



Occurrence of *Laemobothrion maximum* and *Degeeriella fulva* lice infestation in black kites (*Milvus migrans*)

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Abstract

The present study recorded the occurrence of chewing lice *Laemobothrion maximum* and *Degeeriella fulva* on six rescued black kites (*Milvus migrans*). This is the first documentation of *D. fulva* lice infestation in black kites from India.

Keywords: *Laemobothrion maximum*, *Degeeriella fulva*, Black kites.

Introduction

Avian lice are small wingless, dorso-ventrally flattened permanent ectoparasites of the order Mallophaga. Over 4000 bird lice species have been recognized globally (Price *et al.*, 2003). These lice typically pose little or no visible health concerns for wild birds, unless their hosts are unwell, or under stress. However, in heavy infestation, they can cause severe skin irritation, increased feather deformation, and diminish host survival by affecting flying performance, body weight and host sexual selection (Clayton, 1990). Therefore, identification of these lice is crucial for the maintaining the health and reproduction of the bird. The present study records the presence and identification of two species of chewing lice in black kites (*Milvus migrans*) from Madhya Pradesh, India.

Six black kites were rescued by the forest department from various locations in Jabalpur, Madhya Pradesh, and brought to the School of Wildlife Forensic and Health, Nanaji Deshmukh Veterinary Science University, Jabalpur for health evaluation between

January and October 2022. During clinical examination, lice infestations were noticed in the feathers of birds (Fig. 1a). Large-sized lice collected from five birds, and smaller lice from one bird were preserved in separate glass vials in 70% alcohol for identification. For processing, the lice were kept in 10% KOH for a minute, washed in water and dehydrated in ascending grades of (70%, 80%, 90%, and 100%) alcohol and cleared in xylene (Lakshminarayana, 1970). The specimens were mounted in DPX, examined under a microscope, and identified based on morphological and micrometry features as previously described (Nelson and Price, 1965; Lakshminarayana, 1970; Perez *et al.*, 1995; Clay, 1958; Dik, 2006).

Two types of chewing lice were identified. The larger louse was *Laemobothrion maximum* (Fig. 1) while the smaller one was *Degeeriella fulva* (Fig. 2). *Laemobothrion maximum* lice showed large head with narrow flatter anterior border (Fig. 1b), prominent lateral pre-ocular swellings in front of the eyes (Fig. 1c), sitophore sclerite of the hypopharynx with two large holes and noticeable U-shaped structure. The temples were small in width with lengthy setae on either side. The subvulvar region was pigmentless with setae on each side. The third pair of legs was larger than the first

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two and females had four setae (Fig. 1d) in the proximo-dorsal region of femur II, whereas males had only two. Similar morphological features were previously recorded by Nelson and Price (1965), Lakshminarayana (1970) and Perez *et al.* (1995). Detailed micrometry data for *L. maximum* lice are presented in table 1.

Table 1. Morphometric details of *Laemobothrion maximum* and *Degeeriella fulva*

Specimens/Measurement Parameters	Observations (Mean \pm S.D.) *	Reference standards (Dik, 2006) (Min. to Max.) *
<i>L. maximum</i>		
Adult female	N=12	N=2
Length (mm)	9.97 \pm 0.29	10.01 (9.71 to 10.32)
Head width (mm)	1.90 \pm 0.08	1.76 (1.72 to 1.80)
Abdominal width (mm)	3.70 \pm 0.65	2.93 (2.60 to 3.35)
Adult male	N=1	N=1
Length (mm)	8.24	8.30
Head width (mm)	1.52	1.60
Abdominal width (mm)	2.80	2.70
<i>D. fulva</i>		
Adult female	N=3	N=13
Length (mm)	2.286 \pm 0.438	2.30 (2.21 to 2.42)
Head width (mm)	0.384 \pm 0.020	0.48 (0.45 to 0.50)
Abdominal width (mm)	0.593 \pm 0.037	0.65 (0.61 to 0.73)
Adult male	N=1	N=4
Length (mm)	1.913	2.19 (2.14 to 2.23)
Head width (mm)	0.532	0.45 (0.44 to 0.46)
Abdominal width (mm)	0.482	0.63 (0.62 to 0.63)

*S.D.=Standard deviations, Min.= Minimum & Max.= Maximum

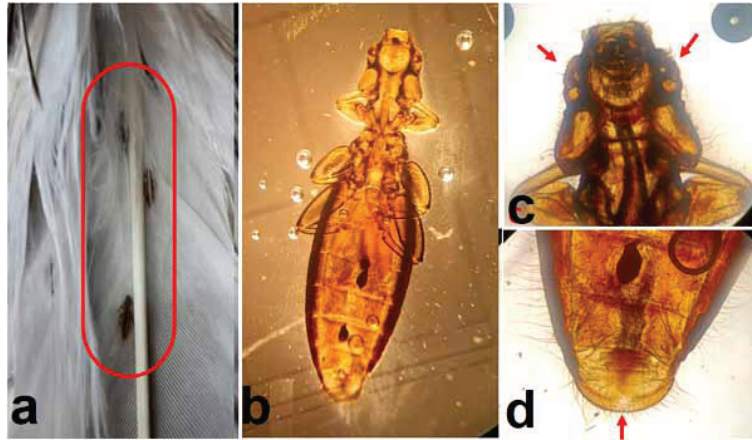


Fig. 1: *Laemobothrion maximum* infestation in feathers of black kite. The red circle (a) depicts lice adhering to feathers. Adult female (b) *L. maximum* louse (ventral view). Head of louse (c) with large preocular swellings in front of the eyes (arrows) and pigment less sub vulvar region (d) with setae on either side (arrow)

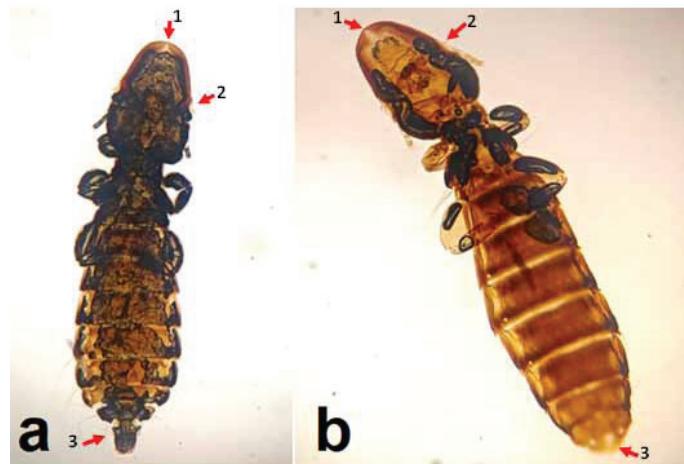


Fig. 2: Ventral view of *Degeeriella fulva* louse adult male (a) and female (b), Arrows indicate: 1. notch, 2. conus and 3. terminal segments of abdomen with setae (a) and terminal segments of abdomen (b)

L. maximum is a fast-moving louse generally found on the wings and abdomen of Accipitriformes birds (Nelson and Price, 1965). These giant lice not only induce anaemia, but also reduce vigour and productivity of the birds. In India, *L. maximum* was documented in greater coucals (Jeyathilakan *et al.*, 2012; Jeyathilakan *et al.*, 2021), long-billed vultures (Kushwaha, 2015) and black kites (Saxena, 2017; Kuniyil *et al.*, 2019).

In *D. fulva* (Fig. 2), the head was slightly rounded, much longer than wider, the ventral suture reached or nearly reached the anterior margin of the head and the inner dorsal margin of the marginal carina was notched

medially. There was presence of conus, five segmented antennae and two setae on either sides of the marginal temporal. The abdomen and its sides were narrow and sub-parallel. Male had three pleural setae on each side in the posterolateral area of the last segment of the abdomen. These morphological characteristics aligned with those previously described by Clay (1958) and Dik (2006). However, the present study revealed slight differences in the micrometry of these lice when compared to earlier descriptions (Table 1). These lice have not been described previously from India, and hence the present record could be considered as the first record from India.



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