

ON TWO SPECIES OF SPIDER CRABS OF THE GENUS *DOCLEA*  
(CRUSTACEA: DECAPODA: BRACHYURA: MAJIDAE: PISINAE)  
FROM CHINA, ONE OF WHICH IS NEW

H.-L. Chen

Institute of Oceanology, Chinese Academy of Sciences, 7 Nan-Hai Road, Qingdao 266071, People's Republic of China  
Email: chenhuil@public.qd.sd.cn

Peter K. L. Ng

Raffles Museum of Biodiversity Research, Department of Biological Sciences, National University of Singapore,  
Kent Ridge, Singapore 119260, Republic of Singapore  
Email: dbsngkl@nus.edu.sg

**ABSTRACT.** – A new species of spider crab, *Doclea unidentata*, is described from the South China Sea. Allied to *D. brachyrhynchus* Bleeker, 1856, and *D. macracanthus* Bleeker, 1856, it can easily be distinguished by its very short, unidentate rostrum. The identity of *Doclea canalifera* Stimpson, 1857, is resolved with the selection of a neotype, and it is here regarded as a senior subjective synonym of *D. japonica* Ortmann, 1893. The taxonomy of this species as well as the allied *D. ovis* (Fabricius, 1787) is also discussed.

**KEY WORDS.** – Majidae, taxonomy, *Doclea*, new species, neotype designation.

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INTRODUCTION

The Indo-West Pacific genus *Doclea* Leach, 1815 (type species: *Doclea rissoni* Leach, 1815, by monotypy) is currently represented by 10 species, viz., *D. aduncus* Wagner, 1986, *D. alcocki* Laurie, 1906, *D. armata* De Haan, 1839 (= *D. tetraptera* Walker, 1887, *D. calcitraba* White, 1847), *D. brachyrhynchus* Bleeker, 1856, *D. canaliformis* Ow-Yang, in Lovett, 1981 (= *D. simeti* Griffin & Tranter, 1986, *D. johnsoni* Ow-Yang, in Lovett, 1981), *D. japonica* Ortmann, 1893, *D. macracanthus* Bleeker, 1856 (= *D. microchir* Bleeker, 1856), *D. muricata* (Herbst, 1788) (*Inachus hybridus* Weber, 1795 (nomen nudum), *Inachus hybridus* Fabricius, 1798, *D. hybridoides* Bleeker, 1856), *D. ovis* (Fabricius, 1787) (= ?*D. canalifera* Stimpson, 1857), and *D. rissoni* Leach, 1815 (= *D. gracilipes* Stimpson, 1857, *D. andersoni* De Man, 1888, *D. sebae* Bleeker, 1856, *D. sinensis* Dai, 1981) (Wagner, 1986; Griffin & Tranter, 1986; Loh & Ng, 1999).

In China, five species have been recorded thus far, viz. *D. armata*, *D. canaliformis*, *D. japonica*, *D. ovis* and *D. rissoni* (cf. Dai et al., 1986; Dai & Yang, 1991; Ng et al., 2001). In the collections of the Institute of Oceanology of the Chinese Academy of Science are several lots of *Doclea*, most of which can be referred to the above species. One unusual specimen clearly belongs to the same group as *D. brachyrhynchus* and

*D. macracanthus*, but is here regarded as a new species. The identity of the problematic *D. canalifera* Stimpson, 1857, is clarified, and is here regarded as a senior subjective synonym of *D. japonica* Ortmann, 1893. In this paper, we describe the new species. We also select a neotype for *D. canalifera*, redefine it and clarify the taxonomy of *D. japonica* and *D. ovis*.

The material examined is deposited in the Institute of Oceanology, Chinese Academy of Sciences (IOCAS) in Qingdao, China; U.S. National Museum of Natural History (USNM), Smithsonian Institution, Washington D.C.; Zoological Museum of the University of Copenhagen (ZMUC), Denmark; The Natural History Museum (NHM), London, England; and Zoological Reference Collection of the Raffles Museum of Biodiversity Research, National University of Singapore (ZRC). The following abbreviations are used: G1 = male first gonopod; cws = total carapace width (including lateral spines), cw = carapace width (excluding spines), cls = total carapace length (including rostrum and intestinal spine when present), cls = post-rostral carapace length (from imaginary line joining the preorbital angle of the supraorbital eave or region of both sides, to centre of posterior margin of carapace, at base of intestinal spine if present).

## TAXONOMY

## FAMILY MAJIDAE

*Doclea* Leach, 1815*Doclea unidentata*, new species

(Figs. 1, 2)

**Material examined.** – Holotype – male (cw 12.7 mm, cws 18.5 mm, cl 14.7 mm, cls 18.4 mm) (IOCAS Q133B34), station 6183, Beibu Bay, 16 m, sandy-mud, China, coll. 13 Feb.1960.

**Description.** – Carapace rounded, dorsal surface covered with short, dense pile; rostrum entire, very short, not extending beyond orbits, broadly triangular, not bifid; margins slightly rimmed. Orbital margin separated from the postorbital spine by deep V-shaped slit. Postorbital spine strongly produced

anteriorly, extending to just beyond tip of rostrum, inner margin concave, outer margin strongly convex, distal part of spine curved inwards. Epigastric region with 3 median low, rounded granules arranged close to each other. Medial line of carapace with 7 rounded granules or spines, last 2 most pronounced, produced as spines. Each protogastric region with 1 small granule along inner edge adjacent to mesogastric region, 2 large granules on posterior outer edge adjacent to branchial region. Mesogastric region with 3 longitudinally arranged rounded granules. Metagastric region with a large median tubercle. Urogastric region with 1 low granule. Cardiac region with 1 obliquely posteriorly directed spine. Intestinal region with 1 large posteriorly directed spine. Subhepatic region with 1 rounded granule dorsally, 1 large subventral tubercle and 1 smaller granule just anterior to this. Branchial region with 6 rounded granules, 1 anterior, 1 posterior, 4 arranged in an oblique median row with inner 3 positioned close to each other. Anterolateral margin with 3 progressively larger tubercles, culminating in very large obliquely posteriorly directed epibranchial spine. Basal antennal article with 1 inner spine. Anterolateral angle of buccal frame produced into a low spine. Pterygostomial canal not discernible. Chelipeds short, slender; merus ca. 3 times as long as broad; chelae slender; palm about twice as long as broad; fingers slightly shorter than palm; cutting margins with small teeth. Ambulatory legs long, slender, covered with pile; first ambulatory leg not substantially longer than second pair.

**Remarks.** – The present new species is represented by only one relatively young male, but its features are so distinctive that we do not hesitate in naming it. With regards to its rounded carapace and very short rostrum, it is closest to *D. brachyrhynchos* Bleeker, 1856, and *D. macracanthus* Bleeker, 1856, both from Indonesia. *Doclea unidentata*, however, can easily be distinguished from these two species in that the rostrum is composed of just one triangular lobe, without any distal cleft or fissure to even suggest it may be bifid. There are no indications that the rostrum is due to regrowth or had been damaged, and all indications that it is normal. The simple rostrum allies the new species to *Neodoclea boneti* Buitendijk, 1950, from Mexico, but the latter species has an unarmed buccal cavity, a differently proportioned third maxilliped and the tip of the G1 is bifid (see Wagner, 1986: 895).

*Doclea canalifera* Stimpson, 1857

(Figs. 3, 4A)

*Doclea japonica* Ortmann, 1893: 46, pl. 3 fig. 4; Wagner, 1986: 902; Griffin & Tranter, 1986: 115; Ng et al., 2001: 13.

*Doclea canalifera* Stimpson, 1857: 217; 1907: 7, Pl. 1 fig. 4; Rathbun, 1902: 29; Gee, 1925: 166; Gordon, 1931: 529; Shen, 1940: 80; Griffin, 1974: 10; Dai et al., 1986: 133, pl. 17(7), text fig. 75(2); Dai & Yang, 1991: 148, pl. 148, pl. 17(7), text fig. 75(2).

*Doclea ovis* – Adams & White, 1848: 7; Wagner, 1986: 897 (part) (not *Cancer ovis* Fabricius, 1787); Dai et al., 1986: 133, pl. 17(6), text fig. 75(1); Dai & Yang, 1991: 148, pl. 147, pl. 17(6), text fig. 75(1).

(for rest of synonymy, see Wagner, 1986: 902, and Ng et al., 2001: 13, under *D. japonica*)

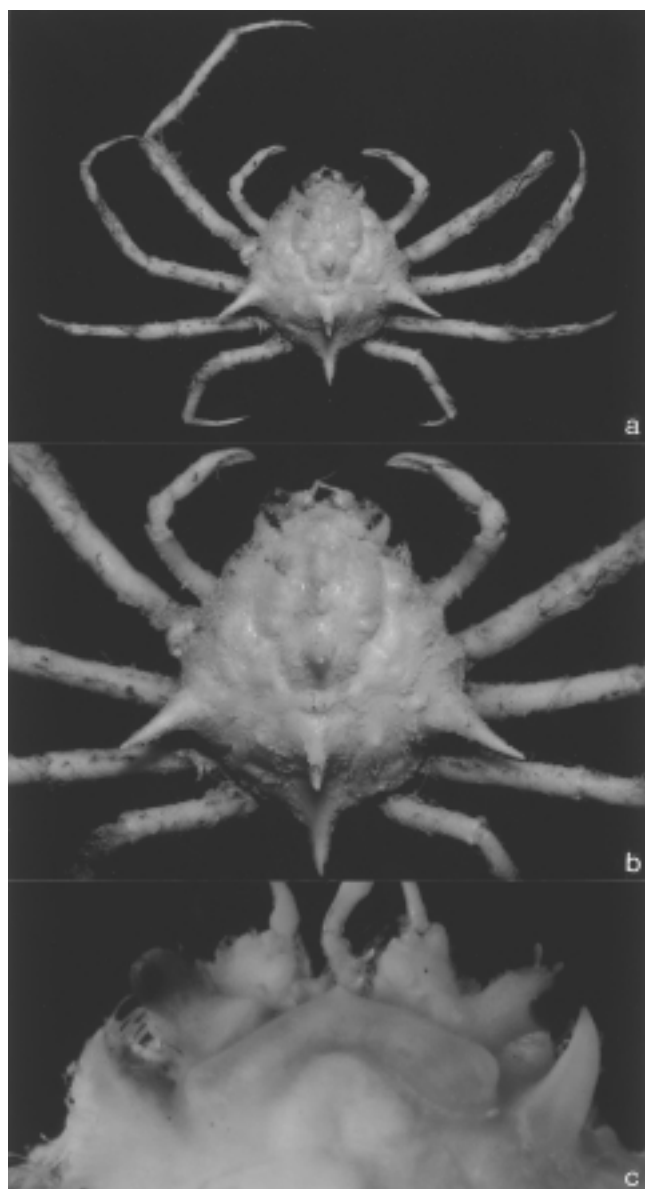


Fig. 1. *Doclea unidentata*, new species. Holotype male (cws 18.5 mm, cls 18.4 mm) (IOCAS Q133B34), China. A, overall view; B, carapace; C, front.

**Material examined.** – **China:** 1 male (cw 56.1 mm, cws 58.4 mm, cl 52.8 mm, cls 60.3 mm) (ZRC 1999.447), neotype of *Doclea canalifera* Stimpson, 1857, Qianjiang Fish Port, Guangdong, Nanao Island, 150 km northeast of Hong Kong, China, coll. Y. Cai & N. K. Ng, 12 Nov.1998; 1 male, 2 females (ZRC), 1 juvenile female (ZRC 1999.462), Qianjiang Fish Port, Guangdong, Nanao Island, 150 km northeast of Hong Kong, China, coll. Y. Cai & N. K. Ng, 12 Nov.1998; 1 female (IOCAS), Fujian Province, China, coll. 15 Apr.1957; 5 males (4 juveniles), Tung-Shan, Fujian Province, China, coll. 16 Apr.1957; 1 male (IOCAS), Sing-Chun, Hainan, China, coll. 21 Apr.1955; 1 male, 1 female (IOCAS), Sang-Ya, Hainan, China, coll. 14 Apr.1955; 1 male (IOCAS), Sang-Ya, Hainan, coll. 25 Dec.1934; 1 male (cw 30.2 mm, cws 34.9 mm, cl 30.8 mm, cls 40.9 mm) (IOCAS S61-39), station 6026, 26.5m, South China Sea, 6 Apr.1959; 1 male (ZRC), station 6185, N36B15, 55 m, South China Sea, coll. Tang, 18 Apr.1959; 4 small males (IOCAS S61-39), station 6026, 26.5m, South China Sea, 6 Apr.1959; 1 male (IOCAS 119B-126), station 6004, 37.4 m, South China Sea, 11 Nov.1959; 1 juvenile female (IOCAS SIII36B-8), station 6009, South China Sea, rough sand, 24 m, coll. 21 Jul.1959; 1 male (IOCAS), station 6192, 21°00'N 109°15'E, northern South China Sea, 16 m, coll. 17 Jul.1960; 5 males (IOCAS), station 7104, 20°15'N 109°45'E, Beibu Bay, northern South China Sea, 29 m, coll. 26 Aug.1962; 1 juvenile female (IOCAS X177B-61), station 7202, 31 m, rough sandy bottom, Beibu Bay, 22 Jan.1962; 1 male, 1 female (IOCAS), Shan-Wei, Guangdong, China, coll. 10 Feb.1955; 1 male (cw 36.0 mm, cws 43.9 mm, cl 37.6 mm, cls 49.8 mm) (USNM 59168), Chekiang (= Zhejiang) Province, Hangzhou, 18 Jul.1923, exchange with National Southeastern University. **Taiwan:** 1 male (ZRC 1998.436), 1 female (ZRC 1998.445), Tashi, Ilan County, northeastern Taiwan, coll. P. K. L. Ng, 17 Jul.1994; 1 female (ZRC 1998.445), Tashi, Ilan County, northeastern Taiwan, coll. X. Q. Ng, 17 Oct.1985; 1 male, 1 female

(ZRC 1998.184), Tashi, Ilan County, northeastern Taiwan, coll. P. K. L. Ng, 3-4 Aug.1996; 1 juvenile male (ZRC 1999.766), Tashi, Ilan County, northeastern Taiwan, coll. P. K. L. Ng & K. Lim, May.1999; 1 juvenile female (ZRC 1999.546), Tashi, Ilan County, northeastern Taiwan, coll. 19 November 1997; 2 males, 1 juvenile female (ZRC 1998.185), Tashi, Ilan County, northeastern Taiwan, coll. P. K. L. Ng, 3-4 Aug.1996; 1 female (cws 41.4 mm, cls 46.7 mm) (ZRC 1998.840), Tashi, Ilan County, northeastern Taiwan, coll. P. K. L. Ng, 25 May.1997; 1 female (cw 21.0 mm, cws 24.4 mm, cl 26.9 mm, cls 30.5 mm) (ZRC 1998.511), Nanfangao, Su-Ao, Ilan County, northeastern Taiwan, coll. P. K. L. Ng & S. H. Tan, 14 May.1998; 1 male, 1 female (ZRC 1998.512), Tashi, Ilan County, northeastern Taiwan, coll. P. K. L. Ng, 25 May.1998; 2 males (larger cws 66.0 mm, cls 64.6 mm), 2 females (larger cws 60.3 mm, cls 66.1 mm), 1 juvenile male, 1 juvenile female (ZRC 2001.55), Tashi, Ilan County, northeastern Taiwan, coll. K. X. Lee, 2000. **THAILAND:** 1 female (ZRC 1992.10315), off Pattaya, Gulf of Thailand, coll. P. K. L. Ng & L. B. Holthuis, 25 Dec.1991; 1 male (cws 55.2 mm, cl 57.6 mm, cls 63.4 mm) (ZRC 2000.929), Si Racha Port, Chonburi Province, Gulf of Thailand, coll. P. K. L. Ng, 22 Feb.2000.

**Description.** – Epigastric region with 3 median low, rounded granules arranged close to each other. Medial line of carapace with 7 rounded granules or spines, last 2 most pronounced, produced as spines. Mesogastric region with 3 longitudinally arranged rounded granules. Protogastric region with 4 obliquely arranged rounded granules, outer- and posterior-most one largest. Metogastric region with a large sharp vertical tubercle medially. Urogastric region with 1 prominent, relatively high but not sharp granule. Cardiac

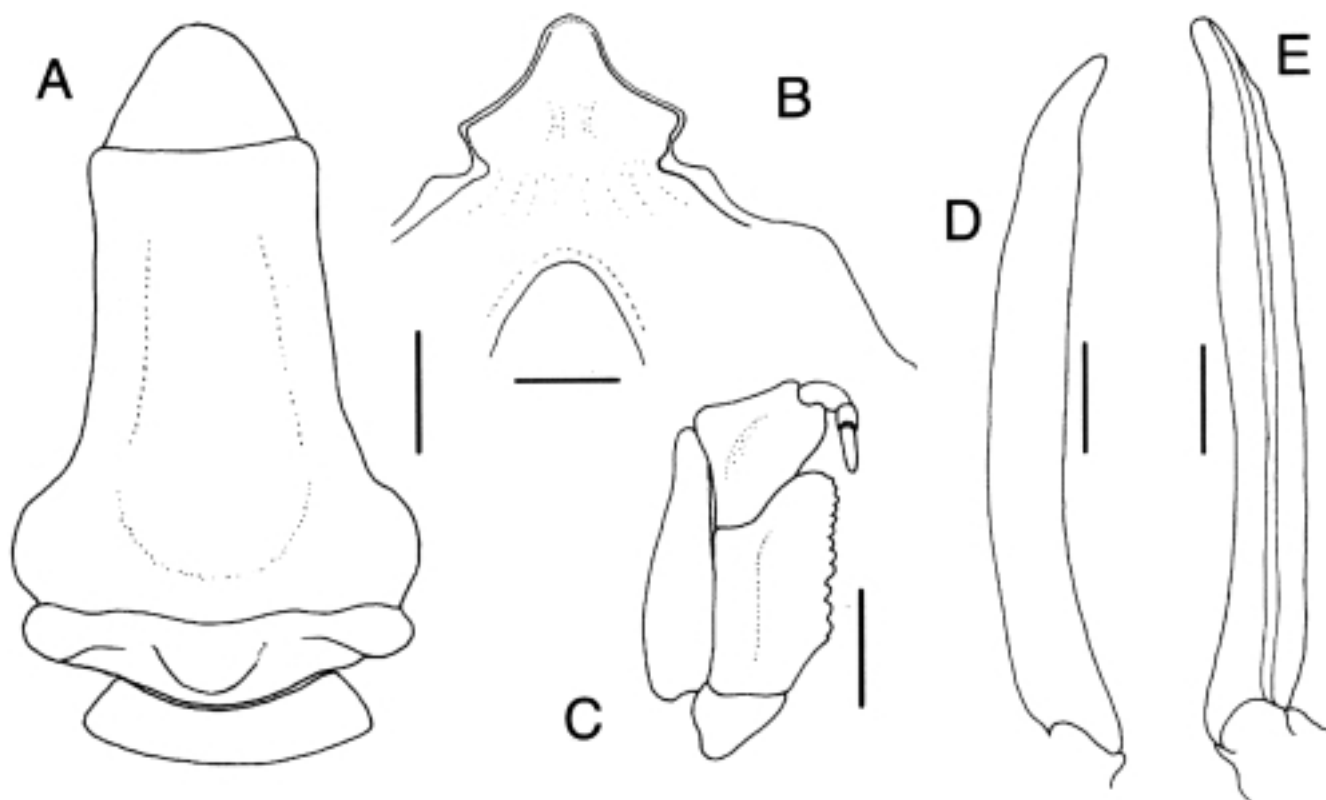


Fig. 2. *Doclea unidentata*, new species. Holotype male (cws 18.5 mm, cls 18.4 mm) (IOCAS Q133B34), China. A, male abdomen; B, anterior part of thoracic sternum; C, right third maxilliped; D, ventral surface of right G1; E, dorsal surface of right G1. Scales: A-C = 1.0 mm, D, E = 0.5 mm.

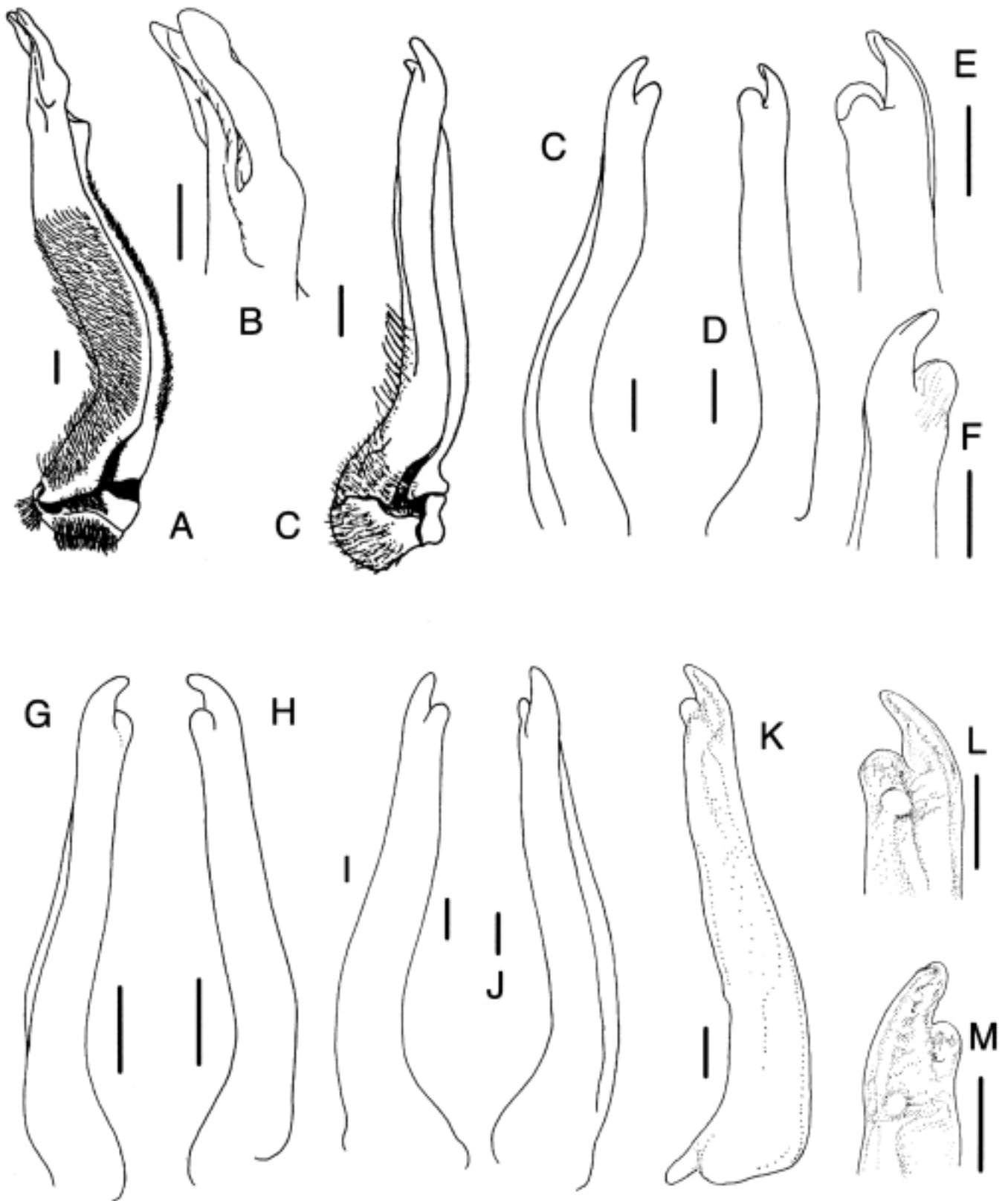


Fig. 3. *Doclea canalifera* Stimpson, 1857 (= *D. japonica* Ortmann, 1893). G1s. A, B, male, Vietnam (after Wagner, 1986: Figs. 6, 7); C, male, Japan (after Wagner, 1986: Figs. 5); G, H, male (cws 24.9 mm, cls 29.8 mm) (ZRC 1998.512), Taiwan; I, J, male (cws 48.5 mm, cls 52.8 mm) (ZRC 1998.185), Taiwan; K-M, male (cws 34.9 mm, cls 40.9 mm) (IOCAS S61-39), South China Sea. A, C, K, ventral view of right G1; B, distal part of right G1, ventral view; C, G, I, ventral views of left G1s; D, H, J, dorsal views of left G1s; E, distal part of left G1, dorsal view; F, distal part of left G1, ventral view; L, distal part of right G1, ventral view; M, distal part of right G1, dorsal view. Scales: A, C-M = 1.0 mm; B = 0.5 mm.

region with 1 obliquely posteriorly directed spine. Intestinal region with 1 large posteriorly directed spine. Subhepatic region with 1 rounded granule dorsally, with 1 large subventral tubercle and 1 smaller granule just anterior to this. Branchial region with 7 rounded granules, 2 adjacent to mesogastric region, 2 closely adjoined medially, with 1 granule anterior and 1 granule posterior to them, adjacent to epibranchial spine. Anterolateral margin with 3 tubercles (progressively larger posteriorly), culminating in very large obliquely posteriorly directed epibranchial spine. Basal antennal article with 1 inner spine. Anterolateral angle of buccal frame produced into a low spine. Pterygostomial canal not discernible. Ambulatory legs long, slender, covered with pile; first ambulatory leg not substantially longer than second pair.

**Remarks.** – The identity of *D. canalifera* Stimpson, 1857, is difficult. It was originally described on the basis of a young male measuring about 42 mm in carapace length (intestinal spine inclusive) from about 20 fathoms (36 m) of water off Tamtoo, south of Hong Kong (see also Rathbun, 1902: 29). In his revision of the genus *Doclea*, Wagner (1986: 901) commented that “As the type material of *D. canalifera* is lost it is not certain whether the species are juveniles of *D. ovis* or of *D. japonica*” and “It is uncertain whether STIMPSON’s type material from Hong Kong, described as *Doclea canalifera*, is a young of this species or of *D. ovis*. The nomenclatural status of *D. canalifera* may ultimately be

established by the selection of a male neotype from Hong Kong” (p. 903). Nevertheless, he retained *D. canalifera* under the synonymy of *D. ovis*, commenting that the only specimens (two females) he has seen from Hong Kong are *D. ovis* (however, see later). The problem is vexatious. Griffin & Tranter (1986: 115) commented that “... the two are geographically separated, one occurring in the Indian Ocean east to Singapore [*D. ovis*] and one species occurring around Japan and off China [*D. japonica*]. The former species is clearly *D. ovis*”. On the other hand, according to Wagner (1986), the distributions of both *D. ovis* and *D. japonica* overlap in the northern part of the South China Sea, with Hong Kong within this range.

The two species are indeed very similar, and only adults can effectively be separated. The G1 structure is the most diagnostic. Adult specimens of *D. ovis* (ca. 50 mm cws and larger) have the distal part of the G1 very slender and elongate, with a small slender lobe basally (Figs. 5A, C, D; cf. Wagner, 1986: Fig. 4; Griffin & Tranter, 1986: Fig. 34a). Adult *D. japonica* on the other hand (ca. 50 mm cws and larger), have the distal part of the G1 separated into two finger-like processes subequal in length (Figs. 3A, B; cf. Wagner, 1986: 6; Griffin & Tranter, 1986: Figs. 34b, f, g). Smaller specimens of *D. ovis* (ca. 30-40 mm cws) still have G1s similar in form to the adults but the elongate distal part is less pronounced and there is no trace of the small basal lobe (Fig. 5B). Smaller specimens of *D. japonica* (ca. 25-40 mm cws) have a G1 distal part in which one projection is finger-like and much larger than the other, and appears somewhat subchelate, but the finger-like projection is still relatively stout and not prominently elongate (Figs. 3C-M)). In fact, the size-related variation in G1 form led Dai et al. (1986) and Dai & Yang (1991) to recognise two “species” in China, one with a G1 in which the two distal projections are subequal in length (their “*D. ovis*”) and one with a G1 in which one projection is much shorter than the other (their “*D. canalifera*”). Both are actually what is presently called *D. japonica*. In fact, Wagner (1986) had already illustrated this clearly, showing that juveniles have the second type of G1 (Wagner, 1986: Fig. 5) and adults the first condition (Wagner, 1986: Figs. 6, 7). In general, specimens smaller than 20-25 mm cws are very difficult to distinguish as their G1 structures are very similar. For females, as noted by Wagner (1986) and Griffin & Tranter (1986), the overall shape of the vulvae are diagnostic, being more swollen and round in *D. japonica* (Fig. 4A) but transversely ovate and more slit-like in *D. ovis* (Fig. 4B). However, this is only valid for adult females (ca. larger than 45-50 mm cws) in which their vulvae are fully formed and the female abdomen prominently domed and covering most of the thoracic sternum. Smaller female specimens (ca. less than 40-45 mm cws) which have more quadrate and flatter abdomens that do not cover most of the sternum do not have the vulvae raised, and as such, cannot be reliably distinguished. The vulva of small *D. japonica* superficially resembles that of *D. ovis* (less swollen and rounded) and confusion can thus result. In general, juvenile specimens of both species cannot be reliably identified on the basis of just external morphology. Wagner (1986) lists material of *D. ovis* from China, Hong Kong, Philippines and Vietnam, but a good

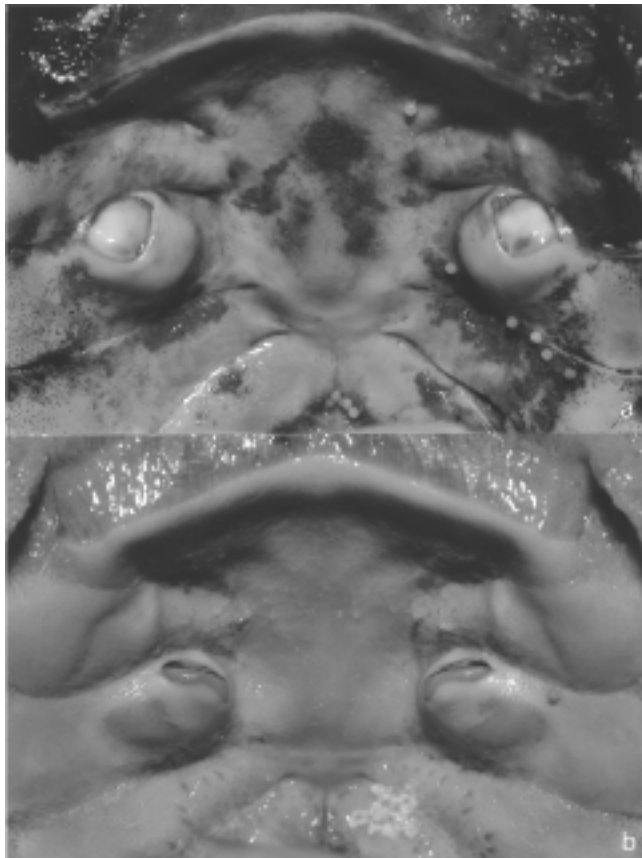


Fig. 4. Vulvae. A, *Doclea canalifera* Stimpson, 1857 (= *D. japonica* Ortmann, 1893), ovigerous female (cws 60.3 mm, cls 66.1 mm) (ZRC 2001.55), Taiwan; B, *Doclea ovis* (Fabricius, 1787), ovigerous female (cws 52.1 mm, cls 57.9 mm) (ZRC 1987.456), Singapore.

part of this was based on female specimens (sizes not stated) and it is possible that at least some may have been misidentified. Certainly, one adult male specimen from China (USNM 59168) identified by Wagner (1986) as *D. ovis* is here shown to be clearly *D. japonica*, its G1 structure being diagnostic (cf. Figs. 3A, B).

All the specimens we have examined show that the two species have discrete distributions and if they overlap, it can only be in the northern part of the South China Sea, although we have no material that actually shows this. In the Indian Ocean all the way to Singapore and the southern part of the South China Sea, only one species is present, *D. ovis*. From Japan through to southern China and Taiwan, only *D. japonica* is present. Although we have not examined the types of *D. japonica*, all the available data indicates there is only one species in Japan and it is the same as that in China (see also Griffin & Tranter, 1986; Wagner, 1986). The Gulf of Thailand has two species; in the northern part (the Pattaya and Chonburi areas), we only have specimens of *D. japonica* and from the southern part (Pattani area), we only have specimens of *D. ovis*. Admittedly, our samples from the Gulf of Thailand are rather limited and we have no material from the central part. As such, it seems more likely that if the distributions of the two species overlap, it would be in the Gulf of Thailand and adjacent areas. The two specimens from Hong Kong (type locality of *D. canalifera*) referred to *D. ovis* by Wagner (1986: 898) are both females (NHM 1930.12.2.263, coll. Barney). Paul Clark (NHM) was kind enough to check these specimens for us. Of the two, one is

in very poor condition and the carapace is missing. The other specimen is intact and is an ovigerous female measuring 51 mm cws. The vulvae of this specimen matches that for what is presently called *D. japonica* (Fig. 4A) and not *D. ovis* (Fig. 4B) (P. F. Clark, pers. comm.), confirming our suspicion that there are actually no known confirmed records of *D. ovis* from Chinese waters. The records from Vietnam (André, 1931; Serène, 1937; Dawydoff, 1952; Wagner, 1986), Gulf of Thailand (Rathbun, 1910; Suvatti, 1937, 1950; Naiyanetr, 1980, 1998; Wagner, 1986) and Philippines (Wagner, 1986) will also need to re-examined to see if they belong to *D. ovis* and/or *D. japonica*.

As a result, we do not think *D. canalifera* Stimpson, 1857, is synonymous with *D. ovis* (Fabricius, 1787), contrary to Wagner's (1986) supposition. In fact, all the available evidence points to the fact that *D. canalifera* is actually identical with what is presently called *D. japonica*. To conclusively resolve the taxonomic impasse over the identity of *D. canalifera* and the problem of Stimpson's lost type(s), a neotype is clearly necessary. The only specimens known from Hong Kong (NHM 1930.12.2.263), unfortunately are females, and although one of them is what is presently known as *D. japonica*, in the context of the present problem, selection of an adult male is clearly preferable. To this effect, we hereby select a recently collected male (cws 58.4 mm, cls 60.3 mm) (ZRC 1999.447) from Nanao Island in Guangdong Province, southern China, as the neotype of *Doclea canalifera* Stimpson, 1857. In its external features, it agrees well with the brief description and simple figure of the species by

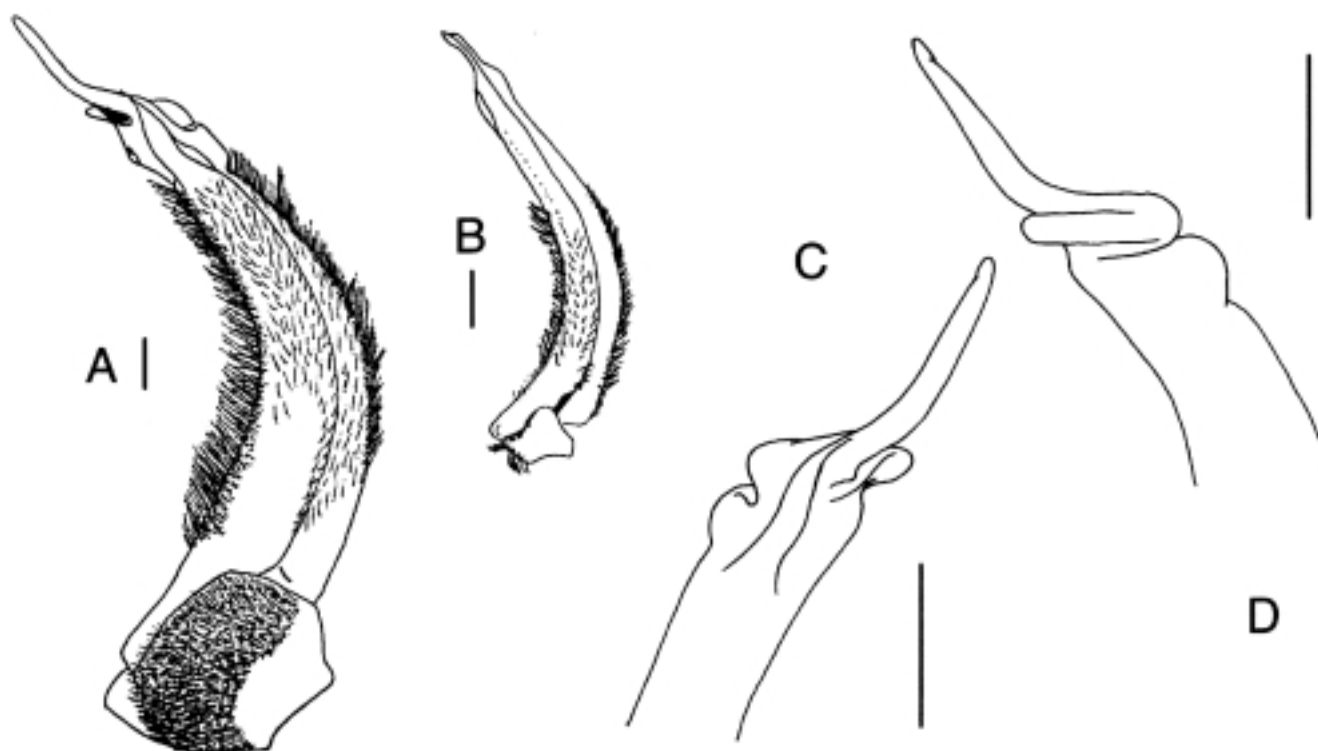


Fig. 5. *Doclea ovis* (Fabricius, 1787). G1s. A, male, Peninsular Malaysia (after Wagner, 1986: Fig. 4); B, male, India (after Wagner, 1986: Fig. 3); C, D, male (cws 55.5 mm, cls 61.7 mm), (ZRC 1965.10.14.33-34), Singapore (modified from Ow-Yang, 1963). A, B, ventral view of right G1; C, D, distal part of left G1, ventral view, setae not drawn; D, distal part of left G1, dorsal view, setae not drawn. Scales: A, B = 1.0 mm; C, D = 2.5 mm.

Stimpson (1857, 1907). This locality is only about 140 km northeast of Hong Kong. *Doclea japonica* Ortmann, 1893, thus becomes a subjective junior synonym of *D. canalifera* Stimpson, 1857. This should not cause any problems as the name *D. japonica* was only resurrected from the synonymy of *D. ovis* relatively recently by Wagner (1986) and Griffin & Tranter (1986), and has been used only sporadically. The species has no economic value and has not been used extensively for research.

A note on *Doclea ovis* (Fabricius, 1787) is necessary. The species was described (as *Cancer ovis*) from "India orientali" by Fabricius (1787: 324) on the basis of an unspecified number of specimens. Zimsen (1964: 647) noted that there was one specimen originally from Kiel in the ZMUC. We have examined this specimen, an adult female, and we hereby designate it as the lectotype of the species. It has been rehydrated, and is in fairly good condition.

**Comparative material of *D. ovis*.** – Lectotype: female (cws 44.6 mm, cls 46.3 mm) (ZMUC Cru 65), "India orientali". **Singapore:** 1 male (cws 55.5 mm, cls 61.7 mm), 1 female (ZRC 1965.10.14.33-34), Siglap, coll. M. W. F. Tweedie, Jun.1934; 1 female (cws 52.1 mm, cls 57.9 mm) (ZRC 1987.456), Bedok, coll. Singapore Fisheries Research Station, 6 Dec.1956; 1 juvenile (ZRC 1985.141), south of Bedok, station B60, 21-22 fathoms, coll. Singapore Fisheries Research Station, Jun.1963; 1 male (ZRC 1988.2198), Siglap, coll. R. D. Purchon, 9 Feb.1952; 1 juvenile female (ZRC 1965.10.14.27), Siglap, coll. M. W. F. Tweedie, June 1934; 1 male (ZRC 1987.1047), Marine Parade, East Coast, coll. 22 Apr.1960; 1 juvenile female (ZRC 1984.5599), Changi Point, coll. 9 May.1982; 1 female (ZRC 1995.446), Changi Point, coll. P. K. L. Ng, Jun.1993; 1 male (ZRC 1996.2084), off Changi Point, coll. C. M. Yang, 19 Jan.1987; 3 juveniles (ZRC 1985.135-137), shoal west of Raffles Lighthouse, station B28, 5-6 fathoms, coll. Singapore Fisheries Research Station, Jun.1963; 3 juveniles (ZRC 1985.138-140), outer shoal, east of Sentosa island, station B25, 6 fathoms, coll. Singapore Fisheries Research Station, Jun.1963; 2 males (ZRC 1984.5597-5598), East Coast, coll. P. K. L. Ng, May.1982; 1 female (ZRC 1984.5596), East Coast, coll. P. K. L. Ng, Dec.1982; 3 females (ZRC 1981.9.2.36-38), East Coast, coll. P. K. L. Ng, Mar.1981; 1 male (ZRC 1981.9.2.18), off East Coast Lagoon, coll. P. K. L. Ng, Mar.1981. SOUTH CHINA SEA: 1 male, 2 females (ZRC 1984.168-170), near Horsburg Lighthouse, coll. Hee Huat, 26 Nov.1982; 2 males, 1 female (ZRC 1984.6345-6347), near Horsburg Lighthouse, coll. Hee Huat, 10 Sep.1983; 2 males (larger cws 54.1 mm, cl 54.0 mm, cls 58.7 mm) (ZRC 1984.6343-6344), 150 miles off Singapore, coll. Hee Huat, 19 Aug.1983. **Peninsular Malaysia:** 2 juvenile males, 4 juvenile females (ZRC 1984.6431-6436), Kuala Johor, Johor, coll. 17 June 1954; 1 male (ZRC 2001.1307), Pulau Perhantian, Terengganu, coll. 16 May.1976; 1 female (ZRC 1999.1261), Tanjong Telek, Penang, coll. S. Teo et al., 13 Dec.1993; 2 juveniles (ZRC 1988.2199-2200), Penang Straits, 2-4 fathoms, coll. Apr.1935; 1 male, 1 female (ZRC), Andaman Sea, between Penang and Langkawi, coll. C. P. How & C. O. Lau, 12 Nov.1991; 3 males, 2 females (ZRC), Pontian, Johor, coll. C. M. Yang, 31 Mar.1991. **Thailand:** 1 male (ZRC 1998.1135), 1 female (ZRC 1999.142), Andaman Sea, Pichai Fish Port, Phuket, coll. S. Chaitiamvong, Dec.1998; 8 males, 1 female (ZRC 1999.143), Andaman Sea, Pichai Fish Port, Phuket, coll. H. H. Tan et al., Apr.1999; 3 males, 1 female (ZRC 2000.761), Andaman Sea, Pichai Fish Port, Phuket, coll. N. K. Ng et al., 17-20 Jan.2000; 1 male, 1 female (ZRC 2000.827), Andaman Sea, Pichai Fish Port, Phuket, coll. P. K. L. Ng, 3-6 May.2000; 1 male (ZRC 2001.1059), Andaman Sea, Pichai Fish Port, Phuket, coll. 12 Feb.2001; 3 males, 2 females (ZRC), Andaman

Sea, Pichai Fish Port, Phuket, coll. C. Y. Lai, 22-25 Aug.2002; 3 males, 2 females (ZRC), fish port, Pattani Bay, Gulf of Thailand, coll. D. C. J. Yeo, 20 Feb.2003. **India:** 1 female (ZRC 2001.857), Porto Novo, river mouth of Vellar Estuary, Tamil Nadu, coll. N. K. Ng, 7 Mar.2001; 1 male (cws 47.3 mm, cls 51.7 mm, with sacculinid infestation), 2 females (ZRC 2001.905), Tranquebar, Tamil Nadu, coll. N. K. Ng & A. S. Fernando, 16-24 Mar.2001; 1 male, 2 females (ZRC 2001.906), Tranquebar, Tamil Nadu, coll. N. K. Ng & A. S. Fernando, 16-24 Mar.2001.

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