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Metazoan Parasites of *Clarias lazera* Valenciennes, 1840 and *Carassius carassius* (Linnaeus, 1758) from Kepez I Hydro Electric Power Plant Loading Pond, Antalya, Turkey

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Abstract

In this study, metazoan parasites of *Clarias lazera* and *Carassius carassius* from Kepez I hydro-electric power plant loading pond were investigated. A total of 38 *C. lazera* and 89 *C. carassius* were studied. Fish samples were caught in May, August and November 2003 and February 2004. *Quadriacanthus clariadis* (Paperna, 1961) (Monogenea), *Polyonchobothrium magnum* (Zme′ev, 1936) (Cestoidea) and *Orientocreadium* sp. (Trematoda) were identified in *C. lazera*. *Dactylogyrus vastator* (Nybelin, 1924) (Monogenea) and *Diplostomum* sp. (Trematoda) were identified in *C. carassius*. *Quadriacanthus clariadis* and *Polyonchobotrium magnum* are the first record for Turkey.

Key Words: Clarias lazera, *Carassius carassius*, Monogenoidea, Trematoda, Cestoidea.

Introduction

According to the previous records of Turkey, *C. lazera* has been found around Antakya, Asi River and Amik Lake. Today, *C. lazera* is also living out of this region as Antalya and springs of Sakarya River, near Çifteler in Eskişehir. *C. lazera* was also recorded in adjacent areas of Turkey as Syria, Palestine and Egypt (Geldiay and Balık, 1988).

Investigations on *C. lazera* in Turkey were performed by Kara and Bahadıroğlu, 2001; Korkmaz and Kırkağaç, 2003; Korkmaz, 2003.

Molnar and Mossalam (1985) studied on the monogenean parasites of *C. lazera* in Nile River in Egypt. Te (1998) also studied the parasites of other *Clarias* species like *C. batrachus* and *C. macrocephalus* in Vietnam. Reda *et al*. (2003) investigated monogenean parasites of *C.garipienus* in Nile Delta. Present study is the first for the parasite fauna of *C. lazera* in Turkey. The aim of this study is to add parasite species to the inland water fish parasite list of Turkey.

Materials and Methods

Research samples were collected in May, August, November 2003 and February 2004. A total of 38 *C.lazera* and 89 *C.carassius* were studied. Fish were caught from Kepez I hydro-electric power plant loading pond (36° 57′ 289″ N, 30° 37′ 624″ E) (Figure 1). Maximum depth of the pond is 15m and water comes from Kırkgözler spring by 17 km. Amount of water changed between 9m^3/sec at the end of summer and 20m^3/sec around spring. Monthly water temperature is given in Figure 2.

Specimens of *C. lazera* and *C. carassius* were caught by gill nets. Fish were transferred to the research laboratory alive. Liver, kidney, heart, intestine, gill filaments, eyes, skin and fins were examined for parasites in dissection.

Monogenetic trematodes were picked up with pipette or needle and taken into picric acid-glycerin 1:1 or glycerin, gelatin and covered with glass. Cestoda and Trematoda specimens were fixed in Bouin's solution under pressure. The fixed samples were kept in the lithium carbonate solution until they lost their yellow color caused by Bouin's fixative and then stained with aceto-carmine, dehydrated stepwise in ethanol and mounted in Canada Balsam. Measurements from *P. magnum* and *Orientocreadium* sp. were taken from pressed specimens. Preparation of specimens was made according to Bylund *et al*. (1980) and Fernando *et al*. (1972). The parasites were identified according to Bykhovskaya-Pavlovskaya *et al*. (1964) and Markevich (1951).

Results

During the investigation period, one monogenean *Quadriacanthus clariadis*, one cestode *Polyonchobotrium magnum* and one digenetic trematode *Orientocreadim* sp. from *Clarias lazera*; one monogenean *Dactylogyrus vastator* and one digenetic trematode *Diplostomum* sp. from *Carassius carassius* were identified. Parasites and their data concerning prevalence and intensity were given in Table 1.

Quadriacanthus clariadis Paperna (1961)

Quadriacanthus clariadis was found to have 100% infestation prevalence and this value was higher than the two parasites species found on *Clarias lazera* (Figure 3).

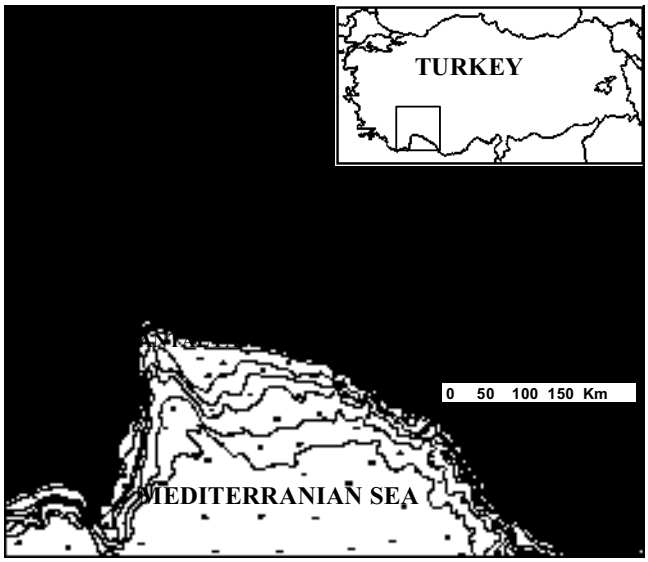

Figure 1. Map of the study area.

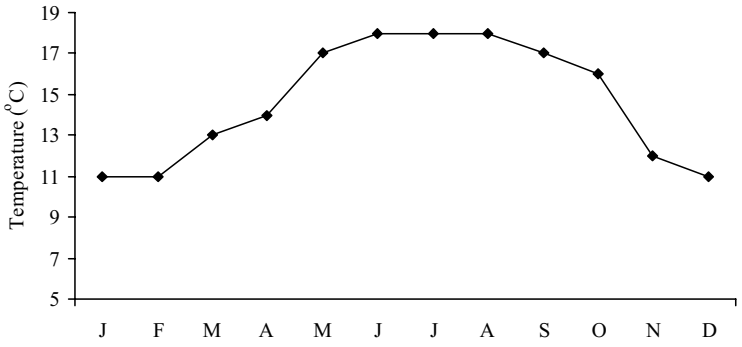

Figure 2. Monthly water temperature of Kepez I Loading Pond.

Table 1. Parasites of *Clarias lazera* and *Carassius carassius in* Kepez I Loading Pond

Parasite	Host fish	Site of infection	Number of fish examined	Number of fish infected	Percent of infection	No. of parasites per fish		
						mean±SE	Min	max
D.vastator	*C. carassius*	Gills	89	9	10.1	1.4±0.176	1	2
Q.clariadis	*C. lazera*	Gills	38	38	100	59±2.56	32	85
P.magnum	*C. lazera*	Intestine	38	7	18.4	2.4±0.481	1	4
O. sp*	*C. lazera*	Intestine	38	12	31.5	23±2.21	15	38
*D.*sp**	*C. carassius*	Lens of eye	89	16	17.9	2.6±0.397	1	7

*: *Orientocreadium* sp.
**: *Diplostomum* sp.

Body was elongated with four head organs and had two pairs of eyespots. Haptor has two pairs of anchors of different shapes and sizes and 14 marginal hooks. Body length 0.71 mm, width 0.079 mm. Length of dorsal anchors was 50µm, width of its base 13 µm. Dorsal bar with trapezoid base has lateral extensions. Width of the bar was between 25 µm and 32 µm with lateral extensions. Length of central process was 13 µm. Ventral anchors smaller than dorsal anchor but similar in shape and with more developed point. Length of ventral anchors 39 µm, appendix 8 µm long. Ventral bar has two rods, each 62 µm long and 9 µm wide forming a v-shaped structure. Marginal hooks different in size. Length changes between 15 µm and 32 µm.

***Dactylogyrus vastator* Nybelin (1924)**

Found fairly scarce on the gills of 9 out of 89 examined *Carassius carassius* specimens.

Large monogenetic trematode, 1.0 mm long, 0.42 mm wide. Length of anchors 33-39 µm, inner root each 22 µm, outer root 10 µm, marginal hooks 25-30 µm. Connecting bar 8 µm x 29-38 µm. Marginal hooks 35 µm. Length of copulatory organ 53 µm. Vaginal armor absent (Figure 4).

***Polyonchobotrium magnum* Zme'ev (1936)**

In seven *Clarias lazera* specimens, minimum 1 and maximum 4 young cestodes were found in the intestine. Head trapezoidal with developed bothria. Scolex 350 µm long, 400 µm wide. Sincipital disk similar to square with rounded corners, having by single row of hooks number about 31-35, length 30-45 µm. Total length of body 45 mm (Figure 5).

***Orientocreadium* sp.**

Found in the intestine of 12 out of 38 *C. lazera*. Vitellaria extend from ovary to midway between posterior testis and end of body. Length of body 1-2.5 mm, maximum width 0.2-0.4 mm, size of oral sucker 190-220 µm, ventral sucker 130-170 µm. Pharynx 80-120 µm. Testis oval or round. Eggs 32-33 µm long and 20-22 µm wide (Figure 6).

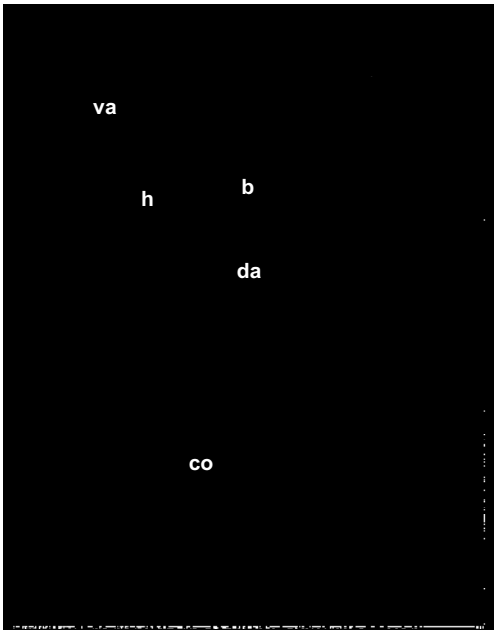

Figure 3. *Quadriacanthus clariadis* Paperna, 1961.
b: bar, da: dorsal anchor, va: ventral anchor, h: hook, co:copulatory organ

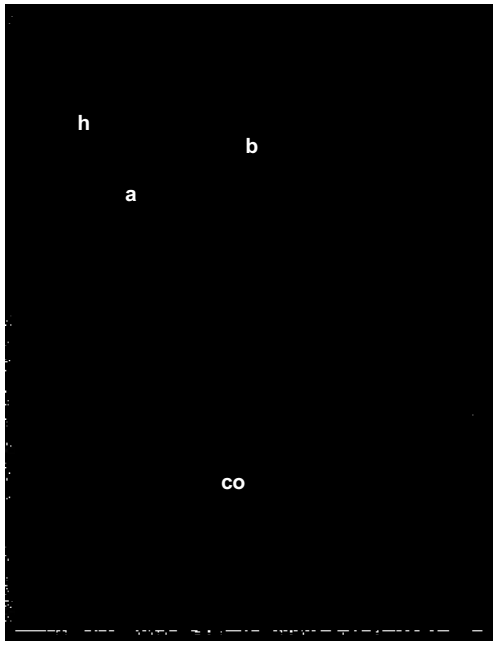

Figure 4. *Dactylogyrus vastator* Nybelin, 1924.
b: bar, a:anchor, h:hook, co:copulatory organ

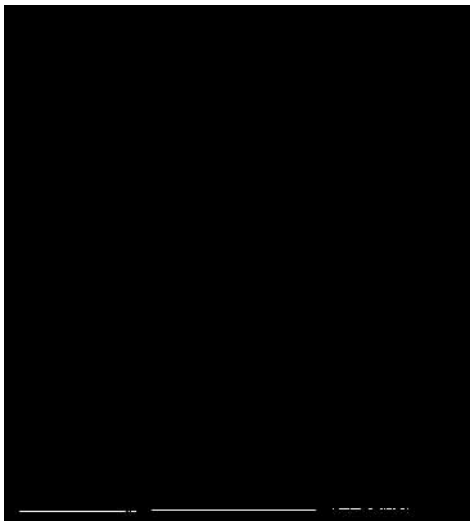

Figure 5. *Polyonchobotrium magnum* (Zme'ev, 1936) head with bothria and hooks

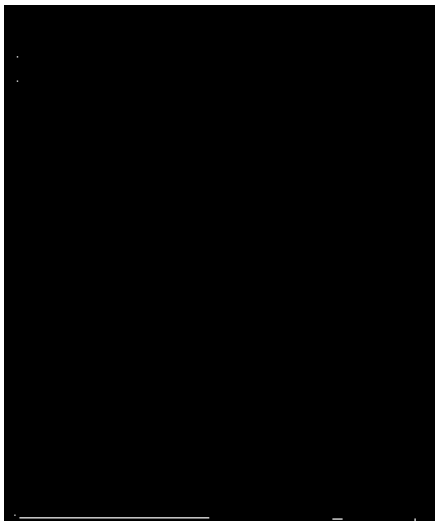

Figure 6. *Orientocreadium* sp.

***Diplostomum* sp. metacercariae**

The parasite was found in fairly low incidence as mean 2.6 individuals. Body broad, anterior end rounded with angular lappet-like protrusions Brandes' organ round and extended transversely. Body length 0.60 mm, width 0.38 mm, oral sucker 55 µm, ventral sucker 35 µm, size of Brandes' organ 90 µm x 65 µm (Figure 7).

Discussion

Kepez loading pond has four fish species as *Clarias lazera*, *Carassius carassius*, *Pseudophoxinus antalyae* and *Cyprinus carpio*. In this study, metazoan parasites of *C. lazera* and *C.carassius* were investigated.

Quadriacanthus clariadis was found on the gills of *C. lazera* in minimum 32, maximum 85 specimens per fish and the infection prevalence of 100%. Molnar and Mossalam (1985) recorded *Q. clariadis* from *C. lazera* of the Nile in Egypt. Three *Quadriacanthus* species from different *Clarias* species are known. *Q. clariadis* from *C. lazera* in Israel, *Q. voltaensis* from *C. walkeri* in Ghana were found by Paperna (1961). *Q. kobiensis* from *C. batrachus* in Vietnam was recorded by Ky (1968). Reda *et al*. (2003) recorded *Q. clariadis*, *Q. allobychowskiella* and *Q. aegypticus* from *C. gariepinus* in Nile Delta.

The copulatory organ of *Q. clariadis* was observed in the most of the specimens but sclerotied organs of vagina was found only in a few mature parasites. Our findings about *Q. clariadis* are the same as described by Molnar and Mossalam (1985).

Dactylogyrus vastator was found in 9 of the 89 fish and seen maximum two specimens per fish. Cengizler *et al*. (2001) found *D. vastator* on *Cyprinus carpio* in Seyhan River in Adana-Turkey. Barysheva and Bauer (1957) and Kogteva (1957) found *D. vastator* on *Carassius carassius*. Bykhovskaya-Pavlovskaya *et al*. (1964) remarked that *D. vastator* found on the gill filaments of *C. carpio*, *C. carassius* and *C. auratus* in the Soviet Union caused serious infections. Many monogenetic trematodes have been spread to the new areas with their host by import operations. They are easily transferred because no intermediate host is necessary. As a result, *D. vastator* was introduced to many countries. *D. vastator* was recorded from *C. auratus* in Erie Lake as an exotic species (Dechtiar, 1972).

Diplostomum sp. (metacercariae) was found in the lens of *C. carassius* as maximum seven specimens per fish, with the infection prevalence of 17.9% which is not a high infection density, whereas, Mishra and Chubb (1969) recorded *Diplostomum spathaceum* from *Rutilus rutilus* in average 135.1 and maximum 408 specimens per fish.

Polyonchobotrium magnum was found in minimum one and maximum four specimens per fish with the infection prevalence of 18.4 %. Since all specimens were in juvenile stage, the genital structure of proglottis was not seen. Species identification was based on the characteristic shape and dimensions of the head. There are 35 hooks on the head in a single row. *P. ophiocephalina*, *P. parva* and *Polyonchobotrium* sp. were found in Vietnam from *Clarias macrocephalus* (catfish) and *C. batrachus* (walking catfish) in Cuuklong River Delta (Te, 1998).

Orientocreadium sp. was found in the intestine of *C. lazera* in minimum 15 and maximum 38 individuals per fish with the infection prevalence of 31.5%. Extension of vitellaria to posterior margin of ventral sucker was an important property. Body of parasite was narrow and long. Soylu (1995) recorded *O. siluri* in *Silurus glanis* from Sapanca Lake in Turkey. Te (1998) found *Orientocreadium batrachoides* and *Orientocreadium* sp. in *Clarias macrocephalus* and *C. batrachus* from lower Mekong River Delta in Vietnam.

Quadriacanthus clariadis and *Polyonchobotrium magnum* are the first records for Turkey.

Figure 7. *Diplostomum* sp. metacercariae

References

Barysheva, A.F. and Bauer, O.N. 1957. Fish parasites of Lake Ladoga. In Parasites and Diseases of Fishes. Bulletin of the all-union scientific research institute of lake and river fisheries, vol. XLII, Leningrad: 171-223.

Bykhovskaya-Pavlovskaya, I.E., Gusev, A.V., Dubinina, M.N., Izyumova, N.A., Sokolovskaya, I.L., Shtein, G.A., Shulman, S.S. and Epshtein, V.M. 1964. Key to Parasites of Freshwater Fish of the USSR. (Translated from Russian). Izdatel'stvı Akademi Nauk SSSR. Moscow-Leningrad.

Bylund, G., Fagerholm, H.P., Calenius, G., Wikgren, B-J. and Wiström, M. 1980. Parasites of Fish in Finland II Methods for Studying Parasite Fauna in Fish. Acta

Academiae Aboensis, Ser. B Vol. 40 Nr.2 Finland.

Cengizler, İ., Aytaç, N., Sahan, A., Ozak, A.A. and Genç, E. 2001. Ecto-Endo Parasite Investigation on Mirror Carp (*Cyprinus carpio* L., 1758) Captured from the River Seyhan Turkey. E.Ü. Su. Ür. Derg., 18(1-2): 87-90.

Dechtiar, A.O. 1972. New parasite records for Lake Erie Fish. Dept. of Lands and Forests, Research Branch Mample Ontario.

Fernando, C.H., Furtado, J.I., Gussev, A.V., Hanek, G. and Kakonge, S.A. 1972. Methods for the study of freshwater fish parasites. Univ. of Waterloo Biology Series No: 2, 76 pp.

Geldiay, R. and Balık, S. 1988. Türkiye Tatlısu Balıkları. Ege Univ., Fen Fak Kitapları Serisi No: 97.

Kara, C. and Bahadıroğlu, C. 2001. Kumaşır Gölü (Kahramanmaraş) nün Ekolojik Özellikleri. K.S.Ü., Fen ve Müh. Dergisi, 4(1): 57-62.

Kogteva, E.P. 1957. Fish Parasites from Pskov-Chud water reserve. All-union Research Institute of Lake and River Fishery. Vol.XLII. In Parasites and Diseases of Fish, 239-265.

Korkmaz, A.Ş. 2003. Sakarya nehrindeki karayayın (*Clarias lazera* Cuv et. Val 1840) ın üreme dönemindeki boy-ağırlık ilişkisi ve kondisyon faktörleri (Fulton-K,Ricker-a ve oransal kondisyon-kn).Eğirdir Su Ür. Fak. Dergisi, 8: 52-61.

Korkmaz, A.Ş. and Kırkağaç, M. 2003. Sakarya Nehri (Sakaryabaşı bölgesi) Karayayın balıklarının (*Clarias lazera* Cuv. Et.Val 1840) vücut kompozisyonu ve et verimi üzerine bir araştırma. Eğirdir Su Ür. Fak. Dergisi, 8: 35-42.

Ky, H. 1968. New species of Monogeneans from freshwater fishes of North Vietnam. Pt. I. Parasitologiya, 2(4): 297-301. Rusian, Engl. sum.

Markevich, A.P. 1951. Parasitic fauna of fresh water fish of the Ukrainia (Israel program for scientific translation Ltd.), Ukrainia, 388 pp.

Mishra, T.N. and Chubb, J.C. 1969. The parasite fauna of the fish of the Shropshire Union Canal, Cheshire. J. Zool., 157: 213-224.

Molnar, K. and Mossalam, I. 1985. Monogenean parasites from fishes of the Nile in Egypt. Parasit. Hung., 5-11.

Paperna, I. 1961. Studies on the monogenetic trematodes in Israel. 3:Monogenetic trematodes of Cyprinidae and Claridae of the lake of Galile'e. Bamidgeh, 13: 14-29.

Reda, E.S., El-Naggar, M.M. and Arafa, S.Z. 2003. Egg variability, hatching and anatomy of the oncomiracidia of three Quadriacanthus species (Monogenea) from the Nile Delta catfish, Clarias gariepinus. Acta Parasitologica, 48(4): 246-254.

Soylu, E. 1995. Sapanca Gölündeki bazı balık türlerinde bulunan digenean ve cestod parazitler. Ege Üniv. Su Ür. Fak. Su Ür. Derg., 12(3-4): 253-265.

Te, B.Q. 1998. Parasitic fauna of the freshwater fish of the Cuulong River delta (lower Mekong River Delta) and methods for prevention and treatment. AHHRI Newsletter Article Vol.7, No1 Vietnam.