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PJBS

ISSN 1028-8880

Pakistan Journal of Biological Sciences

ANSInet
Asian Network for Scientific Information
308 Lasani Town, Sargodha Road, Faisalabad - Pakistan

Pakistan Journal of Biological Sciences 3 (10): 1708-1711, 2000

Digenetic Trematodes of *Larus genei* (Lariformes; Laridae) Caught from Al-Rames Coast of Al-Qateef in Eastern Province of Saudi Arabia

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Abstract: Forty nine of 50 slender-billed gull (*Larus gene* collected from Al-Rames coast of Al-Qateef in eastern province of Saudi Arabia were infected with one or more of nine species of trematodes belonging to 7 families. Individual birds contained 1-6 species (mean 4 species, SD = 1.6.), *Heterophyopsis* sp was the most common species occurring in 98% of birds examined, Prevalence of other trematodes were: *Cotylorus* sp, 70%; *Carcarioides aharonii,* 60%; *Parorchis acanthus,* 40%; *Philophthalrnos gralli,* 34%; *Ornithobilharria inreanedia,* 20%; *Pschytrema calculus,* 10%; *Dietziella cfeparcum,* 6% and *Dipolosromum spathaceum,* 4%. All trematode species are reported far the first time from Saudi Arabia and also as new host record except for *D. spathaceurn.* The high species richness, low abundance and diversity of the helminths as compared to those of other gulls reported from other parts of the world reflect the specialized non selective diet of slender-billed gull.

Key words: Aquatic birds, gulls, *Larus genei*, trematode

Introduction

Eastern coastal region of Saudi Arabia in general and Al-Rames coast of Al-Qateef in particular are good habitat for many local and migratory aquatic birds. Wild birds play an important role in spreading diseases and parasites to domesticated birds and even to the man (Soulsby, 1982). On the other hand, wild aquatic birds may transmit diseases to the fishes as these birds act as final hosts for many nematodes whose larvae infect fishes and cause diseases in them (Williams and Jones,1994). In spite of such importance , the aquatic birds of Saudi Arabia has received no attention as far as their parasitic fauna is concerned. Although many reports have been published on helmintha of various species of the gulls from many parts of the world (Torres *et al*., 1991; Uchida *et al*., 1991; Kostadinova, 1995, 1997; Eydal *et al*., 1998; Kreiter and Semenas, 1997; Roca *et al*., 1999) however, there is no report from Saudi Arabia. In the present study specimens of *Larus genei* were examined for the various parasites. The purpose of the study was to conduct an analysis of the helminth communities of slender-billed gull.

Materials and Methods

Specimens of slender-billed gull (*Larus genei*) were caught from Al-Rames coast of Al-Qateef (Let. 26°35'N: Long, 50°01'E) in the eastern province of Saudi Arabia during January 1999 to April, 1999. Birds were brought to the laboratory, identified with reference to Jennings (1981), kept in cages and fed on small fishes twice daily. Birds were killed with an overdose of chloroform and observed for any possible parasitic infections. First of all, eyes were examined under a simple microscope. Then various organs like air sacs, heart, lungs, kidney, liver, gall bladder, gizzard, small intestine and bursa fibricus were separated in small petri-dishes containing normal saline and tore open to find the parasites. Parasitic worms obtained were washed in several changes of saline, fixed in Acetic acid-formalin-alcohat (A.F.A.) or 10% buffered formalin under slight pressure of a cover glass or slide depending on the thickness and size of worms. Some of the fixed specimens were stained in borax carmine and whole mounts were prepared while others were embedded in paraffin wax and 7-8 u thick sections were cut, stained with haematoxylin-eosine.

Digenetic trematodes obtained were identified following Brinkmann (1942) and Yamaguti (1971).

Specimens were measured and photographed with a camera attached to a Carl Zeis microscope . All the measurements are in mm, mostly as ranges followed in parenthesis by the mean.

Results and Discussion

The trematodes found and prevalence of infection in *L. genei* are shown in Table 1 and Fig. 1-11. Forty nine of the 50 gulls collected were found to be infected with one or more of the nine species of digenetic trematodes belonging to 7 families. Individual birds contained 1-6 species (mean 4 species, SD = 1.6).

***Heterophyopsis* sp. (Fig. 4):** *Heterophyopsis* sp. was the most common parasite occurring in the intestine of 98% of the birds examined. Intensity of infection ranges from 10 to 100 worms/infected bird, small worms flattened, sub-cylindrical measuring 0.442-0.941 (0.660) × 0.144-0.278 (0.1461), spirted Oral sucker subterminal, 0.045-0.057 (0.051) in diameter. Pre-pharynx long, pharynx well developed, oesophagus very short, caeca reaching posterior extremity. Acetabulum, 0.038-0.053 (0.044) in diameter closer to the mid-way than to the anterior extremity. Two testes almost equal in size 0.060-0.076 (0.0681 × 0.045-0.068 (0.053) diagonal in posterior half of the body. Seminal vesicle constricted into 2 or 3 portions. No cirrus pouch. Hermaphroditic duct surrounded by circular muscular layer, opening into genital atrium at the base of which lies a sucker with a crown of numerous spines. Genital pore posterosinistral to acetabulum. Ovary, 0.030-0.053 (0.040) median, pre-testicular, post equatorial, uterus extending to near posterior extremity. Vitelfaria extending in lateral fields of greater middle portion of the hind body. Excretory vesicle, tubular. This parasite could not be identified to *species* level though its description resembles with that of *Hetephyopsis continua.* an intestinal parasite of fish eating birds and mammals. Uchida *et al.* (1991) published the checklist of helminth parasites of Japanese birds and reported *H. continua major* from the *L. crassirostris.* Several species of family Heterophyidae including *H. continua* have been reported from human in Korea and Japan (Ito, 1964;

Table 1: Prevalence and intensity of infection of trematodes in *Laws _penal* from Al-Barnes coast of Al-Qateef in Saudi Arabia

Family/Helminth	Site	Prevalence 196)	Intensity of infection	
			Range	X ± S.D.
PhOophthalagdae:				
Phllophthalmus gralli	E	34	3-7	5 ± 2.00
Parorchis acanthus	B	40	4-9	7 ± 1.00
Pachytremetidee:				
Pachyrrerna calculus	GB	10	1.4	2 ± 1.50
Heterophyidae:				
Heterophyopsis sp.	SI	98	10.100	35 ± 17.50
Cercarioides aharonii		80	7-12	9 ± 2.50
Diplostomatidae:				
Df:plosromum Spathaceum	Si	4	1.3	2 ± 1.00
Echinostomatidae:				
Diettrada daparcum	SI	6	1.3	2 ± 0.50
Strigeidae:				
Cotylurus sp	SI	70	5-8	8 ± 1.50
Schistosamatidee:				
Ornithabitharzia interrnedi4	L,K	20	4-10	6 ± 2.00

B, bursa fibricus, GB, gall bladder, SI, small intestine, E, eye, L. liver, K. kidney

Chai and Lee, 1991; Hong *et al*., 1991, 1996) thus emphasizing the zoonotic importance of this parasite.

***Cotylurus* sp. (Fig. 3):** *Cotylurus* sp was the second most common parasite of *L. gene;* found in 70% of the birds examined sharing the intestinal habitat with the *Heterophyopsis* sp. However, *Cotylurus* also could not be identified to the species level so a brief description is given here. Body, 6.221-11.596 (9.126) is divisible into two portions. Fore body, 1.229-2.380 (1.958) × 0.960-2.188 (1.660) globular, cup shaped containing lobed tribocytic Organ with pseudosuckers. Hind body, 4.992-9.216 (7.168) × 0.998-1.612 (1.216) cylindrical, more or less arched, without neck portion. Bursa with dorsal sub-terminal opening, genital cone absent. At the antero-dorsal corner of the bursa is a muscular protrusible sucker like bulb. When this structure is protruded out of bursa the two terminal genital ducts come to open outside directly. Oral sucker, 0.105-0.134 (0.117) acetabulum, 0.460-0.576 (0.506) and pharynx present. Testes, 0.384-0.768 (0.622) × 0.240-0.605 (0.461) tandem, closer to the posterior end of the hind body than its anterior end. Ejaculatory pouch present. Ovary, 0.201-0.336 (0.288) × 0.240-0.432 (0.355) round, immediate pretesticular. Vitellaria confined to ventral and sub-lateral sides of hind body.

***Dlatzlella deparcurn* (Dietz, 1909; Skrjabin at Baskirove, 1956) (Fig. 5):** Elongated worms were found in the small intestine of 6% of birds. Variable in size, 0.844-1.585 (1.240) × 0.374-0.480 (0.414) with a well developed head collar having a single row of spines (24 in number) Cuticle beset with spines. Oral sucker, 0.057-0.086 (0.070) and pharynx well developed, oesophagus long. Acetabulum moderately large, 0.163-0.221 (0.188), not produced backward, a little closer to mid body than to the anterior extremity. Testes (0.131 × 0.177) tandem, contiguous, in posterior half of the body. Cirrus pouch weakly developed, not reaching middle of acetabulum, Ovary (0.086) immediately pre-testicular. Uterus rather short, containing small number of very large (0.091 × 0.076) eggs. Vitellaria occupying lateral fields of posterior half of the body.

Size of the worms in present study was different from that of the type species reported from *Haematropus* sp. in Brazil. However, on the basis of the characteristic features we considered it as *D. deparcum.*

***Dlplosromurn spathaceum* (Rudolphi, 1819) (Fig. 6):** Fourth species obtained from the intestine of *L. genei* was identified as *D. spathaceum* however, the prevalence of infection was very low (496). This trematode has also been reported earlier in *L. californicus* and *L. dela warensis* by Palmieri *et al.* (1977) and together with *D. shigini* in *L. genei* from Bulgarian Black Sea coast by Kostadinova (1997). *D. spathaceum* enjoys a world wide distribution and has been found infecting a large number of aquatic birds. On the basis of the wide geographical range attributed to this species Niewiadomska (1996) suggested this name may represent a complex of species and true number of species of genus *Diplpstornum* has yet to be established having criteria for recognizing the natural variability within cercariae, metacercariae and adults.

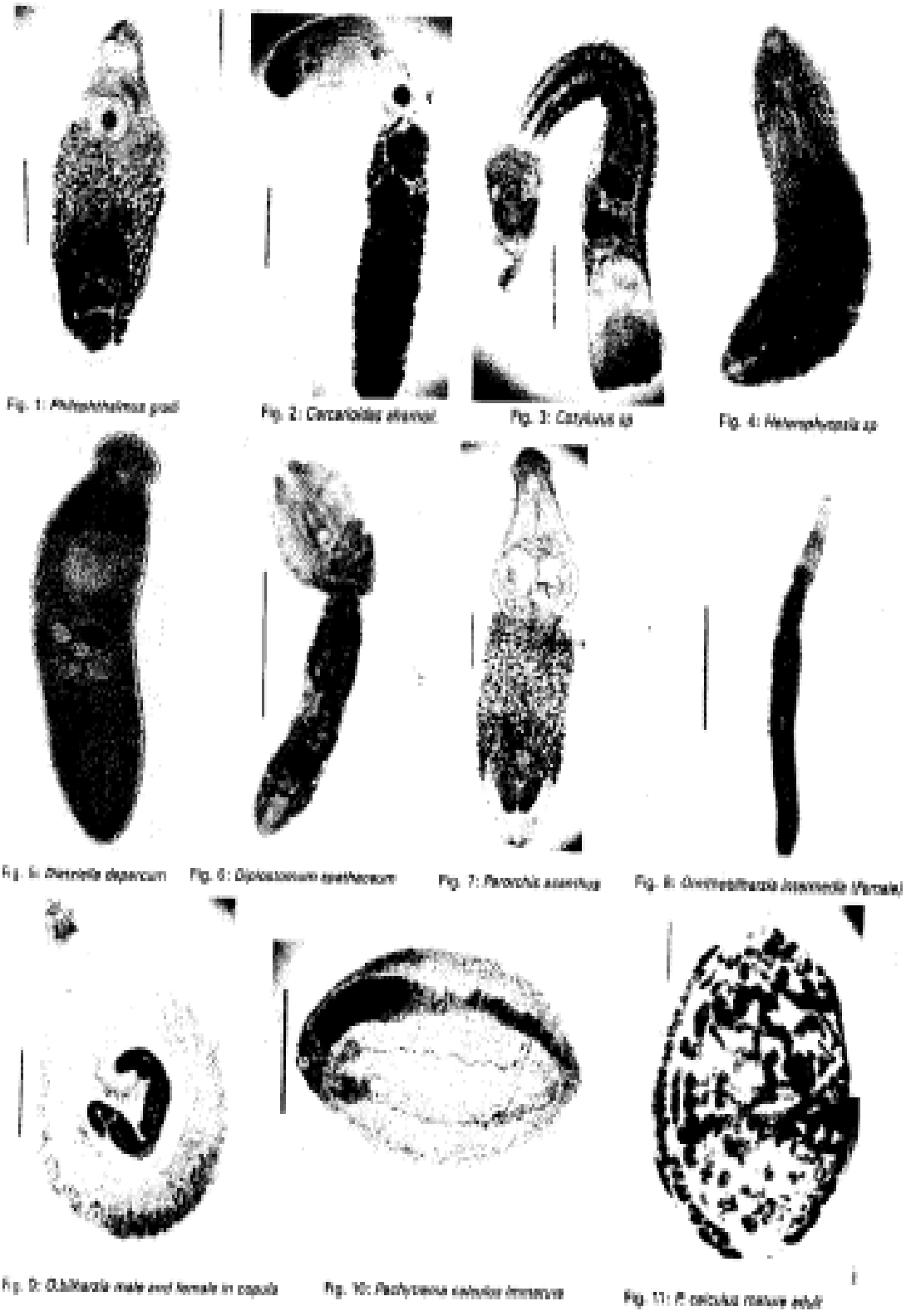
***Carcarioldes aharonii* (Witenberg, 1929) (Fig. 2):** *C. aharonii* was found to infect the bursa fibricus of the bird, It is quite common parasite infecting 60% of the gulls examined. it has earlier been reported from other species of gulls: *Lergentatus* and *L. crassirostris* (Tang and Tang, 1992).

Parorchis acanthus (Nicol, 1906) (Fig. 7): Specimens of *P. acanthus* were found in the bursa fibricus of *L. gariei.* The incidence of infection was 40%. It has also been reported from bursa fibricii of *L. canus, L. argentatus* and other species of *Larus* in Europe and America (Yamaguti, 1971).

***Ornithobfflitazia interntudia* (Odhner,1912) (Fig. 8, 9):** Twenty percent of the birds examined were found to be infected with *O. intermedia* inhabiting the liver and kidney. Earlier it was found in the veins of the gut of *L. hiscus* in *Sweden, L. argentatus* and *Latricilla* in North Carolina and in *Laws* sp. from USSR. Threlfall (1968) reported 29% infection of *Ornfthobilharzia lari* in *L. argentarus* from Canada.

***Pachytrama calculus* (Loon, 1907) (Fig. 10, 11):** Infection of *P. calculus* was found in the gall bladder of 10% of the birds examined. Mature as well as immature specimens were obtained. It was reported from *L. melanocephalus* and *L. canus* from the Bulgarian Back Sea coast (Kostadinova, 1997) and also in *L. argentetus.*

***9.Philophthalmus gralli* (Mathis and Leger, 1910) (Fig. 1):** Ocular infection with *P. graili* was found in 34% of the birds



(bars = 1 mm, unless otherwise stated)

examined. Parasites were recovered from both the eyes of the infected birds. It is interesting to mention that earlier we found the larval stages of this parasites in *Melanoides tuberculatus* obtained from other location in the eastern region of Saudi Arabia and experimentally developed into adults in various avian hosts (Kalantan *et al.,* 1997) suggesting the possibility of native origin of the infection. Kostadinova (1997) also found 2 out of 7 *L. genei* from Bulgarian Black sea to harbor the ocular infection with *Philophthalmus* sp., however he did not perform specific identification.

As a result of present study 9 species of digenetic trematodes belonging to7 families were recovered from *L. genei* from Al-Rames coast of Al-Qateef in eastern province of Saudi Arabia. All species are reported for the first time from Saudi Arabia and with the exception of *D. spathaceum*, also as a new host record. Though recently, Kostadinova (1997) reported 10 species of trematodes in *L. genei* from Bulgaria but except the one mentioned above, none was similar to species reported herewith. This study supports the view of Kennedy and Bakke (1989) that in gulls as a group, helminth communities show common features of high species richness, low abundance, few or no core species and a number of species that occur rarely and in low numbers. Further this relative species richness and diversity of the heiminth are comparable to those of other gulls reported from other parts of the world and probably reflect the specialized non-selective diet of *L. genei.*

Acknowledgments

The authors are grateful to the Chairman, Department of Zoology for providing facilities and King Abdulaziz City for Science and Technology (KACST) for some of the literature.

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