

## Cestode Fauna of Hill-Stream Fishes in Garhwal Himalayas, India

VI. *Ptychobothrium nayarensis* n. sp. from *Barilius bola* (Ham.) and  
*Schizothorax richardsonii* (Gray)\*

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### INTRODUCTION

The available literature records several revised schemes of classification of cestode of the order Pseudophyllidea Carus (1863) (Yamaguti, 1959; Tadros, 1966; Freze, 1974; Protasova, 1974). Recently Wardle, McLeod and Radinovsky (1974) recognised class Cotyloda Wardle *et al.* (1974) to include order Pseudophyllidea with families Ptychobothriidae Lühe (1902), Bothriocephalidae Blanchard (1849) emend. Wardle *et al.* (1974) and Triaenophoridae Lönnberg (1889) emend. (Triaenophorinae Lühe, 1899); order Diphyllidea n. ord. Wardle *et al.* (1974) with family Diphyllbothriidae Lühe (1910); and class Eucestoda Southwell (1930) to include order Lecanicephalidae Baylis (1920) with family Tetragonocephalidae Yamaguti (1959). The morphological studies of the collected specimens revealed them to belong to genus *Ptychobothrium* Lönnberg (1889) of family Ptychobothriidae, order Pseudophyllidea. Recently Malhotra (1981) proposed systems models suggesting parasite pathways by *P. nayarensis* n. sp. in hill-stream fishes.

### MATERIALS AND METHODS

Four of the 114 *Barilius bola* (Ham.) and

nine of the 205 *Schizothorax richardsonii* (Gray) examined for cestode infection at 325-750 mASL in River East and West Nayar in District Pauri-Garhwal, India harboured 28 mature tapeworms. Specimens were fixed in aqueous Bouin's solution; stained in haemalum; cleared in xylol, and mounted in canada balsam. The measurements are in millimeters unless otherwise stated; mean in parentheses. Camera lucida drawings were prepared. Polythetic divisive classificatory system (Malhotra, Dixit and Kapoor, 1981) was applied for the assessment of taxometric variations.

### RESULTS

*Ptychobothrium nayarensis* n. sp.  
 (Figs. 1-5)

Cestodes small, 12-27 (17.667) × 1.131 in size. Scolex, 0.652-1.25 (1.223) × 0.434~1.241 (1.156), unarmed, distinctly heart-shaped with an apical disc (Fig. 1). Apical disc, 0.156~0.234 (0.198) × 0.221~0.377 (0.306). Bothria well developed, distinctly 3-4 lobed, measure 0.403~0.98 (0.646) × 0.091~0.50 (0.417). Neck absent. External segmentation present but may be obliterated by secondary segmentation. Immature, mature (Fig. 2) and gravid proglottids (Figs. 3, 4), 0.011~0.195 (0.15) × 0.301~0.715 (0.66), 0.208~0.517 (0.338) × 0.924~1.631 (1.028) and 0.216~

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0.65 (0.477) × 0.443~1.605 (0.975) respectively. Proglottids wider than long. Testes 52-78 (66) in number and measure, 0.026~0.079 (0.033) × 0.019~0.109 (0.05). Testes lie in dorsal medulla in two lateral groups. Vas deferens 0.005~0.018(0.01) in diameter, forms a few coils before entering into cirrus pouch. Cirrus pouch somewhat pyriform (Fig. 5), 0.05~0.343 (0.273) × 0.04~0.165 (0.054), thick walled. Thickness of the wall of the cirrus pouch 0.009~0.072 (0.066). Proximal end of cirrus pouch not surrounded by gland cells. Cirrus coiled inside cirrus pouch and measure 0.011~0.028 (0.025) in diameter. Internal seminal vesicle absent. Cirrovaginal pore in mid-dorsal line anterior to ovary, 'V' shaped, 0.012~0.156 (0.104) × 0.105~0.273 (0.234) located near the posterior border of proglottid. Vagina straight tube, 0.007~0.023 in diameter. Receptaculum seminis, 0.074~0.104 (0.098) × 0.029~0.12(0.035). Vitelline follicles measure 0.009~0.076 (0.018) × 0.01~0.099 (0.026), numerous, cortical and in 2 lateral groups. Uterine duct, 0.019~0.155(0.144) in diameter, follows 'S' shaped course before forming a uterine sac near the anterior margin of proglottids. Uterine sac, 0.038~0.154 (0.081) × 0.042~0.231 (0.106). Uterine sac opens on the ventral side by the side of median line of proglottids. Eggs operculate, elliptical, 0.01~0.046 (0.018) × 0.01~0.049 (0.029). Oncosphere, 0.005~0.019 (0.01) × 0.013~0.026 (0.019).

Excretory vessels 6 pairs in number. The

**Table 1.** Values of various coefficients between *Ptychobothrium nayarensis* n. sp. *vis-a-vis* close species

	<i>P. belones</i>		
	L	W	No.
Coefficient of dissimilarity			
Eggs	0.231	0.304	—
Mean character difference			
Eggs	0.437	0.481	—
Coefficient of divergence			
Eggs	2.556	2.666	—
Excretory vessels	—	—	2.714

values of various coefficients between the new species *vis-a-vis* close species are given in Table 1.

## DISCUSSION

The new species comes closer to *P. belones* (Dujardin, 1845) Löennberg (1889) but differs from it in presence of an apical disc at the anterior end of scolex, less wider proglottids in relation to their length, larger number of excretory vessels, a 'V' shaped bilobed ovary, vitelline follicles in lateral cortical fields leaving only median area free, smaller, operculate and elliptical eggs.

In view of the above mentioned significant points of difference/the substantiated taxometrically present form is being considered as a new species *Ptychobothrium nayarensis* n. sp., named after the river from which the collections were made.

Host —*Barilius bola* (Ham.) and *Schizothorax richardsonii* (Gray)

Habitat —Stomach and anterior part of intestine.

Locality —River East and West Nayar, District Pauri-Garhwal, U.P., India.

Holotype—Holotype slide no. PCLS 041/81 deposited with the Parasitology Laboratory, Department of Zoology, University of Garhwal, Srinagar (Garhwal) 246 174, U.P.

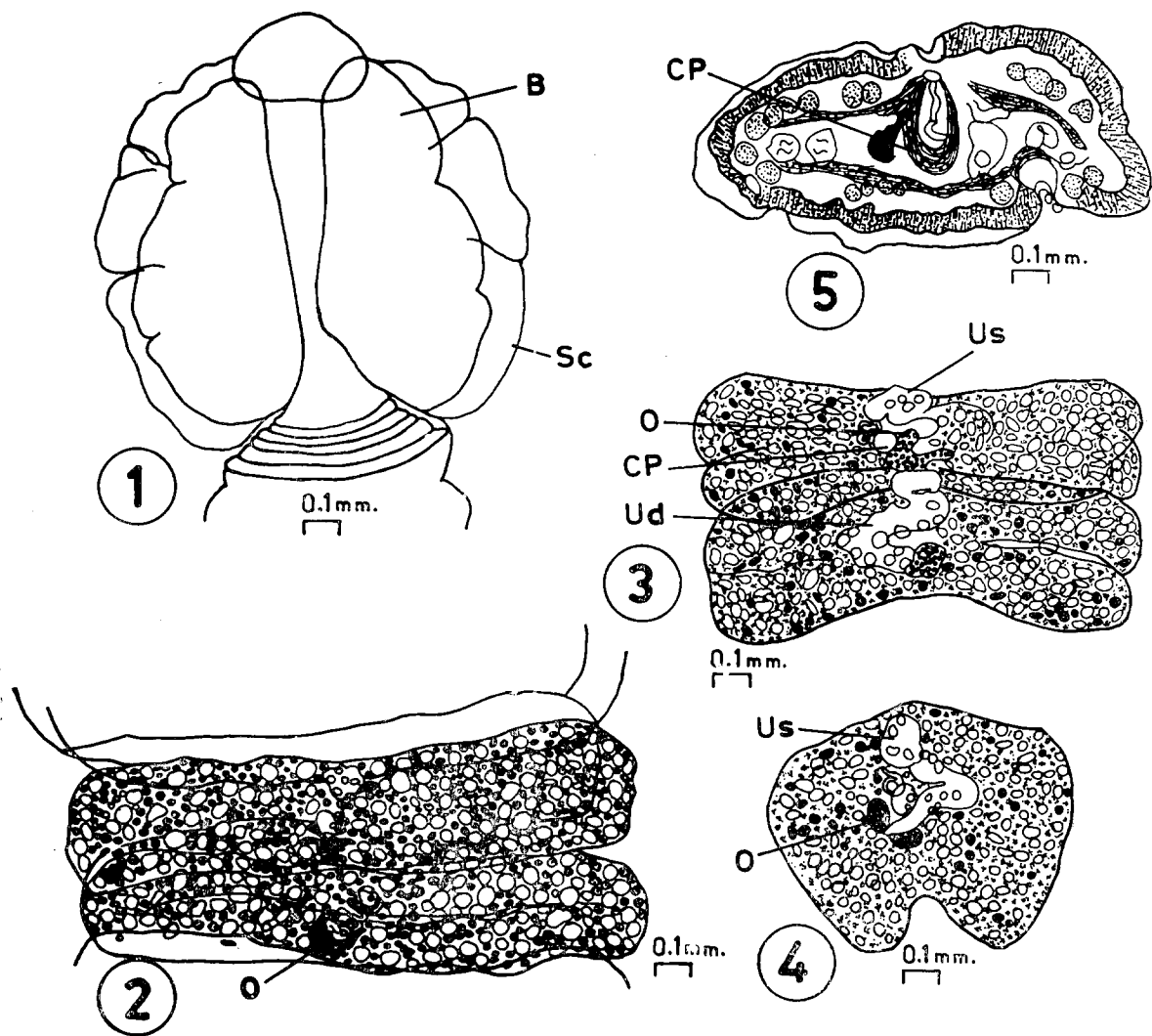
## ABSTRACT

*Ptychobothrium nayarensis* n. sp. has been described from two hill-stream fishes, *Barilius bola*(Ham.) and *Schizothorax richardsonii*(Gray) at 325~750 mASL. The new species has been compared with close species. Taxometric evaluation of the new species has been done on available data.

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**EXPLANATION OF FIGURES**

**Figs. 1-5.** *Ptychobothrium nayarensis* n. sp. (1) scolex  $\times 10$  (2) mature proglottids  $\times 10$  (3) gravid proglottids  $\times 10$  (4) last gravid proglottid  $\times 10$  (5) T.S. through a mature proglottid showing location of cirrovaginal pore and uterine aperture  $\times 10$

Abbreviations

B, bothria; Cp, cirrus pouch; O, ovary; Sc, scolex; Ud, uterine duct; Us, uterine sac.