THE MALAYSIAN TROPODIAPTOPUS (COPEPODA : CALANOIDA) AND ITS DISTRIBUTION

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Abstract

In Peninsular Malaysia there are three species of Tropodiaptomus namely: T. hebereri Kiefer, T. ruttneri Brehm, and T. vicinus Kiefer. The last species is most common in swampy habitats along the west coast whereas T. ruttneri occurs only in the north and T. hebereri is present in the south. The affinity of the Malaysian tropodiaptomids and their Sunda counterparts is discussed.

Introduction

Tropodiaptomus is one of the 20 genera of freshwater calanoids commonly found in a once connected land mass of Africa, India and Australia, probably including the southern fringe of the Sunda Archipelago in the geological past (Sewell, 1956). These include Adiaptomus, Allodiaptomus, Anadiaptomus, Acanthodiaptomus, Arctodiaptomus, Euadiaptomus, Eodiaptomus, Heliodiaptomus, Hemidiaptomus, Metadiaptomus, Megadiaptomus, Mixodiaptomus, Neodiaptomus, Paradiaptomus, Phyllodiaptomus, Rhinediaptomus, Sinodiaptomus, Spicodiaptomus, Thermodiaptomus and Tropodiaptomus. Pseudodiaptomids are not considered here because of their euryhaline occurrence. Out of these calanoids only two genera namely, Neodiaptomus and Tropodiaptomus are widespread in Peninsular Malaysia and Singapore (Lai & Fernando, 1978).

The systematics of the Asian Tropodiaptomus needs further reviews due to the lack of follow-up investigation after the earlier works like those of Brady (1886) and Kiefer (1933), to mention a few. There are over 2 dozen species of Tropodiaptomus in the world. The first species belonging to this genus was Diaptomus orientalis (Brady, loc. cit.) and it was reviewed and placed under the genus of Tropodiaptomus by Kiefer (1932, 1936) as T. australis. The most recently described Tropodiaptomid in this region was T. gigantoviger from the Philippines by Brehm (1933), and it was further reviewed by Lai and his coworkers (1978).

The aim of this articles is to bridge the gap in our (loc. cit.) previous report on the Malaysian and Singapore freshwater calanoids.

Methods

The tropodiaptomids were isolated from our main plankton samples, dissected and mounted in polyvinyl lactophenol with lignin pink. The parts of the animals were drawn with the aid of a camera lucida.

Systematics

Tropodiaptomus Kiefer

Kiefer (1932) placed the freshwater calanoids of the world under 1 family, 2 subfamilies and 15 genera. This list was extended considerably recently. The genus Tropodiaptomus comes under the subfamily Diaptominae and family Diaptomidae.

Most tropodiaptomids have a bulky build. The last thoracic lobes are usually symmetrical. The endopod of the female fifth leg has 2 slender setae at the end. The second basopod of the male right fifth leg has some outgrowth along its inner margin. The second exopod segment of the same leg has a hyaline spine near the base of
the exopod spine. The exopod of the male left fifth leg is fused into a single flattened piece, its margin and denticulation vary from species to species. The endopods of both left and right male fifth leg are generally minute. The Greifantenne bears spines on segments 10, 11, 13 and 15, segment 14 is usually devoid of any spine. The process of the antepenultimate segment is always smooth.

Tropodiaptomus ruttneri Brehm
Probably T. oryzanus Kiefer

Materials examined:
Muda Reservoir. 21.IX.74; 30.XI.74; 6.IV.75; 19.VI.75; 12.VI.76.

Female:
The lateral lobes of the last thoracic segment indistinct (Fig. 1). The urosomal segment is cylindrical and symmetrical. Leg 5: it is a typical tropodiaptomid structure in that the endopod has 2 slender setae and is equipped with some minute spinules at their base (Fig. 2). The unsegmented endopod is shorter than the first exopod segment. The end claw is massive and it reaches or surpasses the length of the first exopod segment.

Male
The wings of the thoracic segment indistinct (Fig. 3). The first and fourth urosomal segments protrude slightly backward at their right posterior corner. The Greifantenne bears spines at segments 13, 15, 11, 10 and 16 in order of reducing length (Fig. 4). There is no spine at segments 12 and 14. The process of the antepenultimate segment is smooth and it measures about the same length as the penultimate segment (Fig. 5). Leg 5 varies considerably (Figs. 6-12). In general the right second basopod segment bears 1-2 spinous outgrowth along its inner margin (Figs. 6, 7, 8 and 9). Some specimens possess a short and stout exopod spine (Figs. 6, 7 and 8) whereas the other has a slender exopod spine (Fig. 9). The 'circular saw' or Kreissage, the German equivalent, is consistently in one whole piece which bears minute spinules at the margin. Sometimes the proximal spinules are coarser than the distal spinules, but the two set of spinules are never as contrast as they are in the 'circular saws' of Tropodiaptomus australis (Lai et al., 1978).

Remarks
T. ruttneri was described by Brehm (1923 via Kiefer, 1932) with specimens from Yunnan and Szechwan Provinces of China. The main features of this species are (1) the single blade of the circular saw of the left fifth leg in male, (2) the transition of the spinule size from the proximal to distal direction is slight, (3) the absence of a minute spine on segment 12 of the Greifantenne and (4) the enormous end claw of the female fifth leg. Kiefer (1937) reported a new species of Tropodiaptomus oryzanus from Tainan in Taiwan. This species resembles T. ruttneri in many respects, except the spinules of the circular saw in the left fifth leg of the male. If the Kiefer's (1937, Fig. 16, p. 63) diagrams are accepted as correct, it seems that spinules of