Acta Veterinaria Hungarica 38 (4), pp. 239—242 (1990)

OCCURRENCE OF MONOGENEANS ON FRESHWATER FISHES IN IRAN: *DACTYLOGYRUS* SPP. ON CULTURED IRANIAN FISHES

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(Received March 26, 1990)

Thirteen *Dactylogyrus* spp. were found on cultured fishes in five Iranian fish farms. Besides typical *Dactylogyrus vastator*, specimens with small anchors were often found in goldfish, which were designated as *D. vastator forma minor*. *Rutilus frisii kutum*, a fish cultured only in Iran, was infected by two *Dactylogyrus* spp. during its short period of prerearing in Iranian fish farms. All *Dactylogyrus* found are new for the Iranian fauna.

Keywords: Monogenea, *Dactylogyrus* spp., freshwater fishes, Iran

Only few data are available on parasitic infections and diseases of Iranian cultured fishes. Mokhayer (1976 and 1985) reported on some pathogenic fish parasites. No information exists about monogeneans.

Of the neighbouring regions, in the Soviet Union the parasitic infections of cultured fishes are well studied. The parasite fauna of fish was reviewed by Agapova (1966) in Khazakhstan and by Mikhailov (1975) in Azerbaidzhan. A comprehensive work on diseases and parasites of cultured fishes was written by Bauer et al. (1981). A work by Salih et al. (1988) on the helminth fauna of pond fishes of Iraq may concern similar problems as those existing the neighbouring, south-western region of Iran.

The occurrence of *Dactylogyrus* spp. on the gills of Iranian fishes is reported in this paper.

Materials and methods

The common carp *(Cyprinus carpio)* is the main fish of Iranian carp farms, but introduced "Chinese or herbivorous" fishes (grasscarp, *Ctenopharyngodon idella;* bighead, *Aristichthys nobilis;* silver carp, *Hypophthalmichthys molitrix*) are often raised in polyculture. Herbivorous fishes were first imported from the Soviet Union and placed into the Anzali lagoon (Caspian water system) in 1971. Later on, in 1982 3–4 million larvae of common carp and Chinese carps were brought in from Romania and in 1987 about 800 breeders of the

same fish species were imported from Hungary. Besides common carp and Chinese carps, a good-quality fish *(Rutilus frisii kutum)* is readily cultured in some Iranian pond farms: specimens of this fish are hatched and reared for four months before released into rivers flowing into the Caspian Sea. The gibel carp *(Carassius auratus gibelio)* as a wild fish very often inhabits the ponds and irrigating channels of fish farms. In addition to table fishes, the goldfish *(Carassius auratus)* is also cultured in some Tehran fish farms which are supplied by underground water.

Samples of fish were collected in 5 fish farms (Sangar and Sameskandeh in the Caspian water system; Esfahan, which drains its water into sodium lakes in Central Iran; farms in Khozestan belonging to the Gulf region; and a farm close to Tehran).

Fish were examined in different seasons of the year, and specimens of different size were studied. Only positive cases (*Dactylogyrus*-infected fish) were recorded.

Fish were examined either at the fish farm or taken to a laboratory alive for a more thorough examination. Parasites were collected under microscope at a magnification of ×40–100. Monogeneans were picked off the gill scrapings alive, placed under a coverslip and fixed in ammonium picrate solution.

Results and discussion

Infection of fish by *Dactylogyrus* spp. in different fish farms is shown in Table I. In the majority of cases host-specific parasites were found, species which commonly infect European and Asian cultured fishes (Bauer et al., 1981; Gussev, 1985; Molnár and Szakolczai, 1980). *Dactylogyrus vastator* infected three fishes, namely *Cyprinus carpio*, *Carassius auratus* and *Carassius auratus gibelio*. In goldfish, besides the typical *D. vastator* specimens (Fig. 1) parasites resembling *D. vastator* in morphology but having anchors about half the size of the normal specimens (Fig. 2) were commonly found. Determination of the taxonomic position of this *Dactylogyrus vastator forma minor* needs further studies. A similar phenomenon was observed by Sidorov (1956) who found *D. alatus* in *Alburnus alburnus* and *D. alatus forma maior* in *Leuciscus idus*. Two *Dactylogyrus* spp. were found on the gills of the bighead. They were identified as *D. nobilis* and *D. aristichthys*. The copulatory complex of the latter, however, resembled also *D. taihuensis* Long et Lee, 1960, which suggests that the validity of the later species might be questioned. The frequent occurrence of *Dactylogyrus sahuensis* also deserves special attention, as so far this carp parasite has been found only in China (Ling, 1965), in the Far East (Gussev, 1955) and in Hungary (Molnár, 1984). During the short 4-month period of its rearing in fish ponds *Rutilus frisii kutum* was found to be infected by two species of

Table I

***Dactylogyrus* spp. from Iranian cultured fishes**

Dactylogyrus spp.	Hosts	Fish farms				
		Sangar	Sames-kandeh	Esfahan	Khozes-tan	Tehran
Dactylogyrus anchoratus (Dujardin, 1845)	*Cyprinus carpio*	+	+		+	+
D. aristichthys Long et Yu, 1958	*Aristichthys nobilis*	+	+			
D. baueri Gussev, 1955	*Carassius auratus* *Carassius auratus gibelio*	+				
D. dulkeiti Bychowsky, 1936	*Carassius auratus*	+				+
D. extensus Mueller et Van Cleave, 1932	*Cyprinus carpio*	+	+	+	+	
D. formosus Kulwiec, 1927	*Carassius auratus* *Carassius auratus gibelio*	+				
D. hypophthalmichthys Achmerov, 1952	*Hypophthalmichthys molitrix*	+	+			+
D lamellatus Achmerov, 1952	*Ctenopharyngodon idella*	+	+			
D. nobilis Long et Yu, 1958	*Aristichthys nobilis*	+	+			+
D. sahuensis Ling, 1965	*Cyprinus carpio*		+			
D. vastator Nybelin, 1924	*Cyprinus carpio* *Carassius auratus gibelio*	+	+			+
D. vastator forma minor	*Carassius auratus*	+				+
D. frisii Bychowsky, 1933	*Rutilus frisii kutum*	+	+			
D. rarissimus Gussev, 1966	*Rutilus frisii kutum*	+	+			

Dactylogyrus, *D. frisii* and *D. rarissimus*. Both species were found also in older fish living in the Caspian Sea and in the rivers flowing into it. All *Dactylogyrus* spp. found proved to be new for Iran.

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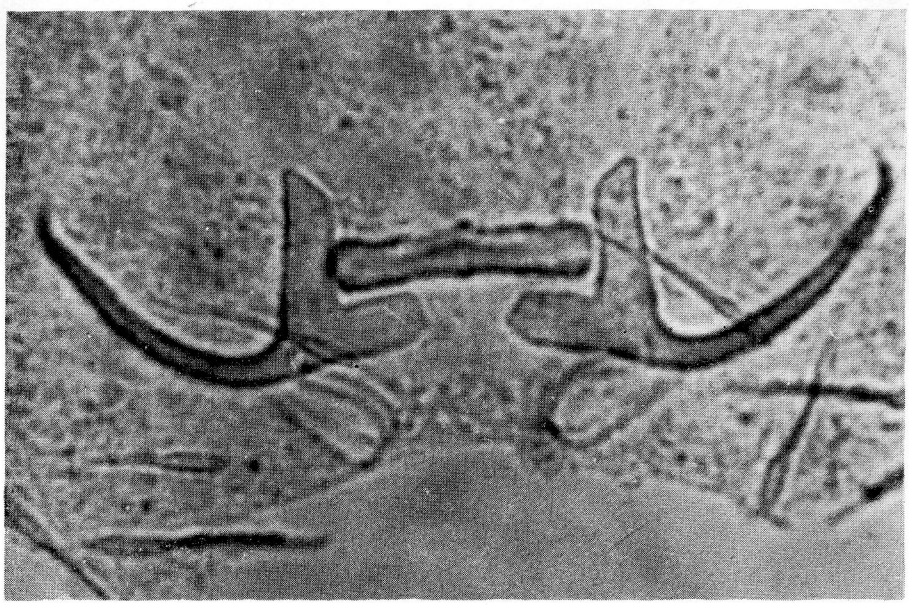

Fig. 1. Anchors and hooks of a typical *Dactylogyrus vastator* specimen from common carp. ×1000

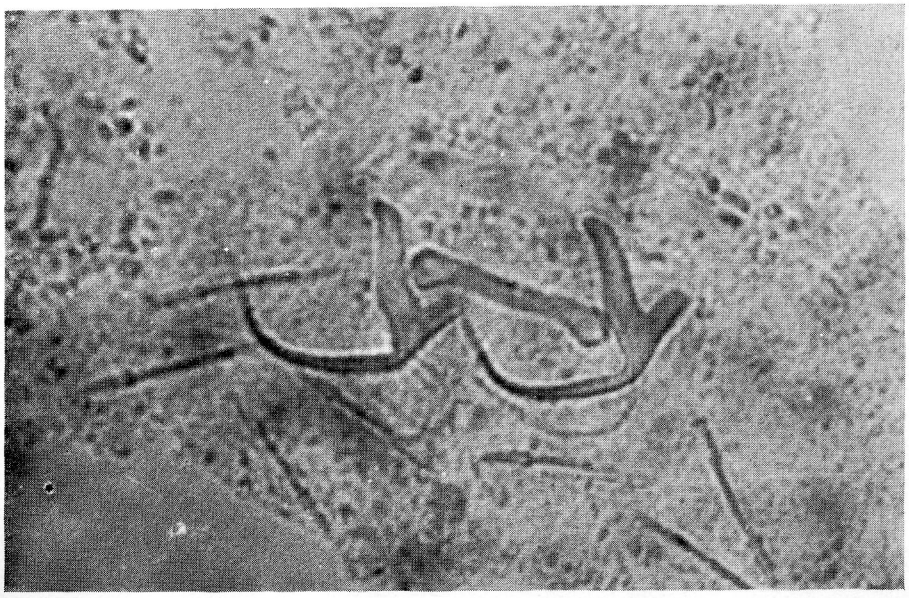

Fig. 2. Anchors and hooks of *Dactylogyrus vastator forma minor* from goldfish. ×1000