

smooth to mildly tuberculated, the distal part of the G1 bends at 90° (Fig. 18G) or slightly inwards (Fig. 18L), and the right first and second anterolateral lobe of a female specimen (ZRC, 13.3 by 19.2 mm) are separated by a narrow gap but the left lobes are fused.

The syntype deposited in the BMNH is hereby designated as the lectotype for the species.

A specimen from southern China was examined and it fits well into the current definition of *H. japonica*. This record thus extends the range of the species further south.

Host records. - Often found on *Comanthus japonicus*.

Distribution. - Occurs in Japan and southern China. In Japan, it has been often found together with *C. trilobatus* on comatulid crinoids. In southern China, two other crinoid dwelling species, *C. frontodentata*, *C. longimanus* and *Rhabdonotus pictus* are present as well.

Harrovia longipes Lanchester, 1900

(Figs. 19-23)

Harrovia albolineata var. *longipes* Lanchester, 1900: 729, pl. 44: Fig. 3 [type locality Singapore]; Flipse, 1930: 76, 77, 80, 90 [list only]; Serène et al., 1958: 239 [list only].

Harrovia albolineata - Serène et al., 1958: 200, 239, Figs. 7G, 8, 9, 13C 13 [broken-line drawing], pls. 4C, 6, 7: Figs. A, B [Vietnam] (part); Serène, 1968: 63 [list only] (part); Lim & Ng, 1988: 217, Fig. 1 [Singapore; larvae]; Stevcic et al., 1988: 1311 [list only] (part); Ng & Lim, 1990: 257 [Singapore] [not *Harrovia albolineata* Adams & White, 1849].

Harrovia longipes - Chia et al., 1993: 274, plate 1B, Figs. 1B, 3, 4, 5C, D, 6B, D, 7K-N, 8A [Singapore, Malaysia].

Harrovia plana Ward, 1936: 10, pl. 3: Figs. 7, 8 [type locality Lindeman Island, Whitsunday Passage, Queensland, Australia]; Serène et al., 1958: 198, 240 [list only]; Serène, 1968: 63 [list only]; Stevcic et al., 1988: 1312 [list only].

Material examined. - **Singapore:** 1 female (ZRC 1997.184), Raffles Lighthouse, coll. J. Christophe, Apr. 1993. **Peninsular Malaysia:** 2 males (6.0 by 8.2 mm) (ZRC 1997.185-186), Pulau Gelok, coll. D. Chia & C. P. How, 27 Jun. 1993. **Vietnam, Gulf of Tonkin:** 1 female, (6.4 by 8.9 mm) (IOAS), Yezhu Island, Yolong Bay, 6-9 m, from crinoid, leg. Neumann, 23 Nov. 1990. **Philippines:** 1 male (4.0 by 4.5 mm) (MNHN B25636), coll. MUSORSTOM 3, R.V. 'Coriolis', no other data. **Australia:** 1 male (5.5 by 6.6 mm) (QM W741, holotype of *H. plana*), Lindeman Island, Whitsunday Passage, Australia, M.E.Q. - 1 female (QM W16275), Flinders reef, off Cape Moreton, SE Queensland, 26°59'S, 153°29'E, 6-20 m, coll. P. Davie, J. Short & P. Lawless, 10 Mar. 1989. - 1 female (QM W15970), Davies reef lagoon, northeast Queensland, A.I.M.S., 18°50'S, 147°39'E, 7 m, coll. K. Fabricius, 24 Oct. 1988. - 1 juvenile male (2.7 by 2.7 mm) (MNHN B24737), Lizard Island, Queensland, 15 m, on *Lamprometra palmatagyges*, coll. P. Castro, 8 Aug. 1992. - 3 males (5.0 by 5.9 mm), 5 females, 6 juveniles (MNHN B25637), Great Barrier Reef, Queensland, Australia, coll. K. Fabricius. - 1 male (4.6 by 5.4 mm) (AM P17857), off Heron Island, Queensland, Australia, 23°27'S, 151°55'E, coll. K. Gillett, 6 Jan. 1969. **New Caledonia:** 1 male (4.8 by 5.8 mm) (MNHN B21548), coll. 1903. - 1 male (5.8 by 7.2 mm) (MNHN B25638), Lagon East, Station 0692, 21°31'S, 166°12.3'W, 44-48 m, coll. 9 Aug. 1986. - 1 female (MNHN B25639), Lagon East, Station 0710, 21°24'S, 166°02'E, 30-31 m, coll. 10 Aug. 1986. - 1 female (MNHN B25640), Iles des Pins, Station 586, 22°48'S, 167°35'E, 57 m, coll. 18 Jul. 1985. - 1 male (5.2 by 6.0 mm), 1 female (MNHN B25641), Lagon East, Station 0686, 21°34.3'S, 166°15.8'E, 33-35 m, coll. 9 Aug. 1986. - 1 male (MNHN B25642), Lagon East, Station 0736, 22°06.7'S, 166°58.4'E, 44-45 m, coll. 12 Aug. 1986. - 1 male (5.5 by 6.7 mm), 1 female (MNHN B25643), Lagon East, Station. 0723, 21°21.6'S, 165°56.7'E, 45 m, coll. 12 Aug. 1986. - 1 male, 1 female (MNHN B25644), east coast Touho, Ti°, 5-7 m, coll. no other data. - 2 males (badly damaged) (7.1 by 8.2 mm, 7.1 by 9.5 mm) (MNHN B25645), Touho, Ti° shoal, 5-7 m, coll. 9 Sep. 93. - 1 male (6.8 by 8.4 mm), 1 female (MNHN B25646), Bathust Cruise, Station DW 1236, 21°18.13'S, 165°53.68'E, coll. R.V. 'Alis', 13 Mar. 1993. - 1 female (MNHN B25647), east coast of Touho,

20°44.20'S, 165°14'E, 51-59 m, Montrouzier expedition, coll. 15 Sep. 1993. **Papua New Guinea:** 1 male (8.0 by 10.1 mm), 1 female (MNHN B24750), Wongad Island, Madang, 3-6 m, on *Comaster* sp., coll. P. Castro, 19 Aug. 1992. - 1 female (MNHN B24752), Tab Island, Madang, 1-6 m, on *Comaster* sp., coll. P. Castro, 18 Aug. 1992. - 1 female (MNHN B24751), Rasch Passage, Madang, 14 m, on *Comissia* sp., coll. P. Castro, 19 Aug. 1992. - 1 female (MNHN B24753), Wongad Island, Madang, 10 m, on *Comaster gracillis*, coll. P. Castro, 21 Aug. 1992. - 1 female (MNHN B24754), Madang, on *Comaster* sp., coll. P. Castro, no other data. - 1 female (IRSNB I.G n° 26.227), NE Duangit, dredged in Hansa Bay, 50 m, sand, *Halimeda* substratum, coll. J. Pierret, 9 Dec. 1980. - 1 male (IRSNB), Lahaye, on *Comaster multibrachiatus*, Nov. 1990, no other data. - 1 male (IRSNB sample no. 212), east side of Miller slope, on *Comaster schoenovi*, 42 m, no other data. - 1 male (IRSNB sample no. 252), on *Comaster multifidus*, no other data. - 1 female, 2 juveniles (ZRC 1997.187-189), Padoz Tinan Reef, Madang, 5°09.53'S, 145°48.88'E, 3 m, on *Comaster multifidus* (3 separate crinoids), reef crest, coll. P. Castro, 21 Dec. 1993. - 1 male, 2 females (ZRC 1997.190-192), north Tab Island, Madang, 5°10'S, 145°50'E, 5 m, on *Comaster multifidus* (3 separate crinoids), reef crest of barrier reef, coll. P. Castro, 20 Dec. 1993. - 2 males (ZRC 1997.193-194), Wongad Natun reef, Madang, 5°08.31'S, 145°49.36'E, 4 m, on *Comaster multifidus*, reef crest, coll. P. Castro, 29 Dec. 1993. - 2 males, 1 female (ZRC 1997.195-197), Padoz Tinan Reef, Madang, 5°09.53'S, 145°48.88'E, 3 m, on *Comaster multifidus*, reef crest, coll. P. Castro, 19 Dec. 1993. - 1 female (ZRC 1997.198), Padoz Natun Reef, Madang, 5°09.60'S, 145°48.77'E, on *Comaster multifidus*, reef crest, coll. P. Castro, 17 Dec. 1993. - 1 male (ZRC 1997.199), Padoz Natun Reef, Madang, 5°09.60'S, 145°48.77'E, 1 m, on *Comaster multifidus*, reef crest, coll. P. Castro, 27 Dec. 1993. - 1 male (ZRC 1997.200), Padoz Tinan Reef, Madang, 5°09.53'S, 145°48.88'E, 3 m, on *Comaster multifidus*, reef crest, coll. P. Castro, 26 Dec. 1993. - 1 male (ZRC 1997.208), Matazeng Reef, Madang, 3 m, on *Comaster multifidus*, reef crest, coll. P. Castro, 27 Dec. 1993. **Indonesia:** 2 males, 2 females (8.8 by 11.3 mm) (MNHN B24764), Siladen, Sulawesi, 10-12 m, on crinoid, coll. P. Castro, 20 Sep. 1992. - 2 females (11.2 by 14.9 mm) (MNHN B24765a-b), Bunaken, Sulawesi, 10-15 m, on crinoid, coll. P. Castro, 20 Sep. 1992. 1 male (7.5 by 10.0 mm), 1 female (MNHN B24763a-b), Mantehage, Sulawesi, 18 m, on crinoid, coll. P. Castro, 19 Sep. 1992. - 1 female (MNHN B24761), Samalona Island, Sulawesi, 4 m, on crinoid, coll. P. Castro, 13 Sep. 1992. - 1 juvenile female (MNHN B24762), Nain Island, Sulawesi, on crinoid, coll. P. Castro, 19 Sep. 1992. - 1 female (MNHN B24770), Amed, Bali, Lesser Sunda Islands, 3-5 m, on crinoid, coll. P. Castro, 3 Oct. 1992. - 5 males (4.0 by 4.5 mm), 5 females (9.3 by 11.6 mm, 9.0 by 11.5 mm, 6.7 by 8.3 mm) (MNHN B24768a-j), Saparna Island, Moluccas, 10-15 m, on crinoid, coll. P. Castro, 24 Sep. 1992. (For type and materials from Malaysia and Singapore, see Chia et al., 1993).

Diagnosis. - Carapace hexagonal, regions not well defined, usually with two tubercles on protogastric regions, but sometimes absent; surface usually thinly pubescent. Anterolateral margins separated into four lobes; separated by shallow, narrow fissures, the first and second lobes generally lobiform, very low, subtruncate, the margins usually straight or slightly concave; third lobe varies, either subtruncate or dentiform or lower part of the third lobe becomes dentiform whereas upper part remains subtruncate; fourth lobe distinctly dentiform. Frontal margin with small median fissure, slightly deflexed, appearing straight from dorsal view, shallow median cleft. Chelipeds cylindrical, carpus without large tubercle or spine on distal inner margin of carpus, several tubercles on the inner and outer proximal margin of merus. Ambulatory legs long, slender, ratio of length to width of fourth ambulatory merus 3.0-4.3, anterior margin of the ambulatory merus lined with strong spinules. Distal part of G1 bends at approximately 45°, sometimes 90°.

Sexual dimorphism. - Males have disproportionately larger and stouter chelipeds as compared to the females.

Remarks. - Chia et al. (1993) have clarified to a large extent the taxonomy and status of *H. longipes* occupying the Sunda Shelf (continental Southeast Asia). However, re-examination of the extant type specimens and extensive preserved and live materials from other regions has shown that the poorly known species, *H. plana* Ward, 1936, is actually a junior synonym of *H. longipes* Lanchester, 1900.

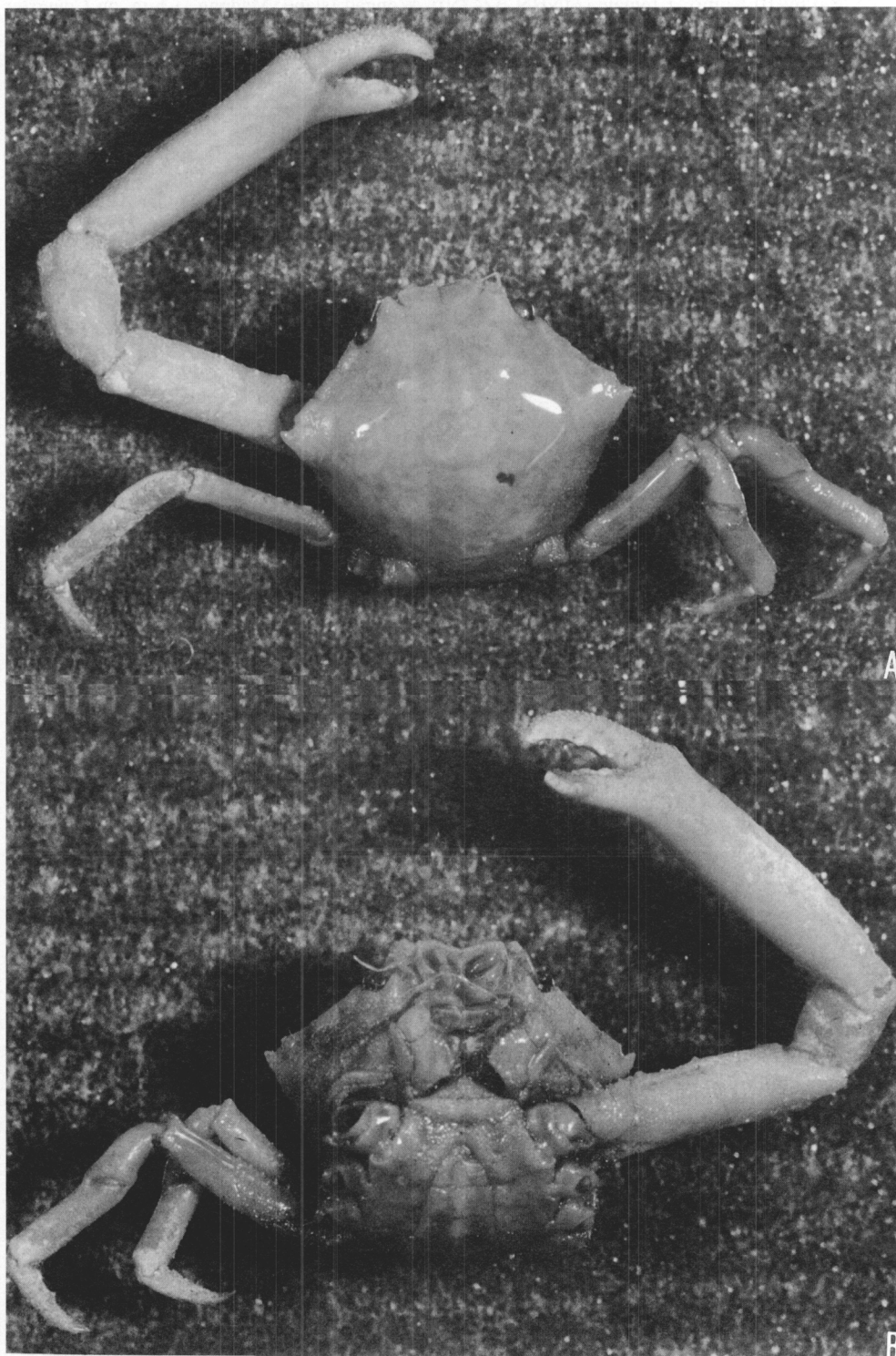


Fig. 19. *Harrovia longipes* Lanchester, 1900. Holotype male, 6.4 by 8.3 mm (BMNH 1900.10.22.42). A, dorsal view; B, ventral view.

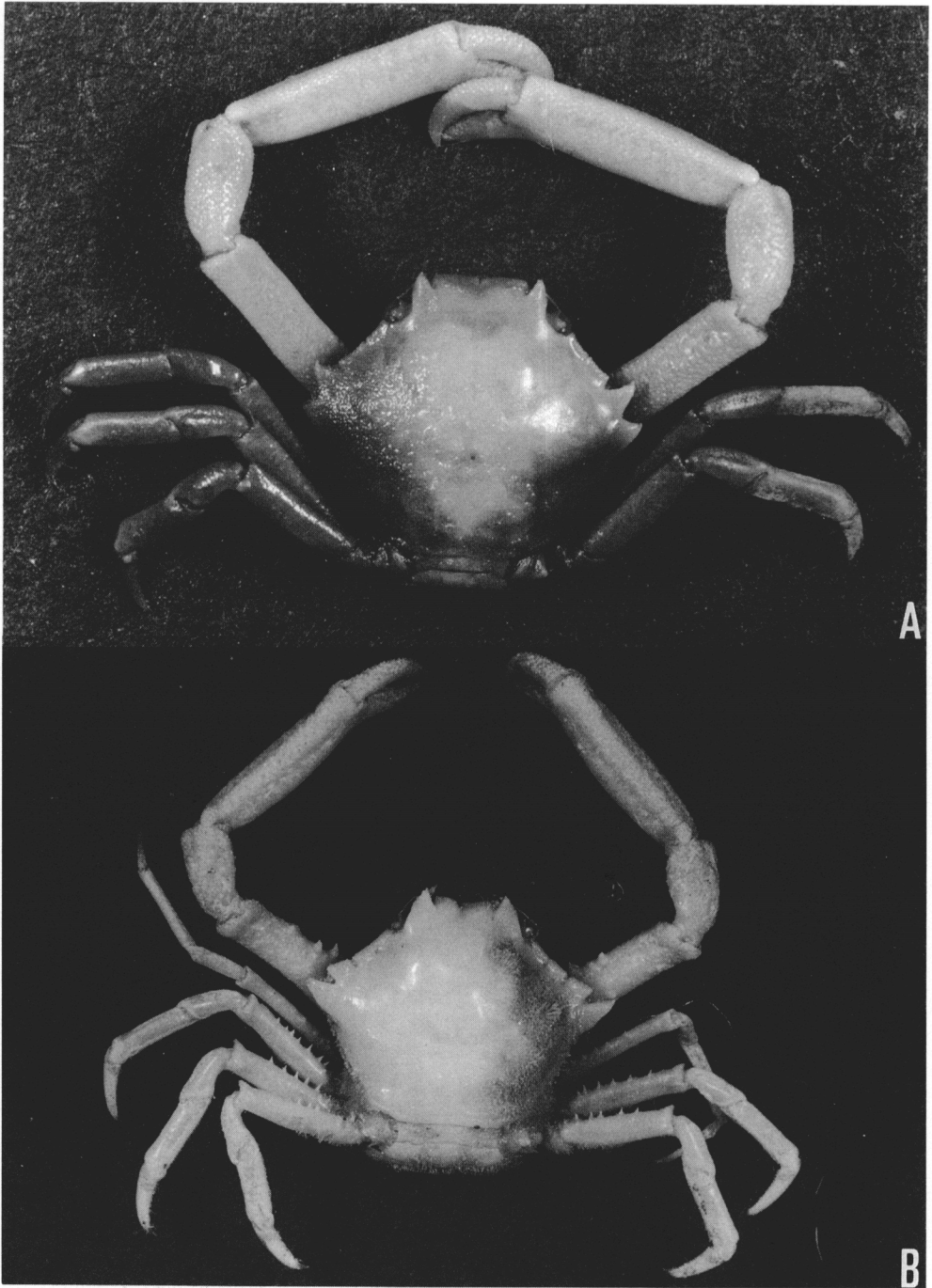


Fig. 20. *Harrovia longipes* Lanchester, 1900. A, holotype male of *H. plana* Ward, 1936, 5.5 by 6.6 mm (QM W741). B, female, 6.4 by 8.9 mm (IOAS).

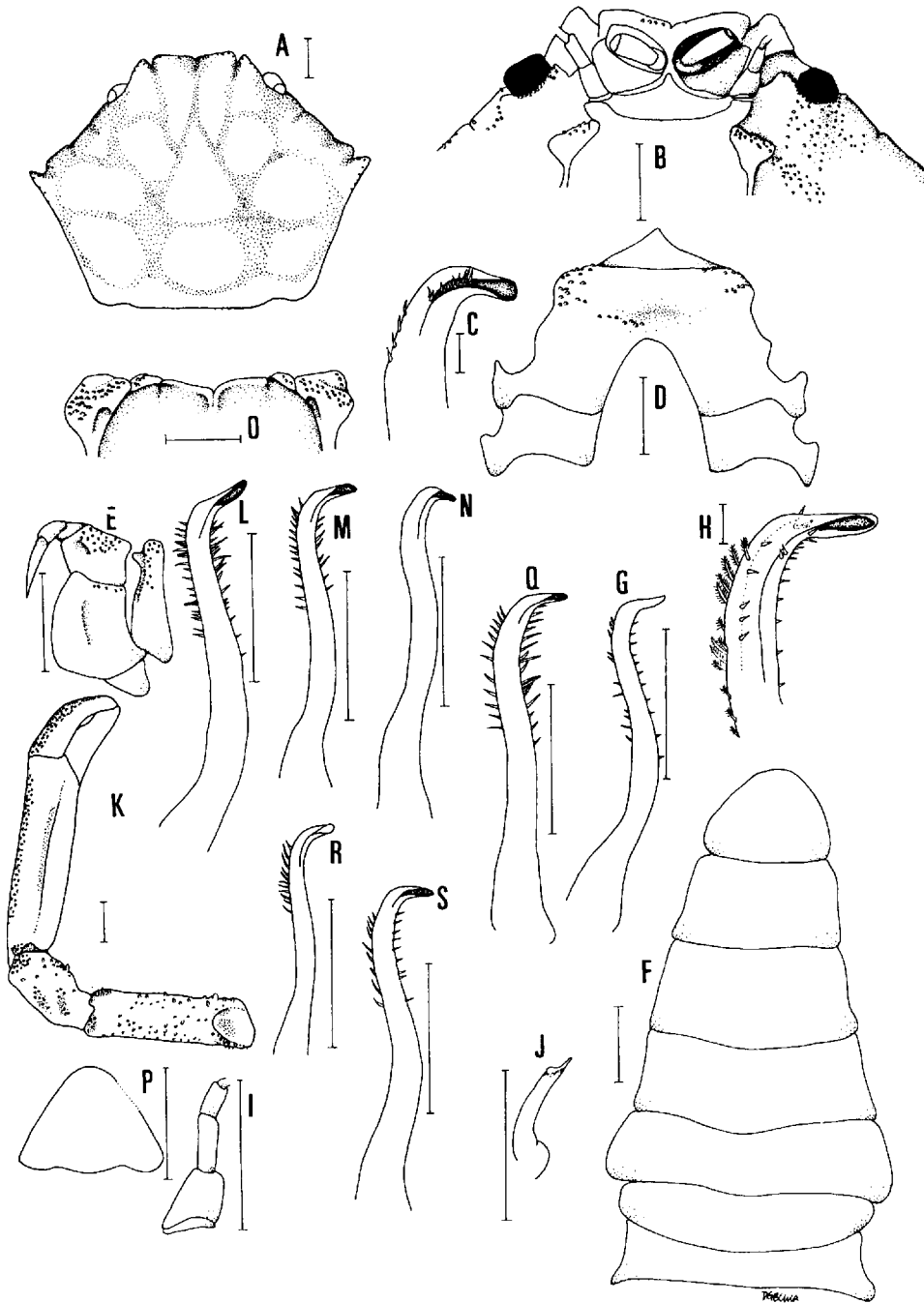


Fig. 21. *Harrovia longipes* Lancheater, 1900. A, B, D, E, G-K, P, holotype male, 6.4 by 8.3 mm (BMNH 1900.10.22.42); C, N, holotype male of *H. plana*, 5.5 by 6.6 mm (QM W741); F, O, male, 9.1 by 11.8 mm (ZRC 1992.9525); L, male, 8.0 by 10.1 mm (MNHN B24750); M, male, 5.2 by 6.0 mm (MNHN AC82-83); Q, male, 6.0 by 8.2 mm (ZRC 1997.185-186); R, male, 4.6 by 5.4 mm (AM P17857); S, male, 5.8 by 7.2 mm (MNHN AC79). A, dorsal view of carapace; B, face of carapace; C, distal tip of left G1; D, thoracic sternum; E, left third maxilliped; F, abdomen; G, left G1; H, distal tip of left G1; I, antenna; J, left G2; K, postero-dorsal view of left cheliped; L, M, left G1; N, left G1; O, endostome; P, 7th abdominal segment; Q-S, left G1. Scales: A-B, D-G, I-S = 1.0 mm; C, H = 0.1 mm.

The only difference between *H. longipes* and *H. plana* seems to lie in the form of the anterolateral lobes. *Harrovia longipes* usually has anterolateral lobes one, two and three subtruncate, follow by a dentiform fourth anterolateral lobe (Fig. 23A). In *H. plana*, anterolateral lobes one and two are subtruncate and tuberculated, but anterolateral lobes three and four are distinctly dentiform and acute (Fig. 23J). This character proves to be highly unsatisfactory when it comes to identifying specimens from New Caledonia, Papua New Guinea, Moluccas and Sulawesi (especially in the latter two localities). There seems to be an intermediate form existing in the Sulawesi. In these areas, the third anterolateral lobe of some specimens seem to be half truncate and half dentiform (Figs. 23E, F). The upper part of the third anterolateral appears to be subtruncate and lined with tubercles whereas the lower part is dentiform. Other than the intermediates, there is also a mixture of specimens examined from these regions, some resembling *H. longipes* (Fig. 23D), others resembling

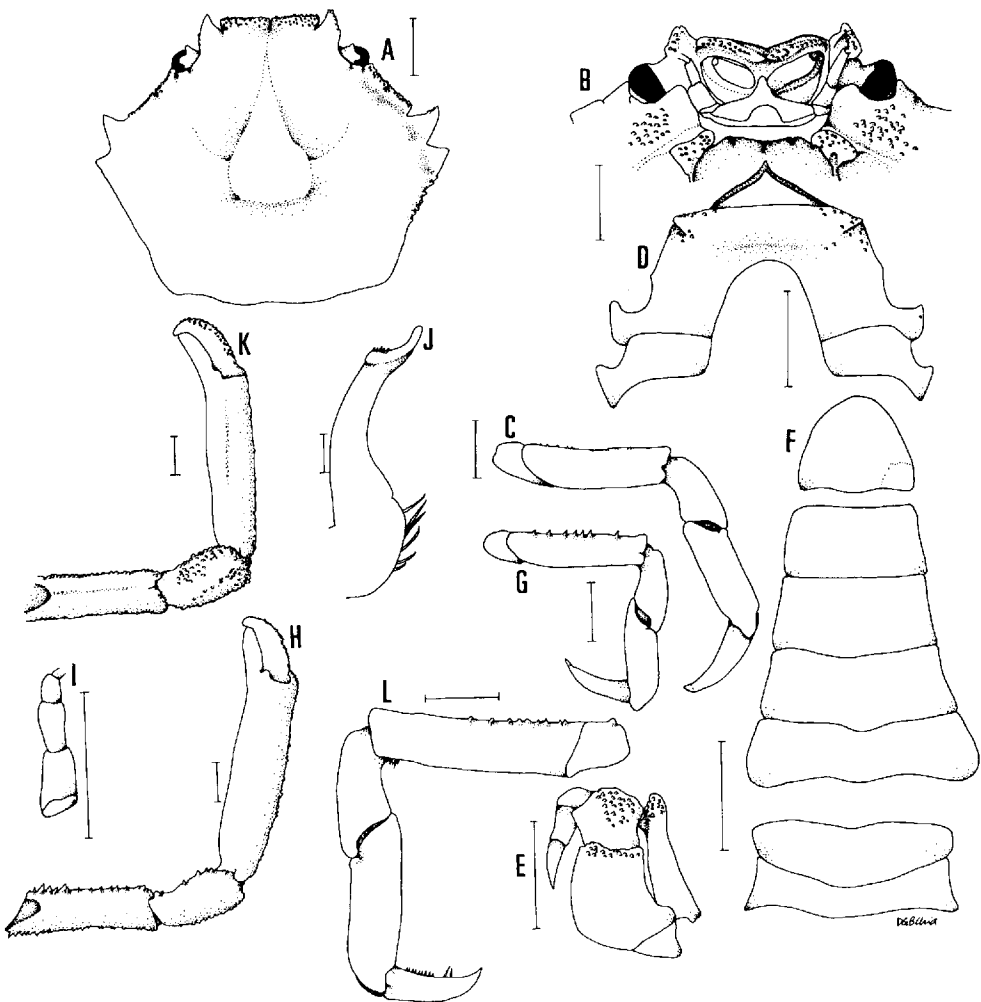


Fig. 22. *Harrovia longipes* Lanchester, 1900. A-F, I-K, holotype male (of *H. plana* Ward, 1936), 5.5 by 6.6 mm (QM W741); G, H, male, 5.8 by 7.2 mm (MNHN AC79); L, holotype male of *H. longipes*, 6.4 by 8.3 mm (BMNH 1900.10.22.42). A, dorsal view of carapace; B, face of carapace; C, fourth right ambulatory leg; D, thoracic sternum; E, left third maxilliped; F, abdomen; G, fourth right ambulatory leg; H, postero-dorsal view of right cheliped; I, antenna; J, left G2; K, postero-dorsal view of right cheliped; L, fourth left ambulatory leg. Scales: A-I, K-L = 1.0 mm; J = 0.1 mm.

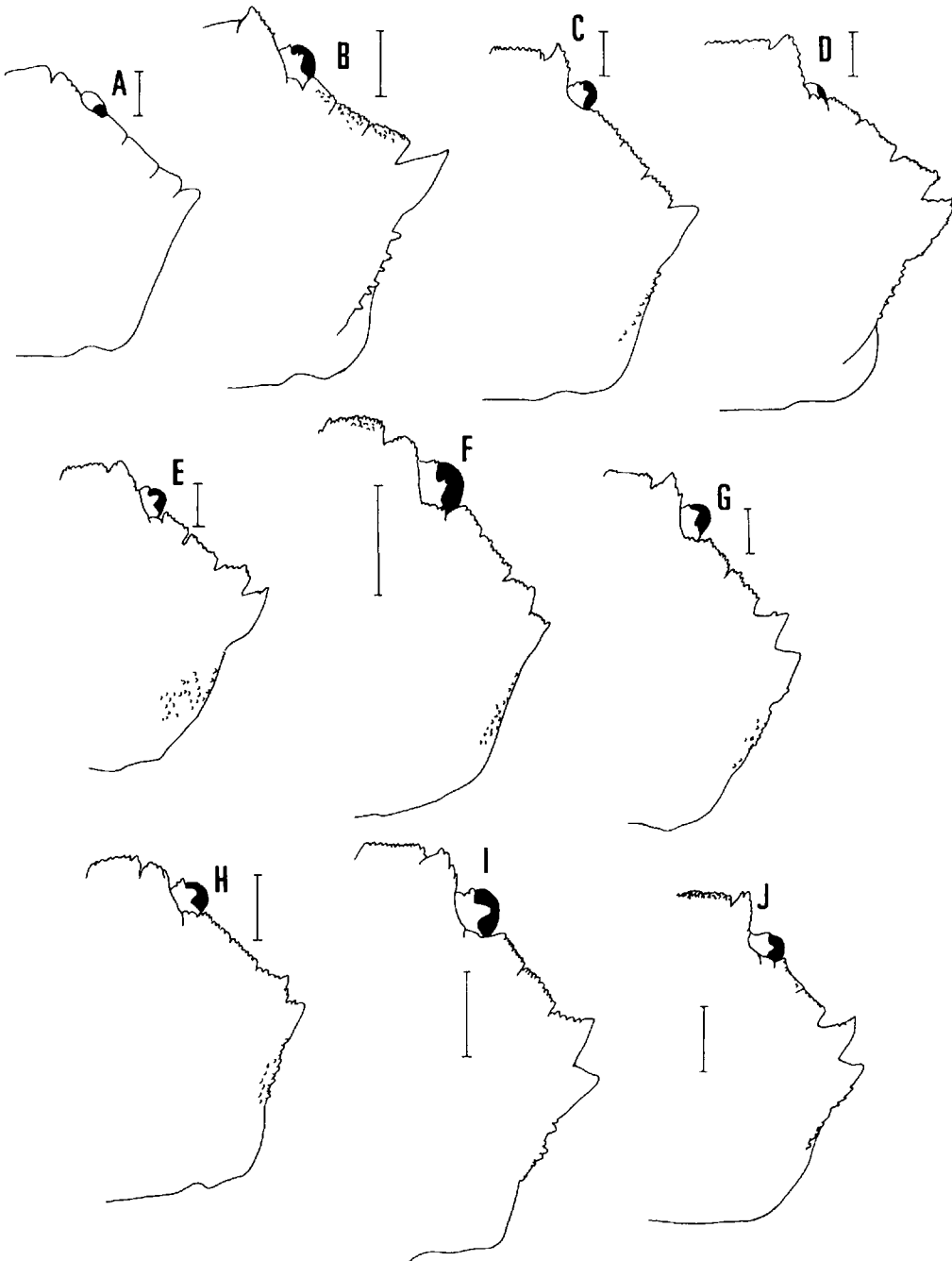


Fig. 23. *Harrovia longipes* Lanchester, 1900. Anterolateral lobes (schematic): A, holotype male, 6.4 by 8.3 mm (BMNH 1900.10.22.42); B, female, 6.4 by 8.9 mm (IOAS); C, male, 8.8 by 11.3 mm (MNHN B24764); D, female, 11.2 by 14.9 mm (MNHN B24765); E, male, 7.5 by 10.0 mm (MNHN B24763a); F, male, 4.0 by 4.5 mm (MNHN B24768a); G, female, 9.0 by 11.5 mm (MNHN B24768c); H, male, 5.5 by 6.7 mm (MNHN AC85); I, male, 5.2 by 6.0 mm (MNHN AC82-83); J, holotype male of *H. plana* Ward, 1936, 5.5 by 6.6 mm (QM W741). Scales = 1.0 mm.

H. plana (Fig. 23G). Most of the specimens from Sulawesi approach *H. longipes*, while specimens from Moluccas, Papua New Guinea, New Caledonia and Australia seem to have specimens that match *H. plana*. There seems to be a gradual trend for the third anterolateral lobe to transform from truncate to dentiform when moving eastward (i.e. from Southeast Asia to Australasia). But one cannot overlook the fact that when specimens from the Sunda and Sahul Shelves are compared, the difference in the third anterolateral lobe seems to be rather obvious. Since there is evidence of a cline, in the present revision, *H. plana* Ward, 1936, is regarded as a junior synonym of *H. longipes* Lanchester, 1900.

There are two morphological variants regarding the distal part of the G1, some bending at 110° (Figs. 21L-M) and others at 90° (Figs. 21G, Q, S), both of which can be found in the same locality. The distal part of the G1 of the type of *H. plana* (QM W741) seems to turn slightly more downwards (Fig. 21N) but this is not observed in the other specimens from the Great Barrier Reef, Australia (Fig. 21R). Hence this character is regarded as part of the normal variation of the species. The surfaces of the chelipeds appear as spiny to tuberculated. The anterior margin of the ambulatory legs are lined with low to high spinules (Figs. 22C, G, L).

A female collected from the Gulf of Tonkin (6.4 by 8.9 mm, IOAS) has unusually incised anterolateral lobes and the inner supraorbital teeth appear to be rather broad (Fig. 23B). In other aspects (the form of the anterolateral lobes (three subtruncate and one dentiform), strongly spiniform ambulatory legs and chelipedal meri), it belongs to *H. longipes*. A small male (4.0 by 4.5 mm, MNHN AC64) from the Philippines was examined and tentatively identified as *H. longipes*, albeit doubtful. Its identity is difficult to ascertain due to its small size. The anterolateral lobes one and two of this specimen are truncate, the third lobe is subtruncate and subdentiform, and the fourth lobe is dentiform, all of which seems to fit into the present definition of *H. longipes*.

Larvae. - The first zoea was described by Lim & Ng (1988) as *H. albolineata* but its identity as *H. longipes* was determined by Chia et al. (1993).

Host records. - Mostly found on comasterids.

Distribution. - This shallow water, coral reef species occurs from the Sunda Shelf (continental Southeast Asia) to the Sahul Shelf (continental Australia) and reaching as far north to the Philippines.

***Harrovia ngi* Chen & Xu, 1992**

(Figs. 24, 25)

Harrovia longipes - Chen & Xu, 1991: 87 [Chinese text], 105 [English text], Fig. 30 [type locality Nansha Islands, 6°30'N, 108°17'E, South China Sea] [not *Harrovia longipes* Lanchester, 1900].
Harrovia ngi Chen & Xu, 1992: 265 [replacement name].

Material examined. - Holotype: male (3.4 by 5.1 mm) (IOCAS SSB III 17-20), Nansha Islands (= Spratly Islands), Station 10, 6°30'N, 108°17'E, 94 m, sandy substratum, 7 May 1986.

Diagnosis. - Carapace hexagonal, regions well defined, with tubercles on protogastric, metagastric, branchial, cardiac and metabranchial regions; surface very smooth, with few occasional low, scattered tubercles. Anterolateral margins separated into four lobes, margins

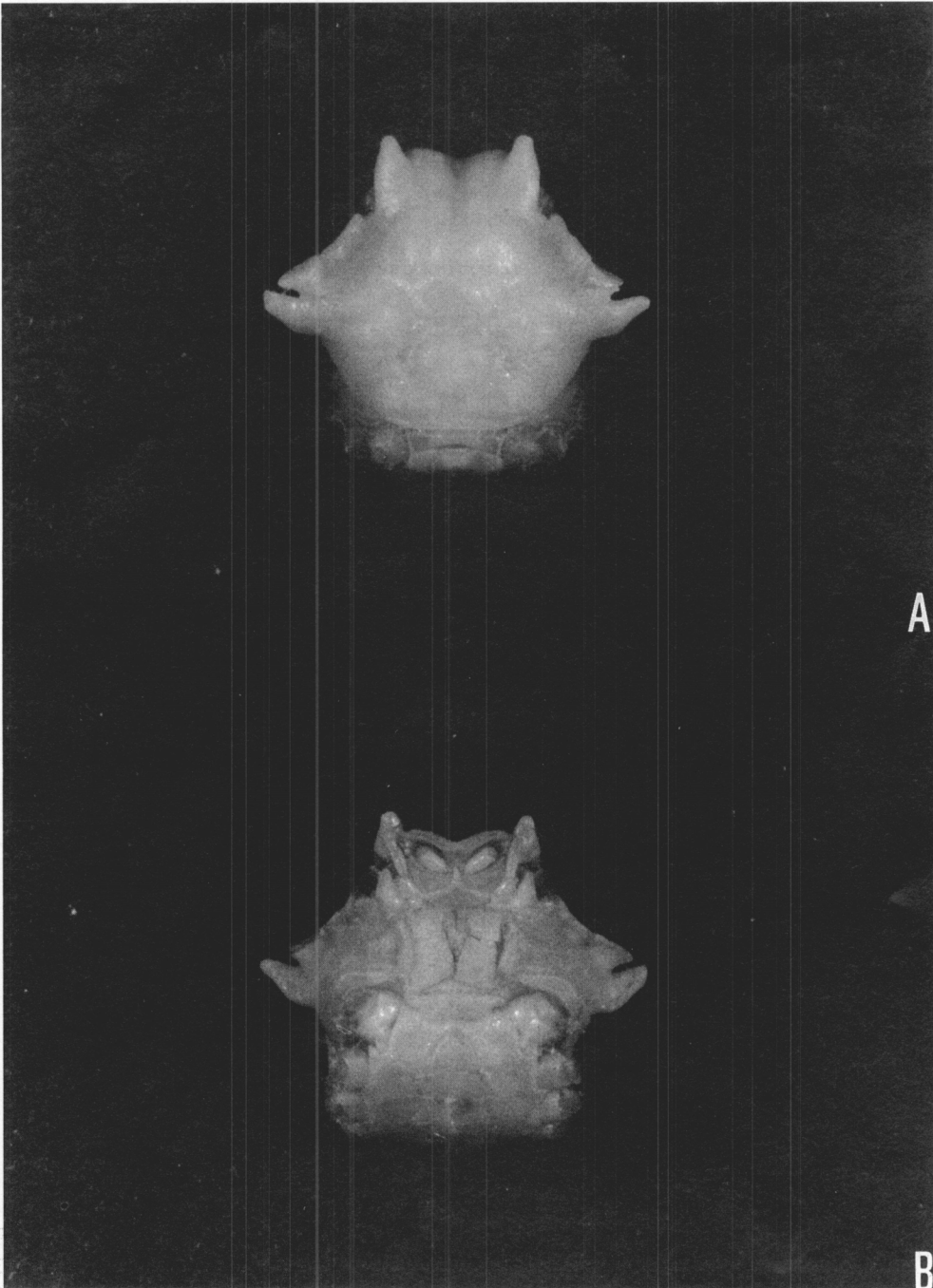


Fig. 24. *Harrovia ngi* Chen & Xu, 1992. Holotype male, 3.4 by 5.1 mm (IOAS SSB III 17-20). A, dorsal view; B, ventral view.

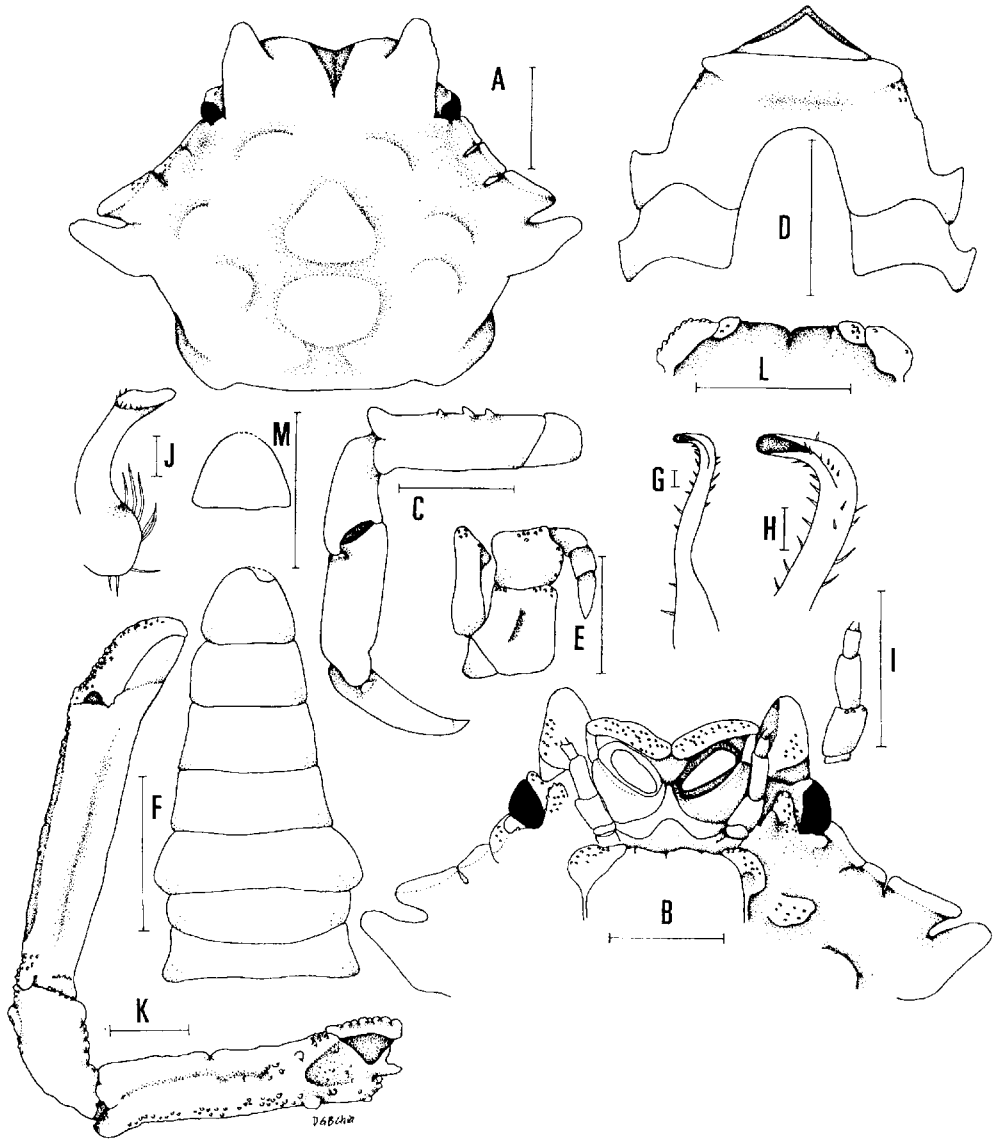


Fig. 25. *Harrovia ngi* Chen & Xu, 1992. Holotype male, 3.4 by 5.1 mm (IOAS SSB III 17-20). A, dorsal view of carapace; B, face of carapace; C, fourth left ambulatory leg; D, thoracic sternum; E, right third maxilliped; F, abdomen; G, right G1; H, distal tip of right G1; I, antenna; J, left G2; K, postero-dorsal view of left cheliped; L, endostome; M, 7th abdominal segment. Scales: A-F, I, K-M = 1.0 mm; G-H, J = 0.1 mm.

of lobes with few tubercles; separated by deep, narrow fissures, the first, second and third lobes generally lobiform, very low, subtruncate, the margins usually straight or slightly concave; lower part of the third lobe, slightly dentiform, directs slightly forward, surface smooth; fourth lobe distinctly dentiform, lower part expanded, abrupt, plate-like. Frontal margin with small median fissure, slightly deflexed, appearing straight from dorsal view, shallow median cleft, margin smooth. Posterolateral margin smooth. Surface of third maxilliped smooth. Chelipeds cylindrical, carpus without large tubercle or spine on distal inner margin of carpus, surface of chelipeds lined with numerous small tubercles, no large tubercles along margins. Ambulatory legs long and slender, ratio of length to width of fourth ambulatory merus 3.1, anterior margin of the ambulatory merus lined with small spinules. Distal part of G1 bends approximately 90°, median part sinuous.

Sexual dimorphism. - Not known.

Remarks. - This species was first described by Chen & Xu (1991) as *H. longipes*. As this name is preoccupied by *H. longipes* Lanchester, 1900, a replacement name was given by the same authors in 1992.

The holotype was re-examined in the present study. It seems to be the only specimen of the species. In terms of the carapace proportions and the form of the anterolateral lobes, *H. ngi* and *H. cognata* are very similar in appearance to *C. trilobatus*. However, the ratio of the length versus width of the second antennal segment for *H. ngi* is 2.0 and 2.6 for *H. cognata* (vs. 4.4-4.7 for *C. trilobatus*), thus establishing them as members of *Harrovia*. The close proximity of *H. ngi* with *H. cognata*, has been discussed earlier.

Distribution. - Known only from the Spratly Islands

***Harrovia tuberculata* Haswell, 1880**

(Figs. 26-28)

Harrovia tuberculata Haswell, 1880: 455, pl. 27: Fig. 4 [type locality Darnley Island, Torres Strait, Queensland, Australia]; 1882: 39 [list only]; Balss, 1922: 136 [list only]; Flipse, 1930: 76, 77, 80, 90 [list only]; Serène et al., 1958: 197, 199 [in key], 240, Fig. 7D [list only]; Serène, 1968: 63 [list only]; Wu, 1983: 165 [name in Chinese]; Stevcic et al., 1988: 1312 [list only]; Chen & Xu, 1991: Figs. 29-5 - 29-7 [holotype re-figured].

Material examined. - Holotype: male (6.0 by 8.2 mm) (AM P40853), Darnley Island, Torres Strait, 09°35'S, 143°46'E, coll. Chevert Expedition. Others: **Australia:** 1 male, 1 female (4.4 by 5.5 mm, 6.0 by 7.5 mm) (QM W18657), Northwest Shelf, Western Australia, Australia, 19°05.4S, 118°53.3'E, 02B04S, 82 m, epibenthic sledge, sublittoral, coll. CSIRO (Commonwealth Scientific and Industrial Research Organisation), R.V. 'Soela', 27 Apr. 1983.

Diagnosis. - Carapace hexagonal, regions well-defined, with very strong tubercles on protogastric, metagastric, cardiac and branchial regions, surface usually pubescent; anterolateral margins separated into four teeth, separated by deep, narrow fissures; the first tooth low, subtruncate, second low, blunt, third and fourth large, distinctly dentiform, strongly developed, third more lobate, can be smaller than fourth. Frontal margin with small median fissure, not strongly deflexed, appearing straight from dorsal view. Chelipeds cylindrical, surfaces very eroded, sculptured and tuberculated; high ridge on median dorsal surface of carpus, one large tubercle or spine on distal inner margin of carpus; several strong tubercles along the inner and outer proximal margin of merus. Ambulatory legs short and stout; ratio