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## Research Article



### The parasitic fauna of the Ferruginous duck *Aythya nyroca* (Güldenstädt, 1770) collected in central Iraq

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#### Abstract

A small collection of the ferruginous duck was collected in central Iraq and examined for their parasites. The recovered parasites include *Plasmodium* sp., *Leucocytozoon* sp., *Diploposthe laevis*, *Amidostomoides acutum*, and *Epomidiostomum uncinatum*. The first two parasites were recorded for the first time for this duck. Remarks on the first breeding report of this bird in Iraq were also provided. The results were discussed with the pertinent literature.

**Keywords:** *Aythya nyroca*, blood parasites, *Diploposthe laevis*, *Amidostomoides acutum*, *Epomidiostomum uncinatum*.

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#### Introduction

The ferruginous duck *Aythya nyroca* (Güldenstädt, 1770) is one of 29 species of anseriform bird group in Iraq. It is a winter visitor in few numbers in suitable areas of the middle and south regions of Iraq including shallow water, pools with dense vegetation, and freshwater and sometimes brackish lakes (Allouse, 1960, Salim *et al.*, 2006). The species is assessed as near threatened (NT) by IUCN due to overall population estimation to be declined at a moderate rate throughout its range especially southwest Asia region (BirdLife International, 2014). Hundreds of birds were hunted every winter by net to be sold at local markets for their meat in Baghdad and Al-Najaf provinces. Iraqi works on parasites of anatid birds include those of Awad *et al.* (1993), Mhaisen (1994), Mahmoud (2001), Jassim *et al.* (2005), Shubber (2006), Al - Jaddoua *et al.* (2007), Al-Taee *et al.* (2011), Mohammad and Al-Moussawi (2011), Al-Labban *et al.* (2013), Mohammad (2014), and Al-Moussawi (2014). The aim of the present work is to investigate about the parasitic species infect the ferruginous duck and confirming the bird breeding in certain marshy areas in central Iraq.

#### Materials and Methods

Specimens of this duck were purchased in the field from the net hunters in the Dalmaj lake, Al-Diwaniya Province (15 birds, 9 [5 , 4 ] in January-April 2014, 6 [3 , 3 ] in September-December) and at some local markets in Baghdad (12 [6 , 6 ] at autumn and winter months of 2014). Small amount of fresh feces of each bird was kept in 2.5% Potassium Dichromate solution (K<sub>2</sub>Cr<sub>2</sub>O<sub>7</sub>) for a week at room temperature to allow sporulation of coccidial oocysts. Thin blood smears were taken for each bird from the brachial vein. The smears were air dried, fixed with absolute methanol or ethanol for 3-5 minutes and stained with Giemsa's stain at strength of 1:10 at pH 7.2. The birds then were dissected and their enteric coelae were inspected for presence of helminths with the aid of a suitable glass lens. The digestive tract then separated and put in normal saline and examined under dissecting microscope. The recovered parasites were kept in 70% alcohol. Cestodes were dehydrated through a series of 70%, 80%, 90% and 100% alcohol for 30 minutes for each rinse, stained with acetocarmine, cleared in xylene and mounted with

Canada balsam. Nematodes were cleared with lactophenol.

**Results**

Table 1 summarizes the results of inspection of the ferruginous duck collected in the central region of Iraq. It would show that 21 (77.8%) out of 27 birds are infected with one or more species of the parasites: *Leucocytozoon* sp. (Protozoa:), *Plasmodium* sp. (Protozoa:), *Amidostomoides acutum* (Lundahl, 1848) (Nematoda: Amidostomatiidae), *Epomidiostomum uncinatum* (Lundahl, 1848) (Nematoda: Amidostomatidae), and *Diploposthe laevis* (Bloch,

1782) (Cestoda: Hymenolepidiidae). No coccidial parasites were recovered. The single infections count 17 and the double infections 4 representing 63% and 37% respectively. Infection rate in Al-Dalmaj lake is 73.3% while it is 83.3% in the local markets in Baghdad. In regard to host gender, the infection rate is 85.7% in males while it is 69.2% in females. Infection rate with haematozoan parasites *Leucocytozoon* sp. and *Plasmodium* sp. is 7.4% for both. For the nematodes, *A. acutum* and *E. uncinatum* it is 7.4% and 3.7% respectively. Infection with *D. laevis* is the most common infection among the other parasites counting for 70.4% of the total parasitemia.

**Table 1:** collection place, bird sex, and parasites species of the infected ferruginous duck *Aythya nyroca* collected in central Iraq.

Site of collection	Host sex	<i>Leucocytozoon</i> sp.	<i>Plasmodium</i> sp.	<i>Amidostomoides acutum</i>	<i>Epomidiostomum uncinatum</i>	<i>Diploposthe laevis</i>
Al-Dalmaj Lake		+				+
						+
						+
						+
					+	+
			+			
					+	+
						+
						+
						+
Local markets (Baghdad)				+		+
						+
		+				
						+
						+
						+
				+		+
						+

**Discussion**

The host smaller sample size examined in this study made it difficult to retrieve a solid conclusion in regard to compare the infection rates of males and females, between collection sites and the mode of

infection. It is clear that more samples need to be collected in future to reply these questions. Reporting *Plasmodium* sp. and *Leucocytozoon* sp. in this study coincides with Pasti Apsari *et al.* (2004) who found the same parasites in Bali ducks.

Bennett *et al.* (1982) in their host-parasite catalogue of the avian haematozoa did not report any of *Pasmodium* or *Leucocytozoon* in the ferruginous duck. Infection of the present host with *Leucocytozoon* sp. is in agreement with the finding of Mohammad (2014) who reported on *L. simondi* from the marbled teal *Marmaronetta angustirostris* in Iraq. Although Shamsuddin and Mohammad (1980) examined 6 individuals of anatid birds belong to 3 species including 3 specimens of the ferruginous duck collected from central Iraq but they found no haematozoa. This is the first report of the two mentioned parasites from the ferruginous duck and constitutes a new host records. The infection of the present host with *Leucocytozoon* sp. is in agreement with the finding of Mohammad (2014) who reported on *L. simondi* from the marbled teal *Marmaronetta angustirostris* in Iraq. However, Wehr and Farr (1956) found *L. simondi* in domestic and wild ducks emphasizing that it is the cause of sickness and death to duck flocks. The identification of this parasite to the generic level only is due to bad state of the blood film which made it impossible to get the specific identification.

Okulewicz and Bu kowska (2012) in their review on the reasons for helminth infections in hosts, reported *D. laevis* in many species of *Aythya* ducks. They noticed that these cestodes secrete toxic active chemical substances leading to regulate the numbers of other parasites in the host. This may explain, partially, the high infection rate with this cestode in this study. Shubber (2006) found that this cestode was the most common parasite among other parasites infect the Red-Crested Pochard *Netta rufina* with an infection rate of 60.5%. Mohammad (2014) found this cestode with highest infection rate among other parasites infect the marbled teal *Marmaronetta angustirostris* in Iraq. Similar result was found by da Silveira and Amato (2008) in *Netta peposaca* (Anatidae) in Brazil. Marinova *et al.* (2013) reported it from *A. nyroca* in Bulgaria. Schmid (1993) reported this cestode from the ring-necked ducks *Aythya collaris* wintering in eastern Texas.

The nematodes *A. actum* and *E. uncinatum* are frequently reported from anatidae (Kavetska *et al.*, 2012). In Iraq, *A. acutum* was reported from the Gadwall *Anas strepera* (Mizhir, 2002), the red-crested pochard *Netta rufina* (Shubber, 2006), the Mallard *Anas platyrhynchos* (Mohammad and Al-Moussawi,

2011), and the shoveler *Anas clypeata* (Al-Moussawi, 2014). It was recorded also in the Coot *Fulica atra* and the Moorhen *Gallinula chloropus* (Ralliformes: Rallidae) (Mizhir, 2002). *Epomidiostomum uncinatum* was reported frequently from a wide range of hosts. It was reported from the mallard *Anas platyrhynchos* in central Iraq by Mohammad and Al-Moussawi (2011), from the marbled teal *Marmaronetta angustirostris* (Mohammad, 2014), and from the shoveler *Anas clypeata* (Al-Moussawi, 2014). It was recovered also from chicken (Galliformes: Phasianidae) in Wasit province, central Iraq (Hamza, 2009).

### Remarks on breeding of the bird in Iraq

Field observations of the author during the years 1983-1988 in Al-Attariya, 50 km south-east of Baghdad city, central Iraq and the years 2010-2013 in Al-Daghara town, 20 km east of Al-Diwaniya city, central Iraq approved breeding of this bird in certain marshy areas. This is the first report on breeding of this bird in Iraq which was considered by (Salim *et al.*, 2006) as a winter visitor. It constitutes an additional reason to study the parasitic fauna of this bird, besides; it was assessed by IUCN as near threatened (BirdLife International, 2014). These mentioned breeding areas were extremely exposed to changing water levels due to considerable continuous fluctuation of water income to the marshlands and seasonally inundated plains bounded by desert and dry shrub land.

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