

## On a new species of tree-climbing crab of the genus *Labuanium* (Crustacea: Decapoda: Brachyura: Sesarmidae) from Taiwan

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**Abstract.**—Specimens of a tree-climbing sesarmid crab from Taiwan previously referred to *Labuanium rotundatum* (Hess, 1865) are here shown to belong to a new species, *L. scandens*. The new species differs from *L. rotundatum* s. s. in having a less prominently granulated carapace, the outer surface of the chela covered with numerous small and closely arranged granules, and a differently structured male first pleopod.

The genus *Labuanium* Serène & Soh, 1970, currently contains 10 species from the Indo-West Pacific (Serène & Soh 1970). Of these, one of the more often reported species is *L. rotundatum* (Hess, 1865), a taxon that has been reported from many parts of the Indo-West Pacific, although apparently, it is not a very abundant species, and not many specimens are known. Tesch (1917:193–198), in a detailed discussion on the taxonomy of this species provided a long list of junior synonyms for this species, viz. *Sesarma dentifrons* A. Milne-Edwards, 1869, *Sesarma oceanica* De Man, 1889, *Sesarma gardineri* Borradaile, 1900, *Sesarma (Episesarma) rotundata papuomalesiaca* Nobili, 1899, and *Sarmatium faxoni* Rathbun, 1906.

*Labuanium rotundatum* was first reported from East Asia by Sakai (1939) on the basis of a male specimen collected from Tansui in northern Taiwan, and although cited by subsequent authors (Sakai 1940, 1976; Dai et al. 1986, Dai & Yang 1991, Cai et al. 1994), no further material was forthcoming until Liu (1999) recorded this species from southern Taiwan. Ng et al. (2001) subsequently added some notes on this species from Taiwan. In 1999, through the courtesy of Lu Eldredge of the Bernice P. Bishop

Museum, the first author examined some specimens of *L. rotundatum* from some Pacific islands that appeared to differ in several respects from the Taiwanese material. But because there was a lack of material from Taiwan and other parts of the Pacific, not much else could be done. Between 2000 and 2001, we obtained an excellent series of specimens from Guam and Taiwan, and the study of this material confirmed our suspicion of the existence of two separate species, one of which is undescribed. The description of the new species forms the basis of the present paper.

Material examined is deposited in the Bernice P. Bishop Museum, Honolulu, Hawaii, U.S.A. (BPBM); National Museum of Natural History, Smithsonian Institution, Washington D.C. (USNM); Taiwan National Museum, Taipei, Taiwan (TMCD); Institute of Zoology, Academia Sinica, Nankang, Taipei, Taiwan (ASIZ); National Museum of Marine Biology and Aquarium, Pingtung, Taiwan (NMMBA); and Zoological Reference Collection of the Raffles Museum, National University of Singapore (ZRC). The abbreviations G1 and G2 are used for the male first and second pleopods respectively. The measurements are cited as: cw (carapace width) × cl (carapace

length). The terminology essentially follows that used by Ng (1988). The length of the ambulatory legs were obtained by adding the maximum lengths of the merus, carpus, propodus and dactylus.

***Labuanium scandens*, new species**

Figs. 1–4

*Sesarma (Sesarma) rotundatum*.—Sakai 1939:687, pl. 110 fig. 4, 1940:32. (Not *Sesarma rotundatum* Hess, 1865.)

*Labuanium rotundatum*.—Sakai 1976:663, text fig. 362, Dai et al. 1986:486, Dai & Yang 1991:532, Cai et al. 1994:597, Liu 1999:88, Ng et al. 2001:42. (Not *Sesarma rotundatum* Hess, 1865.)

*Material examined*.—All localities in Taiwan. Holotype male, 42.3 × 41.2 mm, TMCD 3290, Hsiang-Chiao-Wan, Hengchun, Pingtung County, coll. H.-C. Liu, 24 Jan 2002. Paratypes: 3 males, 38.5 × 37.5 mm, 31.8 × 30.3 mm, 14.6 × 14.4 mm, 1 female, 23.2 × 21.8 mm, ZRC 2002.444, Hsiang-Chiao-Wan, Hengchun, Pingtung County, coll. H.-C. Liu, 24 Jan 2002; 1 male, 16.3 × 15.8 mm, 1 female, 38.4 × 37.2 mm, TMCD 3291, Hsiang-Chiao-Wan, Hengchun, Pingtung County, coll. H.-C. Liu, 15 Dec 1999; 1 female, 27.1 × 27.0 mm, NMMBA 2002-01, Hsiang-Chiao-Wan, Hengchun, Pingtung County, coll. P.-H. Ho, 3 Oct 2001; 1 male, 36.1 × 35.8 mm, 2 females, 36.8 × 36.3 mm, 32.3 × 31.6 mm, IZAS 72860, Hsiang-Chiao-Wan, Hengchun, Pingtung County, coll. H.-C. Liu, 22 Dec 2001; 2 males, 35.5 × 34.2 mm, 19.1 × 18.7 mm, 3 females, 28.1 × 26.8 mm, 28.1 × 27.1 mm, 21.5 × 20.3 mm, ZRC 2001.29, Hsiang-Chiao-Wan, Hengchun, Pingtung County, coll. P. K. L. Ng, 7 Nov 2000; 1 female, 40.2 × 39.7 mm, ZRC 1998.447, Hsiang-Chiao-Wan, Hengchun, Pingtung County, coll. H.-C. Liu, 20 May 1998.

*Diagnosis*.—Carapace slightly wider than long, dorsal surfaces finely granular; posterolateral regions with finely granular oblique striae; outer surface of chela with

numerous small, uniformly arranged rounded granules, dorsal margin with a distinct granulated but non-pectinated ridge on outer edge with 26–32 relatively longitudinally elongate granules, dorsal surface of dactylus with numerous granules; outer surface of ambulatory meri rugose, dorsal margin gently serrated; lateral margins of male segment 6 with distal part convex, proximal part almost straight; G1 relatively stout, almost straight; distal part bent 90° from vertical, distal chitinous part gently upcurved.

*Description of male holotype*.—Carapace rounded, slightly wider than long, broadest at median part of carapace, dorsal surfaces finely granular, regions well defined, gastric and branchial regions swollen; posterolateral regions with finely granular oblique striae (Fig. 1A, B). Frontal margin deflexed, sinuous from dorsal view, vaguely divided into 2 low lobes by broad U-shaped cleft, margin relatively entire; postfrontal cristae distinct, sharp, separated into 4 parts, median parts larger, wider, sharper, positioned more anteriorly than lateral parts, separated from lateral parts by short fissure, lateral parts adjacent to low inner supraorbital angle; frontal region prominently concave (Fig. 1A, B). Supraorbital margin smooth, with small cleft before external orbital tooth (Fig. 1B, C). Anterolateral margin strongly convex, gently curving into posterolateral margin, junction not discernible; external orbital tooth well developed, triangular, outer margin convex, directed anteriorly, outer margin distinctly convex, separated from rest of anterolateral margin by deep V-shaped cleft, rest of margin with 2 relatively low teeth; posterolateral margin gently convex, converging to almost straight posterior carapace margin (Fig. 1A, B).

Merus of third maxilliped longitudinally ovate, anterior part widest, posterior part tapering sharply to ischium (Fig. 1C), distinctly longer than ischium; ischium with shallow median sulcus; exopod slender, reaching to mid-length of merus, flagellum long, reaching across width of merus.

Male chelipeds subequal (Fig. 1A, B);

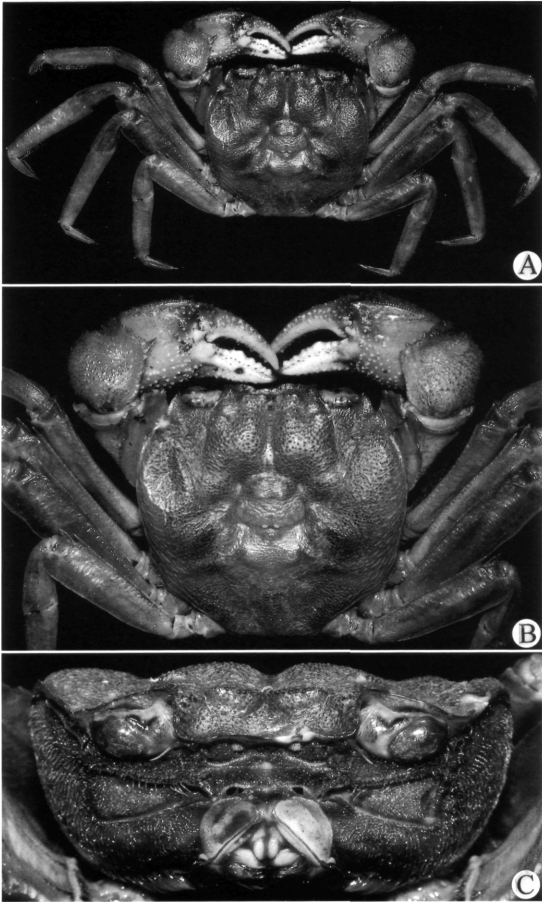


Fig. 1. *Labuanium scandens*, new species. Holotype male, 42.5 × 40.5 mm, TMCD 3290, Taiwan. A, overall view; B, carapace and chelipeds; C, frontal view.

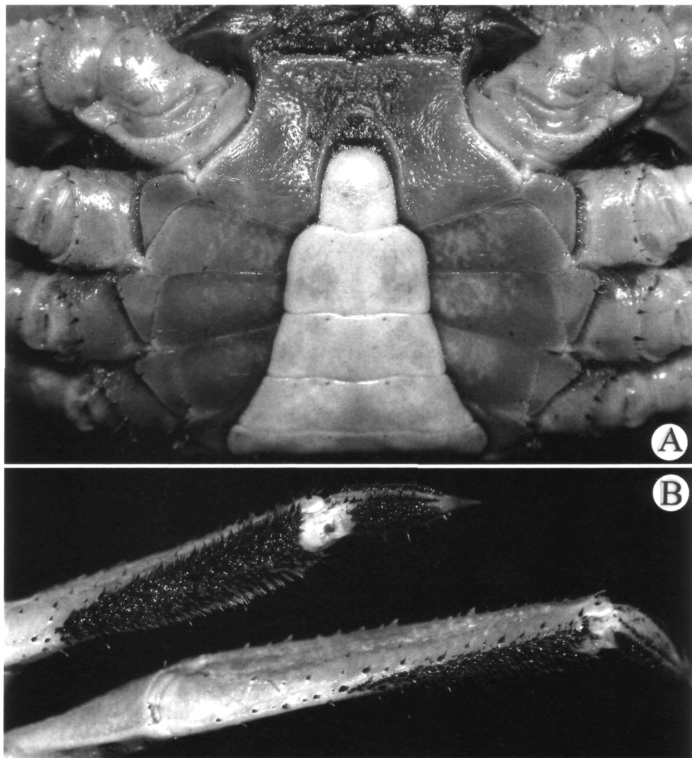


Fig. 2. *Labuanium scandens*, new species. Holotype male, 42.5 × 40.5 mm, TMCD 3290, Taiwan. A, anterior thoracic sternum and abdomen, ventral view; B, propodi and dactyli of first two ambulatory legs.

outer surface with numerous small, uniformly arranged rounded granules (Fig. 3A). Ventral surface of ischium with 2 short rows of tubercles, distal ones more prominent; ventral surface of basis granulated. Outer surface of merus with numerous rounded granules on outer surface, with low but discernible longitudinal median granulated ridge; inner margins prominently ser-

rated, dorso-distal part dilated to form sublamelliform structure that is just visible from dorsal view. Outer surface of carpus finely granulated; slightly longer than broad; inner distal angle with long sharp tooth, distal and proximal margins serrated with some spines larger (Fig. 1B). Palm inflated, outer, dorsal and inner surfaces with numerous small, uniformly arranged round-

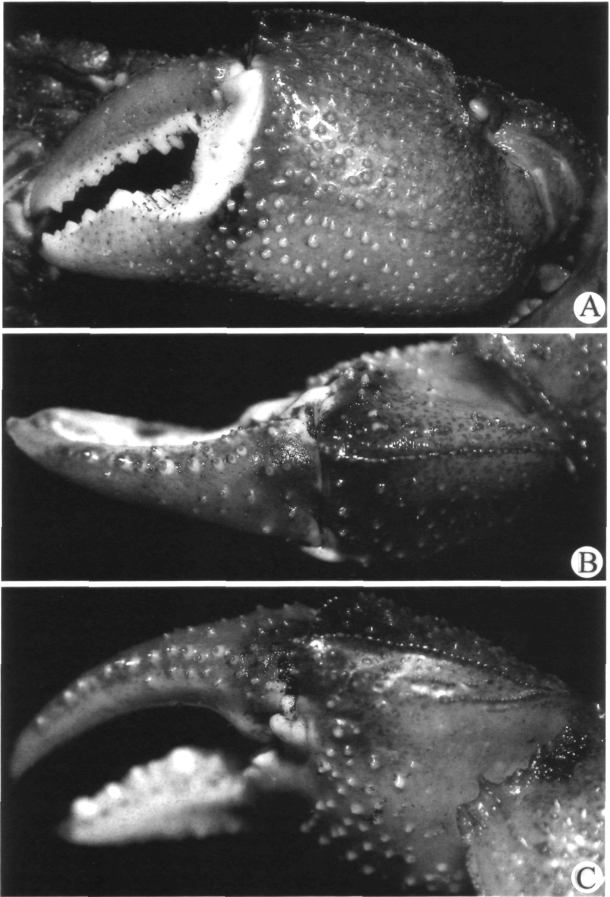


Fig. 3. *Labuanium scandens*, new species. Holotype male, 42.5 × 40.5 mm, TMCD 3290, Taiwan. Left chela. A, outer view; B, dorsal view; C, inner view.

ed granules (Fig. 3A); dorsal margin with a main, always distinct granulated but non-pectinated ridge on outer edge with 27 or 29 relatively more longitudinally elongate closely arranged granules, joining another less well defined (sometimes barely discernible) granulated ridge which extends from proximal edge of palm and curving along inward surface and gradually disappearing as it reaches median part (Fig. 3B, C); ventral margin (including pollex) with small sharp granules. Fingers shorter than palm, forming basal proximal gape when closed (Fig. 3A); dorsal surface of dactylus with numerous granules, most of which have a corneous tip, proximal 8–11 granules relatively smaller, scattered, subsequent 8 or 9 granules relatively larger, arranged in uneven row (Fig. 3B, C); cutting edges of dactylus and pollex with numerous prominent teeth (Fig. 3A).

Third ambulatory legs longest (Fig. 1A). Carpus of all legs with 2 subparallel low ridges on outer surface (Fig. 1A). Outer surface of propodus with short curved low ridge on proximal part. Meri of all legs relatively slender; surfaces rugose, dorsal margin gently serrated, subdistal tooth prominent (Fig. 1A). Dorsal and ventral margins of all dactyli with densely packed short setae forming brush-like structures; prominent brush-like setae present on distal half of ventral margins of first and second propodus, that on second propodus relatively less extensive; distoventral margins of propodi of other legs with tufts of short black setae, but not as dense or continuous, not distinctly brush-like (Fig. 2B).

Surfaces of thoracic sternites gently rugose; sternites 3 and 4 separated by almost straight, setae-lined ridge; abdominal cavity reaching to median part of sternite 4 (Fig. 2A). Abdomen triangular (Fig. 2A); telson shorter than segment 6, lateral margins gently convex on distal part but almost straight proximally, tip rounded; segment 6 with distal part of lateral margins convex, proximal part almost straight; segments 3–5 increasingly trapezoidal; lateral margins

of segment 5 gently convex, that of segment 4 gently concave, that of segment 3 gently convex (Fig. 2A). Segments 1 and 2 transversely narrow.

G1 relatively stout, almost straight; distal surface strongly setose, obscuring margins, distal part sharply bent 90° from vertical, distal chitinous part gently upcurved from lateral view (Fig. 4). G2 short.

*Etymology.*—The name is derived from the Latin "scansus" for climb, alluding to the habits of this species. The name is used as a noun in apposition.

*Distribution.*—Known for certain only from Taiwan thus far.

*Variation.*—The holotype is the largest specimen of *L. scandens* available, and other than having its left branchial region slightly depressed (probably because of injury shortly after it molted), it is in excellent condition. Differences between sexes in this species are not substantial, most obvious being the proportionately more slender chela of females. The general forms of the male and female chelae are similar. Smaller specimens of *L. scandens* tend to be more squarish, with the lateral carapace margins almost straight or only gently convex; and the dorsal surface is relatively flatter. In larger specimens, the lateral carapace margins become prominently more convex and the dorsal surface is relatively more swollen. This is also true of *L. rotundatum*. In the series of specimens of *L. rotundatum* examined, the frontal margin of females may be more denticulate, appearing weakly serrated, although this is not always the case, with even a few of the smaller males also having a denticulate margin. The frontal margin of *L. scandens* is usually entire, although in some specimens, appears uneven; with only three or four individuals having distinct denticles. Based on the specimens of *L. rotundatum* examined, the presence of denticles along the frontal margin does not appear to be correlated with sex or size.

The strength of the anterolateral teeth of *L. scandens* varies. In smaller specimens,

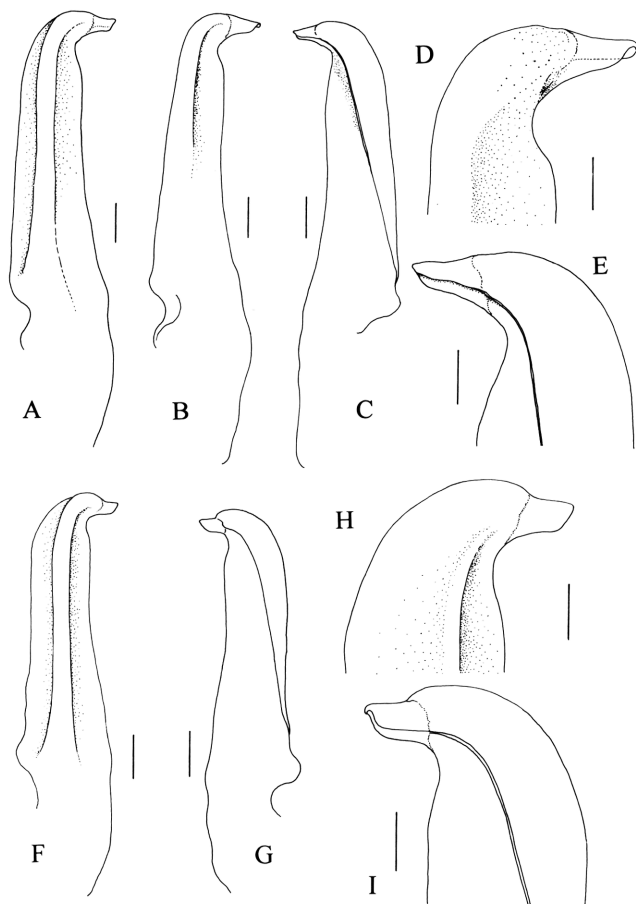


Fig. 4. *Labuanium scandens*, new species. Left G1s (denuded). A–E, holotype male, 42.5 × 40.5 mm, TMCD 3290, Taiwan; F–I, paratype male, 35.5 × 34.2 mm, ZRC 2001.29, Taiwan. A, F dorsal (sternal) views; B, marginal view; C, G, ventral (abdominal) views; D, H, distal part, dorsal (sternal) views; E, I, distal part, ventral (abdominal) views. Scales equal 1.0 mm (A–C, F, G), and 5.0 mm (D, E, H, I).

the two teeth are usually more pronounced and sharper, and in larger specimens, the second tooth is invariably low, sometimes barely discernible. The cleft on the supra-orbital margin is usually absent, with the margin appearing entire being present only on the holotype and a few other specimens. The strength of the inner dorsal granulated ridge of the palm varies a great deal, and in some specimens it is almost absent. The outer ridge on the other hand, is always distinct, although the number of granules varies from 26 to 32. The density and extent of the brush-like setae on the ambulatory propodi and dactyli does not differ substantially between the sexes, but smaller specimens invariably have less setae, with the ventral margins of the propodus being often almost glabrous. These observations are also valid for *L. rotundatum*.

*Remarks.*—It is rather surprising that none of the five junior synonyms of *L. rotundatum* are conspecific with the present material from Taiwan. Still, those taxa had all been described, often from limited material, from various parts of the south and southwest Pacific, and Hawaii, with one record from Nias in the eastern Indian Ocean, viz. *Sesarma dentifrons* A. Milne-Edwards, 1869 (one female, type locality Samoa), *Sesarma oceanica* De Man, 1889 (one male, one female, type locality Ponape Island), *Sesarma (Episesarma) rotundata papuomalesiaca* Nobili, 1899 (two males, one female, type localities Nias Islands [western Sumatra, Indonesia], New Guinea), *Sesarma gardineri* Borradaile, 1900 (six males, four females, type locality Funafuti, Rotuma Islands), and *Sarmatium faxoni* Rathbun, 1906 (three males, four females, Marshall Islands and type locality Oahu [Hawaii]). *Sesarma rotundatum* Hess, 1865, s. str. was described from one male, ostensibly from Sydney, Australia, but this data is likely to be incorrect (see "Remarks" for *L. rotundatum*). De Man (1891, 1896) and Tesch (1917) provide compelling arguments to show that *S. dentifrons*, *S. oceanicum*, *S. gardineri*, *S. rotundata papuoma-*

*lesiaca* and *S. faxoni* are all junior synonyms of *L. rotundatum*.

Although we have not examined the type material for most of these species, fortunately, Hess (1865), A. Milne-Edwards (1869), De Man (1889), Nobili (1899), Borradaile (1900), Rathbun (1906) all provided good figures and/or sufficiently detailed descriptions for their species (supplemented by the detailed comments by Man 1891, 1896; Tesch 1917), and we are confident their taxa are conspecific with the excellent series of specimens of *L. rotundatum* we have from Guam and elsewhere. All these specimens are characterized by their carapaces being prominently striated on the lateral surfaces, the median surface is strongly granulated, the regions are not well indicated and the gastric and branchial regions are not prominently swollen (Fig. 5), the outer and inner surfaces of the chelipedal carpus and chela having relatively few but larger and well spaced large conical or rounded granules, with the areas between them smooth (Fig. 7); the dorsal margin of the male chela possessing a outer ridge which has 10 to 14 relatively large granules (Fig. 7B); and the lateral margins of adult male abdominal segment 6 gradually diverging posteriorly (Fig. 6A). The carapaces of males tend to have smoother frontal margins (often more denticulate in females, see "Variations") and there is a clear tendency for the carapace to become proportionately wider with size, especially in males.

Comparisons of the excellent series of specimens from Guam and Taiwan reveal numerous differences that confirm that we are dealing with two different species. Compared to *L. rotundatum*, *L. scandens* has the carapace granules and striae distinctly smaller and lower (but more numerous), with the regions more prominent, the gastric and branchial regions distinctly swollen and the groove separating them broader and deeper (Fig. 1); the outer and inner surfaces of the chela has smaller but far more granules, the entire surface ap-



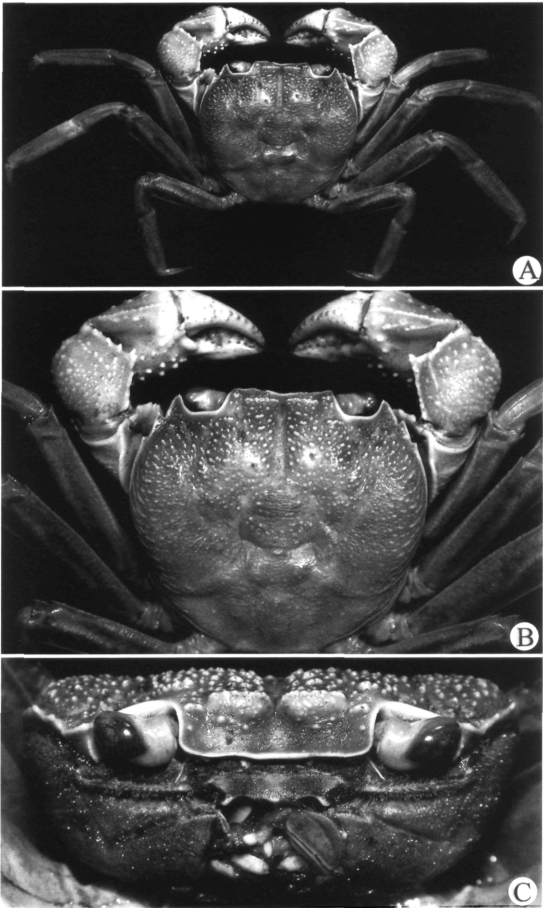


Fig. 5. *Labuanium rotundatum* (Hess, 1865). Male, 42.9 × 39.7 mm, ZRC 2002.454a, Faifai Beach, Guam. A, overall view; B, carapace and chelipeds; C, frontal view.

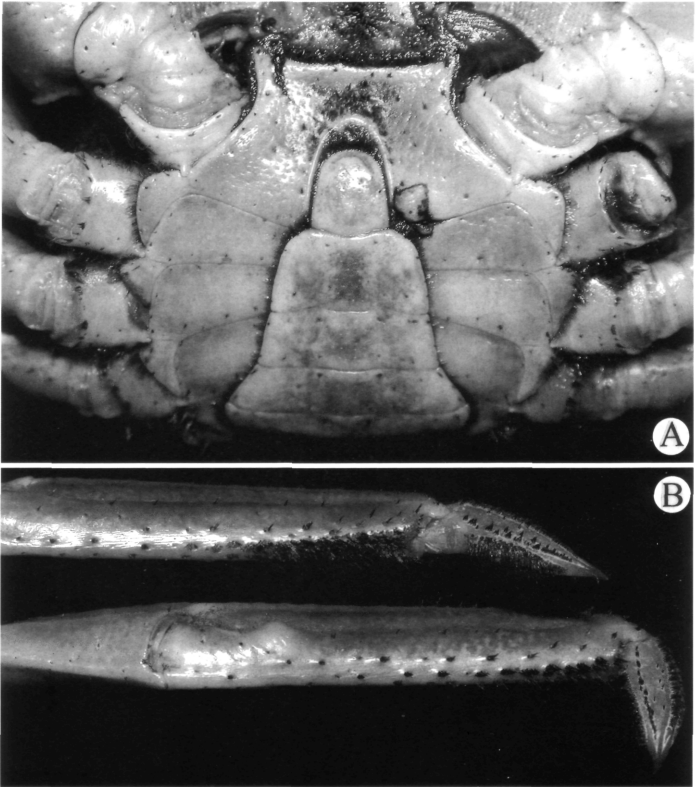


Fig. 6. *Labuanium rotundatum* (Hess, 1865). Male, 42.9 × 39.7 mm, ZRC 2002.454a, Faifai Beach, Guam. A, anterior thoracic sternum and abdomen, ventral view; B, propodi and dactyli of first two ambulatory legs.

pearing granular (Fig. 3); the dorsal margin of the male chela has an outer ridge with more (26–32) relatively smaller granules (Fig. 3B); and the lateral margins of adult male abdominal segment 6 are subparallel (Fig. 2A). These differences are apparent even for smaller male specimens for both

species. The G1s of the two species also differ, with that of *L. scandens* being relatively more slender with the chitinous distal part relatively longer and bent at an angle of 90° (vs. relatively shorter and bent slightly upwards) (Fig. 4 vs. Fig. 8A–D, H, I). The G1 structure is slightly variable within

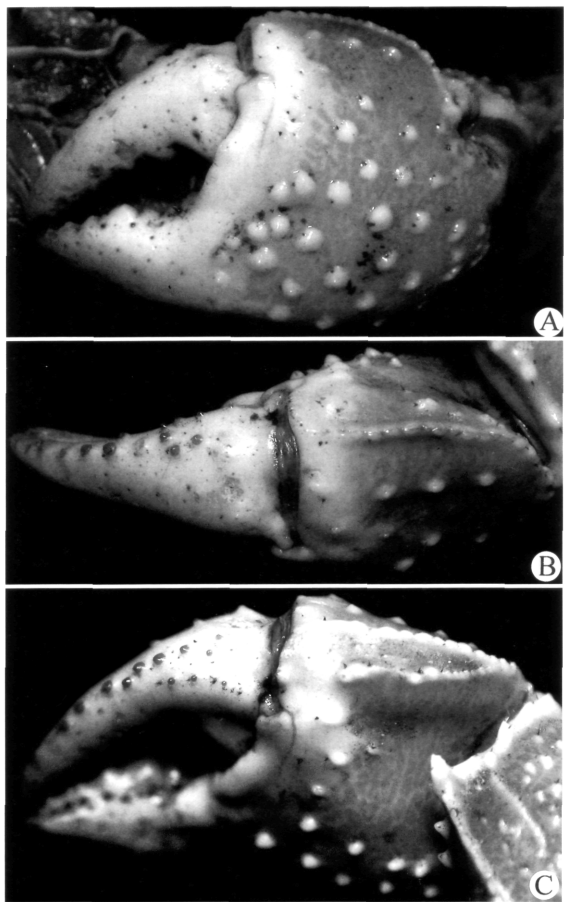


Fig. 7. *Labuanium rotundatum* (Hess, 1865). Male, 42.9 × 39.7 mm, ZRC 2002.454a, Faifai Beach, Guam. Left chela. A, outer view; B, dorsal view; C, inner view.

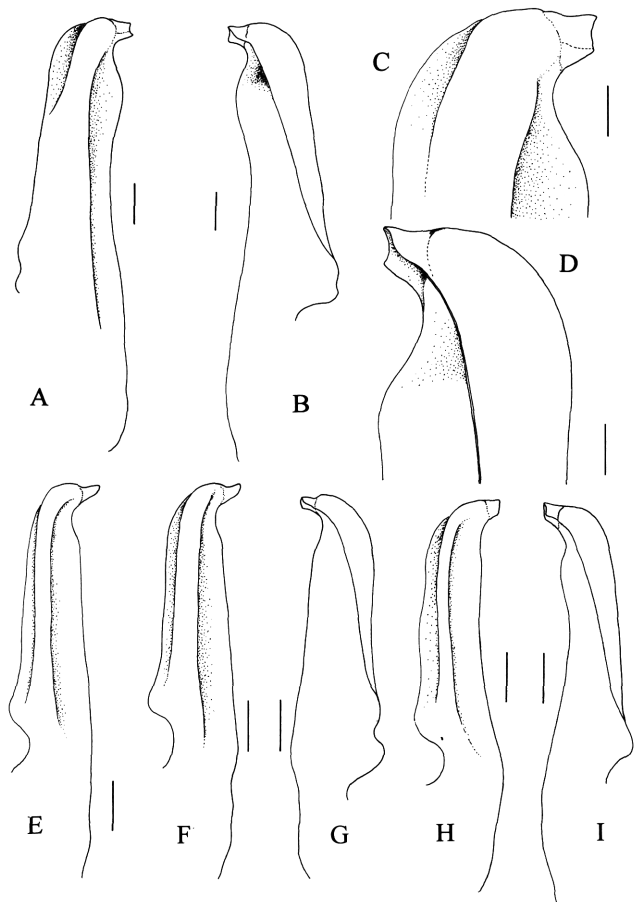


Fig. 8. *Labuanium rotundatum* (Hess, 1865). Left G1s (denuded). A–D, male, 42.9 × 39.7 mm, ZRC 2002.454a, Faifai Beach, Guam; E–G, male, 28.0 × 29.1 mm, BPBM 4191, Swain's Island; H, I, male, 27.9 × 17.0 mm, ZRC, Haputo Beach, Guam. A, E, F, H, dorsal (sternal) views; B, G, I, ventral (abdominal) views; C, distal part, dorsal (sternal) view; D, distal part, ventral (abdominal) view. Scales equal 1.0 mm (A, B, E–I), and 0.5 mm (C, D).

each species, but when specimens of equivalent or similar sizes are compared, the differences are marked.

The specimens of *L. rotundatum* from Swain Island in Samoa (BPBM 4191) are rather problematic in that their carapace is somewhat less granular compared to those from Guam (but still more so than in *L. scandens*), and their G1s appear to be more slender (Fig. 8E–G). In fact, the overall form of the G1 of these specimens is more similar to that of *L. scandens*, although the distal chitinous part is gently bent upwards like in *L. rotundatum* rather than at 90°. Also notable is that the carapaces of both males from Samoa are longer than broad. No other specimens of *L. rotundatum* examined so far from elsewhere have such proportions, their carapaces always being broader than long. The form of their chelae, however, is typical for *L. rotundatum*. Nevertheless, in lieu of more specimens, it seems best to refer these specimens to *L. rotundatum* for the time being. However, it is quite possible that there is more than one species belonging to what is here identified as *L. rotundatum*, and some of the synonyms may be shown to be valid in the future. But the G1s of more specimens from throughout the Pacific must be examined before more can be said. In any case, there is no doubt that the Taiwan specimens are very different from *L. rotundatum* and all the other taxa now synonymized with it.

*Labuanium scandens* is known only from southern Taiwan thus far. Although Sakai (1939) recorded *L. rotundatum* from Tansui in northern Taiwan, we have not yet found it there. The coastal areas of northern Taiwan have been heavily developed in recent years and pristine habitats are no longer extant there. Sakai's (1939: pl. 110 fig. 4, 1976: text fig. 362) figure of *L. rotundatum* leave little doubt that his specimen is conspecific with *L. scandens*.

*Color*.—The color of *L. scandens* varies somewhat with age. Smaller specimens are usually darker brown and mottled with light brown to white blotches and dark specks.

Larger specimens are usually of a more uniform darker brown. The chela of larger males and females are mainly dirty white, with the dactylus purplish. In sharp contrast, adult *L. rotundatum* are usually a more uniform grey to dark greyish-brown, although smaller ones have a blotchy carapace. In general, the color of *L. rotundatum* is darker than *L. scandens*. The chelae of *L. rotundatum* are also uniformly white to dirty-white.

*Notes on habits*.—*Labuanium scandens* is a phytotelmic tree-climbing species. Its presence is closely associated with the presence of closed forest canopy and the availability of water-filled tree-holes. Tree species where the crabs have been recorded from are *Hernandia sonora*, *Barringtonia asiatica* and *Aglaia elliptifolia*. The tree cavities in which *L. scandens* live can sometimes be deep, occasionally over 50 cm. The tree holes collect rain-water, and the pools vary in depth from several centimeters to over 40 cm, depending on the season. The phytotelm water ranges from clear to dark-brown and turbid with a lot of sediment. The tree holes in which the crabs are found are always sheltered from direct sunlight. *Labuanium scandens* not only uses these holes as refuges, but also molts there, under the water. In the several cases when *L. scandens* was observed molting in the wild, the exuviae were not eaten soon after, disappearing only after a few days, although it is not certain if the crab itself is responsible. In three cases, the crab molted in captivity, and the exuviae were consumed by the crab shortly after it had hardened. *Labuanium scandens* has been found to inhabit holes between 0.5 to 4 m from the ground, but have been observed climbing over 5 m high in trees. It is primarily nocturnal, hiding in tree-holes during the day. Of the over 52 specimens of *L. scandens* observed (not all collected), the only time they were found on the ground is when they are ovigerous and are making their way to the sea. Ovigerous females can be found from July to October. The eggs are

small and hatch out into pelagic, free-swimming larvae. The release of larvae seems correlated with the lunar cycle, with females making their way to the sea during the full moon period.

Not much is known about their diet. Specimens have been observed to scrape algae or lichens off the tree bark, as well as feed on dried leaves and flowers. The chelae of *L. scandens* are not particularly adapted to scrape algae off trees like in many other known tree climbing sesarmid crabs (Sivasothi et al. 1993, Lim et al. 1999), suggesting that this species has a more varied diet, probably including animal matter.

*Labuanium rotundatum* (Hess, 1865)

Figs. 5–8

*Sesarma rotundata* Hess, 1865:149, pl. 6 fig. 9 (type locality ostensibly Sydney, Australia, but see "Remarks").

*Sesarma dentifrons* A. Milne-Edwards, 1869:31 (type locality Samoa).

*Sesarma oceanica* De Man, 1889:429, pl. 10 fig. 9 (type locality Ponape Island).

*Sesarma (Episesarma) rotundata* var. *papuo-malesiaca* Nobili, 1899:268 (type localities Nias Islands [western Sumatra, Indonesia], New Guinea).

*Sesarma gardineri* Borradaile, 1900:593, pl. 42 fig. 8 (type locality Funafuti, Rotuma Islands).

*Sarmatium faxoni* Rathbun, 1906:841, pl. 7 fig. 1 (type locality Oahu, Hawaii).

*Labuanium rotundatum*—Serène & Soh 1970:401; Davie, 2002:221.

(For complete synonymy, see Tesch 1917: 193)

*Material examined*.—7 males, 16.4 × 15.9 mm, 31.6 × 30.8 mm, 34.4 × 32.1 mm, 36.8 × 35.6 mm, 39.3 × 39.2 mm, 42.9 × 39.7 mm, 43.7 × 41.2 mm, 3 females, 15.1 × 14.8 mm, 28.1 × 27.3 mm, 42.5 × 39.7 mm, ZRC 2002.454, in forest, Faifai Beach, near Gun Beach, Tumon Bay, Guam, coll. H.-C. Liu & P. K. L. Ng, 28

Jul–01 Aug 2001; 2 males, 22.2 × 21.1 mm, 22.5 × 21.2 mm, ZRC 2002.457, Ritidian Point, northern Guam, coll. H.-C. Liu & P. K. L. Ng, 31 Aug 2001; 2 males, 27.9 × 17.0 mm, 19.1 × 18.6 mm, 1 female, 11.9 × 11.6 mm, ZRC 2002.456, Haputo Beach forest, Guam, coll. P. K. L. Ng, 3 Aug 2001; 1 ex-ovigerous female, 31.6 × 30.4 mm, ZRC 2002.455, with first zoeae, hatched 4 Aug 2001, Haputo Beach forest, Guam, coll. P. K. L. Ng, 3 Aug 2001; 1 male, post-molt, carapace soft, deformed, ca. 37.9 × 35.7 mm, BPBM 4354, Puka-Puka Island, northern group of Cook Islands, coll. R. D. Frisbe, 1936; 1 male, 28.0 × 29.1 mm, 1 female, 35.2 × 34.5 mm, BPBM 4191, 1 male, 24.0 × 24.5 mm, ZRC 2002.453, Swain's Island, American Samoa, coll. Itasca Expedition, Mar 1936; 1 male, 23.5 × 23.8 mm, 1 female, 36.5 × 35.6 mm, BPBM S10701, Arno Atoll, Marshall Islands, no other data. 1 female, 37.0 × 34.4 mm, USNM 22837, holotype of *Sarmatium faxoni* Rathbun, 1906, Oahu, Hawaii.

*Distribution*.—Nias Islands (western Sumatra, Indonesia), Java, Samoa, Ponape Island, Nias Islands (western Sumatra, Indonesia), New Guinea, Guam, Puka-Puka Island (Cook Islands), Funafuti (Rotuma Islands), Marshall Islands, Oahu (Hawaii).

*Remarks*.—In describing *Sesarma rotundata*, Hess (1865) noted that he only had one specimen measuring 45 by 45 mm from "Sydney". The specimen was supposed to be deposited in the Zoological Museum of Göttingen (Germany). The specimens of Hess have since been transferred to the Senckenberg Museum (Frankfurt am Main). Andreas Allspach, who compiled a list of the extant Hess material for Peter Davie, could not locate the type of *Sesarma rotundata*, and the specimen is almost certainly no longer extant (P. Davie, pers. comm.). In addition, Davie (2002:221) comments that "The type locality of 'Sydney' [for *Sesarma rotundata*] is certainly erroneous; extensive field collecting across northern Australia has so far failed to rediscover the exist-

tence of *L. rotundatum*; it is most likely that it was collected from the islands of the south-west Pacific and sent to Hess via Sydney". The selection of a neotype for *Sesarma rotundata* Hess, 1865, would be necessary if it is later shown that what is now called *L. rotundatum* is composed of more than one cryptic species. But this should only be done when all the types of the putative synonyms are also re-examined. As things are now, *L. scandens* is so different from *L. rotundatum* as it is now understood that there is no need for a neotype for the latter species.

Other aspects of the taxonomy of *L. rotundatum* have been discussed earlier under the "Remarks" for *L. scandens*.

*Color*.—The carapace of adult *L. rotundatum* is usually uniform grey to dark greyish-brown, with smaller specimens having more light and dark colored blotches. The chelae are always uniform white to dirty-white, without any bright colors.

*Notes on habits*.—It is also useful to make some notes about the ecology of *L. rotundatum* in Guam. In general, the habits of *L. rotundatum* parallel those of *L. scandens*. On Guam, we have found them on coconut trees some 20–30 m from the sea, as well as on large *Pandanus*. Specimens were observed at heights of up to 4 m from the ground. Smaller specimens have also been found on near-vertical rocks at the base of large trees. They are more active during rain. Specimens were mostly observed moving about only at night.

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#### Literature Cited

- Borradaile, L. A. 1900. On some Crustaceans from the South Pacific. Part IV. The Crabs.—Proceedings of the Zoological Society of London 1900:568–596, pls. 40–42.
- Cai, E.-X., Z.-G. Huang, A.-Y. Dai, H.-L. Chen, & S.-L. Yang. 1994. Brachyura. Pp. 576–600 in Z.-G. Huang, ed., Marine species and their distributions in China's Seas. Department of Ocean Management and Monitoring State Oceanic Administration. China Ocean Press, Beijing.
- Dai, A.-Y., & S.-L. Yang. 1991. Crabs of the China Seas. China Ocean Press, Beijing & Springer-Verlag, Berlin, pp. 21+608, figs. 1–295, pls. 1–74.
- , Y.-Z. Song, & G.-X. Chen. 1986. Crabs of the China Seas. China Ocean Press, Beijing, 11+642 pp. (in Chinese)
- Davie, P. J. F. 2002. Crustacea: Malacostraca. Eucarida (Part 2). Decapoda—Anomura, Brachyura. Zoological Catalogue of Australia. 19.3B. CSIRO Publications, 641 pp.
- Hess, W. 1865. Beiträge zur Kenntnis der Decapoden-Krebse Ost-Australiens.—Archiv für Naturgeschichte 36:127–173, pls. 1, 2.
- Lim, K. K. P., D. H. Murphy, N. Sivasothi, P. K. L. Ng, & K. S. Tan. 1999. Animals. Pp. 4–158 in P. K. L. Ng & N. Sivasothi, eds., A guide to the mangroves of Singapore. II. Animal diversity. Singapore Science Centre.
- Liu, H.-C. 1999. Tales of Taiwanese land crabs.—Taiwan Natural Science 63:76–90. (in Chinese)
- Man, J. G. De. 1889. Ueber einige neue oder seltene indopacifische Brachyuren.—Zoologische Jahrbücher, Abteilung für Systematik, Geographie und Biologie der Tiere 4:409–452, pls. 9, 10.
- . 1891. Carcinological studies in the Leyden Museum. No. 5.—Notes of the Leyden Museum 13:1–61, pls. 1–4.
- . 1896. Ueber neue und wenig bekannte Brachyuren des Hamburger und Pariser Museums.—Mitteilungen aus dem Naturhistorischen Museum zu Hamburg 13:75–118, 3 pls.
- Milne-Edwards, A. 1869. Notes sur quelques nouvelles espèces du genre *Sesarma* (Say).—Nouvelles Archives du Muséum d'Histoire Naturelle, Paris 5:25–31.
- Ng, P. K. L. 1988. The Freshwater Crabs of Peninsular Malaysia and Singapore. Department of Zoology, National University of Singapore, Shinglee Press, Singapore, pp. i–viii, 1–156, 4 color pls.
- , C.-H. Wang, P.-H. Ho, & H.-T. Shih. 2001.

- An annotated checklist of brachyuran crabs from Taiwan (Crustacea: Decapoda).—National Taiwan Museum Special Publication Series, Taipei 11:1–86, 8 color pls.
- Nobili, G. 1899. Contribuzioni alla conoscenza della fauna carcinologica della Papuasia, delle Molucche e dell'Australia.—*Annali dei Museo Civico di Storia Naturale di Genova* (2)20:230–282.
- Rathbun, M. J. 1906. The Brachyura and Macura of the Hawaiian Islands.—*United States Commission Bulletin for 1903, part 3*:827–930, i–viii (index), pls. 1–24.
- Sakai, T. 1939. Studies on the crabs of Japan. IV. Brachygnatha. Brachyrhyncha. Pp. 365–741, pls. 42–104. Yokendo Ltd., Tokyo.
- . 1940. Bio-geographic review on the distribution of crabs in Japanese waters.—*Records of Oceanographic Works, Japan* 11:27–63.
- . 1976. Crabs of Japan and the adjacent seas. In three volumes: (1) English Text, pp. xxix+773 pp.; (2) plates vol., pp. 1–16, plates 1–251; (3) Japanese text, pp. 1–461. Kodansha Ltd., Tokyo.
- Serène, R., & C. L. Soh. 1970. New Indo-Pacific genera allied to *Sesarma* Say, 1877 (Brachyura, Decapoda, Crustacea).—*Treubia* 27(4):387–416.
- Sivasothi, N., D. H. Murphy, & P. K. L. Ng. 1993. Tree-climbing and herbivory of crabs in the Singapore mangroves. Pp. 220–237 in A. Sasekumar, ed., *Mangrove Fisheries and Connections. ASEAN-Australia Marine Science Project: Living Resources (Malaysia)*. Kuala Lumpur, Malaysia.
- Tesch, J. J. 1917. Synopsis of the genera *Sesarma*, *Metasesarma*, *Sarmatium* and *Clistocoeloma*, with a key to the determination of the Indo-Pacific species.—*Zoologische Mededelingen, Leiden* 3: 127–260, pls. 15–17.