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IOTONCHUS PRABHOOI SP. N. (MONONCHIDA-NEMATODA) A NEW PREDATORY NEMATODE FROM THE SOILS OF KERALA

IN a survey of the predatory nematodes in the soils of Kerala State a form of *Iotonchus* which does not fit into any known species of the genus has been collected and is described here as a new species. A few other predatory nematodes collected in the survey has been reported earlier[1,2].

Iotonchus prabhooi n.sp.

Paratypes, 14♀♀: L = 1·41–1·72 mm; a = 24–28; b = 3·6–3·9; c = 6·8–7·3; c' = 5·4–6·9; tail length = 0·20–0·25 mm, 13–14·6% of body length; V = 48–60; buccal cavity = 23–26 × 43–48 μm.

Holotype ♀: L = 1·69 mm; a = 28; b = 3·8; c = 7·3; c' = 6·1; tail length = 0·23 mm, 13·6% of body length; V = 60; buccal cabity = 24 × 48 μm. Ventrally arcuate on fixation. Maximum thickness of cuticle 4, 3 and 5 μm at neck, midbody and tail region respectively. Lip region slightly expanded, 14 μm high and 38 μm wide. Amphid opening very close to lip region, 4 μm wide and 6 μm from anterior end (7–10 μm in paratypes). Buccal cavity about twice as long as wide, wall about 2·5 μm thick. Dorsal tooth small, basal, 10–12 μm from base of stoma. Anterior surface of dorsal tooth concave and the posterior surface convex. Oblique subventral wall of the stoma with two small teeth. Nerve ring 144 μm from anterior end. Gonad didelphic; ovary reflexed; proximal portion of oviduct enlarged. Vagina short, less than half of vulval body-width. Cuticular pieces present at vulva. Tail arcuate, and conoid. Caudal glands three, its opening terminal.

Male : Not found.

Type habitat and locality : Soil around roots of rubber, Kottayam, collected on 31–12–1973.

Holotype and two paratype females deposited with National Collection of Nematodes, Zoological Survey of India, Calcutta and three paratype females deposited with National Nematodes Collection, Division of Nematology, I.A.R.I., New Delhi–12.

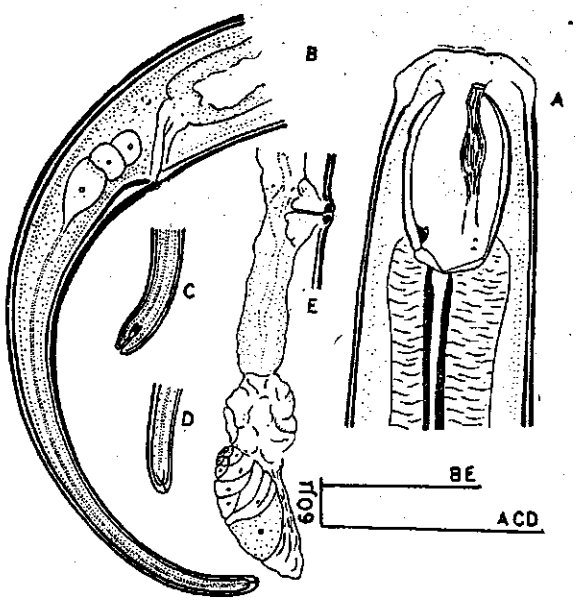

FIG. 1. *Iotonchus prabhooi* sp. n. female. A—anterior end; B—posterior end; C, D—tail tips; E—posterior gonad.

Differential diagnosis : This species resembles *I. basidontus* Clark[3], but differs in the absence of males, smaller body and smaller tail. (L = 1·8–2·4 mm and tail length = 0·26–0·36 mm in *I. basidontus*). This species also differs in the presence of caudal glands and spinneret which are obscure in *I. basidontus*. It also resembles *I. risoceiae* (Carvalho[4]). Andrássy, 1958 but differs in the shape and size of buccal cavity, smaller body and absence of males.

The species is named after Dr. N. R. Prabhoo, my teacher, in appreciation of his guidance and encouragement. Thanks are due to late Prof. K. K. Nayar and

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ADAPTIVE CHANGES IN THE BLOOD BICARBONATE LEVELS OF THREE AIR-BREATHING FISHES FOLLOWING AERIAL EXPOSURE

Introduction

FISHES, which depend upon water-breat' ing only, have very low carbon dioxide and bicarbonate concentrations in the blood. In water, the high solubility of carbon dioxide helps its release to a very great extent. But in the case of air-breathing fishes, when exposed to aerial conditions during torrid seasons, the elimination of carbon dioxide becomes a problem particularly in those fishes which have thick covering of scales. A rise in carbon dioxide tension in the blood then, would, result in a fall in blood pH, unless there is an adaptive increase in buffering capacity of the blood. Reduction in oxygen uptake and accumulation of lactic acid in blood of fishes following aerial exposure, further necessitates the operation of an efficient buffering mechanism to minimize the change in blood pH and delay the onset of physiological disturbances.

An adaptive increase in buffering capacity with increased importance of air-breathing in fishes is reported and bicarbonates acting as buffering agents in blood are demonstrated for a number of air-breathing fishes[1–5].

In the present investigation, an attempt is made to evaluate the operation of the buffering system by estimating the blood bicarbonate levels of three species of air-breathing fishes, *Anabas scandens* (Cuvier), *Ophiocephalus gachua* (Hamilton-Buchanan) and *Mystus vittatus* (Bloch) under normal and exposed conditions.

Materials and Method

The Climbing perch, *Anabas scandens* (Order : Acanthopterygii; Family : Anabantidae) inhabits tropical freshwater ponds (dissolved oxygen content, 1 to 8·5 ppm; pH, 7·6 to 8·0) with thick growth of vegetation, where the oxygen content will be greatly depleted, particularly during the nights in summer. *A. scandens* is reported to habitually leave the waters and migrate overland at times of danger from drought[6,7]. When out of water, the fish utilizes atmospheric oxygen, making use of the accessory respiratory organs consisting of suprabranchial chambers and labyrinthine organs[8].

The snake-headed fish, *Ophiocephalus gachua* (Order : Acanthopterygii; Family : Ophiocephalidae) is also a tropical fish living under habitat conditions similar to those of *A. scandens*. *O. gachua* is known to survive for prolonged periods out of water (about 18 hrs) and obtain oxygen from air using a pair of air chambers, dorsal to the branchial area and partly enclosed within the cavity of the skull[9].

The catfish, *Mystus vittatus* (Order : Physostomi; Family : Bagridae) is a fast swimmer, occurring in rivers and nearby ponds fed by those rivers and is not known to leave waters. It has no well-defined accessory air-breathing organs, though it is known to survive out of water for short periods (5–8 hrs) by breathing atmospheric air[10].

Samples of *A. scandens* (size range : 16–30 g), *O. gachua* (size range : 16–35 g) and *M. vittatus* (size range : 9–16 g), collected from local ponds, were maintained in separate cement cisterns at 28 ± 1° C and fed with boiled eggs and earthworms alternatively, every two days. Feeding was stopped one day before the fishes were used in the experiments.

Fishes were removed from the cement cisterns and the blood samples for estimation of bicarbonate levels were collected from ductus Cuvier as described by Hawk *et al.*[11]. Microtitration method[11] was employed for the estimation of bicarbonate levels in the blood.

Bicarbonate levels of blood were estimated in *A. scandens* and *O. gachua* before and after exposure to aerial conditions for 5 and 10 hrs and in *M. vittatus* before and after exposure for only 5 hrs (since the fish survived out of water for only 5 to 8 hrs). Exposure of fishes was carried out by keeping individual fishes separately in empty glass jars (at 28 ± 1° C and 80% R.H.) covered by wire gauze for aeration.

Bicarbonate levels of blood were estimated and expressed in mM per litre of plasma (mM/l) and the changes observed in the blood of fishes under different experimental conditions were statistically tested for their significance, using Student's '*t*' test at 5% level. Mean values of bicarbonate levels, under each experimental condition, were obtained from 8 estimations for each species.