APHARYNGOSTRIGEA ODEROLALENSIS SP. N. (TREMATODA: STRIGEIDAE, RAILLIET, 1919) FROM THE CATTLE EGRET (*BUBULCUS IBIS* LINN) IN PAKISTAN

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خلاصہ

APHARYNGOSTRIGEA ODEROLALENSIS کی نئی نوع سندھ میں Cattle Egret کی چھوٹی آنت سے دریافت کی گئی ہے۔اس نوع کا نام میزبان کی مقامی جگہ کے مطابق رکھا گیا ہے۔

Abstract

Apharyngostrigea oderolalensis new species a member of the family Strigeidae, is described from the small intestine of the cattle egret (*Bubulcus ibis* Linn.) from Sindh, Pakistan. The new species of trematode is characterized by a porous, spined tegment, small oral sucker, lobe like slightly lateral with tentacular appendages which are lobe-like, the fore body is separated from hind body by a slight constriction; large acetabulum; round to oval testes; pretesticular ovary; vitellaria present in fore body and hind body. Uterus extends up to the posterior end of acetabulum. Genital cone somewhat delimited from body parenchyma. Eggs thin walled, large in size.

Introduction

This family Strigeidae Railliet, 1919 is common in birds and other animals around the world (Yamaguti 1958, Chowdbury and Aguirre 2001). The genus belongs to the subfamily Strigeinae due to the distribution of the Vitellaria. Apharyngostrigea which lacks a pharynx also has no pseudosuckers both characteristics prominent with the line drawings figures in this paper. Our new species is described in the results and compared with other strigeid worms. The currently-described genus is common throughout the world in a variety of birds (Yamaguti 1958).

The cattle egret (*Bubulcus ibis* Linnaeus, 1758) is a cosmopolitan species of heron (family Ardeidae) found in the tropics, subtropics and warm temperature zones. It is found near farmland and livestock. Also in the wetlands. The cattle egret feeds on a wide variety of prey including grasshoppers, flies, moths, spiders, earthworms and frogs (Krebs *et al*., 1994). The species is usually found with cattle and other large grazing and browsing animals and catches creatures disturbed by mammals. Only a few reports are available on trematodes associated with cattle egret from Pakistan (Bhutta and Khan, 1975; Dharejo, *et. al.*, 2009; Khan *et al.*, 2009; Khan and Ghazi, 2011 and Ghazi, *et al.*, 2013). In the present study, a new species of trematode, *Apharyngostrigea oderolalensis* sp. n., in cattle egret from Sindh, Pakistan is being reported.

Materials and Methods

Six birds (cattle egret (*Bubulcus ibis* Linnaeus, 1758) were caught from Oderolal Station, District Matiari, Sindh, Pakistan and were anaesthetized in the laboratory. Viscera were cut open and examined in different Petri dishes containing physiological saline. Ten trematode specimens were recovered from four birds, of these, seven were fixed in F.A.A. solution, dehydrated in graded series of alcohol, stained with Mayer's carmalum and the subsequent whole worms were mounted in Canada balsam.

Measurements are given length by width in millimeters. Drawings were prepared with the aid of camera Lucida. Holotype and paratype are in the collection of the senior author.

Apharyngostrigea oderolalensis sp.n.
(Figs. 1-9)

Host: cattle egret (*Bululcus ibis* Linnaeus)

Locality: Oderolal Station, District Matiari, (25°36'N, 68° 26'E), Sindh, Pakistan

Location: Small intestine

No. of host examined/infected: 6/4

No. of specimens recovered: 10

Description

Body small with porous and spined segment, divided into two regions, fore body broader as compared to hind body, somewhat bent, measuring 2.18 – 2.37 by 0.62 – 0.75. Small oral sucker, slightly lateral, measuring 0.14-0.18 by 0.16-0.19, situated at the anterior margin of fore body, with tentacular appendages which are lobe-like and extend out from the anterior end; Pharynx absent. The fore body is separated from the hind body by a slight constriction, while there is obvious constriction at the base of hind body near the region of copulatory bursa. Acetabulum well-developed, larger compared to oral sucker at the base of fore body measuring 0.20-.023 by 0.22-0.24. The distance between the oral sucker and acetabulum is 0.24-0.30. Round to oval testes well separated from each other, the anterior larger as compared to posterior, measuring 0.15-0.20 by 0.18-0.20 while the posterior measuring 0.12-0.14 by 0.13-0.14. Prestesticular ovary, nearly round, measuring 0.11-0.14 by 0.11-0.13. Distance between acetabulum and ovary 0.52-0.56. Vitellarium present in both hind body and fore body extending up to tribocytic organ. Genital cone somewhat delimited from body parenchyma. Hermaphrodictic duct opens at apex of genital cone. Uterus extends up to posterior end of acetabulum. Eggs large in size, oval to elongated, thin walled measuring 0.073-0.084 by 0.043-0.049.

Discussion

Ciruea (1927) erected the genus *Apharyngostrigea* with *A. cornu* (Zeder, 1800) as its type species in *Ardea* spp.; *Botauruslentiginosus lengtiginosus, Casmerodius albus, Ciconia ciconia, Egretta garzetta, Nycticorax nycticorax, Tringa, Herodias* from Europe, Siberia and U.S.A. This species was also reported in *Ardea herodias herodias, Nycticorax nycticorax hoactili* in Havana, and *Bubulcus ibis* in Mexico.

Later the species was recorded from India where *A. egreti* Verma, 1936 in *Bubulcus coromandus*; *A. ramai* Verma, 1936 in *Nycticorax nycticorax; A. indiana* Vidyarthi, 1937 in *Egretta alba* and *A. ardeolina* Vidyarthi, 1937 in *Ardea cinerea.*

A.bilbobata Olsen, 1940 was reported from the small intestine of *Nycticorax n. hoactli* and *Ardea h. herodios* from U.S.A.: which differs from all the other species of the genus in having a bi-lobed ovary. *A. simplex* and *A. cornu* were recovered by Flowers *et al.,* 2004 in piscivorous birds in North Carolina, U.S.A. *A simplex* was found in *Ardea herodiasi* which represents a new host record, while *A. cornu* represents a new locality.

A. (*Apharyngostrigea*) *simplex* (Johnston, 1904); *A.* (*A) serpentia* sp.n. were studied by Ukoli (1967) with an evaluation of the genus *Apharyngostrigea* Ciurea, 1927 by the method of Numerical Taxonomy.

The present specimens (2.18 – 2.37) are smaller in length as compared to *A. ardeolina* Vidyarthi, 1937 (5.75 – 5.86); *A. bilobata* Olsen, 1940 (2.8 – 4.0); *A. garciai* Tubangui, 1933 (2.8 – 5); *A. multiovata* (Pérez Vigueras, 1944) (4.35); *A. ramai* (Verma, 1936) (3.27 – 4.14); *A. serpentine* Ukoli, 1967 (5.24) and *A. simplex* (Johnston, 1904) Szidat, 1928 (3.8).

The eggs (0.073 – 0.084 by 0.043 – 0.048) are smaller as compared to *A. cornu* (0.09 – 0.11 by 0.054 – 0.070); *A. ibis* (0.085 – 0.095 by 0.040 – 0.066); *A. insulae* (0.088 by 0.050); *A. madagascariensis* (0.085 by 0.065); *A. multiovata* (0.095 by 0.0167) and *A. simplex* (0.085 – 0.095 by 0.052 – 0.070).

The present species is differentiated from the type species *A. ascornu* (Zeder, 1800) Ciurea, 1927 in the body shape, distance between oral sucker and acetabulum, shape of testes and size of eggs. As compared to the only other species of the genus namely *Apharyngostrigea megaovata* Das and Ghazi, 2012, the present species differs in host and locality which were, *Egretta alba* (Linn.) and Karachi for the previous species. The oral sucker in the present specimens is smaller (0.14-0.18 by 0.16-.19) as compared to *A. megaovata* (0.30-0.31 by 0.30-0.24). The testes in *A. megaovata* are multi-lobed, while in the present species they are oval to rounded. Moreover, the shape of eggs in present species is oval to elongated while in *A. megaovata*, eggs have one end broad and the other comparatively narrow. Keeping in view of the above-mentioned differences in species *A. oderolalensis*is proposed, the species' name refers to the locality of the host.

Recently, other new species of *Apharyngostrigea* have been reported. (Sudarikov and Ivanov, 1993). Other studies have enlightened the life history of this genus (Ostrowski de Nunez, 1989). There has been continual

interest in the parasites of the Egret group with many surveys being completed (Sepulveda *et al*. 1999, Abd-Al-Aal *et al* 2008; Dzienkonshka-Rhynko *et al* 2014). Besides the Egrets, other animals harbor this digenetic trematode (Schotthoefer, 2009; Yamaguti 1958). *Apharyngostrigea* is a common trematode parasite that is found worldwide in the parasite fauna. The name of the new species *A oderolalensis* refers to the locality of the host.

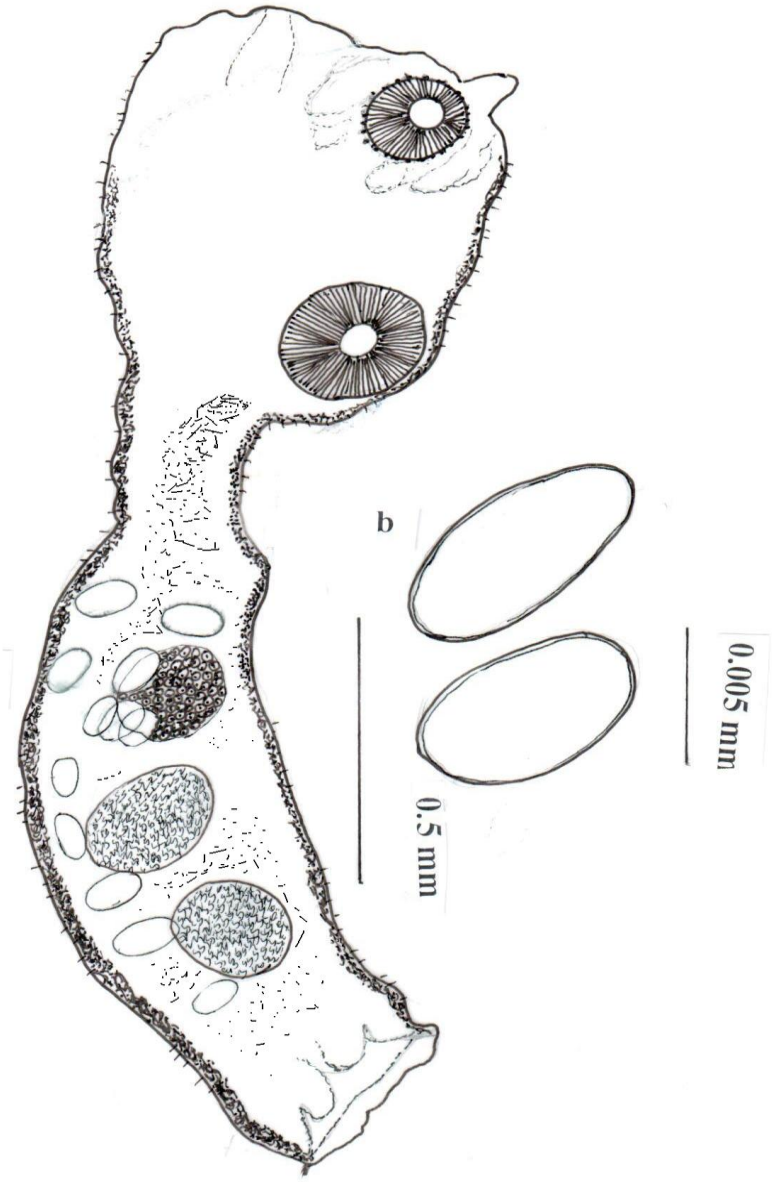

Fig. 1. ***Apharyngostridgea oderolalensis*** **n.sp.**

a. Entire b. Eggs

References

Abd Al-Aaal, Z., Amer, O.H., Badawy, A. and El-Ashram, A.M.M. (2008). Digenetic trematodes of the little egret, *Egretta garzetta*, and possibility of transmission to *Oriochromis niloticus* at El-abbassia fish farms, Egypt. In: Proceedings of the 8th Int. Symposium on Tilapia in aquaculture, 2008 pp. 1351-1364.

Bhutta, M.S. and Khan, D. (1975). Digentic trematodes of vertebrates form Pakistan, Bulletin, Department of Zoology, University of Punjab, (N.S.) article 8, 1-175.

Chowdbury, N. and Aguirre, A. A. (2001). Helminths of Wildlife. Science Publishers, Inc. Enfield SA. 514 pp.

Ciurea, I. (1927). Contribution a petude morphologique de *Strigea cornu* (Rud.). *Bull. Sect. Sc. Acad. Roumaine.*, 11 :12-16.

Das, S.N. and Ghazi, R.R. (2012). *Apharyngostrigea megaovat*an. sp. (Trematode: strigeidae, Raillet, 1919) from a new host *Egretta alba* Linnaeus) in Sindh, Pakistan. *Proceedings of Parasitology*., 53: 61-66.

Dharejo, A.M., Bilqees, F.M. and Khan, M.M. (2009). *Echinostoma sindhense* new species (Digenea: Echinostomalidae) from cattle egret (*Bubulcus ibis (*Ardeidae) from Hyderabad, Sindh, Pakistan. *Proceedings of Parasitology*., 48: 73-80.

Dzienkonshka-Rynko L., Mievaejewska, K. and Hilwa, P. 2014. Helminths in Grey Heron (*Ardea cinerea)* chicks. *Biologia*., 70: 279-282.

Faust, E.C. (1918). Studies on American Stephanaphialinae. *Tr. Am. Micr. Soc*., 37: 183-198.

Flowers, J.R., Poore, M.F., Mullen, J. E. and Levy, G. (2004). Digeneans collected from piscivorous birds in North Carolina, U.S.A. *Comparative Parasitology*., 71: 243-244.

Galigher, A.E. and Kozloff, E.N. (1971). *Essentials of Practical Microtechnique*. 2nd edition. Lee and Febiger, Philadelphia, Pennsylvania.

Ghazi, R.R., KHAN, A. and Sayed, M. (2013). *Paramonostomum bilqeesae,* new species (Trematoda: Notocotylidae) from common teal (*Anas crecca* L.) in Sindh, Pakistan. *Pakistan J. Zoology*., 48: 843-845.

Johnston, S.J. (1904). Contribution to the knowledge of Australian Entoza No. III. On some species of *Holostomidae* from Australin birds. *Proc. Linn. Soc. N.S.W*., 29: 108-116.

Karema, M.E.B. and Al-Tyar, A.A.A.H. (2011). Studies on internal parasites of the cattle egret and its role in the environmental pollution in some areas in Alexandria and Behera Governorates. *Alexandria Journal of Veterinary Science*., 33: 165-174

Khan, A., Das, S.N., Ghazi, R.R. and Noor-un-Nisa. (2009). A new species of trematode genus *Schwartzitrema* Perez vigueras, 1941 (Strigeidae) from a bird (cattle egret, *Bubulcus ibis* L.) in Sindh, Pakistan. *Int. J. Biol. Biotech.*, 6: 1-3.

Khan, A. and Ghazi, R.R. (2011). *Nephrostomum oderolalensis* n.sp. (trematode: Digenea) in cattle egret (*Bubulcus ibis* L.) from Sindh, Pakistan. *Int. J. Biol. Biotech.*, 8: 487-490.

Krebs, E.A., Riven-Ramsey, D. and HUNTE, W. (1994). The colonization of Barbados by Little Cattle Egret (*Bulbulcus ibis*). 1956-1990 colonical water birds. *Waterbird Society*., 17: 86-90.

Olsen, O.W. (1940). Two new species of trematodes (*Apharyngostrigea bilbobata*: Strigeidae, and *Cathaemasia nycticoracis*: Echinostomatidae) from herons, with a note on the occurrence of *Clinostomum complanatum* (Rud.). *Zoologica.*, 25: 323-328.

Ostrowski de Nunez, M. (1989). The life history of a trematode, *Apharyngostrigea simplex* (Johnson 1904), from the ardeid bird *Egrettathula* in Argentina. *Zoologischer Anzeiger*., 5/6: 322-366.

Perez, V.I. (1944). Trematodes de la superfamilia Strigeoidea: descripcion de un genero y sicte espacies nuevas . *Rev. Univ. Habana*., (52-54): 294-346.

Railliet, A. (1919). Nouyeaux trematodes du chien *Recueil de Medecine Veterinaire*., 44: 43-45.

Richard, I. (1965). Trematode d'oiseaux de Madagascar. IV. Strigeides et Cyathocotylidés. Bull. *Mus. Nat. Hist. Nat.*, 2:5, 36: 506-522.

Schotthoefer A.M., Bolek, M.G., Cole, R.A. and Beesley, U.R. (2009). Parasites of the mink frog (*Rana septentrionalis*) from Minnesota, U.S.A. *Comp. Parasitology*., 76: 240-246.

Sepulveda, M.S., Spalding, M.G., Kinsella, J.M. and Forrester. D.J. (1999). Parasites of the great egret (*Ardea alba*) in Florida and a review of the helminths reported for the species. *Journal of Helminthology*., 66: 7-13

Sudarikov, V.E. and Ivanov, V.M. (1993). Matacercariae of the trematode *Apharyngostrigea ibis*- a new element in the USSR fauna. *Trudy Gel'mintologicheskoilaboratorii*., 39: 185-191.

Szidat, L. (1929). Studies on einigen seltenenam. Parasiten der Kurischen Nehring *Z. Parasit.*, 1: 331-344.

Tubangui, M.A. (1933). Trematode parasites of Philippine Vertebrate V Description of a new species and classification. *Philipp. J. Sci.*, 52: 167-197.

Ukoli, F.M.A. (1967). On *Apharyngostrigea (Apharyngostrigea) simplex* (Johnston, 1904) new comb, and *A. (Apharyngostrigea) serpentia*n.sp. Taxonomy of the genus *Apharyngostrigea* Ciurea, 1927 by the method of numerical taxonomy. *Journal of Helminthology*., 41: 235-256.

Verma, S.C. (1936). Notes on trematode parasites of Indian birds *Pt. I Allahabad. Univ. Stud.*, 12: 147-188.

Vidyarthi, R.D. (1937). New Strigeids (Trematoda) from Indian birds. *Proc. Nat. Acad. Sci. India*., 7: 196-201.

Yamaguti, S. (1958). *Systenia Helminthum, the Digenetic Trematodes of Vertebrates- Parts I and II.* Interscience Publishers, Inc. New York, London 1575 pp.

Zeder, J.G.H. (1800). Erster Nachtrag Zur Naturgeschichte der Eingeweidewumer, mit Zusätzen und Anmerkungen herausgegeben. Leipzig, XX + 320 PP.