

Identification of metazoan parasites of some native fish from Bazoft River, Iran

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Abstract. Evaluation of 93 freshwater endemic fish species including: *Capoeta damascina* (n = 51), *Capoeta aculeata* (n = 30) and *Alburnus mossulensis* (n = 12) from four stations in Bazoft River (Chaharmahal va Bakhtiari Province, Iran) revealed 66 specimens infested by metazoan parasites. Metazoan species were isolated from skin, gills and intestines of the fish by wet mount preparations and examined under a light microscope. Results indicated that 10 (19.6%) of the *C. damascina*, 13 (43.3%) of the *C. aculeata* and 5 (41.7%) of the *A. mossulensis* samples were infected by *Gyrodactylus elegans*. Among of infested samples, *Dactylogyrus lenkorani* were observed in 10 (19.6%) of the *C. damascina*, 13 (43.3%) of the *C. aculeata* and 3 (25%) of the *A. mossulensis* samples. *C. damascina* was affected by *Myxobolus varicorhini* (3.9%) and *Rhabdochona denudata* (7.8%). The parasitic prevalence was the highest in both *Gyrodactylus elegans* (30.1%) and *Dactylogyrus lenkorani* (28.0%) while, *M. varicorhini* was found only in two fish sample (2.2%) and showed the lowest total prevalence of the parasites contamination.

Key Words: metazoan parasites, *Dactylogyrus*, *Myxobolus*, Bazoft River.

Introduction. Bazoft River is located in west part of Iran in Chaharmahal va Bakhtiari Province and is one of the permanent river, which provides water needed for tap water, agriculture and aquaculture purposes (Pirali-Kheirabadi & Hosseini-Shekarabi 2014). Therefore, this fresh water reservoir is very important water resource in this area and metazoan parasites can be horizontally transmitted to cultured fishes under certain conditions. Wide host range of metazoan parasites in fresh water fish species was recorded (Pronin et al 1997; Torchin et al 2003). *Capoeta damascina*, *Capoeta aculeata* and *Alburnus mossulensis* species belong to Cyprinidae family, recognized as endemic fish in the region (Coad & Krupp 1994).

Invasion and penetration of these type of parasites to the scales, skin and tissue layers of the fish, not only induce deep ulcer and abscesses accommodating but also reduce the fish normal growth and survival rate which cause serious economic loss in aquaculture industry (Piasecki et al 2004; Ravichandram et al 2009; Bruno et al 2013).

Many parasitological studies have been done on the identification and isolation of the various external parasites from endemic fish species in Iranian inland waters (Eslami & Mokhayer 1977; Williams et al 1980; Mokhayer 1981; Jalali & Molnar 1990; Jalali et al 2000; Pazooki et al 2007; Raissy et al 2010; Pirali-Kheirabadi & Hosseini-Shekarabi 2014). For instance, Jalali (1998) reported the infestation of *Dactylogyrus* species among the endemic fish species of Karkhe River, Iran. Ectoparasites recorded in big head gobies (*Neogobius kessleri*) were represented by adult *Gyrodactylus proterorhini* which infested the fish fins (Ondračková et al 2005).

The present study describes the metazoan parasite fauna of some native fish stock from Bazoft River, Iran.

Material and Method. A total of 93 samples were collected from four stations including: *C. damascina* (n = 51), *C. aculeata* (n = 30) and *A. mossulensis* (n = 12) throughout three times sampling in a month from June-August 2012 with a gill net in the Bazoft river. Then they were fixed in 10% buffered formalin prior to further analysis. Examination and identification of the fish specimens has been carried out by the key proposed by Berg (1964) and Coad & Krupp (1994).

The collected samples were transferred to the laboratory and biometric characteristics of each specimen were calculated individually (Table 1). Diagnosis was made by wet mount preparations of the fish skin, gills and intestine according to Moravec (1994). Apparent examination of the gill filaments, fins and skin were carried out by stereomicroscope (Leica, Germany) at $\times 40$ magnification and photographs were taken. The parasites were identified in according to the keys (Fernando et al 1972; Ash & Orihel 1987; Moravec 2004). Prevalence, abundance and mean density were measured according to Bush et al (1997).

Table 1

Biometric characteristics of studied fish

Fish species	No. of fish		Body weight (g)	Total length (mm)
	Male	Female		
<i>Capoeta damascina</i>	15	36	41.3 \pm 79.11	127.3 \pm 60.61
<i>Capoeta aculeata</i>	12	18	43.6 \pm 55.21	139.8 \pm 39.44
<i>Alburnus mossulensis</i>	3	9	9.7 \pm 6.36	93.1 \pm 21.36

Results and Discussion. In this study, four different metazoan parasites namely, gill fluke, *Dactylogyrus lenkorani* (Platyhelminthes: Dactylogyridae), salmon fluke, *Gyrodactylus elegans* (Platyhelminthes: Gyrodactylidae), *Myxobolus varicorhini* (Cnidaria: Myxobolidae) and *Rhabdochona denudata* (Nematoda: Rhabdochonidae) were isolated from studied fish (Figure 1). Several studies have been done to recognize metazoan parasites population in cultured and wild fish of Iran (Raissy et al 2010; Pazooki et al 2007, 2011; Raissy & Ansari 2012). Attachment and activity of these parasites can lead to secondary infection and cause mass mortality in cultured and wild fish species (Piasecki et al 2004).

Table 2 indicates the name of different metazoan parasites with their hosts within the present study. According to the results 66 fish samples (70.1%) were affected by metazoan parasites and 27 samples (29.9%) were not affected. In all fish samples, *G. elegans* was observed on the skin with 30.1% frequency and *D. lenkorani* was isolated from the gills of fish samples with 28.0% frequency. *M. varicorhini* affection was detected only on the dorsal fins root of *C. damascina* (3.9%). Moreover, *R. denudata* was found in the intestine of *C. damascina* (7.8%) and *C. aculeata* (20.0%).

Table 2

Metazoan parasites of some endemic fish in Bazoft River

Parasite	Host	No. of infested fish	Infested organ	Prevalence of infestation (%)	Total prevalence (%)
<i>G. elegans</i>	<i>C. damascina</i>	10	skin	19.6	30.1
	<i>C. aculeata</i>	13	skin	43.3	
	<i>A. mossulensis</i>	5	skin	41.7	
<i>D. lenkorani</i>	<i>C. damascina</i>	10	gills	19.6	28.0
	<i>C. aculeata</i>	13	gills	43.3	
	<i>A. mossulensis</i>	3	gills	25.0	
<i>M. varicorhini</i>	<i>C. damascina</i>	2	fin	3.9	2.2
<i>R. denudata</i>	<i>C. damascina</i>	4	intestine	7.8	10.8
	<i>C. aculeata</i>	6	intestine	20.0	

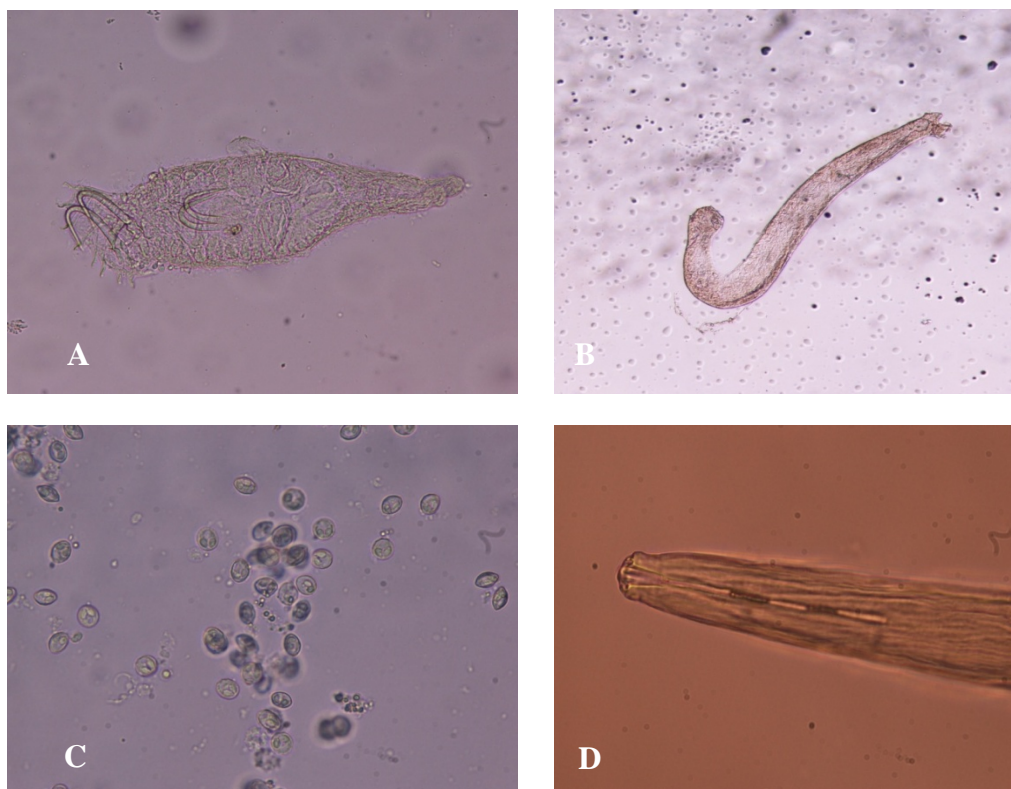


Figure 1. Metazoan parasites from some freshwater endemic fish of Bazoft River, Iran. A: *G. elegans* found in wet mount preparations of *C. damascina* skin, B: *D. lenkorani* found in wet mount preparation of *C. aculeata* gill, C: *M. varicorhini* found in wet mount preparation of *C. damascina* dorsal fins root and D: *R. denudata* found in wetmount preparation of *C. damascina* intestine.

Most of the parasites reproduction occurs during the warmer periods of the year (Bichi & Bawaki 2010). Therefore, the present work was carried out during summer season. All samples affected at least to one of the metazoan paradises. In this study, *G. elegans* and *D. lenkorani* were detected in all studied fish species and were the most dominate parasites. These two parasites have been isolated from different fish species and probably become widespread throughout Chaharmahal va Bakhtyari Province (Pazooki & Aghmandi 1999; Jalali & Barzegar 2006) and few researches were carried out on metazoan parasites in the inland waters of Iran (Raissy et al 2010; Raissy & Ansari 2012; Fadaei et al 2001). In this study *G. elegans* and *D. lenkorani* prevalence in the two native fish species (i.e. *C. damascina* and *C. aculeata*) was totally 62.9%. Similarly in previous studies, *Dactylogyrus* genus was found from freshwater resources in the Province (Fadaei et al 2001; Raissy et al 2010; Raissy & Ansari 2012). According to the present study, high levels of infection with both *G. elegans* and *D. lenkorani* suggested that these parasites are suitable pathogens for this environmental condition. This result agrees well with previous research revealing that *D. lenkorani* infestation prevalence (71.4%) of some fish species in Gandoman Lagoon which is located in the same region (Raissy et al 2010). Also *D. lenkorani* is specific to *Capoeta* genus which had been previously isolated from *C. aculeata* and *C. damascina* (Buchmann & Lindenstrom 2002; Raissy et al 2010). Fish respiration system will be impaired by *Dactylogyrus* and *Gyrodactylus* species due to hyperplasia, adhesion and mechanically injured of the fish gill filaments (Buchman 1998; Balm et al 1995).

Infestation level of *C. damascina* with *M. varicorhini* (33.3%) in Gandoman Lagoon (Raissy et al 2010) was observed higher than our result. Masoumian et al (2007) reported *M. varicorhini* from Zayandehrood River (Esfahan Province, Iran) for the first time with 14.7% frequency. However, lower infestation with *M. varicorhini* was recorded in Bazoft River. This suggested that metazoan parasitic infestation prevalence may be related to water temperature, host immune response and habitat conditions.

The nematode found in this study was *R. denudata* from *C. damascina* and *C. aculeata* intestine which it had already been reported from *Capoeta capoeta* in West Azerbaijan Province, Iran (Pazooki et al 2012).

Conclusions. Parasitic infestation prevalence of endemic fish species in Bazoft River (Chaharmahal va Bakhtiari Province, Iran) showed that *D. lenkorani* and *G. elegans* were the most widely distributed parasites among the examined native fish species. Increasing water temperature and organic matters are probably related to current drought conditions and aquaculture development in this region which are caused a markedly decrease of Bazoft River water volume and lead to increase the risk of parasitic infestation.

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