ON A COLLECTION OF CHEWING-LICE (PHTHIRAPTERA : INSECTA) FROM NEPAL

By

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Piaget (1881) is the earliest report on the chewing-llice from Nepal. Kellogg & Paine (1914) is the first systematic work dealing with Indian Museum collections (now National Zoological collections of the Zoological Survey of India), some of which were collections from Nepal. Unfortunately, the four species from Nepal included in it were lost during River Varuna floods at Varanasi (cf. Lakshminarayana, 1982a), and no longer available in Z. S. I., collections. Since then stray reports appeared from time to time. Emerson (1971, 1973) also include species reported from Nepal, on birds and mammals respectively based on his collections. In addition to these published records, a few species are available in the British Museum (Nat. History), London, which the author examined during his visit, and some of them have also not been reported in print. Lakshminarayana (1979a, 1982b) included so far known species including the non-recorded species referred to. Thus so far, 32 genera and 83 species have been recorded on Nepalese birds and mammals.

My erstwhile esteemed colleague Dr Biswamoy Biswas carried out an ornithological survey in Nepal during 1947, and incidentally collected some specimens from these birds. These collections were placed at the author’s disposal for study. The following is a report on this material together with some species generously donated by Dr. K. C. Emerson, and now incorporated in Z. S. I. collections. Some of the species have now been recorded for the first time from Nepal, while others are on new host species/subspecies, and therefore of interest.

Reference is invited to Lakshminarayana (1972, 1975) for literature from India and adjacent countries including Nepal. In the literature cited in the end, all references mentioned under synonymy, those references listed in Keler (1960), Eichler et al. (1969, 1973), and Lakshminarayana (1972, 1975) have not been provided for brevity, and references not given in these works alone are cited. The measurements are given in mm.
Records of the Zoological Survey of India

SYSTEMATIC ACCOUNT

Order : PHTHIRAPTERA
Sub-order : AMBLYCPEROPHTHIRINA
Family : LAEMOBOTHRIIDAE

1. Laemobothrion maximum (Scopoli, 1763)

(Pl. I, figs. 1-2; Pl. II, figs. 1-4)

Pediculus maximus Scopoli, 1763. Ent. Carniolica : 382. Type host: (Falco buteo)
Buteo buteo (Linne).

Nomen novum for maximus Scopoli, etc.

Milvus migrans govinda Sykes.


8, 12, & 16-18 ; Price & Emerson, 1969. Proc. ent. Soc. Wash., 69 (3): 251 ;

Only the more important synonymies are given here, and for a
fuller list attention is invited to Nelson & Price (1965). These authors
thoroughly reviewed the species of Laemobothrion off Falconiformes
and concluded only four species are valid though several names were
given to local populations or on hosts in various parts of the world.
Lakshminarayana (1970) discussed the evolutionary trends in the
Laemobothrion—complex, and recognized the following genera, viz.,
Laemobothrion Nitzsch parasitic on Falconiformes, Eulaemobothrion
Ewing on Gruiformes, Oiconiicola Lakshminarayana on Oiconiiformes
(Hagedashia), and Ornithopeplechthos Eichler on Galliformes (Opisthoco-
mus only).

Clay & Hopkins (1951, 1954, 1960) discussed the early literature
and recognized L. maximum Scopoli as the valid name for this species.
Nelson & Price (op. cit.) provided excellent redescription.

The specimens collected now from Milvus migrans lineatus (J. E.
Gray) are referable to L. maximum (Scopoli) (Pl. 1 figs. 1-2; Pl. 2
figs. 1-4) by the key characters, viz., sitophore sclerite of the hypo-
pharynx with two large holes and more or less reduced U-shaped
structure (Pl. 1 fig. 1); spiniform setae on the proximodorsal aspect
of the femora II less than 4; a medial unpigmented area to the abdo-
mental tergites absent; and absence of a postvulval pigment spot (cf.
Nelson & Price, 1965). Male genitalia as in Pl. 1 fig. 2; Pl. 2 fig. 2.
Material: Four ♂♂ and eight ♀♀ off Milvus migrans lineatus (J. E. Gray) (B 1/21.vi.1947), Hitaura, 21.vi.1947, coll. B. Biswas (Reg. Nos. 679/H 16 (2 ♂♂, 1 ♀), 680/H 16 (2 ♀♀), 904/H 16 (1 ♀), 905/H 16 (1 ♀), & 906/H 16 (1 ♂, 2 ♀♀)).

Measurements

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<tr>
<th></th>
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<th>Female</th>
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<tbody>
<tr>
<td></td>
<td>Length</td>
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<tr>
<td>Head</td>
<td>1.02-1.05</td>
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Remarks: This species has been reported from various parts of the world on different species of Falconiformes including Milvus migrans lineatus (J. E. Gray) on which the present collections were made and attention is invited to Nelson & Price (op. cit.) for known hosts.

In India and adjacent, the species was reported as L. titan on (Baza jerdoni) Aviceda jerdoni (Blyth) from Kurseong (Kellogg & Nakayama, 1916), as L. giganteum from Shembaganur and Madurai (Kéler, 1937), as L. indicum on Milvus migrans govinda Sykes from India (Sen, 1952), on the same host from Lyallpur, Pakistan, (Ansari, 1951), as L. cirri on Circus ae. aeruginosus (Linne) from India (Clay & Hopkins, 1954), as L. siddiqui on Circaetus g. gallicas (Gmelin) from Pakistan, and as L. hieraeti on (Hieraaetus pennatus) Hieraaetus pennatus (Gmelin) from Shujaval, Pakistan (Ansari, 1955, 1956a, 1956b); L. maximum from Milvus/migrans/lineatus from Burma, Haliastur indus (Boddaert) from Sri Lanka and India, Accipter badius (Gmelin), Buteo rufinus (Cretzschmar) and Butastur teesa (Franklin) from India (Nelson & Price, 1965). The find on M. migrans lineatus (Gray) though on a known host is the first record from Nepal. These specimens are also slightly smaller than those studied by Nelson & Price (1965) and Clay & Hopkins (1954).

Lakshminarayana (1970) while discussing the evolutionary trends in Laemobothrion-complex, placed L. maximum (Scopoli) at a higher plane than L. vulturis (J. C. Fabricius) on the basis of sitophore sclerite with in Laemobothrion sens. str.
Records of the Zoological Survey of India

Family: Menoponidae

2. Amyrsidea minuta Emerson, 1961

(Pl. I, fig. 3; Pl. II, fig. 5)


Clay (1947) pointed that Amyrsidea off Pavo cristatus contain apparently two species of which the larger one was described as A. phaeostoma (Nitzsch), while the smaller remained undescribed. The smaller form was described as A. minuta in Emerson (1961) from material collected on the type host from Canada, British Isles, and United States of America. While working on Amyrsidea from India, the present author requested Dr Emerson for a ♂ and ♀ of A. minuta. Dr Emerson was kind enough to donate them from material collected from Nepal in his project.

Though the description was meagre, the excellent figures of Emerson (1961) readily help us in identifying the species.

These specimens along with those collected by Dr B. Biswas from Halon Valley, Madhya Pradesh (India) showed some minor variations which may be worth mentioning. (Pl. 2 fig. 5). Occipital margin bears 8 long setae, posterior prothoracic margin is fringed with 12-13 setae in ♀ and 14 in ♂, plus a spine-like seta in the middle. Hind femora with brush of setae of 15 in ♀, and 19-23 in ♂. Male genitalia as in (Pl. 1 fig. 3). Vulval margin is provided with 8 setae.


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<td></td>
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<td>Total</td>
<td>1.33</td>
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Remarks: Emerson (1961) stated that this species can be easily recognized by its short parameres which are little curved distally, and endomeres in male. It has been reported from Vancouver; London; Bridgnorth, Shropshire; New Orleans, Lousiana: Portland, Oregon; McAllen, Texas. The credit of the present record from Nepal should in fact, goes to Dr Emerson, though not reported by himself. Further it also confirms, *P. cristatus* as a natural host for this species, since the type material was collected from zoo garden host. The present record is the first report from Nepal, which together with Halon Valley material also forms the first report from the Indian Region.

Sub-Order : ISCHNOCEROPHTHIRINA

Family : PHILOPTERIDAE

3. **Goniodes ocellatus** (Rudow, 1869)
   
   *(Pl. I, figs 4-6 ; Pl. II, figs 6-7)*


   Rudow (1869) described the species from *(Nycthemerus linearis)* *Lophura nycthemerus lineatus* (Vigors) as *Goniocotes ocellatus*, and in a later paper as *G. dentatus* (Rudow, 1870). Since the original description seems to be that of a female *Goniodes* from that host, and the author himself compared with related *Goniodes* spp., Clay (1940) treated it as *Goniodes* and not as *Goniocotes* and used the specific appellation *dentatus*. This was however, corrected to *G. ocellatus* (Rudow) for priority reasons in Hopkins & Clay (1952). Emerson (1973) unfortunately used both the names in his list of ectoparasites of the birds of Asia.

   Clay (1940) included this species in Group I of *Goniodes* in her revisionary studies. This group is fairly a large one with species having larger bodies, head showing sexual dimorphism, male (Pl. 1 fig. 4 ; Pl. 2 fig. 6) with little and female with greatly expanded temples, (Pl. 2 fig. 7) ; partly membraneous coni, antenna with or without an appendage
to the enlarged segment I, III produced in male, but simple and filiform in female. Meso-metasternal setae absent. Male genital opening unmodified, bifid process to the internal genital organs absent in the female, vulva with setae concentrated at the lateral corners, a spinous process present on the genital region. The specimens under discussion are referrable to this group and G. ocellatus in particular. It is characterised as follows: Head as in Pl. 1 fig 4 and Pl. 2 figs 6 & 7. Coni small, antennal segment I enlarged bearing a small appendix, occipital angles in female sharp and temples produced. Prothorax rectangular, pterothorax trapezoidal with two lateral and four marginal setae on each side. Abdomen oval with two sterno-central setae to segments I-VII, and the anterior ones may have 2-4 additional setae, tergo-central setae to the female 6-8. Male genitalia characteristic (Pl. 1 fig. 5) reaching near the base of hind coxae. Terminal segments of the female as in (Pl. 1 fig. 6). with setae at the lateral corners of the vulva and with pediculate spiniform setae.

Material: Four ♂ ♂ and four ♀ ♀ from Lophura leucomelana (Latham), Nepal, 18.vi.1947, coll. B. Biswas (Reg. Nos. 628/H 16 (♂), 629/H 16 (♂, ♀), 630/H 16 (1 ♂, 2 ♀ ♀, 1 X), 824/H 16 (1 ♂, 2 ♀ ♀), 825/H 16 (2 ♂ ♂, 1 ♀).
type host. The present material off _Lophura leucomelana_ (Latham) was collected from a wild bird shot by Dr. Biswas confirms it as a natural host.

4. **Goniodes mayuri** (Lakshminarayana & Emerson, 1971)

*(Pl. I, figs. 7 & 8; Pl. II, fig 8)*


_Goniocotes rectangulatus_ Nitzsch : Emerson & Ellbel, 1957, *Proc. Ent. Soc. Wash.*, 59 (5) : 241, fig. 11 (Figure only); Emerson, 1964. *Check List of the Mallophaga of North America (North of Mexico)*, Pt. I : 60 (Error).


_Goniodes mayuri_ was originally well described and figured by Lakshminarayana & Emerson (1971). Following after Hopkins & Clay (1952) it was placed under the genus _Goniocotes_ along with _Gc. parviceps_ (Piaget) the other member in the sympatric pair with which it was confused. The male of _G. mayuri_ is separable from _G. parviceps_ in the temporal margin slightly constricted, marginal temporal carina narrow, provided with smaller and thinner temporal marginal setae, antennal appendage with a lanceolate seta; nearly rectangular prothoracic margins; abdominal tergite strongly projecting into thorax anterolaterally, tergite VII with 4 setae, terminal abdominal tergite with 6 long setae, and by the presence of characteristic symmetrical genitalia (Pl. 1 fig. 8 ; Pl. 2 fig. 8) as against the asymmetrical ones in _parviceps_. The females of both the species are difficult to separate: however, the female of _mayuri_ is usually of larger size, the terminal abdominal tergite provided with 8 setae, and a prominent internal circular-shaped vulval chamber.

**Material:** One ♂ off _Pavo cristatus_ Linne, Tamispur, Navalpur, Parasi Dist., 15.i.1968, Coll. R. E. Lewis (Iowa State Univ. Ames). Coll. No. Np. 313 (Paratype), (Reg. No. 668/H 16 (♂) (Dr Emerson's donation).


5. **Lipeurus brunneipictus** (Giebel, 1877)

(Pl. I, fig. 9; Pl. II, fig. 9)


Clay (1938) while revising the mallophaga of gallinaceous hosts, stated that *Lipeurus intermedius* Piaget (1880) was based on composite species viz., a male of *brunneipictus* and female of *Oxyleipeurus piageti* Clay (later emended to *piagetinu8* in Hopkins, 1950). The author further remarked that some of the females in Piaget's collections resemble the drawings of *L. brunneipictus* provided by Dr Kéler based on Giebel's material (before part of it was destroyed in the Halle Museum now housed in Museum fuer Naturkunden der Humboldt Universität, Berlin and not available during the present author's visit and apparently lost (of. Goellner-Scheiding, 1973).

The material under study comprise four ♀ ♂ from *Lophura leucome-lana* (Latham) (Pl. 2 Fig. 9) resemble very much the female of *L. brunneipictus* (Giebel) sensu Clay (1939), with very minor variations. The ♀ of this species is quite close to the ♀ of *L. keleri* Clay, but differs from the latter by the narrow preantennal region and chaetotaxy of the genital region (Pl. 1 Fig. 9). The vulval setae are longer ranging from 8-10 in a row and another series of 4-6 spiniform setae above.


### Measurements

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<td>0.39-0.49</td>
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<td>2.16-2.25</td>
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</table>
LAKSHMINARAYANA: Collection of chewing-lice from Nepal

Remarks: Clay (1939) reported the species from skins of Lophura rufa (Raffles) from Sumatra, and one male from L. i. ignita (Shaw) in Piaget’s collections. Though, Kellogg reported the occurrence of L. intermedius Piaget on Pucrasia melanolopha (Lesson), on examination the material was found conspecific with Reticuligerus pucrasia (Clay). The present record is therefore interesting for two reasons viz., firstly, the host is a new record, and secondly the species is reported for the first time from the Indian Region. Although Emerson (1973b) recorded L. introductus Kellogg on Lophura leucomelana the present specimens appear more like brunneipictus only.

6. Upupicola upupae (Schrank, 1803)

(P1. I, fig. 10; Pl. II, fig. 10)

Pediculus upupae Schrank, 1803. Fauna Boica: 189. Type host: (Wiedehopf) Upupa e. epops Linne.

Docophorus upupae Denny, 1842. Mon. Anogl. Brit.: 45, 92, pl. 8, fig. 1. Type host: Upupa e. epops Linne.


Schrank (1803) described the species from Upupa e. epops Linne, which was believed identical with Piaget’s figure of Nirmus melanophrys Nitzsch (Piaget, 1880), and the description in Giebel (1866, 1874), a sketch in Nitzsch’s manuscript, and Piaget’s specimens labelled as Nirmus melanophrys in British museum (Nat. Hist.) (cf. Clay & Hopkins, 1960). Denny (1842) independently described Docophorus upupae for specimens off the same host. His syntypes found in British Museum (Nat. Hist.) were also found to be identical with U. upupae. Harrison (1916) considered upupae Schrank as a Philopterus, and upupae Denny as a Degseriella, and melanophrys Nitzsch as conspecific with D. upupae.
Fig. 1-10. 1-2. *Laemobothrium maximum*: 1. Sitophore sclerite; 2. $\delta$ genitalia.

3. *Amyrsides minuta*: $\delta$ genitalia.

4-6. *Goniodes ocellatus*: 4. $\delta$ head; 5. $\delta$ genitalia; 6. Terminal abdominal segments of the $\delta$.

7-8. *Goniodes mayuri*: 7. $\delta$ entire; 8. $\delta$ genitalia.


10. *Upupicola upupae*: Distal portion of $\delta$ genitalia.
Fig. 1-10. 1-4. *Laemobothrion maximum*: 1. ♂ head; 2. Terminal abdominal segments showing ♂ genitalia; 3. ♀ head; 4. Terminal ♀ abdominal segments.

5. *Amyrsidea minuta*: ♂.
Clay & Meinertzhagen (1939) established the genus *Upupicola* with *D. melanophrys* (Nitzsch) as the type species. Now that *upupae* Schrank, *upupae* Denny, and *melanophr* Nitzsch are all conspecific the genus contains a single species.

The single male and female from *Upupa epops saturata* Lönning (Pl. 2 fig. 10) in the present collections agree with redescription and figures of *U. upupae* (Schrank) *sensu* Clay & Hopkins (1960) and the generic description of *Upupicola* Clay & Meinertzhagen (1939). Male genitalia as in Pl. 1 fig. 10.

**Material**: One ♂ and ♀ from *Upupa epops saturata* Lönning (B6/5.4.47), Gowcharan, Nepal, 5.iv.1947, Coll. B. Biswas.

**Measurements**

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<th>Male</th>
<th>Female</th>
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<td>Length</td>
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<td>Head</td>
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**Remarks**: Schrank (1803), Denny (1842), ‘Nitzsch’ (1866), Piaget (1880), and Séguy (1944) recorded the species on *Upupa epops* Linne. Blagoveshtchenskii (1951) reported on the same host from Kondora as *D. upupae* (Denny). Bedőrd (1932) also reported under the latter name on *U. africana* Bechst from S. Africa. Clay & Hopkins (1960) designated neotype from material off the type host from Hodonin, Czechoslovakia and neoparatypes from France, Italy, Portugal. Czechoslovakia, Asia Minor, India and Pakistan. Ansari (1947) reported it as *U. melanophr* (Nitzsch) on (*U. e. orientolis*) *Upupa epops ceylonensis* Reichenbach from Lyallpur (Pakistan) and later corrected it to *U. upupae* (Schrank).

The present record from *Upupa epops saturata* Lönning is the first report Nepal and also on a new subspecies of the type host. The specimens are smaller than those of clay & Hopkins (1960), but the male is smaller and female is larger than those of Ansari (1947). The male however, agrees with the size of the male but the female is larger than those of Piaget (1880), and Séguy (1944).
ACKNOWLEDGEMENTS

The author wishes to thank Dr. B. K. Tikader, former Director and Dr R. S. Pillai, Deputy Director, Zoological Survey of India for all the facilities. His sincere thanks are due to Dr Biswamoy Biswas, formerly Jt Director, Z. S. I., and the collector of the material for placing the material at his disposal. Thanks are also due to Dr Miss Theresa Clay and the authorities of the British Museum (Nat. History) for all facilities to examine the collections in the latter museum, to Prof. Dr wd. Eichler, and Dr Goellner-Schieding and the authorities of Museum an der Humboldt Universität, Berlin for enabling the author to examine Dr Kéler's material which also incidentally contain Nitzsch and Giebel's material. His sincere thanks are also due to the Department of Science & Technology, Govt. of India, and Prof. S. Khera, formerly Jt Director in-Charge for his deputation abroad. Last but not the least to Dr K. C. Emerson, formerly of Smithsonian Institution. Washington, for loan and donation of some species from Nepal for a study.

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