

## Monogenean species from freshwater fishes of Zanzan province, Iran

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**Abstract:** This parasitological research was conducted from September 2002 to August 2003 on the freshwater fishes in Zanzan province. Totally 155 fishes including *Capoeta capoeta gracilis* (91), *Carassius auratus* (8), *Leuciscus cephalus* (18), *Ctenopharyngodon idella* (10), *Barbus lacerta* (8), *Alburnoides bipunctatus* (10) and *Alburnus filippi* (10), were seined from five different stations. The fishes were transferred to Laboratory of Aquatic Organisms Research in Science Faculty of Shahid Beheshti University. The skin and gills of fishes were studied under light and stereomicroscope. The identified monogenean parasites included seven *Dactylogyrus* species as: *D. chramuli*, *D. gracilis*, *D. lenkorani* and *D. pulcher* from *Capoeta capoeta gracilis*; *D. lamellatus* from *Ctenopharyngodon idella*; *D. goktschaicus* from *Barbus lacerta* and *D. vistulae* from *Alburnoides bipunctatus* and *Alburnus filippi*. Various *Gyrodactylus spp.* from skin and gills of different fish specimens and one *Paradiplozoon sp.* from gill of *Alburnoides bipunctatus* were also observed. This is the first parasitological investigation that has been done on the freshwater fishes of Zanzan province.

**Keywords :** Fish, parasite, Monogenean, Zanzan, Iran

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Monogeneans are parasites with a body commonly flattened dorsoventrally. The most important characteristic feature is their chitinous opisthohaptors. Heavily infected fish increase its mucus secretion on their gills and skin. The genera *Dactylogyrus* and *Paradiplozoon* commonly infect the gills and genus *Gyrodactylus* attach to the skin of fishes (Paperna, 1964). These parasites are mostly host specific and their distribution are important from the zoogeographical point of view (Molnar & Jalali, 1992). More than 100 species of monogeneans have been recorded in freshwater fishes from different parts of Iran, 60 of which described as new species (Jalali, 1995).

A parasitological investigation on fishes from Zanjan Province during September 2002 to August 2003 was done. Totally, 155 fish specimens were seined from five stations, including: Sohrein, Hasan Abdal, Khandaghloo, Sojasrood and Ghezel Uzoon by using cast-net. The fish species included *Alburnoides bipunctatus*, *Alburnus filippi*, *Barbus lacerta*, *Capoeta capoeta gracilis*, *Carassius auratus*, *Ctenopharyngodon idella* and *Leuciscus cephalus*. The fishes were transferred alive to Aquatic Organisms Research Laboratory at Faculty of Science, Shahid Beheshti University. Length and weight of fishes were recorded (Table 1) and then parasitological investigation carried out on their gills and skins by light and stereo microscope. Monogenean were collected from fishes and then fixed by Glycerin-gelatin.

**Table 1: Total length and weight of seined fishes**

Fish species	No.	Weight (g)	length (cm)
<i>Capoeta capoeta gracilis</i>	91	11.22-110.9	10.5-21.9
<i>Carassius auratus</i>	8	6.75-16.08	7.7-10.4
<i>Leuciscus cephalus</i>	18	171-210.11	26-31.5
<i>Ctenopharyngodon idella</i>	10	310.2-419.04	22-30.5
<i>Barbus lacerta</i>	8	29.70-32.3	16-17.2
<i>Alburnoides bipunctatus</i>	10	12.64-15.7	10-11.8
<i>Alburnus filippi</i>	10	20.42-22.98	11.6-12.8

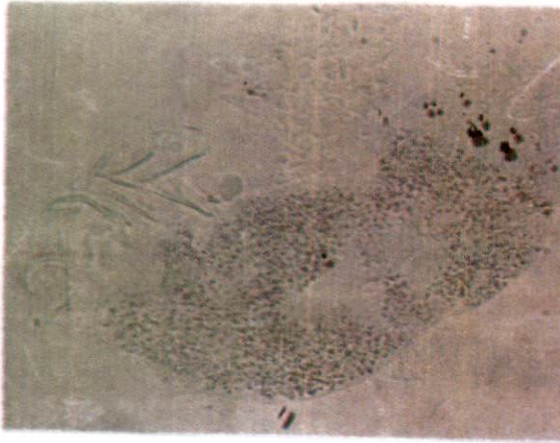
Seven species of *Dactylogyrus*, various specimens of *Gyrodactylus* spp. and one species of *Paradiplozoon* sp. were identified. *Dactylogyrus chramuli* (Fig. 1), *D. gracilis* (Fig. 2), *D. lenkorani* (Fig. 3) and *D. pulcher* (Fig. 4) from *Capoeta capoeta gracilis*, *D. lamellatus* (Fig. 5) from *Ctenopharyngodon idella*, *D. goktschaicus* (Fig. 6) from *Barbus lacerta* and *D. vistulae* (Fig. 7) from *Alburnoides bipunctatus* and *Alburnus filippi* were collected. *Gyrodactylus* spp. (Fig. 8) were separated from skin of *Barbus lacerta*, *Alburnoides bipunctatus*, *Alburnus filippi* and gill and skin of *Capoeta capoeta gracilis*. In addition, *Paradiplozoon* sp. (Fig. 9) was separated from the gill of *Alburnoides bipunctatus*. Frequency of monogenean parasites in different stations, seasons and hosts, has been represented in Tables 2, 3 and 4.



**Figure 1:** *Dactylogyrus chramuli*  
(350x)



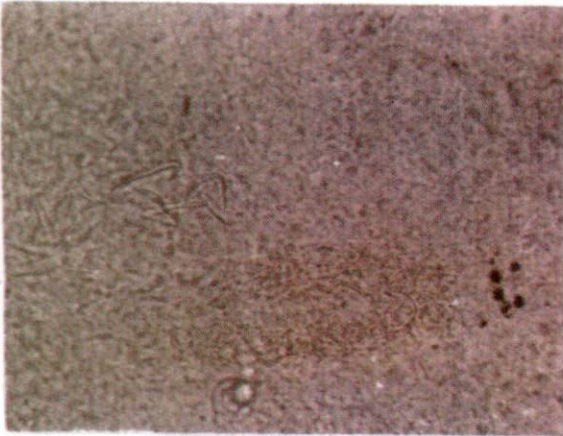
**Figure :2** *Dactylogyrus gracilis*  
(87.5x)



**Figure 3:** *Dactylogyrus lenkorani*  
(350x)



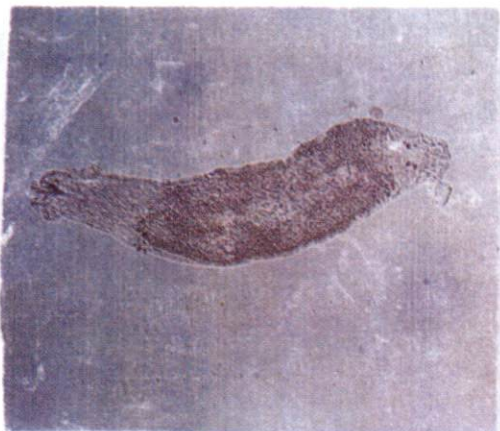
**Figure 4:** *Dactylogyrus pulcher*  
(350x)



**Figure 5:** *Dactylogyrus lamellatus*  
(350x)



**Figure 6:** *Dactylogyrus goktschaicus*  
(87.5x)



**Figure 7:** *Dactylogyrus vistulae*  
(87.5x)



**Figure 8:** *Gyrodactylus sp.*  
(350x)



**Figure 9:** *Paradiplozoon sp.* (43x)

Monogeniasis is one of the most prevalent diseases among farmed fishes in Iran. This disease, caused by various species of *Dactylogyrus* and *Gyrodactylus* in gills and skin, is an important reason for many different damages and fatality of fishes. Dispersion of native fishes and their specific parasites used for ecological and zoogeographical edges (Dogiel, 1961). Monogeneans are mostly specific and by special hosts are transferred to the different regions. Due to ecological condition, their prevalence and intensity are different. So many species of *Dactylogyrus*, *Gyrodactylus* and *Diplozoon* have been recorded from different freshwater fishes of Iran. Most of them infect freshwater fishes from a same family or genus and species in adjacent provinces. Zanzan province is located in Sarmatian Region and its water bodies are in the vicinity of the Caspian basin and as a result having a common fauna with other neighboring regions. Finding *D. chramuli* in *Capoeta capoeta* from Zaiandehrood (Molnar & Jalali, 1992), *D. goktschaicus* in *Barbus capito* from Ghasemloo river (Shamsi & Jalali, 1997), *D. gracilis* in *capoeta capoeta* from Sefidrood and Zaiandehrood (Molnar & Jalali, 1992), *D. lamellatus* in *Ctenopharyngodon idella* from Shahid Beheshti Hatchery (Jalali & Molnar, 1990a), *D. lenkorani* in *Capoeta capoeta* from Jajrood, the Tar lake, Zaiandeh rood and Tonekabon river (Molnar & Jalali, 1992), *D. pulcher* in *Capoeta capoeta* from sefidrood and Tonekabon rivers, in *Capoeta trutta* from Jajrood, Tajan and Ghasemloo rivers and in *Barbus lacerta cyri* from sefidrood river (Jalali & Molnar, 1990b), *D. vistulae* in *Capoeta capoeta* from Zarrinehrood and in *Chalcalburnus chalcoides* from Sefidrood (Jalali, 1995) and in *Chalcalburnus chalcoides* from Ghasemloo river (Molnar & Jalali, 1992) can be a reason for this remark. All these regions are parts of Sarmatian ecological regions.

Paying attention to finding and identification of *Gyrodactylus* and *Paradiplozoon* from Zanzan province reservoirs and knowing that this province is part of the Caspian basin, it can be expected that common species of the parasites are seen in fishes of this domain .

Decrease in frequency of most monogenean parasites in this research during autumn and winter may be due to environmental conditions. The life cycle and reproduction of monogeneans is retarded or completely stopped in cold seasons. This is the first parasitological study in Zanzan province. The results of this study is important from parasites dispersion point of view and fish culture in this small province as well.

Table 2 : Frequency of various species of *Dactylogyrus* in infected fish

Stations	Fishes	Total number	Spring					Summer					Autumn					Winter						
			<i>D. chrannuli</i>	<i>D. gokschtchicus</i>	<i>D. gracilis</i>	<i>D. lamellatus</i>	<i>D. lenkorani</i>	<i>D. pulcher</i>	<i>D. vistulae</i>	<i>D. chrannuli</i>	<i>D. gokschtchicus</i>	<i>D. gracilis</i>	<i>D. lamellatus</i>	<i>D. lenkorani</i>	<i>D. pulcher</i>	<i>D. vistulae</i>	<i>D. chrannuli</i>	<i>D. gokschtchicus</i>	<i>D. gracilis</i>	<i>D. lamellatus</i>	<i>D. lenkorani</i>	<i>D. pulcher</i>	<i>D. vistulae</i>	
Sohrein	<i>Capoeta capoeta</i>	30	0	0	0	0	50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	<i>gracilis</i>		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Hasan Abdal	<i>Capoeta capoeta</i>	14	0	0	0	0	25	0	0	0	0	50	0	0	0	0	0	0	0	0	0	0	0	
	<i>gracilis</i>		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Khandaghlou	<i>Ctenopharyngodon</i>	10	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	
	<i>idella</i>																							
Ghezal Uzun	<i>Capoeta capoeta</i>	25	0	0	37	0	62	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	<i>gracilis</i>		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Sojastrood	<i>Capoeta capoeta</i>	22	25	0	50	0	50	25	0	42	0	57	0	57	42	0	25	0	50	0	25	25	0	0
	<i>gracilis</i>		0	0	33	0	0	0	0	0	33	0	0	0	0	0	0	0	0	0	0	0	0	0
	<i>Barbus laevis</i>	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	<i>Alburnoides bipunctatus</i>	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	<i>Alburnus flippoi</i>	10	0	0	0	0	0	0	0	0	0	0	0	33	0	0	0	0	0	0	0	0	0	0

\* - Seasons that no fish was seized.  
(0) - No infection

Table 3: Frequency of *Gyrodactylus* sp. in infected fish

Stations	Fishes	Total number	Infected organ	Spring			Summer			Autumn			Winter			
				0	1	2	0	1	2	0	1	2	0	1	2	
Soltein	<i>Capoeta capoeta gracilis</i>	30	Skin	25	0	0	0	0	0	0	0	0	0	0	0	0
			Gill	0	0	0	0	0	0	0	0	0	0	0	0	0
Hasan abdal	<i>Capoeta capoeta gracilis</i>	14	Skin	0	0	0	0	0	0	0	0	0	0	0	0	0
			Gill	0	0	0	0	25	0	0	0	0	0	0	0	0
Ghezzi uzun	<i>Capoeta capoeta gracilis</i>	25	Skin	62.5	0	0	0	0	0	0	0	0	0	0	0	0
			Gill	0	0	0	0	0	0	0	0	0	0	0	0	0
Sojastood	<i>Capoeta capoeta gracilis</i>	22	Skin	50	0	0	0	0	0	0	0	0	0	0	0	0
			Gill	0	0	0	0	0	0	0	0	0	0	0	0	0
Sojastood	<i>Barbus lacerta cyri</i>	8	Skin	0	33.4	0	0	0	0	0	0	0	0	0	0	0
			Gill	0	0	0	0	0	0	0	0	0	0	0	0	0
Sojastood	<i>Alburnoides bipunctatus</i>	10	Skin	0	0	0	0	0	0	0	0	0	0	0	0	0
			Gill	0	0	0	0	0	0	0	0	0	0	0	0	0
Sojastood	<i>Alburnus filippi</i>	10	Skin	0	0	0	0	0	0	0	0	0	0	0	0	0
			Gill	0	0	0	0	0	0	0	0	0	0	0	0	0

\* - Seasons that no fish was seined.  
 ( 0 ) - No infection



**Table 4: Frequency of *Paradiplozoon sp.* in infected fish**

Station	Fishes	Total number	Spring	Summer	Autumn	Winter
Sojasrood	<i>Alburnoides bipunctatus</i>	10	33.4	25	*	0

\*- Seasons that no fish was seine

(0) - No infection

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