

***Indocucullanus kakari*, a New Species of the Genus *Indocucullanus* Ali, 1965 (Ascaridida: Cucullannidae) from Fresh Water Fishes found in Different Localities of River Zhob, Balochistan, Pakistan**

ASMAT SHAH KAKARABDULLAHZAI AND JUMA KHAN KAKARSULEMAUKHEL[†]

Cement Stockist Dealer, Tehsil Road, Zhob, Balochistan, Pakistan

[†]Sandflies-Leishmaniasis & Mosquitoes Lab. / Zoology, University of Balochistan, Quetta, Pakistan

¹Corresponding author's e-mail: jumakhankakar@yahoo.co.uk

ABSTRACT

This paper describes a new species *Indocucullanus kakari* of nematode of the genus *Indocucullanus* Ali, 1956 from fresh water fishes of the River Zhob (Balochistan).

Key Words: *Indocucullanus*; Nematode; River Zhob

INTRODUCTION

Parasitic survey of fish fauna of the river Zhob, Balochistan (Pakistan) was carried out by Kakarabdullahzai (2002) during 2001-2002. Further, a survey of fish fauna of river Zhob (Balochistan) was conducted by Kakarabdullahzai and Kakarsulemankhel (2004). During the survey of helminth parasites of fresh water fishes, 4 specimens (1 male, 3 female) of *Crossocheilus latius* Hamilton were collected from river Zhob at Badenzai (Balochistan). After careful preoccupation, it was revealed that they belong to a new species new to science. This species is described here and is named *Indocucullanus kakari*, the name of the area from where it has been recorded first.

MATERIALS AND METHODS

The worms were washed in normal saline, fixed in hot 70% alcohol and preserved in glycerin alcohol. The worms were cleared in glycerin. Diagrams were made with the help of Camera Lucida. All the measurements are in millimeters (mm) unless otherwise specified.

The holotype specimens have been housed with the collection of the first author (ASK), Government High School, Mina Bazaar, Zhob, Balochistan.

Indocucullanus kakari, new species (Figs. 1-2)

Host: *Crossocheilus latius* (Hamilton) (Family Cyprinidae)

Location: Intestine

No. of specimens recovered: 1 male and 3 females from hosts.

No. of hosts examined: 225

Date of collection: 1.7.2001

Specimen number: ASK: 25, 27, 124, 125

Description. Based on 1 male and 3 females specimen

Medium sized worms with somewhat stiffed bodies, cylindrical in appearance, striations at anterior end more conspicuous but generally and gradually become faint toward the posterior region and less apart. Male worms were smaller than females. The anterior end is quite broader than the remaining body of the worm. The apical portion of the

anterior part of the head of male and female worm bears a conspicuous row (0.1366-0.2111 mm long) having about 57-85 fine, chitinous hard structures, sharply pointed at apex. But comparatively border (0.961 μ) at center and pointed at the base. Laterally, these structures are relatively longer (8.65-9.615 μ) but at the middle, are of shorter length (4.807-7.45 μ). Mouth is rounded and becomes narrower towards posterior. Two lateral lips bond the mouth. Body narrows gradually from post equatorial region to cloacal opening and finally becomes pointed at the posterior. Esophagus somewhat longer, muscular, club shaped and dilates interiorly to form pseudo-buccal capsule. Intestine is simple without any diverticula.

Male. (Fig. 1) The male worm is smaller than the females and measures 7 mm in length. Head is 0.19 mm broad, neck is 0.21 mm broad and the maximum width at the middle of the body is 0.35 mm. The muscular esophagus 0.7 mm long: anterior region 0.1 mm, middle region 0.09 mm, and posterior region 0.15 mm broader. From anterior region of the worm, nerve ring is at the 0.35 mm. Eight pairs of caudal papillae: 5 pairs are pre-anal and 3 pairs are post-anal. Spicule 0.47 mm long, 0.074 mm broader and stout with blunt proximal end. Tail small (0.35 mm) and somewhat pointed.

Female. (Fig. 2) are distinctly larger than males. Mature eggs bearing specimens are 0.0248-0.0372 by 0.0248-0.0273. Posterior end is tapering while the head is broader like that of male. Mouth region and lips of females are same as of male. Head diameter 0.19-0.26 mm. Esophagus muscular, club shaped measuring 0.95–1.2 mm long. Breadth of anterior muscular region 0.08 – 0.17 mm, middle region 0.07– 0.18 mm and posterior region 0.16–0.26. From anterior region of the worm, nerve ring is at the 0.35- 0.6 mm. Ratio of the Esophagus to the total body length is 1: 9.73: 9.89: 10.0. Vagina muscular, pad like structure, protruded outwards. Vulva opening situated at a distance 1: 2.08: 2.31: 2.94 from the posterior

extremity of the body. Small tail 0.35 – 0.45 mm roughly pointed and bears no spine like terminal structure.

DISCUSSION

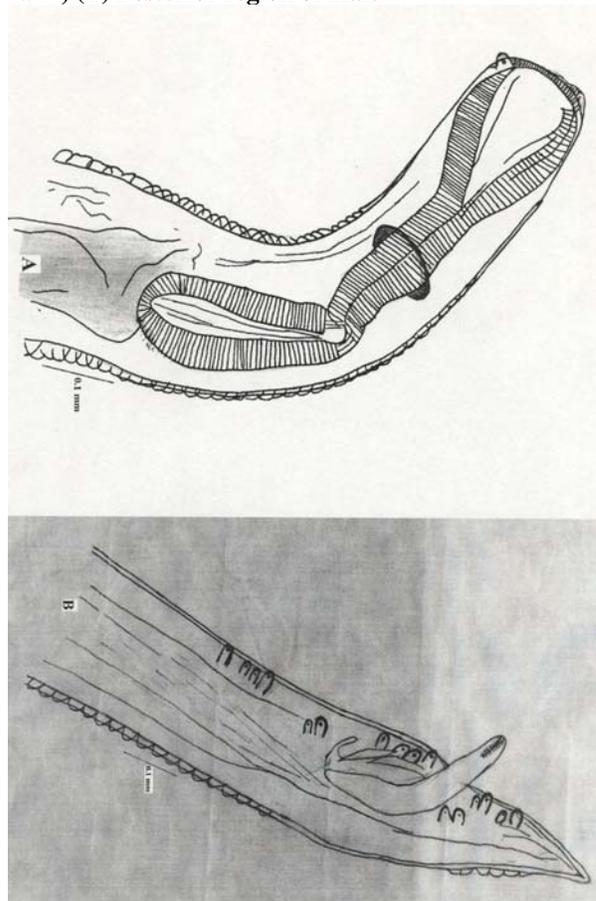
A great number of species belonging to the genus *Indocucullanus* has been described from various localities. These species are reported both from fresh water and marine fishes. Many species are reported from India and Pakistan viz; *Cucullanus jaiswarii* (Ali, 1957) Petter, 1974 syn. *Indocucullanus jaiswarii*, (Ali, 1957); Soota and Sarkar (1980), *C. arabianse* (Ali & Kalyankar, 1967) Petter, 1974 syn. *I. arabianse* (Ali & Kalyankar, 1967); *C. psudeutropi* Agarwal (1967). *I. longispiculum* (Khan, 1969). *C. alii*, (Petter, 1974) syn. *I. alii*, *C. jalnaensis*, (Petter, 1974) syn. *I. jalnaensis*, *C. malvanae* (Petter, 1974) syn. *I. malvanae* (Kalyankar, 1971); *I. calcariferii* (Zaidi & Khan, 1975); *I. guerreroi* (Arya & Johnson, 1975); *I. karachii* (Zaidi & Khan, 1975); *I. ariusi*; *I. puriensis*; (Srivastava & Gupta, 1976) *I. wertheimae* (Gupta & Garg, 1976) *I. sciaenai* (Gupta & Gupta, 1977) *I. longispiculum diacanthi* (Bilquees, 1980) *I. simhai*; *I. trichiurisi* (Gupta & Naqvi, 1983) *I. indica*; *I. thapari* (Gupta & Srivastava, 1984); and so on (Akram, 1997) described the evaluation of taxonomically important morphological characteristics of Cucullanids.

The present species are regarded un-described species of the genus as it is different from all the previous species. The male of the present species (7 by 0.35 mm) are larger as compared to *I. longispiculum*, (3.236-3.264 by 0.24-0.34 mm), *I. alii* (3.95 by 0.22 mm), *I. calcariferii* (2.58-2.98 by 0.203-0.260 mm), *I. karachii* (4.350-4.405 by 0.319-0.320 mm), *I. ariusi* (2.52 by 2.64 mm), *I. wertheimae* (4.95 by 0.17 mm), *I. thapari* (4.45-5.20 by 0.50-0.625 mm), while smaller as compared to *I. jaiswarii* (809 by 0.41mm), *I. arabiansae* (14.72 by 0.36 mm), *I. jalnaensis* (13.03 by 0.55 mm), *I. malvanae* (17.11 by 0.64 mm), *I. puriensis* (8.9 by 0.81 mm), *I. sciaenai* (9.25 by 0.29 mm), *I. simhai* (11.65-14.20 by 0.28-0.36 mm), *I. trichiurisi* (10.70 by 0.46 mm), *I. indica* (7.8- 8.4 by 0.375-0.40 mm).

The esophagus in the male (0.7 mm) is larger as compare with to *I. longispiculum* (0.503-0.598), *I. alii* (0.53 mm), *I. calcariferii* (0.542-0.611mm), *I. karachii* (0.099 mm), *I. ariusi* (0.61 mm), *I. wertheimae* (0.64 mm), *I. thapari* (0.65-0.72 mm) while smaller as compared to *I. jaiswarii* (0.94 mm), *I. arabiansae* (1.66 mm), *I. jalnaensis* (1.30 mm), *I. malvanae* (0.96 mm), *I. guerreroi* (0.85-0.95 mm), *I. puriensis* (1.0 mm), *I. sciena* (1.7 by 0.2 mm), *I. trichiurisi* (1.10 mm), *I. indica* (0.856- 0.900 mm). Similarly, females of the present species are larger (9.25-12.875 by 0.3-0.5 mm), *I. jaiswarii* (9.51 by 0.44 mm), *I. guerreroi* (14.15 by 0.21-0.24 mm), *I. puriensis* (15.13-16.38 by 0.45-0.61 mm), *I. sciaenai* (18.0 by 0.45 mm), *I. simhai* (13.70-17.25 by 0.27-0.33 mm), *I. trichiurisi* (17.15 by 0.55 mm).

The esophagus in the females are (0.525-1.2 mm) larger as compared to *I. longispiculum* (0.612-0.693 mm), *I.*

Fig. 1. (A) Anterior region of male *Indocucullanus kakri*, (B) Posterior region of male

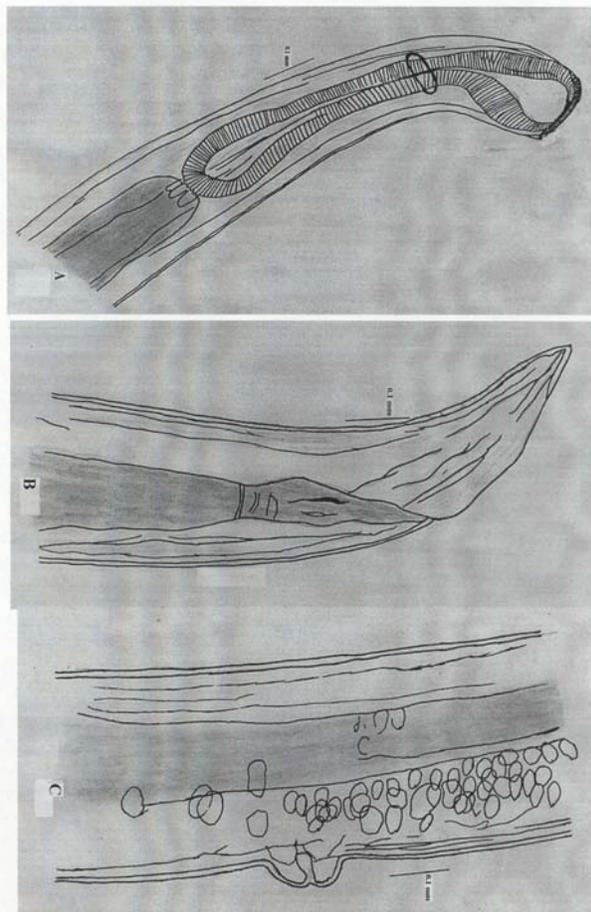


alii (0.55 mm), *I. calcariferii* (0.669-0.738 mm), *I. guerreroi* (0.85-0.95), *I. wertheimae* (0.65-0.76mm), *I. thapari* (0.82 mm), while smaller as compared to *I. puriensis* (1.37-1.52 mm), *I. sciaenai* (1.65 mm).

The tail in the male (0.35 mm), and in the females (0.35-0.45 mm), are longer as compared to *I. jaiswarii* (0.25 mm), (0.23 mm), *I. longispiculum* (0.018-0.122 mm), (0.095-0.163 mm), *I. alii* (0.1 mm), no female observed, *I. guerreroi* no male observed (0.18-0.19 mm), *I. ariusi* (0.154 mm), female not observed, *I. wertheimae* (0.12 mm) (0.12mm), *I. simhai* no male observed (0.14-0.21mm), *I. trichiurisi* male not observed (0.33 mm), *I. indica* (0.230-0.275 mm), (0.175-0.320 mm), *I. thapari* (0.15-0.17 mm) (0.33 mm).

The present specimen has spicule (0.47 mm) of characteristic shape in tail region while spicules of *I. jaiswarii*, *I. arabiansae*, *I. longispiculum*, *I. alii*, *I. jalnaensis*, *I. malvanae*, *I. calcariferii*, *I. guerreroi*, *I. karachii*, *I. ariusi*, *I. puriensis*, *I. wertheimae*, *I. sciaenai*, *I. simhai*, *I. trichiurisi*, *I. indica*, *I. thapari* are different in size and shape. In the present specimen, there are eight pairs of caudal papillae: 5 pairs are pre anal and three pairs are post anal in position. While *I. jaiswarii* 5 pairs caudal papillae, *I. arabiansae* 11 pairs, *I. longispiculum* 13 pairs, *I. alii* 9 pairs,

Fig. 2. (A) Anterior extremity of female *Indocucullanus kakari*, (B) Posterior extremity of female (C) Vulva region of female



I. jalnaensis 9 pairs, *I. malvanae* 11 pairs, *I. calcariferii* 4 pairs, *I. karachii* 12 pairs, *I. ariusi* 7 pairs, *I. puriensis* 9 pairs, *I. wertheimae* 5 pairs, *I. sciaenai* 8 pairs, *I. simhai* 6 pairs, *I. trichiurisi* 12 pairs, *I. Indica* 3 pairs, *I. thapari* 10 pairs of caudal papillae.

The eggs (0.0372-0.0248 by 0.0273-0.0248 mm) of present specimens are found larger as compared to eggs of *I. alii* eggs rounded (0.033-0.038 mm diameter), *I. guerreroi* eggs spherical (0.005-0.01 mm in diameter), *I. puriensis* eggs un-segmented (0.051-0.062 by 0.037-0.052 mm), *I. wertheimae* eggs (0.32-0.038 by 0.019-0.026 mm) thin smooth shelled, un-segmented, *I. simhai* eggs thick shelled, elongated, sickle-shaped (0.030-0.050 by 0.002-0.005 mm), *I. indica* eggs un-segmented (0.03-0.05 by 0.030-0.055 mm).

The eggs (0.0248-0.0372 by 0.0248-0.0273 mm) are smaller to *I. jaiswali* eggs thin shelled, un-segmented (0.065 by 0.055 mm), *I. calcariferii* eggs rounded, un-segmented (0.051-0.062 by 0.037-0.052 mm), *I. sciaenai* eggs un-segmented (0.055-0.065 by 0.038-0.053 mm), *I. trichiurisi* eggs thick-shelled oval (0.05-0.07 by 0.01-0.03 mm). The present species also differs from other described from

various parts of the world in a combination of characters such as number of papillae, location of papillae, egg size and spicule etc.

The above-mentioned differences when compared with the species reported, the present species is regarded as a new species with the specific name *Indocucullanus kakari*. The new species is named as it is collected in the locality of Kakar area.

REFERENCES

- Agarwal, V., 1967. Some new Camallanoidea (Spirurida) nematodes from fishes, Amphibians and Reptiles- *Annals Parasit. hum. Comp.*, 42: 327-42
- Akram, M., 1997. Evaluations of taxonomically important morphological characteristics of Cucullanids. *Kar. Univ. J. Sci.*, 25: 71-80
- Ali, S.M., 1957. Studies on the nematode parasites of fishes and birds found in Hyderabad state. *Indian J. Helminthol.*, 8: 1-83
- Ali, S.M. and S.D. Kalyankar, 1967. *Indocucullanus arabianse* n. sp. from the intestine of *Tachysurus maculatus* (Cat-fish) in India. *Indian J. Helminthol.*, 18: 74-6
- Arya, S.N. and S. Johnson, 1975. A new Cucullanid nematode from the fish *Cybbium guttatum* from Indian waters (Spiruroidea, Cucullanidae). *Memoria de la Sociedad de Ciencias Naturales la Salle*, 35: 291-5
- Bilquees, F.M., 1980. Marine Fish nematodes of Pakistan. Part XI. Occurrence of *Indocucullanus longispiculum diacanthi* in the fish *Arius serratus* (Day) of Karachi coast. *Pakistan J. Sci. Ind. Res.*, 23: 51-2
- Bilquees, F.M., H. Fatima and R. Rehana, 1977. Marine Fish nematodes of Pakistan. VII. Description of three species including two new nematodes. *Pakistan J. Zool.*, 9: 167-75
- Gupta, S.P. and R.C. Gupta, 1977. On some Nematode parasites of marine Fishes. *Indian J. Helminthol.*, 29: 104-12
- Gupta, N.K. and V.K. Garg, 1976. On two new spiruroid nematodes from marine food fishes in India. *Revista Iberica de Parasitologica Spain*, 36: 181-8
- Gupta, S.P. and N.H. Naqvi, 1983. Nematode parasites of Fishes - VII. On two new species of the genus *Indocucullanus* Ali, 1956 from fishes. *Indian J. Helminthol.*, 34: 78-85
- Gupta, S.P. and A.B. Srivastava, 1984. On three new nematode parasites (Nematoda: Cucullanidae) from Indian fishes. *Acta Parasitologica Polonica*, 29: 77-84
- Khan, D., 1969. A new species of *Indocucullanus* Ali 1957 from Pakistan. *Pakistan J. Zool.*, 1: 77-9
- Kalyankar, S.D., 1971. On some nematodes from India with the description of a new species (Ascaridoidea: Stomachidea). *Rivista de Parasitologica*, 33: 203-8
- Kakarsabdullahzai, A.S., 2002. Survey of Fishes and its parasitic diversity of River Zhob, Balochistan, Pakistan. *M.Sc. Thesis*, Department of Zoology, University of Balochistan, Quetta, Pakistan, p. 197
- Kakarabdullahzai, A.S. and J.K. Kakarsulemankhel, 2004. Additions to the Fish Fauna of the River Zhob, Balochistan, *Pakistan J. Biol. Sci.*, 4: 293-7
- Khan, D., 1969. A new species of *Indocucullanus* Ali, 1957 from Pakistan. *Pakistan J. Zool.*, 1: 77-9
- Petter, A.J., 1974. Eassai de classification de la famille des cucullanidae. *Bulletin du Museum National D. Histoire Naturelle*, 177: 1469-91
- Soota, T.D. and S.R. Dey Sarkar, 1980a. On three species of the nematode genus *Cucullanus* Mueller 1777, and a note on *Lappetascaris lutjani* Rohseid, 1965, from Indian marine fishes. *Records of the Zoological Survey of India*, 76: 1-6
- Srivastava, A.B. and S.P. Gupta, 1976. Nematode parasites of Fishes -II. On two new species of the genus *Indocucullanus* Ali, 1956. *Japanese J. Parasitol.*, 26: 46-8
- Zaidi, S.D.A. and D. Khan, 1975. Nematode parasites from fishes of Pakistan. *Pakistan J. Zool.*, 7: 51-73

(Received 01 December 2004; Accepted 20 May 2005)