Menacanthus palmai, a new species of chewing louse (Menoponidae: Amblycera: Phthiraptera) from the *Coturnix coromandelica*

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Received: 19 June 2012 / Accepted: 13 September 2012 / Published online: 31 October 2012
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Abstract The new species *Menacanthus palmai* collected from *Coturnix coromandelica* (Gmelin), in Rampur district (UP), India, is described and illustrated. Morphologically the new species is close to *M. abdominalis* from *Coturnix coturnix* but differs in having long pointed ventral processes on the postero-medial angles of the second to fifth pleurites. Furthermore, these two species also differ in the number of tergal and sternal abdominal setae, and the morphology of the male genitalia. Another species, *Menacanthus pallipes* from *C. chinensis*, does not have ventral processes on the postero-medial angles of pleurites.

Keywords Chewing lice · Biting lice · New louse · Louse taxonomy · *Menacanthus*

Abbreviations

TW Temple width
HL Head length
PW Prothorax width
PL Prothorax length
MW Metathorax width
ML Meso-Metathorax length
AL Abdominal length
AW (IV) Abdominal width of segment IV
TL Total length
ML Male genitalia length
All measurements are given as arithmetic means (range) in mm.

Introduction

The genus *Menacanthus* Neumann (1912) contains about 100 known species recorded from hosts belonging to the avian orders Galliformes, Piciformes, Tinamiformes and Passeriformes (Price et al. 2003; Cicchino 2003; Palma and Price 2005). Carriker (1946) revised the species from Neotropical galliform hosts. However, the remaining species, especially those from old world Galliformes, need urgent revision and keys for their identification.

Two species of *Menacanthus* are known to parasitize two species of *Coturnix*, from a total of seven species in this bird genus recorded with lice (Price et al. 2003). One species, *Menacanthus pallipes* infests *Coturnix chinensis* (L.), while the other species, *M. abdominalis*, parasitizes *Coturnix coturnix* (L.). During the present study, specimens of the genus *Menacanthus* were collected from the rain quail, *C. coromandelica* (Gmelin) and were found to belong to a new, yet undescribed species.

Materials and methods

Twenty-five specimens (6 male, 12 female, 7 nymphs) were collected from two *C. coromandelica* in 2008, from Rampur district (UP), India. The host birds were deloused (Saxena et al. 2007) and released back into the wild. The entire louse load was transferred to 70 % alcohol and separated by sex and stages. For light microscopy studies, the lice were subjected to maceration (10 % KOH), dehydration (ethanol series), clearing (clove oil) and slide mounting (Canada Balsam) according to the technique by Palma (1978).

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Menacanthus palmai sp. n.

Type material: Holotype female and paratype male ex *C. coromandelica*, India: Rampur district (Uttar Pradesh), 2008, A. Ahmad coll. have been sent to the National Zoological Survey of India, Calcutta. Paratypes: 5 male and 11 female are deposited in the collection of Department of Zoology, Government Raza Postgraduate College Rampur, India.

Etymology: The new species has been named after the renowned Phthirapterist and currently the most reputed specialist of this group, Dr Ricardo Palma, Curator Entomology, Museum of New Zealand Te Papa Tongarewa.

Description

Female (Figs. 1, 12): Head short, broadest across temple with very straight and shallow preocular slit, frons convex. Eyes large, flat, with a slight latero-median concavity; ocular fleck black, kidney shaped. Dorsal head seta 15 and 16 long (0.07–0.09 mm). Occipital seta 21, 22 and 23 very long (measuring 0.22–0.24, 0.23–0.24 and 0.18–0.20 mm, respectively) with alveoli in straight line on each side. Dorsal head seta 24 (0.017–0.019 mm) and 25 minute (0.011–0.13 mm), seta 26 much longer (0.29–0.32 mm) and finer than 27 (0.17–0.19 mm). Subocular comb row proceeded anteriorly by series of 12 short brush like setae. On the ventral aspect of the head, mandibles situated fairly close to anterior margin, clypeal region and labrum reduced, hypopharyngeal sclerite clear; chitinous framework for articulation of mandibles well developed. Post palpal spine hyaline, peg-like, small, about 0.067 mm long (Fig. 3). Quadrate gular plate with 4+4 setae (Fig. 4).

Prothorax short, protruded, lateral angles obtusely expanded, posterior margin with 3 short and 5 long setae on each side, arranged SLSSLLLL from lateral corner to midline. Prosternal plate triangular with 4+4 seta. Mesothorax reduced, bare. Metathorax with a total of 12–14 marginal setae, 10–12 of those long; irregular diagonal row of 2–4 short latero-anterior setae. Metasternal plate pentagonal with 4+4 seta. Hind femora with thin patches of 19–21 femoral brushes.

The abdomen is elongate and oval shaped. Tergites I to VIII have a series of longish setae (measuring up to 0.19 mm) along posterior margin. Sternites II to VIII have short anterior setae (measuring up to 0.05 mm) along with long marginal setae (measuring up to 0.09 mm). Long ventral processes on the postero-medial angles of pleurites II to V (Figs. 2, 6). Pleurites III to VII have short anterior and long marginal setae (measuring up to 0.31 mm) while II and VIII with single row of marginal setae. Sternal brushes (Fig. 5) present on III to VII; sternites with short

setae. Anus with anal fringe, dorsal fringe has 18–20 setae and ventral fringe bears 20–22 setae.

Abdominal chaetotaxy as follows:

Tergal setae: ($n = 8$), I 6–8 ($m = 8$), II 12–14 ($m = 13$), III 10–16 ($m = 13$), IV 13–16 ($m = 14$), V 12–14 ($m = 13$), VI 10–12 ($m = 12$), VII 8–12 ($m = 12$), VIII 7–9 ($m = 8$). Anterior pleural setae: III 7, IV 5, V 5, VI 6, VII 2 each side. Marginal pleural setae: II 4, III 3, IV 5, V 5, VI 5, VII 4 and VIII 2 each side. Anterior- central sternal setae: II 7–9 ($m = 7$), III 10–13 ($m = 12$), IV 10–13 ($m = 12$), V 7–10 ($m = 9$), VI 6–8 ($m = 7$), VII 4–6 ($m = 5$) and VIII 4–6 ($m = 5$) each side. Marginal central sternal setae: II 5–6 ($m = 6$), III 6–9 ($m = 8$), IV 6–8 ($m = 8$), V 6–8 ($m = 7$), VI 6–9 ($m = 6$), VII 2–4 ($m = 4$) and VIII 4–6 ($m = 6$) each side. Anterior setae in each sternal brush: III 6–9 ($m = 8$), IV 6–8 ($m = 7$), V 16–19 ($m = 18$), VI 11–13 ($m = 13$) and VII 6–7 ($m = 6$) each side. Marginal setae in each sternal brush: III 2–4 ($m = 4$), IV 3–4 ($m = 4$), V 5–6 ($m = 6$), VI 4–5 ($m = 5$) and VII 4 ($m = 4$) each side.

Measurements: ($n = 8$), TW = 0.62 (0.54–0.65), HL = 0.32 (0.31–0.35), PW = 0.50 (0.46–0.52), PL = 0.20 (0.18–0.23), MW = 0.69 (0.65–0.75), ML = 0.19 (0.18–0.20), AW IV = 0.99 (0.91–1.19), AL = 1.44 (1.32–1.53), TL = 2.14 (2.01–2.23).

Male (Figs. 7, 9, 10, 11, 13): As for female, except the following:

Much shorter than female in total length. Metasternal plate with 3+3 setae. Abdominal chaetotaxy as follows:

Tergal setae: ($n = 3$), I 12–14 ($m = 13$), II 18–19 ($m = 19$), III 17–19 ($m = 18$), IV 14–16 ($m = 15$), V 15–17 ($m = 16$), VI 12–14 ($m = 13$), VII 12–13 ($m = 12$), VIII 8–12 ($m = 10$). Anterior pleural setae: III 1, IV 1, V 2, VI 1 each side. Marginal pleural setae: II 5, III 4, IV 6, V 5, VI 4, VII 5 and VIII 3 each side. Anterior- central sternal setae: II 3–6 ($m = 5$), III 7–8 ($m = 8$), IV 9–13 ($m = 12$), V 5–9 ($m = 7$), VI 9–14 ($m = 11$), VII 4–6 ($m = 5$) and VIII 3–4 ($m = 4$) each side. Marginal central sternal setae: II 3–5 ($m = 4$), III 6–9 ($m = 9$), IV 7 ($m = 7$), V 5–6 ($m = 6$), VI 5–9 ($m = 7$), VII 5–7 ($m = 6$) and VIII 4–8 ($m = 7$) each side. Anterior setae in each sternal brush: III 5–6 ($m = 5$), IV 8–10 ($m = 10$), V 10–13 ($m = 12$), VI 6–7 ($m = 7$) and VII 3–5 ($m = 3$) each side. Marginal setae in each sternal brush: III 3–4 ($m = 4$), IV 4–5 ($m = 5$), V 5 ($m = 5$), VI 3 ($m = 3$) and VII 2 ($m = 2$) each side.

Measurements: ($n = 3$), TW = 0.48 (0.46–0.51), HL = 0.29 (0.28–0.31), PW = 0.40 (0.39–0.42), PL = 0.15 (0.13–0.17), MW = 0.44 (0.42–0.45), ML = 0.34 (0.33–0.35), AW IV = 0.51 (0.49–0.54), AL = 0.77 (0.75–0.81), TL = 1.41 (1.36–1.47), ML = 0.35 (0.35).

Male genitalia: The basal apodeme of male genitalia is short and convex at its anterior end (Figs. 8, 14). The parameres are strong and curved outward at their posterior

Figs. 1–6 LM photograph of adult female of *Menacanthus palmai*: 1, adult; 2, II–V abdominal segments showing ventral processes of pleurites; 3, ventral post palpal spine on head; 4, gular plate; 5, abdominal sternite V–VI showing sternal brushes; 6, enlarged abdominal segment III showing ventral process of pleurites (*sp* spinous process, *gp* gular plate, *s-iv* sternite IV, *s-v* sternite V, *sb* sternal brushes)

end. The endomeres are comparatively thin and pointed at the tip.

Discussion

The new species described herein is the first amblyceran louse known from *C. coromandelica*. A literature survey shows that the ventral processes on the postero-medial

angles of pleurites have been recorded in two species of *Menacanthus*, i.e. *M. mituensis* (Carriker 1946) (infesting *Crax mitu*) and *M. abdominalis* (on *Coturnix coturnix*). In the case of *M. mituensis* the posterior margins of prothorax are distinctly oval and the ventral processes on the postero-medial angle of pleurites II to V are moderately elongated, not reaching the succeeding segment. In the case of *M. abdominalis* the margins of pleurites are nearly straight, and the ventral processes on the postero-medial angles of

Figs. 7–11 LM photograph of adult male of *Menacanthus palmai*: 7, adult; 8, enlarged view of basal part of male genitalia; 9, enlarged view of antenna; 10, enlarged abdominal segment III and IV showing ventral processes of pleurites; 11, II–IX abdominal segment showing ventral processes of pleurites and genitalia

pleurites II to V are small. *Menacanthus palmai* resembles *M. abdominalis* in having a prothorax with straight margins but it differs in the elongation of the ventral processes on the postero-medial angles, being much longer and reaching the succeeding segments; they also differ in the posterior margin of VI, VII and VIII tergal plates and in the chaetotaxy. Moreover, the male genitalia of *M. palmai* are characteristically different from that of *M. abdominalis* in

the shape of the parameres, and of the endomeral and basal plates. The male of *M. mutuensis* has not been described yet.

We have not been able to obtain authenticated specimens of *Menacanthus pallipes* but succeeded in securing images of a female. Thus, considering the available descriptions and images, we are able to summarize the differences between *M. palmai* and *M. pallipes* as follows: larger in total length

Figs. 12–14 *Menacanthus palmai*: 12, adult female; 13, adult male; 14, male genitalia

(2.01–2.23 mm) with the posterior margin of the metathorax straight; occipital margin almost straight; 4+4 gular plate setae; abdomen oval; ventral processes on the posterior-

medial angles of the pleurites from segments II to V much longer and reaching to succeeding segments; broadest at segment IV (0.98–0.99 mm); narrowest (0.11–0.14 mm) at segment I; the dorsal fringe of anus bears 18–20 and ventral fringe has 20–22 fine setae. *Menacanthus pallipes* is shorter in total length (1.6 mm); with metathorax bell rounded; without ventral processes on the postero-medial angles of the pleurites; abdomen widest at segment V, and lengths of abdominal segments I to VII equal.

Acknowledgments The authors are indebted to the Principal, Government Raza PG College, Rampur (UP) for providing laboratory facilities; to the Chief Wild Life Warden of UP (India) for permission to catch the birds, and to the CSIR, New Delhi for providing financial support to Dr. A. K. Saxena in the form of project no. 37/(1298)/07/EMR II. Also, we thank Ricardo L. Palma (Museum of New Zealand Te Papa Tongarewa, Wellington, N. Z.) for his revision of our first draft and to Vincent S. Smith (Entomology Department, Natural History Museum, London, U.K.) for providing the images of *M. pallipes*.

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