

Laemobothrion maximum (chewing lice) in Iranian Golden Eagles

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Abstract

The Golden Eagle species have a wide geographical distribution in Iran. Some species of these birds are native and living in many aeries of Iran with different distribution. This study was carried out on 26 Iranian Golden Eagle that were referred for treatment to the poultry clinic of the veterinary faculty, university of Shahrekord. Twenty eight chewing-lice specimens were collected on the body surfaces of the birds. The parasites were fixed in a 75 % filtered ethanol solution, cleared in 85 % lactic acid and mounted on slides using Hoyer fluid. They were mounted on slides separately after being cleared in lactophenol. *Laemobothrion maximum* were identified by microscopically examination, also one abnormal shape of this lice was observed.

Key Words: *Laemobothrion maximum*, Iranian Golden Eagles, lice.

Introduction

Some species of the eagles are native and living in many aeries of Iran with different distribution. The Golden Eagle inhabits a wide range of latitudes throughout the world and uses a variety of habitats ranging from arctic to desert (Suter and Jones, 1981). Golden Eagle feeds mainly on mammals (80- 90% of prey items), secondarily on birds, and less often on reptiles and fish during nesting season. 23.9 to 33.2 kg of food needed to raise a chick from hatching to fledging (10 weak), based on estimates from feeding trials (Brodeur et al., 1996). Most of Golden Eagles do not acquire a nesting territory until they are at least 4 years old, after they have molted into definitive plumage (Suter and Jones, 1981). Length ranges of Golden Eagle are from 70 to 84 cm; wing span 185-220 cm; mass of males 3,000-4,475g; females 3,940-6,125g. Adult plumage differs from Juvenal and subsequent subadult plumages. Juvenal plumage (0-1 yr) distinguished from adults by much darker color, and by white at base of secondaries and inner primaries (Suter and Jones, 1981).

Chewing lice are continuous ectoparasites that rely on the warmth and humidity of the host's body for reproduction. They seldom leave the host except to transfer between parents and their offspring, or during other instances of direct contact. The life cycle requires 3-4 weeks and includes the egg , three nymphal instars and the adult stage (Ash, 1960; Marshall, 1981).

Avian chewing lice are divided into the suborders Ischnocera and Amblycera. Ischnocera feed exclusively on feathers and dermal debris, which they metabolize in the presence of symbiotic bacteria (Eichler et al, 1972). Ischnocera are morphologically specialized for locomotion on feathers and rarely if ever venture onto the skin of the host. In contrast, Amblycera are more agile and occur on the skin as well as the feathers and feed on both feathers and blood (Ash 1960; Marshall 1981). Amblycera are capable of abandoning a dying host and so may be less dependent than Ischnocera on direct contact between hosts for transmission.

The Mallophaga are a group of economically important ectoparasitic insects infesting birds and mammals. They do not only affect the fitness, viability and productivity of their hosts, but also play a role as reservoirs and in the transmission of infectious diseases among them (Saxena and Agarwalcl, 1983). Mallophagosis, or louse infestation, is commonly reported in birds of prey, each host species usually being parasitized by several species of lice which occupy the different habitats or niches provided by the host plumage. Heavy infestations are probably caused by the confluent or several host and environmental factors, and cases proving fatal to birds have been reported. Recently significant data on the occurrence of lice and other parasites on migrating raptors have become available (Saxena and Agarwalcl, 1983).

The family Laemobothriidae comprises a number of monogeneric species characterized by their large size and parasitizing several bird orders: Podicipediformes, Ciconiiformes, Falconiformes, Galliformes and Gruiformes (Hopkins and Clay, 1952; Nelson and Price, 1965; Clay, 1970). On the basis of their morphological characters only a few *Laemobothrion* species can be distinguished as ectoparasites of Falconiformes birds (Nelson and Price, 1965). *Laemobothrion (L.) maximum* (Scopoli, 1763) has been

considered as a cosmopolitan species, being cited on 32 raptor species belonging to 18 genera (Clay, 1976). This study presented the data of observation of chewing lice in Iranian Golden Eagles.

Materials and methods

This study was carried out on 26 Iranian Golden Eagle that were referred for treatment to the poultry clinic of the veterinary faculty, university of Shahrekord. A total of 26 Iranian Golden Eagles were sampled within 24 hours after reception to avoid as far as possible non-natural conditions and contaminations. In order to obtain live material for different studies, the use of diethyl ether or insecticide together with a plastic bag was avoided. The birds were handled by a person on a clean white surface and the whole plumage was profusely and systematically surveyed by another person, in order to remove, as far as possible, parasite specimens were found. As an average, we spent about 60 minutes preening the bird feathers.

The parasites were fixed in a 75 % filtered ethanol solution, cleared in 85 % lactic acid and mounted on slides using Hoyer fluid. They were mounted on slides separately after being cleared in lactophenol.

The identification of louse was carried out primarily following Martfn Mateo et al. (1984), Gállego et al. (1987), and Tendeiro (1987).

Results and Discussion

28 lice were collected from the 26 Iranian Golden Eagles; belong to species of *Laemobothrion maximum*. (Fig 1, 2). One louse was identified as new species or abnormal *Laemobothrion maximum* by microscopically examination. The shape of the head and size in abnormal *Laemobothrion maximum* was different from normal shape of *L. maximum*. (Fig 1, 2)

Almost 50% of lice were found on the wing feathers, mainly on the ventral surface of primary and secondary feathers. The location of lice ranged from a specific region to the whole plumage of the host. Adult lice females were more numerous than males. Some dimensions of this species were shown in Table 1.

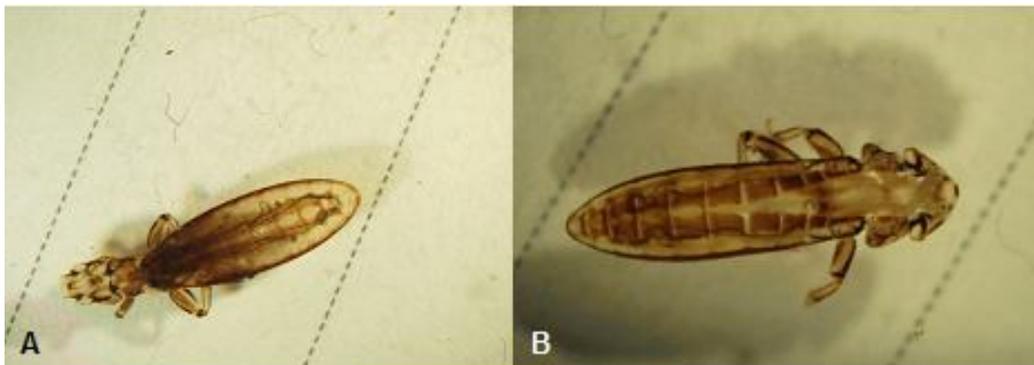


Fig 1. *Laemobothrion maximum*, ♀ (A) and abnormally shape of *Laemobothrion maximum* (B)



Fig 2. Macroscopic *Laemobothrion maximum*, Abnormal (A) and normally (B) shapes from surveyed eagles

Table 1. Some dimensions of *Laemobothrion maximum* (Alborzi and Naddaf, 2008)

	Min	Max	Av.	Av.
C.L.	1.48± .02 mm	1.63± .02 mm	1.51± .04 mm	1.47 ± .05 mm
C.W.	1.62 ± .01 mm	1.80± .04 mm	1.71± .06 mm	1.53± .02 mm
C.I.	1.05± .03 mm	1.04± .01 mm	1.10± .01 mm	1.07± .03 mm
T.L.	1.90 ± .02 mm	2.13± .05 mm	2.06± .02 mm	1.71± .02 mm
P.W.	1.40± .04 mm	1.37± .03 mm	1.39 ± .04 mm	1.30± .04 mm
Tot.L.	9.41± .1 mm	10.12 ±.2 mm	9.91± . 2 mm	8.17± .2 mm

(Min. Minumum, Max. Maximum, Av. Average, C.L. Cephalic Length, C.W. Cephalic Width, C.I. Cephalic Index, T.L. Thoracic Length, P. W. Prothoracic Width, Tot. L. Total Length)

Rafiy et al. (1969) reported 15 different species of Mallophaga from domestic birds in Iran. Ardalan (1971) gave a list of six more species as a new record and later on, she added four more species to her findings. She also gave the name and the localities of their host. They were all collected from the western and southern parts of Iran, except one namely *Cuclotogasier heterographus* which was collected from *Corvus corax* and geese around Tehran, This louse was also reported from geese and chickens by Anwar et al. (1971) in their revised list of parasites from domestic birds in Iran. They also added two species as the new record to their previous report (Anwar et al., 1971).

There are a few points which need further explanation. In spite of the precautions taken, there were a number of cases in which mallophaga were found on birds which are not their normal hosts. Although mallophaga are generally narrowly host-specific, there are species which are found on different hosts.

This has also been reported by Ardalan (1972) who found *Cuclotogaster heierographus* from goose and *Corvus corax*, which is actually an ectoparasite of *gallus domesticus*. Anwar et al. (1971) also found this parasite on chickens and ducks. Whether this is the parasite of chickens only and our findings are accidental, needs further investigation. Although several broad, quantitative surveys of bird lice have been conducted (Geist, 1935; Ash, 1960; Wheeler and Ihrelfall, 1986).

This study is the first report of abnormal *Laemobothrion maximum* (chewing lice) in Iranian Golden Eagles, although, the first survey of lice from Golden Eagle was reported by Rak et al. (1975). 27 species of mallophaga have been reported from birds in Iran. (Rafyi et al., 1968; Anwar et al., 1971; Ardalan, 1971) of which 16 species were reported from domestic birds. Ardalan gave the name of species which she found in wild birds. Her findings are from the birds collected in the western and southern parts of Iran, but only one species has been reported around Tehran. The first report of *Laemobothrion maximum* in Bonellis Eagle from khuzestan province-Iran was reported by Alborzi and Naddaf (2008).

The protection of eagles requires some knowledge of what needs to protection. Nesting management guidelines for eagles are now quite well known. Guidelines for Golden Eagles are not as well-defined as for bald Eagles. Protection of nesting Golden Eagles is crucial to their survival. Due to their low fecundity, loss of individuals can have significant impacts on the stability of populations.

In summary, we recommend the reporting of legal violations related to eagles, that we exercise extensive outreach to educate landowners and land managers about eagles and their needs, and finally that we take these efforts to all levels of government and land ownership including the most local levels.

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