

Paramonostomum (Paramonostomum) macrovesiculum*, new species (Trematoda: Notocotylidae) from Black Coot *Fulica atra* (Aves: Rallidae) of Hyderabad Sindh, Pakistan

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Abstract.- Two trematodes recovered from the intestine of the bird Black Coot *Fulica atra* from Hyderabad Sindh, Pakistan, are described and named *Paramonostomum (P) macrovesiculum* new species. The present specimens were compared with all the previous species and found different in several morphological characteristics including relative dimensions, long esophagus, very small pharynx, voluminous five to six transverse looped external seminal vesicle, extent of vitellaria and egg size. Other morphological and morphometric differences noted are also illustrated.

Key Words: Trematode, *Paramonostomum (P) macrovesiculum* new species, *Fulica atra*, Sindh, Pakistan.

INTRODUCTION

The trematode fauna of the birds of different feeding habits are poorly known in Pakistan. The only reports published on the morphotaxonomy of parasites of birds are those of Bilqees (1970, 1980), Bilqees and Jehan (1971), Bhutta and Khan (1975), Khan and Riaz (1983), Farooq and Qamar (1996), Begum *et al.* (1997), Bilqees *et al.* (2003) and Bilqees and Khan, (2006).

The River Indus is located in the migration path of several species of wild birds. The Black Coot *Fulica atra* is a migratory bird. This species is widely distributed in Europe and Asia. The parasitic helminth fauna of *Fulica atra* have been studied in different countries where Black Coot passes sometime in their migratory route to Europe from Africa. *Fulica atra* is a protected species in Pakistan and their populations are restricted to aquatic habitats. Examination of gut contents of the birds revealed that their diet consists of vegetable matter, mostly submerged weeds, Annelid worms, fresh water Gastropods, aquatic insects and small fish. Black coots are a traditional food item of Sindh 'mirbahars' a professional fishing tribe (Roberts,

1991), and considered palatable food by local people of Sindh province of Pakistan. The trematodes collected from the gut contents of Black Coot are identified as *Paramonostomum (P) macrovesiculum* and are described here.

MATERIALS AND METHODS

Trematodes were recovered from the intestine of the bird. These were fixed in AFA solution under slight glass slide pressure, stained with Mayer's carmalum, dehydrated in graded series of alcohol, cleared in clove oil and xylol. These specimens were finally mounted permanently in canada balsam for detailed study. Diagrams were made with camera lucida. Measurements are in millimeter (mm) and those of eggs in micrometer (μm).

***Paramonostomum (Paramonostomum) macrovesiculum*, new species (Fig. 1)**

Host:	Black Coot, <i>Fulica atra</i>
Habitat:	Intestine
Locality:	Hyderabad, Sindh
No. of specimens recovered:	2 from a single host
	Holotype No. SUZDT-45
	Paratype No. SUZDT-46

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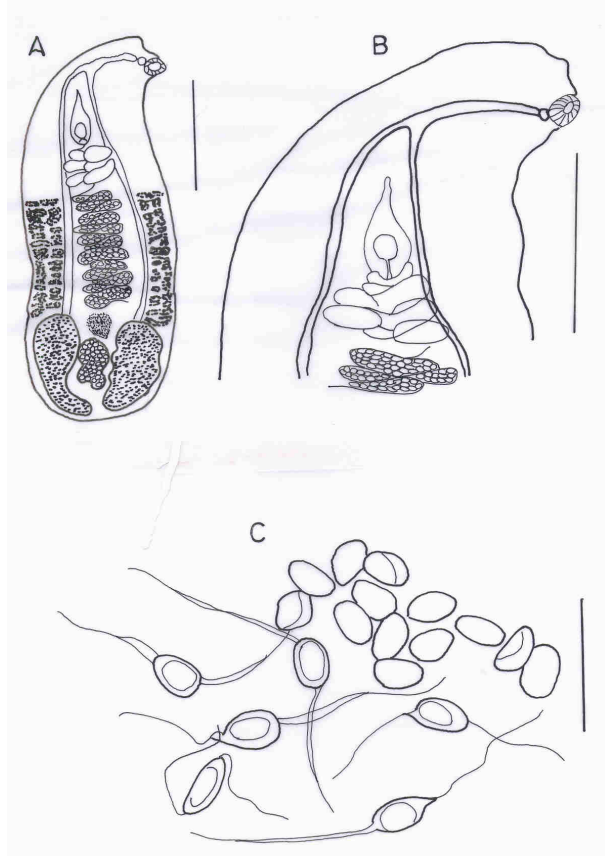


Fig. 1. *Paramonostomum macrovesiculum*, new species A, entire worm; B, anterior portion (enlarged); C, eggs. Scale bars: A, 0.5 mm; B, 0.05 mm; C, 50 μ m.

Description

Body is elongated, aspinose, flattened posteriorly, without ventral glands and, measuring 1.88-1.98x0.71-0.74 in size. Oral sucker is relatively very small, terminal and 0.018-0.019 in diameter. A very small pharynx is present and the esophagus is relatively very long and measure 0.23-0.25 in length. The intestinal ceca are simple and overlap testes posteriorly but not reaching to posterior extremity. Genital pore is median and located little behind the intestinal bifurcation.

Testes are dissimilar, broadly flattened anteriorly and tapering posteriorly. Left testis is inverted, pear shaped, smooth, 0.45-0.49x0.23-0.25 in size; whereas the right testis is elongated, slightly indented laterally in mid region, and 0.43-0.49x

0.26 in size. Both testes occupy posterior most portion of the body. Cirrus pouch is bulb-shaped, narrow and pointed towards the anterior end while broadly rounded posteriorly. Cirrus pouch has rounded internal seminal vesicle and poorly developed pars-prostatica. Cirrus pouch is 0.23-0.26x0.11-0.13 in size. External seminal vesicle is voluminous, consisting of five to six transverse loops. Excretory vesicle is not prominent.

Ovary is irregular, intertesticular and 0.25-0.27x0.13-0.15 in size. Receptaculum seminis is diffused, rounded, median and lies immediately anterior to ovary and is 0.13-0.14 in size. Vitellaria consist of flattened follicles, extracecal, arranged in lateral fields and extend backward from the level of first transverse loop of uterus to the upper level of the testes. Uterus is extensive, forming more or less regular transverse coils, and occupying almost whole of the intercecal space between the ovary and posterior end of external seminal vesicle. Metraterm is poorly developed. Eggs are small, numerous, oval and with long filaments at both poles. Eggs with filaments measure, 75.7-148x10.6-13.6 and without filaments are 15.9-20.4x9.8-13.6. Filaments are 22.7-68.1 long.

Discussion

The genus *Paramonostomum* and subgenus *Paramonostomum* was erected by Lühe, 1909. Type species is *P. alveatum* (Mehlis in Creplin, 1846) Lühe, 1909, syn. *Monostomum alveiforme* Cohn, 1904, Europe.— Kossack (1911) and *P. actitidis* Cable, Connor et Balling, 1960; in *Actitis macularia*, *Charadrius hiaticula semipalmatus*, *C. w. wilsonia*, Puerto Rico; *P. anatis* Garkavi, 1965, in domestic ducks, Russia; *P. antarcticum* Graefe, 1968, in *Chionis alba*, Esperanza Bay, Grahamland, Antarctica; *P. brantae* Bullock, 1952, in *Branta canadensis*, N. Hampshire, syn. of *P. alveatum* – Stunkard (1967); *P. bucephalae* Yamaguti, 1935, syn. *Neoparamonostomum b.* (Y.) Lal 1936, in *Bucephala clangula*, *Tadorna tadorna*, *Spatula clypeata*, *Nyroca marila mariloides*, Japan, also in *Nyroca nyroca*, *N. ferina*, *Netta rufina*. *Cygnus olor*, *Anas clypeata*, Russia including Siberia – Yamaguti (1935 and 1939); *P. bychowskoipawlowskoi* Sailov, 1963, in birds, Azerbaidzhan, SSR; *P. casarcum* Lal, 1936, in *Casarca rutila*, India; *P. chabaudi* van

Strydonck, 1965, in *Haematopus ostralegus*, *Anas platyrhynchos*, Belgium; *P. dollfusi* Van Strydonck, 1965, in *Chauna torquata*, Belgium; *P. elongatum* Yamaguti, 1934, syn. *Neoparamonostomum e.* Lal, 1936, in *Olor bewickii jankowskii*, *O. cygnus*, Korea, also in *Cygnus cygnus*, Czechosl. – Skarda (1964); *P. fulicai* Baugh, 1958, in *Fulica atra*, Lucknow; *P. harwoodi* Nath et Pande, 1962, in *Anas crecca*, India; *P. histrionici* Ching, 1961, in *Histrionicus h. pacificus*, Friday Harbor, Wash., U.S.A; *P. ionorne* Travassos, 1921, syn. *Neoparamonostomum i.* (T.) Lal, 1936, in *Ionornis martinica*, *Parra jacana*, *Limnopardalis rythirhynchus*, *Chionis alba*, Brazil, Venezuela, Patagonia; *P. macrostomum* Ku, 1938, in *Fulica a. atra*, China; *P. malerischi* Dunagan, 1957, in *Philacte canagica* (emperor goose), Alaska; *P. microstomum* Moghe, 1932, syn. *Neoparamonostomum m.* (M.) Lal, 1936, in *Philomachus pugnax*, India; *P. microstomum panjabensis* Gupta, 1964, in *Lobivanellus indicus*, India; *P. nettioni* Baugh, 1958, in *Nettion crecca*, Lucknow India; *P. obtortum* Caballero, 1942, in *Querquedula discors*, Mexico; *P. ovatum* Hsu, 1935, in *Anas platyrhynchos*, *A. boschas dom.* China; *P. parvum* Stunkard et Dunihue, 1931, syn. *Neoparamonostomum p.* (S. et D.) Lal, 1936, syn. *P. pseudalveatum* of Swales, 1933, nec Price, 1931 – Harwood (1939), in intestine of *Chen caerulescens*, *Glaucionetta clangula americana*; U.S.A., Canada, syn. of *P. echinum* – Harrah, 1922-Lal (1936); *P. philippinense* Velasquez, 1969; *P. pseudalveatum* Price, 1931, in *Anas Penelope*, E. Scotland; *Nyroca fuligula*, Estonia, *Branta Canadensis*, Nova Scotia, also in *Ondatra zibethica*; *P. querquedula* (sic) Lal, 1936, in *Querquedula circia*, India, also in *Ixobrychus minutus*, Bulgaria; *P. indica* Gupta and Gupta, 1976 in *Anser indicus* India; *P. poecilorhynchai* Gupta and Gupta, 1976 in *Anas poecilorhyncha* India; *P. thapari* Gupta and Gupta, 1976 in *Nettapus coromandelianus* and *Anser indicus* India; *P. kanpurensis* Gupta and Gupta, 1976 in *Anser anser* India; *P. kashmirensis* Fotedar and Khan, 1977 in *Aythya rufa* India; *P. galli* Tanveer and Chishti, 2001 in *Gallus gallus domesticus* India; *P. palwanense* Fischthal & Kuntz, 1972 in *Centropus sinensis bubutus*; *P. signiensis* Jones and Williams, 1969; *P. antarcticum* Odening,

1982; *P. kherai* Gupta and Singh, 1985 in *Casarca ferruginea* and *Dafila acuta* India; *P. makundi* Gupta and Singh, 1985 in *Anser indicus* India; *P. salimi* Gupta and Singh, 1985 in *Anas poecilorhyncha* and *Anas platyrhyncha* India.

Present specimens are larger than *P. microstomum*, *P. parvum*, *P. palawanense*, *P. pseudalveatum*, *P. brantae*, *P. alveatum*, *P. bucephalae*, *P. macrostomum*, *P. philippinense*, *P. microstomum*, *P. histrionici*, *P. nettioni*, and *P. chabaudi*. While this species is smaller than *P. indica*, *P. poecilorhynchai*, *P. thapari*, *P. kanpurensis*, *P. kashmirensis*, *P. dollfusi*, *P. elongatum*, *P. fulicai*, *P. ovatum*, *P. ionorne*, *P. querquedula*, *P. obtortum*, *P. casarcum*, *P. malerischi*, *P. galli*, *P. kherai*, *P. makundi*, and *P. salimi*.

The size of the eggs of present specimens without filaments are 15.9-20.4x9.8-13.6 and with filaments 75.7-148x10.6-13.6. The eggs of the present specimen are larger than *P. indica*, *P. galli*, *P. kanpurensis*, *P. salimi*, *P. poecilorhynchai*, *P. kherai*, *P. ovatum*, *P. casarcum*, *P. thapari*, *P. philippinense*, *P. brantae*, *P. nettioni*, *P. dollfusi*, *P. makundi*, *P. histrionici*, *P. fulicai*, *P. chabaudi*, *P. pseudalveatum*, *P. macrostomum*, *P. alveatum*, *P. bucephalae*, *P. microstomum panjabensis*, *P. ionorne*, *P. querquedula*, *P. parvum*, *P. elongatum*, *P. obtortum*, *P. malerischi*, *P. microstomum*, and are smaller in size than *P. palwanense*. The size of the eggs of *P. anatis*, *P. antarcticum*, *P. bychowskoipawlowskoi*, *P. harwoodi* and *P. kashmirensis* are not mentioned therefore, can not be compared with eggs of the present species. In most of the known species filament sizes are not given separately and even not mentioned in the description, hence not comparable with present species.

The present specimens cannot be included in any of the existing species specially because the species under study has a relatively very long esophagus, a very small pharynx and voluminous five to six looped external seminal vesicle, which is very small, or absent in other species. The pharynx is also supposed to be absent in the genus. The position of vitellaria is also different. The vitellaria in the present specimens are from the anterior level of anterior testis extending to the level of anterior

most uterine loop. While in most of the other species vitellaria are not extending to the anterior most uterine loop and are far behind. The cirrus pouch in the present specimens is bulb-like, rounded posteriorly and narrow and pointed anteriorly but it is more elongated in other species. However, the present new species resembles to *P. brantae*, *P. bucephalae*, *P. echinum*, *P. elongatum*, *P. microstomum*, *P. partum*, *P. microstomum punjabensis* and *P. kanpurensis* in having genital pore behind intestinal bifurcation. Other species have genital pore anterior to intestinal bifurcation or at the posterior level or near the oral sucker.

The combination of diagnostic features, such as size of body, length of the esophagus, presence of a small pharynx, post bifurcal genital pore, bulb-like cirrus sac, large five to six transverse looped external seminal vesicle as well as extension and location of vitellaria, separate the present specimens from all the previously described species of the genus and subgenus *Paramonostomum* (*Paramonostomum*). Therefore, a new species *Paramonostomum* (*P*) *macrovesiculum* is proposed referring to the voluminous external seminal vesicle.

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