be more host-specific than most other genera of lice, with the majority (ca. 90%) of species known only from a single host species *(Johnson et al., 2002)*. However, only a very few *Brueelia* species were ever described from Estrildid finches up to the present day *(Price et al., 2003)*.

African Estrildid finches are known to harbour two species of *Brueelia* lice, *B. astrildae* Tendeiro & Mendes, 1994 and *B. lonchurae* Tendeiro & Mendes, 1994 parasitising the Common Waxbill *Estrilda astrild sousae* and the Bronze Munia *Lonchura cucullata cucullata,* respectively. In Asian Estrildids, *B. eichleri* Lakshminarayana, 1969 parasitise the White-headed Munia *Lonchura maja* while *B. munia* Ansari, 1955 is harboured by the White-throated Silverbill *L. malabarica*. Finally, *B. stenozona* Kellogg & Chapman, 1902 is known from the Scaly-breasted Munia, *L. punctulata nisoria,* a bird also introduced to the Hawaiian Islands.

The Red Avadavat, *Amandava amandava* (*L.*) is an Estrildid finch widespread in the reed beds, grasslands, scrubs and farmlands from the Indian subcontinent through Indochina to the Lesser Sunda Islands, introduced also to Egypt, Arabia, Philippines, Fiji and Hawaii *(Sibley & Monroe, 1991)*. *Clay (1970)* already described a Menoponid chewing louse from this host species, the only Phthirapteran parasite known from the Red Avadavat.

Materials and methods

Two male and three female *Brueelia* lice were collected by *A. K. Saxena* in Rampur, India, 2004. They were preserved in ethyl alcohol, posted to Hungary, and – unfortunately – became slightly damaged at the customs. Slide mounting followed the procedure described by *Palma (1978)*. Taxonomic decisions were based on louse morphology exclusively, with no *a priori* consideration of host relationships. All measurements are in millimetres.

Nomenclature of lice follows *Hopkins & Clay (1952)* and *Price et al. (2003)*, while avian taxonomy, nomenclature and biology is based on *Howard & Moore (1991)*, *Sibley & Monroe (1991), Monroe & Sibley (1993)*, *Ali (1996)* and *Kazmierczak (2000)*.

Description of *Brueelia amandavae* sp. n.

Male

Head: broadly triangular, almost twice as long as wide with a straight anterior margin and slightly concave laterally at the base of the antennae. Head shape characteristic. Preantennal region longer than its width, the clypeal region is quite narrow. The marginal stripe is interrupted at about half way between the dorsal head plate and conus. The shape of the gula is shown in Figure 1. Measures of the antennae, preconal and rear head (temple) width and length, and lateral carina are provided in Table 1. The lateral carina has a characteristic ungulate shape. The clypeus has a concave margin, darker at its edge, with 2-3 short setae. The apical margin on the dorsal part of the clypeus is separated. Conus quite short, does not reach the half of the first segment of the antenna. Two long setae are found above the conus. Antannae are sexually dimorphic as in most Philopterids, longer in the males.

	Holotype male		Paratype male		3 female paratypes	
	Length	Width	Length	Width	Length	Width
Head	0.34	0.18	0.34	0.18	0.37-0.41	0.25
Preantennal region	0.24	0.18	0.22	0.18	0.26	0.21
Rear head /temple	0.12	0.24	0.12	0.23	0.12-0.15	0.26-0.27
Antenna	0.20	-	0.19	-	0.15-0.18	-
Preconal carina	0.15	-	0.15	-	0.20	-
Lateral carina	0.07	-	0.07	-	0.09	-
Conus	0.03	-	0.03	-	0.03	-
Prothorax	0.14	0.16	0.13	0.16	0.10-0.15	0.18
Pterothorax	0.22	0.25	0.20	0.24	0.21-0.22	0.28
Abdomen	0.87	0.37	0.82	0.33	1.34-1.39	0.39-0.44
Genital apparatus	0.15	0.08	0.13	0.08	-	-
Subgenital plate	-	-	-	-	0.12-0.14	0.24-0.26
Total length	1.55	-	1.46	-	2.11-2.16	-

Table 1. Morphological measures of holotype and paratypes of *Brueelia amandavae* sp. n. (measurements in mm)

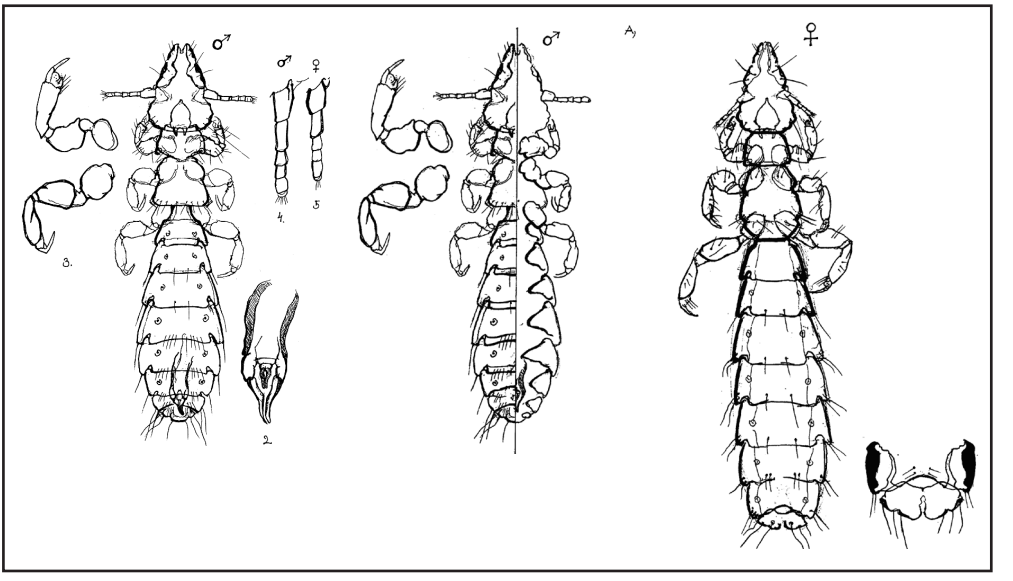

Figure 1. Drawing of *Brueelia amandavae* sp. n. male holotype in dorsal (left) and ventral view (center) with legs, antennae and genitalia also drawn separately as well as female (right) with abdomen terminalia represented separately

Antennal segments bearing two short seatae, but 3-5 setae on the tip of the last (5th) segment. Antennal segments have a dark margin both from the dorsal and ventral views. This antennal margin is continuous but narrower at the joints. The 2nd antennal segment is longer than the 3rd or 4th. The 4th segment is the shortest and the 3rd one is the narrowest. Margin of the occipital region is thickened and marked with a reversed heart-shaped pattern with two posterior extensions of this pattern also intruding into the prothorax. Temple yellowish-brown marked with a characteristic pigmentation pattern different from other *Brueelia* species examined. There is a long and a short seta at the posterior periphery of the temple.

Thorax: The prothorax has a broadly trapezoid shape, somewhat rounded, dark coloured and bearing no setae at the edges. Its length almost equals – only slightly smaller than – its width. Mesothorax and metathorax are fused into a pterothorax. This is narrower than abdomen width, but wider posteriorly than the 1st and 2nd abdominal segments; its width almost equals temple width. The dark pigmentation of prothorax edge also intrudes into the pterothorax. Each limb carry 5-6 longer and 3-4 shorter setae. The femur and tibia of all pairs of limbs are striated with a narrow dark stripe, stronger on the dorsal side. Laterally, the convex prothorax edge swells out between the foreleg and middle leg. The hind leg is somewhat more distant from the middle leg.

Abdomen: It is longer and wider than the head. The male abdomen is more rounded than that of the female. Segments are becoming broader from the 1st to the 5th segment, with the latter being the broadest one. Edges of abdominal tergits are strongly notched and particu-

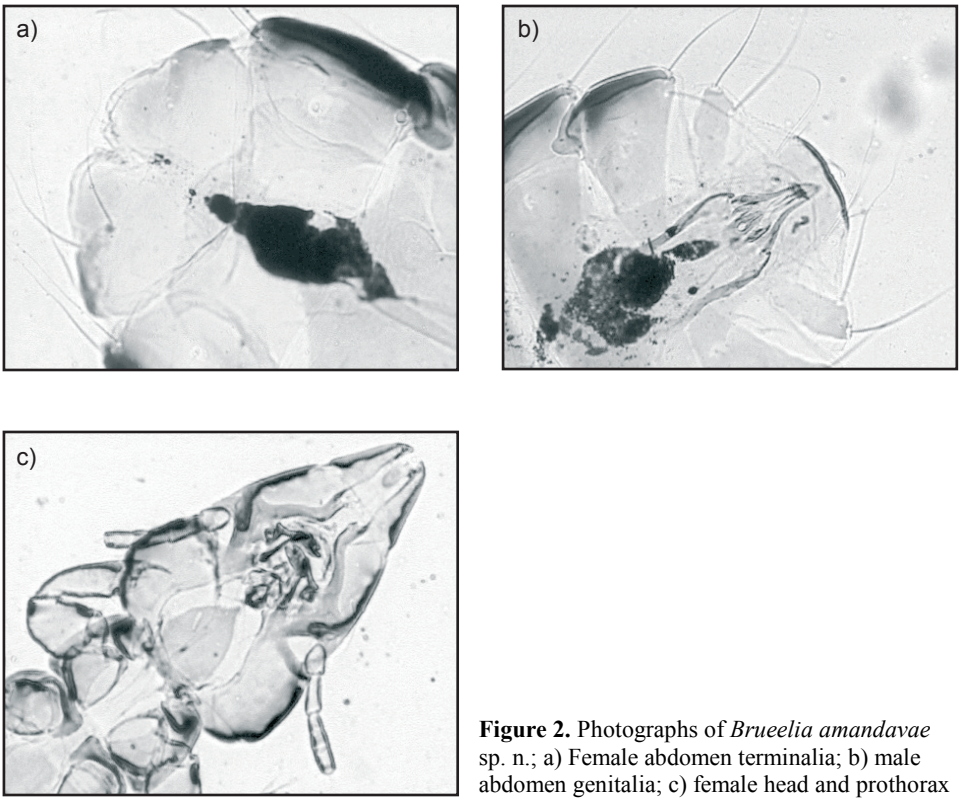

Figure 2. Photographs of *Brueelia amandavae* sp. n.; a) Female abdomen terminalia; b) male abdomen genitalia; c) female head and prothorax

larly so on segments 3 to 5. Tergits of segments 8 and 9 bear no longitudinal edge and are colourless. Tergits are divided centrally. The dorsal setae are longer than the ventral ones. Segment 1 bears no setae, segments 2 to 5 with 1+1, segments 6 to 7 with 4+4, and segments 8 to 9 with 3+3 setae. Setae are positioned singly on the margins of the first few tergits, mostly in pairs on the margins of the next few tergits, and in triplets toward the anterior part of the abdomen. Tergits of the 8th and 9th segments bear 6 long and 4 short setae. Male genitalia have a characteristic shape (Figure 2) differing from the genital shape of related species. The abdomen tip is slightly striated with a small undulate crescent-shaped stripe, apparently absent in other species.

Female

Head and body shape resembles that of the males but larger in dimensions, except for the antennae (Table 1). Antennae are shorter than in males, with the 2nd and 5th segments

being the longest. Head is elongated. Both preconal head and lateral carina are relatively longer than in the males, thus the female head is relatively narrower. Temple pigmentation pattern is similar to that of males, but different from that of females of other *Brueelia* species. Abdomen is more elongated than that of the males, segments 3 to 6 having roughly the same width. Prothorax has a thick and brown margin, which also intrudes into the pterothorax. The subgenital plate with its characteristic pigmentation pattern differs from females of other *Brueelia* species observed.

Taxonomic summary

Holotype: 1 male, Rampur, India, 26.09.2004, leg. *A. K. Saxena,* No 2066/6.
Paratypes: 1 male, No 2066/2, and 3 females, No 2066/4, 2066/9 and 2066/10 all with the same collection data as holotype.
Type host: Red Avadavat *(Amandava amandava).*
Holotype deposited: in the Zoological Department of the Hungarian Natural History Museum, Budapest.
Paratypes deposited: in the Rékási Collection, Pannonhalma, Hungary.
Etymology: this species is named after the type host *Amandava amandava.*

Discussion

There is no published key to the *Brueelia* genus as a whole. *Ansari (1956a, 1957b, 1957)* reviewed species from the Timaliidae and Corvidae, and *Dalgleish (1971)* provided a key to the species known from the Picidae (Aves: Piciformes), however, these species groups are relatively distant from *B. amandavae* described here. Other *Brueelia* reviews and species descriptions – mostly Palearctic passerines – include *Ansari (1956c; 1958), Balát (1955; 1958; 1981; 1982)*, *Bechet (1961; 1966)*, *Cicchino (1986a; 1986b)*, *Eichler (1954; 1957)*, *Fedorenko (1975)*, *Jiménez Gonzalez & Rodriguez Caabeiro (1982)*, *Kéler (1936)*, *Lunkaschu (1970)* and *Zlotorzicka (1964)*.

Estrildid finches and the phylogenetically related ploceid finches and sparrows harbour a number of *Brueelia* species, probably most of them still unknown to science. The few described species include *B. subtilis* (Nitzsch, 1874) and *B. cyclothorax* (Burmeister, 1838) both from the Tree Sparrow *Passer montanus* (L.) and House Sparrow *P. domesticus* (L.), *B. glizi* Balát, 1955 from Brambling, *Fringilla montifringilla* L., *B. munia* Ansari, 1955 from White-throated Silverbill *Lochura malabarica* (L.), *B. xanthocollis* Ansari, 1955 from the Yellow-spotted Petronia *Petronia xanthocollis pyrgita* (Heuglin, 1862), *B. stenozona* Kellogg & Chapman, 1902 from the Scaly Breasted Munia *L. punctulata nisoria* (Temminck), *B. astrildae* Tendeiro & Mendes, 1994 and *B. lonchurae* Tendeiro & Mendes, 1994 from African estrildid finches. Unfortunately, these latter two species are only known from female individuals.

As compared to all the aforementioned species, the 2 male and 3 female individuals examined by us is different in measurements, shape, chaetotaxy and pigmentation. Thus we

conclude that these individuals belong to *Brueelia amandavae* species nova, a parasite of *Amandava amandava* (L.).

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References

Ali, S. (1996): The Book of Indian birds. Bombay Natural History Society, Oxford University Press, Delhi, Calcutta Madras, p. 303–308.

Ansari, M. A. R. (1955): Studies on the ischnoceron Mallophaga infesting birds in Pakistan. *Proceedings of the Seventh Pakistan Science Conference, Biology, Bahawalpur, Pakistan* p. 42–62.

Ansari, M. A. R. (1956a): A brief survey of *Bruelia* species (Ischnocera: Mallophaga) parasitic on the babblers and laughing thrushes (Timaliidae). *Pakistan Journal of Health* **6,** p. 133–174.

Ansari, M. A. R. (1956b): A revision of the *Brüelia* (Mallophaga) species infesting the Corvidae, Part I. *Bulletin of the British Museum (Natural History) Entomology* **4,** p. 371–406.

Ansari, M. A. R. (1956c): Studies on phthirapteran parasites (Mallophaga) infesting birds in the Panjab. *Indian Journal of Entomology* **17,** p. 394–400.

Ansari, M. A. R. (1957): A revision of the *Brüelia* (Mallophaga) species infesting the Corvidae, Part II. *Bulletin of the British Museum (Natural History) Entomology* **5,** p. 143–182.

Ansari, M. A. R. (1958): Studies on ischnoceran Mallophaga infesting birds in the Panjab. *Indian Journal of Entomology* **20,** p. 46–62, 77–103.

Balát, F. (1955): Beitrag zur Kenntnis der Mallophagengattung *Brüelia* I. *Práce Brnenské Základny Ceskoslovenske Akademie* **27,** p. 499–524.

Balát, F. (1958): Beitrag zur Kenntnis der Mallophagengattung der bulgarischen Vögel. *Práce Brnenské Základny Ceskoslovenske Akademie* **30,** p. 397–442.

Balát, F. (1981): A contribution to the knowledge of biting lice (Mallophaga) found on passerines (Passeriformes). *Folia Parasitologica* **28,** p. 273–282.

Balát, F. (1982): Zwei neue Federlinge (Mallophaga) aus Serrahn. *Zoologischer Rundbrief für den Bezirk Neubrandenburg* **1982(2),** p. 43–47.

Bechet, I. (1961): Doua specii noi de *Brüelia* Kéler (Mallophaga). *Studia Universitatis Babes-Bolyai (Ser II.)* **2,** p. 153–158.

Bechet, I. (1966): O specie noua de *Brueelia* (Insecta, Mallophaga) *Brueelia melanocoryphae* n. sp. parazita pe *Melanocorypha c. calandra* (L.) (Aves). *Studia Universitatis Babes-Bolyai (Ser. Biol.)* **1,** p. 79–81.

Cicchino, A. (1986a): Mallophaga Nearctica I. Una nueva especie del genero *Brueelia* Keler, 1936 (Mallophaga Philopteridae), probablemente parasita de *Sturnella neglecta* Audubon, 1844 (Aves, Passeriformes, Emberizidae, Icterinae). *Revista de la Sociedad Entomológica Argentina* **44(1985),** p. 85–89.

Cicchino, A. (1986b): Contribution al conocimiento de los Malofagos Argentinos. XIX. Cuatro nuevas especies del genero *Brueelia* Keler 1936 (Philopteridae) parasitas de especies de *Turdus* Linne 1758 (Aves, Passeriformes, Muscicapidae, Turdinae). *Revista de la Sociedad Entomológica Argentina* **44(1985),** p. 91–102.

Clay, T. (1970): Species of Myrsidea (Insecta: Mallophaga) parasitic on the Estrildidae (Aves). *H. D. Srivastava Commemoration Volume*, p. 561–570.

Dalgleish, R. C. (1971): The *Brueelia* (Mallophaga: Ischnocera) of the Picidae (Aves: Piciformes). *Journal of the New York Entomological Society* **79,** p. 139–146.

Eichler, W. (1954): Deutsche Federlinge I. Genus *Brüelia*. *Naturwissenschaftliches Museum Nachrichten* **42,** p. 59–66.

Eichler, W. (1957): Notes on the *Brüelia* group of Mallophaga (feather-lice), with descriptions of four new species. *Journal of the Bombay Natural History Society* **54,** p. 577–580.

Fedorenko, I. A. (1975): New species of biting lice from the genus *Brüelia* (Mallophaga, Ischnocera) in Passeriformes of the Ukraine. *Vestnik Zoologii Kiev* **2,** p. 46–51.

Hopkins, G. H. E. & Clay, T. (1952): A check list of the genera & species of Mallophaga. British Museum (Natural History) London, 361 p.

Howard, R. & Moore, A. (1991): A complete checklist of the birds of the World. Academic Press, London, p. 506–515.

Jiménez Gonzalez, A. & Rodriguez Caabeiro, F. (1982): Nuevas aportaciones al conocimiento del género *Brueelia* (Mallophaga: Insecta) en Espaňa. *Revista Ibérica de Parasitología* **42,** p. 239–240.

Johnson, K. P., Adams, R. J. & Clayton, D. H. (2002): The phylogeny of the louse genus *Brueelia* does not reflect host phylogeny. *Biological Journal of the Linnean Society* **77,** p. 233–247.

*Kazmierczak, K. (*2000*)*: A field guide to the birds of the Indian Subcontinent. Pica Press, Sussex, p. 291–292.

Kéler, S. (1936): Über einige Mallophagen aus Rossitten. *Arbeiten über morphologische und taxonomische Entomologie aus Berlin-Dahlem* **3,** p. 256–264.

Kellogg, V. L. & Chapman, B. L. (1902): Mallophaga from birds of the Hawaiian Islands. *Journal of the New York Entomological Society* **10,** p. 155–169.

Lakshminarayana, K. V. (1969): Mallophaga Indica III. New name proposed for *Brueelia muniae* Eichler. *Angewandte Parasitologie* **10,** p. 62.

Lunkaschu, M. I. (1970): Two new species of Mallophaga of the genus *Brüelia* Keler from passerines of Moldavia. *Izvestiia Akademii Nauk Moldavskoi SSR (Ser. Biol.)* **1,** p. 53–57.

Monroe, B. L. & Sibley, C. G. (1993): A World checklist of birds. Yale Univ. Press New Haven-London, p. 296–301.

Palma, R. L. (1978): Slide-mounting of lice: a detailed description of the Canada balsam technique. *The New Zealand Entomologist* **6,** p. 432–436.

Price, R. D., Hellenthal, R. A. & Palma, R. L. (2003): World checklist of chewing lice with host associations and keys to families and genera. In *Price, R. D., Hellenthal, R. A., Palma, R. L., Johnson, K. P. & Clayton, D. H.:* The chewing lice: World checklist and biological overview. INHS Special Publication 24. Illinois Natural History Survey, Illinois, USA, 501 p.

Sibley, C. G. & Monroe, B. L. (1991): Distribution and taxonomy of birds of the World. Yale University Press, 1111 p.

Tendeiro, J. & Mendes, L. F. (1994): Sobre a fauna terrestre e ribeirinha da Republica Democratica de São Tomé e Príncipe. Malófagos II. – Espécies encontradas e notas adicionais sobre a fauna malofágica de São Tomé e Príncipe. *Garcia de Orta, Série de Zoologia* **20,** p. 113–130.

Zlotorzycka, J. (1964): Mallophaga parasitizing Passeriformes and Pici II. Brueeliinae. *Acta Parasitologica Polonica* **12,** p. 239–282.