

A REVISION OF THE SHORE CRABS OF THE GENUS *ERIPHIA* (CRUSTACEA: BRACHYURA: ERIPHIIDAE)

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ABSTRACT. – The taxonomy of the shore crabs of the genus *Eriphia* (Eriphiidae), common in most temperate and tropical seas, is revised. Eight species are recognised. One species, *E. verrucosa* (Forskål, 1775), occurs in the Mediterranean; another, *E. gonagra* (Fabricius, 1781) is only known from the western Atlantic, while two species, *E. squamata* Stimpson, 1859, and *E. granulosa* A. Milne-Edwards, 1880, are eastern Pacific in distribution. Four species are known from the Indo-West Pacific, *E. sebana* (Shaw & Nodder, 1803), *E. smithii* (MacLeay, 1838), *E. scabricula* Dana, 1852, and a new species, *E. ferox*. The new species has previously been confused with *E. smithii*. The differences between *E. sebana* and *E. smithii*, which have been often been confused with each other, are clarified, and new characters defined. A key to all the members of the genus is provided.

KEYWORDS. – Revision, shore crabs, Eriphiidae, *Eriphia*, new species, keys.

INTRODUCTION

Crabs of the genus *Eriphia* Latreille, 1817 (Brachyura: Eriphiidae) are common in rocky shores and reefs in most tropical and subtropical habitats. The genus currently contains seven species, viz. *E. verrucosa* (Forskål, 1775), *E. gonagra* (Fabricius, 1781), *E. sebana* (Shaw & Nodder, 1803), *E. smithii* MacLeay, 1838, *E. scabricula* Dana, 1852, *E. squamata* Stimpson, 1859, and *E. granulosa* A. Milne-Edwards, 1880 (Ng et al., 2008). *Eriphia verrucosa* is Mediterranean in distribution, while *E. gonagra* is only known from the western Atlantic. *Eriphia squamata* and *E. granulosa* are known from the Pacific coast of tropical America while the other three species, *E. sebana*, *E. smithii* and *E. scabricula* have a wide Indo-West Pacific distribution. One species previously classified in *Eriphia*, *E. norfolcensis* Grant & McCulloch, 1907, is very aberrant and more closely resembles species of *Globopilumnus* Balss, 1933, and was transferred to a new genus, *Bountiana*, by Davie & Ng (2000).

The genus *Eriphia* is revised in this study. The identities of *E. sebana* and *E. smithii* are clarified and both species are redefined. A study of the type of *E. smithii* MacLeay, 1838, and topotypic specimens from South Africa also shows that specimens from Southeast and East Asia previously referred to this species should be described as a new species, here named *E. ferox*, instead.

Ng (1998) argued that both names previously used for the group, Menippidae Ortmann, 1893, and Oziidae Dana, 1851, are junior synonyms of Eriphiidae MacLeay, 1838. Crosnier (in Serène, 1984) recognised three subfamilies in his Menippidae, Eriphiinae MacLeay, 1838, Oziinae Dana, 1851, and Dacryopilumninae Serène, 1984, and provided a key for their differentiation. Ng et al. (2001) suggested that the Eriphiidae be separated into five subfamilies on the basis of their orbital and antennal form and position, structure of the chelae, form of the male first and second pleopods, viz. Eriphiinae MacLeay, 1838, Oziinae Dana, 1851, Menippinae Ortmann, 1893, and Dacryopilumninae Serène, 1984. In the most recent classification, Ng et al. (2008) recognised one superfamily, the Eriphioidea with six families: Eriphidae, Menippidae, Oziidae, Playtyxanthidae, Dairoididae and Hypothalassiidae. Within the Eriphidae, only two genera were recognised, *Eriphia* Latreille, 1817, and *Eriphides* Rathbun, 1897.

MATERIALS AND METHODS

Specimens used are located in the following repositories: Australian Museum (AM), Sydney, Australia; Queensland Museum (QM), Queensland, Australia; Western Australian Museum (WAM), Perth, Australia; MacLeay Museum (MMUS), University of Sydney, Sydney, Australia; Natural History Museum (NHM) (former British Museum of Natural History, London, U. K.; Nationaal Natuurhistorisch Museum,

former Rijksmuseum van Natuurlijke Historie (RMNH), Leiden, The Netherlands; Swedish Museum of Natural History (SMNH), Stockholm, Sweden; Muséum national d'Histoire naturelle (MNHN), Paris, France; Zoologisk Museum, University of Copenhagen (ZMUC), Copenhagen, Denmark; Zoological Museum, Berlin (ZMB), Germany; South African Museum (SAM), Cape Town, South Africa; National Museum of Natural History, Smithsonian Institution (USNM), Washington, D.C., U.S.A.; American Museum of Natural History (AMNH), New York, U.S.A.; Bernice P. Bishop Museum (BPBM), Honolulu, Hawaii, U.S.A.; and Zoological Reference Collection (ZRC), Raffles Museum of Biodiversity Research, Department of Biological Sciences, National University of Singapore, Singapore.

All measurements provided (in millimeters, mm) are of the carapace length and width respectively. The abbreviations G1 and G2 are used for the male first and second pleopods respectively.

TAXONOMY

Genus *Eriphia* Latreille, 1817

Eriphia Latreille, 1817: 404; H. Milne Edwards, 1834: 425; Dana, 1852b: 246; Hess, 1865: 135; A. Milne-Edwards, 1873: 255; Miers, 1886: 162; Alcock, 1898: 213; Stimpson, 1907: 71; Stebbing, 1910: 302; Rathbun, 1930: 545; Sakai, 1939: 522; Ward, 1939: 11; Ward, 1941: 13; Ward, 1942: 98; Garth, 1946: 482; Barnard, 1950: 273; Balss, 1857: 1651; Holthuis, 1962: 236; Sakai, 1976: 477; Manning & Holthuis, 1981: 124; Crosnier, in Serène, 1984: 309; Dai & Yang, 1991: 256; Ng et al., 2008: 83.

Type species: *Eriphia verrucosa* (Forskål, 1775), by subsequent designation (Holthuis, 1962: 236).

Diagnosis. – Carapace hexagonal; surfaces tuberculated anteriorly, generally smooth posteriorly; regions well defined anteriorly; frontal, gastric and hepatic regions tuberculated. Front not continuous with orbital margin, usually denticulated. Orbits denticulated, with at least one external orbital spine; orbital hiatus absent. Anterolateral margin convex; with spines decreasing in size from front to back. Posterolateral margin distinctly convergent towards posterior carapace margin, generally smooth, longer than anterolateral margin. Posterior carapace margin with a smooth transverse ridge. Second antennular segment folding transversely. Antenna positioned on external part of frontal margin, not in contact with orbital margin; flagellum short, not reaching orbital margin. Merus of third maxillipeds irregularly pentagonal; entire along outer margin. Branchial channel partially covered by merus of third maxilliped. Chelipeds asymmetrical in males; denticles present at ventral margin of basis-ischium and merus along inner ventral margin; inner median margin of carpus with prominent spine, sometimes with a few small spines; chela relatively short, stout, cutting edge of finger of major chela with basal molariform tooth on both propodus and dactylus. Ambulatory legs relatively long, subcylindrical; surfaces smooth; margins generally pubescent to varying

degrees. Anterior male thoracic sternum pubescent with short, stiff setae, setae arranged in tufts. Sixth abdominal segment longer than telson. G1 short, stout, subcylindrical, tapering distally; spinules present along inner and/or outer margins. G2 very slender, longer than G1; distal part shorter than subdistal part.

Remarks. – Within the Eriphiidae, the genus *Eriphia* sensu stricto is quite distinct from other genera, with members having a hexagonal carapace, antennae inserted at the external edge of the frontal margin, and presence of denticles on the ventral margin of the basis-ischium of the cheliped. Despite this, in the form of the male abdomen (all segments freely movable), as well as in its simple, stout G1 and relatively long G2, they agree with other members of the family.

Eriphia verrucosa (Forskål, 1775) (Figs. 1, 3A–C)

Cancer verrucosus Forskål, 1775: 93; De Haan, 1833: Table B.

Cancer spinifrons Herbst, 1785: Pl. 185 Fig. 65.

Eriphia spinifrons – H. Milne Edwards, 1834: 426; Stimpson, 1858: 37; Herklots, 1861: 125; A. Milne-Edwards, 1875: 69; Miers, 1886: 162; Ortmann, 1893: 479; Stimpson, 1907: 72; Bouvier, 1911: 226; Monod, 1932: 217.

Eriphia verrucosa – Chapman & Santler, 1955: 374; Figueira, 1960: 9; Forest & Gantès, 1960: 352; Holthuis, 1961: 54; Holthuis, 1962: 236; Zariquiey Alvarez, 1968: 393, Figs. 1i, 135b; Kocatas, 1971: Pl. 4 Fig. 2; Pretzmann, 1971: 477; Türkay, 1976: 61, 67; Manning & Holthuis, 1981: 124; Manning & Števíč, 1982: 299; Schembri & Lanfranco, 1984: 29; Lewinsohn & Holthuis, 1986: 44; Grippa, 1991: 355; Holthuis, 1987: 367; Falciai & Minervini, 1992: 223; D'Udekem d'Acoz, 1992: 26; Števíč & Galil, 1994: 67; González Pérez, 1995: 201; Zavodnik & Simunovic, 1997: 131; Sakai, 1999: 31, Pl. 16E; d'Udekem d'Acoz, 1999: 236; Ng et al., 2008: 83.

Material examined. – **TURKEY:** 1 dried male (49.5 × 69.5 mm) (ZMB 2084) (lectotype of *Cancer spinifrons* Herbst, 1785), 1 dried male (52.0 × 74.5 mm) (ZMB 441) (paralectotype of *Cancer spinifrons* Herbst, 1785), Sea of Marmara, Istanbul. Others: **TUNISIA:** 1 male (32.5 × 44.2 mm), 1 female (18.1 × 27.1 mm) (NHM 1974.504), El Hauciria, shore collection, Project Mermaid, coll. P. Clark, 31 Aug. 1974. **SPAIN:** 1 male (20.9 × 29.9 mm), 1 female (35.0 × 50.3 mm) (RMNH 11511), Havenvan, Barcelona, ca. 0.1 m depth, coll. Kademuur, 19–22 Sep. 1957. **FRANCE:** 2 males (21.9 × 30.8 mm, 21.6 × 30.6 mm), 2 females (24.1 × 36.0 mm, 21.7 × 30.1 mm) (RMNH 21039), Biarritz, plage du Port-Vieux, coll. I. W. Frankryc, 11 Apr. 1960. **AZORES:** 1 male (29.9 × 42.9 mm), 1 female (24.9 × 35.6 mm), 1 juvenile (11.2 × 15.9 mm) (RMNH 36328), north coast S. Torge, Fajada, Caldeira, 38°38'N 27°56'W, Cobble Beach and lagoon, coll. Tydeman Azores Expedition 1981, Cancap V, 13 Jun. 1981. **ITALY:** 1 male (50.6 × 60.4 mm), 1 ovigerous female (41.1 × 58.8 mm) (USNM 152249), Mediterranean Sea, Sierly, Syracuse, fish market, coll. Luicotta, 22 Jun. 1974; 1 female (ZMUC), Messina, coll. 1993; 1 male, 1 female (ZMUC), Cadiz Sea, coll. Thor, 22 Jun. 1910. **CROATIA:** 1 female (ZMUC), saline bay, Rovinj, coll. 11 Jun. 1986. **ISRAEL:** 1 male (35.1 × 50.8 mm), 1 female (41.6 × 57.6 mm) (ZRC 2000.2203), Mediterranean Sea, Tel Aviv, coll. Oct. 1971 (male), 1960 (female).

Type locality. – Istanbul, Turkey.

Diagnosis. – Carapace transversely hexagonal; tubercles

arranged in twos or threes, pubescent anteriorly. Distinct cervical groove reaching to third anterolateral spine. Front with five to seven denticles on each side of median notch. Orbits denticulated, with two curved external and one internal orbital spines. Anterolateral margins with five or six acute pigmented spines. Pterygostomial region minutely tuberculated anteriorly, pubescent posteriorly. Chelipeds tuberculated, pubescent, tubercles pigmented. Anterior male thoracic sternum with row of setae on anteriormost surface, tuberculated anteriorly. G1 curved terminally, with some spinules at extreme inner terminal end and laterally, medially pubescent along inner edge.

Description. – Carapace transversely hexagonal, dorsal surface relatively flattened, tubercles arranged in twos or threes, pubescent anteriorly. Regions well defined. Frontal region with row of tubercles; pubescent immediately behind it. Gastric region well defined; slightly inflated. Protogastric region weakly separated from gastric region by row of tubercles; surface pubescent. Hepatic region well defined; with acute tubercles anteriorly; distinct cervical groove reaching to third anterolateral spine. Branchial region with some tubercles anteriorly.

Front with deep U-shaped notch; each side with five to seven denticles. Orbit rounded, deep, entire margin denticulated,

with two curved external and one internal orbital spines; supraorbital margin with two longitudinal fissures, infraorbital margin with two obscure longitudinal fissures. Anterolateral margin convex, with five or six acute pigmented spines, first three spines may have accessory denticles. Posterolateral margin sharply convergent, smooth; longer than anterolateral margin. Posterior carapace margin slightly concave medially, ridged margin minutely denticulated. Second antennular segment folding transversely. Antennae short, not reaching orbital margin; positioned at external edge of frontal margin. Third maxilliped surface generally smooth, pubescent; merus irregularly pentagonal; entire along outer margin, surface tuberculated. Pterygostomial region minutely tuberculated anteriorly, pubescent posteriorly. Suborbital region denticulated.

Chelipeds asymmetrical, outer surfaces tuberculated, pubescent; tubercles with pigmented tips. Denticles present on ventral margin of basis-ischium and merus. Merus relatively smooth, pubescent anteriorly. Carpus with a prominent acute spine on distal inner margin, another spine present ventrally. Chela relatively long, tuberculated, tubercles in numerous longitudinal rows, may extend to proximal part of dactylus. Tuberculation and pubescence on major chela less extensive; surfaces may appear reticulated. Cutting edge of minor chela minutely denticulated while that of major chela has basal molariform tooth on basal part of propodus and dactylus.

Ambulatory legs relatively long, subcylindrical; surfaces smooth, both anterior and posterior margins almost always with long and short setae.

Anterior male thoracic sternum slightly pubescent anteriorly; row of setae present on anteriormost region; tuberculated anteriorly. G1 relatively short, stout, bent one-third from tip; tapered, curved terminally; with some spinules at extreme inner terminal end and laterally; pubescent on median part of inner edge; sparse pubescence on basal outer edge. G2 longer than G1.

Remarks. – Holthuis (1962) discussed the problems associated with the type species of *Eriphia* Latreille, 1817. *Cancer spinifrons* Herbst, 1785, is often regarded as the type species of the genus, but it is actually a subjective junior synonym of *Cancer verrucosa* Forskål, 1775. Since the species is of no economic importance, he requested the International Commission of Zoological Nomenclature to place the name *Cancer verrucosa* Forskål, 1775, instead of *Cancer spinifrons* Herbst, 1785, on the Official List of Generic Names in Zoology (ICZN, 1987). Thus, *Cancer verrucosa* Forskål, 1775, is now the type species of *Eriphia* Latreille, 1817. Sakai (1999) recorded two syntypes of *Cancer spinifrons* Herbst, 1785, in the Berlin Museum, and the one figured by him is here designated as the lectotype of the species. Forskål's (1775) specimen(s) of *Cancer verrucosa* are no longer extant, but the species is so well known that there is no real need to select a neotype for the moment.

Stevcic & Galil (1994) compiled a checklist on the Mediterranean decapods in which they divided the

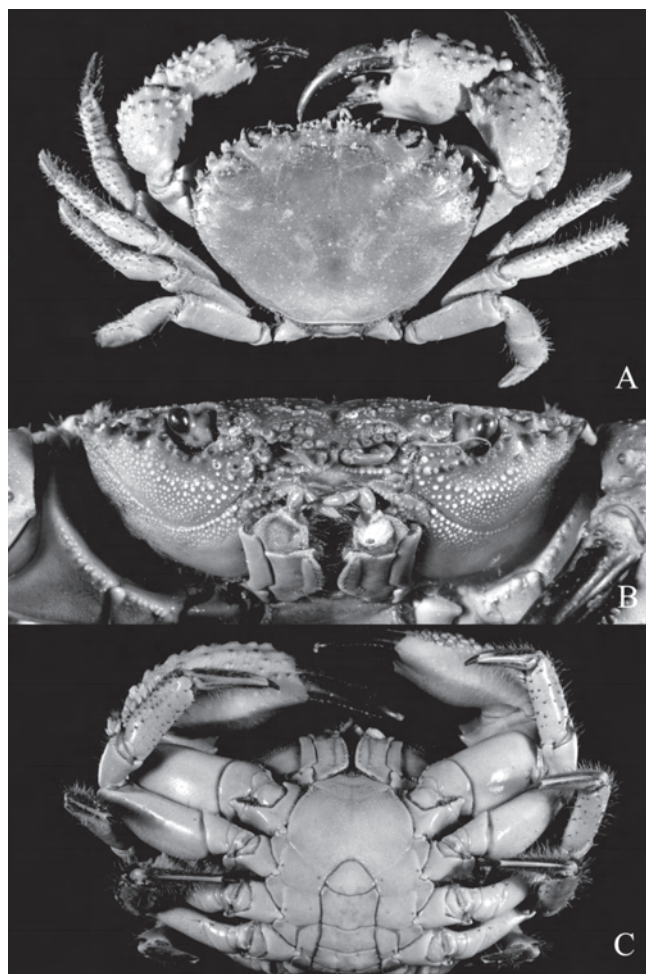


Fig. 1. *Eriphia verrucosa* (Forskål, 1775), male, 50.6 × 60.4 mm, USNM 152249: A, dorsal view; B, frontal view; C, ventral view.

Mediterranean into several subregions: western, central and eastern, including Adriatic and Black Sea. They noted that *E. verrucosa* was reported from all the subregions, even penetrating into the Black Sea where conditions are generally very unfavourable for crabs. The species, according to Lewinsohn & Holthuis (1986: 45) is a "... a frequent littoral species throughout Mediterranean, with numerous records in eastern basin". Also, Holthuis (1961) noted that the crabs are used for food and is sold on markets in Istanbul, Antalya and Samsun. It is only occasionally eaten in the Adriatic (C. Frogli, pers. comm.).

In all the specimens examined, the frontal margin is strongly denticulated with randomly arranged tubercles. Both chelae are tuberculated to varying degrees with the minor one highly tuberculated on both anterior and posterior edges while only the anterior half of the major chela is tuberculated, with the tubercles arranged in such a way to give the surface a superficially reticulated pattern. These tubercles are pigmented, with the anterior half dark. As the carapace size increases, the first few anterolateral spines become more denticulated and the infraorbital margin changes from slightly denticulate to highly spinate.

Specimens from Caldeira, however, appear slightly smoother than the rest. The carapace and both chelae of the male specimen examined are less tuberculated and pubescent. This is especially so on the major chela where only the proximal portion of the palm is tuberculated with the rest smooth. The juvenile specimen is relatively smooth, with its major palm entirely devoid of tubercles. For the moment, there is no reason to believe these differences are significant or to suspect these specimens are not *E. verrucosa* sensu stricto.

Distribution. – Throughout Mediterranean Sea, extending to Adriatic and Black Sea (Števčić & Galil, 1994).

***Eriphia gonagra* (Fabricius, 1781)**
(Figs. 2, 3D–F)

Cancer gonagra Fabricius, 1781: 505; Herbst, 1788: 238.

Eriphia gonagra – H. Milne Edwards, 1834: 426; Dana, 1852b: 250; Stimpson, 1860: 217; Herklots, 1861: 125; Heller, 1886: 24; Stimpson, 1871: 10; Von Martens, 1872: 92; Miers, 1886: 162, 163; Ortmann, 1893: 480; Rathbun, 1897b: 21; Rathbun, 1898a: 276; Rathbun, 1898b: 590; Rathbun, 1900: 141; Rankin, 1900: 527; Verrill, 1908: 362; Hay & Shore, 1918: 439, Pl. 35 Fig. 6; Boone, 1930: 144, Pl. 47 Fig. B; Rathbun, 1930: 545, Text–Fig. 83, pl. 222; Rathbun, 1933: 75; Rathbun, 1936: 386; Finnegan, 1931: 646; Lunz, 1937: 25; Holthuis, 1959: 210; Williams, 1965: 182, Figs. 164A–C; Coelho & Ramos, 1972: 192; Gomes-Corrêa, 1972: 7; Felder, 1973: 64, Fig. 5; Powers, 1977: 90; Garth, 1978: 327; Rodriguez, 1980: 370, Pl. 54; Lemaitre, 1981: 251; Williams, 1984: 419; Abele & Kim, 1986: 652; De Melo, 1996: 346; De Melo, 1998: 482; De Melo, 1999: 458, Fig. 45; Boschi, 2000: 80; Nizinski, 2003: 137; Ng et al., 2008: 63.

Eriphia armata Dana, 1852a: 83; Dana, 1852b: 248; Dana, 1855, Pl. 14 Fig. 6a–d; Miers, 1886: 162.

Eriphia laevimana var. *smithii* – Cano, 1838: 210 (part) (not MacLeay, 1838).

Material examined. – Lectotype: 1 dried male (11.7 × 16.2 mm) (ZMUC Cru 37), Jamaica, Banks Collection. Others: **JAMAICA:** 2 dried males (MMUS–C 1989–1990). **ST. THOMAS ISLAND:** 1 male, 1 female (ZMUC), Fabricius Collection. **BRAZIL:** 1 male (18.7 × 26.0 mm), 1 female (27.1 × 41.3 mm) (NHM 1887.23), Pernambuco, coll. H. N. Ridley; 1 male (24.6 × 36.9 mm), 1 female (25.2 × 28.7 mm) (USNM 40572), Pernambuco, coll. Hartt Exploring Expedition, 1875–1877; 1 male (ZMUC), Rio de Janeiro, Fabricius Collection. **CUBA:** 1 dried male, 1 female (MMUS–C 1987–1988). **NORTH AMERICA:** 1 male (21.1 × 29.5 mm), 1 female (11.0 × 15.8 mm) (USNM 57127), Florida, Bush Key, Dry Tortugas, coll. Bartsch, Jun. 1921; 4 males (17.1–7.3 × 24.9–10.5 mm), 3 females (12.2–8.1 × 18.3–11.9 mm) (ZRC 1984.6119–6125), Barbados, River Bay, under stones, littoral, coll. M. Telford, 23 Aug. 1974; 2 dried males, 1 dried female (MMUS–C 1984–1986); 2 dried males, 6 dried females (MMUS–C 1975–1982).

Type locality. – Jamaica.

Diagnosis. – Carapace transversely hexagonal, tuberculated, tubercles may be joined in twos or threes, pubescent anteriorly. Hepatic region separated by transverse groove extending from second anterolateral spine; tuberculated anterolaterally. Branchial region weakly separated into two anterior portions by oblique groove. Front with two transverse ridges immediately behind frontal margin, may be denticulated externally. Orbit completely denticulated; external and internal

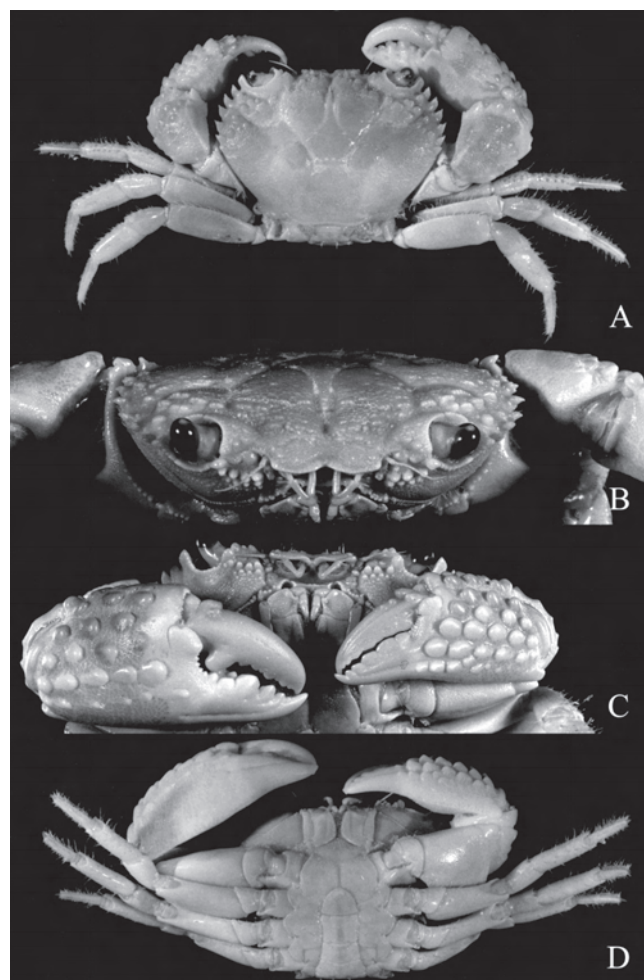


Fig. 2. *Eriphia gonagra* (Fabricius, 1781), male, 18.7 × 26.0 mm, NHM 1887.23: A, dorsal view; B, frontal view; C, chelipeds; D, ventral view.

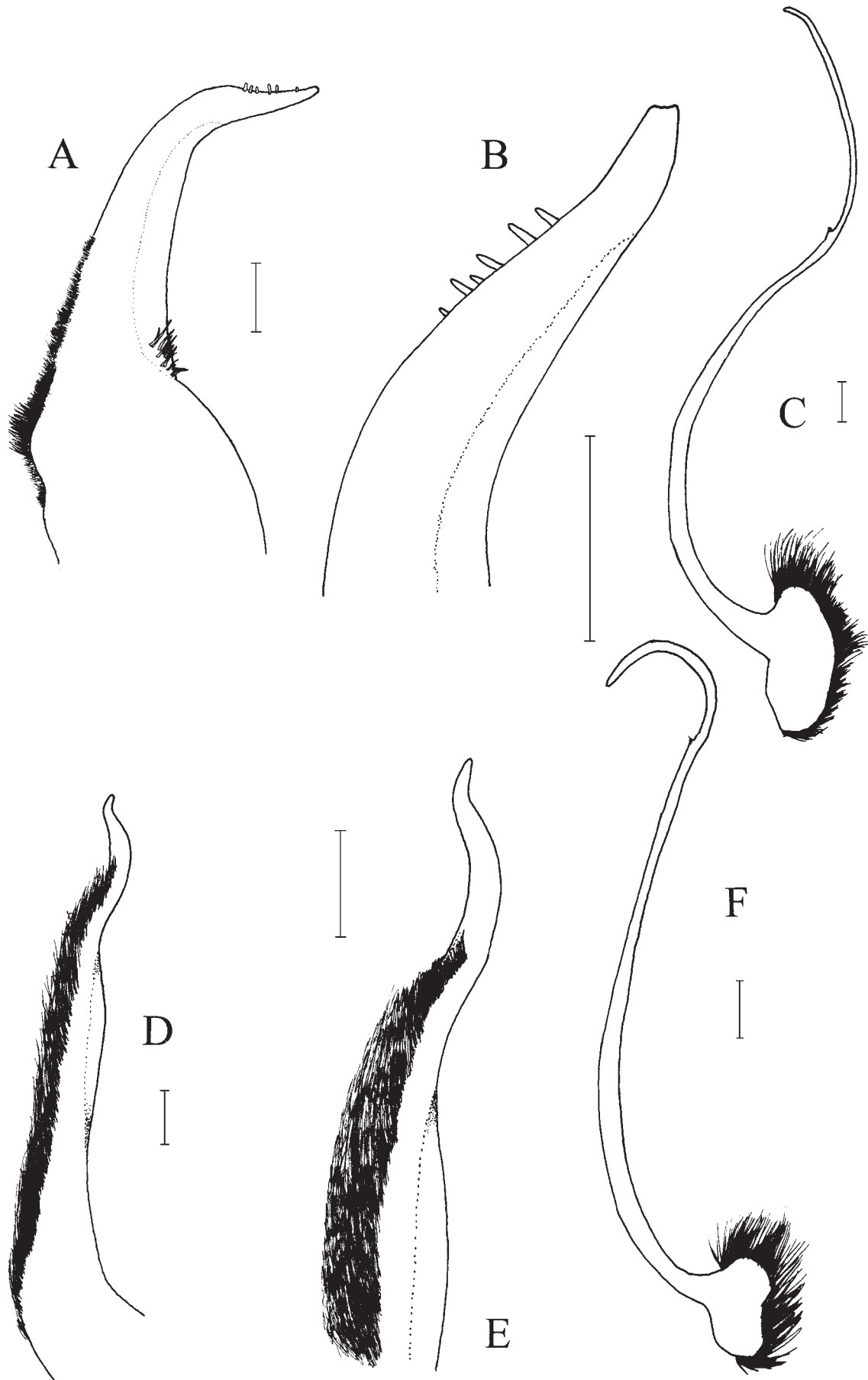


Fig. 3. Gonopods: A–C, *Eriphia verrucosa* (Forskål, 1775), male, 50.6 × 60.4 mm, USNM 152249. D–F, *E. gonagra* (Fabricius, 1781), male, 26.0 × 18.7 mm, NHM 1887.23: A, D, G1s; B, E, distal part of G1s; C, F, G2s. Scale bars = 1.0 mm.

orbital spines present; supraorbital and margins each with two longitudinal fissures. Anterolateral margin convex, with six or seven acute spines. Surface of third maxilliped minutely granulated, sparsely pubescent. Pterygostomial region pubescent, minutely granulated. Suborbital region slightly denticulated. Chelipeds tuberculated, tubercles rounded, produced forward in longitudinal rows; anterior margin of merus pubescent, surfaces minutely granulated; carpus with acute tubercles distally, prominent acute spine present at inner margin, with a smaller one further below ventral surface; chela covered with acute tubercles in longitudinal rows, tubercles may be present on dactylus; tubercle rows on major chela reduced in numbers posteriorly. Anterior male thoracic sternum minutely granulated anteriorly. G1 relatively short, stout, long spinules present at inner edge, extending some distance from tip to basal portion; sinuous at tapered acute tip; slightly pubescent on outer edge.

Remarks. – Zimsen (1964) states that the type specimen(s) in London are lost, but it is clear that the present specimen in the ZMUC is part of the collection of Banks and is thus part of the original, i.e. type series examined or used by Fabricius. It was probably given to Fabricius subsequently and retained in the ZMUC. As such, the present specimen is clearly a syntype, and is here designated as the lectotype of *Cancer gonagra*. Dana (1952a) described *Eriphia armata* from Patagonia, but on the basis of his description and figures (Dana, 1852a, b, 1855), there seems little reason not to regard it as conspecific with *E. gonagra*.

Superficially, *E. gonagra*, *E. squamata* and *E. granulosa* resemble each other, with regards to the carapace shape, tuberculation on the carapace and chelipeds, orbits, shape of anterolateral spines etc. Rathbun (1930) constructed a key to separate them with the use of tubercular arrangement and male first pleopods. On closer examination, there are other characters that can also serve to distinguish them. *Eriphia granulosa* can be easily separated from its two allied species by having a prominent deflexed front and two inflated frontal lobes. Apart from Rathbun's (1930) use of the G1 to distinguish *E. gonagra* and *E. squamata*, several other characters can also be utilised with some confidence. Tubercles on the outer surface of the chela of *E. gonagra* are rounded and distributed sparsely; while those on *E. squamata* are flattened and densely packed in longitudinal rows. The anterior male thoracic sternum of *E. gonagra* is minutely tuberculated without tufts of setae while in *E. squamata*, this structure is smooth with scattered tufts of setae. The male abdomen of *E. squamata* is also very narrow compared to that of *E. gonagra*, with both lateral margins distinctly concave. Lastly, as highlighted by Rathbun (1930), the tip of the G1 in *E. gonagra* is acute with the subterminal part slightly bent while that of *E. squamata* is rounded and shaped like a golf club.

Stimpson (1860) quoted from Dr. Cooper that these crabs "... built nests of mud upon branches and roots of the mangroves at the edge of water". Garth (1978) further commented that they are abundant and can invariably be taken by hand sampling on the rocky shores. Holthuis (1959) expressed

doubts with regards to records of the species from Surinam, noting that the muddy coastlines of the country were unsuited to the species.

Rathbun (1900) noted that *E. gonagra* are always bright in colour: some reddish-brown while others yellowish-brown in colour with darker patches. The light yellow coloured ambulatory legs are largely covered with fine red dots while the tuberculation on the upper surfaces of their claws are dark red in colour.

Distribution. – Western Atlantic Ocean, extending from Patagonia to Brazil, including Bermuda.

Eriphia squamata Stimpson, 1859 (Figs. 4, 7A–C)

Eriphia squamata Stimpson, 1859: 56; Stimpson, 1860: 217; A. Milne-Edwards, 1880: 339, Pl. 56 Fig. 3; Miers, 1886: 162; Rathbun, 1898b: 590; Rathbun, 1910b: 544, 586, Pl. 41 Fig. 1; Rathbun, 1923: 625; Rathbun, 1924b: 376; Rathbun, 1930: 550, Text-Fig. 84, Pl. 223, Pl. 224 Fig. 1; Boone, 1929: 575, Fig. 12 a–b; Hult, 1938: 13; Garth, 1946: 482, Pl. 83 Figs. 5–6. Crane, 1947: 81; Garth, 1948: 50; Buitendijk, 1950: 278; Holthuis, 1954: 33; Garth, 1957: 66; von Prael, 1982: 80, Fig. 9 a–b; von Prael & Froidefond, 1985: 268; Lemaire & León, 1992: 56; Hendrickx, 1995: 95; Hendrickx, 1996: 615; Boschi, 2000: 80; Ng et al., 2008: 63.

Eriphia laevimana var. *smithii* – Cano, 1889: 102, 210 (part). (not MacLeay, 1838)

Material examined. – **CENTRAL AMERICA:** 2 males (23.2 × 33.5 mm, 14.7 × 21.3 mm), 3 females (21.6–19.1 × 31.3–27.8 mm), 2 juveniles (12.1 × 19.0 mm, 10.3 × 14.8 mm) (NHM uncat.), west coast Central America, coll. Captain Daw; 2 dried males, 1 dried female (MMUS–C 2117–2119), California. **PANAMA:** 1 male (29.9 × 40.9 mm), 1 female (27.5 × 39.5 mm) (USNM 17787). **MEXICO:** 1 male (15.5 × 22.5 mm), 1 female (12.0 × 19.5 mm) (USNM 50481), Agua Verde Bay, coll. Albatross Expedition, 21 Apr. 1911.

Type locality. – Mazatlan, Mexico.

Diagnosis. – Carapace transversely hexagonal, dorsal surface relatively flat, tuberculated, tubercles may be arranged in twos or threes, slightly pubescent anteriorly. Hepatic region separated by transverse groove extending from second anterolateral spine. Front with two transverse ridges immediately behind frontal margin, denticulated to varying degrees. Orbit oval, deep, entire margin denticulated; external and internal orbital spines present; supraorbital and infraorbital margins each with two longitudinal fissures. Anterolateral margin convex, with six or seven acute spines. Surface of third maxilliped minutely granulated, sparsely pubescent. Pterygostomial region pubescent, minutely granulated. Suborbital region slightly denticulated. Cheliped surface tuberculated; denticles present at ventral margin of basis-ischium and merus; anterior margin of merus pubescent, surface relatively smooth; carpus covered with large, flattened tubercles distally, with prominent acute spine on distal inner margin and a smaller one below ventral surface; outer

surface of chela covered with flattened tubercles arranged in longitudinal rows, rounded tubercles may be present on dactylus; tubercle rows on larger chela always prominent, dense. Surface of ambulatory leg smooth, both anterior and posterior margins pubescent. Anterior male thoracic sternum smooth anteriorly. G1 relatively short, stout, long spinules present at inner edge, extending immediately after twisted tip; portion of distal tip shaped like golf-club end; minute spinules present at distal portion of outer edge.

Remarks. – Rathbun (1930) had regarded both *E. gonagra* and *E. squamata* as analogous species on opposite sides of the American continent, with *E. gonagra* on the Atlantic and *E. squamata* on the Pacific side. The differences between them have already been discussed under the remarks for *E. gonagra*. Von Prahl (1982) erroneously referred the diagram of *E. squamata* as Figure 10, it should be Figure 9 instead.

Crane (1947) noted that *E. squamata* has a variable dark colour, from dark grayish-green to brown-black. They are often mottled with greenish or dark blue colour. The ambulatory legs are seen with bands of white or cream and purple, dark blue or brown; fingers and ocular spines furnished with burnt sienna to scarlet-orange. Often, there are two narrow violet stripes extending down two-third of the abdomen. The eyes are olive green with a brown centre.

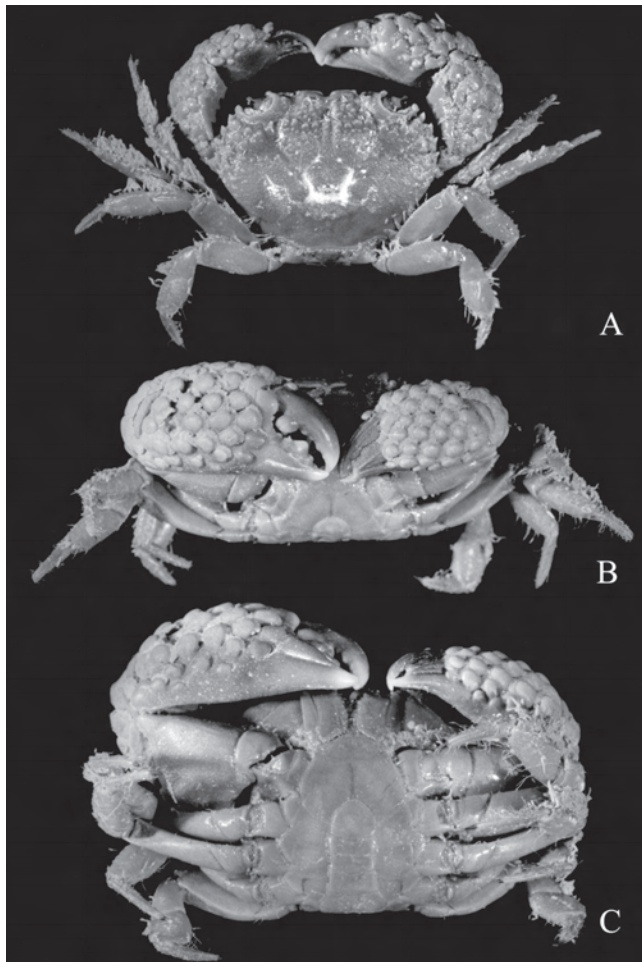


Fig. 4. *Eriphia squamata* Stimpson, 1859, male, 29.9 × 40.9 mm, USNM 17787: A, dorsal view; B, chelipeds; C, ventral view.

Crane (1947) commented on the ecology of this species, noting that they are extremely common in tide pools and midtide stony zones, and can be seen feeding both under water on molluscs in tidepools as well as on tube worms out of water at night. Garth (1948) suggested that their ubiquitous nature may be due to their tolerance to a wide variety of conditions. Boone (1929) remarked that female crabs approximately 20 mm in carapace width are already ovigerous.

Distribution. – Eastern Pacific Ocean, extending from Lower California, Gulf of California to western coast of Mexico, to Gulf of Panama; Galapagos Islands.

***Eriphia granulosa* A. Milne-Edwards, 1880**
(Figs. 5, 6, 7D–G)

Eriphia granulosa A. Milne-Edwards, 1880: 339, Pl. 56 Fig. 2–2b; Miers, 1886: 162; Rathbun, 1902: 282; Rathbun, 1924a: 158; Boone, 1927: 234; Rathbun, 1930: 551, text–fig. 85, Pl. 224 Fig. 2–4; Finnegan, 1931: 646; Sivertsen, 1933: 18; Schmitt, 1939: 25; Garth, 1946: 383, Pl. 80 Fig. 2; Hendrickx, 1995: 95; Boschi, 2000: 80; Hickmann & Zimmerman, 2000: 121; Ng et al., 2008: 63.

Material examined. – Holotype: 1 dried female (12.0 × 17.0 mm) (MNHN B–2447S), ? Chile. Others: **GALAPAGOS ISLANDS:** 8 males (10.0–2.9 × 14.9–4.1 mm), 6 females (5.2–4.3 × 8.5–5.9

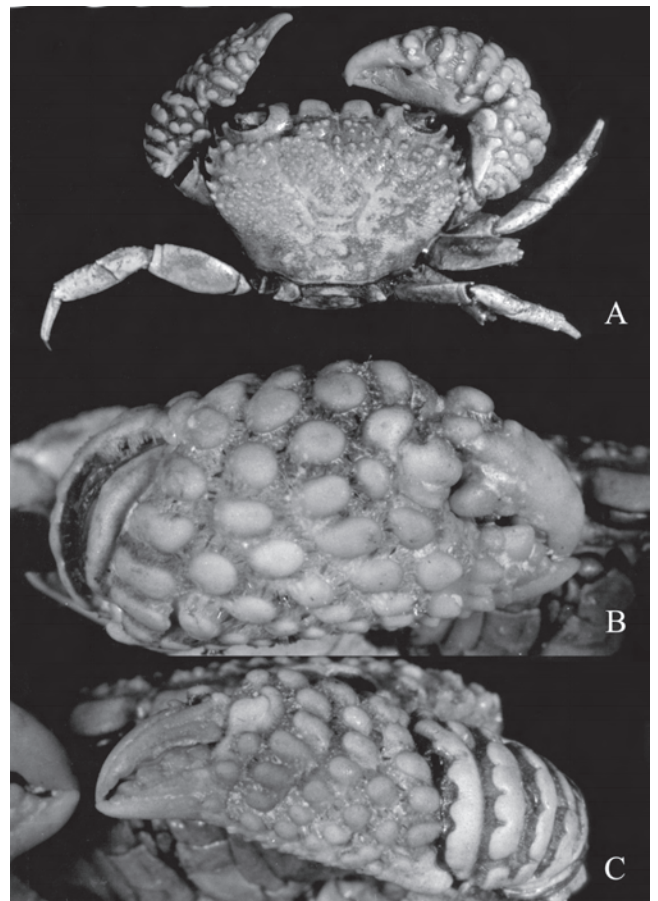


Fig. 5. *Eriphia granulosa* A. Milne-Edwards, 1880, holotype female (dried), 12.0 by 17.0 mm, MNHN 2447S. A, dorsal view; B, right chela; C, left chela.

mm), 4 ovigerous females (9.2–6.0 × 13.8–9.0 mm), 2 damaged (USNM 78218), James Islands, Sullivan Bay, coll. W. L. Schmitt, 24 Jul. 1938.

Type locality. – Chile(?).

Diagnosis. – Carapace transversely hexagonal, dorsal surfaces relatively flat, tuberculated anteriorly, tubercles arranged individually, decreasing in size medially, slightly pubescent anteriorly. Frontal region distinctively inflated, smooth, pubescence row behind the region. Orbit oval, deep, margin minutely denticulated; external and internal orbital spines present; supraorbital and infraorbital margins each with two longitudinal fissures. Anterolateral margin convex, with four or five acute spines. Surfaces of third maxillipeds smooth. Pterygostomial region minutely tuberculated. Suborbital region inflated. Chelipeds surface tuberculated, slightly pubescent; pubescence present at ventral margin of basis-ischium and merus; meral surfaces smooth; carpus tuberculated, tubercles joined in transverse rows; outer surfaces of chela covered with acute tubercles arranged in longitudinal rows; tubercles may be present on dactylus. Surfaces of ambulatory leg smooth, both anterior and posterior margins pubescent. Anterior male thoracic sternum smooth anteriorly. G1 relatively short stout, long spinules present at inner edge, extending immediately after twisted tip; ending in tapered acute tip.

Remarks. – The type specimen was ostensibly from Chile, although in his original description, A. Milne-Edwards (1880: 340) writes (in French) that the sole specimen he had was part of the collections of the museum and the label indicated it was

from Chile. The way the sentence was written suggests that A. Milne-Edwards had doubts about its locality (D. Guinot, pers. comm.). Rathbun (1930: 551) had put a question mark against the locality in her treatment of this species, and in a separate footnote (Rathbun, 1930: 552), she queried the Chile locality. Garth (1964) also doubted that Chile was the true type locality of this species, believing that *E. granulosa* was actually a Galapagos endemic.

In addition to the prominent deflexed front and two inflated frontal lobes, *E. granulosa* can be separated from *E. gonagra* and *E. squamata* by several other characters. On the basis of the specimens reported and presently examined, *E. granulosa* does not attain a size more than 20 mm in carapace width as compared to the other two species that can reach carapace widths of 70 mm. The tuberculation on *E. granulosa* extends to the posterior of the carapace whereas those on *E. gonagra* and *E. squamata* only reach as far as the anterior half. *Eriphia granulosa* also has a smooth suborbital region while in the other two species, this structure is tuberculated.

Not much variation is seen among the specimens examined, the tuberculation remaining prominent from juvenile to adult except for the increase in size of the tubercles. *Eriphia granulosa* seems to be a small-sized species, the largest male specimen we have is approximately 19.0 mm in carapace width and females attain maturity at about 6.0 mm. As the size increases, the tubercles on the dactylus of the cheliped also become more prominent.

Garth (1964) noted the live colour of *E. granulosa*: the carapace and chela are purplish-brown with apple-green markings on the cardiac region of the carapace; the presence of two longitudinal purple bands on the third maxillipeds and three on the subhepatic region; the setal row on the hepatic region is yellow; the abdominal segments are marked with purplish-brown; and the last three tubercles on the chela are white. He also commented that the species lived under rocks or in *Pocillopora* coral heads.

***Eriphia scabricula* Dana, 1852**
(Figs. 8, 12A–C)

Eriphia gonagra Krauss, 1843: 36 (not *Cancer gonagra* Herbst, 1798).

Eriphia scabricula Dana, 1852a: 82; Dana: 1852b: 247, Pl. 14, Fig. 5 a–b; Stimpson, 1858: 37; A. Milne-Edwards, 1873: 256; Hilgendorf, 1879: 198; Richters, 1880: 151; Miers, 1884: 518; Miers, 1886: 162; Ortmann, 1893: 480; Whitelegge, 1897: 137; Alcock, 1898: 216; Borradaile, 1900: 589; Borradaile, 1902: 263; Nobili, 1906: 292; Rathbun, 1907: 57; Stimpson, 1907: 72; Calman, 1909: 48; Stebbing, 1910: 303; Rathbun, 1911: 233; Edmondson, 1923: 19; Sandler, 1923: 39; Urita, 1926: 16; Boone, 1934: 156, Pl. 80; Sakai, 1934: 311; Balss, 1935: 66; Miyake, 1936: 509; Miyake, 1939: 217; Sakai, 1939: 523, Pl. 94, Fig. 3; Barnard, 1950: 275; Tweedie, 1950: 125; Holthuis, 1953: 20; Forest & Guinot, 1962: 68; Chang, 1963: 5; Michel, 1964: 26; Derijard, 1966: 169; McNeill, 1968: 66; Serène, 1968: 83; Stoddart & Taylor, 1971: 99; Lundoer, 1974: 7; Sakai, 1976: 478, Pl. 172, Fig. 2; Takeda & Nunomura, 1976: 76; Hwang & Yu, 1980: 153, Pl. 8(1); Miyake, 1983: 131, Pl. 44 Fig. 4;

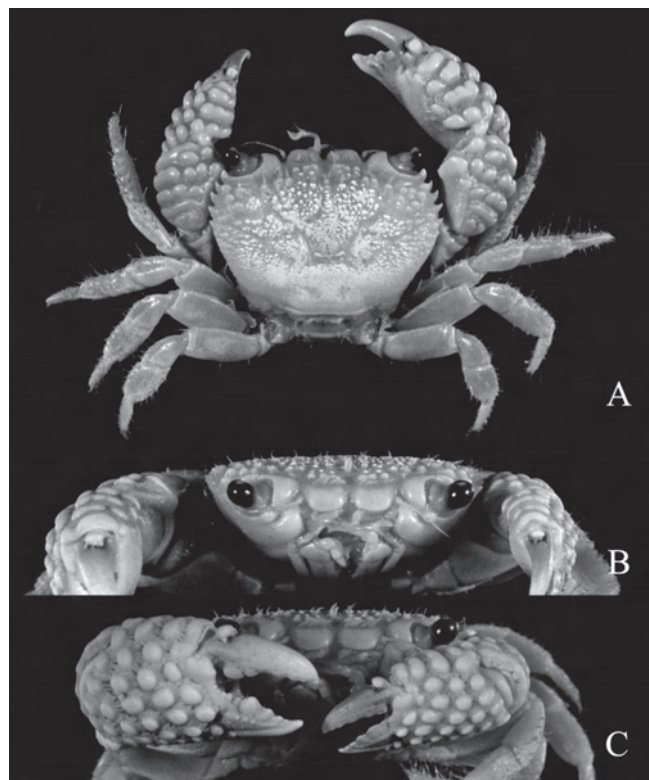


Fig. 6. *Eriphia granulosa* A. Milne-Edwards, 1880, male, 10.0 × 14.9 mm, USNM 78218: A, dorsal view; B, frontal view; C, chelipeds.

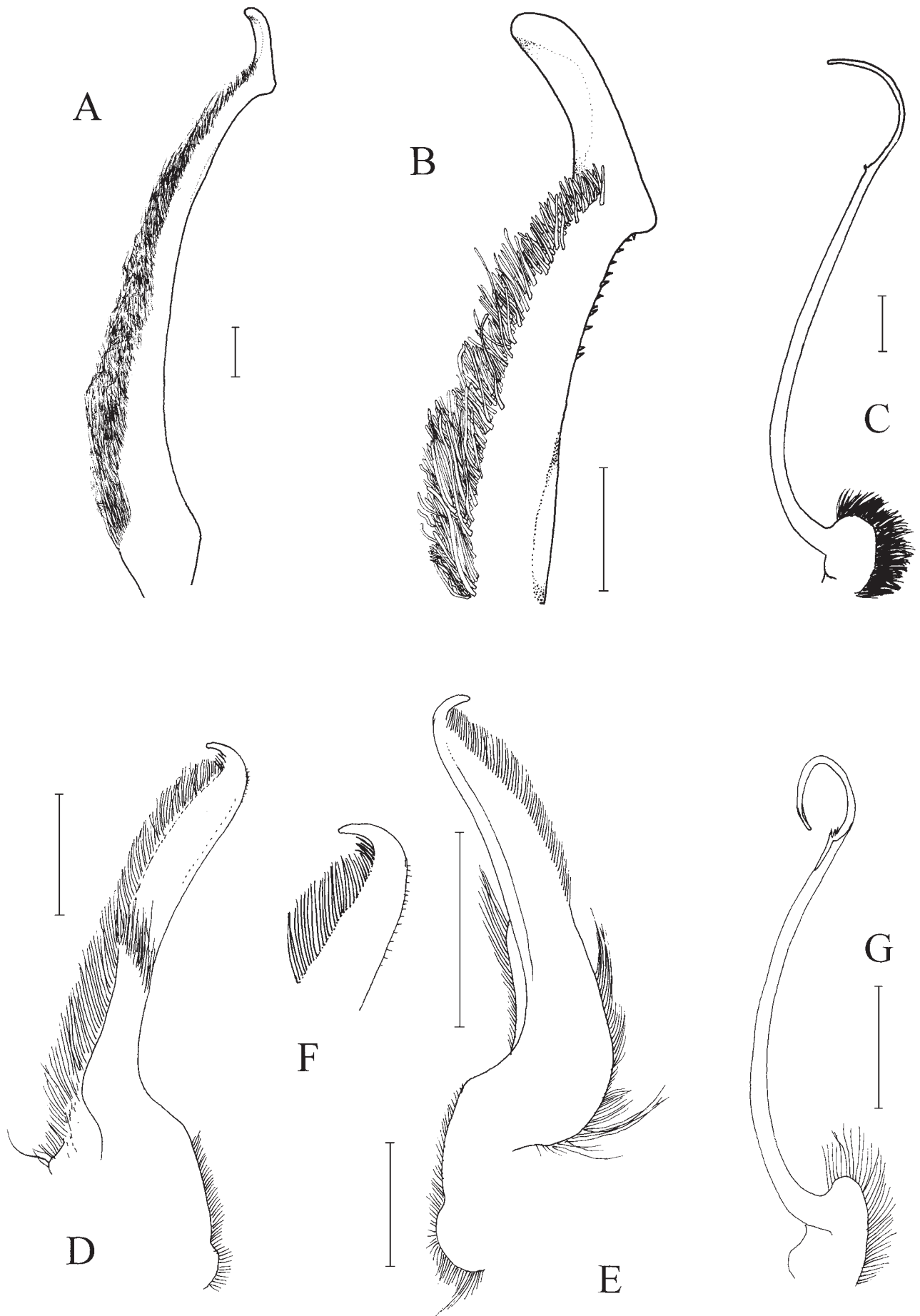


Fig. 7. Gonopods: A–C, *Eriphia squamata* Stimpson, 1859, male, 29.9 × 40.9 mm, USNM 17787; D–G, *E. granulosa* A. Milne-Edwards, 1880, male, 10.0 × 14.9 mm, USNM 78218. A, D, F, G1s; B, E, distal part of G1s; C, G, G2s. Scale bars = 1.0 mm.

Crosnier, in Serène, 1984: 311, Figs 232–233, Pl. 47A – Guinot, 1985: 450; Dai et al., 1986: 333, Pl. 48(1), Fig. 174(2); Garth et al., 1987: 257; Dai & Yang, 1991: 357, Pl. 48(1), Fig. 174(2); Takeda et al., 1994: 287; Yu et al., 1996: 54, Fig. 54; Ng et al., 2001: 23; Davie, 2002: 174; Ng et al., 2008: 63.

Eriphia scabricula garciaensis Ward, 1942: 99, Pl. 6, Fig. 4; Serène, 1968: 83; Stoddart & Taylor, 1971: 99.

Eriphia pilumnoides Ward, 1941: 13, Fig. 25, 26; Serène, 1968: 83.

Material examined. – **NATAL:** 2 males (16.1 × 23.2 mm, 14.5 × 20.0 mm), 2 females (15.1 × 23.0 mm, 14.9 × 22.2 mm) (SAM-A 12155), Boteler Point, intertidal pools, coll. Jan.1965. **COCOS-KEELING ISLANDS:** 6 males (16.3–6.2 × 23.9–9.8 mm), 2 females (13.4 × 20.6 mm, 8.7 × 12.7 mm), 1 ovigerous female (10.9 × 16.0 mm) (ZRC 1965.11.17.41–49), coll. C. A. Gibson-Hill, 1941. **CHRISTMAS ISLAND (Indian Ocean):** 8 males (12.3–5.3 × 18.9–8.0 mm), 5 females (8.4–6.1 × 13.3–9.1 mm), 1 ovigerous female (8.3 × 12.7 mm) (ZRC 1965.11.17.50–59), coll. C. A. Gibson-Hill, 1940; 1 male (14.2 × 20.7 mm) (WAM 2262-86), Flying Fish Cove, coll. Powell, Jul.1961. **PHILIPPINES:** 1 male (11.4 × 17.4 mm) (AMNH 8301) (holotype of *Eriphia pilumnoides* Ward, 1941), Gulf of Davao, Padoda Beach, coll. G. R. Oesch, 6–19 Jul.1936. **TAIWAN:** 1 male (22.4 × 15.3 mm), 1 female (11.5 × 17.9 mm) (ZRC 1995.617), Kaoshiung, coll. C. C. Lin, 27 Nov.1987; 2 males (13.3 × 19.6 mm, 12.8 × 19.4 mm), 2 females (12.7 × 19.1 mm, 10.1 × 15.2 mm), 1 ovigerous female (14.0 × 21.1 mm) (ZRC 1988.426), Pingtung County, Hengchun peninsula, Hsiang Chiao Wan, coll. H. C. Liu, 19 May 1998; 1 male (17.3 × 24.9 mm), 1 female (16.9 × 24.8 mm) (ZRC 1998.450), Pingtung

County, Hengchun Peninsula, Hsiang Chiao Wan, coll. H. C. Liu, 19 May 1998. **AUSTRALIA:** 1 male (12.9 × 18.7 mm) (AM-P 9099), Pleasant Islands, coll. Power & Stephens; 1 female (11.3 × 17.5 mm) (AM-G 3203), Santa Cruz Group, Vanikoro Islands, 11°42'S 166°50'E, coll. E. Troughton & A. A. Livingstone, 1926; 1 ovigerous female (16.1 × 23.9 mm) (AM-P 3723), Queensland, Hope Islands, coll. A. R. McCulloch, 1905; 1 juvenile (4.7 × 6.5 mm) (AM-P 17047), Queensland Herald Group, North East Cay, 170°20'S 148°28'E, coll. D. F. McMichael & J. C. Yaldwyn, 9 Nov.1964; 2 females (14.2 × 21.0 mm, 8.1 × 12.3 mm) (WAM 667–85), north Western Australia, Scott reef, northwestern sandy islet, station 2, coll. P. Berry, 9 Sep.1984; 1 male (10.5 × 15.2 mm) (WAM 695–85), north Western Australia, Scott reef, reef flat, coll. P. Berry, 15 Sep.1984; 2 females (11.2 × 16.3 mm, 7.0 × 10.0 mm) (WAM 1396–86), northwestern station 15, near wreck of the 'Mildura', large intertidal rock platform, coll. WAM Group, 16 Feb.1986; 1 male (16.1 × 24.0 mm) (WAM 1399–86), northwestern Station 15, near wreck of the 'Mildura', large intertidal rock platform, coll. WAM Group, 16 Feb.1986; 1 male (15.7 × 22.9 mm) (WAM 2263–86), entrance to Anamo Bay, station NH 11, Hawl 1, 11–15 fms, coll. Marquesas Expedition, 1909/1967; 1 male (15.7 × 22.5 mm, damaged), 4 females (13.0–11.0 × 19.6–16.0 mm), 3 ovigerous females (13.8–11.7 × 19.8–17.4 mm), 1 juvenile (6.6 × 9.7 mm) (WAM 2265–86), western Ningaloo homestead, Point Cloates, coll. Ningaloo Expedition, 4 Oct.1968; 2 males (17.8 × 25.6 mm, 14.6 × 20.4 mm), 4 females (14.9–11.5 × 22.7–17.1 mm) (WAM 2266–86), north Ningaloo Islands, Carbaddaman, 22°28'S 113°44'E, coll. Ningaloo Expedition, 23 Aug.1968; 1 male (6.7 × 9.7 mm) (WAM 2267–86), Western Australia, Point Quobba, coll. Oct.1959; 1 male (11.0 × 16.4 mm) (WAM 687–85), north Western Australia, Scott reef, sandy islet, coll. P. Berry, 15 Sep.1984; 1 male (17.1 × 24.8 mm) (WAM 764–85), north Western Australia, Scott reef, reef flat, coll. P. Berry, 15 Sep.1984; 1 male (8.7 × 22.4 mm) (WAM 2264–86), Rowley Shoals, western part of Mermaid Reef, reef flat, coll. Rowley Shoal Expedition, 26 Jul.1982; 1 ovigerous female (20.1 × 29.4 mm) (WAM 2268–86), Western Australia, Barrow Islands, intertidal coral reef, coll. 12 Aug.1986; 1 male (20.0 × 29.0 mm) (WAM 21419), Bluebell Islands, northern barrier reef, Montebella's Station 4b, 20°23'21'S 115°30'00'E, 0–1 m, coll. L. Marsh & S. Slack-Smith, 20 Aug.1993; 1 juvenile (6.4 × 8.8 mm) (WAM 153–94), Western Australia, Montebello, outside reef, flat rocky bottom with sandy hollows, 20°20'52'S 115°29'22'E, coll. P. Berry et al., 13 Aug.1993. **ENIWETOK:** 2 males (BPBM 10507), seaward reef, coll. E. Guinther, 15 Sep.1970; 1 ovigerous female (BPBM 10663), coll. B. Bruce, 1978. **GUAM:** 1 male, 2 females (BPBM), coll. Hornbostel, 1933; 2 males, 2 females (ZRC 2000.689), Pago Bay, outside marine biology station, University of Guam, coll. P. K. L. Ng & C. H. Wang, 15–18 Apr.2000. **PALMYRA ISLANDS:** 1 male (BPBM 860), coll. Thurston, 1922. **JARVIS ISLAND:** 1 male (BPBM 4979), coll. Itasca Expedition, 1935; 1 male, 1 female, 1 juvenile (BPBM 1989), coll. Whip-Poor-Will Expedition, Aug.1924. **HOWLAND ISLAND:** 2 males (BPBM 4160), coll. Itasca Expedition, Mar.1936; 4 males (BPBM 2041), coll. Whip-Poor-Will Expedition, Oct.1924; 2 males (BPBM 4171), coll. Itasca Expedition, 27 Jun.1935; 1 male, 3 females (BPBM), coll. 1935. **BAKER ISLAND:** 1 male (BPBM 4204), coll. Itasca Expedition, 1936. **WAKE ISLAND:** 1 male (BPBM 1428), coll. C. H. Edmondson, 1923. **FANNING ISLAND:** 1 male, 2 females (BPBM 7916), ocean side of reef, opposite Vai Tepu, Line Island, coll. E. Guinther, Jan.1970; 5 males, 5 females (BPBM 807), coll. Ball & C. H. Edmondson, Jul.–Aug.1922; 1 male (BPBM 7917), ocean side of reef, opposite cable station, coll. E. Chave, Jan.1917. **CAROLINE ISLANDS:** 2 females (BPBM 4470), coll. Y. Kondo. **TUVALU:** 1 male (14.3 × 21.0 mm) (AM-G 1379), Pacific Ocean, Funafuti, 08°31'S 179°14'E, coll. Hedley. **FIJI:** 1 dried male (MMUS-C 1332), Ovalau. **SAMOA:** 1 male, 1 female, 1 juvenile (BPBM 4839), 1 male (20.6 × 14.4 mm) (ZRC), coll.

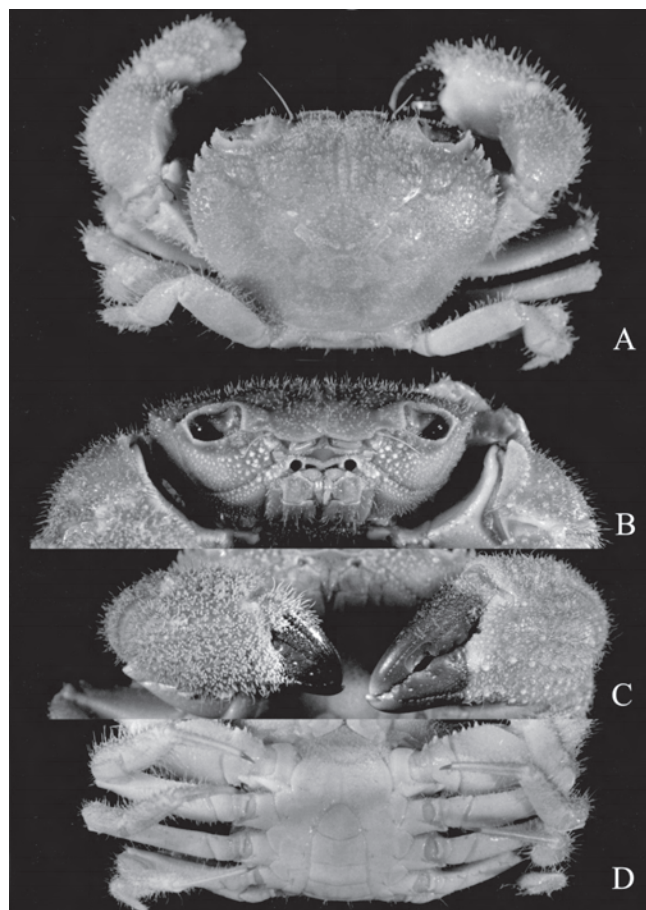


Fig. 8. *Eriphia scabricula* Dana, 1852, male, 20.0 × 29.0 mm, WAM C 21419: A, dorsal view; B, frontal view; C, chelipeds; D, ventral view.

Harris Expedition, 1937–1938. NIUE: 1 female (BPBM 1699), coll. Loeb, 1924. CHRISTMAS ISLAND (Pacific): 1 male (BPBM 1877), coll. Whip-Poor-Will Expedition, 1924.

Type locality. – Fiji Islands.

Diagnosis. – Carapace broader than long, dorsal surface slightly convex, entirely tuberculated, pubescent. Front entire on each side of median notch. Orbit occupying one third of anterior margin, entire margin minutely denticulated; external orbital spine present, usually denticulated forming bifurcated structure; supraorbital margin with two longitudinal fissures, infraorbital margin with one longitudinal fissure. Anterolateral margin convex, with three to five spines. Surface of third maxilliped generally smooth, uniformly pubescent. Pterygostomial region glabrous, smooth. Suborbital region tuberculated, especially near external edges of antennules, endostome and distal part of third maxilliped exopod. Chelipeds tuberculated, pubescent; denticles present on ventral margin of basis-ischium and merus, with one prominent spine on distal part of basis-ischium; carpus with prominent acute spine at distal inner margin, one or two more minute ones below ventral surface; chela pubescent, outer surface densely tuberculated, arranged in numerous rows, may be tuberculated ventrally. Ambulatory leg surface smooth, both anterior and posterior margins with long and short setae. Anterior male thoracic sternum pubescent. G1 relatively short, stout, few spinules present on inner edge, with row of smaller ones extending to basal segment.

Remarks. – *Eriphia scabricula* is a small-sized species, with adults not exceeding 30 mm in carapace width. It is also the only species that has its frontal margin smooth and devoid of denticles. This does raise the question of its relationship with other *Eriphia* species which easily can reach a size of 70 mm. Examination of a large series of specimens, however, shows that *E. scabricula* is a valid species of *Eriphia*. Its form actually resembles juveniles of other *Eriphia* species especially Pacific ones like *E. sebana* and *E. smithii*. *Eriphia scabricula* also shares all the diagnostic characters of *Eriphia* species, such as the antennae being inserted at the external edge of the frontal margin; a denticulate anterolateral margin and shape of the third maxillipeds.

There seems to be little variation among the specimens examined, except for the density of the pubescence from juvenile to adult. Juvenile specimens have the entire carapace and chela covered with pubescence that becomes progressively less dense and shorter in adults. The external orbital spine may be denticulated, the denticles arranged in groups of two or three, giving it a multi-spinate appearance. The tuberculation on both chelae varies, with the density of tubercles and pubescence on the major chela much less than those on the minor one. The most distinctive character of the species is perhaps the presence of a spine on the inner ventral margin of the merus of the cheliped. Sometimes, an additional one is present, but this is not common, being present in only a few specimens.

Stebbing (1910) commented that the *Eriphia gonagra* of Krauss (1843) predated *Eriphia scabricula* Dana, 1852. While

this is true, this earlier name unfortunately cannot be used as it is a junior homonym of *Cancer gonagra* Fabricius, 1781, which is now also a species of *Eriphia*. We have examined the type of *Eriphia pilumnoides* Ward, 1941, and we have no doubt that it is a junior synonym of *E. scabricula*. Ward (1942) also described *Eriphia scabricula garciaensis* from Chagos, Diego Garcia, in the Indian Ocean. He felt that the subspecies could be separated by the more intense granulations on the carpus of the cheliped, a shorter and broader telson, a shorter frontal lobe and much longer and thinner fingers of the chela. While we have not examined his specimen, on the basis of his figure and descriptions, as well as the good series of specimens on hand, we believe that all these differences can be easily accounted for by variation.

There are no known existing types of *E. scabricula*, with Dana's specimens all believed to be lost. The species, however, is so distinct, that we feel that a neotype designation is not necessary at the present time.

Distribution. – West Pacific Ocean extending north to Japan southwards to Marshall Islands to Australia, spreading to westwards to Indian Ocean to Mozambique, Africa. It is not known from the Sunda Shelf per se.

***Eriphia sebana* (Shaw & Nodder, 1803)**
(Figs. 9–11, 12D–F, 18A, B, 19B)

Cancer sebana Shaw & Nodder, 1803: 591, Text-Fig.

Gecarcinus anisochelae Latreille, 1818: pl. 269, Fig. 1.

Eriphia laevimana Guérin-Ménéville, 1832: Pl. 3; H. Milne-Edwards, 1834: 427; Dana, 1852b: 249, Pl. 14, Fig. 7a–c; Stimpson, 1858: 37; A. Milne-Edwards, 1862: 5; A. Milne-Edwards, 1868: 71; Heller, 1865: 24; A. Milne-Edwards, 1873: 255; Hilgendorf, 1879: 197; Richter, 1880: 151; Haswell, 1882: 75; Miers, 1884: 517; Miers, 1886: 162; De Man, 1887: 68; Henderson, 1893: 367; Ortmann, 1893: 480; Ortmann, 1894: 54; Zehntner, 1894: 161; Whitelegge, 1897: 137; Alcock, 1898: 214; Nobili, 1899: 260; Borradaile, 1900: 589; Borradaile, 1902: 263; Grant & McCulloch, 1906: 14; Stimpson, 1907: 72; Calman, 1909: 48; Gravely, 1927: 145; Balss, 1935: 140; Miyake, 1936: 508; Sakai, 1936: 169, Pl. 12, Fig. 3; Sakai, 1939: 522, Pl. 94, Fig. 1; Miyake, 1939: 217; Miyake, 1940: 155; Barnard, 1950: 274; Tweedie, 1950: 124; Sakai, 1953: 75; Edmondson, 1962: 289, Fig. 26a; Sankarakutty, 1962: 146; Serène, 1968: 83; Garth, 1971: 188; Stoddart & Taylor, 1971: 99; Lundoer, 1974: 7; Choy, 1991: 128.

Eriphia fordii MacLeay, 1838: 60; Ng & Ah Yong, 2001: 90, Fig. 3B.

Eriphia trapeziformis Hess, 1865: 135, Table 6, Fig. 4.

Eriphia sebana – Rathbun, 1906: 865; Rathbun, 1907: 57; Rathbun, 1911: 233; Edmondson, 1923: 19; Sandler, 1923: 39; McNeill, 1926: 309; McNeill & Ward, 1930: 381, Pl. 54, Fig. 1–2; Boone, 1934: 159, Pl. 81–84; Ward, 1937: 212, 214; Sakai, 1934: 311; Holthuis, 1953: 20; Forest & Guinot, 1962: 68; Holthuis, 1968: 217; Derijard, 1966: 169; McNeill, 1968: 66; Serène, 1966: 6, 10; Serène, 1968: 83; Healy & Yaldwyn, 1970: 94, Pl. 44; Garth, 1971: 188; Takeda & Hayashi, 1973: 73; Sakai, 1976: 478, Pl. 172, Fig. 1; Takeda & Nunomura, 1976: 76; Chen & Lan, 1978: 276; Miyake, 1983: 131, Pl. 44 Fig. 2; Crosnier, in Serène, 1984: 311, Figs. 234–235, Pl. 47B; Wang, 1984: 41; Guinot, 1985: 450; Dai et al., 1986: 331, Pl. 47(7), Fig. 174(1); Garth et al., 1987: 237, 257; Dai & Yang, 1991: 356, Pl. 47(7),

Fig. 174(2); Jones & Morgan, 1991: 177; Choy, 1991: 128; Poupin, 1994: 50, Fig. 46; Wang & Liu, 1996: 58, Fig. Yu et al., 1996: 56, Fig. 55; Lai et al., 1997: 230, Fig. 78; Ng, 1998: 1104, 1108; Ng et al., 2001: 23; Davie, 2002: 174.

Eriphia sebana hawaiiensis Ward, 1939: 11, Fig. 13–14.

Eriphia sebana laevimana – Ward, 1942: 98.

Material examined. – Neotype of *Eriphia sebana* (here designated): male (38.5 × 53.8 mm) (ZRC 1999.1020), Okinawa, Japan, coll. H. C. Liu, 16 Jul.1995. Others: **MAURITIUS**: 1 male (34.6 × 46.9 mm) (MNHN B-2443S) (lectotype of *Eriphia laevimana* Guérin-Méneville, 1832); 1 female (38.8 × 51.6 mm) (MNHN B-2442S) (paralectotype of *Eriphia laevimana* Guérin-Méneville, 1832); 1 dried female (MMUS-C 1251); 1 male (ZMUC), Flad Island, coll. Th. Mortensen Expedition 1929–30, 17 Oct.1929. **PERSIAN GULF**: 3 females (ZMUC), intertidal area, coll. Loppenthin, 22 Mar.1938 & G. Thorson, 20 Apr.1937; 5 females (3 ovigerous) (ZMUC), station 69, Quisman (Tavila), coll. G. Thorson, 18 Apr.1937. **KENYA**: 1 male (ZMUC), Flad Island, coll. Th. Mortensen Expedition 1929–30, 17 Oct.1929; 1 male (ZMUC), mangrove, Gazi, 50 km south of Mombassa, coll. T. Wolff, 24 Jun.1970. **SOUTH AFRICA**: 1 female (39.2 × 52.3 mm) (MMUS-C 2927), Cape of Good Hope, coll. Dr. A. Smith (holotype of *Eriphia fordii* MacLeay, 1838). **MOZAMBIQUE**: 1 male (19.2 × 26.6 mm) (SAM-A 43361), Vilanculos, coll. B. F. Kensley, 21 May 1973. **SEYCHELLES**: 1 female (46.8 × 63.3 mm) (SMNH 14385), Long Islands, coll. H. Sundberg, 2 Apr.1935; 1 female (33.8 × 46.7 mm) (SMNH 14369), Frigate Islands, coll. H. Sundberg, 11 Apr.1935. **NICOBAR ISLANDS**: 1 female (ZMUC), station no. 224, Nancowry Island, coll. Galathea Expedition 1950–52, 6 May 1951; 7 females (largest 72.9 × 57.9 mm, 2 ovigerous) (ZMUC), coll. Galathea Expedition, 1846. **COCOS-KEELING ISLANDS**: 2 males (40.9 × 56.4 mm, 18.6 × 25.9 mm) (WAM 737-89(2)), Horsburgh Islands, intertidal, coll. F. Wells, 9 Feb.1989; 1 male

(41.0–30.5 × 55.0–41.1 mm) (ZRC 1965.11.17.91–93), coll. C. A. Gibson-Hill, 1941. **CHRISTMAS ISLAND (Indian Ocean)**: 1 male (24.4 × 31.1 mm), 3 females (29.9–16.3 × 41.5–23.0 mm) (WAM 1293-85), Flying Fish Cove, on reef, under rocks, coll. E. Car, 26 Jun.1961; 1 female (47.0 × 63.3 mm), 1 ovigerous female (37.8 × 51.4 mm) (WAM 1802-85), coll. E. Car, Jul.1961; 2 females (16.0 × 21.9 mm, 11.2 × 15.7 mm), 1 juvenile (6.6 × 9.4 mm) (WAM 17675), Flying Fish Cove, under stones, coll. R. W. George & V. Russel, 13 Feb.1978; 1 male (10.5 × 15.3 mm) (WAM 1752-85), Australia, Flying Fish Cove, under rocks, coll. E. Car, 13 Jun.1961; 1 female (49.6 × 65.9 mm) (WAM 2250-86), Ethel Beach, coll. Powell, 5 May 1961; 1 male (38.8 × 52.8 mm) (WAM 2251-86), Ethel Beach, coll. Powell, 21 Jul.1961; 1 female (35.7 × 48.8 mm) (WAM 2258-86), coll. Powell, Sep.1961; 1 juvenile (9.3 × 13.1 mm) (WAM 642-88), coll. H. Yorkston, Aug.1968; 1 juvenile (10.3 × 14.6 mm) (WAM), Flying Fish Cove, on reef, under rocks, coll. E. Car, 28 Jun.1961; 4 males (41.2–17.0 × 56.5–23.8 mm), 5 females (38.5–22.9 × 52.0–32.2 mm), 1 ovigerous female (34.7 × 47.1 mm) (ZRC 1965.11.17.80–89), coll. C. A. Gibson-Hill, Aug.–Sep.1932. **THAILAND**: 2 males (37.5–38.2 × 53.2–52.3 mm), 2 females (41.6 × 56.7 mm, damaged) (ZRC 1999.1023), Phuket, coll. P. K. L. Ng, Dec.1998; 1 female (31.2 × 45.0 mm) (ZRC 1999.1024), Phuket, coll. P. K. L. Ng, Apr.1999; 1 female (35.8 × 48.1 mm) (ZRC 1999.1039), Thailand, Phuket Province, Liam Phan Wa, coll. Sisukri, 21 Apr.1977; 1 male, 1 female (ZMUC), coll. S. Lundoer, 16 Dec.1971; 1 female (ZMUC), station 1134, northeast Koh Lon island, coll. 5th Thai-Danish Expedition, 24 Feb.1966. **MALAYSIA**: 1 male (31.0 × 43.1 mm) (ZRC 1996.1929), Talang Besar reef, coll. J. R. Henderson & D. S. Johnson, 16 Feb.1963; 1 female (37.8 × 53.7 mm) (ZRC 1987.36),

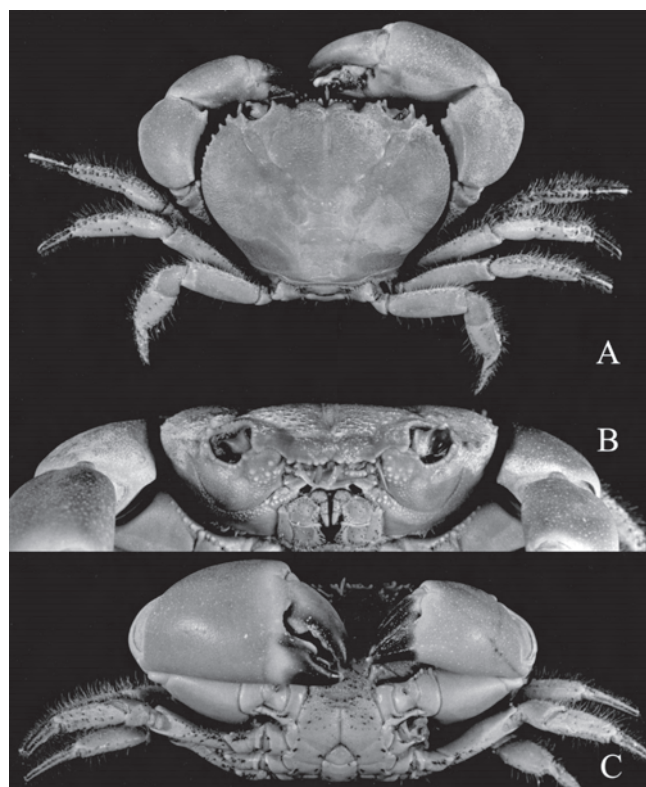


Fig. 9. *Eriphia sebana* (Shaw & Nodder, 1803), neotype male, 38.5 × 53.8 mm, ZRC 1999.1020: A, dorsal view; B, frontal view; C, chelipeds.

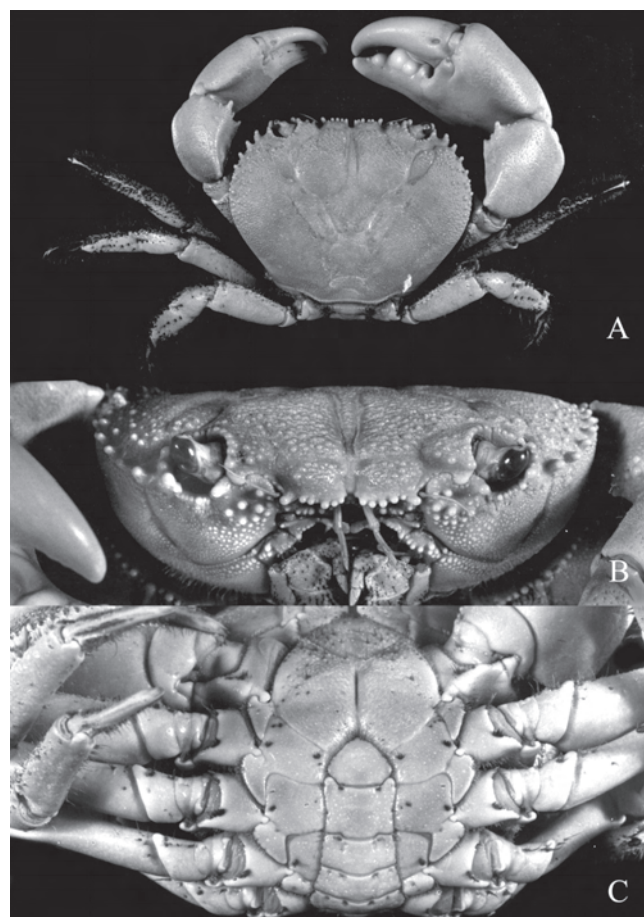


Fig. 10. *Eriphia sebana* (Shaw & Nodder, 1803), male, 48.3 × 67.1 mm, AMNH 7615, holotype of *Eriphia sebana hawaiiensis* Ward, 1939. A, dorsal view; B, frontal view; C, ventral view.

Kota Kinabalu Fish Market, Sabah, coll. Lee Nyanti, 5 Nov.1986; 1 female (35.2 × 51.0 mm) (ZRC 1987.850), Kota Kinabalu Fish Market, Sabah, coll. Lee Nyanti, 5 Nov 1986; 1 male (34.0 × 46.4 mm) (ZRC 1965.11.17.90), Aor Island, coll. M. W. F. Tweedie, Jun.1938; 1 female (37.8 × 52.7 mm) (ZRC 1965.11.17.38), no precise data. **SOUTH CHINA SEA:** 1 female (46.8 × 62.5 mm) (ZRC 1985.1164), waters off Singapore, coll. D. S. Johnson. **PHILIPPINES:** 1 male (29.5 × 40.4 mm), 1 female (29.1 × 39.7 mm) (WAM 2254-6), Sulu Sea, Palawan, Balabac Islands, Claredon Bay, coll. B. R. Wilson on "Pele", 10 Mar.1964; 1 male (24.3 × 34.4 mm), 1 female (31.3 × 43.5 mm) (WAM 2255-86), Quyan Province, Balongey District, near Panukalon, among or near mangroves, under stones, coll. B. R. Wilson, 30 Jul.1965. **CHINA:** 1 male (44.0 × 60.7 mm), 1 female (38.1 × 52.4 mm) (ZRC 1999.1022), Xisha Islands, coll. 7 Mar.1975. **TAIWAN:** 1 female (26.6 × 37.4 mm) (ZRC 1998.385), Pingtung County, Hengchun peninsula, Hsiang Chiao Wan, coll. H. C. Liu, 19 May 1998; 1 female (33.3 × 45.8 mm) (ZRC 1998.387), Pingtung County, Hengchun Peninsula, Hsiang Chiao Wan, coll. H. C. Liu, 19 May 1998; 2 males (31.2–28.9 × 43.2–38.9 mm) (ZRC 1998.501), Pingtung County, Hengchun, Chuan Fan Shr, coll. P. K. L. Ng et al., 31 May 1998; 2 females (30.4–30.2 × 43.0–42.3 mm) (ZRC 1999.1025), Pingtung County, Kenting, coll. 11 Jun.1998; 1 female (34.9 × 48.5 mm) (ZRC 1999.1026), Pingtung County, Kenting, Chuan Fan Shr, coll. H. C. Liu, 15–17 Nov.1995; 1 female (34.2 × 48.0 mm) (ZRC 1999.1027), Taitung, Tu Lan Wan, coll. H. C. Liu et al., 16 Dec.1995. **JAPAN:** 1 male (30.2 × 42.7 mm) (ZRC 1999.1021), Okinawa, coll. H. C. Liu, 16 Jul.1995. **AUSTRALIA:** 1 male (42.0 × 59.9 mm) (AM-P 15678), north New South Wales, Angourie, 29°29'S 153°22'E, coll. A. A. Cameron, 4 Feb.1967; 1 female (15.5 × 21.0 mm) (AM-P 7258), New South Wales, New Castle, coll. M. Ward; 1 female (47.3 × 65.4 mm) (AM-P 16924), Queensland, Coral Sea, Diamond Islets, West Cay, 13°11'S 143°43'E, coll. McMichael & J. C. Yaldwyn, 23 Oct.1964; 1 male (40.3 × 54.5 mm) (AM-P 16925), Queensland, Coral Sea, Diamond Islets, West Cay, 13°11'S 143°43'E, coll. McMichael & J. C. Yaldwyn, Oct.1964; 1 male (9.2 × 12.9 mm) (QM-W 22535), northeastern Queensland, Coral Sea, Coringa-Herald Nature Reserve, northeastern Herald Coy, 16.56'S 149.11'E, 4m, coll. P. Davie, 18 Jun.1997; 1 male (28.9 × 40.4 mm) (WAM 2256-86),

Queensland, Raine Islands, coll. G. F. Mees, 8 Oct.1961; 2 dried males, 2 dried females (MMUS-C 1255–1258), Bramble Cay; 1 dried male, 2 dried females (MMUS-C 1262–1264), Bramble Cay; 1 male (32.2 × 43.9 mm) (WAM 2257-86), Heron Islands, reef flat beach edge, under rocks, coll. R. W. George, 21 May 1961; 1 female (47.6 × 65.8 mm) (WAM 43-58), Lowendahl Islands, near Montebello, coll. R. W. George, 21 Sep.1958; 1 female (49.4 × 67.1 mm) (WAM 45-58), Double Islands, Barrow Islands, coll. R. W. George, 19 Sep.1958; 2 females (41.6 × 55.5 mm, 30.9 × 42.0 mm) (WAM 52-58), southeastern Islands of Montebello groups, coll. R. W. George, 8 Sep.1957; 1 male (42.7 × 57.3 mm) (WAM 290-74), northern Western Australia, Kendrew Islands, Darpier, coll. Crown of Thorns Survey, May 1972; 1 female (45.9 × 61.2 mm), 1 ovigerous female (42.9 × 58.2 mm) (WAM 359-74), near Cape Dupy, northern end of Burrow Islands, coll. L. S. Hammond, 29 Sep.1974; 1 male (34.4 × 46.9 mm) (WAM 1103-85), Heron Island, reef at evening, coll. R. W. George, 10 May 1961; 1 female (33.4 × 44.5 mm) (WAM 1104-85), Northwestern Cape, northwestern Yardie CK homestead, beach, coll. P. Cawthorn, 15 Aug.1962; 2 females (47.7 × 64.2 mm, 44.5 × 60.3 mm) (WAM 2249-86), western Ningaloo homestead point, reef crest, under stones, coll. Ningaloo Expedition, 4 Sep.1968; 1 female (46.1 × 41.7 mm) (WAM 2253-86), northern Western Australia, Ningaloo Station, north Norwegian Bay, coll. Ningaloo Expedition, 22 Aug.1968; 1 male (32.2 × 43.9 mm) (WAM 2257-86), Heron Island, reef flat beach edge under rocks, coll. R. W. George, 21 May 1961; 1 female (20.4 × 38.6 mm) (WAM 2259-86), Western Islands, Anchor Islands, Mary Ann Passage, coll. R. J. Harrison, 16 Jul.1963; 2 females (42.4 × 58.1 mm, 31.7 × 44.0 mm) (WAM 2261-86), between Cape Dupy and Cape Malouet, rocky shore platform, pools and brown algae covered stones, 20°40'to 42'S, 115°25'E, coll. WAM-USNM Barrow Islands, WA Expedition 1966, 6 Aug.1966; 1 female (46.0 × 62.2 mm) (WAM 24069), Ethel Beach, coll. P. B., Nov.1987; 2 females (54.5 × 76.3 mm, 45.0 × 62.4 mm) (WAM 243-93), Western Australia, Montebello Islands, 20°23'31'S 115°29'39'E, coll. L. Marsh & C. Bryce, 21 Aug.1993; 1 female (55.9 × 73.8 mm) (WAM 244-93), Western Australia, Montebello Islands, coll. W. A. M. MB Expedition, Aug.1993; 1 male (34.0 × 46.5 mm) (WAM uncat.), Western Australia, northwestern Montebello Islands, coll. F. E. Wells, 19 Aug.1986. **PAPUA NEW GUINEA:** 1 female (37.3 × 51.1 mm) (ZRC 1995.406), Laing Islands, coll. D. Vandenspiegel, 8 Mar.1992. **GILBERT ISLANDS:** 1 ovigerous female (42.0 × 56.8 mm) (AM-P 19988), Teirio Islands, Abaiang Atoll, coll. B. Goldman. **SAMOA:** 1 male (BPBM 4846), coll. Harris Expedition, no other data; 1 male (BPBM 10661), Aunu'u Island, 14°17'S 170°33'W, leeward side, coll. D. M. Devaney, 26 Mar.1971; – 1 male (BPBM 1672), no other data; 2 females (ZMUC), from Godeffroy Museum. **FIJI:** 1 female (BPBM 10662), Matuku, Vitu, Uula, coll. Y. Kondo, 1968; 1 male (BPBM 3974), coll. C. H. Edmondson, Feb.1933; 2 females (BPBM 6228), Suva Reef, coll. Ostergaard, 23 Jun.1926; 2 dried males, 2 dried females (MMUS-C 1258–1261). **NEW CALEDONIA:** 1 dried female (MMUS-C 1263); 1 male, 2 females (ZMUC), small island 12 km east of Mbau Island, reef at low tide, southeast Viti Levu, coll. T. Wolff, 4 May 1965; 1 male (ZMUC), 0–0.5 m, Suva Harbour, coll. 2 May 1934. **MARIANAS:** 1 female (BPBM 2881), coll. Hornbostel, 1923. **GUAM:** 7 males, 2 females (ZRC 2000.690), Pago Bay, outside marine laboratory, University of Guam, coll. P. K. L. Ng & C. H. Wang, 15–18 Apr.2000. **MARSHALL ISLANDS:** 1 female (BPBM 10504), Arno Atoll, no other data; 2 males (ZMUC), coll. Captain Hart; 1 male (ZMUC). **ENIWETOK:** 1 male, 1 female (BPBM 10506), ocean side of reef, coll. E. B. Guinther, 17 Sep.1970; 1 female (BPBM 10508), Runit Island, ear reef, coll. Stokes, 14 Jun.1965. **PALMYRA ISLANDS:** 1 female (BPBM 858), coll. C. M. Cooke, 1913; 1 male (BPBM 859), coll. L. L. Thurston, 1922. **TONGA:** 1 male (BPBM 2991), Tongatabu, reef off Nukulota, coll. Ostergaard, Jul.–Aug.1926; 1 female (BPBM

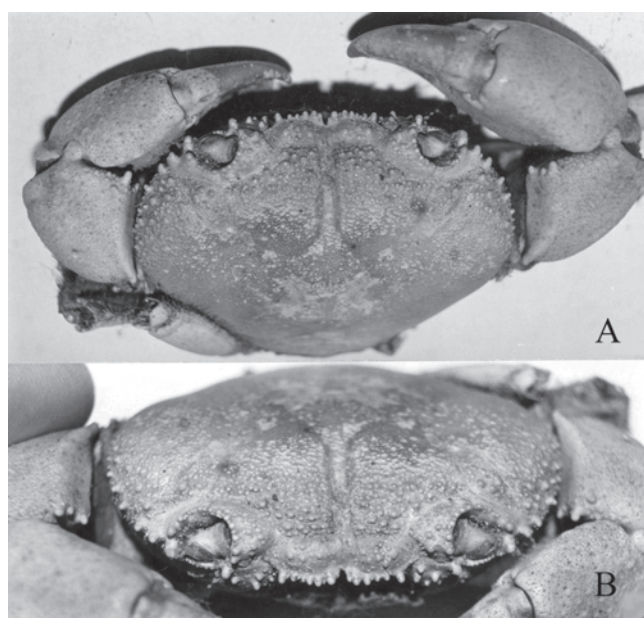


Fig. 11. *Eriphia sebana* (Shaw & Nodder, 1803), female, 36.2 × 52.3 mm, MMUS-C 2927, holotype of *Eriphia fordii* MacLeay, 1838. A, dorsal view; B, frontal view.

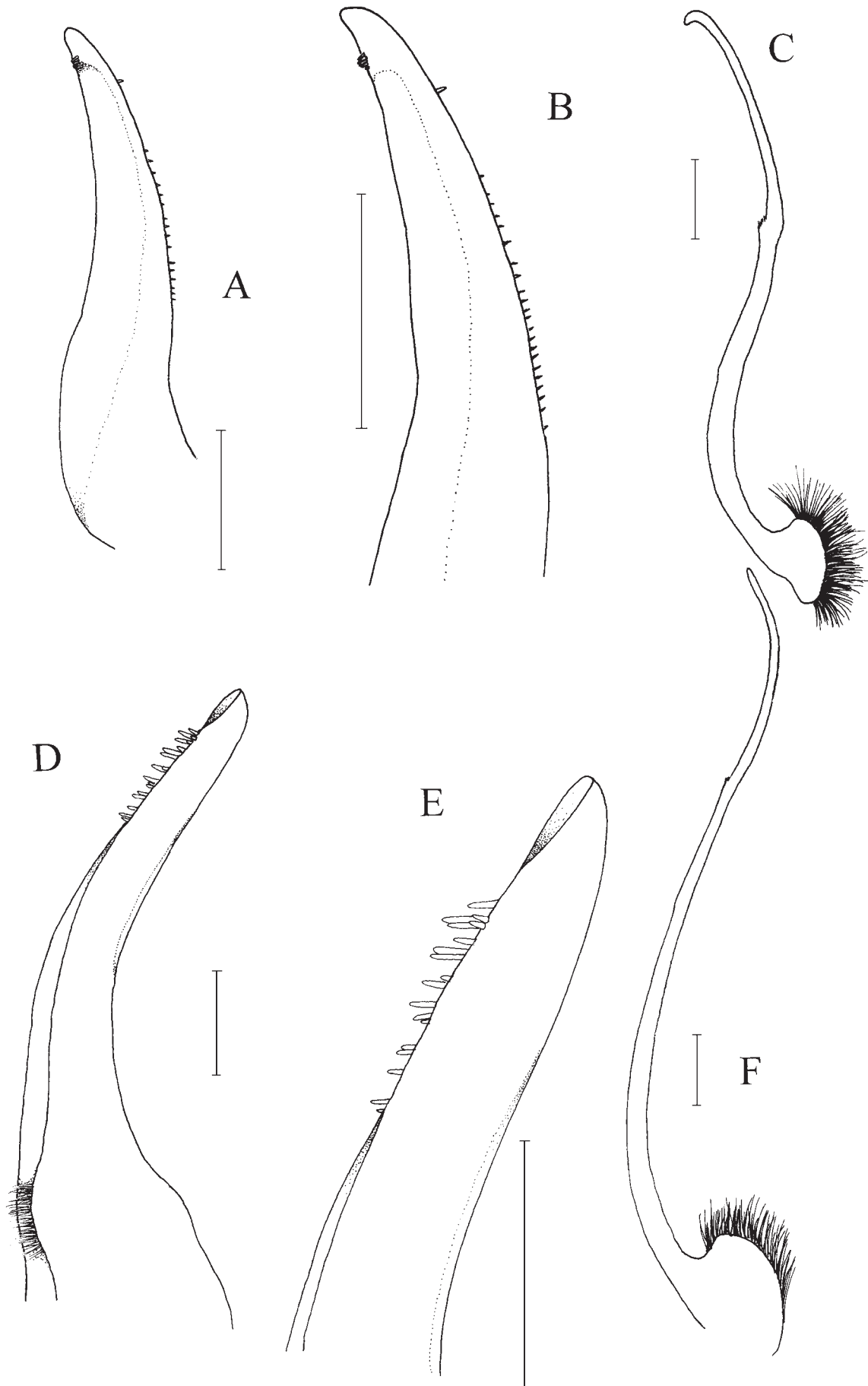


Fig. 12. *Eriphia scabricula* Dana, 1852, male, 16.1 × 23.2 mm, SAM-A 12155: A–C; *Eriphia sebana* (Shaw & Nodder, 1803), male, 42.0 × 59.9 mm, AM-P 15678. A, D, G1s; B, E, distal part of G1s; C, F, G2s. Scale bars = 1.0 mm.

10665), coll. T. Dye, 5 Aug. 1976; 1 male (BPBM 10664), coll. T. Dye, 5 Aug. 1976. **JARVIS ISLAND**: 1 female (BPBM 4978), coll. Itasca Expedition, 1935; 2 males (BPBM 4088), coll. Itasca Expedition, 27 Jun. 1935; 1 male (BPBM 4128), coll. Coman Expedition, 1935. **FANNING ISLAND**: 1 female (BPBM 7914), lagoon side at North Pass, coll. E. B. Guinther, 10 Jan. 1970; 2 males, 6 females (BPBM 806), coll. Ball & C. H. Edmondson, Jan.–Aug. 1922. **BAKER ISLAND**: 5 females (BPBM 2096), coll. Whip-Poor-Will Expedition, Oct. 1924. **HOWLAND ISLAND**: 1 male (BPBM 4348), coll. Coman Expedition, Jan. 1936; 1 male (BPBM 4095), coll. Itasca Expedition, 1935; 1 female (BPBM 4141), coll. Coman Expedition, Jan. 1936; 1 male, 1 female (dried) (BPBM 4170), coll. Itasca Expedition, 27 Jun. 1935. **WASHINGTON ISLAND**: 2 males (BPBM 1951), coll. Whip-Poor-Will Expedition, Aug. 1924. **HAWAII**: 1 male (48.3 × 67.1 mm) (AMNH 7615), Honolulu, Honolulu Market, coll. Second Templeton Crocker Expedition, Nov. 1936 (holotype of *Eriphia sebana hawaiiensis*); 1 male, 2 females (BPBM 5054), coll. Whip-Poor-Will Expedition, 1924; 3 males, 3 females (BPBM 2040), coll. Whip-Poor-Will Expedition, Oct. 1934. **PHOENIX ISLAND**: 1 female (BPBM 10660), Gardner Atoll, coll. D. R. Stoddart, Mar. 1975. **CHRISTMAS ISLAND (Pacific)**: 1 female (BPBM 10505), coll. P. Helfrich; 1 female (BPBM 2953), coll. Whip-Poor-Will Expedition, Aug. 1924; 2 males, 2 females (BPBM 2122), coll. J. C. London, Kamiloa Expedition, 14 Dec. 1924; 3 males, 3 females (BPBM 1871), coll. Whip-Poor-Will Expedition, Aug. 1924. **TUAMOTU**: 1 male (BPBM 8532), Rangivoo, coll. A. Fielding, 7 Oct 1975. **NO DATA**: 1 dried female (MMUS-C 1252); 1 male (ZMUC), “Oest Indien”.

Type locality. – Japan (based on neotype).

Diagnosis. – Carapace hexagonal; dorsal surface tuberculated anteriorly, tubercles scale-like, low; rest of surface minutely granulated. Gastric region with low tubercles covering half of protogastric and anterior hepatic region. Front with five or six denticles on each side of median notch, external frontal spine most prominent, other spines decreasing in size from median notch. Orbit denticulated; two external and an internal orbital spines present; supraorbital and infraorbital margins each with two longitudinal fissures. Anterolateral margin convex, with four to six spines, decreasing in size posteriorly, spines acute. Surface of third maxilliped generally smooth, pubescent with setal tufts uniformly distributed. Pterygostomial region not pubescent, relatively smooth. Acute tubercles present on suborbital region. Chelipeds generally smooth, except for occasional tubercles on anterior region of minor chela, major chela generally smooth; carpus with prominent acute spine at distal inner margin and one or two smaller ones on ventral surface where some tubercles may be present; fingers short, stout, usually pigmented white. Surfaces of ambulatory leg smooth, both anterior and posterior margins with long and short dark setae; merus tuberculated anteriorly, with long setae along both margins. Anterior male thoracic sternum pubescent, minutely tuberculated anteriorly. G1 relatively short, subcylindrical, sinuous medially, tapered distally, tip rounded, spinules at one-sixth length of G1 along inner edge, with pubescence above basal segment.

Remarks. – Seba (1759) published a catalogue on his personal specimen collection, and in it, he included a figure of the species, *Eriphia sebana* which he named “Cancer fluviatili, sive gammarus americanus ...”. Since his name is

non-binomial, it is a nomen nudum. Holthuis (pers. comm.) commented that “His [Seba] descriptions were poor, his locality and habitat labels notoriously untrustworthy, only the illustrations made the value of his book ...”. Shaw & Nodder (1803), nevertheless, followed Seba’s (1759) figure and data, and named it “*Cancer Sebanus*” and stated that its type locality was America. However, there have been no reports of such (or any even similar) species from America. We have also been unable to locate any specimens or know of any published record which can even be vaguely attributed to this species from the New World. All the specimens we have examined or know of *E. sebana* have been collected from the Indo-Pacific. Most likely, Seba had given the wrong locality in his catalogue again. In any case, Seba’s specimens are no longer extant.

Guérin-Ménéville (1832) introduced the name *Eriphia laevimana* for this species on a plate published between 1830 and 1832, giving its type locality as Mauritius. Henri Milne Edwards (1834) subsequently listed the species, recognising it as Guérin-Ménéville’s (1832) taxon. Rathbun (1906) synonymized *E. sebana* and *E. laevimana*, but did not give any reasons for doing so. In the Paris Museum are two Guérin-Ménéville specimens, a male (34.6 × 46.9 mm, MNHN B-2443S) and a female (38.8 × 51.6 mm, MNHN B-2442S), both from Mauritius. The specimens were examined and photographed in detail by Oliver Chia at our request – they are clearly conspecific with Seba’s (1759) and Shaw and Nodder’s (1803) taxa. The male specimen (MNHN B-2443S) is here regarded as the lectotype. Latreille (1818) also reproduced Seba’s (1759) figure but inexplicably named it *Gecarcinus anisochelae* instead. As such, it shares the same holotype (Seba’s 1759 specimen) as Shaw and Nodder’s species, *Cancer sebana*, and both names are thus objective synonyms.

Many authors, however, were apparently more familiar with Guérin-Ménéville’s (1832) *E. laevimana* than Shaw & Nodder’s (1803) *E. sebana*. Until Rathbun (1906), all authors referred to this species under the former name. There is some confusion, however, with the supposed authorship for *E. laevimana*. Many believed that *E. laevimana* was a Latreille species (e.g. Haswell, 1882; Calman, 1909; Sakai, 1939; Edmondson, 1962) while some regarded H. Milne Edwards (1834) as the original author (e.g. Miers, 1884). As Seba’s original specimen(s), which is the de facto type of *Cancer sebanus* Shaw & Nodder, 1803, is lost, an ethanol preserved male specimen (ZRC 1999.1020) from Okinawa, Japan, is here designated as the neotype. We believe this is necessary to stabilize the taxonomy of this problematic species, especially since Shaw and Nodder’s name has clear priority, and there has been so much confusion with its taxonomy, identity and validity over the years.

In addition, on examination of the holotype of *Eriphia sebana hawaiiensis* Ward, 1939, we have no doubt that it is only a large male *Eriphia sebana*. From the original descriptions and figures of *Eriphia trapeziformis* by Hess (1865) (type locality Australia), we are also confident that it is also a subjective junior synonym of *E. sebana*. In any case, we have

examined a good number of specimens from many parts of Australia and the Pacific, and all are clearly referable to *E. sebana* as here defined.

Many authors have expressed doubts in trying to separate *E. sebana* and *E. smithii* sensu lato, as the only major difference appeared to be the presence of tubercles on the outer surface of the chela in *E. smithii* which are absent in *E. sebana*. Some have regarded the difference as mere variation and do not recognise the two species (e.g. Miers, 1880; Lanchester, 1900; Sakai, 1936; Edmondson, 1962; Khan, 1977). Examination of a sizeable collection on hand of both species shows that although this character is not always reliable, *E. smithii* is certainly not a subspecies or variety of *E. sebana*, with other characters available to easily separate them.

Compared to *E. smithii* MacLeay, 1838 sensu stricto and the related *E. ferox*, new species, *E. sebana* Shaw & Nodder, 1803, has a prominent external frontal denticle with the rest of the frontal denticles often decreasing in size externally. The tubercles on the carapace are also low, blunt and scale-like, extending only to half of the protogastric region and proximal anterolateral region (see **Diagnosis**). Occasionally, specimens with the minor chela slightly tuberculated proximally are observed, but the tubercles are never acute, remain low and blunt and are almost undiscernible. The fingers of both chelipeds are often white in colour, with those of larger specimens (approximately over 60 mm in carapace width) being occasionally darkly pigmented.

De Man (1887) mentioned that two male young specimens from Owen Islands (Mergui Archipelago, Indian Ocean) were unusual. One (carapace width of 10 mm) had tubercles on both chelae, while another (carapace width of 14 mm) had eroded tubercles. Therefore, he concluded that young specimens of *E. sebana* had tubercles that soon disappeared on maturity. Although we have examined young specimens (e.g. WAM 2260-86, carapace widths 9 to 22 mm) from Christmas Island with completely smooth chelae, there is a young specimen (carapace width 21 mm) from New South Wales, Australia, which has tuberculated chelae. In a collection from Quisma in the Persian Gulf (ZMUC), the outer surface of the larger right chela of one female (40.9 × 52.2 mm) had small rounded granules on the upper proximal one-fifth; but in the larger chela of the other four female specimens in this lot, the chela is completely smooth. Examination of specimens from Phuket (western Thailand) (e.g. ZRC 1999.1023) and Sabah (Malaysia) (e.g. ZRC 1999.1023) showed that De Man's (1887) suggestion might not be valid. Specimens approximately 35 mm in carapace width retain the tuberculation on the minor chela with occasional marks on the major chela which indicate where there were previously tubercles. These marks are often obvious in freshly preserved specimens, even when the surface of the chela feels completely smooth to the touch. However, all share the same characters as mentioned in the present definition of *E. sebana*, with a prominent external frontal spine on each side and the presence of dense setae on the anterior margin of the ambulatory merus.

Examination of the type of *Eriphia fordii* MacLeay, 1838, previously believed to be a junior synonym of *E. smithii* MacLeay, 1838, by Miers (1880), shows that the latter action is unjustified. As noted by Ng & Ah Yong (2001), the two species differ in many ways. *Eriphia fordii* has a prominent external prominent frontal spine on each side and dense pubescence on the ambulatory leg meri anteriorly, with almost smooth chelae except for a few tubercles at the proximal part of the minor chela. *Eriphia fordii* resembles *E. sebana* in all aspects, and the two species are accordingly synonymised (see Ng & Ah Yong, 2001).

Eriphia sebana seems to prefer more oceanic waters such as the Indian Ocean and eastern Pacific Ocean, and has seldom been reported from the less saline waters of the Sunda Shelf.

Natives in many parts of the world catch this species for food, and there are cases of death reported upon consumption (Ward, 1937; Holthuis, 1968; Wang & Liu, 1996; Ng, 1998). Natives of some other places like the Pacific island of Su'uholo, regarded *E. sebana* as a totem, whereby consumption of the crab is forbidden (Ward, 1937).

Distribution. – Indo-Pacific region, north from Japan, China, Taiwan to Pacific Islands such as Hawaii, French Polynesia and Samoa, Australia, to Christmas Island, Cocos-Keeling Islands to India, eastern coasts of Africa.

***Eriphia smithii* MacLeay, 1838, sensu stricto**
(Figs. 13–15, 18C)

Eriphia smithii MacLeay, 1838: 60; A. Milne-Edwards, 1868: 71; Hoffman, 1874: 6, Pl. 1, Fig. 1a–c; Ortmann, 1894: 54; Stebbing, 1910: 303; Barnard, 1950: 274, Fig. 37, f, Fig. 51; Sankarakutty, 1962: 147; Michel, 1964: 26; Crosnier, in Serène, 1984: 311, Figs. 236–237, Pl. 47C; Tirmizi & Ghani, 1996: 24, Fig. 8; Ng & Ah Yong, 2001: 89, Fig. 3C; Ng et al., 2008: 63.

Eriphia laevimana smithii – Hilgendorf, 1879: 197; Alcock, 1898: 216; Nobili, 1906: 291; Balss, 1922: 13; Chhapgar, 1957: 439, Pl. 11; Khan, 1977: 186, Pl. 3D.

Eriphia sebana smithii – Stephenson, 1946: 140, Fig. 34C–D.

Material examined. – Holotype: dried male (43.0 × 56.4 mm) (MMUS-C 2926), Cape of Good Hope, South Africa, coll. Dr. A. Smith. Others: **MOZAMBIQUE**: 2 males (36.1 × 47.4 mm, 33.6 by 42.6 mm) (SAM-A 15414), Inhaca Island, coll. 6 Jun. 1971; 1 female (36.8 × 50.2 mm) (SAM-A 15416), Zavora Point, coll. 18 Jun. 1971; 2 females (38.8 × 52.8 mm, 35.9 × 48.0 mm) (SAM-A 43360), Vilanculos, coll. 21 May 1973; 1 male (24.3 × 33.2 mm), 1 female (27.8 × 38.1 mm) (ZRC 2000.10), between Durbo and Marague, coll. M. L. Azzarou, 23 Oct. 1973. **KENYA**: 1 female (43.0 × 33.2 mm) (ZMUC Cru 247-1913), Tangae, Mengoriff, from Munich Museum, coll. Zimmer; 1 male (34.2 × 26.0 mm), 1 female (32.0 × 24.4 mm) (ZMUC), reef flat, Mbudya, Kunovemi, coll. P. Blanner, 5 Aug. 1974.

Type locality. – Cape of Good Hope, South Africa.

Diagnosis. – Carapace hexagonal; dorsal surface tuberculated anteriorly, tubercles low, blunt; minutely granulated posteriorly. Gastric region with scale-like tubercles covering

three-quarters of protogastric region. Tuberculations on hepatic region mostly blunt, except for some near anterolateral margin. Front with five to seven denticles on each side of median notch, arranged randomly. Orbits denticulated entirely, two external spines and an internal orbital spine present; supraorbital and infraorbital margins each with two longitudinal fissures. Anterolateral margin gently convex, with five or six blunt, low spines, decreasing in size posteriorly; first anterolateral teeth may have smaller spine. Posterolateral margin minutely granulated. Surface of third maxilliped granulated, lightly pubescent on ischium. Pterygostomial region granulated. Acute tubercles present on suborbital region. Outer surfaces of chelae tuberculated to varying degrees; major chela with few low tubercles on anterior region; minor chela entirely covered with densely packed acute tubercles; denticles present on ventral margin of basis-ischium and merus; carpus of major chela sparsely tuberculated, densely tuberculated on carpus of minor chela; fingers short, stout, darkly pigmented. Surfaces of ambulatory legs smooth, sparsely pubescent; merus smooth anteriorly, with few short setae proximally. Anterior male thoracic sternum tuberculated, pubescent. G1 relatively short, stout, tubular, spinules present on inner margin.

Remarks. – MacLeay (1838) described *E. smithii* from South Africa. He noted that the dorsal surface of the carapace is tuberculated except posteriorly, the orbit is tuberculated, the frontal margin has five tubercles on each side, the major chela is sparsely tuberculated while the smaller chela is densely so. Subsequently, this species has been reported by many authors (e.g. Dana 1852b; Stimpson, 1858; 1907; Sakai, 1934; Takeda, 1982; Ng, 1998) from the Indo-West Pacific

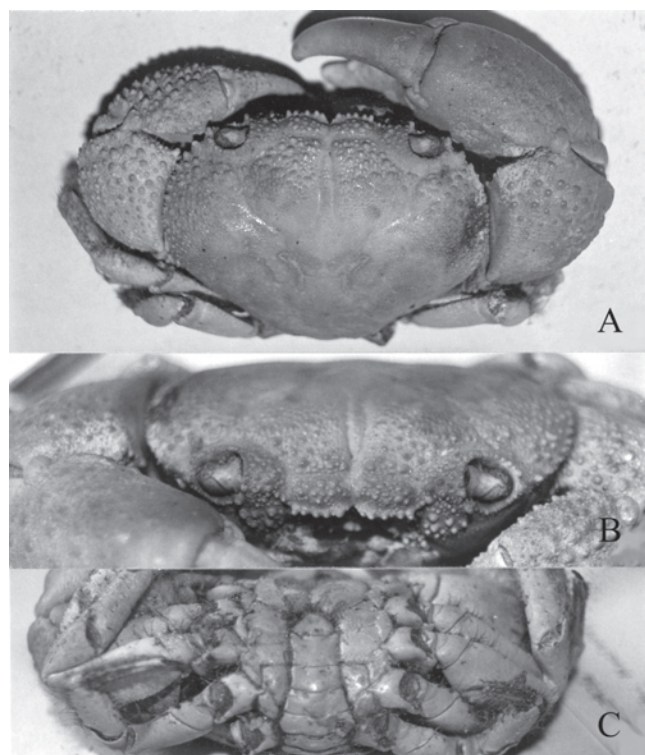


Fig. 13. *Eriphia smithii* MacLeay, 1838, holotype male (dried), 43.0 × 56.4 mm, MMUS-C 2926, holotype male: A, dorsal view; B, frontal view; C, ventral view.

region. Examination of MacLeay's (1838) holotype of *E. smithii* shows that the SAM specimens from the eastern coasts of South Africa agree very well with it in almost all respects. The number of tubercles on the frontal margin, however, varies from five to seven.

However, direct comparisons of the South African specimens with those from the Sunda Shelf and western Pacific showed that there are numerous differences between them. Overall, the tuberculation on the carapace and anterolateral teeth of the South African specimens are lower and blunter compared to those from other areas, which are sharp and acute. The pubescence on the dorsal surfaces of the chelipeds present in the Sundaic and western Pacific specimens has not been observed in any of the South African specimens or mentioned by any previous workers. When the G1s were compared, those from South Africa are relatively stout, straight, tubular, with the outer margin of the basal part having a shelf-like structure (Fig. 15); while those from the Sunda Shelf and west Pacific are relatively more slender, sinuous, slightly tapered distally, with the outer margin of the basal part sloping gradually and without a distinct shelf (Fig. 17). Specimens

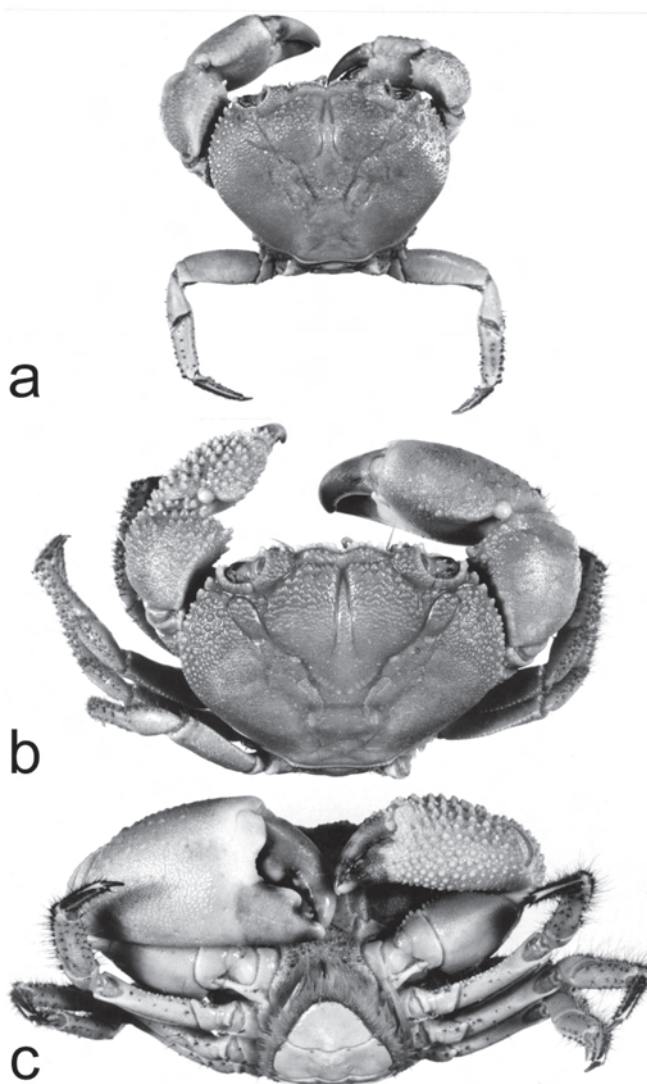


Fig. 14. *Eriphia smithii* MacLeay, 1838, male, 36.1 × 47.4 mm, SAM-A 15414: A. Female, 38.8 × 52.8 mm, SAM-A 43360: B, C. A, B, dorsal views; C, ventral view and chelipeds.

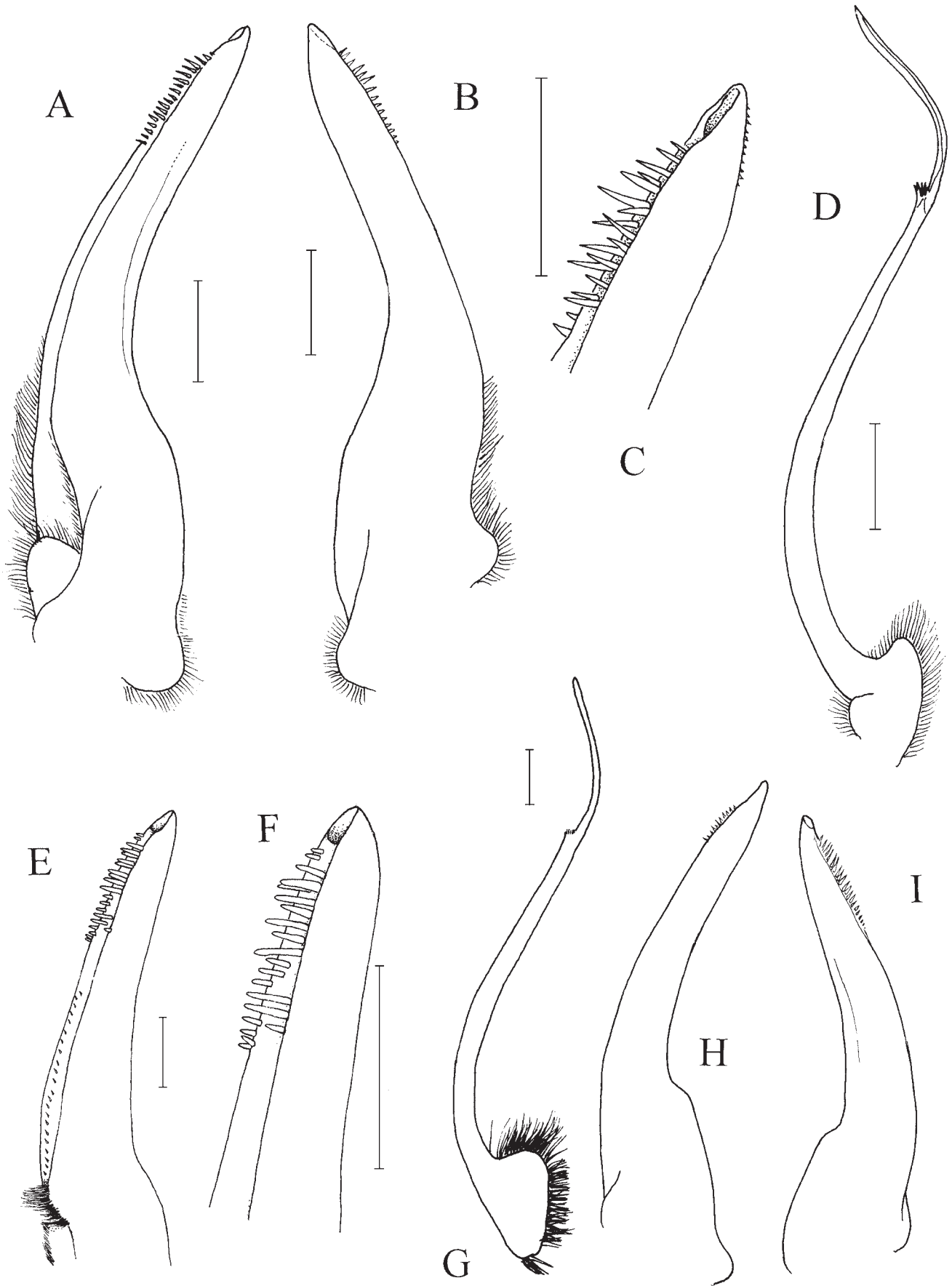


Fig. 15. *Eriphia smithii* MacLeay, 1838, male, 24.3 × 33.2 mm, ZRC 2000.10: A–D; SAM-A 15414, 36.1 × 47.4 mm, male: H, I; ZMUC, 34.2 × 26.0 mm: E–G. A, B, E, H, I, G1s (H, I setae not drawn); C, F, distal part of G1s; D, G, G2s. Scale bars = 1.0 mm.

from the Sunda Shelf and Pacific are here referred to a new species, *E. ferox*.

A study of the literature suggests that only the records of *E. smithii* from east and southern Africa, western India, Gulf of Oman and Persian Gulf are valid (cf. Hoffman, 1874; Stephensen, 1946; Chhapgar, 1957; Crosnier, in Serène, 1984; Tirmizi & Ghani, 1996).

Distribution. – On the basis of the available literature, the species has a western Indian Ocean distribution.

***Eriphia ferox*, new species**
(Figs. 16, 17, 19A)

Eriphia smithii Dana, 1852b: 251; Stimpson, 1858: 37; Stimpson, 1907: 72; A. Milne-Edwards, 1868: 71; Lundoer, 1974: 7; Sakai, 1976: 478, Pl. 172, Fig. 3. – Takeda, 1978: 40; Miyake, 1983: 131, Pl. 44 Fig. 3; Lai et al., 1997: 230, Fig. 7C; Ng, 1998: 1104, 1106; Ng et al., 2001: 23. (not *E. smithii* MacLeay, 1838).

Eriphia laevimana smithii – Miers, 1880: 237; Miers, 1884: 517; Lanchester, 1900: 253; De Man, 1929: 2; Gordon, 1931: 528; Sakai, 1939: 523, Text-Fig. 49, Pl. 94, Fig. 4; Sakai, 1953: 75; Chang, 1963: 5.

Eriphia laevimana smithii – Shen, 1940: 86.

Eriphia smithii – Dai et al., 1986: 332, Pl. 47(8), Fig. 174(3); Dai & Yang, 1991: 356, Pl. 47(8), Fig. 174(3).

Eriphia sebana smithii – Rathbun, 1910a: 359; Urita, 1926: 16; Serène, 1966: 6.

Material examined. – Holotype: male (47.3 × 66.0 mm) (ZRC 1999.1001), rocks off Salu Island, Singapore, coll. 10 Dec.1970. Paratypes: **SINGAPORE**: 1 male (40.2 × 55.6 mm) (ZRC 1965.11.17.39), Pasir Panjang; 1 female (34.5 × 47.4 mm) (ZRC 1965.11.17.40), Pisang Island Lighthouse, coll. 1934; 1 male (24.3 × 34.5 mm) (ZRC 1965.11.17.60), Sultan Shoal, coll. M. W. F. Tweedie, Dec.1933; 1 juvenile (16.9 × 23.4 mm), 3 females (42.7–35.2 × 60.0–49.2 mm), 1 ovigerous female (26.5 × 36.4 mm) (ZRC 1965.11.17.72–76), Pawai Island reef, coll. M. W. F. Tweedie, Nov.1933; 1 male (36.4 × 50.5 mm) (ZRC 1965.11.17.79), Biola Island, near Raffles Lighthouse, coll. 17 Aug.1930; 1 ovigerous female (35.7 × 48.9) (ZRC 1981.8.14.152), no data; 1 male (26.4 × 36.4 mm) (ZRC 1985.11.65), Sudong Island reef flat, coll. A. Serle, 16 Mar.1953; 1 ovigerous female (40.0 × 55.4 mm) (ZRC 1985.11.68), Raffles Lighthouse, coll. D. S. Johnson, 6 Mar.1955; 1 female (43.9 × 62.9 mm), 1 ovigerous female (38.2 × 51.5 mm) (ZRC 1985.11.69–1170), Raffles Lighthouse, under rocks, coll. J. R. Henderson, Jul.1952; 1 female (40.5 × 56.9 mm) (ZRC 1985.11.71), Raffles Lighthouse, mid tide pool, coll. 1 Jul.1954; 1 male (40.3 × 55.8 mm) (ZRC 1989.2973), Sentosa reefs, coll. P. K. L. Ng, 1988; 1 female (31.9 × 44.5 mm) (ZRC 1993.260), Labrador Beach, coll. P. K. L. Ng, Mar.1987; 1 male (34.5 × 48.2 mm) (ZRC 1993.6909), Semakau Island, gill net, coll. REST group, 7 Sep.1993; 2 females (35.8 × 49.5 mm, 35.2 × 48.0 mm), 1 female (27.6 × 38.4 mm) (ZRC 1993.6961), Semakau Island, coll. REST group, 7 Sep.1993; 1 female (40.8 × 55.5 mm) (ZRC 1999.0301), Cyrene Reefs, coll. D. C. J. Yeo & S. H. Tan, 19 May 1999; 1 male (32.5 × 44.6 mm) (ZRC 1999.1002), Labrador Beach, coll. S. H. Tan, 5 Nov.1998; 1 ovigerous female (35.7 × 52.9 mm) (ZRC 1999.1003), Seringat Island, coll. S. Teo, 21 Aug.1997; 1 ovigerous female (42.2 × 57.6 mm) (ZRC 1999.1005), Labrador Beach. Others: **SINGAPORE**: 2 females (55.1–54.0 × 38.5–37.7 mm) (ZRC 1999.1004), P. Seringat, coll. H. K. Lua et al., 23 Jul.1997; 4 males (39.6–38.5 × 55.0–52.7 mm), 3 females (32.4–21.3 × 44.8–30.5 mm) (ZRC 1999.1006);

1 ovigerous female (37.0 × 51.3 mm) (ZRC 1999.1007), off Singapore; 1 male (33.2 × 46.2 mm), 2 females (29.0 × 40.1 mm, damaged) (ZRC 1999.1016); 1 female (33.7 × 47.5 mm), 1 ovigerous female (32.7 × 47.3 mm) (ZRC 1996.1928), in rock holes, just above water level at low tide; 1 male (27.8 × 38.3 mm), 1 female (33.3 × 46.2 mm) (ZRC 1985.11.72–1173); **MALAYSIA**: 1 male (34.0 × 47.9 mm), 2 juveniles (10.8–9.3 × 15.6–13.1 mm) (ZRC 1965.11.17.61–66); 1 male (29.6 × 40.5 mm), 1 female (23.5 × 32.9 mm) (ZRC 1965.11.17.67–68), South China Sea, Tioman Island, Telok Bunga, coll. N. Smedley, May 1907; 1 female (36.2 × 49.8 mm) (ZRC 1965.11.17.69), Malacca Strait, Pisang Island, coll. M. W. F. Tweedie, Jan.1934; 2 females (34.0 × 47.2 mm, 32.2 × 42.2 mm) (ZRC 1965.11.17.70–71), South China Sea, Aor Island, coll. M. W. F. Tweedie, Jun.1938; 1 male (38.9 × 52.5 mm), 1 female (41.4 by 56.7 × 41.4 mm) (ZRC 1965.11.17.77–78), South China Sea, Tioman Island, Telok Bunga, coll. N. Smedley, May 1907. 2 males (13.9–14.0 × 18.7–19.9 mm), 2 females (16.9–29.1 × 24.1–41.2 mm) (ZRC 1999.1041), Tioman Island, Paya Beach, coll. 24 Jun.1999; 1 female (28.5 × 38.6 mm) (ZRC 1985.11.66), Sarawak, Talang Island, Talang Besar, coral reef, low tide, coll. J. R. Henderson, 16 Mar.1953; 1 male (26.9 × 37.5 mm) (ZRC 1985.11.67), Sarawak, Talang Island, Talang Besar, beach, coll. J. R. Henderson, Aug.1952; 1 female (36.5 × 50.3 mm) (ZRC 1985.11.75), South China Sea, northern Babi Island, coll. 15 Mar.1957; 1 male (28.5 × 39.8 mm), 4 females (38.5–27.9 × 53.7–38.0 mm) (ZRC 1996.1913), Chanderang, Kuala Trengganu, rocky beach, coll. 28 Apr.1967; 1 female (38.5 × 52.4 mm) (ZRC 1996.2628), Redang Island, coll. Oct.1950; 1 female (35.5 × 50.2 mm) (ZRC 1997.686),

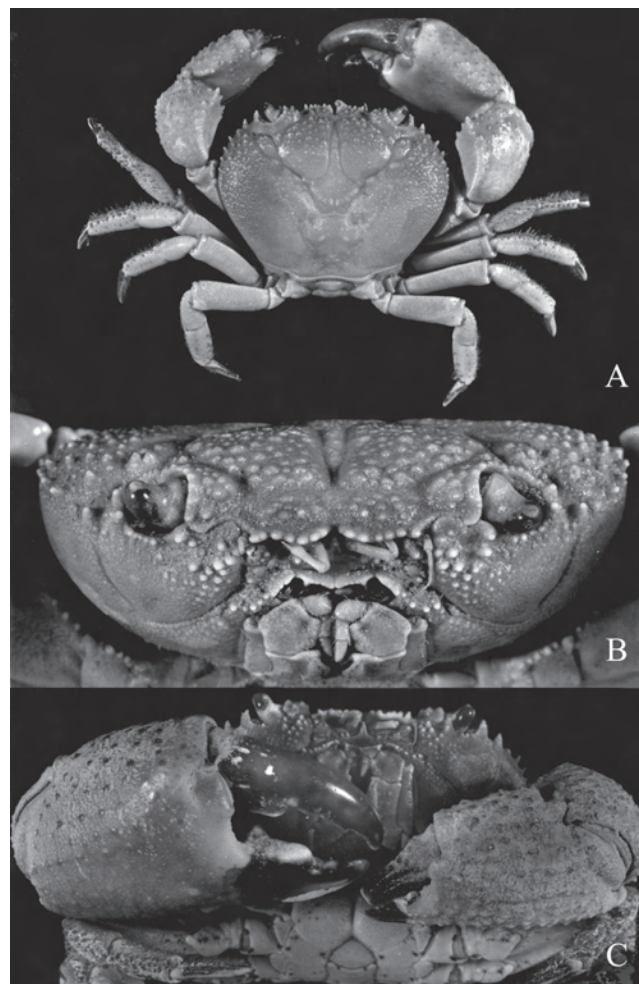


Fig. 16. *Eriphia ferox*, new species. Holotype male, 47.3 × 66.0 mm, ZRC 1999.1001: A, dorsal view; B, frontal view; C, chelipeds.

Johore, Tanjong Balau, coll. K. S. Tan, 21 May 1991; 1 male (23.5 × 33.3 mm) (ZRC 1999.1013), Perak, Rumbia Island, off Bagon Datok, coll. K. Lim, 9–12 Jun.1994; 1 male (31.8 × 44.2 mm), 4 females (35.1–23.8 × 48.2–33.1 mm) (ZRC 1999.1015), Pemalang Island, coll. 14 Dec.1974. **INDONESIA:** 2 males (36.0–21.1 × 50.0–30.4 mm), 1 female (28.6 × 48.0 mm) (ZRC 1996.1905), Sumatra, Bintan Island, Tanjong Tondang, coll. Hon. Class 95, Jun.1995; 1 female (39.7 × 55.5 mm) (ZRC 1989.2883), Batam Island, Riau Archipelago, coll. S. Giam, 10 Apr.1989; 1 male (19.7 × 28.0 mm), 1 female (26.1 × 35.9 mm) (ZRC 1999.1014), northern Bintan Island, Lagois, coll. P. K. L. Ng et al., May 1993. **THAILAND:** 1 male (26.5 × 36.1 mm) (ZRC 1999.1011), Rayong Province, Pan Phe, coll. 18 Jul.1970; 1 female (ZMUC), south of Koh Chang island, Gulf of Thailand, coll. Th. Mortensen, 8 Jan.1900; 1 male (32.1 × 43.4 mm) (ZRC 1999.1010), Phuket, coll. P. K. L. Ng, 1998. **INDO-CHINA:** 1 male (BPBM 6234), coll. Jan.1956, no other data. **TAIWAN:** 1 female (31.7 × 51.7 mm) (ZRC 1999.1008), Hsinshu, Hi Shan Chuan Ao, coll. 20 Oct.1996; 1 female (22.6 × 31.5 mm), 2 females (31.7–27.1 × 44.3–37.3mm) (ZRC 1999.1009), Taipei County, Lai Lai, coll. H. C. Liu, 2 May 1996. **MAINLAND CHINA:** 1 ovigerous female (26.2 × 35.9 mm) (ZRC 1999.1012), Hainan island, coll. 11 Jun.1957; 1 male

(ZMUC). **NO DATA:** 1 male (38.3 × 53.0 mm) (ZRC 1985.1174), probably Singapore, coll. D. S. Johnson, 15 Oct.1954.

Type locality. – Singapore.

Diagnosis. – Carapace hexagonal, dorsal surface tuberculated anteriorly, tubercles acute, sharp; minutely granulated posteriorly. Gastric region with acute tubercles covering most of the protogastric and anterior hepatic region. Front with six or seven denticles on each side of the notch, randomly arranged. Orbits denticulated, almost spiniform; two external and an internal spines present; supraorbital margin with two longitudinal fissures, infraorbital margin with two longitudinal fissures. Anterolateral margin convex, with five or six spines, decreasing in size towards posterior, spines acute, sharp, first anterolateral spine bispinate. Third maxilliped surface granulated, pubescent with tufts of setae. Pterygostomial region minutely granulated. Acute tubercles on suborbital region. Surface of chelipeds pubescent, tuberculated to varying degrees; major chela less tuberculated compared to

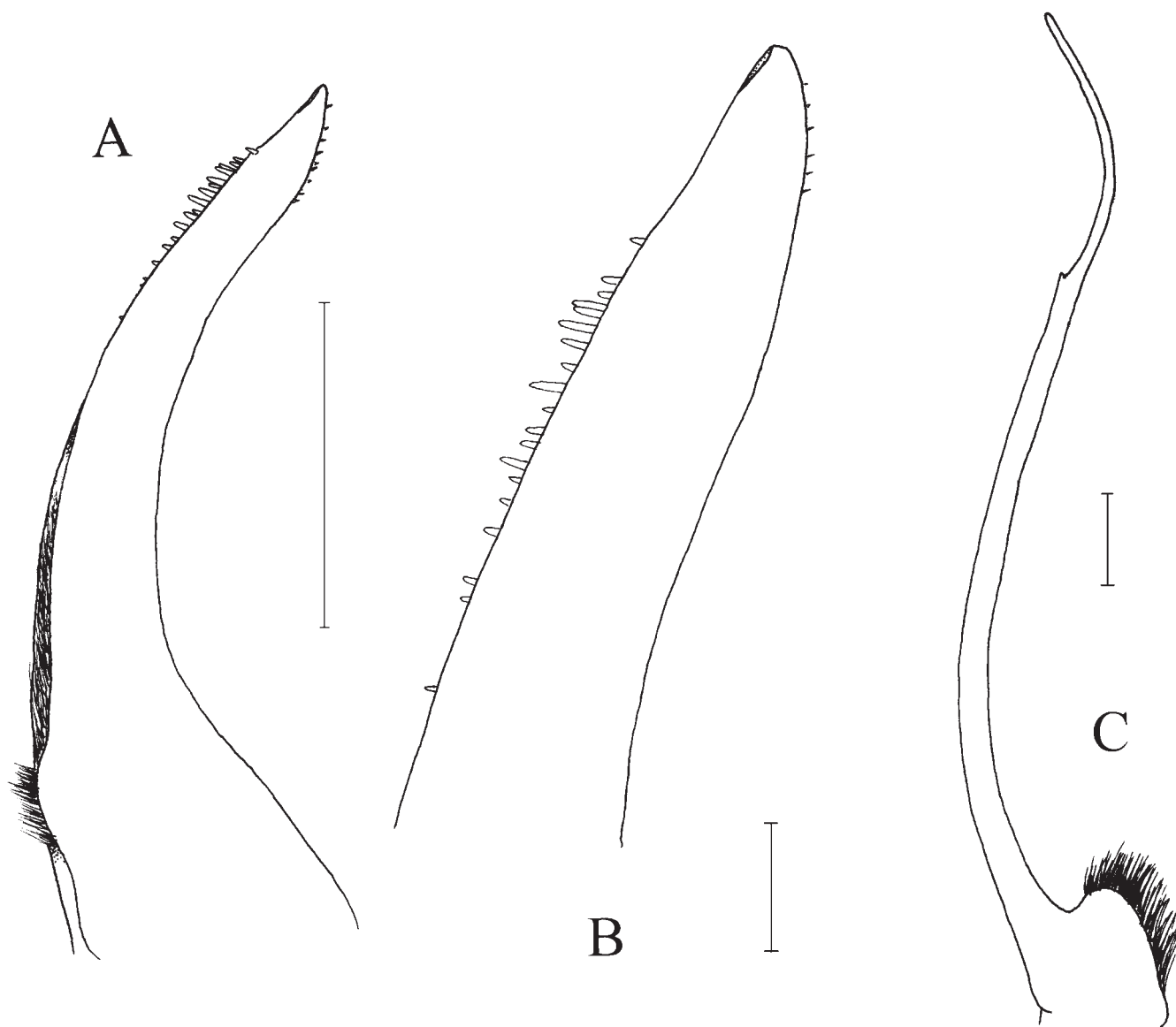


Fig. 17. *Eriphia ferox*, new species. Holotype male, 47.3 × 66.0 mm, ZRC 1999.1001: A, G1; B, distal part of G1; C, G2. Scale bars = 1.0 mm.

minor chela, tubercles acute, sharp; denticles present at ventral margin of basis-ischium and merus; carpus tuberculated, with prominent acute spine on distal inner margin and one or two smaller ones on ventral surface; fingers short, stout, darkly pigmented. Surfaces of ambulatory leg smooth, pubescent on last three segments; merus with occasional setae at proximal end. Anterior male thoracic sternum pubescent, minutely tuberculated anteriorly. G1 short, subcylindrical, sinuous distally, tapered distally, spinules at one-fourth length of G1 along inner edge, with pubescence after spinules.

Description. – Carapace hexagonal; dorsal surface slightly convex, tuberculated anteriorly, tubercles acute, sharp, minutely granulated posteriorly. Regions well defined. Protogastric region tuberculated almost to posterior portion. Front notched medially, V-shaped; each side with six or

seven denticles, arranged randomly. Orbit denticulated, almost spiniform; two external and an internal orbital spines present; supraorbital margin with two longitudinal fissures, infraorbital margin with two longitudinal fissures. Anterolateral margin convex with five or six acute spines, decreasing in size towards posterior end. Posterolateral margin longer than anterolateral margin, minutely granulated. Third maxilliped surface minutely granulated, slightly pubescent. Pterygostomial region not pubescent, minutely granulated. Suborbital region tuberculated, especially near antennules, endostome region and distal part of exopod of third maxilliped.

Chelipeds asymmetrical, surfaces pubescent, tuberculated to varying degrees. Denticles present along ventral margin of basis-ischium and merus. Merus pubescent, denticulated

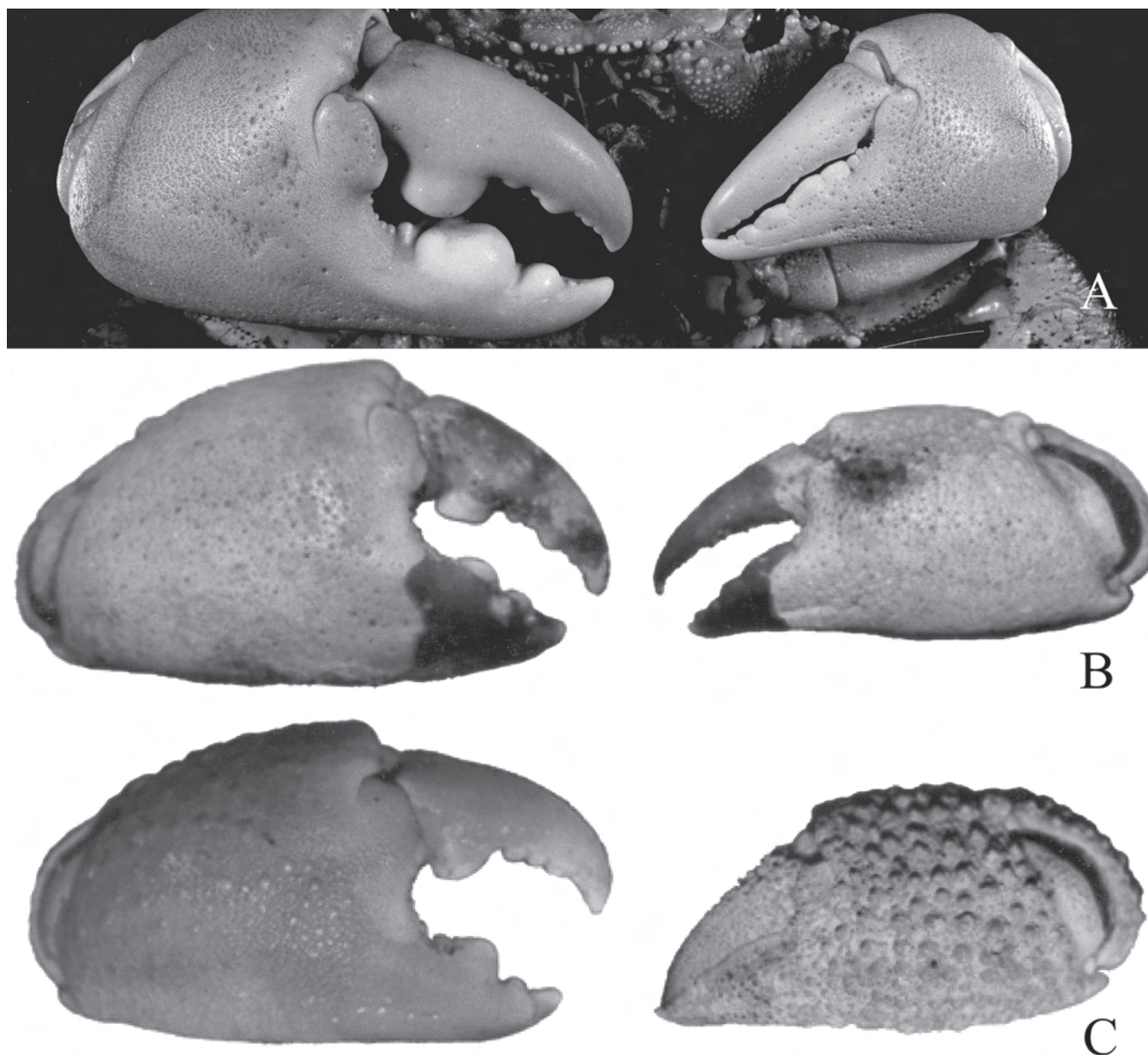


Fig. 18. Chelipeds: A, *Eriphia sebana* (Shaw & Nodder, 1803), male, 48.3 × 67.1 mm, AMNH 7615, holotype of *E. sebana hawaiiensis* Ward, 1939; B, *E. sebana* (Shaw & Nodder, 1803), female, 36.2 × 52.3 mm, MMUS-C 2927, holotype of *E. fordii* MacLeay, 1838; C, *E. smithii* MacLeay, 1838, holotype male (dried), 43.0 × 56.4 mm, MMUS-C 2926.

anteriorly; surfaces minutely tuberculated near anterior region. Carpus entirely tuberculated, with prominent acute spine at distal inner margin, with one or two smaller ones on the ventral surface, few tubercles may be present in between. Chela relatively short, stout, tuberculated. Tuberculation rounded or acute. Cutting edges of minor chela denticulated while those of major chela with a basal tooth on propodus and dactylus. Pubescence on inner cutting edge arranged in tufts.

Ambulatory legs surface smooth. Merus tuberculated anteriorly, almost naked except for some setae at distal anterior and posterior margin.

Anterior male thoracic sternum pubescent, minutely tuberculated anteriorly. G1 short, subcylindrical, sinuous at distal end, tapered towards tip, spinules at one fourth length of G1 at inner edge, with pubescence after spinules. G2 longer, much slender than G1; distal part shorter than the subdistal part.

Remarks. – The tuberculation on both chelipeds to many authors (see Sakai, 1934; 1976; Dai & Yang, 1991) has always traditionally been the most distinctive character to identify *E. smithii* MacLeay, 1838. Its use is so prevalent that all other characters have been overlooked. As discussed under *E. sebana*, it is an unreliable character to separate *E. sebana* and *E. smithii*. *Eriphia smithii* MacLeay, 1838, since its original description, has been reported from many locations, e.g. by Dana (1852b) from Singapore, Stimpson (1858) from Hong Kong, Sakai (1934) from Japan and Shen (1940) from China. On the basis of the presence of tuberculations on the

outer surface of both chelae, they identified their specimens as *E. smithii* MacLeay, 1838 (see also Ng, 1998).

Examination of a good series of “*Eriphia smithii*” from the Sunda Shelf and western Pacific shows that there are quite different from MacLeay’s (1838) *E. smithii*. As such, they are here described as new, *Eriphia ferox*. Although the two species closely resemble each other superficially, they differ in the following aspects.

Most distinctively, the G1s of both species are quite different in shape. The G1 of *E. smithii* is more slender, sinuous distally, usually tapered towards the distal end, with the outer margin of the basal part appearing more shelf-like (Fig. 15A, B, E, H, I); whereas that of *E. ferox* is stouter, straighter, more tubular, and the outer margin of the basal part is a gradual slope, without any trace of a shelf (Fig. 17A, B). The tuberculation on the carapace and chelipeds of *E. ferox* is always acute and sharp. On the other hand, the tuberculation on *E. smithii* is blunt and low on the carapace and major chela, while that on the minor chela is acute but never sharp. The anterolateral spines in *E. ferox* are acute and sharp, the first anterolateral spine being bispinate while in *E. smithii*, the first two anterolateral spines are relatively acute, the rest that follow are blunt and low, almost like tubercles, and the first anterolateral spine may or may not be bispinate. The pubescence present on the chelipeds of *E. ferox* is always distinct but is absent in *E. smithii*.

The G1 of *E. ferox* resembles closely that of *E. sebana*. Both G1s are tapered towards the tip, sinuous at the distal end and has spinules on the distal part. Although the number of spinules differs in both species, it is not a consistent character for younger male specimens, whereas there are fewer spinules. Diagnostically, *E. sebana* has a prominent external spine on each side of the frontal margin and a dense row of long setae on the anterior meral segment of each ambulatory leg. *Eriphia ferox* lacks these two features, with no external frontal spine and no dense pubescence on the anterior margin of the ambulatory leg merus except for the occasional short setae proximally.

In *E. ferox*, the tuberculation remains prominent in all stages. The major chela is sparsely tuberculated as compared to the minor chela but the tubercles remain acute. The distribution of pubescence is uniform on both chela and carapace. The fingers of both chelae are always darkly pigmented.

On the basis of the published literature and specimens on hand, we believe that *E. ferox* has a wide distribution, ranging from the eastern Indian Ocean through to the Sunda Shelf and western Pacific. It is not yet known from Australia.

Distribution. – South China Sea, from north such as Japan, Taiwan, China to Thailand (Rayong Province), Malaysia, Singapore, Indonesia and Sarawak.

Etymology. – The word ‘*ferox*’ means “fierce” in Latin and describes the behaviour of this crab, aggressive, often stretching out its chelipeds when threatened.

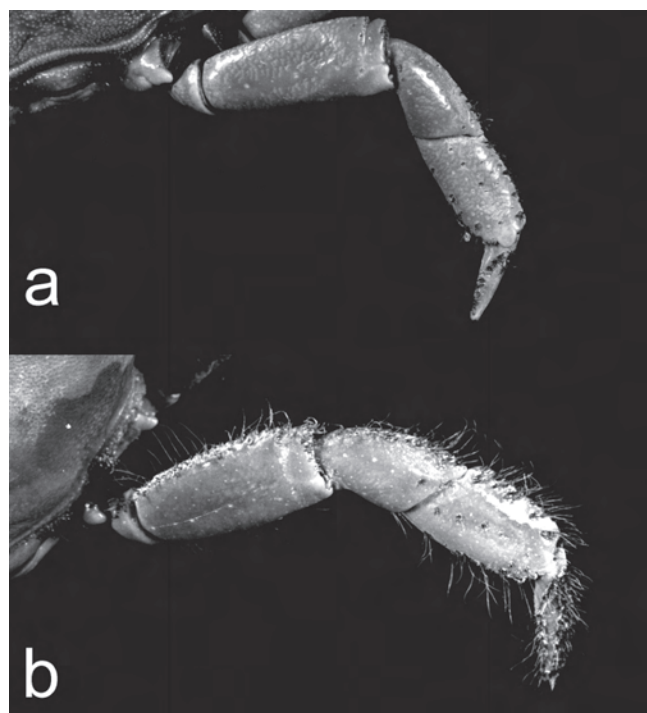


Fig. 19. Last ambulatory legs: A, *Eriphia ferox*, new species, holotype male, 47.3 × 66.0mm, ZRC 1999.1001; B, *E. sebana* (Shaw & Nodder, 1803), neotype male, 38.5 × 53.8 mm, ZRC 1999.1020.

Key to species of *Eriphia*

1. Frontal margin either entire or slightly denticulated 2
 - Frontal margin prominently denticulated, with at least five well developed denticles 4
2. Prominent spine present on ventral inner margin of basis-ischium of cheliped *E. scabricula* Dana, 1852
 - No spine on ventral inner margin of basis-ischium of chelipeds 3
3. Front deflexed prominently, with frontal lobes significantly inflated *E. granulosa* A. Milne-Edwards, 1880
 - Front not deflexed prominently, with flattened frontal lobes 4
4. Outer surface of chela with scattered, rounded granules; G1 with tip gradually tapering, acute
 - Outer surface of chela with flattened densely packed granules; G1 with tip blunt, shaped like a golf club
 - *E. gonagra* (Fabricius, 1781)
 - *E. squamata* (Stimpson, 1859)
- 5a. Anterior margin of ambulatory legs densely pubescent 6
 - Anterior margin of ambulatory legs slightly or not pubescent 7
6. Frontal lobes denticulated, with acute denticles; pubescent ...
 - Frontal lobes tuberculated, with flattened tubercles; not pubescent *E. verrucosa* (Forskål, 1775)
7. Carapace and chela not pubescent; G1 relatively straight, basal part with distinct shelf-like structure on outer surface *E. smithii* MacLeay, 1838
 - Carapace and chela pubescent, with short setae; G1 relatively slender, basal part expanded but without shelf-like structure *E. ferox*, new species

ACKNOWLEDGMENTS

The authors are most grateful to the following for their help in obtaining specimens or permission to examine material in their care: Penny Berents and Shane Ahjong (AM and MMUS), Peter Davie (QM), Diana Jones (WAM), Paul Clark (NHM), Charles Fransen (RMNH), Sven Kullander (SMNH), Danièle Guinot (MNH), Danny Jacobsen and Torben Wolff (ZMUC), Hans Gruner (ZMB), Michele van de Mehr (SAM), Rafael Lemaitre (USNM), Chris Boyko (AMNH), Lu Eldredge (BPBM), Yang Chang Man and the late Yeo Keng Loo (ZRC). Marcos Tavares (Universidade de São Paulo, Brazil) helped obtain some locally unavailable American literature. Thanks are also due to two anonymous reviewers who provided many helpful suggestions to improve the manuscript. The first author thanks members of the Systematics and Ecology Laboratory for help rendered during her tenure there. The study has been partially supported by a research grant to the second author from the National University of Singapore.

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