



**A new species of Genus *Menacanthus* Neumann, 1912
(Phthiraptera: Amblycera: Menoponidae) on *Gallus gallus* L.
from Sindh, Pakistan.**

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Abstract

During the examination of domestic fowls *Gallus gallus* L. for their chewing lice, a new species of genus *Menacanthus* Neumann, 1912 (Phthiraptera: Amblycera: Menoponidae) have been recovered. The present new species has been described in details and compared with other species of *Menacanthus* found on domestic fowl and other allied galliform birds in having differences in morphometry, chaetotaxy, body sclerotization, terminalia and male genitalia. The new species has been proposed its name as *M. longiscleritus* on the basis of long and peculiar genital sac sclerites.

Keywords: *Menacanthus*, new species, *Gallus gallus*, Karachi, Pakistan.

Introduction

Domestic fowl, *Gallus gallus* L. (Galliformes: Phasianidae) harbors different types of ectoparasites including chewing lice, fleas and mites. The high infestation rate of these parasites may lead to a considerable loss of health of these economically important birds ultimately low down the economy of poultry industry especially in developing countries (Rehana, et al., 1986; Fabiyi, 1988; Zaria, et al., 1996; Ruff, 1999; Salam, et al., 2009; Nnadi and George, 2010).

There are three species of genus *Menacanthus* Neumann, 1912 (Amblycera: Menoponidae) are reported from the domestic fowls throughout the world (Price, et al., 2003). In the checklist of Mallophaga given by Lakshminarayana (1979) from Indian region, only one species *M. stramineus* (Nitzsch, 1818) has been reported from Pakistan by Ansari (1951). Naz, et al., (2011) recorded three species, *M. pallidulus*

(Neumann, 1912), *M. stramineus* and an unidentified species of *Menacanthus* from this host.

The present work deals with the new species of *Menacanthus* from *Gallus gallus* from Sindh region, Pakistan. This species has been compared with other three species, *M. cornutus* (Schommer, 1913), *M. pallidulus* and *M. stramineus* found on domestic fowls as well as other species of *Menacanthus* found on allied galliform birds including guinea fowl, quail, partridge and peacock.

Materials and Methods

Total five domestic fowls were examined for their lice. Chewing lice were collected by using white cotton clothed pouched bags and hand picking methods following Lakshminarayana (1980). After collection,

lice were processed through maceration, neutralization and dehydration process and were mounted in Canada Balsam (Palma, 1978). Lice were identified by the literature in hand, dissected for their genitalia especially where male specimens were present. Drawings were made by using ocular micrograph attached with NIKON-binocular Light microscope and photographs were taken under Light microscope using NIKON-P7000 digital camera. Measurements were taken by ocular micrometer in millimeters, given in Table 1. The terms were used for measurements in this work are: AL for abdominal length in mid line of dorsal side, GL for male genitalia length, GSSL for

genital sac sclerite length, GW for male genitalia width at proximal end of parameres, HL for head length in mid line, ML for metanotal length, MW for metanotal width, PL for pronotal length, PML for length of parameres, POW for preocular width, PPP for postpalpal process, PW for pronotal width, TL for total length, TW for temporal width.

The holotype and paratype were deposited in the Collection of Advanced Parasitology Lab, Department of Zoology, University of Sindh, Jamshoro (APL-DZUSJ), Pakistan.

Table- 1: The comparative morphometry of eight species^a of genus *Menacanthus* found on different galliform birds.

Species of <i>Menacanthus</i> and their parts	Present Species	<i>M. cornutus</i> (Schommer, 1913)	<i>M. lyali</i> * Caabeiro et al.,1983	<i>M. pallidulus</i> (Neuman, 1912)	<i>M. stramineus</i> (Nitzsch, 1818)	<i>M. kaddoui</i> Eichler and Mey, 1978	<i>M. pricei</i> Wiseman, 1968
TL	1.500	1.96	1.96	1.527	2.895	1.82	1.74
HL	0.275	0.31	0.37	0.312	0.367	0.37	0.34
POW	0.385	0.41	0.5	0.380	0.535	0.49	0.37
TW	0.485	0.54	0.6	0.507	0.672	0.53	0.55
PPP	0.063	0.07	0.075	0.05	0.051	-	0.069
PL	0.172	0.19	0.18	0.200	0.277	-	0.15
PW	0.360	0.42	0.44	0.377	0.542	0.44	0.378
ML	0.105	0.15	0.19	0.147	0.192	-	0.20
MW	0.445	0.53	0.52	0.408	0.590	0.51	0.47
AL	0.895	1.25	1.15	0.906	1.915	-	0.95
GL	0.510	-	0.66	0.331	0.700	-	-
GW	0.115	-	0.088	0.089	0.255	-	-
GSSL	0.285	0.06	0.1	0.051	0.145	-	-
PML	0.189	-	0.174	0.114	0.180	-	-

^aall male specimens were taken for measurements. *Measurement of holotype (Caabeiro et al., 1983)

Results

Menacanthus longiscleritus Species novum

Figures: 1-14; Plate: A-B.

Head: Preocular slit short and narrow; ocular and occipital nodi almost absent; temples short and rounded; DHS 8 very shorter than DHS 9; DHS 10 slightly longer than 11, DHS 11 needle like, sharp; DHS 14 long and fine, DHS 15 and 16 subequal and very short; ocular seta 19 absent, 20 present; ocular comb developed, two subocular seta present; occipital setae 21-22 long and fine; temporal marginal setae 23-25 and 27 very short microsetae; setae 26, 28 and 30

long to very long, alveolus of seta 25 touching the seta 26, seta 29 normal and fine; maxillary palpus typical of genus and longer, terminal segment longer, without subterminal setae; postpalpal process present, long, measuring 0.070-0.080; hypopharynx weakly developed, with a pair of large holes; gular plate large, developed with clear lateral margins and four long lateral gular setae; antennae long, second segment with latero-ventral small, projected corner, bearing four to five fine microsetae, third segment short, terminal segment large, oblong, with five small and five-eight very small microsetae on its terminal disc.

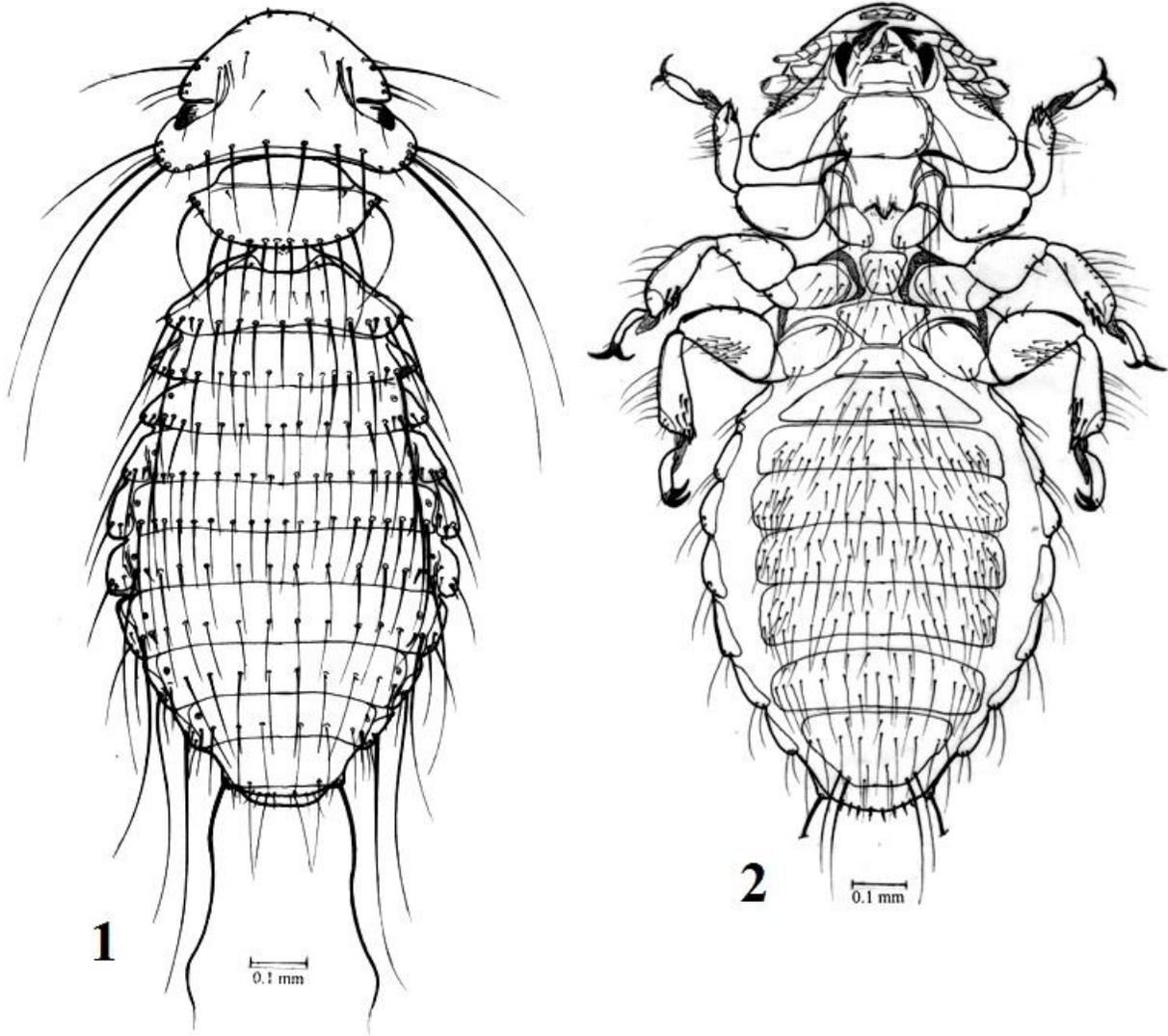
Thorax: Pronotal anterior seta 1 very small microseta, seta 2 larger than seta 1, evident; pronotal lateral to posterior marginal setae 1 and 3 small, spiniform setae, seta 2 normal, highly curved, seta 4-8 long, normal setae; postnotum present with four grouped mesonotal setae at posterior; prosternal plate weak to moderately developed, pointed posteriorly, anterior margin unclear, one pair of very microseta present at anterior to plate; mesonotum with one pair of lateral mesonotal setae; mesosternal plate short, weakly sclerotized, roughly triangular, with six-eight scattered fine setae and two minute microsetae; metanotum trapezoidal and more than double wider than long, bearing five-six anterior microsetae; two pairs lateral setae; sixteen-seventeen lateral to posterior metanotal marginal setae, seta 1 and 4 spiniform, 2-3, 5-8 or 9 large normal setae, usually in straight line; metasternal plate large, trapezoidal or diamond shaped, with eight-nine long normal setae; legs normal; femur III with a bunch of microsetae at its venter; tibia I-III with four-

five thick, sharp, hyaline setae at its ventro-termination.

Abdomen: Tergites I-VIII complete, with median single transverse row of marginal setae; anterior tergal setae absent; laterally pleurites visible, without pleural thickenings; tergal marginal setae on tergite I: 14, II: 15, III: 17, IV: 19, V: 14, VI: 14, VII: 10, VIII: 8; tergal marginal seta 1 shortest, peg like on tergites I-VI; postspiracular setae long on tergite I, very long on tergites II-VI, short on tergites VII and VIII; pleurites bear short spiniform to fine normal setae at posterior margin; spiracles on tergites; sternites separated from pleurites by a wide gap; sternites moderately developed; sternite I short, with one pair of setae; sternite III-VI bearing thin setal bunches on lateral sides of plates, not as setal brushes; sternal setae small, fine, thin, positioned as anterior and posterior setal rows, on sternite II: 13, III: 36, IV: 48, V: 48, VI: 38, VII: 27, including setal bunches.



Plate: A: *M. longiscleritus* male; B: Male genitalia, arrow shows long genital sclerite.

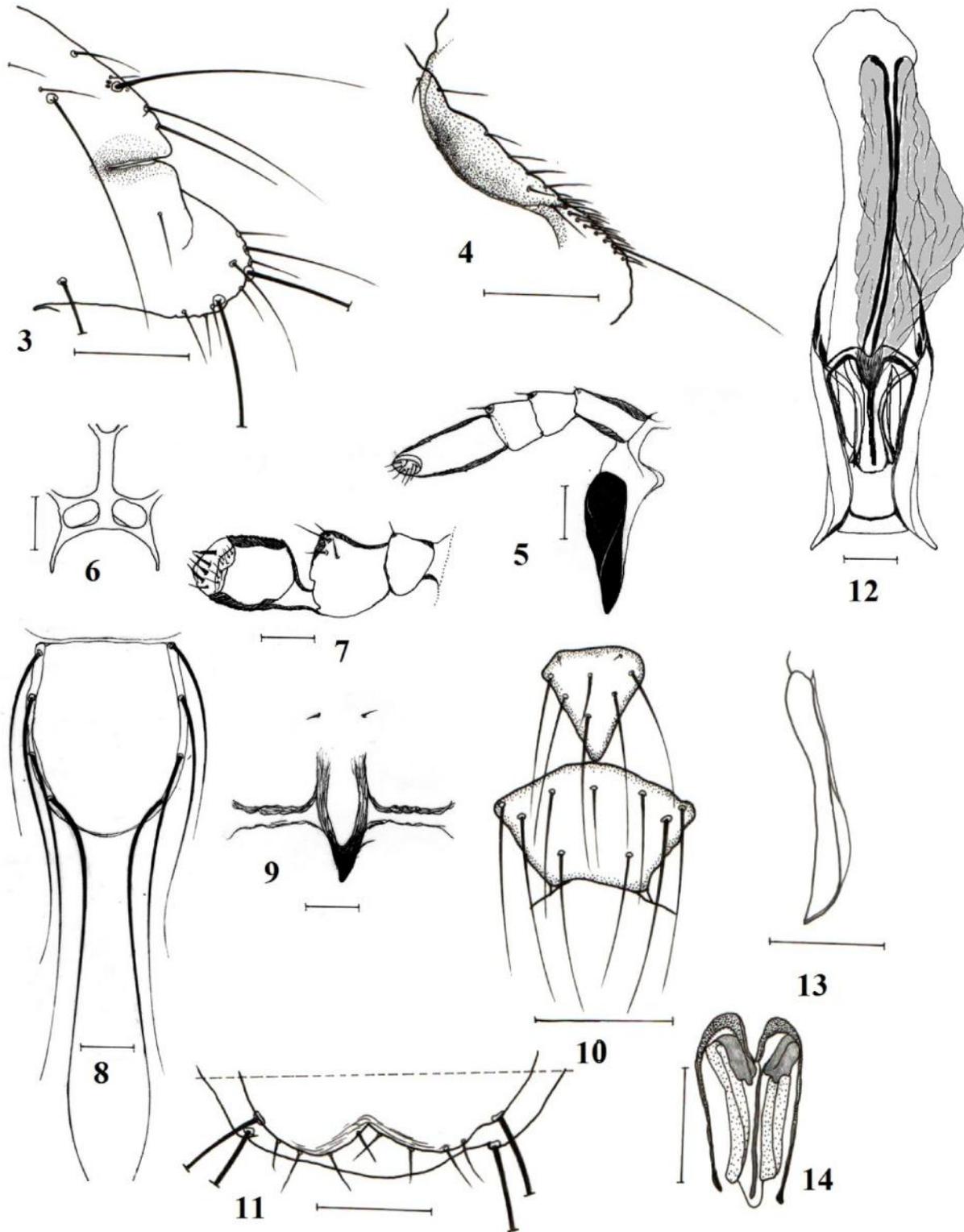


Menacanthus longiscleritus sp.n..

- 1: dorsal habitus of male;
- 2: ventral habitus of male;

Male Terminalia: Tergite IX larger than X; laterally expanded; tergite IX bears one pair of tergal marginal setae at posterior; one pair of long lateral macrosetae present at lateral pleural projections, measuring 0.475-0.480; posterior margin of terminal segment bear marginal setal row of ten-twelve fine, microsetae of variable lengths; subgenital plate short, formed by fused sternite VIII-X, bearing sixteen fine normal setae, scattered throughout the plate and two pairs of normal macrosetae at latero-posterior margin of plate, measuring 0.200-0.210 outer setae and 0.230-0.240 inner setae, posterior margin of terminal segment bear eight small, stout, peg like setae at medial portion.

Male Genitalia: Basal apodeme thinly sclerotized, anteriorly broad, convex, spatulate, medially narrow, posteriorly broader at base of parameres; parameres elongated, slender, curved outwards posteriorly and behind the medial endomeral plate; endomeral plate broad posteriorly with smooth and straight posterior margin; mesomeral plate elongated, developed, projecting elongated penial structure; genital sac present with very slight speculations; genital sac sclerite very elongated, measuring 0.283-0.287; subequal to basal apodeme in length, thin, unevenly thickened, anteriorly rounded and attached with the genital sac.



Menacanthus longiscleritus sp.n.

3: Head latero-ocular to temporal margin showing chaetotaxy; 4: Ventral ocular chaetotaxy; 5: Maxillary Palpus with Postpalpal process; 6: Hypopharyngeal Sclerite; 7: Antenna; 8: Gular Plate; 9: Prosternal Plate; 10: Mesosternal and Metasternal Plates; 11: Male Terminalia; 12: Male Genitalia, genital sac shaded ; 13: Paramere; 14: Mesomere enlarged.

Magnification: 100X (0.1mm): figs.1-2; 400X (0.1mm): figs.3-4, 10-11, 13-14; 400X (0.025mm): figs. 5-9; 100X (0.05mm): fig. 12.

Taxonomic Summary:

Type Host: *Gallus gallus domesticus* (L.).
Locality: Gulistan-e-Johar, Karachi, Pakistan.
Number of Specimens collected: 03 male, 01 female nymph.
Number of birds examined: 05
Holotype: 01 m#, niche: wings and ramp feathers, 16-vi-2010; leg. Naz, S.
Paratype: 02 m# and 01 nymph, same as above.
Deposition: Collection at Advanced Parasitology Laboratory, Department of Zoology, University of Sindh, Jamshoro, Sindh, Pakistan.

Etymology:

The present species of the genus *Menacanthus* has been named on the very long sclerites, associated with the genital sac in male genitalia.

Key to the species of genus *Menacanthus* found on *Gallus gallus* L. in the world.

1. Total length of body less than 2 2
Total length of body 2 or more 3
2. Hypopharyngeal sclerite strong; male genital sclerites short (0.051) *M. pallidulus*
Hypopharyngeal sclerite weak; male genital sclerite very long among all species of *Menacanthus* *M. longiscleritus* sp. n.
3. Body length usually slightly less than 2; fewer setae on metathorax; single row of tergal setae on abdomen; male genital sclerite short, V-shaped, tubular *M. cornutus*
Body length more than 2; many scattered setae on metathorax; double row of tergal setae on abdomen; genital sclerite peculiar, wing shaped *M. stramineus*

Discussion

The present species, *Menacanthus longiscleritus* sp. n. is found on *Gallus gallus* (L.), recorded for the first time on the host from Karachi, Pakistan. It is exceptionally separated from the other species of the genus *Menacanthus* found on the same host in having very long genital sclerites, associated with the genital sac, measuring 0.283-0.287. These genital sclerites in *M. cornutus*, *M. pallidulus* and *M. stramineus* measured up to 0.06-0.62, 0.056-0.061 and 0.14-0.15 respectively. Other morphometric differences of

previously known three species and the present species are given in Table. 1.

It also differs from *M. cornutus* (Schommer, 1913) of *Gallus gallus* L. and *M. kaddoui* (Eichler and Mey, 1978) from Pea fowl *Pavo cristatus* L. in having temporal width more expanded; postpalpal processes short and not touching the line of ocular slit (Caabeiro et al., 1983), whereas lesser temporal width and postpalpal processes large and touching the line of ocular slit in *M. longiscleritus*.

The basal apodeme in the male genitalia of *M. pricei* Wiseman, 1968 of Bobwhite Quail *Colinus virginianus* L. is narrow and long; genital sclerite is very short, less than the half length of basal apodeme, whereas in *M. longiscleritus*, the basal apodeme is median in length but broader with genital sclerites more or less equal in the length of basal apodeme. The parameres shorter than mesosomes in *M. stramineus* (Nitzsch, 1818), longer than mesosome in *M. numidae* (Giebel, 1874) (ex. Helmeted Guinea fowl *Numida meleagris*) and *M. cornutus* (Eichler 1971; Gonzalez and Caabeiro, 1982), whereas very long in the present species.

The present species also varies from *M. lyali* Caabeiro et al., 1983 of Red-legged Partridge *Alectoris rufa* L. in having genital sclerite V-shaped, less than 0.1mm in length (Caabeiro et al., 1983), while in *M. longiscleritus*, it is more than 0.2 mm long as in fig. 12.

On the above finding, the present species is evidently a separate species in its taxonomic position amongst the gallinaceous *Menacanthus* species. Almost each species of the genus contains shorter genital sclerites than endomeral plate and paramere, it is the only species which has subequal length of genital sclerite and basal apodeme (Schommer, 1913; Carriker, 1946; Emerson, 1956; Wiseman, 1968; Caabeiro et al., 1983; Price and Emerson, 1988; Sychra et al., 2008).

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