

Original Article

Redescription of *Ctenapseudes sapensis* (Chilton, 1926) from the Upper Songkhla Lagoon, Thailand (Crustacea: Tanaidacea)

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Abstract

The parapseudid tanaidacean *Ctenapseudes sapensis* (Chilton, 1926) is minutely redescribed and illustrated. The species is very similar to *C. chilkensis*, described by the same author based on samples from the brackish Chilka Lake in India (Chilton, 1924). *C. sapensis* was the only apseudomorph tanaidacean found in Upper Songkhla Lagoon, southern Thailand. This species is dominant in this lagoon, and, at the same time, is a major food source for some catfishes (*Osteogeneiosus militaris*, *Arius truncatus* and *Arius maculatus*).

Keywords: *Ctenapseudes sapensis*, Redescription, Tanaidacea, Thailand

1. Introduction

The apseudomorph tanaidacean *Ctenapseudes sapensis* was originally described by Chilton (1926), under the name of *Apseudes sapensis*, from Talé Sap of Siam (now known as Songkhla Lake or Songkhla Lagoon of Thailand), but with incomplete illustrations. This species is very similar to *Apseudes chilkensis* (now *Ctenapseudes chilkensis*) which was described by the same author based on samples from the brackish Chilka Lake in India (Chilton, 1924). Later Barnard (1935) re-examined the preserved specimens of *A. chilkensis* and compared them with specimens from southwestern (Alleppey, Travancore) and northeastern (Salt Lakes, Lower Bengal) India, and subsequently concluded that *A. chilkensis* has two forms: the *chilkensis* form, found in Lower Bengal, and the *sapensis* form, found in Travancore (southwestern India).

Bamber *et al.* (1996) subsequently established the new genus *Ctenapseudes*, (Parapseudidae), based on the new species, *C. extravaganza*, collected from Sri Lanka. *C. extravaganza* is very similar to both species described by Chilton (1924, 1926) but Bamber *et al.* (1996) did not make any reference those two species. Sieg (1983: 47, 48) synonymized the Chilton's species (1924, 1926) and, implicitly, the Barnard's forms (1935). In contrast with Sieg's opinion, Gutu and Angsupanich (2004: 76) considered the *Apseudes sapensis* (and Barnard's form, *sapensis*) as a valid species and transferred it to genus *Ctenapseudes* Bamber *et al.*, 1996. Also, Gutu (2008: 49) reclassified the species *Apseudes chilkensis* in the same genus.

C. sapensis is a dominant species widely distributed in Songkhla Lagoon, with its highest density in February during the post-rainy season in Middle Songkhla Lagoon (Angsupanich and Siripech, 2001). It is a major food source for the dominant catfishes (*Osteogeneiosus militaris* and *Arius maculatus*) in the lake (Angsupanich *et al.*, 2005b).

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2. Materials and Methods

The material was collected in the Upper Songkhla Lagoon (Figure 1), using a 0.05 m² Tamura grab and sieved over a 0.5 mm mesh sieve. In addition, numerous complete and incomplete specimens were also obtained from the stomach contents of catfishes (*Osteogeneiosus militaris*, *Arius truncatus* and *Arius maculatus*) which were caught in the study area. The materials were preserved in 10% buffered formalin for dissection and in 2.5% glutaraldehyde for two hours at room temperature for scanning electron microscopy (SEM). Specimens were processed for SEM by washing in 0.1 M phosphate buffer at pH of 7.4 (3 changes, 5 min each) to remove excess fixative. After that, specimens were washed in distilled water (3 changes, 5 min each), and dehydrated in a graded ethanol series (distilled water to 50%, 70%, 80% and 90%, two 15-min changes each, followed by 100% (2 changes, 30 min each)), followed by critical-point drying for three hours. Specimens were then mounted on stubs and sputter-coated with gold. Specimens were examined and photographed using a JEOL JSM-5800-LV.

Family PARAPSEUDIDAE Gutu, 1981

Genus *Ctenapseudes* Bamber, Ariyananda and Silva,

1996

Ctenapseudes sapensis (Chilton, 1926)

2.1 Studied material

- 120 specimens (50 females, 50 males and 20 juveniles), collected from some stations in the Upper Songkhla Lagoon, 7° 31' – 7° 47' N, 100° 09' – 100° 19' E, 0.5 – 1.5 m depth, silt clay, 26 – 28 February, 1 March 2004.

- numerous fragments and complete specimens from the stomach contents of some catfishes (*O. militaris*, *A. truncatus* and *A. maculatus*), 10 April 2004.

2.2 Redescription of the species

Female – Body (Figure 2A,2B): more or less dorso-ventrally flattened; length about 7.7 mm; 5.7 times as long as carapace width; carapace as wide as long, with acute triangular rostrum, pointed slightly downward; ocular lobes distinctly anterolaterally produced, eyes pigmented light brown; epistome pointed with small upturned spine; pereonites 1 to 6, respectively 2.7, 2.1, 1.6, 1.1, 1.1 and 1.1 times as wide as long, laterally smooth with a few short, thin setae at the anterior corners; pereonite with mid-ventral spinous processes (hyposphenia) on all segments; pleon consists of five short, broad pleonites and the pleotelson; pleonites 1–5 equal in length, with mid-ventral acute thick tubercle; pleonite 1 with a transverse row of small and dense plumose setae mid-dorsally; pleonites 2–5 sharp at the posterior corner; pleonites 1–4 bear short plumose setae on lateral margins; pleotelson 1.4 times as long as wide.

Antennule (Figure 2C): article 1 of the peduncle about 2.5 times as long as wide, and about one third of carapace length, with some brush-tipped setae and simple setae on the lateral margins; article 2 about 0.5 times the length of article 1, and about three times as long as article 3; article 4 short, with subequal flagella: inner flagellum with 15–16 articles, and the outer one with 11–13 articles (excluding common article); flagella articulated, but not conspicuously so.

Antenna (Figure 2D): subequal in length to peduncle of antennule, composed of five peduncular articles, together subequal in length to the flagellum; article 1 of peduncle short, with medial projection terminating in sharp tooth produced at its inner distal angle; article 2 slightly longer than article 5, bearing oval squama with seven or eight long setae; article 3 shortest; article 4 slightly longer than the fifth one, the last having four short plumose setae on inner margin; the flagellum of eight articles; first article with about six long simple setae on the outer side and only 3–4 ones in the inner margin; other articles with at least one short setae.

Labrum (Figure 2E): apex convex, with three tufts of fine setules on anterior margin.

Labium (Figure 2F): terminal lobe bearing two apical setiform spines and dense long setules on lateral and medial margins.

Mandible (Figure 3A): palp, stout and 3-articled; article 1 short with many long setae; articles 2 and 3 bearing long setae and comb of short leaf-like spines at the inner margin (Figures 6A–B); molar process distally with rugose

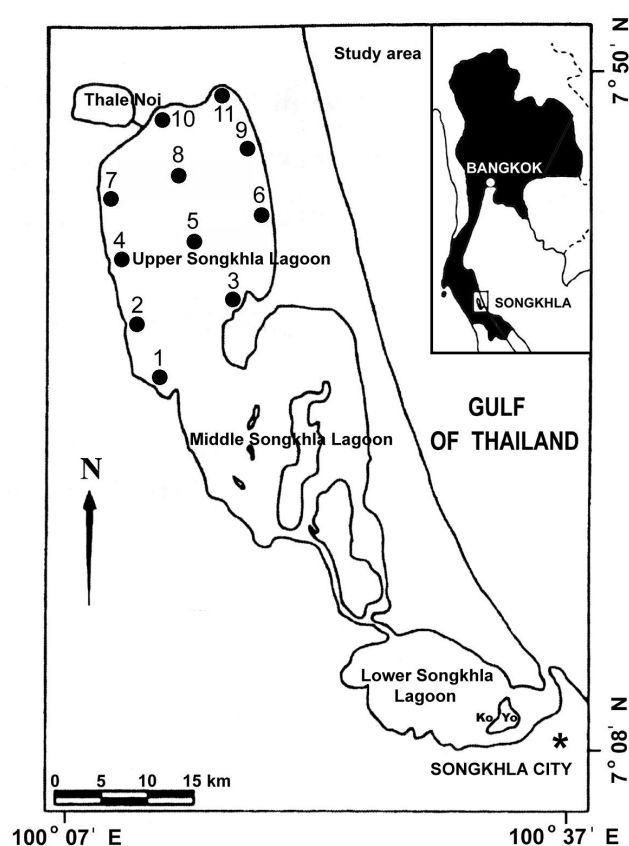


Figure 1. Songkhla Lake and study area, showing sampling stations 1 to 11.

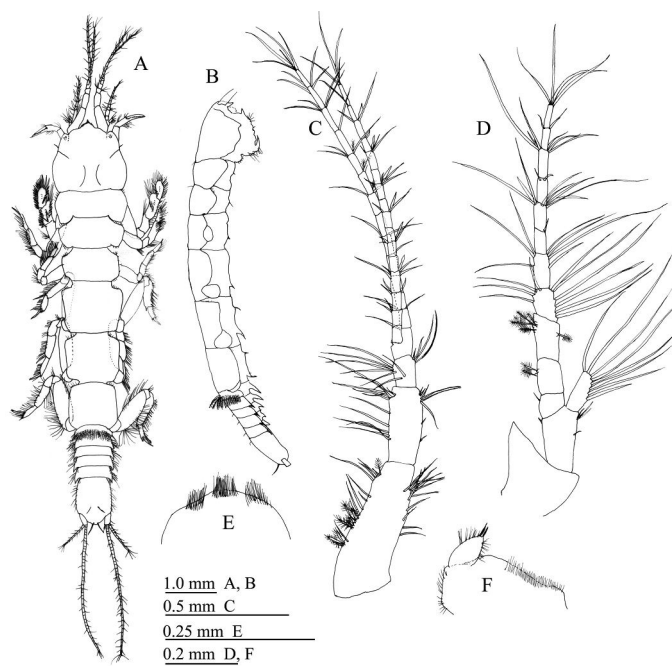


Figure 2. *Ctenapseudes sapensis*, female. A, body, dorsal; B, lateral; C, antennule; D, antenna; E, labrum; F, labium.

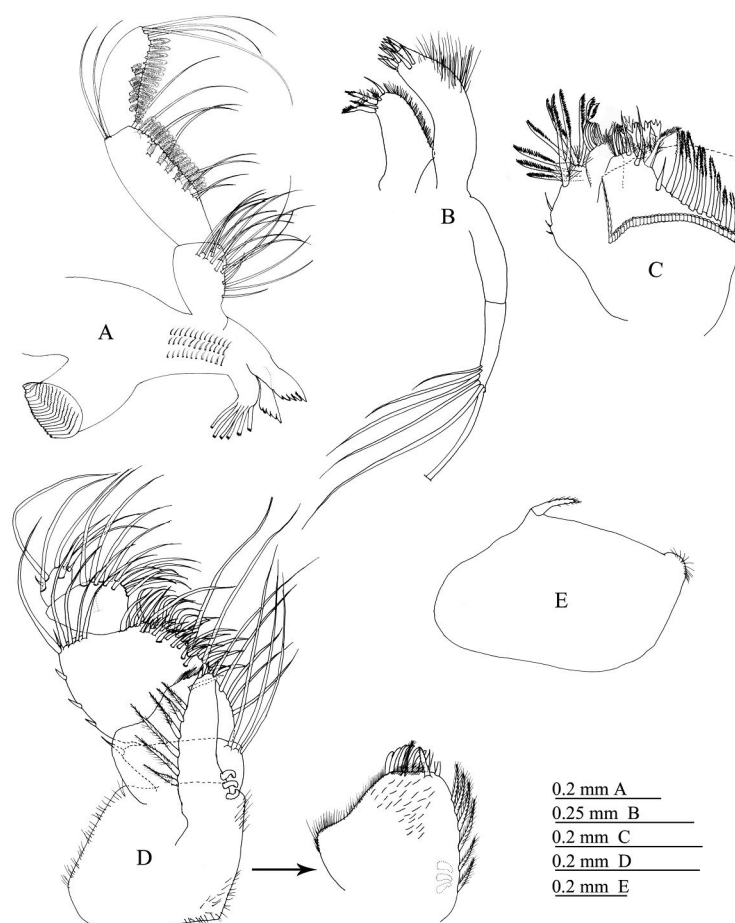


Figure 3. *Ctenapseudes sapensis*, female. A, left mandible; B, maxillule; C, maxilla; D, maxilliped and endite; E, epignath.

grinding surface; pars incisiva and lacinia mobilis (on left mandible only) with five denticles, seven accessory setae on setiferous lobe.

Maxillule (Figure 3B): 2-articled palp, last article slightly shorter than first, with six unequal setae, finely pectinated terminally; outer endite with 11 blunt terminal spines and two finely plumose subapical setae; inner endite with three branching and two ciliate setae on distal margin.

Maxilla (Figure 3C): outer lobe of movable endite bearing ten long, pinnate setae; inner lobe of movable endite with dense sickle-shaped setae, four pinnate and 3 ciliate setae; outer lobe of fixed endite with three forked, two pinnate, two palm leaf-like, two ciliate setae and about seven sickle-shaped setae on the apical margin; inner lobe of fixed endite with one row of about 37 ciliate setae and another row of nine thick, ciliated setae, and one subapical simple setae.

Maxilliped (Figure 3D): basis as long as wide, palp of four articles; palp article 1 short and wide with three long setae on the inner edge; article 2 largest with three short spines on the outer edge and five long setae on the distal

outer corner and numerous unequal simple setae on the inner edge; article 3 much smaller than article 2, triangular with many long setae; article 4 very small, with several ciliate setae distally; endite with six plumose setae along its inner side, three or four coupling hooks, and row of spiniform and setiform elements on the rostral side (detail Figure 3D).

Epignath (Figure 3E): cup-shaped, with strong spine bearing fine setulose setae near tip.

Cheliped (Figure 4A): 3-articled exopodite, distal article of which bears four plumose setae; basis narrow, swollen distally, about three times as long as wide, with four distosternal setae; merus small, about three times as long as wide, with some proximal and sternal setae; carpus longer than basis, about eight times as long as wide with three rows of setae on the surface; propodus shorter than carpus, with a slender fixed finger which have a row of spinules on the inner margin, and a short claw; dactylus equal in length to fixed finger, claw longer than that of fixed finger.

Pereopod 1 (Figure 4B): wide (swimming-type); 3-articled exopodite present with six plumose setae on distal

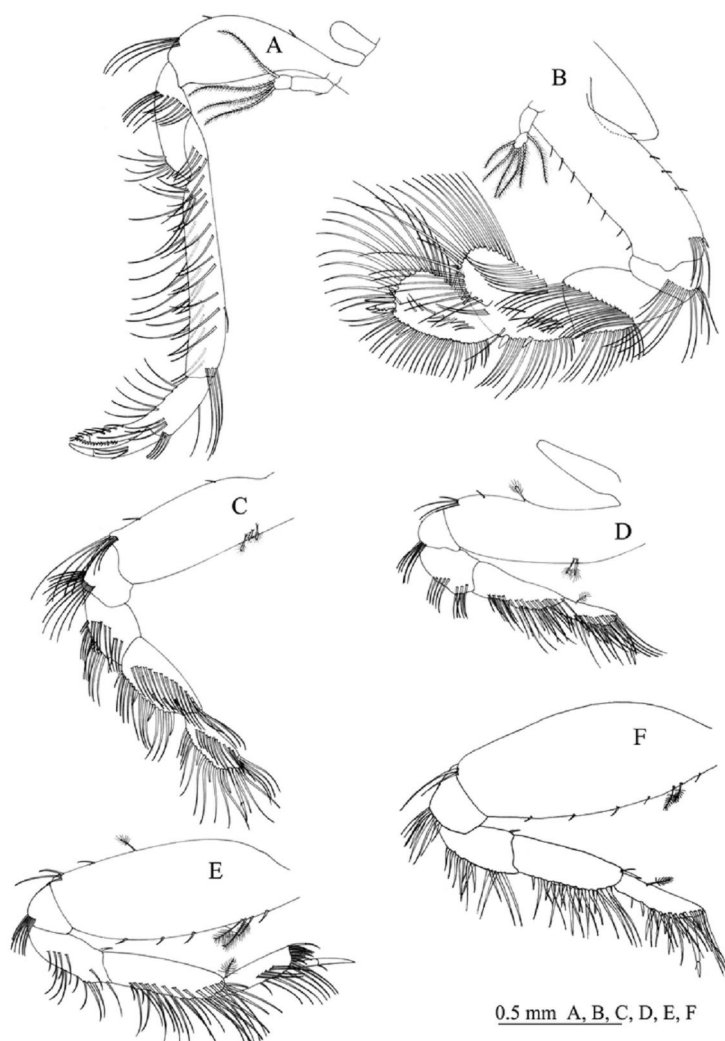


Figure 4. *Ctenapseudes sapensis*, female. A, cheliped; B–F, pereopods 1–5, respectively.

article; basis about three times longer than wide, with some spinules on both margins and a distosternal blunt spine and four or five simple setae; ischium short, with many long setae; merus, equal in length to carpus, has numerous simple setae (disposed as in drawing) and one distosternal stout spine; carpus, expanded distotergally, with numerous long simple setae on both margins, and with one long distotergal and two sternal stout spines; propodus, narrower than carpus, with numerous long setae on both margins; dactylus short, about as long as adjacent spines, with some sternal denticles, and a very small (tuberculiiform) claw.

Pereopod 2 (Figure 4C): basis about three times as long as wide, subequal to combined length of ischium, merus and carpus; ischium small, with many distosternal setae; merus shorter than carpus with a distosternal short spine and numerous setae; carpus with four long spines on sternal margin and two rows of numerous setae; propodus with three sternal spines and one distotergal spines and two rows of long setae.

Pereopod 3 (Figure 4D): rather similar to pereopod 2 but slightly shorter and narrower.

Pereopod 4 (Figure 4E): basis swollen; ischium small, with some distosternal setae; merus about half as long as carpus; carpus sparsely setose and spinose on the sternal margin; propodus shorter than carpus, with distal row of leaf-like spines and distal simple spines and setae; dactylus with its claw slightly shorter than propodus.

Pereopod 5 (Figure 4F): similar size to pereopod 4, but basis more swollen; ischium short, with many distosternal

setae; carpus with sternal spines and setae, only one short distal spine; propodus slender with marginal setae and spines; dactylus shorter than propodus.

Pereopod 6 (Figure 5A): basis swollen with two marginal rows of long plumose setae; ischium short, with some distosternal setae; merus and carpus with two to three and six to seven, respectively, tergal plumose setae; sternally with simple setae and some fine spines; propodus short, with distal row of 32–33 leaf-like spines and scattered simple spines; dactylus with acute claw.

Oostegites: five pairs on cheliped and pereopods 1–4.

Pleopods (Figure 5B): biramous, in five pairs, all similar, with oval (long and narrow rami) bearing long, plumose setae; endopodite longer than exopodite.

Uropod (Figure 5C): filiform and biramous; endopodites about four times as long as exopodites, rami with indistinct articulation, exopodites composed of nine to ten articles; endopodites slightly thicker than exopodites, with about 38–39 articles.

Male. – Body similar to that of female, but with slightly longer antennule and with more articles on the outer (17–18) and the inner (21–22) flagella in adult male. Inner flagellum longer than the outer one (Figure 6C), while those of female subequal (Figures 2C, 6D). Larger and more robust cheliped with thick basis (Figures 5D and 6E). Carpus about twice as long as wide, with three rows of setae on surface less dense than in female. Propodus stout, fixed finger distally square with setae and cutting edge; dactylus subequal to fixed finger. Mid-ventral spinous process (hyposphaenia) on pereonites

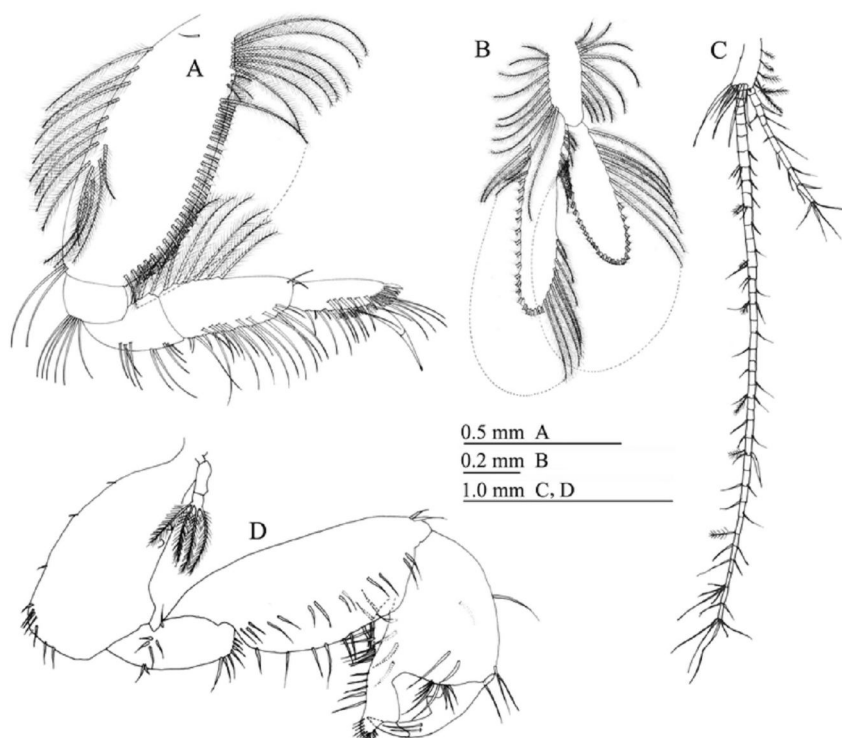


Figure 5. *Ctenapseudes sapensis*, female and male (D). A, pereopod 6; B, pleopod; C, uropod; D, cheliped.

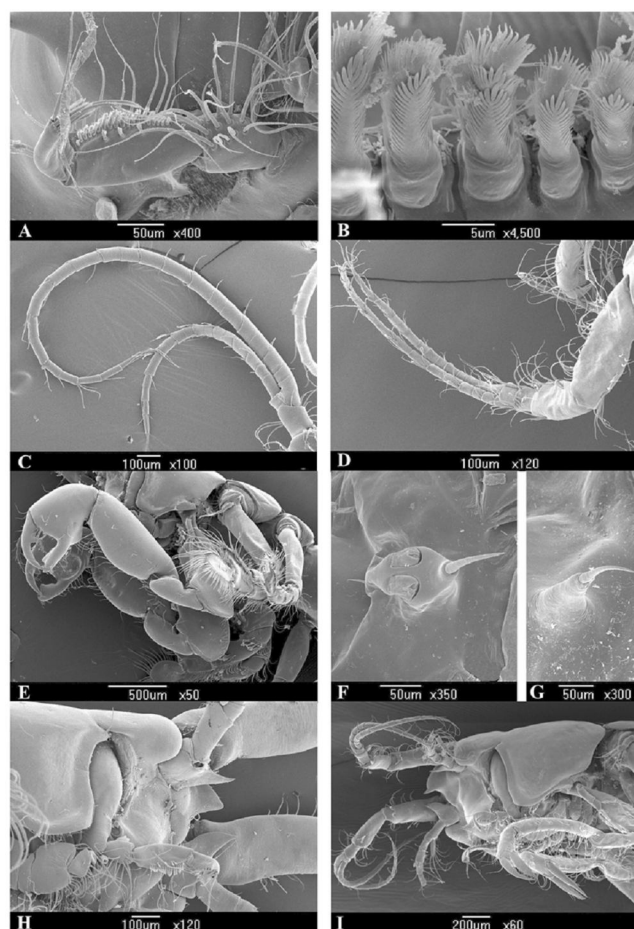


Figure 6. *Ctenapseudes sapensis*, SEM images. A–B, female mandibular palp with a comb of leaf-like spines; C, male antennule flagella; D, female antennule flagella; E, male cheliped; F, G sixth pereonite hyposphaenia of male and female, respectively; H, anterior part of carapace with broad triangulate rostrum of male; I, first part of body with acute triangulate rostrum of female.

1–5 similar to those of female, with the exception of the large sixth spinous process which functions as a genital cone (Figures F–G). Rostrum not acute as in female (Figures H–I).

Remarks. *Ctenapseudes sapensis* is slightly distinct from *C. extravaganza* in the details of its antennules. In the *C. sapensis* female, the antennule flagella are subequal in length, while in the male the outer flagellum is about half as long as the inner one. Except for juveniles and subadult males, which are distinguished by the size and shape of the chelipeds (similar to those in the adult male but smaller), the lengths of the flagella are not markedly different. In *C. extravaganza* the female inner flagellum of the antennule is about half as long as the outer one (Bamber *et al.*, 1996, Figure 1C). However, Bamber *et al.* (1996) did not describe the first antenna of the male.

A detailed comparison with *Ctenapseudes chilensis* is not at present possible, because no material could be conveniently obtained from India, but as it results from Chilton's description (1924, figure 1c), the main differentiating feature between the Indian and Thailand species consists in the number of sternal spines of pereopod 1 propodus. Thus, *C. chilensis* has five sternal spines on the pereopod 1 propodus, in contrast with three (cf. Chilton, 1926, figure 1l) or with only two (as we remarked, figure 4B) in the *C. sapensis* from Thailand waters. Other differences are commented on by Barnard (1935).

In the present study, besides *Ctenapseudes sapensis*, there was no any other tanaidacean species was found in the Upper Songkhla Lagoon. This species is widely distributed throughout the Songkhla Lagoon, where the optimum salinity ranges from 2 to 20 psu (Angsupanich and Siripecth, 2001). This is a different distribution pattern from two other apseudomorph tanaidacean species discovered in Lower Songkhla Lagoon, *Pagurapseudopsis thailandica* (Angsupanich, 2001) and *Longiflagrum koyonense* (Angsupanich, 2004), which were not found in Middle (Angsupanich *et al.*, 2005a) or Upper Songkhla Lagoon.

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