

TWO NEW SPECIES OF *HERMILIUS* (COPEPODA : CALIGIDAE) FROM KERALA

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ABSTRACT

During the course of a detailed survey of the Kerala Coast the author collected two new species *Hermilius alatus* sp. nov. and *Hermilius pseudari* sp. nov. belonging to Caligid genus *Hermilius* Heller, 1865. *Hermilius alatus* was obtained from the gills of *Pseudarius jella* (Day) and *Arius acutirostris* (Valenciennes) at Trivandrum whereas *Hermilius pseudari* was collected only from *Pseudarius jella* (Day). The two new species are described in detail comparing with all the related species in this genus. A key is provided for the identification of all the six species hitherto recorded.

INTRODUCTION

Hermilius is an interesting genus in the family Caligidae parasitic on catfishes. The carapace usually got folded along the middorsal region making it like the shells of a bivalve mollusc attached firmly on the gills. The highly modified second antennae help the parasite to hold strongly on the mucus covered gill filaments. The two species are described and illustrated here.

I have great pleasure to record my gratitude to Dr. N. Krishna Pillai, Dept. of Aquatic Biology and Fisheries, Trivandrum for the encouragement and helpful guidance rendered during the course of this study.

DESCRIPTION

Genus *Hermilius* Heller

Hermilius Heller, 1865, p. 186; Basset-Smith 1899, p. 445; Barnard, 1955, p. 100; Pillai, 1962, p. 180; Kabata, 1964, p. 617; Hameed and Pillai, 1972, p. 209.

So far four species of *Hermilius* namely *H. pyrivenstris* Heller (1865), *H. longicornis* Basset-Smith (1898), *H. helleri* Pillai (1962), *H. youngi* Kabata (1964) have been recorded. *H. armatus* Capart (1959) is considered as synonym of *H. pyrivenstris* Heller. The present

paper adds two more species *H. pseudari* and *H. alatus*.

Pillai (1962) and Kabata (1964) revised the genus *Hermilius* giving revised definitions and provided key for the identification of the species known then. Hameed and Pillai (1972) described for the first time the male of the genus *Hermilius*. In the light of the description of the unknown male and the present discovery of the two new species a revised definition of the genus *Hermilius* together with a key for identification of all the species is given.

Female: Cephalothorax folded along the mid-dorsal line like the shells of a bivalve mollusc, dorsal ribs many, radiating from the centre, lateral borders with one or more pairs of incisions and ventrally frilled, membranous flange normally developed. Frontal plates indistinct and slanting medially, without lunules. Fourth thoracic segment not distinct, genital segment unusually large, abdomen one or two-segmented, anal laminae with setae, normal or modified. First antenna normally developed. Second antenna very large, three to four-segmented, with an accessory claw. First maxilla absent, second maxilla large. First maxilliped rather degenerated, with very short end claws. Second maxilliped rather slender, distal segment

with an unguis. Sternal fork present. Thoracic appendages as in *Caligus*. Claws of exopod of first leg winged, apron of third leg reduced, fourth leg rather degenerated, one to two-segmented.

Male : Carapace similar to that of female, frontal plates slightly more prominent than in female. Fourth thoracic segment distinct, genital segment long and subcylindrical, anal laminae with normal setae. Appendages similar to those of female, fourth leg three-segmented (in the only species known) with strong claws.

The six species hitherto recorded can be distinguished thus.

- | | |
|--|--------------------|
| 1a. Second antenna 3 segmented | 2 |
| 1b. Second antenna 4 segmented | 3 |
| 2a. Abdomen 2 segmented | <i>longicornis</i> |
| 2b. Abdomen 1 segmented | 4 |
| 3a. Abdomen 1 segmented | <i>pseudari</i> |
| 3b. Abdomen 2 segmented | 5 |
| 4a. Rami of sternal fork narrowed and not winged | <i>youngi</i> |
| 4b. Rami of sternal fork winged | <i>alatus</i> |
| 5a. Genital segment ovate or oblong.. | <i>pyriventris</i> |
| 5b. Genital segment abruptly constricted behind | <i>helleri</i> |

The species of *Hermilius* show such monotonous uniformity in the morphological characters that specific identification is based on the segmentation of the second antenna, fourth leg and abdomen. Even in these there is some ambiguity as in *H. youngi* Kabata where the abdomen can be described as unsegmented or indistinctly segmented. This similarity is not very surprising since all the known species parasitise catfishes of the genera *Arius*, *Ariodes*, *Pseudarius*, *Neoarius*, *Netuma* and *Galeichthys*. This definite preferences for a group of closely related host genera has induced the develop-

ment of identical characters. It is also very unusual for a caligid to cling on to the gill filaments of the host as *Hermilius* does.

Hermilius alatus sp. nov.

Material: Six females from the gills of *Pseudarius jella* (Day) and five females from the gills of *Arius acutirostris* (Val.) examined. at Trivandrum.

The holotype female will be deposited in the Indian Museum, Calcutta, India.

Female: Carapace (Fig. 1 a) broader than long, with two pairs of antero-lateral indentations. Frontal plates indistinct, slanting towards the antero-median part, membranous flange broad, lunules absent. Dorsal side of carapace with very prominent ribs radiating from the centre. Posterior sinuses narrow, but deep. Posteromedian lobe of carapace narrower than lateral lobes. Membranous flange of carapace narrow, a frilled surface bordering the carapace ventro-laterally. Fourth thoracic segment short, much broader than long, more or less fused with the genital segment. Genital segment swollen, as long as carapace, narrowing forward, postero-laterally rounded. Abdomen one-segmented, longer than broad; anal laminae stout, longer than broad, with six plumose setae.

Basal segment of first antenna (Fig. 1 b) with stout pectinate setae, distal segment with a terminal bunch of slender naked setae. Second antenna (Fig. 1 c) three-segmented, first segment small and partially fused with the carapace, second segment stout, with corrugated inner surface, third segment very long, with a small inner basal process, apically curved and with a strong equally large distal accessory claw almost at the beginning of the curve. First maxilla absent. Second maxilla (Fig. 1 d) elongate, triangular, proximal inner corner produced, apex with a thin flange; palp with one long and two short setae. First maxilliped (Fig. 1 e) small, first segment stout, distal claws of terminal segment well

developed and winged, proximal claw comparatively very small. Basal segment of second maxilliped (Fig. 2 a) comparatively long and slender, second segment narrow, shorter than first, with a clearly demarcated unguis carrying a small tooth near its base, unguis with sub-

seta. Vestigial endopod (Fig. 2 d) large, oblong and spiny. Second segment of exopod (Fig. 2 e) with three claws, a very short spine and three plumose setae. First claw very long, as long as the first and second segment of the exopod combined, second claw as long as the first

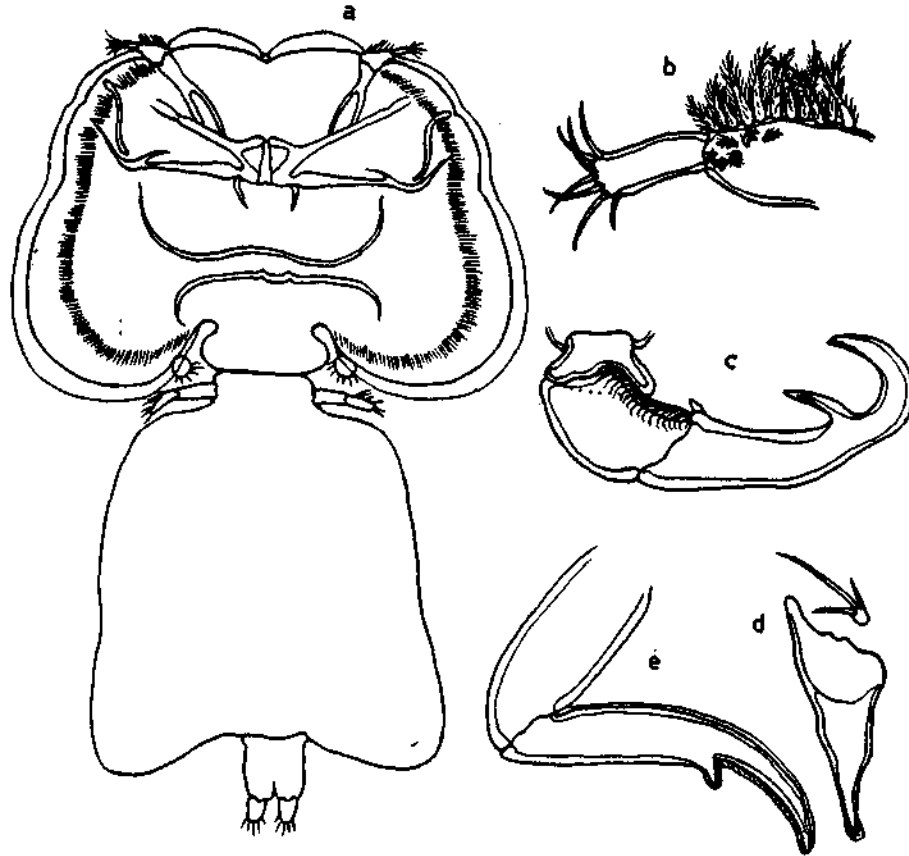


Fig. 1. *Hermilus alatus* sp. nov. female : a. dorsal view; b. First antenna; c. Second antenna; d. Second maxilla and e. First maxilliped.

apical inner indentation. Base of the sternal fork (Fig. 2 b) highly swollen, rami diverging, with very broad wings.

Basipod of first leg (Fig. 2 c) strongly spiny, with a pectinate outer seta and a small lower

segment of the exopod, third claw slightly more than half the length of the second claw, each claw with a curved trigger-like apical process and with frilled ventral flange. Exopod of second leg (Fig. 2 g) three-segmented, each segment with a winged claw, third claw com-

paratively long, first seta of third segment fully winged, second winged externally. Segments of endopod (Fig. 2 h) with rows of minute spinules along the outer border. Basal claw of exopod of third leg (Fig. 3 a) curved and externally winged, rami broad and overlapping.

Remarks: In the absence of a partition beyond the accessory claw of the penultimate segment of the second antenna, *H. alatus* sp. nov. resembles *H. longicornis* Bassett-Smith (1898) and *H. youngi* Kabata (1964). *H. longicornis* shows further resemblance in

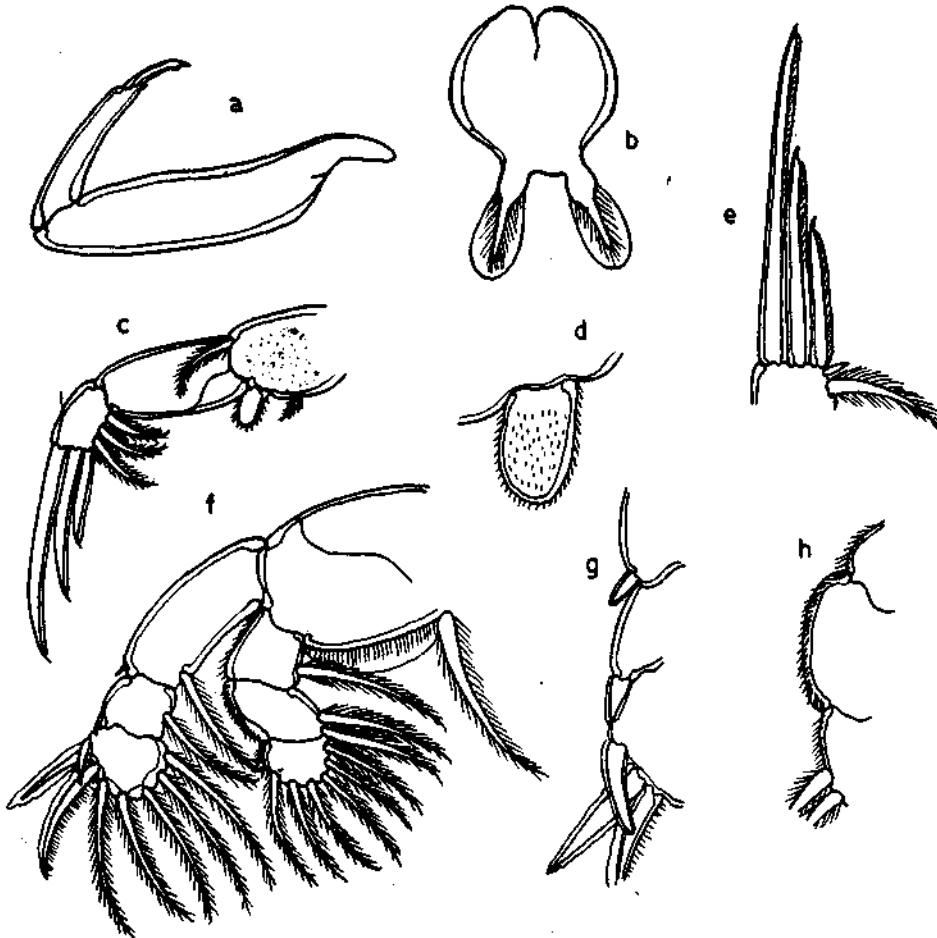


Fig. 2. *Hermilius alatus* sp. nov. female: a. Second maxilliped; b. Sternal fork; c. First leg; d. Same endopod; e. same, tip enlarged; f. second leg; g. same, exopod and h. same, endopod.

Fourth leg (Fig. 3 b) small, two-segmented, basal segment stout and longer than distal, carrying a ventral distal plumose seta, distal segment with three apical and one subapical winged claws. Total length 2.5 mm.

the shape of the basal claw of the exopod of the third leg and in the structure of the fourth leg. But in the new species the abdomen is one-segmented whereas it is two-segmented in *H. longicornis*. In the shape of the genital

segment and the sternal fork this species differs very widely.

The abdomen of *H. youngi* is one-segmented as in *H. alatus*, but in the former the fourth leg is vestigial and one-segmented, but two-segmented and fairly prominent in *H. alatus*.

***Hermilius pseudari* sp. nov.**

Material: Five females were collected from the gill filaments of *Pseudartius jella* (Day) at Trivandrum.

The holotype female will be deposited

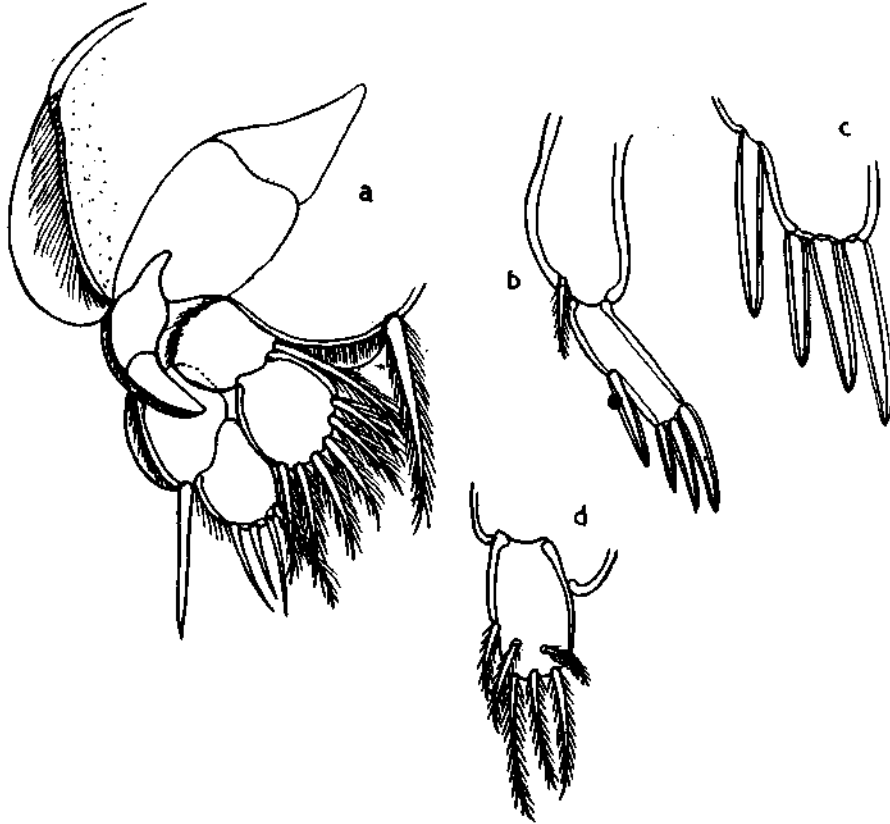


Fig. 3. *Hermilius alatus* sp. nov. female: a. Third leg, b. Fourth leg; c. same, tip enlarged and d. Anal lamina.

In *H. youngi* the rami of the sternal fork diverge and attenuate towards the tip, but in this species the rami are apically blunt and carry prominent wings. In fact the sternal fork of this species is very characteristic.

in the Indian Museum, Calcutta, India.

Female: Carapace (Fig. 4 a) slightly broader than long, frontal plates ill defined, lunules absent. Dorsal ribs of carapace very prominent.

radiating from the centre. Posterior sinuses wide open, median lobe of carapace nearly as broad as lateral lobes and very slightly

segment much broader than long. Genital segment pyriform, regularly narrowing backwards. Abdomen very long, one-segmented,

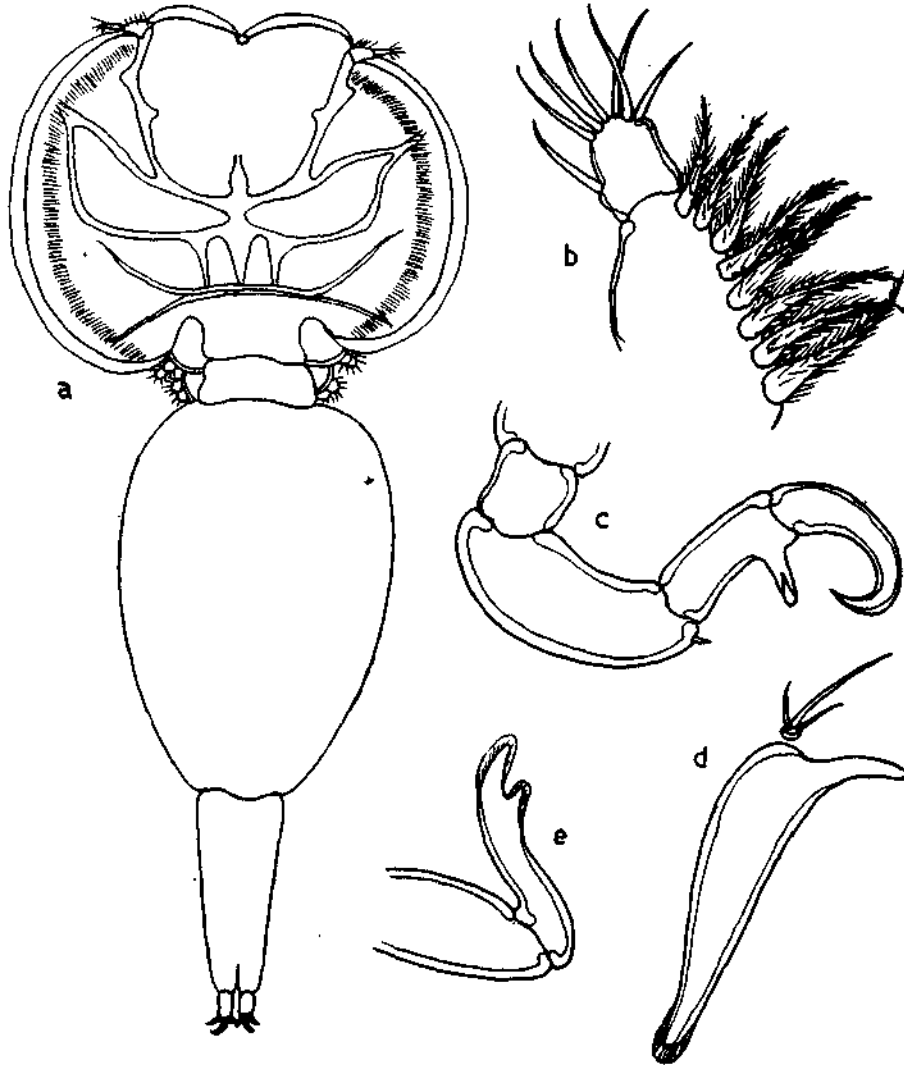


Fig. 4. *Hermilius pseudari* sp. nov. female: a. Dorsal view; b. First antenna; c. Second antenna; d. Second maxilla and e. First maxilliped.

overreaching the latter. Membranous flange of carapace narrow, lateral parts of carapace having frilled ventral surface. Fourth thoracic

anal laminae longer than broad, carrying three curved claws, and an inner and outer plumose setae.

Basal segment of first antenna (Fig. 4 b) antenna (Fig. 4 c) stout, with a small spinule very stout, with long stout pectinate setae, at the anterior distal part, third segment



Fig. 5. *Hermiltus pseudari* sp. nov. female: a. Second maxilliped; b. same, tip enlarged; c. sternal fork; d. First leg; e. same, endopod; f. same, tip enlarged and endopod; g. Second leg.

distal segment small, bearing a bunch of naked terminal setae. Basal segment of second long, bearing a strong curved distal accessory claw, fourth segment equal in length to third

and strongly curved at the tip. First maxilla absent. Second maxilla (Fig. 4 d) elongate-conical, bearing a long claw-like process at the proximal inner part, apex covered with a very thin flange; palp carrying one long and two short setae. First maxilliped (Fig. 4 e)

unguis, latter with a subapical inner indentation. Bas of sternal fork (Fig. 5 b) broad, rami roughly cylindrical and strongly diverging, with thin apical flange.

Basipod of first leg (Fig. 5 d) stout, with a

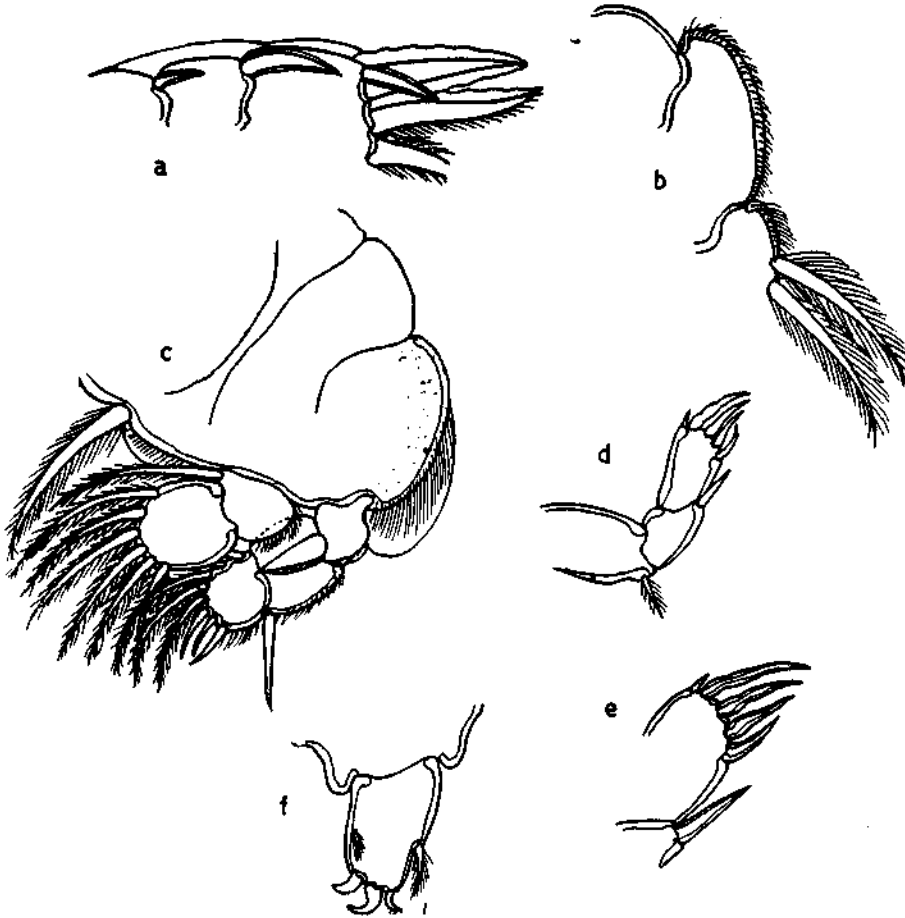


Fig. 6. *Hermilius pseudari* sp. nov. female : a. Second leg exopod; b. same, endopod; c. Third leg; d. Fourth leg; e. same, tip enlarged and f. Anal lamina.

comparatively very small, segments equal in length second segment with two distal processes covered with thin flange. Basal segment of second maxilliped (Fig. 5 a) stout and much longer than distal, distal segment produced into a prominent tooth at the base of the

long pectinate upper seta and a small lower seta. Vestigial endopod (Fig. 5 e) large, oblong and spiny, terminal segment of exopod (Fig. 5 f) with three long distal claws, an upper and lower very short spine and three plumose setae; the claws successively decreasing in

length and each with a ventral frill beyond which the claw proper is produced as a hook. Exopod of second leg (Fig. 5 g, 6 a) three-segmented, each segment with a winged claw, first claw small, first two setae of third segment modified. Second and third segments of endopod (Fig. 6 b) carrying spinules along the outer border. Basal claw of exopod of third leg (Fig. 6 c) straight and winged externally, rami broad, lower outer part of apron spiny. Fourth leg (Fig. 6 d) three-segmented, first segment as long as second and third segments combined, with a ventral distal plumose seta, second and third segments subequal in length, former with one and latter with four claws and a small spinule. Total length, 2.7 mm.

Remarks: *H. pseudari* sp. nov. resembles *H. pyriventris* Heller (1865) and *H. helleri* Pillai (1962). The second antenna, second maxilla, first and second maxillipeds and anal laminae of *H. pyriventris* are identical

with those of the present species. But in *H. pyriventris* the genital segment is oval and the abdomen is short and two-segmented whereas in *H. pseudari* the genital segment narrows posteriorly and the abdomen is one-segmented and very long. The sternal fork in the present species is totally different from that of *H. pyriventris* and the fourth leg is clearly three-segmented against two-segmented in *H. pyriventris*. In the shape of the genital segment and in the nature of the appendages *H. helleri* closely resembles *H. pseudari*. But in the former the abdomen is short and indistinctly two-segmented. In *H. pseudari* the fourth leg is three-segmented and armed with five claws whereas in *H. helleri* it is two-segmented and carries four claws. The comparatively very long one-segmented abdomen and the distinctly three-segmented fourth leg easily distinguish *H. pseudari* from all the known species.

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