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STUDIES ON INDIAN CALANOIDS V. OCCURRENCE OF TROPODIAPTOMUS AUSTRALIS KIEFER (COPEPODA : DIAPTOMIDAE) IN THE ANDAMAN AND NICOBAR ISLANDS, INDIA.

TUSHARENDU ROY
Zoological Survey of India, Calcutta - 700 016

INTRODUCTION

The genus *Tropodiaptomus* was created by Kiefer (1932) to accommodate *Diaptomus orientalis* Brady, 1886 originally collected from Ceylon. This genus now includes forty six species (Roy, 1984) out of which the following nine have been recorded from India. These are : *T. dorai* (Richard, 1894); *T hebereri* Kiefer, 1930; *T mutatus* Kiefer, 1930; *T vicinus* Kiefer, 1930; *T. euchaetus* Kiefer, 1936; *T. informis* Kiefer, 1936; *T. nielseni* Brehm, 1953; *T lakhimpurensis* Reddiah, 1964 and *T chauhani* Roy (lit. cit.). The present discovery increases the number of Indian species to ten.

The specimens described herein were collected by the author in the Andaman and Nicobar Islands on September 25, 1972 during the faunistic survey of the Islands by the Zoological Survey of India. The first collection of 6 females and 3 males was obtained by towing a plankton net in a small temporary pool, 94 sq. metres in area and 1 metre in depth. None of the females carried egg sacs or attached spermatophores. One of the males had a spermatophores attached to the tip of the left fifth leg.

Tropodiaptomus australis Kiefer

(Figures : 1 a-d, adult female; e-h, adult male)

(?) *Diaptomus orientalis* Brady (nomen dubium), 1886, p. 296; De Guerne and Richard, 1889, pp. 81-83 (partim); Daday, 1898,p. 22; Tollinger, 1911, p. 50 (partim).

Diaptomus orientalis Sars, 1889, pp. 59-68; 1903, pp. 16-17; De Guerne and Richard, 1889, pp. 81-83 (partim), figs. 25-27; Tollinger, 1911 P. 50 (partim); Grochmalicki, 1915, p. 228; Henry, 1922, pp. 554-555; Bayly, 1961, p. 88.

Tropodiaptomus orientalis (Sars) Kiefer, 1932,pp. 466-467.

Tropodiaptomus australis Kiefer, nomen novum, 1936, pp. 79-81.

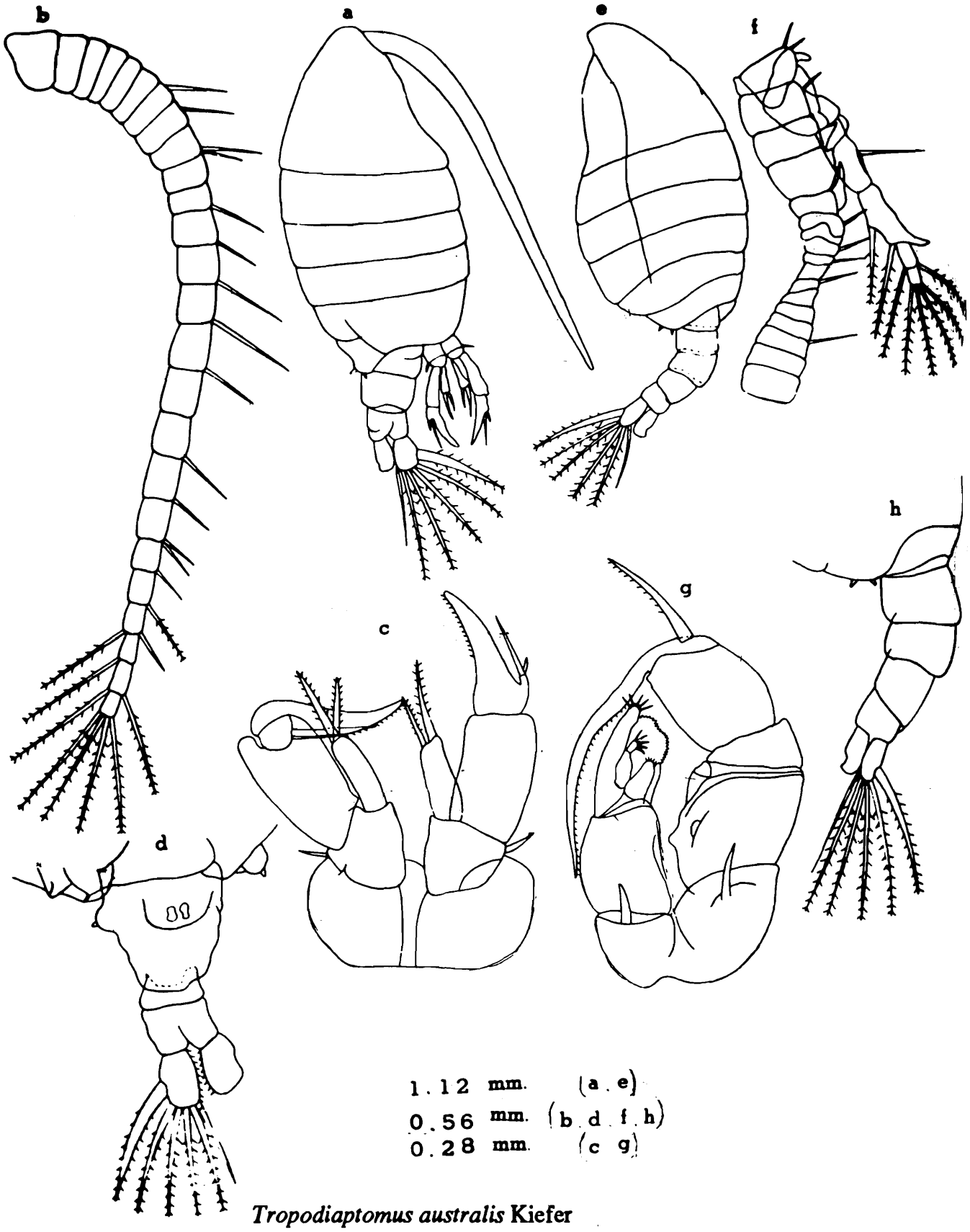
Diaptomus (Tropodiaptomus) australis (Kiefer). Bayly, 1966, pp.127-131.

(Non) *Diaptomus orientalis* Brady. Cooper, 1906, p. 97; Tollinger, 1911, p.50 (partim).

(Non) *Diaptomus orientalis* Brady. Kiefer, 1930, pp. 120-122.

(*Tropodiaptomus mutatus* Kiefer, nomen novum, 1936, p. 81).

Material : 4 exs., Z.S.I. Regd. No. C3235/2 (3 Females, 1 Male), T. Roy,26.9.1972, Small pool on the road side of Malacca village (Car Nicobar) about 2 furlongs away from the Govt. Rest House, Andaman & Nicobar Islands, INDIA.



Tropodiaptomus australis Kiefer

Fig. 1. (a -h), a -d, adult female; e - h, adult male a. dorsal view; b. antennule; c. fifth pair of legs; d. urosome with last thoracic segment e. dorso-lateral view; f. right antennule; g. fifth pair of legs; h. urosome with last thoracic segment'

Description of the adult female :

Total length excluding caudal setae is 1.63 mm.The wings of the last thoracic segment (fig. a) are symmetrical, with a larger distal lobe on either side. The prosome is nearly 4 times longer than the urosome. The urosome (fig. d) is three-segmented. The genital segment is the largest and has a swelling on the left side which carries a small lamella and a small sensilla on the right side. The second segment is the smallest. Each caudal ramus bears six setae. The setae are equal in size and plumose except the inner most which is shorter and thinner than the rest and naked. This seta has a weakly sclerotised knee a short distance from the base. The inner margin of the caudal rami is hairy. The proportional lengths of the urosomal esgments are as follows :

Segments	–1	–2	–3	caudal rami	
	48	9	20	23	= 100

The antennule :

The first antennule (fig.b) consisting of 25 segments. The proportionate lengths of the segments are as follows :

Segments	1	:	2	:	3	:	4	:	5	:	6	:
	66	:	41	:	24	:	24	:	24	:	29	:
	7	:	8	:	9	:	10	:	11	:	12	:
	29	:	35	:	41	:	35	:	29	:	47	:
	13	:	14	:	15	:	16	:	17	:	18	:
	47	:	47	:	59	:	59	:	53	:	48	:
	19	:	20	:	21	:	22	:	23	:	24	:
	47	:	35	:	41	:	35	:	35	:	41	:

$\frac{25}{29} = 1000$

Fifth leg :

The fifth legs (fig. e) are symmetrical with two segmented protopod, two segmented exopod and one segmented endopod on their right and left legs.

The right fifth leg :

It (fig. c) consists of two segmented protopod, two segmented expod and one segmented endopod. The proximal segment is nearly circular and larger than the other segment of the protopod. The proximal part of the claw is wider and posseses two unequal spines on its outer edge. The inner spine is nearly four times longer than the outer spine. The half of the margin of the claw is finely serrated. The endopod is nearly 2/3rd length of the first exopod which is cylindrical and its tip with two unequal setae with serrations.

The left fifth leg :

The left fifth leg (fig. c) is almost identical in shape and structure of the right fifth leg. It also bears equal number of segment as in the right leg.

Description of the adult male

Total length of the male (fig. e) excluding the caudal setae is 1.59mm. The wings of the metasomal segment are symmetrical without prominent lobes. The left lobe bears two small spines laterally. The urosome (fig. h) is five segmented. The proportionate lengths of the segments are as follows :

Segments	–1	-2	–3	–4	–5	caudal rami	
	14	20	18	21	11	16	= 100

The caudal rami are symmetrical. Each ramus bears six setae, excepting the inner most, all other setae have a feather like arrangement with thickened setules. The inner most naked seta is shorter and thinner with a sclerotised knee a short distance from the base.

The antennule :

The antennule (fig. f) consists of 23 segments. The proportionate lengths of the segments are as follows :

Segments	1	:	2	:	3	:	4	:	5	:	6	:
	44	:	37	:	29	:	22	:	22	:	22	:
	7	:	8	:	9	:	10	:	11	:	12	:
	22	:	29	:	15	:	22	:	22	:	22	:
	13	:	14	:	15	:	16	:	17	:	18	:
	29	:	60	:	51	:	58	:	44	:	66	:
	19	:	20	:	21	:	22	:	23	=	1000	
	104	:	111	:	96	:	44	:	29			

A strongest, stoutest and highly chitinised spine present on the 13th segment. Segments 14 and 17 bear a small spine. The antepenultimate segment bears a small spine terminally which is straight and slightly recurved distally. The setae of the ultimate and penultimate segments are feather like arrangement with fine setules.

Fifth leg :

The fifth leg (fig. g) is asymmetrical. The left leg is shorter than the right and the tip of its reaching the middle of the second exopod segment. The size and shape of the segments of the fifth leg are as shown in the figure.

The right fifth leg :

The first protopod segment is nearly circular and smaller than the second protopod segment. It bears a strong spine on the upper portion of the dorsal margin. The second protopod segment bears a small hyaline tubercle in the middle of the inner margin and a short strong spine appears very close of it. The first exopod segment is short. The second exopod segment is larger than the first and a long strong spine arising from it which is very close to the base of the third exopod segment (claw). The inner margin of the spine is ornamented with fine hairs. The third exopod segment which forms claw is strong and tappers distally and originates from the distal portion of the second exopod segment. About 2/3rd of the inner margin of the third exopod segment is ornamented with fine hairs. The endopod is so short and strong that it is usually difficult to seperate it by pressing the cover slip. The endopod originated from the dorso-lateral portion of the inner margin of the second protopod segment.

The left fifth leg :

It consists of two protopod segments, one exopod segment and one endopod segment. The first protopod segment is nearly circular and shorter than the counterpart of the right leg. The second protopod segment is as long as but little thinner than the second protopod of the right leg. The tip of the exopod segment reaching 2/3rd distal edge of the second exopod segment of the right leg. Posterior surface along the inner distal of the exopod segment produced curved serrated lamella. A lobe from the outer margin of the exopod segment projecting inwards and bearing a row of fine setae along proximal edge of it. A cluster of setae projecting little beyond the serrated lamella. The endopod is single segmented and extending about the middle of the exopod segment.

DISCUSSION OF SYNONYMY

There is some confusion regarding the momenclature of this species. Brady first described this species in brief under the name of *Diaptomus orientalis* from Ceylon in 1886. Sars (1889) while studying the fresh water copepod fauna of Australia, redescribed it as Brady's (lit. cit.) original description was too inadequate. Subsequently, De Guerne and

Richard (1889) from Ceylon; Sars (1903) from Sumatra; Tollinger (1911) from Australia and Sumatra; Grochmalicki (1915) from Java; Henry (1922) from Casino of New South Wales recorded this species under the same name. But in 1932, Kiefer recognised that this species is in reality a member of the genus *Tropodiaptomus* Kiefer. In the meantime Bayly had in 1961 described briefly under the name *Diaptomus orientalis* a species widely distributed in the northern parts of Australia, Again, Bayly (1966) described in brief this species under the name *Diaptomus (Tropodiaptomus) australis* from Western Australia. Kiefer (1936) pointed out after studying Brady's female specimens of *Diaptomus (Tropodiaptomus)* that all female specimens were almost similar and asserted that specific identification of *Diaptomus (Tropodiaptomus)* spp. could better be made on the male characters. Kiefer (lit. cit.) therefore, stressed that the shape and structure of the distal protopodite segment of the male right fifth leg bears considerable importance in the taxonomy of *Diaptomus (Tropodiaptomus)*. However, as the male specimens of Brady's (lit. cit.) collection were never described, it was better to accept Kiefer's (lit. cit.) designation of *D. orientalis* as " Species incarta" (nomen dubim) and the new name *Tropodiaptomus australis* must be valid

SUMMARY

Based on material collected in the Andaman and Nicobar Islands, *Tropodiaptomus australis* Kiefer is redescribed. The present record increases the number of species of *Tropodiaptomus* known from India to ten.

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