

Redescription of *Echinoplax rubida* Alcock, 1895, a valid species of *Pleistacantha* from the Andaman Sea (Crustacea: Brachyura: Oregoniidae)

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Abstract. The deep-water spider crab, *Pleistacantha rubida* (Alcock, 1895) is known only from the description and figures of the female holotype from the Andaman Sea, and has been variously regarded as a valid species or as a synonym of *Pleistacantha oryx* (Ortmann, 1893) (type locality: Japan). *Pleistacantha rubida* is redescribed and refigured based on the holotype and confirmed as a valid species, distinct from *P. oryx*. Although the two species are similar in most respects, restudy of the holotype of *P. rubida* shows that it clearly differs from *P. oryx* in the ornamentation of the anterolateral margins of the buccal cavity and rostral proportions. *Pleistacantha rubida* is one of three species of the genus known from Indian waters.

Key words. decapoda, spider crab, India

INTRODUCTION

Alcock (1895) recorded two species of deep-water spider crab in the genus *Echinoplax* Miers, 1886, from the Andaman Sea: *E. pungens* Wood-Mason in Wood Mason & Alcock, 1891, and *E. rubida* Alcock, 1895. *Echinoplax* is currently considered a junior synonym of *Pleistacantha* Miers, 1879, and from early on, *E. pungens* and *E. rubida* were synonymised with *P. moseleyi* (Miers, 1879) and *P. oryx* Ortmann, 1893, respectively (Doflein, 1904; Sakai, 1963; Griffin & Tranter, 1986a, b). Ah Yong & Ng (2007) showed *P. pungens* to be a valid species (see also Ng et al., 2017), but the status of *P. rubida* has remained ambiguous, being variously regarded as a synonym of *P. oryx*, a valid species, or of uncertain status (Guinot & Richer de Forges, 1982, 1986; Ah Yong & Lee, 2006; Ng et al., 2008). Aside from *P. rubida*, *Pleistacantha* currently includes 12 Indo-West Pacific species (Ah Yong et al., 2005; Ah Yong & Lee, 2006; Ah Yong & Ng, 2007; Ng et al., 2008, 2017). *Pleistacantha oryx* (type locality: Japan) is one of the most widely reported but least known species of the genus, previously reported from the Western Arabian Sea to Australia and

Japan (Griffin, 1974; Griffin & Tranter, 1986a). Ongoing revision of *Pleistacantha* by the first author, however, has shown that previous reports of *P. oryx* from many parts of its presumed range are referable to other species; *P. oryx* is currently known with certainty only from East Asia, with most published records requiring verification (Ah Yong & Lee, 2006). Although the status of *P. rubida* as a junior synonym of *P. oryx* has been questioned (Guinot & Richer de Forges, 1986; Ah Yong & Lee, 2006), Alcock's type material has neither been restudied nor has further material attributable to *P. rubida* sensu stricto been reported. Here, based on the holotype, we redescribe *P. rubida* and recognise it as a valid species of *Pleistacantha* in advance of a full revision of the genus, currently underway.

MATERIAL AND METHODS

Pleistacantha has been traditionally placed in Inachidae MacLeay, 1838, but has more recently been transferred to Oregoniidae Garth, 1958, within the subfamily Pleistacanthinae Števcíć, 2005, together with four other genera (Marco-Herrero et al., 2013). Ongoing examination of Pleistacanthinae suggests that it warrants recognition as a separate family but is herein retained in Oregoniidae pending further study.

Morphological terminology follows Ah Yong & Lee (2006) and Ah Yong & Ng (2007). Carapace length (cl) is measured along the dorsal midline from the level of the apices of the rostral spines to the posterior margin of the carapace. Postrostral carapace length (pcl) is measured from the base of the sinus between the rostral spines to the posterior margin of the carapace. Carapace width (cw) is the greatest width (excluding spines). Specimens are deposited in the Zoological

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Survey of India, Kolkata (ZSI), Australian Museum, Sydney (AM), and Lee Kong Chian Natural History Museum, National University of Singapore (ZRC).

Comparative material of *Pleistacantha oryx*. AM P34571, 2 males (cl 44.5 mm, pcl 27.3 mm, cw 19.4 mm; cl 40.2 mm, pcl 26.1 mm, cw 18.2 mm), 2 ovigerous females (cl 30.4 mm, pcl 21.9 mm, cw 16.5 mm; cl 37.4 mm, pcl 25.3 mm, cw 19.0 mm), Okinose, Sagami Bay, Japan, 540 m, coll. Th. Mortensen, 1914; ZRC 2001.0065, 1 male (cl 43.5 mm, pcl 30.1 mm, cw 22.5 mm), Donggang, Kaohsiung County, Taiwan, 6 November 2001.

SYSTEMATICS

Oregoniidae Garth, 1958

Pleistacantha Miers, 1879

Pleistacantha rubida (Alcock, 1895)

(Figs. 1, 2A)

Echinoplax rubida Alcock, 1895: 179. — Alcock & Anderson, 1896: pl. 17 fig. 2, 2a. — Sakai, 1963: 14, 17.

Pleistacantha rubida. — Serène & Lohavanijaya, 1973: 42, 43, 44. — Sakai, 1976: 173. — Guinot & Richer de Forges, 1982: 1101; 1986: 129, pl. VII fig. E. — Kazmi, 1997: 85. — Ahyong et al., 2005: 1. — Ng et al., 2008: 112.

Holotype. ZSI IM9480/9, female (cl 33.8 mm, pcl 26.2 mm, cw 20.9 mm), Andaman Sea, 90–177 fathoms (165–324 m), RIMSS *Investigator*.

Description. Carapace pyriform, postrostral carapace length 1.28× width. Rostral spines 0.26 pcl; widely separated basally, divergent; unarmed dorsally; with 2 ventral (excluding basal) spine; with 2 or 3 well-spaced lateral spines. Orbital margin with 5 or 6 well-spaced spines increasing in size posteriorly: 1 or 2 small preorbital spines near rostral base, 2 larger, slender supraorbital, slender intercalated and postorbital spines. Hepatic spine large, anterolaterally directed, with 2 or 3 small accessory spines basally. Branchial margins lined with short spines and 2 larger spines: 1 each between pereopod 1/pereopod 2, and pereopod 2/pereopod 3 articulations, respectively. Dorsal surface covered with short conical tubercles of similar size in addition to widely spaced, long, upright spines, longest on gastric and anterior branchial regions. Branchial regions neither markedly swollen nor contiguous in the carapace midline, distinctly separated by cardiac region; cardiac region width at least half length.

Epistome with small ventrally directed spine lateral to antennal gland aperture, and cluster of few acute tubercles midway between antennal aperture and anterolateral angle of buccal cavity; anterolateral angle of buccal produced to prominent anterolaterally directed spine, extending beyond hepatic margin beneath hepatic spine.

Eye, when folded back into ‘orbit’, extending posteriorly slightly beyond level of antennal gland aperture. Eyestalk with few, stiff setae on anterior margin.

Interantennular spine bifurcated in distal quarter, slightly divergent; distal margin of antennular sinus produced to slender, ventrolaterally directed spine. Antennal peduncle article 1 ventrally and distally spinose; article 2 distally and ventrally spinose; article 3 unarmed; flagellum extending slightly beyond rostral apices.

Maxilliped 3 merus as wide as ischium; meral surface spinose, with slender spine on either side of carpal articulation, anterolateral margin triangular with spinose margins; ischium margins dentate, surface with conic tubercles and shallow longitudinal groove.

Thoracic sternites 3 and 4 weakly tuberculate. Female abdomen forming operculum, with 6 somites and telson, widest at somite 6; surface spinulose.

Cheliped (pereopod 1) length 1.29 pcl; slender, markedly spinous; palm, carpus and merus with longitudinal rows of slender, upright spines, longest on lower and inner margins; propodus palm length 3.61× height; dactylus 0.53× propodus length; occlusal margins of dactylus and pollex dentate, with slight gape.

Walking legs (pereopods 2–5) long, slender, decreasing in length posteriorly; articles spinous, with longitudinal rows of long, widely spaced, upright spines along lower and lateral margins, particularly on merus; dactyli with dense setae and corneous tips; dactyli of pereopods 2 and 3 0.62× propodus length, those of pereopods 4 and 5 0.54× propodus length. Pereopod 2 2.84 pcl, merus 0.97 pcl. Pereopod 5 1.52 pcl; merus 0.62 pcl.

Remarks. *Pleistacantha rubida* closely resembles *P. oryx*, with which it has been synonymised, in the combination of the short distal bifurcation of the interantennular spine, basally divergent rostral spines, and dorsal carapace ornamentation consisting of several longer spines within a field of much shorter spines or acute granules. The two species, however, differ most clearly in the armature of the anterolateral margin of the buccal cavity, but also in the length and curvature of the rostral spines. The anterolateral margin of the buccal cavity is produced to a prominent anterolaterally directed spine in *P. rubida* (Fig. 2A), extending almost to the hepatic margin in the holotype. In contrast, the anterolateral buccal margin of *P. oryx* is only dentate but not produced to a long spine (Fig. 2B). The rostral spines of the holotype of *P. rubida* are distinctly shorter than similarly-sized *P. oryx* (0.26 versus > 0.39 pcl), in which the rostral spines are either straight or curved slightly outwards (cf. Fig. 1A, B, Sakai, 1965: fig. 10A).

Pleistacantha rubida remains known only from the single type specimen, the adult female holotype from the Andaman Sea (Alcock, 1895). In exploring the possible validity of *P. rubida*, Guinot & Richer de Forges (1986) reported several specimens in the Natural History Museum, London, from the western Indian Ocean that were identified as *P. rubida* by W.T. Calman in 1916. Sakai’s (1963, 1976) purported examination of a cotype of *E. rubida* from the British Museum

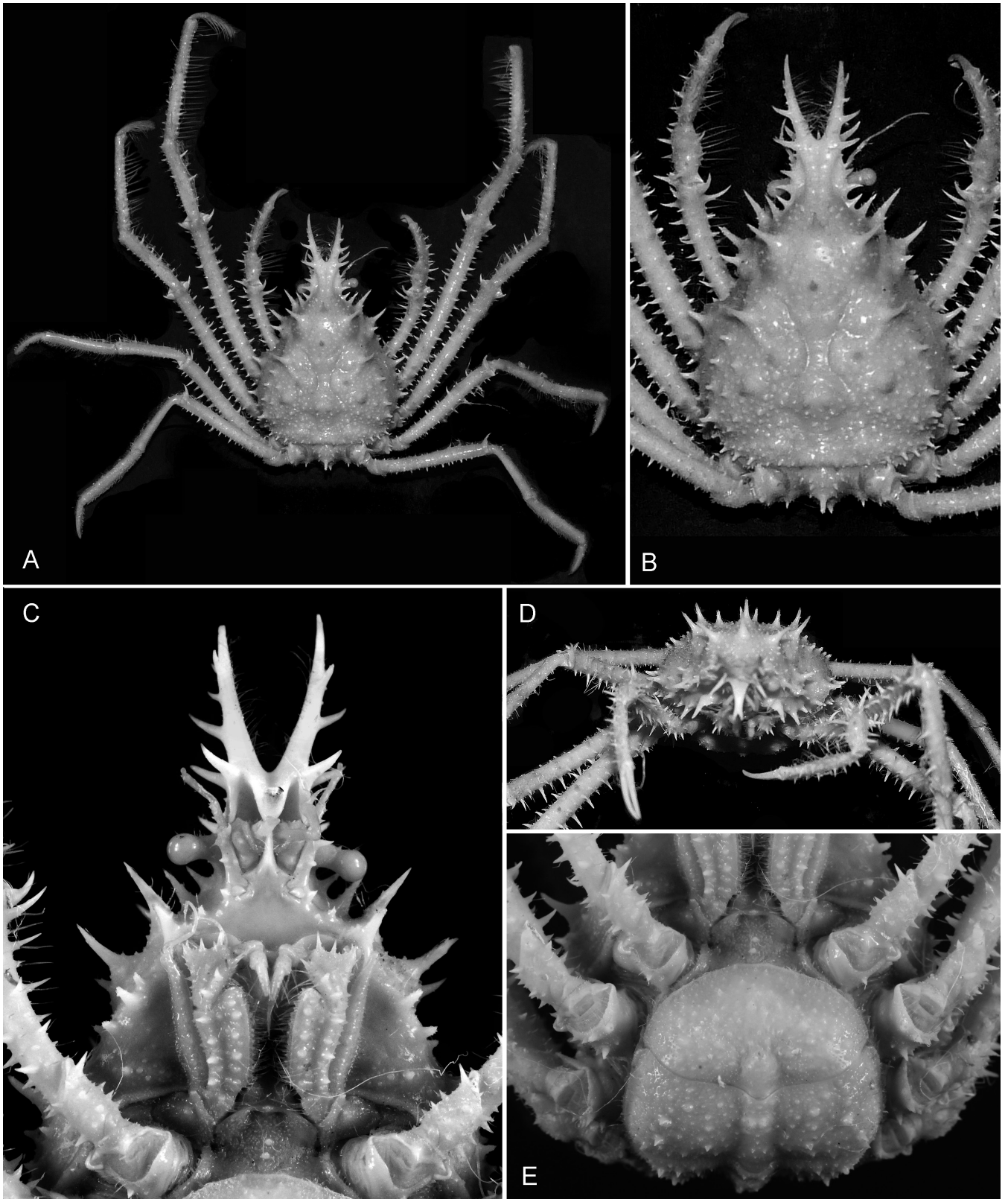


Fig. 1. *Pleistacantha rubida* (Alcock, 1895), female holotype, cl 33.8 mm, pcl 26.2 mm, cw 20.9 mm, Andaman Sea, ZSI IM9480/9. A, dorsal habitus; B, carapace, dorsal view; C, anterior cephalothorax and oral field, ventral view; D, anterior cephalothorax, anterior view; E, abdomen and ventral view.

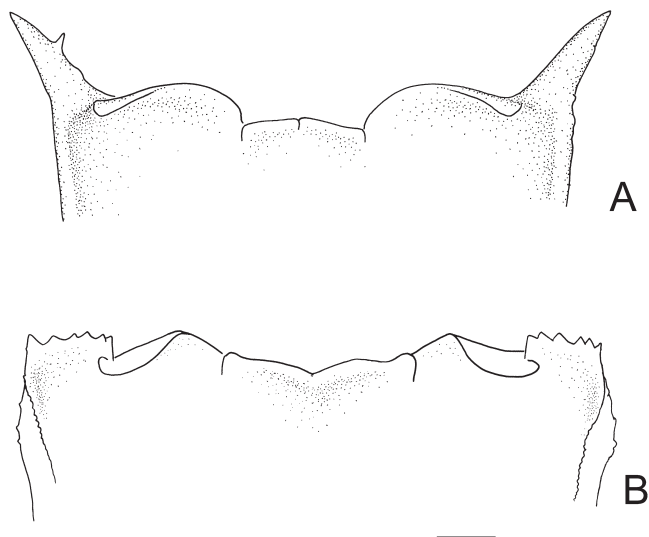


Fig. 2. Anterior margin of buccal cavity. A, *Pleistacantha rubida* (Alcock, 1895), female holotype, cl 33.8 mm, pcl 26.2 mm, cw 20.9 mm, Andaman Sea, ZSI IM9480/9; B, *Pleistacantha oryx* Ortmann, 1893, male, cl 43.5 mm, pcl 30.1 mm, cw 22.5 mm, Taiwan, ZRC 2001.0065.

is evidently based on these western Indian Ocean specimens, rather than the holotype of *E. rubida* in the ZSI. Although similar in many respects to *P. rubida* and *P. oryx* in carapace spination and the shallowly bifurcate interantennular spine, the western Indian Ocean form represents a separate species, currently under study.

The only other species of *Pleistacantha* known from the Andaman Sea, *P. pungens*, is readily separated from *P. rubida* by the dense, even covering of short dorsal carapace spines (Ahyong & Ng, 2007: fig. 6; Ng et al., 2017: fig. 4B) (versus several long spines interspersed among acute tubercles in *P. rubida*; Fig. 1A, B), the weakly dentate anterolateral margin of the buccal cavity (Ng et al., 2017: fig. 7D, E) (versus produced to a strong spine in *P. rubida*; Fig. 1C, 2E), and the much larger adult size. *Pleistacantha pungens* matures at sizes exceeding pcl 60 mm, rather than less than pcl 30 mm in *P. rubida*. Males of *P. rubida* are as yet unknown.

Distribution. Presently known only from the Andaman Sea; 165–324 m.

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LITERATURE CITED

Ahyong ST, Chen H & Ng PKL (2005) *Pleistacantha stilipes*, a new species of spider crab from the South China Sea (Decapoda: Brachyura: Majidae). *Zootaxa*, 822: 1–10.
 Ahyong ST & Lee T (2006) Two new species of *Pleistacantha* from the Indo-West Pacific (Crustacea, Decapoda, Majidae). *Zootaxa*, 1378: 1–17.

Ahyong ST & Ng PKL (2007) *Pleistacantha ori*, a new species of deep water spider crab from the western Indian Ocean. *Raffles Bulletin of Zoology*, Supplement 16: 67–74.
 Alcock A (1895) Materials for a carcinological fauna of India. No. 1. The Brachyura Oxyrhyncha. *Journal of the Asiatic Society of Bengal*, 64: 157–291.
 Alcock A & Anderson ARS (1896) Crustacea, Part IV. Illustrations of the Zoology of the Royal Indian Marine Surveying Steamer “Investigator”. Trustees of the Indian Museum, Calcutta, pls 16–27.
 Doflein F (1904) Brachyura. *Wissenschaftliche Ergebnisse der Deutschen Tiefsee-Expedition auf dem Dampfer “Valdivia” 1898–1899*, 6, 1–6 + i–xiv + 1–314 pp., figs. 311–358, Atlas (pls. 311–358).
 Garth JS (1958) Brachyura of the Pacific coast of America. Oxyrhyncha, Text. *Allan Hancock Pacific Expeditions*, 21(1): 1–499.
 Griffin DJG (1974) Spider crabs (Crustacea: Brachyura: Majidae) from the International Indian Ocean Expedition, 1963–1964. *Smithsonian Contributions to Zoology*, 182: i–iv, 1–35.
 Griffin DJG & Tranter HA (1986a) The decapoda brachyura of the Siboga expedition. Part VIII. Majidae. *Siboga-Expedition Monograph*, 39: 1–335.
 Griffin DJG & Tranter HA (1986b) Some majid spider crabs from the deep Indo-West Pacific. *Records of the Australian Museum*, 38: 351–371.
 Guinot D & Richer de Forges B (1982) Nouvelles récoltes des genres *Cyrtomaia* Miers et *Pleistacantha* Miers (Crustacea, Decapoda, Brachyura). *Bulletin du Muséum national d’Histoire naturelle*, Paris, series 4, section A, 4: 1087–1125.
 Guinot D & Richer de Forges B (1986) Crustacés Décapodes: Majidae (genres *Platymaia*, *Cyrtomaia*, *Pleistacantha*, *Sphenocarcinus* et *Naxioides*). *Résultats des Campagnes MUSORSTOM I & II, Philippines*, 2. *Mémoires du Muséum national d’Histoire naturelle*, Paris, series A, Zoologie, 133: 83–177.
 Kazmi QB (1997) A review of spider majid crabs of the northern Arabian Sea, with particular reference to Pakistani species, and with description of an undescribed *Pleistacantha*. *Pakistan Journal of Marine Science*, 6: 79–91.
 MacLeay WS (1838) On the Brachyurous Decapod Crustacea. Brought from the Cape by Dr. Smith. In: Smith A (ed.) *Illustrations of the Zoology of South Africa*; consisting chiefly of figures and descriptions of the objects of natural history collected during an expedition into the interior of South Africa, in the years 1834, 1835, and 1836; fitted out by ‘The Cape of Good Hope Association for Exploring Central Africa.’ together with a summary of African Zoology, and an inquiry into the geographical ranges of species in that quarter of the globe. Smith, Elder and Co., London. Pp. 53–71, pls II, III.
 Marco-Herrero E, Torres AP, Cuesta JA, Guerao G, Palero F & Abelló P (2013) The systematic position of *Ergasticus* (Decapoda, Brachyura) and allied genera, a molecular and morphological approach. *Zoologica Scripta*, 42: 427–439.
 Miers EJ (1879) On a collection of Crustacea made by Capt. H. C. St. John, R. N., in the Korean and Japanese Seas. Part I. Podophthalmia. *Proceedings of the Zoological Society of London*, 1879: 18–61, pls I–III.
 Miers EJ (1886) Report on the Brachyura collected by H.M.S. Challenger during the years 1873–1876. *Report on the Scientific Results of the Voyage of HMS Challenger during the years 1873–76*, 17: i–1, 1–362, pls I–XXI.
 Ng PKL, Guinot D & Davie PJF (2008) *Systema Brachyurorum*: Part I. An annotated checklist of extant brachyuran crabs of the world. *Raffles Bulletin of Zoology*, Supplement 17: 1–286.

- Ng PKL, Ravinesh R & Ravichandran S (2017) A new large oregoniid spider crab of the genus *Pleistacantha* Miers, 1879, from the Bay of Bengal, India (Crustacea, Brachyura, Majoidea). *ZooKeys*, 716: 127–146.
- Ortmann AE (1893) Die Decapoden-Krebse des Strassburger Museums, 6. Abteilung Brachyura, 1. Unterabteilung: Majoidea und Cancroidea, 1. Section Portunidea. *Zoologische Jahrbücher, Abtheilung für Systematik, Geographie und Biologie der Thiere*, 7: 23–88, pl. III.
- Sakai T (1963) Notes from the carcinological fauna of Japan, (I). *Researches on Crustacea*, 1: 12–17.
- Sakai T (1965) The Crabs of the Sagami Bay Collected by His Majesty the Emperor of Japan. Maruzen Co., Tokyo. [English text, xvi + 206 pp.; pls. 1–100; Japanese text, pp. 1–92; bibliography and index in English, pp. 1–26; index in Japanese, pp. 27–32; 1 map].
- Sakai T (1976) Crabs of Japan and the Adjacent Seas. Kodansha Ltd., Tokyo. [In three volumes: English text, xxix + 773 pp.; Japanese text, pp. 1–461; plates volume, pp. 1–16, pls. 1–251.]
- Serène R & Lohavaniyaya P (1973) The Brachyura (Crustacea: Decapoda) collected by the Naga Expedition, including a review of the Homolidae. *Naga Report*, 4: 1–187.
- Števcic Z (2005) The reclassification of brachyuran crabs (Crustacea: Decapoda: Brachyura). *Natura Croatica*, 14: 1–159.
- Wood-Mason J & Alcock A (1891) Natural history notes from H.M. Indian Marine Survey Steamer ‘Investigator,’ Commander R. F. Hoskyn, R.N., commanding. — No. 21. Note on the results of the last season’s deep-sea dredging. *Annals and Magazine of Natural History*, series 6, 7: 258–272.