

**THE BOX AND MOON CRABS OF THAILAND,
WITH DESCRIPTION OF A NEW SPECIES OF *CALAPPA*
(CRUSTACEA: BRACHYURA: CALAPPIDAE, MATUTIDAE)**

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ABSTRACT

Eleven species of box crabs (Calappidae: *Calappa bicornis*, *C. calappa*, *C. capellonis*, *C. clypeata*, *C. gallus*, *C. hepatica*, *C. lophos*, *C. philargius*, *C. bilineata* sp. nov., *C. undulata*, *Mursia africana*) and five species of moon crabs (Matutidae: *Ashtoret lunaris*, *A. miersii*, *Izanami curtispina*, *Matuta planipes*, *Matuta victor*) are recorded from Thailand. Of these, one (*Calappa bilineata*) is a new species allied to *C. philargius*, while six are new records for Thailand (*Calappa capellonis*, *C. bicornis*, *C. undulata*, *Mursia africana*, *Ashtoret miersii*, *Izanami curtispina*). Six species are known only from the Andaman Sea, western Thailand. The record of *Mursia africana* is interesting as it was previously only known from East Africa. Keys are provided for all 16 species now known from Thailand.

INTRODUCTION

The box and moon crabs of the families Calappidae and Matutidae (*sensu* Stevcic, 1983; Bellwood, 1996) respectively, are well represented in Thailand, with Naiyanetr (1998) listing nine species, viz. Calappidae: *Calappa calappa* (Linnaeus, 1758), *C. gallus* (Herbst, 1803), *C. hepatica* (Linnaeus, 1758), *C. lophos* (Herbst, 1782), *C. philargius* (Linnaeus, 1758), *C. terrareginae* Ward, 1936, and Matutidae: *Ashtoret lunaris* (Forskål, 1775), *Matuta planipes* Fabricius, 1798, and *Matuta victor* (Fabricius, 1781). In her recent revision, Galil (1997) synonymised *C. terrareginae* Ward, 1936, under *C. clypeata* Borradaile, 1903. The taxonomy of the moon crabs of the genus *Matuta* have also been re-appraised by Galil and Clark (1994) and the generic affinities and specific identities of many species have changed.

The Calappidae has long been considered to contain two distinct subfamilies, Calappinae De Haan, 1833, and Matutidae De Haan, 1835. There have been calls, however, to recognise both these

taxa as separate families (*e.g.* Stevcic, 1983), but most carcinologists adopt a more conservative approach in regarding them as only distinct subfamilies (*e.g.* Ng, 1998). A recent analysis of the intrafamilial relationships (Bellwood, 1996) supports the idea that they should be considered as separate families and are here recognised as such. All calappids can be distinguished by having all their ambulatory dactyli normal and not paddle-like, the right and always larger chela armed with a pair of special cutting teeth designed for 'cutting' open gastropods (Ng and Tan, 1984), and the posterolateral part of carapace usually well expanded and forming a clypeiform structure which covers most of the legs (Ng, 1998). The Matutidae are distinguished by their ambulatory dactyli being distinctly paddle-like, both chelae being subequal in size and neither with special cutting teeth, and the carapace having distinct median lateral spines of varying lengths but with the posteorlateral part never expanded (Ng, 1998).

Of the above species, all but *Calappa clypeata* (as *C. terrareginae*) have been reported from western Thailand. Recent collections in Phuket and

surrounding waters of western Thailand (Andaman Sea) have obtained numerous calappid and matutid specimens, six of which represent new records for the country, viz. *Calappa capellonis* Laurie, 1906, *C. bicornis* Miers, 1884, *C. undulata* Dai and Yang, 1991, *Mursia africana* Galil, 1993, *Ashtoret miersii* (Henderson, 1887) and *Izanami curtispina* (Sakai, 1961). One species of *Calappa*, *C. bilineata*, is here described as new. Although most of the above new records are not remarkable in that most of the species have an Indo-West Pacific distribution, their presence in Thai waters is noteworthy nevertheless. A total of sixteen species from these two families are now recorded from Thailand. Of these, thirteen occur in western Thailand. Seven species, *Calappa capellonis*, *C. bicornis*, *C. bilineata*, *C. undulata*, *Mursia africana*, *Ashtoret miersii* and *Izanami curtispina* are not yet known from eastern Thailand (including the Gulf of Thailand). With the possible exceptions of *Mursia africana* and *Ashtoret miersii*, which are only known from the Indian Ocean, we do not believe that the rest of the observed trends are real, with their absence only reflecting poor collecting.

Most of the specimens used for this study were collected during the biodiversity study of the marine fauna and flora on the Andaman Sea shelf which was conducted aboard the research vessel, *Chakratong Tongyai*, and operated by the Phuket Marine Biological Center (PMBC) between 1996–1998. Additional samples were collected around Phuket Island during the Biodiversity Workshop on Crustacea in the Andaman Sea (29 November to 20 December 1998). Specimens which were collected by two other research vessels, R.V. *Paknam* and R.V. *Chulabhorn*, and obtained during the 5th Thai–Danish Expedition were also included.

The specimens examined are deposited primarily in the Reference Collection at Phuket Marine Biological Center, Thailand. Additional specimens collected from Phuket in the Zoological Museum, University of Copenhagen (ZMUC); and Zoological Reference Collection of the Raffles Museum (ZRC), National University of Singapore, have also been included in this study for completeness. For the study of *Calappa philargius* and *C. bilineata* sp. nov., additional specimens have also been examined from the National Science Museum, Tokyo (NSMT), Japan; Berlin Museum (ZMB), Germany; Australian Museum (AMS), Sydney, Australia; Western Australian Museum (WAM), Perth, Australia; Queensland Museum (QM), Brisbane, Australia; Uppsala University Zoological Museum (UUZM), Sweden; Muséum National d'Histoire naturelle (MNHN), Paris, France; Natural History Museum (NHM), London, England; and Nationaal Natuurhistorisch Museum (previously known as the Rijksmuseum van Natuurlijke Historie (RMNH), Leiden, The Netherlands.

The lobes or teeth of the posterior carapace margin are counted from the posterolateral corner inwards, with the first tooth being outermost. Measurements provided are of the maximum carapace width and length respectively (spines inclusive). The abbreviations G1 and G2 are used for the male first and second pleopods respectively. Colour photographs are provided for the species obtained recently. Unless otherwise stated, all specimens are from Phuket Island. Complete synonymies and author citations for species are not provided for the taxa treated, and the readers are asked to consult Galil (1997) and Galil and Clark (1994) instead.

TAXONOMIC ACCOUNT

Family Calappidae De Haan, 1833

Key to Thai species of Calappidae

1. Lateral margin of carapace with long, well developed spine; no clypeiform process evident *Mursia africana*
- Lateral margin of carapace rounded, never with distinct spine; clypeiform process well developed 2

2. Margin of entire clypeiform (expanded posterior edge) part of carapace smooth, entire, not armed *C. calappa*
- Clypeiform (expanded posterior edge) part of carapace with at least some part of the margin armed with spines or teeth 3
3. Dorsal surface of carapace completely smooth, sometimes with scattered very low granules on gastric and branchial regions 4
- Dorsal surface of carapace distinctly covered with numerous granules of various types (bead-like to squamate or mammilate) 7
4. Lateral and posterolateral margins of clypeiform part of carapace with distinct but low to very low, obtusely triangular teeth *C. clypeata*
- Lateral margins of clypeiform part of carapace with distinct acutely triangular, laterally directed projections, posterolateral margin with distinct obliquely directed spines or teeth 5
5. Posterolateral margin of carapace (including clypeiform part) armed with broad teeth, each of which has the outer edge produced into a sharp tooth or spine; carapace with purple lines on lateral regions, purple spots on median and posterior regions in life *C. lophos*
- Posterior margin of carapace (including clypeiform part) armed with strong, acutely triangular teeth; purple ring around each orbit in life 6
6. Dorsal surface of carapace without longitudinal purple or maroon stripes; carpus and palm of cheliped each with large, prominent purple spot on outer surface *C. philargius*
- Dorsal surface of carapace with 2 prominent longitudinal purple or maroon stripes medially; carpus and palm of cheliped uniformly coloured, without any purple spot on outer surface *C. bilineata*
7. Frontal margin rounded to subtruncate but not distinctly bilobed *C. gallus*
- Frontal margin distinctly bilobed to differing degrees 8
8. Carapace surface and outer surface of chela with numerous with numerous flattened, rounded *C. capellonis*
- Dorsal surface of carapace distinctly covered with numerous granules of various types (bead-like or squamate); posterolateral margin of carapace with low but distinct teeth whose margins are distinctly granulated 9
9. Carapace much broader than long, egg-like, length to width ratio 1.5–1.7; posterolateral margin appears rounded or with 2–3 very sharp spines on each side; life colour a uniform yellowish-grey to grey or greenish *C. hepatica*
- Carapace broader than long, appears rounded, length to width ratio less than 1.4; posterolateral margin distinctly dentate, never with sharp spines; life colour otherwise 10
10. Dorsal surface of carapace with numerous bead-like granules which may be sharp on most parts; frontal margin deeply clefted medially; carapace colour uniform brown in life; carpus of cheliped uniformly coloured, without large coloured spot *C. bicornis*
- Dorsal surface of carapace with many very low, rounded granules on anterior part of carapace, posterior part with striae; frontal margin gently clefted medially; carapace appears bi-coloured in life, with posterior one-third mainly dirty white to yellow and anterior two-thirds brown to blackish-brown; carpus of cheliped with large, prominent yellow spot on outer surface in life *C. undulata*

Calappa bicornis Miers, 1884
(Fig. 1A)

Material examined

PMBC 14605, 1 female, 72.6 by 57.0 mm, Pichai fish port, trawl, 24.12.1990; ZRC 2000.0870, 1 female, 78.2 by 62.0 mm, Pichai fish port, trawl, August 1999.

Remarks

Two specimens collected by trawlers from somewhere off Phuket represents the first record of this species from Thailand. The deeply-cleft rostrum of this species is distinctive. The fresh colours of this species are diagnostic (Fig. 1A), with the large conical granules on the outer surface of the chela being blood-red.

Calappa calappa (Linnaeus, 1758)

Material examined

None from Thailand.

Remarks

This is the largest *Calappa* species in the Indo-West Pacific (Galil, 1997). The species exists in two colour morphs (one plain beige and one beige with numerous distinct unecen spots), but as far as is known, only the uniformly coloured beige or light brown form is present in the Indian Ocean. The taxonomy of these two morphs is now being investigated by the first two authors using morphological and molecular methods. Naiyanetr (1998) records this species from western Thailand but we have not examined any specimens from this area as yet. *Calappa calappa* is essentially a coral-reef species, occurring in the sandy areas between coral heads, usually in the sub-littoral region.

Calappa capellonis Laurie, 1906
(Fig. 1B)

Material examined

PMBC 2033, 1 male, Phuket; PMBC 16811, 2 males, 3 females, BIOSHELF St. PB3–4, 07°51'N,

098°38'E, trawl, 27 m, coll. S. Bussarawit, 21.02.1998; PMBC 16816, 2 males, 13 juveniles, Kai Island–Dok Mai Island, trawl, 24 m, 27.02.1998; PMBC 17005, 1 female, ZRC 1999.0122, 1 female, Andaman Sea, Pichai Fish Port, trawl, December 1998; ZRC 1999.0123, 4 males, 5 females, Andaman Sea, Pichai Fish Port, trawl, April 1999.

Remarks

This is a distinctive species with its large mammilate granules which are distributed all over the carapace including on the clypeiform process. The life colours are also diagnostic among all Thai species, being essentially dark brown all over (Fig. 1B). *Calappa capellonis* can easily be confused with *C. gallus*, but in *C. capellonis*, the front is more distinctly cleft, the carapace appears more transverse (against more rounded) and the gonopods are differently structured (Galil, 1997). Records of '*C. gallus*' by Nateewathana *et al.* (1981) and Naiyanetr (1998) should be referred to *C. capellonis* instead (see later). *Calappa capellonis* was originally described from Sri Lanka.

Calappa clypeata Borradaile, 1903
(Fig. 1C)

Material examined

PMBC 16814, 1 male, BIOSHELF St. PB3–4, 07°51'N, 098°38'E, trawl, 27 m, coll. S. Bussarawit, 21.02.1998; PMBC 16828, 1 female, Andaman Sea, trawl, 43 m, 21.04.1997; PMBC 16827, 1 female, BIOSHELF St. PB7, 07°45'N, 098°41'E, triangular dredge, 29 m, coll. S. Bussarawit, 22.04.1997; PMBC 16817, 1 female, BIOSHELF St. L1, 06°49'N, 099°21'E, triangular dredge, 39 m, coll. S. Bussarawit and C. Aungtonya, 24.02.1998; PMBC 16823, 1 juvenile, BIOSHELF St. H36, 07°44'N, 098°17'E, Ockelmann dredge, 32 m, coll. S. Bussarawit and C. Aungtonya, 09.05.1996; ZRC 2000.1067, 4 females, 1 male; PMBC 17010, 1 female, Andaman Sea, Pichai Fish Port, trawl, December 1998; ZRC 1999.0125, 3 males (1 with sacculinid parasite), 18 females (1 ovigerous), Andaman Sea, Pichai Fish Port, trawlers, April 1999.



Figure 1 Live coloration. A, *Calappa bicornis*; B, *C. capellonis*; C, *C. clypeata*; D, *C. pustulosa*; E, *C. lophos* (adult); F, *C. lophos* (juvenile); G, *C. bilineata* (adult); H, *C. bilineata* (juvenile).

Remarks

This species has long been known as *Calappa terraereginae* Ward, 1936 (type locality Australia), and it was only recently that Galil (1997) synonymised it under *C. clypeata* (type locality Maldives). In the Andaman Sea, it appears to be very common in relatively shallow waters.

Calappa clypeata is distinct among the Thai calappids in being the only species which is greenish-yellow in colour all over with large pinkish

patches. In this respect, however, it seems to differ somewhat from the more pinkish carapace colour reported for the Australian and Pacific specimens (as *C. terraereginae*) (Galil, 1997). The significance of these colour differences cannot be ascertained and may just be geographical variation, our recent direct comparisons of specimens from the Andamans with those from the South China Sea and Australia do not reveal any obvious differences at the moment .

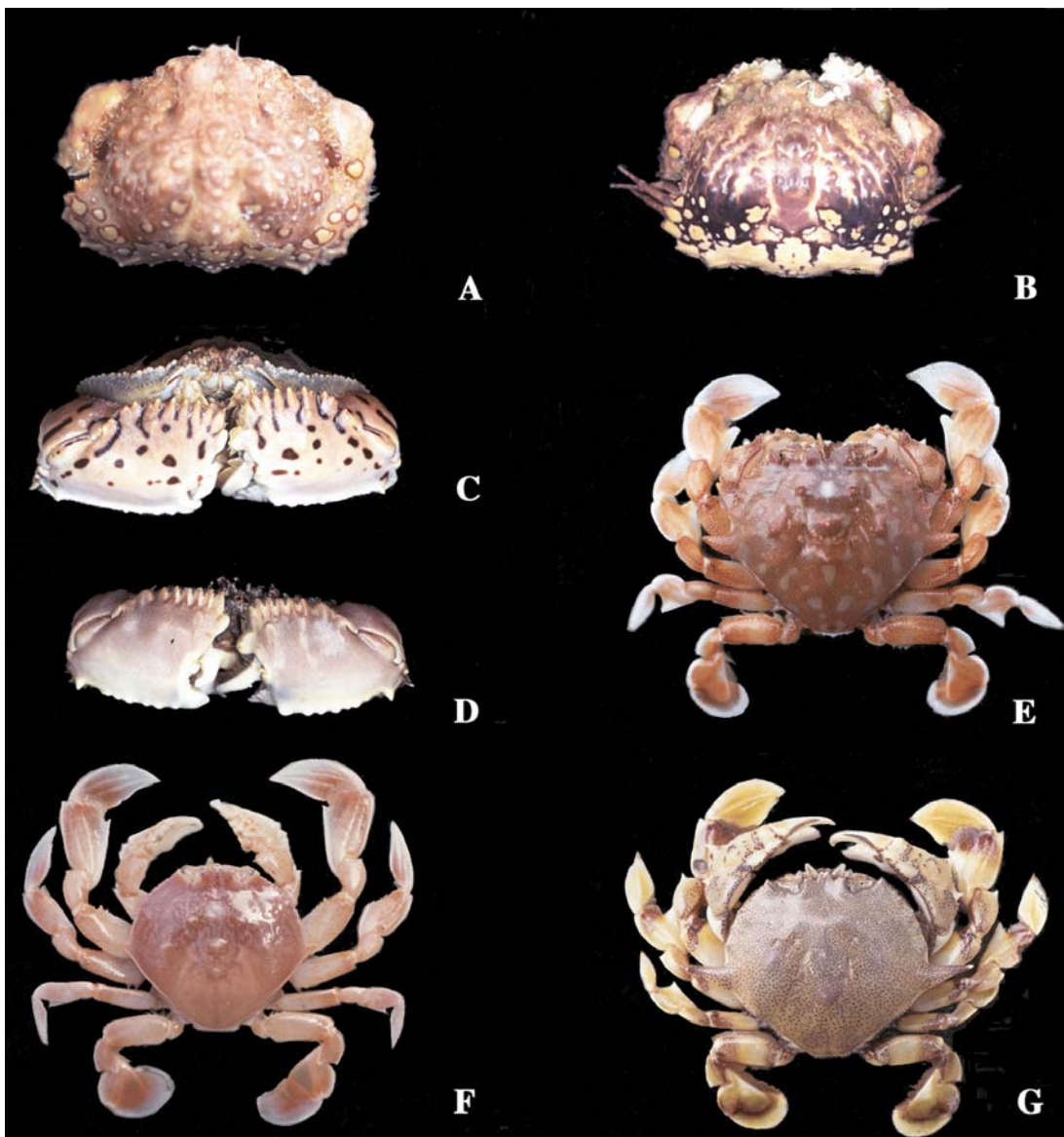


Figure 2 Live coloration. A, B, *Calappa undulata* (different colour morphs); C, *C. lophos* (chelae); D, *C. bilineata* (chelae); E, *Ashtoret miersii*; F, *Izanami curtispina*; G, *Matuta victor*.

Calappa gallus (Herbst, 1803)**Material examined**

PMBC 14606, 1 male, BIOSHELF St. E1, 08°30'N, 098° 06'E, triangular dredge, 38 m, coll. S. Bussarawit and C. Aungtonya, 22.04.1996.

Remarks

Calappa gallus had been reported from Phuket by Nateewathana *et al.* (1981) and Naiyanetr (1998) but this record is incorrect. Their record was based on a specimen identified by S. Lundoer in 1974 and deposited in the Reference Collection (PMBC 2033)—we have examined it and it should be referred to *C. capellonis* instead. *Calappa gallus* is easily confused with *C. undulata* or *C. capellonis* (see Galil, 1997) but they can be separated by several distinct features (see discussion for *C. capellonis*). The present specimen (PMBC 14606) is thus the first true record of *C. gallus* from Phuket and western Thailand. Galil (1997) discusses in depth and resolves most of the taxonomic problems associated with this species (see also Ng, 2000).

Specimens of *C. gallus* the first author has seen from East and South China Seas have been collected on reef flats, with the animals 'hopping' from rock to rock when foraging. See also discussion for *C. capellonis*.

Calappa hepatica (Linnaeus, 1758)**Material examined**

PMBC 17110, 2 males, 2 females, Andaman Sea, trawled outside PMBC, 24.02.1971.

Remarks

This is a common littoral and sublittoral species from coral reefs. We have observed specimens from amongst sea-grass beds, and appears to be one of the preferred habitats of this species.

Calappa lophos (Herbst, 1782)

(Figs 1D, E; 2C)

Material examined

PMBC 16809, 1 female, BIOSHELF St. A3, 09°31'N, 097°38'E, triangular dredge, 87 m, coll. S. Bussarawit and C. Aungtonya, 19.04.1996; PMBC 16810, 1 female, BIOSHELF St. J3–J2, 07°14'N, 098°37'E, trawl, 76 m, coll. S. Bussarawit and C. Aungtonya, 23.02.1998; PMBC 17127, 1 female, R.V. *Paknam*, off Rak Island, trawl, 74 m, 15.03.1989; PMBC 16824, 2 juveniles, Andaman Sea, 8.04.1997; PMBC 17031, 1 female, ZRC 1998.1141, 10 males, 4 females, QMW 25760, 2 males, 2 females, Andaman Sea, Pichai Fish Port, trawlers, December 1998; ZRC 1999.0126, 5 males, 1 juvenile, Andaman Sea, Pichai Fish Port, trawl, April 1999.

Remarks

This is one of the largest calappids known from Thailand (greater than 100 mm carapace width), and second only to *Calappa calappa* in size (see Ng, 1998). Smaller specimens tend to have a somewhat more granulose carapace, especially on the anterior half. The markings on clypeiform process and chelipeds are distinctive (Figs. 1E, 2C). In smaller specimens, the ventral surface of the whole specimen (including the chelipeds) are dirty orange in colour. Small specimens also have two to four regularly arranged ocelli on the carapace which are lost when the specimen becomes larger (Fig. 1F). Galil (1997) synonymised *C. quadrimaculata* Takeda and Shikatani, 1990 (known only from Japan and Taiwan) with this species, arguing that their specimens were merely juveniles. This is incorrect and *C. quadrimaculata* is in fact a valid species (Ng *et al.*, 1999).

The problems associated with the taxonomy of this species has been discussed in some depth by Ng *et al.* (1999).

Calappa philargius (Linnaeus, 1758)
(Figs 3, 4A, 5A, 6A, C)

Cancer philargius Linnaeus, 1758: 626. –Galil, 1997: 307, Figs. 17d, 20d, 21, 33. –Ng, 1998: 1097. –Sakai, 1999: 20–21, pl. 9a, fig. A.

Cancer inconspicuous Herbst, 1794: 162, pl. 40 fig. 3.

Calappa cristata Fabricius, 1798: 346.

(See Galil, 1997: 307, 308, for full synonymy with the exception of those listed for *C. bilineata* sp. nov.)

Material examined

Types: ZRC 1998.67, 1 male, 81.4 by 56.8 mm, neotype of *Cancer philargius* Linnaeus, 1758, and *Calappa cristata* Fabricius, 1798, Changi Beach, seine, 1.5 m, coll. P.K.L. Ng, 27.03.1998; ZMB 774, 1 dried female, 52.0 by 49.0 mm (excluding lateral teeth), lectotype of *Cancer inconspicuous* Herbst, 1794, Asia.

Other material:

UUZM #240, 1 female, 84.0 by 62.0 mm, Linnaean material, Gustavo IV Adolf collection, no precise data, no date; THAILAND: ZRC 1999.0318, 1 male, 2 females, 1 ovigerous female, Pattani Fishing Port, Gulf of Thailand, April 1999; SINGAPORE: ZRC 2000.1175, 1 female, 07.06.2000; ZRC 1992.10537, 1 carapace, Changi, no other data; ZRC 2000.2384, 1 ovigerous female, east coast, June 1926; ZRC 2000.2385, 1 male, 1 female, Tuas, 05.03.1984; ZRC 1984.5356–5357, 2 males, 100.2 by 67.8 mm, Tuas, 08.09.1982; ZRC 1984.5352–5355, 4 males, 109.0 by 71.0 mm, Tuas, 13.09.1982; ZRC 1984.5358–5361, 3 males, 104.3 by 68.5 mm, Tuas, 09.10.1982; ZRC 1984.154–157, 3 males, 1 female, 110.3 by 76.1 mm, Tuas, 15.07.1983; ZRC 1981.8.14.150, 1 female, 92.7 by 64.0 mm, Tuas, 13.06.1981; ZRC 1984.5362, 1 male, 113.5 by 73.5 mm, Tuas, 16.10.1982; ZRC 1984.5907, 1 male, 90.7 by 59.3 mm, Tuas, 15.02.1984; ZRC 1984.5367–5368, 2 males, 116.2 by 73.9 mm, Tuas, 07.01.1983; ZRC 1981.8.14.138, 1 male, 104.4 by 69.3 mm, Tuas, 02.05.1981; ZRC 1984.5351, 1 male, 115.3 by 73.0 mm, Tuas, 08.04.1982; ZRC 1984.146–148, 3 males, Tuas, no date; ZRC 1984.151–153, 3 males,

102.0 by 66.4 mm, Tuas, 15.07.1983; ZRC No 425, 1 male, 64.8 by 46.1 mm, 1 female, 58.1 by 40.5 mm, Tuas, no date; ZRC 1965.10.11.63–73, 4 males, 6 females, Siglap, June 1933; ZRC 1965.10.11.75, 1 male, 89.0 by 60.2 mm, Ponggol, 1941; ZRC No. 1965.10.11.77, 1 female, 106.9 by 74.3 mm, Ponggol, September 1926; ZRC 1984.5363–5366, 3 males, 1 female, 117.5 by 76.6 mm, Horsburgh Lighthouse, 26.11.1982; ZRC 1984.5369, 1 male, 93.5 by 62.3 mm, Horsburgh Lighthouse, 10.09.1983; ZRC 1984.5343–5344, 2 females, larger 114.9 by 80.8 mm, Horsburgh Lighthouse, 19.09.1983; ZRC 1984.5994, 1 male, 80.7 by 60.3 mm, South China Sea, 24.11.1955; ZRC 1984.5997, 1 female, 93.9 by 63.0 mm, South China Sea, no date; ZRC 1984.5998–5999, 1 male, 1 juvenile male, South China Sea, 27.03.1956; ZRC 1988.2232, 1 male, Singapore, no date; ZRC 5995–5996, 2 males, larger 103.5 by 68.1 mm, Singapore, 10.01.1956; ZRC 1984.6000–6001, 1 male, 1 female, 103.7 by 66.8 mm, Raffles Lighthouse, 17.09.1956; TAIWAN: ZRC 1995.580, 1 male, 1 female, off northeastern coast, shallow water <100m depth by gill net, June 1993; ZRC 1999.0804, 1 juvenile male, 25.1 by 19.2 mm, I-Lan County, Nan-Fang Ao fish port, Su-Ao, May 1999; ZRC 1997.741, 1 female, 30.0 by 23.1 mm, southwestern coast, Kao-Shiung, port at Tung-Kang, 05.09.1996; ZRC 1998.208, 3 juvenile males, largest 32.4 by 23.9 mm, ZRC 1997.709, 4 males, 2 females, 51.5 by 35.8 mm, 43.1 by 30.1 mm, Tai-Chi Port, I-Lan County, commercial in-shore trawlers, shallow waters, 03–04.08.1996; ZRC 1999.0756, 1 male, 77.9 by 51.4 mm, Tai-Chi Port, I-Lan County, commercial in-shore trawlers, shallow waters, May 1999; CHINA: ZMUC 125, 1 male, 72.5 by 51.2 mm, identified as *Calappa cristata* Fabricius, 1798; VIETNAM: MNHN B 13466, 2 males, 106.3 by 69.2 mm, 70.0 by 47.4 mm, Cape Saint Jacques (Annam), 1962; JAPAN: NSMT 6089, 1 male, Kainoura, Wakayama, 11.01.1979; NSMT 6112, 1 male, Kii-Nagasima, Wakayama, 19.07.1979; NSMT 7603, 1 female, Kii-Nagasima, Wakayama, 16.12.1976; NSMT 6137, 1 male, Kainoura, Wakayama, 25.02.1979; NSMT 3027, 1 male, Tanabe Bay, Wakayama; NSMT 6159, 1 male, Owase, Mie, 21.02.1979; NSMT 3060, 1 male, Misaki, Sagami

Bay, 09.11.1962; NSMT 9670, 1 juvenile, Osima Passage, Anami-Osima, Ryukyus, 06.08.1988; NSMT 3152, 1 male, no other data; NSMT 3136, 1 female, no other data; NSMT 9625, 1 female, no other data; BORNEO: MNHN B 16286, 1 male, 83.3 by 55.4 mm, 1899; PENINSULAR MALAYSIA: ZRC 1965.10.11.74, 1 male, off East Coast of Malay Peninsula; ZRC 2000.2383, 1 male, 34.1 by 25.2 mm, Pangkor, rocky beach with sandy patches, 07.08.1965; WESTERN AUSTRALIA: WAM C.5575, 1 male, 67.1 by 97.1 mm, Dirk Hartog Island, Western Australia, 17.05.1938; WAM C.8676, 1 male, 73.6 by 110.5 mm, Shark Bay, Western Australia, September 1963; WAM C.8677, 1 male, Coral Bay, Shark Bay, Western Australia; WAM C.11216, 1 male, 52.2 by 72.8 mm, Shark Bay, Western Australia, 19.05.1973; WAM C.11556; 1 male, 52.5 by 76.0 mm, Exmouth Gulf Area, Western Australia, 14.09.1973; WAM C.7757, 1 male, 91.7 by 64.5 mm, Canarvon, trawled, Western Australia, October–December 1959; WAM C.20057, 1 female, Carnarvon, Western Australia, 24.01.1990.

Diagnosis

Width to length ratio of carapace ca. 1.5; dorsal surface smooth, convex; anterior part with minute flat tubercles. Rostrum slightly projecting, with 2 triangular teeth separated by deep sulcus. Median endostomial septum anteriorly visible with third maxillipeds closed. Anterolateral margin cristate, beaded. Clypeiform expansion well developed, with 4 teeth on posterolateral margin, fringed with setae. Posterior carapace margin with 7 well-developed granulated teeth, surface and base of teeth usually weakly granulate, tips of teeth usually slightly turned upwards; median tooth usually shorter than lateral teeth, sometimes subequal in length, never longer in adult specimens. Crest of chela with 7 teeth, distalmost 5 triangular, proximal 2 with relatively broader base, subtruncate. Lateral margin of fifth thoracic sternal segment margin rounded. Second abdominal segment with broadly rounded lateral margin. G1 curved distally, tapering apically to spinulate tip.

Colour. – Dorsal surface of carapace uniformly light grey to pale pink; external subdorsal surface



Figure 3 Linnaean specimen of *Calappa philargius*. Dried female (84.0 by 62.0 mm) (Uuzm #240).

of manus and carpus each with large purple to maroon spot. Inner surface of cheliped with red blotches arranged longitudinally. Dorsal surface of carapace uniformly coloured, without markings; purple to maroon horseshoe-shaped marking surrounding orbit. See also Sakai (1976), Ng (1988, 1998) and Ho (1996).

Distribution

Australia, Pacific Ocean to South-east Asia and Straits of Malacca.

Remarks

Calappa philargius (Linnaeus, 1758) is one of the better known species of box crabs in the Indo-West Pacific and large specimens can grow to sizes of 120 mm in carapace width (Ng, 1998). The taxonomy of *Calappa philargius* has long been regarded as very stable, with both *Cancer inconspiculus* Herbst, 1794, and *Calappa cristata* Fabricius, 1798, regarded as junior synonyms for over a century (see Galil, 1997). The colour pattern of this species is very diagnostic, with a prominent red to purple spot each on the manus and carpus of the cheliped, and a maroon horseshoe-shaped marking encircling the orbit.

In the waters off western Thailand, however, the specimens which have been referred to '*C. philargius*' differ from this typical form (which occurs all over South-East Asia and the western Pacific) most obviously in its colour pattern—it has two longitudinal maroon stripes on its carapace and the outer surface of the chelipeds (manus and carpus) do not have spots. The present study shows that these two 'colour morphs' are actually distinct species. The problem is to ascertain which is the 'real' *C. philargius*.

However, given the rather vague locality description given by Linnaeus (1758) ('Seas of Asia'), *C. philargius* could well have been collected anywhere in the Pacific or Indian Oceans. Thus the name *C. philargius* could belong to either morphotype. In the Linnaean collections in Uppsala, Sweden, there is specimen of *Cancer philargius* Linnaeus, 1758 (see Holm, 1957: 56). This specimen has not been figured before (Fig. 3). In September 1999, Mr. S. H. Tan examined the dried female specimen in question at the request

of the first author and took numerous photographs. Even though the specimen, a dried female 84.0 by 62.0 mm (UUZM #240), was rather bleached and one of the median spines was broken, very faint red pigments could still be identified on the manus and carpus, and the slight upward tilt of the posterior spines were apparent, with the tilt on the damaged and regrown spine most obvious. These characters conform with what is now diagnosed as *C. philargius* s. str. The problem is that this specimen is clearly not one of Linnaeus' type(s) of *Cancer philargius*. The specimen in question was labelled as from the collection of 'Gustav IV Adolf'. The Gustav IV Adolfo collection was obtained by Linnaeus only after 1758, and was reported in his paper of 1764 (Holm, 1957: 56) (see also Wallin, 1997: 16). The present specimen in question was thus obtained only after Linnaeus's description of *Cancer philargius* in 1758. While Linnaeus himself probably identified the specimen, it certainly cannot be regarded as a type. The type of *Cancer philargius* Linnaeus, 1758, is thus almost certainly lost.

Because two closely related species are recognised here, there is a need to establish a neotype to stabilise the nomenclature and taxonomy of the two taxa. It is best to designate a neotype for *Cancer philargius* Linnaeus, 1758, for the typical colour morph (without carapace stripes but with cheliped spots) as it is the one most commonly cited, figured and studied. To this effect, a male specimen, 81.4 by 56.8 mm recently collected from Singapore (ZRC 1998.67) is here designated as the neotype of the species. We have decided against naming the female lectotype of *Cancer inconspiculus* Herbst, 1794 (see below), as the neotype of *Cancer philargius* Linnaeus, 1758, as it is dried, bleached and without obvious colours. Selecting a fresh specimen clearly recognisable as *C. philargius*, with colours and tissues (which can be used for future molecular work) intact seems preferable. The same rationale applies for not choosing the Linnaean specimen (UUZM #240) in Uppsala as the neotype.

The identity of *C. inconspiculus* Herbst, 1794, is not a problem. From Herbst's plates and figures (1974: 162, pl. 40 fig. 3), it is obvious that they are the same species as *C. philargius*. Sakai (1999)

recently provided photographs of a syntype female specimen in the Berlin Museum that confirmed this prognosis. The specimen, collected from somewhere in Asia, is typical of *C. philargius* as currently recognised, with a broad concavity on the teeth of the posterior margin of the carapace, even though it was also bleached such that the spots that are so diagnostic of *C. philargius* could not be clearly seen. In any case, Herbst's original figure of the species clearly shows the spots on the chelipeds and the absence of any stripes on the carapace. This specimen is here designated the lectotype of *Cancer inconspectus* Herbst, 1794.

Calappa cristata, Fabricius, 1798, originally obtained from 'China', is more problematic as the type specimen of is believed to be lost (Zimsen, 1964: 650). There is one specimen labelled as *C. cristata* in the Zoologisk Museum, Copenhagen, which according to an attached label, was regarded by Rathbun to be a possible type specimen. However, the specimen was actually originally labelled by Krøyer, who was curator after Fabricius, and is very unlikely to be the said Fabricius type (T. Wolff, pers. comm.). The type, as Zimsen (1964) correctly concluded, is almost certainly lost. As no type material of *Calappa cristata* is extant, in the interest of taxonomic stability, it is best to select a neotype for this species. The most simple and rational thing to do here is to select as its neotype, the neotype of *Cancer philargius* Linnaeus, 1758. As such, *Cancer philargius* Linnaeus, 1758, and *Calappa cristata* Fabricius, 1798, become objective synonyms.

***Calappa bilineata* sp. nov.**

(Figs 1G, H, 2D, 4B, 5B, 6B, D)

Calappa philargius.—Alcock, 1896: 145 (part).—De Man, 1888: 196.—Henderson, 1893: 396.—Laurie, 1906: 353.—Laurie, 1915: 409.—Stephensen, 1946: 66.—Guinot, 1962: 26, figs. 11–15, 17a–b, 18a–b, pl. 1 fig. 1, pl. 2 fig. 1.—Guinot, 1967: 245.—Sankarankutty, 1962: 153.—Sekharan, 1961: 238–239.—Galil, 1997: 307, 308 (part).—Rice, 1999: 82. (not *Cancer philargius* Linnaeus, 1758)

Material examined

Holotype: PMBC 15789, male (93.1 by 64.9 mm), Andaman Sea, from Pichai Fishing Port, Thailand, December 1998.

Paratypes: PMBC 14607, 1 female, BIOSHELF St. A3, 09°31'N, 097°38'E, triangular dredge, 87 m, coll., 19.04.1996; PMBC 14608, 1 male, 3 females, no station data; PMBC 14609, 1 male, outside Phuket, 28.08.1973; PMBC 146101, male, 1 juvenile, Kai Island–Dok Mai Island, trawl, 24 m, 27.02.1998; PMBC 17090, 1 juvenile male, BIOSHELF St. PB4, 07°52'N, 098°40'E, triangular dredge, 28 m, 21.02.1998; PMBC 17138, 1 female, outside Phuket, 28.08.1973; PMBC 17029, 1 male, St. 341, off Surin Island, 25 m, 1.06.1985; ZRC 1998.1140, 5 males, 2 females, 7 juveniles, QMW 25763, 2 males, 2 females, Andaman Sea, Pichai Fishing Port, Thailand, December 1998; PMBC 16965, 1 male, 3 females (ovigerous), Andaman Sea, Pichai Fish Port, December 1998; ZRC 1999.0127, 10 males, 12 females, 3 juveniles, Andaman Sea, Pichai Fish Port, trawl, April 1999; ZRC 2000.1071, 4 males, 16 females, ZRC 2000.1072, 20 juveniles, Andaman Sea, 22.08.1999; AMS P60, 1 male, 1 female, Andaman Sea, December 1999; ZRC 2000.811, 3 males, 3 females, Andaman Sea, 03–06.05.2000; ZRC 2000.975, 2 males, 5 females, 5 juveniles, Andaman Sea, 17–20.01.2000.

Other materials: ZMUC 1803, 2 males, off Malay Peninsula, just clear of station 1023, Thai waters, trawl, 5th Thai–Danish Expedition, 14.01.1966; NHM 1934.1.16.10–11, 3 juveniles, Gulf of Manaar, Sri Lanka; RMNH 2507, 1 female, Red Sea, Kossmann collection.

Diagnosis

Width to length ratio of carapace ca. 1.5; dorsal surface smooth, convex; anterior area with minute flat tubercles. Rostrum slightly projecting, with 2 triangular teeth separated by deep sulcus. Median endostomial septum visible with third maxillipeds closed. Anterolateral margin crested, beaded. Clypeiform expansion well developed, with 4 teeth on posterolateral margin, fringed with setae. Posterior carapace margin with 7 well-developed granulated teeth, median tooth subequal to adjacent teeth, occasionally longer, surface and base of teeth

prominently granulated, tips rounded in most adults. Crest of chela with 7 teeth, distalmost 5 triangular, proximal 2 with relatively broader base, subtruncate. Lateral margin of fifth thoracic sternite almost straight. Lateral margin of second abdominal segment angular. G1 curved distally, tapering apically to spinulate tip.

Colour. – Dorsal surface of carapace with two prominent maroon longitudinal lines medially; purplish to maroon horseshoe-shaped marking surrounding each orbit. External subdorsal surface of manus and carpus uniformly coloured, both without large maroon spots; inner surface of cheliped with red blotches arranged longitudinally.

Etymology

The name ‘*bilineata*’ refers to the two distinctive longitudinal red stripes on the carapace.

Remarks

At first glance, the external morphology of *Calappa bilineata* sp. nov. is very similar to *C. philargius* (Linnaeus, 1758), the most striking difference being the colour pattern. While *C. philargius* possesses a large maroon spot each on the outer surface of the carpus and manus of the cheliped, these markings are absent on *C. bilineata*. This difference in colour pattern is valid for all the specimens we have examined of both species thus far. *C. bilineata* also has two prominent maroon longitudinal stripes flanking the gastric and cardiac region, which are absent in the specimens of *C. philargius* s. str. This pattern is very apparent even in specimens of *C. bilineata* as small as 20 mm in carapace width. In *C. philargius* s. str., the median part of the carapace is usually uniformed coloured, but some specimens may have two greyish longitudinal stripes but these are never as prominent or brightly coloured as those on *C. bilineata*. Other characters that separate the two species are the shape of the broad concavity between the posterior carapace teeth and the relative length of the posterior median carapace tooth in relation to the adjacent ones, shape of the second abdominal, margin of the fifth thoracic sternal segment, relative length of the posterior carapace spines and structure of the G1.

In *C. bilineata*, the concavity between the

posterior carapace spines is usually less pronounced than in specimens of *C. philargius* of equivalent sizes, with the median posterior spine subequal in length to the adjacent spines. These spines are relatively straight, either rounded at the tips or sharp, and extend further posteriorly away from the carapace margin (vs. a shorter median tooth compared with adjacent teeth, and the teeth not extending so posteriorly from the posterior carapace margin, with the tips slightly turned upwards in *C. philargius*). The bases and surfaces of the posterior carapace teeth are also usually very heavily granulated, much more so in *C. bilineata* than in *C. philargius*. The lateral margins of the second abdominal segment are also relatively more angular in *C. bilineata* compared with *C. philargius* which is usually more rounded and broader. The anterior margin of the fifth thoracic sternal segment is also almost straight whereas it is more rounded in *C. philargius*. The G1 structures of both species are different; with that of *C. bilineata* wider basally (before it curves outwards), compared with *C. philargius* which has this part appearing somewhat narrower. Most of the adult specimens of *C. bilineata* and *C. philargius* examined in this study show the above features, although in some cases, especially with juveniles and damaged specimens, discerning these differences may not be easy. The colour differences, however, are always clear and distinct in fresh specimens. In addition to the specimens listed here, the first two authors have between them, examined hundreds of fresh and/or live specimens of *C. bilineata* in Phuket and *C. philargius* in Taiwan, South China Sea and Singapore brought in by commercial trawlers over the years, and the colour differences observed (especially for the chelipeds) are completely reliable.

Although *Calappa philargius* has been reported from the Indian Ocean (see Alcock, 1896), it is unclear whether those specimens were actually those of *C. bilineata*, since it has already been established that the known range of *C. philargius* is confined to South-East Asia and the Pacific. *Calappa philargius* occurs in waters south of Phuket through the Straits of Malacca and the west Pacific whereas all the *C. bilineata* specimens used in this study were from the Andaman Sea, Sri Lanka

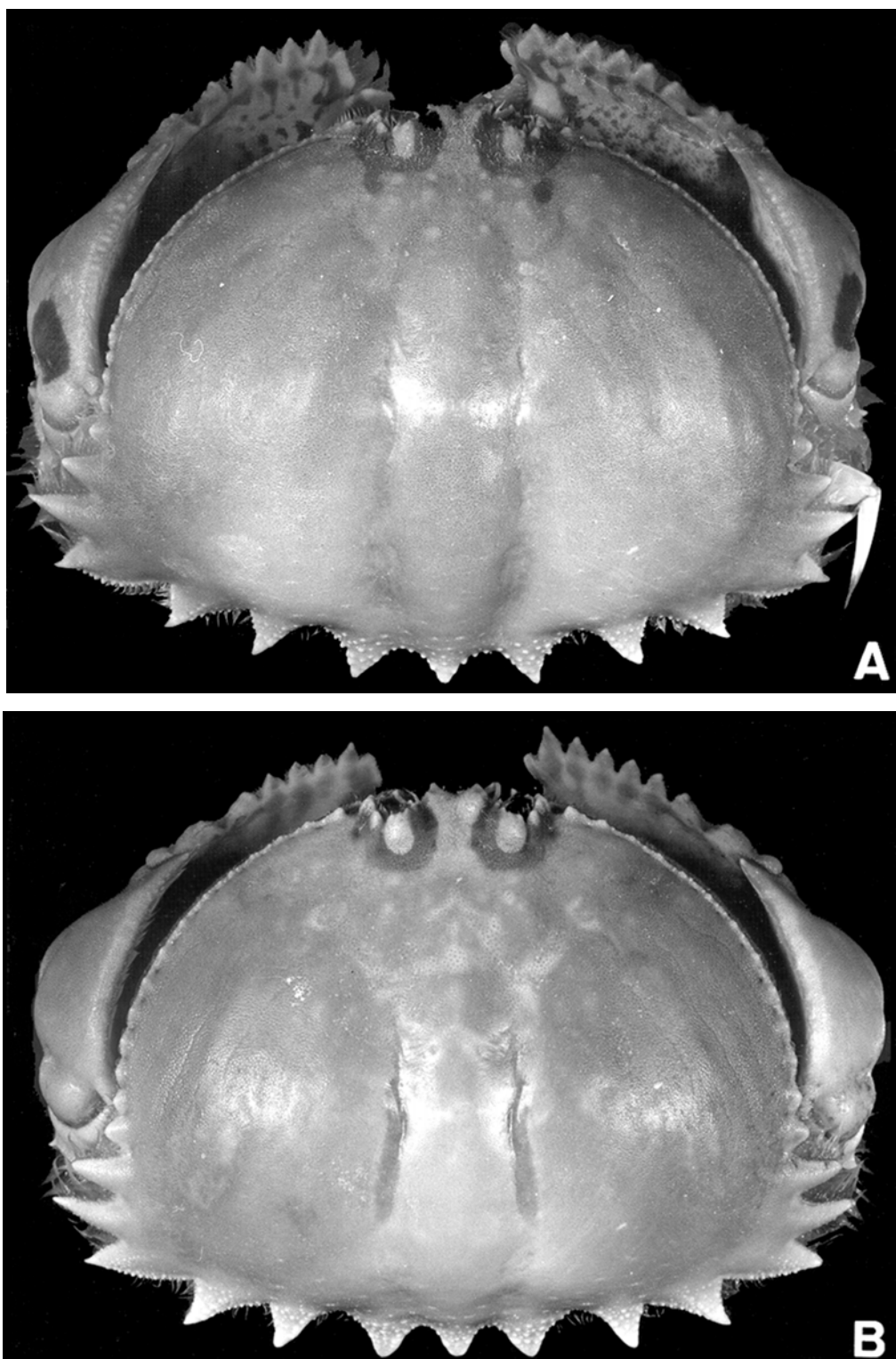


Figure 4 *Calappa philargius*, Dorsal views: A, neotype male (81.4 by 56.8 mm) (ZRC 1998.67), Singapore; B, *C. bilineata*; holotype male (93.1 by 64.9 mm) (PMBC 15789), Andaman Sea.

and Red Sea. Alcock (1896) mentioned *C. philargius* in comparison with *C. lophos* (actually *C. guerini*), and very little detail regarding the life colour and morphology was discussed. Rice (1999: 82) provides a beautiful colour plate of a specimen (which was identified as *C. philargius*) from Ceylon (= Sri Lanka) painted by Pieter de Bevere in the Natural History Museum's Loten Collection of paintings. The markings on the specimen

figured clearly identify it as *C. bilineata*. On the available evidence, specimens previously reported as '*C. philargius*' from the northern part of the Indian Ocean at least, should be referred to *C. bilineata*. The records of *C. philargius* by Jones and Morgan (1994) from the Indian Ocean along the coast of western Australia, however, belong to *C. philargius*, and are clearly not *C. bilineata*. The colour figure of *C. philargius* in Jones and

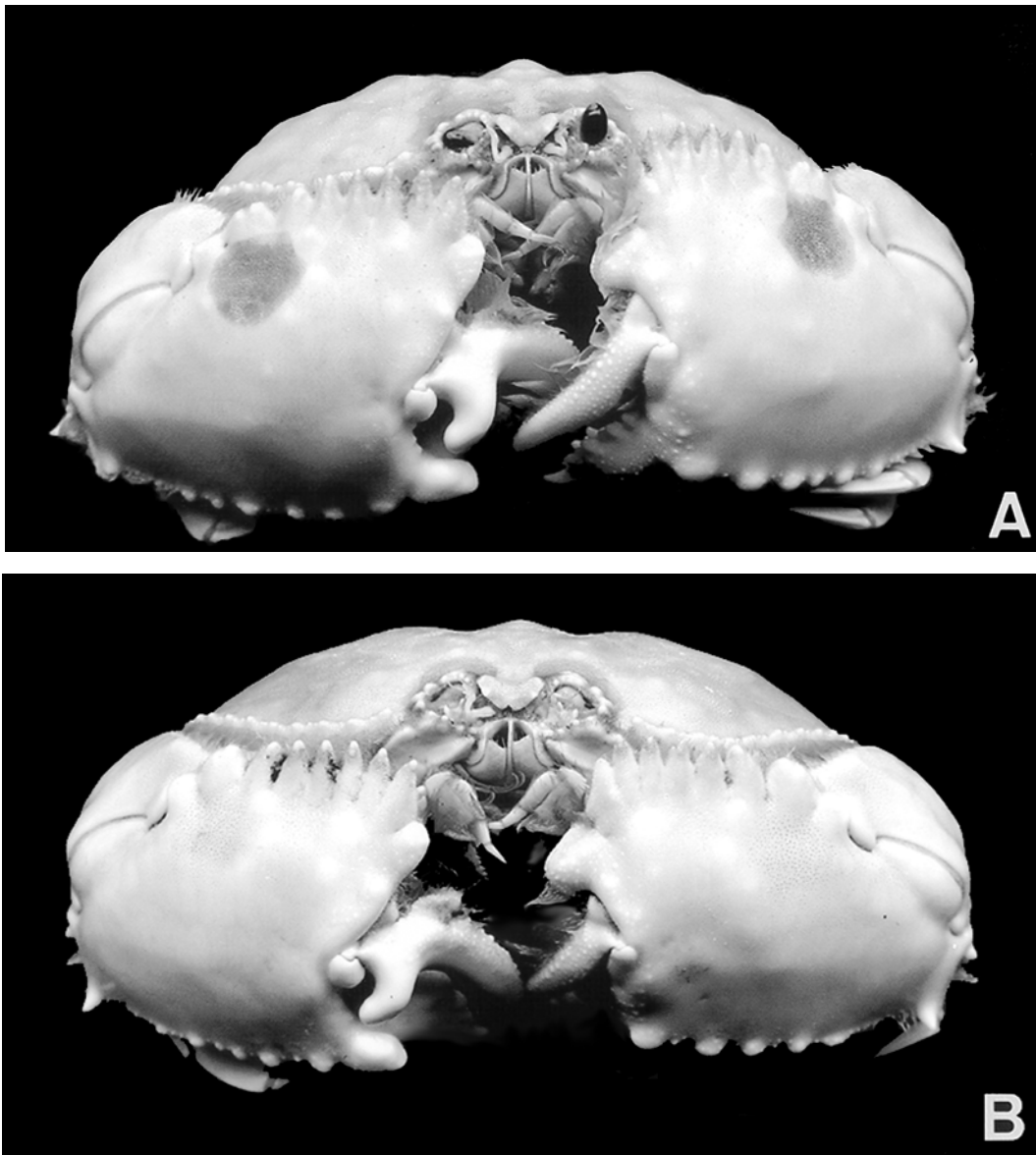


Figure 5 *Calappa philargius*, Frontal views: A, neotype male (81.4 by 56.8 mm) (ZRC 1998.67), Singapore; B, *C. bilineata*; holotype male (93.1 by 64.9 mm) (PMBC 15789), Andaman Sea.

Morgan (1994) matches perfectly what is here defined for this species, as confirmed through examination of their specimens. As such, *C. bilineata* seems to be restricted to the northern part of the Indian Ocean. We also have a large female specimen (RMNH 2507) from the Kossmann collection, supposedly collected from the Red Sea—it is clearly referable to *C. bilineata* as presently defined, with its colour markings still evident.

Calappa philargius, *C. bilineata* and *C. dumortieri* Guinot, 1962 (Red Sea) form a distinct group within the genus *Calappa*, with their well-developed and posteriorly-directed teeth being the most diagnostic character. Of these, *C. philargius* has the widest distribution while *C. dumortieri* appears to be confined to the Red Sea, with *C. bilineata* occurring in the northern part of the Indian Ocean and apparently also entering the Red Sea. *Calappa philargius* and *C. bilineata* have not been found sympatrically, although both may be expected in the northern part of the Malacca Straits which meets the Andaman Sea.

Calappa pustulosa Alcock, 1896
(Fig. 1D)

Material examined

PMBC 14611, 1 female, BIOSHELF St. J3–J2, 07°14'N, 098°37'E, trawl, 76 m, coll. S. Bussarawit and C. Aungtonya, 23.02.1998; PMBC 14612, 1 female, off Rak Island, trawl, 74 m, R.V. Paknam, 15.03.1989; PMBC 14613, 2 juveniles, Andaman Sea, 08.04.1997; ZRC 1999.0085, 1 female, Andaman Sea, Andaman Fisheries Research Station in Phuket, December 1998; PMBC 17114, 1 female, St. 36A, Andaman Sea, Myanmar, trawl, 115–135 m, R.V. *Chulabhorn*, 09.01.1989.

Remarks

This easily recognised species (originally described from the Indian Ocean) is characterised by deep carapace grooves and poorly developed clypeiform processes which do not completely

cover the ambulatory legs. Comparisons with specimens from the South and East China Seas do not reveal any differences in colour or morphology. The pale white carapace with broad longitudinal reddish-brown streaks is diagnostic life coloration for this species (Fig. 1D), and is evident even in specimens the first author has examined from Taiwan.

Calappa undulata Dai and Yang, 1991
(Fig. 2A, B)

Material examined

PMBC 16813, 1 female, BIOSHELF St. F2, 08°15'N, 098°04'E, triangular dredge, 59 m, coll. S. Bussarawit and C. Aungtonya, 16.02.1998; PMBC 16825, 1 female, BIOSHELF St. J2, 07°15'N, 098°51'E, triangular dredge, 62 m, coll. S. Bussarawit and C. Aungtonya, 04.05.1996; PMBC 14614, 1 male, 47.0 by 34.5 mm, BIOSHELF St. E1, 08°30'N, 098°06'E, triangular dredge, 38 m, coll. S. Bussarawit and C. Aungtonya, 22.04.1996; ZRC 1999.0121, 1 male, 1 female, Andaman Sea, Pichai Fish Port, trawl, April 1999.

Remarks

Calappa undulata was originally described from the South China Sea. The present record of this apparently rare species from the Indian Ocean extends its range substantially into the Indian Ocean. The live colour of this species is very distinctive, with the posterior part lighter coloured than the rest of the carapace, the two colour zones being demarcated marked by undulating patterns and/or blotches (Fig. 2A, B). The darker anterior part may be dark maroon-brown (Fig. 2B) to orange-brown (Fig. 2A). One consistent character seems to be the presence of a bright yellow ocellus which has a red rim on the dorsal surface of the carpus of the cheliped. Chen (1993) had also clearly described and figured this colour pattern. Ng *et al.* (1999) provides additional comments on several aspects of the nomenclature of this species.

Mursia africana Galil, 1993**Material examined**

PMBC 17003, 1 male, 68.3 mm (including lateral spines, excluding spines, 54.7 mm) by 42.2 mm, Andaman Sea, Thailand, 06°50'N, 097°54'E, 20.03.1989.

Remarks

The presence of this species in the Andaman Sea is very noteworthy as the species was previously known from only three specimens collected off East Africa. The present Thai specimen is an adult and keys best to Galil's (1993) description and figures for the species. One of the diagnostic features of this species, according to

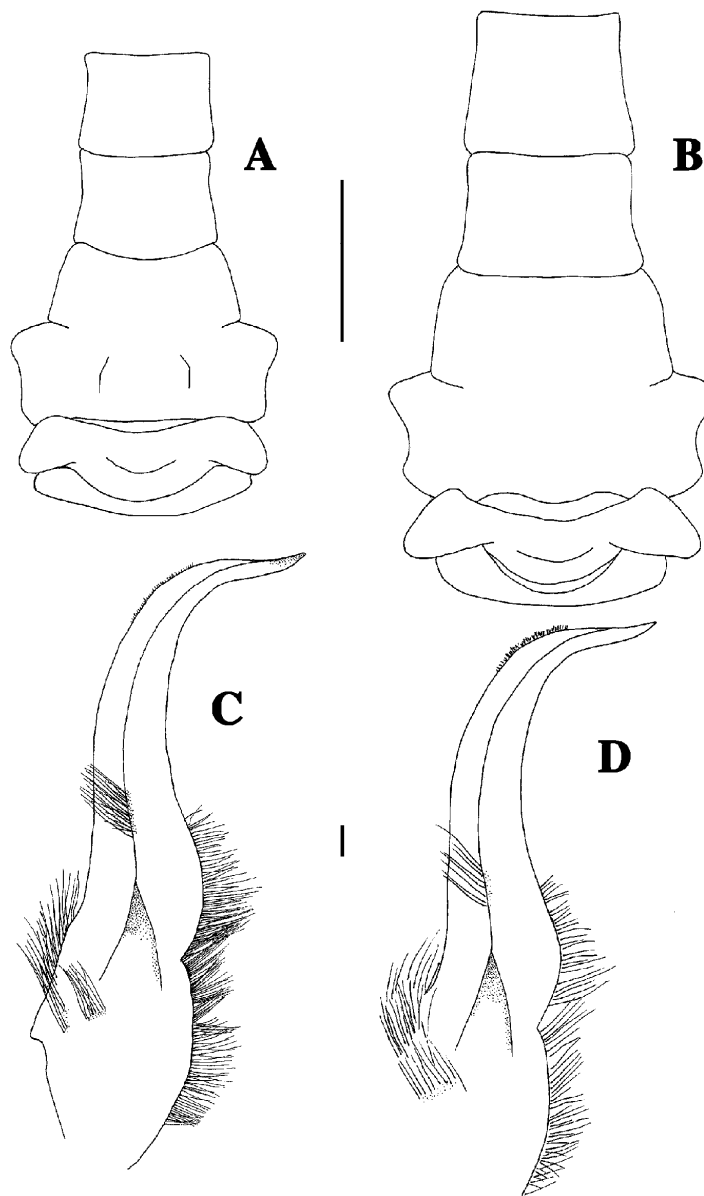


Figure 6 A, C, *Calappa philargius*: A, neotype male (81.4 by 56.8 mm) (ZRC 1998.67), Singapore; C, male (77.9 by 51.4 mm) (ZRC 1999.0756), Taiwan. B, D, *Calappa bilineata*; holotype male (93.1 by 64.9 mm) (PMBC 15789), Andaman Sea. A, B, male abdominal segments 1-6 (schematic); C, D, left G1. Scales: A, B = 5.0 mm, C, D = 1.0 mm.

Galil (1993), is that the three posterior carapace lobes are low and rounded. This is certainly not the case with the Andaman Sea specimen, with the above mentioned structures being sharp and clearly dentiform, with the median lobe rounded but still distinctly triangular. The value of this

character is difficult to determine, but from what is known with many other calappids, it may well vary (*e.g.* through wear and tear) and may not be reliable. For the moment, we think it is better to regard the Thai specimen as belonging to *M. africana*.

Family Matutidae De Haan, 1835

Key to species of Matutidae

1. Lateral carapace spines very short, dentiform to granuliform; outer surface of palm with median longitudinal stridulatory ridge on outer surface; second abdominal segment transversely carinate *Izanami curtispina*
- Lateral carapace spines well developed; outer surface of palm without median longitudinal stridulatory ridge on outer surface; third abdominal segment transversely carinate 2
2. Outer face of palm with ridge subparallel to ventral margin 3
- Outer face of palm with oblique ridge 4
3. Outer median ridge of chela with 2 prominent sharp, anteriorly directed teeth, one of which is distinctly larger; carapace in life covered with numerous evenly and closely spaced fine spots on yellow background *Ashtoret lunaris*
- Outer median ridge of chela with 1 prominent sharp, anteriorly directed tooth; carapace in life colored with red spots, interlaced with reticulate pattern of white patches *Ashtoret miersii*
4. Carapace distinctly longer than broad (excluding lateral spine); in life, carapace surface with pattern of fine red lines forming distinct mesh- or net-like pattern *Matuta planipes*
- Carapace as long as broad (excluding lateral spine); in life, carapace surface with numerous small black spots on yellowish background *Matuta victor*

Ashtoret lunaris (Forskål, 1775)

Ashtoret miersii (Henderson, 1887)
(Fig. 2E)

Material examined

None.

Remarks

As discussed by Galil and Clark (1994) most of the old records of this species are either incorrect or had been based on material containing more than one species and must be rechecked. It is most frequently confused with *M. victor* (see discussion for this species). Considering the known range of *A. lunaris* (see Galil and Clark, 1994; Ng, 1998), however, it is likely that *A. lunaris* is also present in Thailand. It had been recorded from the area by Nateewathana *et al.* (1981) and from the Gulf of Thailand by Naiyanetr (1998), and as such, we have retained this species in our keys.

Material examined

PMBC 16990, 4 males, 2 females; ZRC 1999.0128, 4 males, 4 females, QMW 25762, 1 male, 1 female, Andaman Sea, Pichai Fish Port, trawl, December 1998.

Remarks

This is a very distinctively coloured and patterned species (Fig. 2E) and therefore cannot be mistaken for almost any other taxon. The white patch on the gastric region of the carapace varies considerably in shape and size. It is the only species thus or similarly patterned which has a smooth chelipedal dactylus (in other species, *e.g.* *A. picta*, the outer surface of the dactylus has a milled ridge).

Galil and Clark (1994) commented that in this species, there is no prominent median granule on the posterolateral margin, but this is not the case. The series of specimens at hand indicates that the median posterolateral granule is often present, although its strength does vary and may be small. In some specimens, the granule is not clearly discernible. In some specimens, the strong ridges on the outer dorsal surface of the palm are also relatively weaker and less prominent. In other aspects, however, the present specimens agree well with the description and figures of the species by Galil and Clark's (1994). *Ashtoret miersii* was originally described from nearby Madras, India, and has also been reported from Sri Lanka and Japan (Laurie, 1906; Sakai, 1976).

Izanami curtispina (Sakai, 1961)
(Fig. 2F)

Material examined

PMBC 16815, 1 male, BIOSHELF St. A3, 09°31'N, 097°38'E, triangular dredge, 87 m, coll. S. Bussarawit and C. Aungtonya, 19.04.1996; PMBC 16812, 4 females (3 ovigerous), trawl, 76 m, R.V. Paknam, 17.03.1989; PMBC 16822, 1 male, BIOSHELF St. B3, 09°15'N, 097°42'E, triangular dredge, 80 m, coll. S. Bussarawit and C. Aungtonya, 18.02.1998; PMBC 16826, 29 females (22 ovigerous), BIOSHELF St. I3, 07°30'N, 098°10'E, triangular dredge, 78 m, coll. S. Bussarawit and C. Aungtonya, 02.05.1996; ZRC 1998.1114, 5 males, 7 females, Andaman Sea, Pichai Fish Port, trawl, December 1998.

Remarks

This is a common species in the waters off Phuket. The species agrees well with the descriptions of Sakai (1976), Galil and Clark (1994) and Ng and Huang (1997). The species was described from Japan, but has been reported over a wide area from Madagascar to Japan. Surprisingly, it has not been formally recorded from Thailand before. The colour of the many specimens examined is very uniform, being an even pinkish-red on all dorsal surfaces, with a semi-reticulate pattern of pale red lines on the median part of the carapace (Fig. 2F).

Matuta planipes Fabricius, 1798

Material examined

PMBC 14615, 1 male, Andaman Sea, Pichai Fish Port, Phuket, trawl, December 1999; ZRC 1999.0129, 1 male, 1 female, Andaman Sea, Pichai Fish Port, trawl, April 1999; ZRC 1999.0303, 1 male, 1 female, Pattani Fishing Port, Gulf of Thailand, 25.10.1998.

Remarks

This is well-known and widely distributed Indo-West Pacific species.

Matuta victor (Fabricius, 1781)
(Fig. 2G)

Material examined

PMBC 16998, 1 male, 1 female, Cape Panwa, reef outside PMBC, 24.12.1971; PMBC 17020, 1 male, PMBC reef, Phuket, 08.12.1998; PMBC 17008, 1 male, 2 females, 2 juveniles, Yao Yai Island, Phangnga, 02.07.1983; PMBC 14616, 1 female, Satul, 1994; PMBC 16972, 4 males, 9 females (2 ovigerous); ZRC 1998.1121, 6 males, 2 females, Andaman Sea, Pichai Fish Port, 11.12.1998; ZRC 1999.0130, 5 males, 4 females, 1 juvenile, Andaman Sea, Pichai Fish Port, April 1999; PMBC 17017, 1 female, Andaman Sea, Pichai Fish Port, 13.12.1998; PMBC 17023, 1 female, Hua Hin beach, Satun Province, 15.12.1994; ZRC 1999.0307, 1 male, Pattani Fishing Port, Gulf of Thailand, trawl, 25.10.1998.

Remarks

The long standing problems with the taxonomy of *Matuta lunaris* (Forskål, 1775), *M. banksi* Leach, 1817, and *M. victor* (Fabricius, 1781) was resolved by Galil and Clark (1994) who regarded the first two names as synonyms and referred it to *Ashtoret*, while retaining *M. victor* in *Matuta*. As noted earlier, many of the older records of these species are probably not reliable. The specimens we have examined all belong to *M. victor* as defined by Galil and Clark (1994). In western Thailand at least, the specimens we have examined supposedly of '*Matuta lunaris*' thus far all belong to *Matuta victor* (Fabricius, 1781). The fresh

colours of the specimens examined agree well with each other, all of which have a pale yellow carapace background and covered with numerous, very small and evenly scattered black dots. The pereopods are usually brighter yellow (especially the dactylus), the areas near the joints often have purplish-red patches (Fig. 2G).

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