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First Record of *Cladolabes hamatus* (Sluiter, 1914) (Echinodermata : Holothuroidea: Dendrochirotida) from the South China Sea.

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ABSTRACT.- The holothuroid *Cladolabes hamatus* (Sluiter, 1914) is here reported for the first time from the South China Sea. Its presence is recorded at Ko Phai, Pattaya, Chon Buri Province, Thailand. This sand-burrowing species has its 20 tentacles positioned in two (15+5) circles and presents tables with rudimentary discs and tall two-pillared spires in the body wall and tentacles. The tables of the dorsal papillae, with an irregular disc and the pillars fused to a curve hook, diagnose the species.

KEY WORDS.- Holothuroidea, *Cladolabes hamatus*, South China Sea, Thailand, new record.

INTRODUCTION

The South China Sea is largely enclosed by major land masses and island chains, which include coastal, shallow and deep water (Fig. 1A). Lane *et al.* (2000) classify the Gulf of Thailand as a coastal zone in the South China Sea.

The genus *Cladolabes* Brandt, 1835 is one of the seven genera currently recognised as valid in the sclerodactylid subfamily Cladolabinae Heding & Panning, 1954 (emended diagnosis available in Thandar, 1989: 298). Eleven valid species are currently assigned to it: *Cladolabes aciculus* (Semper, 1868), *C. bifurcatus* (Deichmann, 1944), *C. crassus* (Clark, 1938), *C. hamatus* (Sluiter, 1914), *C. limaconotus* Brandt, 1835 (type species by subsequent designation by Heding & Panning, 1954: 121), *C. monodi* (Cherbonnier, 1950), *C. perspicillum* (Selenka, 1867), *C. pichoni* Cherbonnier, 1988, *C. roxasi* (Domantay, 1934)

C. schmeltzi (Ludwig, 1875) and *C. senegalensis* Panning, 1940 (Clark and Rowe, 1971; Cherbonnier, 1988; Rowe and Gates, 1995). Three of these have previously been reported in the South China Sea: *C. aciculus*, *C. crassus* and *C. schmeltzi* (Lane *et al.*, 2000), with only one, *C. schmeltzi*, known from Southern Thailand, Songkla (Satayamas, 1982). *C. hamatus* is here added to the fauna of the South China Sea and this in Thai waters.

MATERIALS AND METHODS

The Thailand Natural History Museum together with the Eastern Marine and Resources Research Center surveyed and collected marine invertebrates in Chon Buri and Rayong Province, Thailand, in April 2004. This species were collected by hand-picking while SCUBA diving down to the depths of 5 meters.

The specimen were anaesthetized in 10% magnesium sulphate for 12 hours, transferred to 95% alcohol for two days and then transferred to 70% buffered alcohol for permanent storage. It was studied according to

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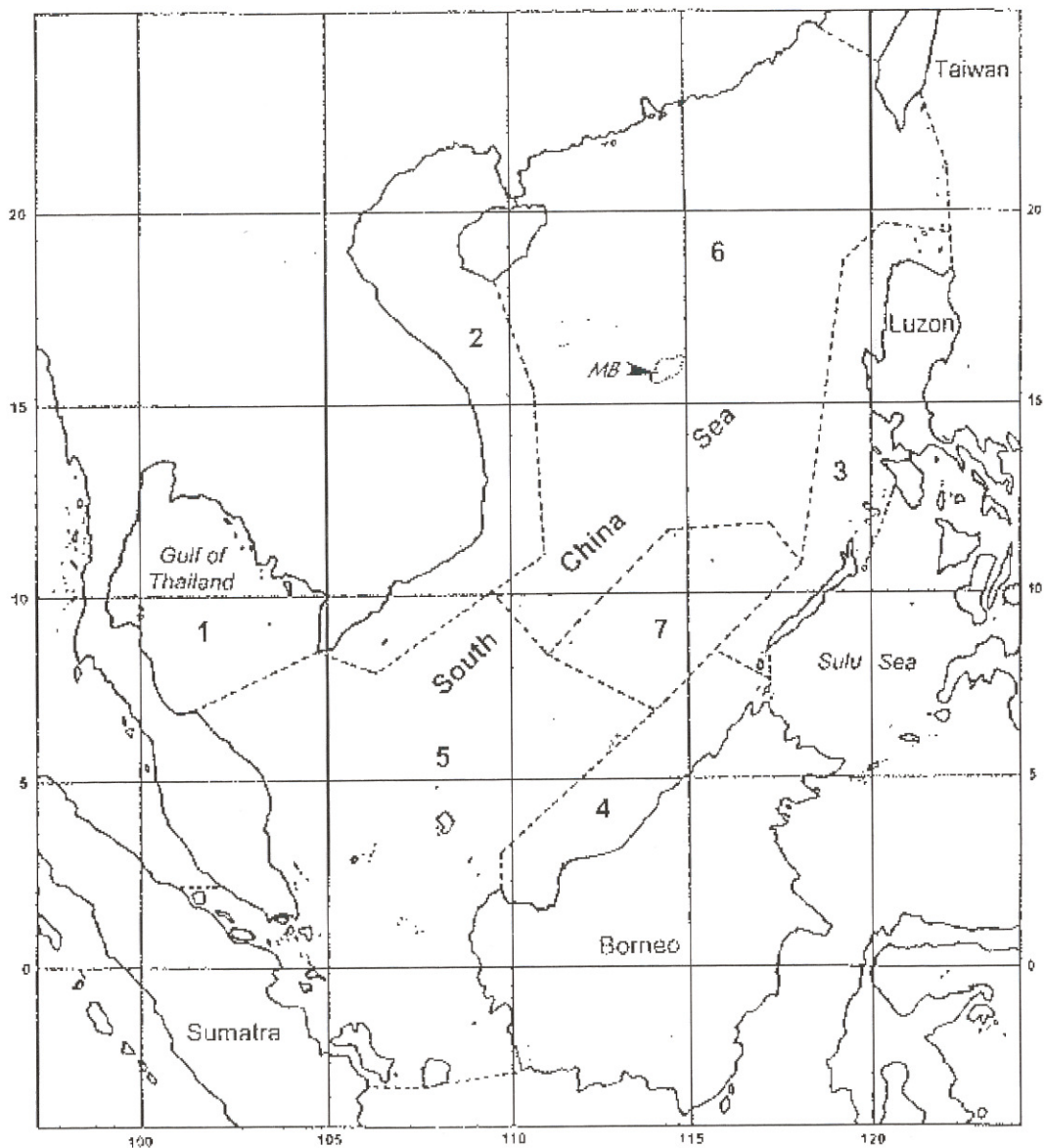


Fig. 1 Map of the South China Sea as taken from Lane *et al.*, 2000. Seven zones are recognised: 1 to 4 being coastal, 5 and 6 more central and 7 encompassing the shallow and deep waters of the Nansha (Spratly) islands. MB = Macclesfield Bank.

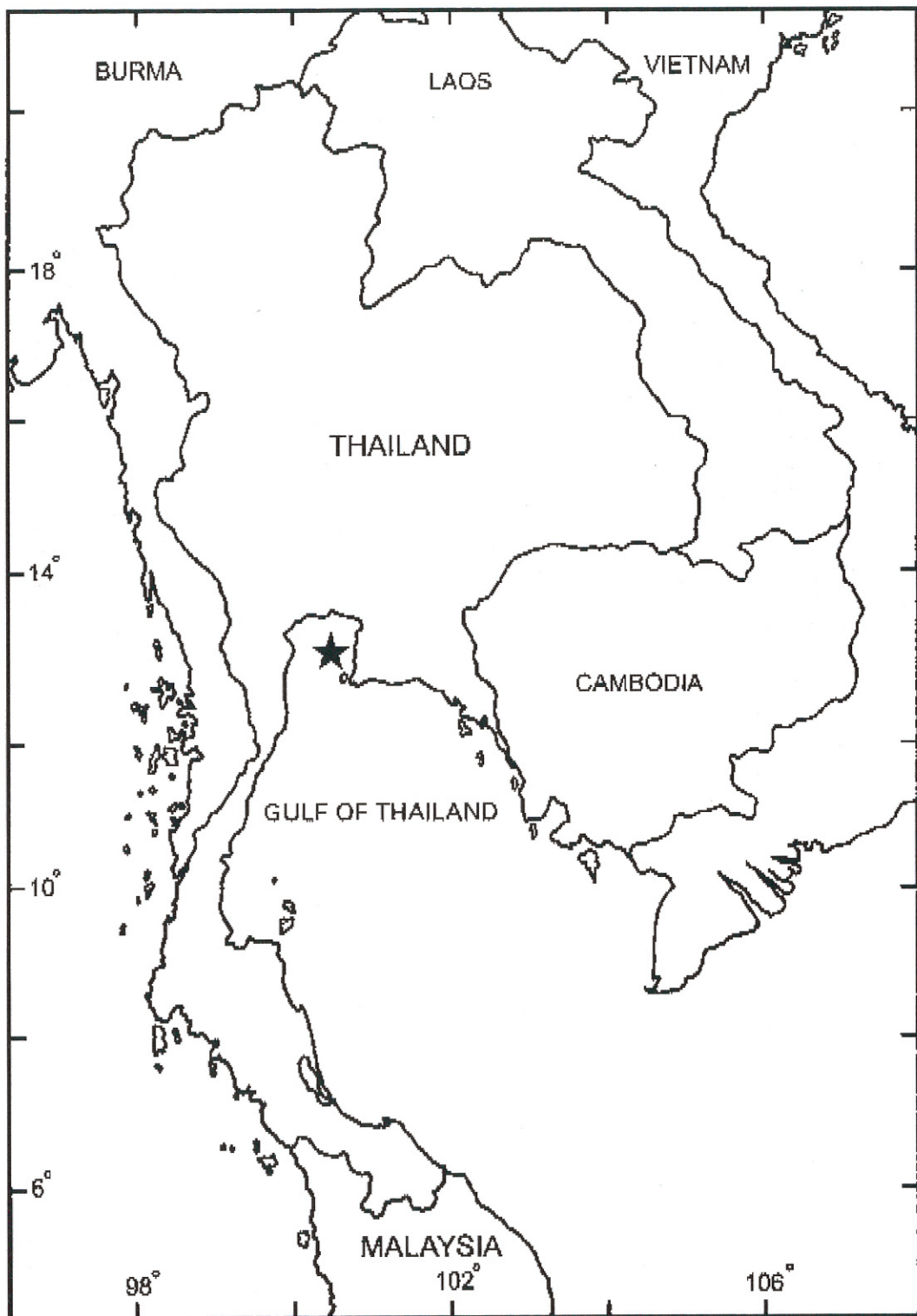


Fig. 2 Collecting locality of *Cladolabes hamatus* (Sluiter, 1914) (asterisk) at Ko Phai, Mu Ko Phai, Pattaya, Chon Buri, Thailand.

conventional methods outlined by workers such as Rowe & Doty (1977) and Massin (1999). Ossicles were removed in household bleach, washed in three changes of distilled water and illustrated with the camera lucida.

The specimen is registered at the Thailand Natural History Museum (THNHM), National Science Museum, Khlong Luang, Pathum Thani province, Thailand, under the number THNHM - Ec - 04564.

RESULTS

Family Sclerodactylidae Panning, 1949
Subfamily Cladolabinae Heding & Panning, 1954

Genus *Cladolabes* Brandt, 1835

Cladolabes hamatus (Sluiter, 1914)
(Figs 3, 4)

Phyllophorus hamatus Sluiter, 1914: 17-19, fig. 6a-d.

Phyllophorus hamatus; Ekman, 1918: 54-57, tab. 5, figs 52-55 (non *P. hamatus* Sluiter).

? *Urodemas hamatum*; Clark H.L., 1938: 502; Clark H.L., 1946: 411.

Urodemas hamatum; Deichmann, 1944: 734, fig. 3a-b.

Cladolabes hamatus; Heding and Panning, 1954: 129-130, fig. 55; Clark and Rowe, 1971: 182-183; Rowe and Gates, 1995: 322.

Cladolabes hamatus; Cannon & Silver 1986: 37 (non *C. hamatus* (Sluiter))

Materials examined: THNHM - Ec - 04564 (1 specimen), Eastern Ko Phai, Pattaya, Chon Buri, Thailand 5 April 2004, 5 m depth, SCUBA-diving, collected by Arom Mucharin.

Description: Specimen entire, well-preserved, 75 x 35 mm in length and width. Living specimen approximately 110 x 70 mm. Colour in life more pronounced than colour in alcohol. Trivium and bivium dark grey and covered by numerous large, white, yellow tipped podia (fig. 3A), distributed evenly over both the

radial and interradial areas. Mouth dorso-terminal, surrounded by 20 yellowish dendritic tentacles positioned in two distinct rings, outer ring with 15 large and inner ring with five smaller tentacles. Anus terminal, unguarded by terminal appendages. Body wall up to 2 mm thick. Calcareous ring approximately 20 mm in length, with large radial interradial plates; posterior processes of radial and interradial plates bifid (fig. 3A). Six club-shaped, short Polian vesicles. Stone canal and madreporite not observed. Gonad present and well-developed, bifid. Respiratory trees well developed, reaching up to half the length of the specimen.

Ossicles: Tentacles with abundant elongated rosettes, 37.5-52.5 μm long (fig. 4B), and tag-like tables with reduced disc and two pillars united by one to two cross-beams; table discs rough, 35.0-37.5 μm across, spire 47.5-55.0 μm high (fig. 4C). Dorsal and ventral body wall have similar slender tables, 87.5-92.5 μm high (fig. 4D-E). Dorsal papillae with tables that resemble a sorcerers hat when viewed from the side, disc 135.0-157.5 μm across, spire 100.0-11.5 μm high (fig. 4F), and perforated plates, up to 200 μm in length (fig. 4G). Ventral tube feet with slender tables as shown in fig. 4D-E; end-plates are 500.0-560.0 μm across (fig. 3H).

Remarks: Even though the genus *Cladolabes* has a widespread Indo-West Pacific distribution (Clark & Rowe, 1971), its species are however nearly invariantly reported in relatively low numbers. This is probably due to their graving behavior, making them hard to spot when sampling. The *C. hamatus* specimen was found living under the sand about 10 meters from the reef, at 5-6 meters depth.

Distribution: *Cladolabes hamatus* has hitherto been recorded with certainty only from Indonesia, Sunda Strait (as Reede von Cheribon) (Sluiter, 1914) and from North Australia (Deichmann, 1944). This first record for Thailand, restricted to Ko Phai (Fig. 2B), is a noteworthy range extension.

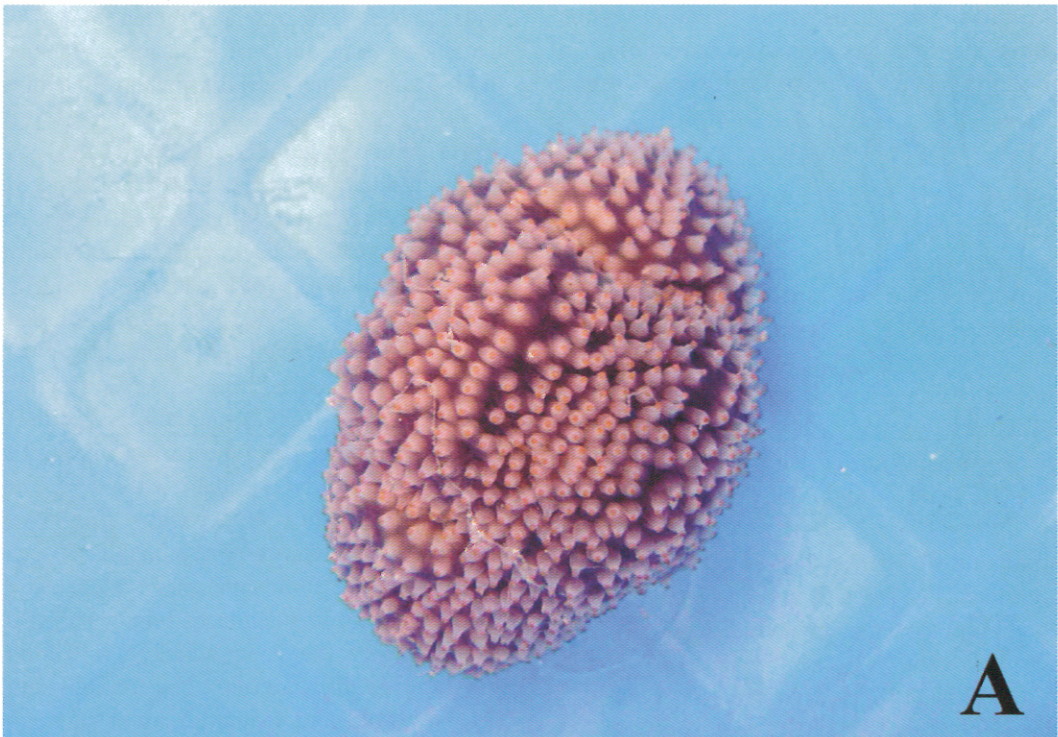


Fig. 3 *Cladolabes hamatus* (Sluiter, 1914). A : living specimen; B : THNHM-Ec-04564, in 70% ethanol.

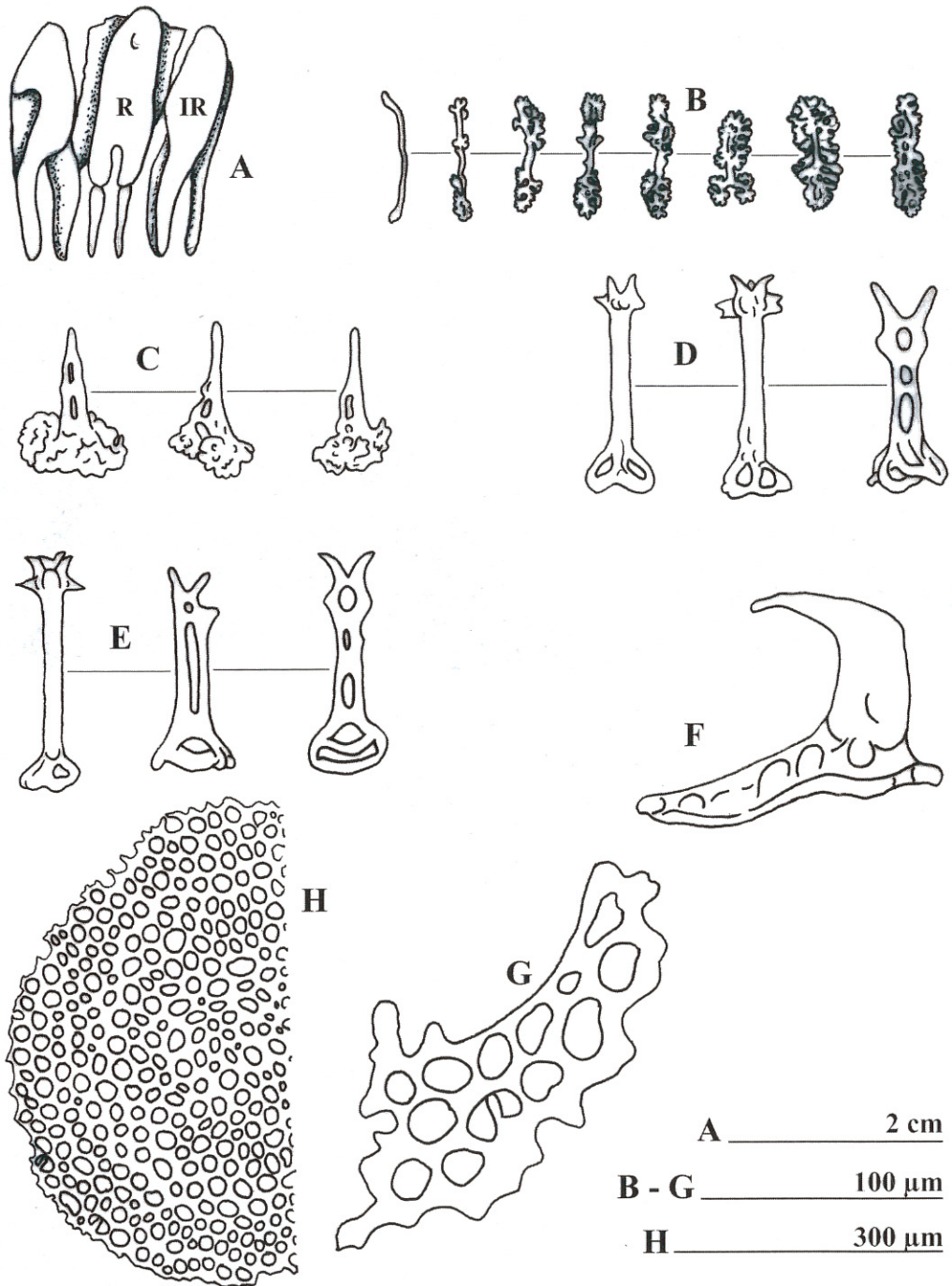


Fig. 4 *Cladolabes hamatus* (Sluiter, 1914). A : calcareous ring (R : radial pieces, IR : interradial pieces); B : rosettes of tentacles; C : tables of tentacles; D : slender tables of dorsal body wall; E : slender tables of ventral body wall; F : table of papillae; G : perforated plate of papillae; H : end plate of tube feet.

Ecology : benthic, filter-feeder, exposing only its tentacles from the sandy substrate in which the body is hidden. Depth range: 5-54 m.

Discussion : Heding & Panning (1954) recognized *P. hamatus* sensu Sluiter and decided to put it in the old genus *Cladolabes* Brandt, 1835 which has priority over the junior synonym *Urodemas* Selenka, 1867. This just decision is here followed.

Ekman (1918) was the first to mention *Phyllophorus hamatus* after Sluiter (1914). Heding and Panning (1954) however referred Ekman's record from Cape Jaubert (Australia) to *C. schmeltzi*, a decision with which we agree. Later H.L. Clark (1938; 1946) mentioned the species under the name *Urodemas hamatum* but noted that there are notable differences between this (his single) specimen and those of Sluiter, but that it (=Clark's specimen) is much smaller than Sluiter's and (that) the differences may be due only to the difference in age (1946: 411). Deichmann (1944), upon a revision of *Urodemas*, recognized *U. hamatum*, from Northern Australia. Her figures (1944: 734, 3a-b) leave no doubt that this is a true *C. hamatus*.

Given that Clark's (1938; see also 1946) record possibly is not referable to *C. hamatus*, and that, apart from Deichman's (1944) record, all the accounts after Clark (1938) are merely recordings based upon the literature, the present record of *C. hamatus* represents only the third verifiable account of this species.

The holothuroid fauna of Thailand was recently reviewed by Putschakarn and Sonchaeng, (2004) and included 94 species. The present record brings the total to 95.

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