

NEW HOST AND LOCALITY RECORD OF *CONTRACAEUM BUBAKII* AKRAM, 1996 (NEMATODA: ANISAKIDAE) FROM THE GIZZARD OF *BUBULCUS IBIS* IN LARKANA, SINDH, PAKISTAN

Abdul Saeed Hulio and Sanjota Nirmal Das

Department of Zoology, University of Sindh, Jamshoro -76080, Pakistan.

Corresponding addresses: drsanjota82@gmail.com

ABSTRACT

An investigation of the helminth parasites of *Bubulcus ibis* in Larkana, Sindh, Pakistan, was conducted. In total, 123 nematodes were found from the gizzard of thirty one (31) hosts (38 ♂ and 85 ♀). Genus *Contracaecum* Railliet and Henry 1912 comprises a number of species; however, the present nematodes possess all essential characteristics of *Contracaecum bubakii*, Akram, 1996. Therefore, present specimens are identified as such. *Contracaecum bubakii*, Akram, 1996, was previously obtained from the stomach of *Phalacrocorax niger* at Manchar Lake, Sindh, whereas the present species was observed in the Gizzard of *Bubulcus ibis* in Larkana, Sindh, Pakistan. *Contracaecum bubakii* (Akram, 1996) is reported for the second time in Sindh in the new host *Bubulcus ibis* and for the first time in the new locality of Larkana in Sindh, Pakistan.

Key Words: Nematode, *Contracaecum bubakii*, *Bubulcus ibis*, Larkana, Sindh, Pakistan.

INTRODUCTION

Species of the genus *Contracaecum* Railliet and Henry, 1912 occur in a wide range of hosts, including fish, birds (especially piscivorous), and mammals. Several species have been reported in India from avian hosts and only one from Pakistan and some *Contracaecum* larvae taken from a fish host *Muraenes oxcinereus* Frosk of the Karachi coast, Pakistan (Bilqees and Fatima, 1994). The literature indicates that *Bubulcus ibis* is a relatively common avian host parasitized by several species of this genus.

Martinez *et al.* (1994) carried out experimental infection of *Contracaecum multipapillatum*. In Mexico, juvenile of *C. multipapillatum* caused infection in *Cichlasoma urophthalmu* (Mayan cichlid) and adults caused infection in *Casmerodius albus* (Great egret) and *Phalacrocorax olivaceus* (olivaceous cormorant) birds, are among new host records. *Contracaecum multipapillatum* juveniles develop into adults when fed to kittens. The development of an avian ascaridoid in the intestine of mammals increases the possibility of this species affecting other mammals in the future. *C. himeu* has been re-described from the stomach of the *Phalacrocorax capillatus* (Japanese cormorant) by Nagasawa *et al.* (1999) and demonstrated its validity and differentiation from closely related species. *Phalacrocorax capillatus* being a new host. A morphological study was conducted by Hugot *et al.* (2004) on *Contracaecum magnicollare* Johnston and Mawson, 1941 from *Anous minutus*. As a result of study, *Contracaecum magbicollare* is no longer recognized as a synonym for *Contracaecum variegatum* (Rudolphi, 1809) Hartwich, 1964.

Apart from general taxonomic and morphometric studies, specimens of *C. rudolphi* (Hartwich, 1964), were described in *Phalacrocorax carbosinensis* from Italy were characterized genetically and compared with those recovered from *P. aristotelis* of the Galician coast, Spain (An-Xing *et al.*, 2005). An attempt was made by D'Amelio *et al.*, (2007) to characterize the genetic components of the members of genus *Contracaecum* found in Florida, USA.

Contracaecum biocain was reported by Mattiucci *et al.* in 2008 from *Pelecaus occidentalis* L. (brown pelican) in Columbia. The authors examined the morphology and molecular evidence of the species, as well as its relationship with its congeners from fish-eating birds.

MATERIAL AND METHODS

Forty two birds *Bubulcus ibis* trapped and collected from the local markets of District Larkana for examination of helminthic parasitic infection. Birds were anesthetized in jar using chloroform and then autopsied for examination of body cavity and visceral organs for collection of helminth parasites. A total of 123 nematodes (38 ♂ and 85 ♀) belonging to the genus *Contracaecum bubakii* Akram, 1996 were collected from the gizzard of Thirty one (31) hosts. The nematodes were first killed by steaming and boiling 70% ethanol, preserved in an alcohol-glycerol solution (9 parts alcohol:1 part glycerol), and then cleared with lactophenol solution.

Camera Lucida was used to make the drawings. All measurements are in millimeters (mm).

RESULTS

Contracaecum bubakii Akram, 1996 (Fig.1.A-D)

Host	:	<i>Bubulcus ibis</i> Linnaeus, 1758 (Cattle egret)
Locality	:	Larkana, Sindh, Pakistan.
Location	:	Gizzard
Host examined/ Infected	:	42/31
Specimen recovered	:	123 (38♂ and 85♀)
Percentage of infection	:	73.80%

DESCRIPTION:

Body stout, moderately long with transverse cuticular striation except lips. The Lips are longer than broader without dentigerous ridges. Two small anterolateral rejections and a pair of papillae are located on each lip. Interlabia muscular, finger-shaped with roughly rounded tip. Cervical papillae present. Nerve ring not clear, Esophagus with small oval-shaped ventriculus present. Ventricular appendix and intestinal caecum present just below the esophagus. Vulva is present in the anterior part of body. Spicules are of same size.

Male:

Males are smaller than female and 16.5–21.3 X 0.61–0.64 in diameter. Esophagus 2.3-2.8 in diameter. Cervical papillae 0.43-0.48 mm away from the anterior end of the body. Large Intestinal caecum 1.6-2.1 in diameter. Ventricular appendix 0.41-0.62 in diameter. Tail roughly rounded with a rounded tip and 0.19-0.27 in diameter. Spicules equal in length and 1.35-1.46 in diameter. Caudal papillae are 91-131 pairs, 80-120 pairs of which are proximal papillae; 5 pairs are paraocloacal papillae; 2 pairs are post paraocloacal papillae, and 4 pairs are distal papillae. A pair of phasmid is also present.

Female:

Females are larger than male and 19.3 -23.6 X 0.74-0.79 in diameter. Esophagus 3.0-3.7 in diameter. Cervical papillae present and 0.41-0.72 mm away from the anterior end of the body. Large intestinal caecum 2.1-2.77 in diameter. Ventricular appendix is 0.52-0.61 in diameter. Tail broadly rounded with a pair of papillae and 0.09-0.34 in diameter. Vulva is present in the anterior part of body and 4.3-6.2 mm away from the anterior end of body. Eggs oval and 70-77 X 46-55 in diameter..

DISCUSSION

Genus *Contracaecum* is among the largest ascaridoid genera, infesting fish, birds, and mammals worldwide. Species of the genus are found in fish-eating birds mostly in the birds of order Ciconiformes and Pelecaniformes (Akram, 1996; Barušet *et al.*, 2000). The genus was originally defined on the basis of morphology of esophagus-intestinal region by Railliet and Henry (1912). Initially the type species was *Contracaecum spiculigerum* (Rudolphi, 1809) (*Ascaris spiculigerum* Rudolphi, 1809). Hartwich (1964) then renamed this original type material as *Contracaecum microcephalum* (Rudolphi, 1809) in a number of *Pelicanus* Spp. in Africa and Europe and later designated as the new type species.

Species of this genus can only be defined using a limited number of morphological criteria of taxonomic significance; Appendix and esophagus do not grow at the same rate as the body or as each other (Mawson, 1956); In fully grown worms, spicules reach their maximum length, but caudal papillae remain constant during growth and phasmids with papillae structures may be difficult to distinguish from distal papillae, Fagerholm (1990); the morphology of labia, interlabia and arrangement of caudal papillae, Barušet *et al.* (2000) and Abolloet *et al.*, (2001) characterized the posterior region of male and arrangement of caudal papillae in specimens recovered from European Shag *Phalacrocorax aristotelis* (Linnaeus, 1967).

Available literature indicate several species of the genus reported in several avian hosts some including *Florida coerulea*; *Pelecanus conspicillatus*; *P. occidentalis*; *P. africanus*; *P. crispus*; *P. capillatus* ; *E. minor*; *A. minutes*; *Butorides s. striatus*, *Ardea Egretta*; *A. cocoa* ; *A. Herodias*; *Ardeasp.*; *Tantalus loculatur*; *P. olivaceous*; *Corvus albus*; *Nycticorax nycticoraxhoactli*; *Diomedea*spp.; *S. magellanicus*; *Bubulcus ibis*, *Egretta thula*; *E. alba*;

Anhinga anhinga; *Nycticorax* spp.; *Phalacrocorax brasilianus*; *P. carbosinensis*; *P. brasilianus*; *P. albiventer*; *Gavia stellate* and in herons and white pelicans from Guyana, Queensland, Colombia, Germany, South Africa, Australia, Greece, Japan, Mexico, Brazil, South America, Florida, Greece, Argentina, Africa, Berlin, Italy, Argentina and Congo

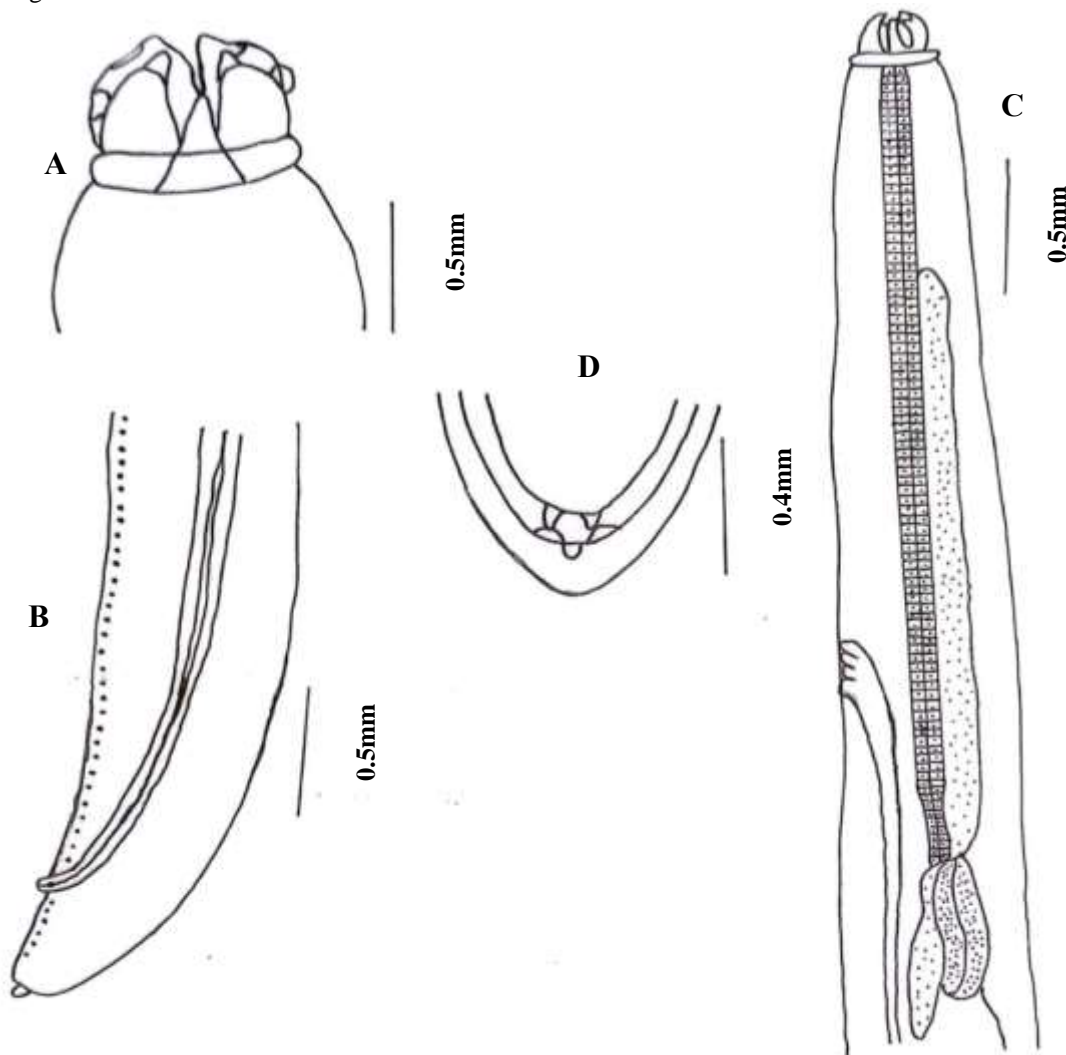


Fig.1. *Contracaecum bubakii* Akram, 1996; A. Head Region of male; B. Posterior end of male; C. Anterior end of female; D. Posterior end of female

In India, three species have been reported: *C. engonium* (Baylis and Daubney, 1922); *C. equulai* (Gupta and Srivastava, 1984) and *Contracaecum engraulisi* (Gupta and Srivastava, 1984) and in Black stork (*Ciconianigra*).

In Pakistan, *Contracaecum* sp. (Railliet and Henry, 1912) was recorded by Das and Ghazi (2009) from *Phalacrocorax fuscicollis*, however, the authors did not reach species conclusions due to the inaccessibility of the full taxonomic literature, and *C. bubakii* (Akram, 1996) has been reported only from *Phalacrocorax niger*.

In comparison with all previously reported species of the genus *Contracaecum* (Railliet and Henry 1912), the present specimens are similar to *Contracaecum bubakii* (Akram, 1996) and so have been identified as such.

Previously, *Contracaecum bubakii* (Akram, 1996) was found in the stomach of a *Phalacrocorax niger* in Manchar Lake, Sindh, Pakistan. In contrast, the present specimens were found in the gizzard of *Bubulcus ibis* (Cattle egret) in Larkana, Sindh, Pakistan. Cattle egret *Bubulcus ibis* is a new host record for the genus in Sindh. *Contracaecum bubakii* (Akram, 1996) is second time reported from Sindh, and first time from District Larkana, Sindh, Pakistan.

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(Accepted for publication March 2024)