

A NEW SPECIES OF *CRANOCEPHALUS* (AMPHIPODA,
HYPERIIDEA, OXYCEPHALIDAE) FROM THE GULF OF
THAILAND AND THE SOUTH CHINA SEA

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S U M M A R Y

Cranocephalus thai sp. nov. was found in the Gulf of Thailand and the South China Sea. Detail description, illustration, and pattern of distribution were given.

The planktonic amphipods upon which this study is based were obtained from the Naga Expedition, 1959-61. This expedition was an oceanographic investigation of the marine biota and its environment in the Gulf of Thailand and the part of the South China Sea lying to the east of South Viet Nam. The plankton samples used for this study were obtained from the samples collected by using a plankton net of 1-meter mouth diameter, 0.65 mm. mesh aperture width, with flow meter mounted in the mouth. The tows were made obliquely to a depth of about 150 meters, or within 10 meters of the bottom where the depth of water was less than 150 meters.

Out of the 10 genera of the family Oxycephalidae, 16 species from 8 genera were found from the samples examined. Genus *Cranocephalus* which has always been recognized earlier by only one species, *C. scleroticus* (Streets), was found to have another species in this study.

Cranocephalus Thai sp. nov.

Type: An ovigerous female, total length 4.5 mm.; collected from 9°06' N., 104°14' E., the depth of haul 7.5 m., on Jan. 23, 1960, between 9:15 to 9:20 p.m.; Naga collection, S-3, station 7. *Allotype*: A male, total length 5.2 mm.; Naga collection, S-3, station 7. *Paratype*: Naga collection; S-3; station 2, 1 male; station 7, 2 males and 3 females; station 8, 6 males and 5 females; station 20, 2 females;

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S-5; station 25, 1 female; S-9; station 17 (2), 1 male and 1 female; S-4; station 37, 1 female; S-6; station 15, 1 male; S-8; station 1A, 1 male and 1 female; station 32, 1 male.

Head: rounded. Female, anterior end produced into short, blunt-tipped rostrum, shorter than portion containing eyes. Male, rostrum broad, subtriangular, blunt-tipped, length of rostrum depending upon size, at times longer than portion containing eyes; posterior portion constricted to form short neck.

Antenna 1: Male: peduncle of 2 articles; 1st article broader than long; 2nd article short, $1/4$ as long as 1st. Flagellum of 4 articles; 1st article long. 1.5 times as long as peduncle, $3/4$ as broad as long, made right angle to peduncle, inferior margin convex, superior concave, shorter than inferior, process at superiodistal corner, few long sensory setae on distal margin of process, medial surface thickly covered with 2 tracts of long setae; 2nd article cylindrical, $1/5$ as long as 1st, attached at base of process of 1st article, few sensory setae on superior margin; 3rd article shorter, narrower than 2nd, 2 sensory setae on median of superior margin; 4th article as long as 2nd and 3rd articles together, tapering.

Female: peduncle coalesced with 1st article of flagellum, together about $1/3$ as broad as long, smaller distally, few long sensory setae on distal half of superior margin; 2nd article $1/3$ as long as peduncle and 1st article, narrower, 2 sensory setae on middle of superior margin; 3rd article 1.5 times as long as 2nd article, tapering.

Antenna 2: Male: single peduncular article, long, cylindrical, broader at distal portion. Flagellum of 4 articles; 1st article as long as 2nd, longer than peduncle; 3rd article as long as peduncle; each article folded backward against preceding article; 4th article small; fine setae along superior margins of every articles.

Female: absent.

Peraeons: posterior ones longer than anterior ones except peraeon 7, slightly longer than peraeon 3; dorsal surfaces of peraeons bumpy.

Peraeopod 1: short, subchelate. Basis about $3/5$ as broad as long, both superior and inferior margins strongly convex. Ischium short, $1/7$ basis, broader than long, superior margin shorter than inferior. Merus $1/5$ basis, expanded distally, broader than long, superior margin shorter than inferior. Carpus about $1/4$ basis, superior margin slightly convex, inferior expanded, strong teeth along distal half, pointed tooth at inferiodistal corner. Propodus longer than carpus, superior margin convex, inferior slightly concave, inferio-distal corner expanded into rounded process, with few teeth on margin. Dactylus almost $2/3$ propodus, curved, and spiniform, with secondary tooth on middle of inferior margin.

Peraeopod 2: similar to per. 1 (peraeopod 1), but longer. Basis longer than that of per. 1, almost $3/5$ as broad as long. Ischium same as of per. 1. Merus slightly longer than that of per. 1. Carpus longer than that of per. 1, about $1/4$ basis, strong teeth on distal half of inferior margin as in per. 1. Propodus and dactylus slightly longer than those of per. 1.

Peraeopod 3: longer than per. 2. Basis long, cylindrical, 4 times as long as broad, superior margin slightly concave, inferior convex. Ischium short, $1/6$ basis, slightly longer than broad, superior margin shorter than inferior. Merus slightly longer than $2/5$ basis, broader distally, superior margin slightly convex, inferior almost straight. Carpus slightly shorter, narrower than merus, $2/5$ basis, superior margin convex, inferior slightly concave. Propodus longer than merus, slightly longer than $1/2$ basis, tapering, superior margin convex, inferior slightly concave. Dactylus almost $1/3$ propodus, curved, and spiniform.

Peraeopod 4: similar to per. 3, but slightly longer. Basis longer, more curved than that of per. 3, 4.5 times as long as broad. Ischium, merus, carpus and propodus, each slightly longer than those of per. 3. Dactylus same as of per. 3.

Peraeopod 5: longest. Basis expanded, almost as broad as long, broadest at distal half, both superior and inferior margins strongly convex, few indistinct coarsely serrations at distal half of superior margin,

inferioproximal corner expanded, inferiodistal corner produced into broad rounded process. Ischium short, about $1/7$ basis, longer than broad, superior margin longer than inferior. Merus long, cylindrical, almost $2/5$ basis, broader distally, about 3 times as long as broad, superior margin straight, inferior slightly convex. Carpus shorter, narrower than merus, $1/3$ basis, superior margin almost straight, inferior convex. Propodus longer than carpus, almost $1/2$ basis, tapering, superior margin slightly concave, inferior convex. Dactylus almost $1/3$ propodus, curved, and spiniform.

Peraeopod 6: similar to per. 5, but shorter. Basis shorter, broader than that of per. 5, subcircular, almost as broad as long, rounded process at inferiodistal corner small. Ischium shorter than that of per. 5. Merus as long as of per. 5, but narrower, 4 times as long as broad, inferior margin almost straight, fine teeth along distal half of superior margin. Carpus and propodus much shorter than those of per. 5; carpus $1/2$ merus, both margins straight; propodus almost as long as merus, both margins slightly convex; fine teeth along superior margins of both carpus and propodus. Dactylus shorter than that of per. 5, $1/3$ propodus, few fine teeth on middle portion of superior margin.

Peraeopod 7: similar to per. 6, but much shorter. Basis shorter than that of per. 6, $3/4$ as broad as long, broadest near proximal end, superioproximal corner strongly expanded, distal half of superior margin slightly concave, inferioproximal corner produced proximally into rounded process, distal half of inferior margin almost straight in female, concave in male, inferiodistal corner strongly expanded, produced broad distal end. Ischium short, $1/10$ basis, slightly longer than broad. Merus short, $1/8$ basis, cylindrical, twice as long as broad. Carpus longer, more slender than merus, $1/5$ basis. Propodus slightly longer than carpus, tapering, superior margin slightly concave, inferior convex. Dactylus small, seta-like.

Pleons: pleon 1 as long as 2, almost twice peraeon 7; pleon 3 shortest.

Epimeral plates: all plates with slightly convex ventral margins, posterior margins sigmoid, posterior angles pointed, not produced.

Urosomes: urosome 1 about $2/3$ as long as pleon 3, lateral margins expanded into rounded processes; coalesced urosomes 2 and 3 as broad as long, together with telson twice as long as urosome 1.

Uropods: uropod 1 longest, reaching to tip of telson in male, reaching well passed that in female; peduncle almost 3 times as long as broad, both superior and inferior margins convex, finely serrated at distal half; inner ramus in female slightly shorter than peduncle, in male $4/5$ peduncle, longer than outer; both margins of both rami finely serrated. Uropod 2 reaching slightly passed distal end of peduncle of uropod 3; peduncle $3/5$ as long as that of uropod 1, broader distally, about 3 times as long as broad; inner ramus slightly shorter than peduncle, slightly longer than outer ramus. Uropod 3 shortest, in male reaching not to tip of telson, in female reaching passed that; peduncle slightly longer than $1/3$ that of uropod 1, broader distally, almost twice as long as broad; inner ramus longer than peduncle, longer than outer ramus; uropods 2 and 3 with inferior margins of outer rami and both margins of inner rami finely serrated.

Telson: subtriangular; in male, slightly longer than urosomes 2 and 3, with tip rounded; in female, as long as urosomes 2 and 3, with tip more pointed.

Remarks. This species is very similar to *Cranocephalus scleroticus*. It can be distinguished by:

1. The rostrum; even though its shape can vary according to the size of the specimen, the tip of rostrum of this species is blunted, not sharply pointed as in *C. scleroticus*.
2. Carpus of per. 2 with strong teeth on the distal half of inferior margin in this species, while it has few setae and is smooth in *C. scleroticus*.
3. The expansion at inferiodistal corner on basis of per. 7 of this species produces broad distal end, while in *C. scleroticus*, the expansion is subterminal. Even though per. 7 is variable, but this difference can be recognized.

4. Lateral margins of 1st urosome in this species are expanded into rounded processes, while they are not in *C. scleroticus*. This characteristic is not as distinct in smaller specimens.
5. Urosomes and uropods of *C. scleroticus* are relatively more slender than those of this species.

Distribution in the Areas Studied

This is a neritic species which was found in the Gulf of Thailand and in the shallow area along the coast and over the Sunda Shelf of the South China Sea.

It was found toward the end of the northeast monsoon period (S-3) with maximum density along the east coast of the outer Gulf where upwelling was evidenced, and also at the location near the west coast in the outer part of the Gulf. There was an intrusion of water from the South China Sea into the Gulf on the eastern side but it did not penetrate very far, and flowed out on the western side. This penetration into the Gulf and the clockwise circulation in the Gulf caused the spread of this species from the east coast to the west and out of the Gulf, which was evidenced by the presence outside the Gulf over the offshore part of the Sunda in the following period (S-4). During the change-over period from the northeast to the southwest monsoon winds (S-5), the population Shelf in the Gulf declined and was found on the eastern side of the inner Gulf. During the southwest monsoon period (S-6), the distribution in the South China Sea moved north along the coast and was found off Nhatrang in the central area. Toward the end of the southwest monsoon to the intermonsoon period (S-7, S-1), it was absent from the Gulf. In the South China Sea, during the change-over period from the southwest to the northeast monsoon winds (S-8), it was found near the coast in the most northern location where the southerly flow was starting, and also at a location over the offshore part of the Sunda Shelf where the northerly flow still remained. At the beginning of the northeast monsoon period (S-9), the water from the South China Sea penetrated into the outer Gulf which

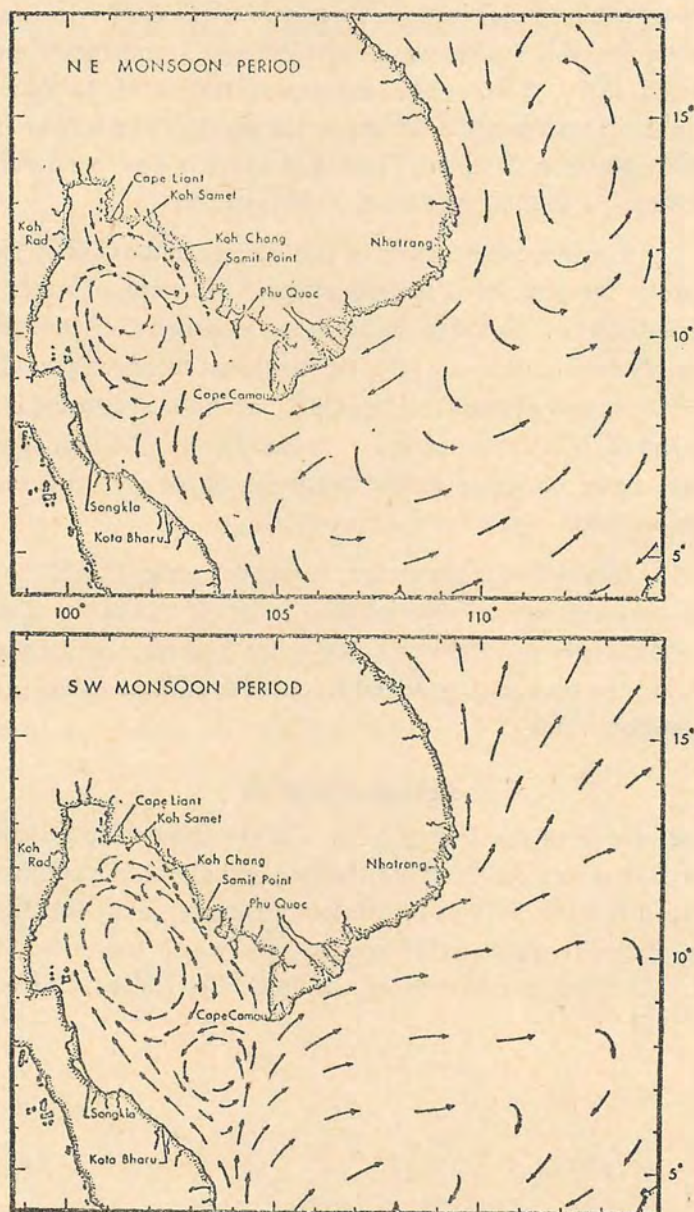
brought this species into the outer part of the Gulf. In the South China Sea, this species was absent during the northeast monsoon period (S-10, S-2). The maximum ranges of salinities and temperatures from the surface to the depth of the surface layer at the localities in the South China Sea where it was found were from 29.93 to 34.490‰/00, and from 29.69° to 22.56° C.

The average densities of this species in the Gulf of Thailand were at the peak of 62 individuals per 1000 cu.m. of water at the period toward the end of the northeast monsoon (S-3), and declined sharply to 6 individuals after the northeast monsoon period ended (S-5). It was absent from the Gulf during the southwest monsoon period (S-7), and reappeared with low density of 6 individuals per 1000 cu.m. of water at the beginning of the northeast monsoon period (S-9).

In the South China Sea, it was not present until the end of the northeast monsoon period (S-4), when it was at the density of 4 individuals per 1000 cu.m. of water, and reached the peak of 9 during the change-over period from the southwest to the northeast monsoon winds (S-8).

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MAPS

Oceanographic currents during the northeast and southwest monsoon periods
(modified from LAFOND, 1963; ROBINSON, 1963; WYRTKI, 1962).



Cranocephalus thai sp. nov.

Female : A, Lateral view; B, antenna 1; C-I, peracopods 1-7; J, pleopod 3; K, uropods and telson.

Male : L, Head; M, antenna 1; N, antenna 2; O, peracopod 7; P, uropods and telson.

(A, L, scale a; B-K, M-P, scale b)

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