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Short Communication / *Kısa Bilimsel Çalışma*

First record of *Lyperosomum longicauda* Rudolphi,1809 (Trematoda:Dicrocoeliidae) in Northern Bald Ibis (*Geronticus eremita)* in Turkey

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Summary: The Northern Bald Ibis (*Geronticus eremita),* a migratory species*,* is a globally threatened species listed as critically endangered at a global scale since 1994. The Turkish Republic established Bald Ibis Breeding Station in Şanlıurfa Birecik in 1977. Recent status of the colony can be defined as "semi-wild". Seventeen Northern Bald Ibis, which were hatched in Turkey and not transmigrated, died for different reasons in Birecik, Turkey. They were sent to Ankara University, Faculty of Veterinary Medicine, Department of Parasitology for the parasitological examination. Two of them have *Lyperosomum longicauda* which is a parasitic trematoda belonging to the family Dicrocoeliidae that is located in bill-ducts and gall-bladder of birds. From the review of the current database, it was detected that this is the first parasite report from Northern Bald Ibis in the world and *L. longicauda* is in Turkey. Some morphological features, measures and photographs of this trematoda are given within this report.

Key words: Dicrocoeliidae*, Geronticus eremita, Lyperosomum longicauda*, Northern Bald Ibis, Trematoda.

Türkiye'de kelaynaklarda (*Geronticus eremita)* ilk *Lyperosomum longicauda* Rudolphi,1809 (Trematoda:Dicrocoeliidae) olgusu

Özet: Türkiye'de Şanlıurfa Birecik'de 1977 yılında kurulan kelaynak üretme istasyonunda yarı vahşi olarak korunma altında tutulan kelaynaklar (*Geronticus eremita*) 1994 yılında nesli tükenmekte olan türler listesine alınmıştır. Bu çalışma, çeşitli sebeplerle farklı zamanlarda üretme istasyonunda ölen ve parazitolojik incelemesi yapılmak üzere Ankara Üniversitesi Veteriner Fakültesi Parazitoloji Laboratuarına gönderilen, Türkiye'de yumurtadan çıkmış ve göç geçirmemiş, 17 kelaynak üzerinde yürütülmüştür. İncelemelerde iki kelaynakta safra kesesi ve safra yollarına yerleşen Dicrocoeliidae familyasında yer alan *Lyperosomum longicauda*'ya rastlanmıştır. Yapılan literatür taramasıyla, *L. longicauda*'nın Dünyada kelaynaklarda bildirilen ilk parazit olgusu olduğu ve Türkiye'de ilk kez tespit edildiği kaydedilmiştir. Çalışmada parazitin önemli morfolojik özellikleri, ölçümleri ve fotoğrafları verilmiştir.

Anahtar sözcükler: Dicrocoeliidae*, Geronticus eremita, Lyperosomum longicauda*, Northern Bald Ibis, Trematoda.

The Northern Bald Ibis (*Geronticus eremita),* a migratory species*,* is a globally threatened species listed as critically endangered at a global scale since 1994 (2). The population of the bird has undergone a continuous decline over the last four centuries from Europe, probably due to habitat loss, persecution, pesticides and negative effect of climate change (1,8). The number of Bald Ibis in Turkey has decreased to critical level in 1950s. In order to avoid extinction of this bird, The Turkish Republic established Bald Ibis Breeding Station in Birecik in 1977. The migration has continued until 1990s but none of the birds came back to Birecik in 1990-1997. The total number Bald Ibis decreased to fewer than 50 in 1998. For this reason, birds have not been allowed to transmigrate by Bald Ibis Breeding Station since 1998 (14 years). Birds are kept in cages between August to the beginning of February and left free flying in the remaining part of the year and recent status of the colony can be defined as "semi-wild". Bald Ibis is a species, which feeds on invertebrates (snails, scorpions, spiders, crickets etc.) and little vertebrates (lizards, small mammals and birds nesting on the ground) (1).

The Dicrocoeliidae (Looss, 1899) constitues a large family, comprising over 400 species, included three subfamilies: Dicrocoeliinae, Leipertrematinae, Prosolecithinae. Subfamilies of Dicrocoeliinae contains 17 genuses. These genuses are distinguished from each others with the localization of testes and ovary and their sizes; vitellarium forms; vitellin bands length, shape and

position; oral and ventral suckers position and size; genital pore position; spined or unsipined body; excretory vesicle shaped; caecum counts and body form (11).

The genus *Lyperosomum* (Looss,1899) show some resemblance with the genus *Megacetabulum* and *Dicrocoelium* but not show any similarity to other genera in the subfamily Dicrocoeliinae. The body is elongate and fusiform; testes are close to ventral sucker; vitelline bands are relatively short; caeca are not reaching to posterior extremity; ventral sucker is larger than oral sucker; ovary is distant from posterior testis; genital pore is usually anterior to intestinal bifurcation in *Lyperosomum*. The body is long and slender; testes are distant from ventral sucker; vitelline bands are long; caeca reach close to posterior extremity in *Megacetabulum*. The body is elongate and lanceolate; suckers are subequal or oral sucker is larger than ventral sucker; ovary is close to posterior testis; genital pore is posterior to intestinal bifurcation in *Dicrocoelium*. As can be seen, there are some differences about body shape; oral and ventral suckers rate; testes, ovary, caeca and genital pore localization between these three genera (11).

The genus *Lyperosomum* presently contains 20 species described from birds (14). These are *L.alagesi* (Skrjabin et Udinzew, 1930), *L.alaudae* (Shtrom et Sondak, 1935), *L.clathratum* (Deslongchamps, 1824), *L.collurionis* (Skrjabin et Issaitschikoff, 1927), *L.corvi* (Yamaguti, 1939), *L.direptum* (Nicoll, 1914), *L.dujardini* (Shtrom et Sondak, 1935), *L.fringillae* (Layman, 1923), *L.kalmikense* (Skrjabin et Issaitschikoff, 1927), *L.longicauda* (Rudolphi, 1809) *L. oswaldoi* (Travassos, 1917), *L.pawlowskyi* (Strom, 1928), *L.petrovi* (Kassimov, 1952), *L.rossicum* (Skrjabin et Issaitschikoff, 1927), *L.schikhobalovi* (Kassimov, 1952), *L.scitulum* (Nicoll, 1914), *L.sinuosum* (Travassos, 1917), *L.skrjabini* (Solowiow, 1913), *L.turdia* (Ku, 1938), *L.urocissae* (Yamaguti, 1939).

Lyperosomum longicauda is a parasitic trematode belonging to the family Dicrocoeliidae that is located in bill-ducts and gall-bladder of birds (4,13,14). The species was first described as a *Distoma longicauda* in 1809 by Rudolphi from *Corvus cornix cornix.* In 1819, he described a further parasite from the same host calling it *Distoma macrourum*. In 1899 Looss created the genus *Lyperosomum.* Braun (1901) examined and re-described Rudolphi's material (1819) and declared *Distoma macrourum* to be synonym of *Lyperosomum longicauda* after finding the eggs to be of similar size to those type species (10).

Lyperosomum longicauda was reported from different birds in some European countries and China (3,6,7,9,10). The chief European records are from *Hieraatus pennatus* by Rudolphi (1819), from *Merula merula merula, Sturnus vulgaris* and *Antus trivialis* by Diesing (1850), from *Lanius collurio* by Linstow (1889), from *Corvus corone corone* and *C. frugilegus frugilegus* by Wolfhügel (1900), from *Turdus ericetorum ericetorum* by Baird (1902), from *Garrulus glandarius rufitergum* by Nicoll (1923), from *Pica pica pica* by Timon-David (1953) from *Corvus frugilegus frugilegus* by Mettrick (1958) (10), from *Corvus monedula* by Davies (1958) (3), and from *Turdus philomelos* by Diaz et al. (1996) (6). From the review of the current database, there is not any parasite report from Northern Bald Ibis in the world up to the present. *Lyperosomum longicauda* is the first parasite report in the Northern Bald Ibis *(Geronticus eremita)* from the world.

All species in the genus *Lyperosomum are* distinguished from each others with the length and the shape of the body; the localization and the beginning of the vitellaria; the number of the vitellaria rows; the structure and shape of the ovary and testes; the distant from the ovary to testes; the distant from each testes and the measurement of testes and ovary (11).

Lyperosomum longicauda shows close resemblance with *L. oswaldoi*, *L. skrjabini* and *L. urocissae* and shows some resemblance with *L. alagesi, L. alaudae, L. fringillae, L. scitulum* and *L. sinuosum* but show important differences from other species (13) in the genus *Lyperosomum* (5,12).

Lyperosomum oswaldoi and *L. longicauda* have the same general body appearance and internal organization but show certain minor differences. The body and internal organs, with the exception of the ova which are considerably larger, are smaller in L. *oswaldoi* than in *L. longicauda.* Vitellaria begin at the level of posterior margin of posterior testis in *L. oswaldoi* and begin at the level of posterior margin of anterior testis in *L.longicauda*. *Lyperosomum oswaldoi* is considered to the New World counterpart of *L. longicauda* by some parasitologist (5). Similarly, *L. skrjabini* and *L. urocissae* considered direct synonym of *L. longicauda* and *L. oswaldoi* respectively. *Lyperosomum longicauda* can be separated from *L. fringillae* and *L.alagesi* by vitellaria position. Vitellaria begin at anterior testis in *L. longicauda*, and begin at posterior to the ovary in *L. fringillae* and *L. alagesi. Lyperosomum longicauda* has nearly round ovary and testes. *Lyperosomum scitulum* and *L. fringillae* have transversely oval ovary**.** *Lyperosomum longicauda* has one row of vitellaria follicles but *L. sinuosum* and *L. alaudae* have two rows (5,7).

Some morphological features, measures and photographs of *L.longicauda* are given within this report. *Lyperosomum longicauda* has not been reported in Turkey. This is the first report of *Lyperosomum longicauda* in Turkey.

Seventeen Northern Bald Ibis, were hatched in Turkey and not migrated (aged between 2 and 10), died for different reasons in Birecik, Turkey. Between 2009-2010 they were sent to Ankara University, Faculty of Veterinary Medicine, Department of Parasitology for the parasitological examination. In the laboratory, body cavity was opened; digestive tract, aerial sacks, heart, lungs, pancreas, kidneys and liver were removed. Each organ was placed in an individual container and opened according to convenient techniques and examined under the stereomicroscope. All helminths found were removed by forceps into vials containing fixative. The fixative used was a mixture of 85% ethanol, 10% glacial acetic acid, and 5% formalin. Collected parasites were measured and identified using a stereomicroscope.

Parasite identify card

Host: *Geronticus eremita,* The Northern Bald Ibis (Aves, Threskiornithidae)

Site of infection: Bill-ducts and gall-bladder

Locality: Birecik, (37^0 02' North latitude, 37^0 55' East longitude), Southeastern Anatolia Region, Şanlıurfa -Turkey.

Intensity of infection: During parasitological examination, 13 *Lyperosomum longicauda* were found in 2 of 17 Northern Bald Ibis.

Description:

The body is fusiform and elongate, 10.98 (10.54-11.26) mm long 1.40 (1.32-1.44) mm width. The greatest width is being in the region of the ventral sucker. Tegument is thin and unspined. The oral sucker is oval and terminal, 0.49 (0.47-0.53) mm by 0.56 (0.54-0.59) mm. The pharynx is large and oval 0.22 (0.19-0.25) mm by 0.37 (0.35-0.40) mm. There is a short oesophagus, branching into two caeca, which run laterally nearly to the posterior end of the body. The ventral sucker is slightly oval, 0.90 (0.87-0.95) mm by 0.93 (0.91-0.98) mm. The testes are nearly round, the anterior being 0.36 (0.34-0.39) by 0.41(0.39-0.44) mm and the posterior 0.39 (0.37-0.43) by 0.43 (0.41-0.46) mm. The ovary is nearly round and a little bigger than the testes, 0.44 (0.42-0.49) by 0.51 (0.48-0.56) mm.

The cirrus sac (approx. 0.91 by 0.36 mm) contains the large cirrus. The vitellaria are follicular, extending laterally from the posterior border of the anterior testis to the posterior 1/3 of the body. The uterus convolute ascending and descending limbs fill the whole of the posterior half of the body (Figure 1). The eggs are thick shelled and measured 0.024x0.039 (0.024-0.026x0.039-0.043) mm (Figure 2).

Our morphological measurements were similar to literatures (3,6,10,13) except small differences (Table 1). Host size is affected by means of the parasite size in classical knowledge and the reason of these differences may be arisen from different hosts.

Figure 1. *Lyperosomum longicauda*
a: oral sucker, **b:** pharynx**, c:** cirrus sac**, d:** intestine**, e:** ventral sucker, **f:** (anterior and posterior) testes**, g:** ovary**, h:** vitellaria, **ı:** uterus
Şekil 1. *Lyperosomum longicauda*
a: ağız çekmeni, **b:** farenks, **c:** sirrus kesesi, **d:** bağırsak, **e:** karın çekmeni, **f:** (anterior ve posterior) testis, **g:** ovaryum, **h:** vitellojen bezler, **ı:** uterus

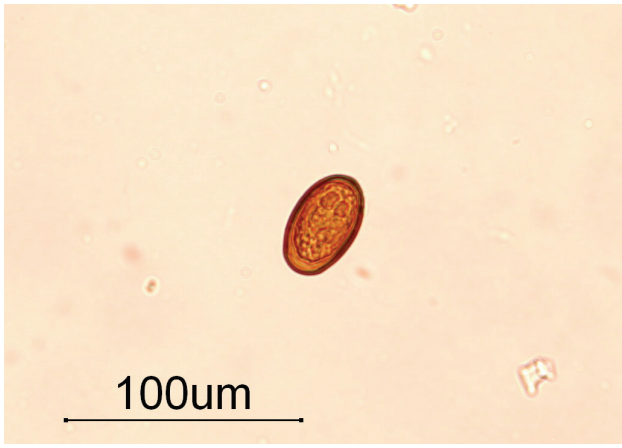

Figure 2. The egg of *Lyperosomum longicauda*
Şekil 2. *Lyperosomum longicauda* yumurtası

Table 1. Comparative mean values measurements (mm) of *Lyperosomum longicauda*
Tablo 1. *Lyperosomum longicauda*'nın karşılaştırmalı ölçüleri (mm)

	Mettrick (1958) (mm)	Davies (1958) (mm)	Diaz et al. (1996) (mm)	Present Specimens (mm)
Length	10.1	7.6	7	10.98
Width	1.2	1.1	1.3	1.40
Oral sucker	0.34x0.44	0.29x0.32	0.37	0.49x0.56
Pharynx	0.19x0.28	-	-	0.22x0.37
Ventral sucker	0.78x0.84	0.72	0.64	0.90x0.93
Anterior testis	052x0.52	0.25	0.29x0.37	0.36x0.41
Posterior testis	0.55x0.49	0.19	0.29x0.37	0.39x0.43
Ovary	0.25x0.31	0.35x0.25	0.27	0.44x0.51
Cirrus sac	0.52x0.23	-	-	0.91x0.36
Egg	0.032x0.021	0.023x0.026	-	0.024-0.039

A detailed description, some morphological and general structures are for the definition about *L. longicauda* presented within this report. This is the first parasite report from Northern Bald Ibis in the world and *Lyperosomum longicauda* in Turkey.

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