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THE AUSTRALIAN STOMATOPODA (CRUSTACEA) IN THE COLLECTIONS OF THE AUSTRALIAN MUSEUM, WITH A CHECK LIST AND KEY TO THE KNOWN AUSTRALIAN SPECIES

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(Figure 1.)

I. INTRODUCTION.

The Museum collection of Stomatopoda is the most extensive existent Australian assemblage of the group, but only a minority of the specimens have been reported upon in publications (see Whitelegge, 1900; McNeill, 1926, 1952; Hynd in MS., 1948; Serène 1950, 1952; Stephenson 1953a). In the present paper the entire collection is detailed, and the records add considerably to the known distributions of several species. Eight species recorded from Australia by past workers (including one of us, W.S.) but not present in the collection, are also listed, thus completing a check list of the known Australian species. A comprehensive key is provided, and this includes species which might be confused with the Australian stomatopod fauna, and also widespread Indo-Pacific species which might be found to occur in Northern Australian waters after more intensive investigation.

The synonymy quoted includes the original author, but excludes most other sources prior to Kemp's (1913) monograph. These are only included where Kemp's synonymy appears at fault or where additional or better figures of the species are given.

Lengths of specimens are measured in a mid-dorsal line from the posterior end of the telson (as near as practicable, excluding spines) to the anterior edge of the carapace, excluding the rostrum. Owing to body curvature, the varying extension of the abdomen and, in some cases, the lack of clear demarcation between bases of spines and posterior margins of telsons, lengths are only accurate to about ± 1 per cent.

Records of specimens received at the Zoology Department, University of Queensland too late to be published in earlier papers (Stephenson 1952, 1953 *a, b*) have been added to the present collection, and are indicated in the text by asterisks.

Localities are arranged under their respective Australian States, and in cases where locality lists within a State are extensive, a geographical north to south arrangement is presented.

II. THE MUSEUM COLLECTION AND ADDITIONAL RECORDS.

***Squilla raphidea* Fabricius.**

Squilla raphidea Fabricius, *Ent. Syst. Suppl.*, 1798, p. 416; Kemp, *Mem. Ind. Mus.*, IV, 1, 1913, pp. 88-92, Pl. VII, fig. 77; Gravier, *Ann. Inst. Océanogr. Monaco*, XVII, 1937, pp. 186-9, figs. 8-10; Lui, *Contrib. Inst. Zool. Nat. Acad. Peiping*, V, 1, 1949, pp. 43-4, Pl. VII, figs. 15-16; Barnard, *Ann. S. Afr. Mus.*, XXXVIII, 1950, pp. 851-2, fig. 1c, g; Stephenson, *Zool. Pap. Univ. Q'ld.*, I, 1, 1952, pp. 4-5.

Nine males, 132-253 mm.; seven females, 165-314 mm.

N. Territory: Two specimens, near Emery Point, Darwin Harbour, early 1954, coll. Capt. F. E. Wells, Hbr. Master, seine netted off beach.

Queensland: Cape Flattery, 1898, pres. Capt. Dawson; Cairns Inlet, pres. Dr. P. S. Clarke; Tin Can Bay, near Gympie, 7/vii/1952, coll. C. Lea, from net*; Tampian Beach, Emu Park, Keppel Bay, 14/vii/1935, pres. H. Bernhard, washed ashore; Port Curtis, 1912, pres. local hotel manager; Port Curtis, pres. C. Bedsor.

N.S. Wales: Cowan Creek, Hawkesbury River, 1/ii/1953, coll. H. Adams; Cowan Crk., Hawkesbury R., March 1950, coll. W. H. Mayo, from stomach of large Flathead (fish); near Jerusalem Bay, Hawkesbury R., May 1952, coll. S. W. Wagg, from stomach of Flathead; Jerusalem Bay, Hawkesbury R., 18/v/1952, coll. A. Gay, from hook and line; Hawkesbury R., March 1952, coll. E. L. Mullins, entangled in fisherman's line from depth of 30 ft.; Rose Bay, Port Jackson 10/iii/1925, coll. A. O. Golding, from prawn net; two specimens, Old collection, no specific locality but undoubtedly from N.S. Wales waters.

Previously recorded from the N. Territory (Tate, 1883) and from Queensland (Stephenson, 1952, 1953*b*), but not from N.S. Wales.

***Squilla granti* Stephenson.**

Squilla granti Stephenson, *Aust. J. Mar. F. W. Res.*, 4, 1, 1953, pp. 201-8, fig. 1 A-D, fig. 2 A, B, D, F, G.

Three females, 39-49 mm.; two males, 60 and 65 mm.

Queensland: Scarborough, Moreton Bay, 26/v/1913, dredged (bearing J. S. Hynd's MS. identification "*Squilla microphthalmalma* M. Edw.")—Paratype; two specimens 5½ miles N.N.E. Woody Point Pier, Moreton Bay, 3/i/1951, coll. E. M. Grant, trawled muddy sand, 12 metres depth—Paratypes; off Point Lookout, S. Queensland, Dec. 1952, coll. M. Drinan, trawled in ocean waters*; almost certainly from Moreton Bay, late 1952, per Q'ld. Dept. Harb. and Marine.*

This recently described species is known only from Queensland.

***Squilla depressa* (Miers).**

Chloridella microphthalmalma (depressa) Miers, *Ann. Mag. Nat. Hist.* (5), V, 1880, pp. 14-5, Pl. II, figs. 1-4.

Squilla depressa Serène, *REC. AUST. MUS.*, XXIII, 1952, pp. 2-11, figs. 3, 4, 9, 18, 21, Pl. I, fig. 3, Pl. II, figs. 3, 6, 7, 8, 9, 10; Stephenson, *Zool. Pap. Univ. Q'ld.*, I, 1952, p. 8; Stephenson, *Aust. J. Mar. F.W. Res.*, 4, 1, 1953, pp. 207-8, fig. 2 E; Stephenson, *Mem. Q'ld. Mus.*, 13, 1, 1953, p. 43.

Male, 74 mm.; two females, 43 and 71 mm.

Queensland: Port Denison, 1921, pres. E. H. Rainford; Great Barrier Reef, 1923, coll. Dr. W. E. J. Paradiçe, R.A.N.; Mackay, pur. C. Volskow (fisherman).

These specimens were commented upon by Serène in his redescription of the species, which is known only from the N. Territory (Miers, 1880) and Queensland (Serène, 1952; Stephenson, 1952, 1953 *a*, *b*).

***Squilla fasciata* de Haan.**

Squilla fasciata de Haan, *Siebold's Fauna Japonica*, Crust., atlas, 1844, Pl. II, fig. 4, Crust. (text), 1849, p. 224; Kemp, *Mem. Ind. Mus.*, IV, 1, 1913, pp. 34-6, Pl. 1, figs. 21-3; Hale, *Rec. S. Aust. Mus.*, II, 4, 1924, p. 496, text-fig. 381 *j*, *k*; Hale, *Crust. S. Aust.*, I, 1927, fig. 21; Gravier, *Ann. Inst. Océanogr. Monaco*, XVII, 1937, pp. 177-9, fig. 1.

Squilla subfasciata Tate, *Trans. Proc. Roy. Soc. S. Aust.*, VI, 1883, p. 52, Pl. II, fig. 1.

Four males, 60-79 mm.; nine females, 37-76 mm.

Queensland: All per Zool. Dept. Univ. Q'ld.:—Trinity Inlet, Cairns, Nov., 1953, coll. G. Rowell, trawled (per Q'ld. Dept. Harb. and Marine); near Townsville, Aug. 1953, trawled R. K. Bryson, about 20 fms.; S.E. edge Pearl Channel, Moreton Bay, 20/xi/1952, trawled E. M. Grant, on muddy sand, 12 metres depth; E.S.E. Redcliffe Jetty, Moreton Bay, 28/iii/1953, trawled E. M. Grant, gritty mud, 12 metres depth; 2 miles E. Redcliffe Jetty, 19/vi/1952, coll. T. C. Marshall, 5 fms. (both raptorial claws missing); 3½ miles S. Woody Point Pier, Moreton Bay, 19/x/1952, trawled E. M. Grant on sandy mud, 8 metres depth; same locality, habitat and collector, 2/xi/1952, 7 metres depth (described by the collector as "egg bearing"); 4 miles N.E. Woody Point Pier, 8/ix/1952, trawled E. M. Grant on shelly mud about 8 metres depth; four specimens, 3 miles N.E. Woody Point Pier, 9/viii/1952, trawled E. M. Grant on sandy mud, 9 metres depth; 3 miles S. Woody Point Pier, 10/xi/1951, trawled E. M. Grant, sandy mud, 6 metres depth.

Within Australia this species is known only from S. Australia (Tate, 1883) and from Queensland, a surprisingly discontinuous distribution.

***Squilla fallax* Bouvier.**

Squilla fallax Bouvier, *C.R. Acad. Sci. (Paris)*, 159, 2, 1914, pp. 698-9; Bouvier, *Bull. Sci. France Belg.*, 48, 1915, pp. 308-11, figs. 39-42.

Male, 51 mm.

N.S. Wales: Off Dawes Point, Port Jackson, Mar. 1933, pres. W. J. Hale, harbour dredge, about 5 fms.

The first Australian record of a rare Indo-Pacific species.

***Squilla miles* Hess.**

Squilla miles Hess, *Arch. f. Naturgesch.*, XXXI, 1, 1865, p. 169, Pl. VII, fig. 21; Kemp, *Mem. Ind. Mus.*, IV, 1, 1913, pp. 36-7; Odhner, *Med. Göteborgs Mus. Zool. Avd.*, 30, 1923, pp. 1-5, figs. 1-3; Hale, *Rec. S. Aust. Mus.*, II, 4, 1924, pp. 492-5, Pl. XXXII, fig. 1, text-fig. 381 *a-i*.

Squilla pectinata Tate, *Trans. Proc. Roy. Soc. S. Aust.*, VI, 1883, p. 50, Pl. II, figs. 2 *a-d*.

Three males, 49-101 mm.; one female, 64 mm.

Victoria: Port Phillip, coll. J. Gabriel.

Tasmania: Near mouth Don River, N. coast, coll. K. G. Hiscock, May 1953, 3 ft. deep rock pool;* Ralph's Bay, estuary of Derwent River, coll. M. Ward, 2-3 fms.

W. Australia: Albany, exch. W. Aust. Museum.

Sydney, N.S. Wales, is recorded as the type locality of this species, but it is significant that there are no N.S. Wales specimens in the collection or any N.S. Wales records subsequent to Hess (1865). A number of crustacean species recorded by Hess from "Sydney" have not been substantiated since, and in the present case Hess' locality is apparently inaccurate. The species has been recorded from Victoria (Miers, 1880*a*) where it is apparently the dominant stomatopod (Stephenson, 1954), and also from Tasmania (Guiler, 1952; Stephenson, 1954). It is evidently common in S. Australia (Tate, 1883; Odhner, 1923; Hale, 1924, 1927) and extends to W. Australia (Alexander, 1916 *a*).

Squilla mcneilli Stephenson.

Squilla armata Whitelegge, *Mem. Aust. Mus.*, IV, 1900, p. 199 (*nec* M. Edw.).

Squilla mcneilli Stephenson, *Aust. J. Mar. F. W. Res.*, 4, 1, 1953, pp. 213-8, fig. 4A-F.

Sixteen males, 40-85 mm.; thirteen females, 41-86 mm.

N.S. Wales: The specimens have recently been reported upon *in extenso* (Stephenson 1953a).

The species is known only from the N.S. Wales coast where it ranges from Newcastle to south of Green Cape. Most specimens were trawled at the unusual depths of from 25-90 fms., and several were from the stomachs of trawled fishes.

Ekman (1953, p. 196) notes the occurrence of *Sq. armata* from S.W. Australia. In a personal communication he gives the source as Balss' (1918) work on the fauna of W. Africa. Balss refers to Whitelegge's misidentification of the present species from N.S. Wales. Ekman's note is therefore based upon a misidentified specimen from a mistaken locality.

Squilla scorpio Latreille.

Squilla scorpio Latreille, *Encycl. Méthod.*, X, 1825, p. 472; Kemp, *Mem. Ind. Mus.*, IV, 1, 1913, pp. 42-4, Pl. II, fig. 30; Lui, *Contrib. Inst. Zool. Nat. Acad. Peiping*, V, 1, 1949, pp. 27-9, Pl. IV, figs. 1, 2.

Not represented in the collection. Miers' (1880) record from the N. Territory may well refer to the next species (see Stephenson, 1953 a).

Squilla terrareginensis Stephenson.

Squilla terrareginensis Stephenson, *Aust. J. Mar. F.W. Res.*, 4, 1, 1953, pp. 208-13, fig. 3A, B.

Two males, 75 and 92 mm.; two females, 54 and 88 mm.

Queensland: Cooktown, 1905, coll. A. R. McCulloch (Allotype female and Paratype male); near mouth Barron River, Cairns, coll. G. A. V. Stanley (Holotype male); Cairns, 25/iv/1953, per Dr. H. Flecker.*

This recently described Queensland species resembles *Sq. scorpio* to a marked degree.

Squilla laevis Hess.

Squilla laevis Hess, *Arch. f. Naturgesch.*, XXXI, 1, 1865, p. 170, Pl. VII, fig. 22; Kemp, *Mem. Ind. Mus.*, IV, 1, 1913, pp. 49-50, Pl. III, figs. 35-7; Hale, *Rec. S. Aust. Mus.*, II, 4, 1924, Pl. XXXII, fig. 2.

Fifty-six males, 17-114 mm.; fifty-five females, 44-124 mm.

Queensland: Point Lookout, S. Queensland, 31/iii/1945, coll. J. S. Hynd, washed up on beach on floating coconut husk; Jumpinpin, Moreton Bay, 3/i/1946, coll. D. Hanify (per J. S. Hynd); Moreton Bay, coll. J. S. Hynd; Yatala, near Southport, coll. Miss M. Willesden.

N.S. Wales: Eleven specimens labelled "No data", almost certainly from N.S. Wales waters; seventy-seven specimens, Evans Head, May-June 1953, per H. Lane, trawled*; near Morisset, Lake Macquarie, 26/i/1912, in prawn net, pres. N.S.W. State Fisheries; Port Jackson, pres. J. Conran; Sow and Pigs Shoal, Port Jackson, pres. Capt. L. Comtesse (dredge "Triton") about 5 fms.; Rushcutters Bay, Port Jackson, pres. J. Lawler, caught in prawn net; Leichhardt Bay, Parramatta River, Port Jackson, pres. J. Brooks; Parramatta R., Dec. 1928, pres. V. Argent; Parramatta R., pres. W. Barnett, in prawn net; Sydney, 1893; Sydney, pres. W. Reek, in purchase of

penaeid prawns from shop; Sydney (?), 1891; Sydney fish market, pres. R. J. Thorpe; Sydney fish market, pres. G. W. Sherar; Sydney fish market, pres. N.S.W. State Fisheries; Lady Robinson's Beach, Botany Bay, pres. G. W. Walker; Kogarah Bay, George's River, in Botany Bay, pres. J. H. Wright, in prawn net, shallow water.

W. Australia: Swan River, pres. Fish. Inspt. A. Abjornsson, 30 ft. depth; Murray River, near Fremantle, pres. Fish. Inspt. A. J. Fraser; off Geraldton Harbour, pres. Fish. Inspt. R. J. Marsh, from crayfish "pot".

Sydney is the type locality, and Stead (1898) also recorded the species from there. It has been recorded from Victoria (Miers, 1880), S. Australia (Hale, 1924), and from S. W. Australia (Hale, 1929*b*) where it is evidently the dominant stomatopod (Stephenson, 1954). It is very common amongst catches of penaeid prawns from Moreton Bay (Queensland) and, as present records show, from Evans Head and Sydney in N.S. Wales.

Squilla quinqueidentata Brooks.

Squilla quinqueidentata Brooks, *Voy. H.M.S. "Challenger"*, Zool., XVI, pp. 26-30, Pl. I, fig. 3, Pl. II, fig. 6; Kemp, *Mem. Ind. Mus.*, IV, 1, 1913, pp. 52-3, p. 195; Holthuis, *Temminckia*, 1941, pp. 244-5.

Male, 50 mm.; female, 138 mm.

N. Territory: Paradise Bay, N. Island, Sir Edw. Pellew Grp., Gulf of Carpentaria, pres. Dr. W. E. J. Paradise, R.A.N., fish trap at night on clean sand, depth 20 ft.

Queensland: Brampton Is., near Mackay, coll. Miss B. Dew, from tidal mud flat.

Until very recently (Stephenson, 1953*b*) this species had not been recorded from Australia, but it is apparently moderately common at Townsville, Queensland. Not recorded previously from the Gulf of Carpentaria.

Squilla foveolata Wood-Mason.

Squilla foveolata Wood-Mason, *Figs. Descr. Nine Squillidae*, 1895, p. 2, Pl. 2, fig. 1; Kemp, *Mem. Ind. Mus.*, IV, 1, 1913, pp. 58-60, Pl. IV, fig. 48.

Not represented in the present collection. Represented in the Queensland Museum collections and recently recorded from Queensland (Stephenson, 1953*b*).

Squilla nepa Latreille.

Squilla nepa Latreille, *Encycl. Méthod.*, X, 1825, p. 471; Kemp, *Mem. Ind. Mus.*, IV, 1, 1913, pp. 60-4, p. 195, Pl. IV, fig. 49; Gravier, *Ann. Inst. Océanogr. Monaco*, XVII, 1937, pp. 179-82, figs. 2-3; Barnard, *Ann. S. Afr. Mus.*, XXXVIII, 1950, pp. 847-8, figs. 1*b*, 2*a*.

Not represented in the present collection. Represented in the Queensland Museum collections and recently recorded from Townsville, Queensland (Stephenson, 1953*b*). Doubtfully recorded from Queensland by Miers (1880) and from "Australia" by Henderson (1893).

Squilla wood-masoni Kemp.

Squilla wood-masoni Kemp, *Rec. Ind. Mus.*, VI, 1911, p. 99; Kemp, *Mém. Ind. Mus.*, VI, 1, 1913, pp. 74-6, Pl. V, figs. 63-5; Hansen, *Siboga Exped.*, 104 Livr., Monogr. 35, 1926, p. 12; Chopra, *Rec. Ind. Mus.*, XXXVI, 1935, pp. 26-7; Holthuis, *Temminckia*, VI, 1941, p. 225; Lui, *Contrib. Inst. Zool. Nat. Acad. Peiping*, V, 1, 1949, pp. 42-3, Pl. VI, figs. 12-14; Stephenson, *Zool. Pap. Univ. Q'ld.*, I, 1, 1952, pp. 5-6.

Ten males, 59-141 mm.; twelve females, 72-134 mm.

N. Territory: Port Darwin, 1879, coll. A. Morton; Sir Edward Pellew Group, Gulf of Carpentaria, pres. Dr. K. Hudson, seine netted (Reg. No. P.8450); near Emery Point, Darwin Harbour, early 1954, coll. Capt. F. E. Wells, Hbr. Master, seine netted off beach.

Queensland: Two specimens, mouth of Norman River, Gulf of Carpentaria, Aug. 1953, coll. T. C. Marshall, 1-2 fms., mud*; four specimens, Townsville, Sept. 1952, trawled G. Coates, per T. C. Marshall*; Magnetic Is., near Townsville, March 1953, coll. R. K. Bryson, trawled 9 fms.*; Moreton Bay, per Q'ld. Dept. Harb. and Marine*.

N.S. Wales: Evans Head, May-June 1953, per H. Lane, trawled*; Folly Point, Middle Harbour, Port Jackson, pres. C. Wheatley.

W. Australia: Two specimens, Exmouth Gulf, 5/ix/1953, coll. K. Sheard, trawled, 7 fms.*; three specimens, mouth of Trubridge Creek, Exmouth Gulf, 12/ix/1952, coll. K. Sheard, P.V. "Lancelin", trawled 2 fms.*; three specimens, Learmouth, Exmouth Gulf, 13/ix/1953, coll. K. Sheard, P.V. "Lancelin", otter prawn trawl, 9 fms.*; E.N.E. of White Is., Sharks' Bay, coll. K. Sheard, P.V. "Lancelin", otter trawl, 4-6 fms.*

The Gulf of Carpentaria specimen, Reg. No. P.8450, has the left submedian denticle of the telson missing, and the entire postero-central area of the telson is malformed.

Previously recorded from N.S. Wales (Kemp, 1913); S.E. Queensland (Stephenson, 1953 *a, b*), but not from the Gulf of Carpentaria, the N. Territory or W. Australia.

***Squilla interrupta* Kemp.**

Squilla interrupta Kemp, *Rec. Ind. Mus.*, VI, 1911, p. 98; Kemp, *Mem. Ind. Mus.*, IV, 1, 1913, pp. 72-4, Pl. V, figs. 60-2; Boone, *Bull. Vanderbilt Mar. Mus.*, V, 1934, pp. 28-31, Pl. 7; Tweedie, *Bull. Raffles Mus.*, 10, 1935, p. 48; Holthuis, *Temminckia*, VI, 1941, pp. 252-4; Lui, *Contrib. Inst. Zool. Nat. Acad. Peiping*, V, 1, 1949, pp. 39-41, text-fig. 3a-b.

Two males, 135 and 147 mm.; four females, 79-153 mm.

Queensland: Brisbane River (?), 9/vi/1945, coll. J. S. Hynd; Brisbane R., 19/xi/1953, coll. N. M. Hayson, trawled*; 7 miles N.E. Woody Point Pier, Moreton Bay, 19/xii/1950, coll. E. M. Grant, trawled 13 metres depth, sandy mud and shell grit*; Deception Bay, in Moreton B., Oct. 1952, trawled A. Keong*; Port Curtis, pres. C. Bedsor.

N.S. Wales: Port Jackson, Old collection, pres. Dr. G. Bennett.

This species is common in S.E. Queensland (Boone, 1934; Stephenson, 1952, 1953*b*) but has not been reported hitherto from N.S. Wales.

***Squilla inornata* Tate.**

Squilla inornata Tate, *Trans. Proc. Roy. Soc. S. Aust.*, VI, 1883, p. 51, Pl. II, figs. 3a-c; Stephenson, *Mem. Q'ld. Mus.*, 13, 1, 1953, pp. 41-2.

Squilla affinis var. *intermedia* Nobili, *Bull. Mus. Zool. Anat. Comp. Torino*, 18, 455, 1903, p. 3.

Squilla oratoria var. *perpensa* Kemp, *Mem. Ind. Mus.*, IV, 1, 1913, pp. 70-2, Pl. V, figs. 57-9.

Squilla oratoria var. *inornata* Hale, *Rec. S. Aust. Mus.*, II, 4, 1924, pp. 495-6; Chopra, *Rec. Ind. Mus.*, XXXVI, 1935, pp. 24-5; Gravier, *Ann. Inst. Océanogr.*, XVII, 1937, pp. 183-5, fig. 6; Holthuis, *Temminckia*, VI, 1941, pp. 248-9; Lui, *Contrib. Inst. Zool. Nat. Acad. Peiping*, V, 1, 1949, pp. 37-8, figs. 2a-b.

Squilla oratoria inornata Tweedie, *Bull. Raffles Mus.*, 10, 1935, pp. 45-8.

Male, 55 mm.; female, 85 mm.

Queensland: Port Denison, 1921, pres. E. H. Rainford; Mapoon, coll. C. Hedley.

Previously recorded from N. Territory (Miers, 1880); Queensland (Hale, 1924; Stephenson, 1953*b*) and S. Australia (Tate, 1883).

***Squilla anomala* Tweedie.**

Squilla anomala Tweedie, *Bull. Raffles Mus.*, 10, 1935, pp. 45-8; Holthuis, *Temminckia*, VI, 1941, p. 253; Stephenson, *Zool. Pap. Univ. Q'ld.*, I, 1, 1952, pp. 7-8.

Two males, 93 mm. and 111 mm.; female, 133 mm.

Queensland: Off Lindeman Is., Cumberland Group, trawled G. P. Whitley, 10 fms.; two specimens, 4 miles E. Scarborough Pier, Moreton Bay, 3/xi/1951, coll. E. M. Grant, trawled 12 metres depth, sandy mud*.

Apart from Queensland records (see Stephenson, 1952, 1953*b*), this species is known only from Singapore.

***Pseudosquilla ciliata* (Fabricius).**

Squilla ciliata Fabricius, *Mantiss Insect.*, I, 1787, p. 333.

Pseudosquilla ciliata Miers, *Ann. Mag. Nat. Hist.* (5), V, 1880, p. 108, p. 458, Pl. III, figs. 7, 8; Kemp, *Mem. Ind. Mus.*, IV, 1, 1913, pp. 96-100; Bigelow, *Bull. Mus. Comp. Zool. Harv.*, LXXII, 4, 1931, pp. 152-60, text-figs. 3-6; Boone, *Bull. Vanderbilt Mar. Mus.*, V, 1934, pp. 16-20, Pl. 4; Gravier, *Ann. Inst. Océanogr.*, XVII, 1937, pp. 91-3; Barnard, *Ann. S. Afr. Mus.*, XXXVIII, 1950, pp. 852, 854, fig. 3*a*; Townsley, *Pacific Sci.*, VII, 4, 1953, pp. 412-5, figs. 10, 11*a-m*.

Seven males, 48-62 mm.; six females, 56-73 mm.

Queensland: Darnley Is., 30/viii/1953, coll. D. J. Tranter, from *Zostera* pools*; six specimens, Murray Is., 1907, coll. C. Hedley and A. R. McCulloch; Palm Island Group, coll. J. S. Hynd; Caloundra, coll. Dr. T. H. Johnston; Myora, Moreton Bay, 4/iv/1946, coll. J. S. Hynd, mud flat; Myora, 28/vii/1946, coll. J. S. Hynd, on sandbanks; Dunwich, Stradbroke Is., Moreton B., Oct. 1953, coll. T. C. Marshall*; N. of Dunwich Lab., Stradbroke Is., 2/viii/1952, coll. W. Stephenson, dug in sand mud, *Zostera* flat*.

Frequently recorded from Queensland (Kemp, 1913; Hale, 1929 *a*; Riek, in MS. 1941; Hynd, in MS. 1948; Stephenson, 1952, 1953 *b*) but as yet not from any other State. Miers' (1880) locality is merely "Australia".

***Pseudosquilla pilaensis* de Man.**

Pseudosquilla pilaensis de Man, *J. Linn. Soc.*, XXII, 1888, p. 296; Kemp, *Mem. Ind. Mus.*, IV, 1, 1913, pp. 105-6; Smith, *Lignan Sci. J.*, 8, 1929, pp. 140-3, Pl. 19, figs. 12-14; Gravier, *Ann. Inst. Océanogr. Monaco*, XVII, 1937, pp. 193-4, fig. 13.

Not represented in the present collection but present in the Queensland Museum collections and recorded from Bowen, Queensland (Stephenson, 1953 *b*).

***Lysiosquilla perpasta* Hale.**

Lysiosquilla perpasta Hale, *Rec. S. Aust., Mus.*, II, 4, 1924, pp. 497-9, Pl. XXXIII, fig. 1, text-fig. 382; Hale, *Crust. S. Aust.*, I, 1927, p. 33, fig. 23.

Twenty-six males, 15-45 mm.; twenty-six females, 21-55 mm.

Queensland: All specimens per Zool. Dept. Univ. Q'ld. Eleven specimens, Dunwich, Stradbroke Is., Moreton Bay, 19/vii/1952, coll. R. Domrow, under dead coral stones on flats; N. of Dunwich Lab., Stradbroke Is., 2/viii/1952, coll. W. Stephenson, in burrow with egg mass in sandy mud on *Zostera* flat; four specimens, Polka Point, Dunwich, 4/vii/1953, coll. W. Stephenson, dug in sand and mud amongst *Zostera*; four specimens, Myora, Moreton B., 19/vi/1952, coll. Miss N. Lavis, under dead coral clumps; five specimens, Myora, 22/x/1952, coll. E. M. Grant, in sand near *Zostera*, extreme L. W. Springs; three specimens, labelled "In Biol. Dept. [Q'ld Univ.] collections, no locality or date" (in J. S. Hynd collections); vicinity of Brisbane, probably Moreton B.

N.S. Wales: Long Reef, Collaroy, 28/xi/1929, coll. F. A. McNeill; seven specimens, Eastern Channel, off Sow and Pigs Shoal, Port Jackson, July-Oct. 1929, pres. Capt. L. Comtesse, dredge "Triton", about 6 fms.; four specimens, Kurnell, Botany Bay, 27/x/1927, coll. F. A. McNeill and party, in sand and shell grit at low tide mark; seven specimens, Kurnell, 22/i/1928, coll. M. Ward, reef between tide marks; George's River, Botany Bay, 1925, pres. A. A. Livingstone, in mud between tide marks, two specimens, Gunnamatta Bay, Port Hacking, coll. F. A. McNeill, dug from sand of tidal flat; Shellharbour, 1926, coll. G. McAndrew, between tide marks.

Victoria: Seaport, Port Phillip, Jan. 1926, coll. M. Ward, under stones below tide mark.

An indigenous species described from S. Australia (Hale, 1924) and since recorded from Queensland (Stephenson, 1952, 1953 *b*) where it is common in Moreton Bay. Present records show it is equally common near Sydney, and in addition it has recently been recorded from Victoria and Tasmania (Stephenson, 1954).

***Lysiosquilla maculata* (Fabricius).**

Squilla maculata Fabricius, *Ent. Syst.*, II, 1893, p. 511.

Lysiosquilla maculata Dana, *U.S. Explor. Exped.*, Crust., 1852, p. 606; Kemp, *Mem. Ind. Mus.*, IV, 1, 1913, pp. 111-6, Pl. VIII, figs. 86-92; Edmondson, *Occ. Pap. Bernice P. Bishop Mus.*, VII, 13, 1921, fig. 1 *d*; Bigelow, *Bull. Mus. Comp. Zool. Harv.*, LXXII, 4, 1931, pp. 169-73, text-figs. 9A, B; Boone, *Bull. Vanderbilt Mar. Mus.*, V, 1934, pp. 21-8, Pls. 5, 6; Chopra, *Rec. Ind. Mus.*, XXXVI, 1935, pp. 28-30; Barnard, *Ann. S. Afr. Mus.*, XXXVIII, 1950, pp. 855-6, fig. 3 *d*; Townsley, *Pacific Sci.*, VII, 4, pp. 216-9, figs. 14, 15 *a-g*; Stephenson, *Mem. Q'ld. Mus.*, 13, 1, 1953, pp. 44-5.

Lysiosquilla miersi De Vis, *Proc. Linn. Soc. N.S.W.*, VII, 1883, p. 321; Kemp, *Mem. Ind. Mus.*, IV, 1, 1913, pp. 116-7, Pl. VIII, figs. 86-91.

Two males, 109 and 263 mm.; female, 138 mm.

N.S. Wales: Off Port Jackson, 10/iv/1954, coll. H. Bates, from hook and line, 20 fms.

W. Australia: N.W. Australia, coll. Dr. J. H. Cumpston, from burrow in tidal mud flat; Broome, coll. B. Bardwell.

A tropical species common in Queensland and extending normally to about the N.S. Wales border (Stephenson *et al.*, 1931; Dakin, 1950; Bennett in MS. 1950; Stephenson, 1952, 1953 *b*); only an extremely rare wanderer would be found in the more southerly temperate waters. There are three previous records from W. Australia (Alexander, 1916 *a, b*; Stephenson, 1953 *b*) and there are several further specimens in the Museum of W. Australia which one of us (W.S.) has had the privilege of examining.

Lysiosquilla vercoi Hale.

Lysiosquilla vercoi Hale, *Rec. S. Aust. Mus.*, II, 4, 1924, pp. 499-501, Pl. XXXIII, fig. 2, text-fig. 383; Hale, *Crust. S. Aust.*, I, 1927, pp. 33-4, fig. 24; Stephenson, *Mem. Q'ld. Mus.*, 13, 1, 1953, p. 46.

Two males, 44 and 52 mm.; female, 49 mm.

N.S. Wales: Kingscliff, S. of Tweed Heads, 1953, coll. Mrs. J. Kirchner, dug from sand, ocean beach; Gerringong, pres. A. O'Sullivan.

Victoria: Port Phillip, coll. C. J. Gabriel.

The Victorian specimen has 13 teeth and the N.S. Wales specimen 20 on the raptorial dactylus.

An indigenous species described from S. Australia (Hale, 1924, 1927), since recorded from Queensland (Stephenson, 1953b) and Tasmania (Stephenson, 1954) and now from the intermediate States of Victoria and N.S. Wales.

Lysiosquilla osculans Hale.

Lysiosquilla vercoi var. *osculans* Hale, *Rec. S. Aust. Mus.*, II, 4, 1924, pp. 501-2, Pl. XXXIII, fig. 3, text-fig. 384.

Lysiosquilla osculans Hale, *Crust. S. Aust.*, I, 1927, p. 34, fig. 24.

Male, 41 mm.; female, 29 mm.

Victoria: Beaumaris, Port Phillip, Jan. 1926, coll. M. Ward; Port Phillip, pres. C. J. Gabriel.

An indigenous species known only from S. Australia (Hale, 1924, 1927) and Victoria (Stephenson, 1954).

Lysiosquilla acanthocarpus Miers.

Lysiosquilla acanthocarpus Miers, *Ann. Mag. Nat. Hist.* (5), V, 1880, p. 11, Pl. I, figs. 7-9; Kemp, *Mem. Ind. Mus.*, IV, 1, 1913, pp. 120-2; Komai, *Mem. Coll. Sci. Kyoto Imp. Univ.*, Ser. B, III, 1927, pp. 30-1; Serène, *Rec. Austr. Mus.*, XXIII, 1952, pp. 12-14, figs. 25-7 (synonymy).

Female, 79 mm.

N. Territory: Paradise Bay, North Is., Sir Edw. Pellew Group, G. of Carpentaria, coll. Dr. W. E. J. Paradise, R.A.N., on sand flat.

This specimen has been reported upon by Serène (1952). The type locality is Port Essington (N. Territory).

Lysiosquilla multifasciata Wood-Mason.

Lysiosquilla multifasciata Wood-Mason, *Figs. Descr. Nine Squillidae*, 1895, p. 1, Pl. I, figs. 4-7; Kemp, *Mem. Ind. Mus.*, IV, 1, 1913, pp. 122-4; Chopra, *John Murray Exped. Sci. Rep.*, 2, 1939, pp. 162-5, figs. 8, 9; Tweedie, *Bull. Raffles Mus.*, 19, 1949, p. 39, fig. 1a, b; Serène, *Rec. Austr. Mus.*, XXIII, 1952, pp. 11-12 (synonymy).

Female, 61 mm.

Queensland: Dunk Is., Family Group, coll. E. J. Banfield.

Reported upon recently by Serène (1952) as a new Australian record of a rare but widespread species.

Lysiosquilla latifrons (de Haan).

Squilla latifrons de Haan, *Siebold's Fauna Japonica*, Crust., Atlas, 1844, Pl. LI, fig. 3; Crust., Text, 1849, p. 222.

Lysiosquilla latifrons Miers, *Ann. Mag. Nat. Hist.* (5), V, pp. 10, 125; Kemp, *Mem. Ind. Mus.*, IV, 1, 1913, pp. 128-9; Komai, *Mem. Coll. Sci. Kyoto Imp. Univ.*, Ser. B, III, 1927, pp. 333-5, Pl. XIV, figs. 3, 3b.

Lysiosquilla brazieri Miers, *Ann. Mag. Nat. Hist.* (5), V, 1880, pp. 11, 125, Pl. I, figs. 3-6; Haswell, *Cat. Aust. Crust.*, 1882, p. 206.

Female, 75 mm.

N.S. Wales: Port Jackson, coll. Mr. Tiley, dredge "Samson".

The only previous Australian record (Miers, 1880 *a*) is also from Port Jackson.

Odontodactylus cultrifer (White).

Gonodactylus cultrifer White, *Proc. Zool. Soc.*, 1850, pp. 96-7, Pl. XVI, figs. 1, 2.

Gonodactylus carnifer Pocock, *Ann. Mag. Nat. Hist.* (6), XI, 1893, p. 478, Pl. XXV, figs. 4, 4a, 4b.

Odontodactylus cultrifer Bigelow, *Proc. U.S. Nat. Mus.*, XVII, 1894, p. 496; Kemp, *Mem. Ind. Mus.*, IV, 1, 1913, pp. 137-8; Sunier, *Contrib. Faun. Indes Néerland. Inst. Sci. Buitenzorg*, I, 1915-18, pp. 72-4; Kemp & Chopra, *Rec. Ind. Mus.*, XXII, 22, 1921, pp. 307-8; Hansen, *Siboga Exped.*, Livr. 104e, *Monogr.* XXXV, 1926, p. 23; Stephenson, *Zool. Pap. Univ. Q'ld.*, I, 1, 1952, pp. 10-11.

Odontodactylus carnifer Kemp, *Mem. Ind. Mus.*, IV, 1, 1913, pp. 138-9.

Two males, 100 and 115 mm.; three females, 72-100 mm.

Queensland: All per Zool. Dept., Univ. of Q'ld.:—Near Townsville, Aug. 1953, trawled R. K. Bryson, about 20 fms.; Magnetic Is., near Townsville, March 1953, trawled R. K. Bryson, 9 fms.; off Peel Is., Moreton Bay, 6/ix/1952, coll. L. Sandars, with hook and line; two specimens, about 4 miles E. of Woody Point Pier, Moreton B., 22/vii/1951, trawled E. M. Grant, on sandy mud.

Only recently recorded from Australia, and only from Queensland (Stephenson, 1952, 1953 *b*).

Odontodactylus scyllarus (Linn.).

Cancer scyllarus Linn., *Syst. Nat.*, 12th ed., I, ii, 1767, p. 1054.

Odontodactylus scyllarus Borradaile, *Proc. Zool. Soc.*, 1898, p. 36, Pl. V, fig. 6; Kemp, *Mem. Ind. Mus.*, IV, 1, 1913, pp. 135-7; Kemp & Chopra, *Rec. Ind. Mus.* XXII, 22, 1921, pp. 307-8; Komai, *Mem. Coll. Sci. Kyoto Imp. Univ.*, Ser. B, III, 1927, pp. 335-6, Pl. XIII, fig. 2; Gravier, *Ann. Inst. Océanogr. Monaco*, XVII, 1937, pp. 200-2, figs. 17-19.

Not represented in the present collection but represented in Q'ld. Mus. collections, and recently recorded from Queensland (Stephenson, 1953 *b*).

Odontodactylus japonicus (de Haan).

Gonodactylus japonicus de Haan, *Siebold's Fauna Japonica*, Crust., Atlas, 1844, Pl. LI, fig. 7; Crust. Text, 1849, p. 225.

Odontodactylus japonicus Bigelow, *Proc. U.S. Nat. Mus.*, XVII, 1894, p. 496. Kemp, *Mem. Ind. Mus.*, IV, 1, 1913, pp. 139-40; Komai, *Mem. Coll. Sci. Kyoto Imp. Univ.*, Ser. B, III, 1927, pp. 336-8, Pl. XIII, figs. 3-4; Bigelow, *Bull. Mus. Comp. Zool. Harv.*, LXXII, 4, 1931, pp. 145-7, Pl. I, fig. 1.

Not represented in the present collection. Recorded from Broome, W. Australia, by Alexander (1916 *b*), but as there are no specimens in the W. Australian Museum, it is just conceivable that Alexander's material was *O. cultrifer* which is common at equivalent latitudes on the east coast of Australia.

Gonodactylus spinoso-carinatus Fukuda.

Gonodactylus spinoso-carinatus Fukuda, *Annot. Zool. Japan*, VII, 1910, p. 143, Pl. IV, figs. 2, 2a; Kemp, *Mem. Ind. Mus.*, IV, 1, 1913, pp. 173-4; Serène, *REC. AUSTR. Mus.*, XXIII, 1, 1952, pp. 14-16, figs. 28-32.

Male, 18 mm.; female, 16 mm.

Queensland: Two specimens, reef, North West Is., Capricorn Grp., Dec. 1931, coll. F. A. McNeill.

These are the only known Australian specimens (see Serène, 1952).

Gonodactylus falcatus (Forskål).

Cancer falcatus Forskål, *Descr. Anim.*, 60, 1775, p. 96.

Gonodactylus glabrous Brooks, *Voy. H.M.S. "Challenger"*, Zool. XVI, 1886, pp. 62-4, Pl. XIV, fig. 5, Pl. XV, figs. 7, 9; Kemp, *Mem. Ind. Mus.*, IV, 1, 1913, pp. 167-9, Pl. IX, fig. 113, fig. 2 on p. 170; Bigelow *Bull. Mus. Comp. Zool. Harv.*, LXXII, 4, 1931, pp. 127-35, text-fig. 1; Boone, *Bull. Vanderbilt Mar. Mus.*, V, 1934, pp. 13-16, Pl. 3; Gravier, *Mém. Inst. égypt.*, 37, 1938, pp. 178-83, fig. 5d; Barnard, *Ann. S. Afr. Mus.*, XXXVIII, 1950, p. 863, fig. 3f.

Gonodactylus glaber Henderson, *Trans. Linn. Soc.*, Zool. (2), V, 1893, p. 454.

Gonodactylus falcatus Holthuis, *Temminckia*, VI, 1941, pp. 484-8, fig. 9a (synonymy); Stephenson, *Zool. Pap. Univ. Q'ld.*, I, 1, 1952, pp. 11-12; Stephenson, *Mem. Q'ld. Mus.*, 13, 1, 1953, p. 47.

Thirty-seven males, 17-61 mm.; fifty-four females, 19-73 mm.

Queensland: Five specimens, Murray Is., 1907, coll. C. Hedley and A. R. McCulloch; three specimens, Cairns Reef, off Cooktown, 1905, coll. A. R. McCulloch; two specimens, Dunk Is., Family Group, coll. E. J. Banfield, from cavities of dead and worn corals; Palm Islands Group, June 1926, Old collection, per J. S. Hynd; Palm Islands Grp., 1921, coll. E. H. Rainford, mangrove mud flat; Hook Reef, E. of Bowen, 1926, coll. Surg. Lieut. L. Lockwood, H.M.A.S. "Moresby"; two specimens, Mapoon, coll. C. Hedley; eight specimens, Masthead Is., Capricorn Group, purch. widow of late F. E. Grant; five specimens, Masthead Is., coll. A. R. McCulloch; two specimens, Masthead Is., Nov.-Dec. 1913, coll. A. R. McCulloch; Masthead Is., Old collection, 17 fms.; three specimens, reef, North West Is., Capricorn Grp., Dec. 1925, coll. G. P. Whitley; Heron Is., Capricorn Grp., June 1947, coll. J. S. Hynd; Bulcock Beach Rocks, Caloundra, Aug. 1945, coll. J. S. Hynd; two specimens, Myora, Stradbroke Is., Moreton Bay, 8/iii/1946, coll. J. S. Hynd, coral patch, from *Acropora*; Myora, Stradbroke Is., 19/vii/1952, coll. Miss N. Darvенеza, pool under rock, L. W. Springs.*

Lord Howe Island: Four specimens, 1888, purch. E. H. Saunders; two specimens, 1898, "Thetis" Expedition; five specimens, 1899, coll. J. B. Waterhouse; eleven specimens, 1899, coll. Mrs. T. Nichols; six specimens, 1900, coll. Mrs. T. Nichols; 1900, coll. Mr. Thompson; two specimens, 1902, coll. W. S. Thompson; four specimens, 1902, coll. Mrs. T. Nichols; 1902, coll. F. Farnell; nine specimens, coll. Mrs. T. Nichols, Old collection; Feb.-Mar. 1921, coll. A. R. McCulloch; two specimens, coll. A. R. McCulloch and E. Troughton; two specimens, Old collection; two specimens, coll. Mr. Langley.

A common warm-water species with records from Queensland (Henderson, 1893; McNeill, 1926; Hale, 1929 *a*; Boone, 1934; Roughley, 1936; Dakin, 1950; Stephenson, 1952, 1953 *b*) and W. Australia (Alexander, 1916 *a*; Hale, 1929 *b*; Glauert, W. Aust. Mus., in MS.).

Gonodactylus graphurus Miers.

Gonodactylus graphurus Miers, *Ann. Mag. Nat. Hist.* (4), XVI, 1875, p. 344; Brooks, *Voy. H.M.S. "Challenger"*, Zool., XVI, 1886, pp. 58-62, Pl. XIV, figs. 1, 4, 6, Pl. XV, figs. 3, 8; Kemp, *Mem. Ind. Mus.*, IV, 1, 1913, pp. 169-71, fig. 1 on p. 170; Gravier, *Ann. Inst. Océanogr. Monaco*, XVII, 1937, pp. 205-7, figs. 21-2.

Twenty-six males, 13-76 mm.; twenty-three females, 13-78 mm.

N. Territory: Two specimens, Port Darwin, 1930, pres. L. B. Wilson; Indian Is., Bynoe Harbour, near Port Darwin, coll. Dr. W. E. J. Paradiçe, R.A.N., among rocks; two specimens, Rail pier, Port Darwin, coll. Dr. W. E. J. Paradiçe, from amongst marine growths on piles.

Queensland: Sixteen specimens, Little Lagoon, Port Langdon, Groote Eylandt—lat. 13° 51' 0" S; long. 136° 51' 15" E, 20/vii/1952, coll. J. L. Wassell, 1 fm. in coral and sponge clusters*; four specimens, Green Is., near Cairns, coll. C. Hedley, Old collection; Dunk Is., Family Group, coll. E. J. Banfield; seven specimens, Port Denison, coll. E. H. Rainford; Port Denison, coll. A. Morton, Old collection; eight specimens, Port Denison, Old collection; four specimens, Shoal Point, Mackay, 25/viii/1953, coll. W. Stephenson and party, under rocks, L.W.S.*; Curtis Channel, Port Curtis, 30/viii/1946, coll. J. S. Hynd, 23 fms.; Great Sandy Strait, near mouth Mary River, 7/vi/1946, coll. J. S. Hynd, from encrusting sponge, 1-2 fms.

W. Australia: One specimen, Old collection—no specific locality.

Recorded from the N. Territory (Miers, 1880*b*; Tate, 1883); Queensland (Miers, 1880*b*; Haswell, 1882; Miers, 1884; Brooks, 1886; Ortmann, 1894; Kemp, 1913; Hynd in MS. 1948; Stephenson, 1952, 1953*b*) and W. Australia (Miers, 1880*b*; Balss, 1921). Like *G. falcatius*, it is common in the warmer waters of Australia.

Gonodactylus demani Henderson.

Gonodactylus demani Henderson†, *Trans. Linn. Soc. Zool.* (2), V, 1893, p. 455, Pl. XI, figs. 23, 24; Nobili, *Ann. Sci. Nat. Zool.* (9), IV, 1906, p. 330; Nobili, *Bull. Sci. France Belg.*, XL, 1906, p. 158; Borradaile, *Trans. Linn. Soc., Zool.* (2), XII, 1907, pp. 210, 212; Kemp, *Mem. Ind. Mus.*, IV, 1, 1913, pp. 164-5, Pl. IX, figs. 108-11; Holthuis†, *Temminckia* VI, 1941, pp. 282-4, figs. 8*a*, *b* (later synonymy).

Male, 22 mm.

Queensland: Green Is., near Cairns, C. Hedley, Old collection. A new Australian record.

Gonodactylus chiragra (Fabricius).

Squilla chiragra Fabricius, *Species Insectorum*, I, 1781, p. 515.

Gonodactylus chiragra Kemp, *Mem. Ind. Mus.*, IV, 1, 1913, pp. 155-62, Pl. IX, fig. 107, fig. 2 on p. 161 (earlier synonymy); Bigelow, *Bull. Mus. Comp. Zool. Harv.*, LXXII, 4, 1931, pp. 113-6, Pl. 2, fig. 1; Boone, *Bull. Vanderbilt Mar. Mus.*, V, 1934, pp. 11-13, Pl. 1, figs. 2*A*, *B*; Gravier, *Ann. Inst. Océanogr. Monaco*, XVII, 1937, pp. 202-4; Holthuis, *Temminckia*, VI, 1941, pp. 277-8.

Gonodactylus platysoma Wood-Mason, *Figs. Descr. nine Squillidae*, 1895, p. 11, Pl. III, figs. 3-9.

† Henderson, 1893 and Holthuis, 1941, spell the specific name with a double "i".

Gonodactylus chiragra var. *acutus* Lanchester, *Fauna Geog. Maldives and Laccadives*, 1903, I, p. 447, Pl. XXIII, figs. 3, 3a.

Gonodactylus chiragra var. *platysoma* Kemp. *Mem. Ind. Mus.*, IV, 1, 1913, pp. 162-3, fig. 1 on p. 161; Bigelow, *Bull. Mus. Comp. Zool. Harv.*, LXXII, 4, 1931, pp. 117-20, Pl. I, fig. 2, Pl. II, fig. 2; Lunz, *Bull. Bingham Oceanogr. Coll.* 5, 5, 1937, pp. 1-4, fig. 1.

Thirty-one males, 42-82 mm.; forty females, 13-88 mm.

N. Territory: Six specimens, Port Darwin, 1902, pres. Messrs. Christie and Godfrey; two specimens, Port Darwin, 11/xi/1927, pres. L. B. Wilson; two specimens, Port Darwin, 1936, pres. F. Reynolds Morris, 3 fms.; two specimens, Old collection, with locality "North Australia" (Reg. Nos. P.1761-2).

Queensland: Darnley Is., pres. Mrs. W. Miller; Darnley Is., 30/viii/1953, coll. D. J. Tranter in grassy pools at M.T. Level (abundant)*; twelve specimens, Murray Is., 1907, coll. C. Hedley and A. R. McCulloch (including Reg. Nos. P.3131, P.3132, P.3135); two specimens, Cairns Reef, off Cooktown, 1905, coll. A. R. McCulloch; six specimens, outer edge St. Crispin Reef, off Port Douglas, 1918, coll. A. R. McCulloch (includes two specimens with Reg. No. P.4297); Coates Reef, off coast near Cairns, 1924, coll. Dr. W. E. J. Paradise, R.A.N. (Reg. No. P8032); Green Is., near Cairns, 1905, coll. A. R. McCulloch (Reg. No. P.3846); Green Is., 1901, coll. C. Hedley; reef, High Is., Frankland Group, July 1924, coll. Dr. W. E. J. Paradise, R.A.N.; reef, Frankland Grp., between 17° and 19° S. lat., 1924, coll. Dr. W. E. J. Paradise, R.A.N.; two specimens, Dunk Is., Family Group, coll. E. J. Banfield; two specimens, Palm Islands Group, near Townsville, Sept. 1953, coll. G. Coates, in coral reef*; Palm Islands Grp., 1921, coll. E. H. Rainford, mangrove mud flat; eight specimens, Port Denison, 1918, coll. E. H. Rainford; two specimens, Port Denison, Old collection; two specimens, Saddleback Is., near Port Denison, 1921, coll. E. H. Rainford; two specimens, Hook Reef, E. of Bowen, 1926, coll. Surg. Lieut. L. Lockwood, H.M.A.S. "Moresby"; reef, Hayman Is., Cumberland Group, Sept. 1946, coll. Drs. Mackerras, upper flat*; Masthead Is., Capricorn Group, coll. A. R. McCulloch; two specimens, Masthead Is., purch. widow late F. E. Grant; two specimens, reef, North West Is., Capricorn Grp., Dec. 1925, coll. G. P. Whitley (Reg. No. P.8581); Heron Is., Capricorn Grp., June 1947, coll. J. S. Hynd; juvenile, Curtis Channel, Port Curtis, 30/viii/1946, coll. J. S. Hynd, 23 fms.; Bird Is., Moreton Bay, June 1938, coll. J. S. Hynd; Myora, Stradbroke Is., Moreton B., July 1939, coll. J. S. Hynd, from coral.

W. Australia: Two specimens, North-west coast of Australia, 1877, pres. Capt. Walcott, R.N.; Broome, 26/viii/1952, coll. K. Sheard*.

Kemp (1913) commented on the considerable variation within this species and concluded that, of most of the previously described varieties (see, for example, Lanchester 1903 and Borradaile 1907) only Wood-Mason's (1895) *Gonodactylus chiragra* deserved separate segregation. He separated this form as var. *platysoma* by six characters: (1) a wider body, with the greatest breadth of the abdomen between 21.5% and 23.5% of the total length including rostrum and tips of the telson; as against less than 20% in the typical form; (2) a shorter raptorial dactylus which is only very slightly bent at the tip; (3) telsonic keels narrow; (4) median telsonic keel not anchor shaped and not ending in a spine; (5) no lateral marginal teeth on the telson; (6) two black spots on the first abdominal somite in alcohol preserved specimens.

In the present collection seven specimens (Reg. Nos. P.1761, P.1762, P.3135, P.3846, P.4297 ♂ and ♀, P.8032) possess this combination of characters, having breadth/length ratios of 21.6%-23.5%. A further specimen (Reg. No. P.3131) agrees in details (2), (3), (4), (5), and (6), and has a breadth/length ratio of 20.5%. Two further specimens (Reg. Nos. P.3132, P.8581) also agree in details (2)-(6) but have breadth/length ratios of 19.8% and 19.5% respectively. These last three specimens,

which are connected by intermediate forms to typical *chiragra*, are evidently *chiragra* themselves. If so, var. *platysoma* retains its independence by virtue of a single character, the breadth/length ratio. In addition the margin of distinction becomes narrower, with var. *platysoma* having ratios of 21.5% and upwards, and *chiragra* having ratios of 20.5% and lower.

The breadth/length ratio is difficult to measure precisely because of varied degrees of telescoping and flexure in the abdominal somites. For example, in one specimen (P.8581) by stretching the specimen very slightly the ratio becomes 19.7% while when slightly telescoped it becomes 20.6%. In addition the ratios vary very greatly in different specimens of typical *chiragra*, from just over 18% to 20.5%. It is concluded that the continued segregation of var. *platysoma* cannot be justified. If so, Lanchester's (1903) var. *acutus* also falls into the synonymy.

G. chiragra is one of the commonest stomatopods in the warmer waters of Australia, with its habitat under stones and coral. It has been recorded from Queensland by Miers, 1880*b*; Haswell, 1882; Miers, 1884; McNeill, 1926; Ward, 1928; Hale, 1929*a*; Stephenson *et al.*, 1931; Foxon, 1932; Hynd in MS., 1948; Dakin, 1950; Bennett in MS., 1950; Stephenson, 1952, 1953*b*. There are also records from N. Australia (Miers, 1880*b*; Tate, 1883; Pocock, 1893), and from W. Australia (Miers, 1880*b*; Pocock, 1893; Alexander, 1916*a, b*; Balss, 1921; and Glauert, W. Aust. Mus. in MS.).

Gonodactylus tweediei Serène.

Gonodactylus tweediei Serène, *Bull. Mus. Hist. Nat. (Paris)* (2), XXII, 5, 1950, pp. 571-2; Serène, *REC. AUST. MUS.*, XXIII, 1, 1952, pp. 16-9, fig. 33.

Two males, 20 and 21 mm.; three females, 19-24 mm.

Queensland: North West Is., Capricorn Group, May, 1931, coll. T. Iredale and G. P. Whitley.

Lord Howe Island: Two specimens, Feb.-Mar. 1921, coll. A. R. McCulloch; April 1932, Erskine Channel, coll. A. A. Livingstone, 4 fms.; Elizabeth Reef, N. of Is., April 1936, coll. G. P. Whitley.

Apart from the present specimens (Serène's 1950 types) another Queensland specimen has been noted (Stephenson, 1952).

Gonodactylus pulchellus Miers.

Gonodactylus trispinosus var. *pulchellus* Miers, *Ann. Mag. Nat. Hist.* (5), V, 1880, p. 122.

Gonodactylus pulchellus Kemp, *Mem. Ind. Mus.*, IV, 1, 1913, pp. 177-9, Pl. X, figs. 117-8; Gravier, *Ann. Inst. Océanogr. Monaco*, XVII, 1937, pp. 207-8.

Female, 35 mm.

Queensland: Hayman Is., Cumberland Group, Jan. 1934, coll. F. A. McNeill, dredged in 5 fms.

Recorded once previously from Australia by Hale (1929*a*) from Princess Charlotte Bay, Queensland.

Gonodactylus trispinosus Dana.

Gonodactylus trispinosus Dana, *U.S. Explor. Exped.*, Crust., 1852, p. 623; Kemp, *Mem. Ind. Mus.*, IV, 1, 1913, pp. 180-1.

Protosquilla trispinosa Borradaile, *Proc. Zool. Soc.*, 1898, p. 33, Pl. V, figs. 1, 1*a*.

Two females, 23 and 34 mm.

Queensland: Cairns Reef, off Cooktown, 1905, coll. A. R. McCulloch; Michaelmas Cay, near Cairns, June, 1926, coll. G. P. Whitley and T. Iredale.

Previously recorded from W. Australia (Pocock, 1893; Balss, 1921) and Queensland (Hale, 1929a).

Gonodactylus glyptocercus Wood-Mason.

Gonodactylus glyptocercus Wood-Mason, *Proc. As. Soc. Bengal*, 1875, p. 232, reprinted in *Ann. Mag. Nat. Hist.* (4), XVII, 1876, p. 263; Kemp, *Mem. Ind. Mus.*, IV, 1, 1913, pp. 186-7; Bigelow, *Bull. Mus. Comp. Zool. Harv.*, LXXII, 4, 1931, pp. 136-9.

Protosquilla cerebralis Brooks, *Voy. H.M.S. "Challenger"*, Zool., XVI, 1886, pp. 72-5, Pl. XIV, figs. 2, 3, Pl. XVI, figs 2, 3; Borradaile, *Proc. Zool. Soc.*, 1898, p. 33, Pl. V, fig. 6a.

Gonodactylus stoliurus McNeill, *Aust. Zoologist*, 4, 1926, fig. 2.

Two males, both 19 mm.; five females, 23-38 mm.

Queensland: Four specimens, Murray Is., 1907, coll. C. Hedley and A. R. McCulloch; two specimens, Michaelmas Cay, near Cairns, June 1926, coll. G. P. Whitley and T. Iredale; reef, North West Is., Capricorn Group, Dec. 1925, coll. G. P. Whitley.

Apparently common in coral in Queensland (McNeill, 1926; Stephenson, 1952, 1953b).

Gonodactylus stoliurus (Müller).

Gonodactylus trispinosus Miers, *Ann. Mag. Nat. Hist.* (5), V, 1880, p. 121 (*partem.*) and p. 460 (*vide* Pocock, *Ann. Mag. Nat. Hist.* (6), XI, 1893, p. 476).

Protosquilla stoliura Müller, *Verhand. Nat. Ges. Basel*, VIII, 1886, Pl. IV, fig. 2.

Gonodactylus stoliurus Ortmann, *Denk. Med. Wiss. Ges. Jena*, VIII, 1894, p. 61; Kemp, *Mem. Ind. Mus.*, IV, 1, 1913, pp. 184-5.

Female, 43 mm.

W. Australia: Lancelin Is., pres. Dr. D. L. Serventy.

Not previously recorded with certainty from Australian waters, but Pocock (1893) quotes Hansen's opinion that Miers' (1880 *b*) record of *G. trispinosus* from Sharks' Bay, W. Australia, refers to the present species.

The specimen, which was received too late (25th Sept., 1954) to be compared with Müller's description or figure, differs in the following minor respects from Kemp's description: (*a*) the cornea is very slightly wider than the eyestalk, (*b*) no serrations are apparent on the inner edge of the raptorial dactylus, (*c*) the median fissure of the telson extends roughly half-way up and there is an appreciable space between it and the median boss, (*d*) the lateral dorsal prominences of the sixth abdominal somite are not eroded, presumably because of less wear, and (*e*) the basal segments of the exopods of the uropods bear nine and ten spines on their outer sides, and not ten or eleven.

Hemisquilla styliфера (H. M. Edwards).

Gonodactylus styliferus H. Milne-Edwards, *Hist. Nat. Crust.*, II, 1837, p. 330, Pl. XXVII, figs. 9-14.

Pseudosquilla styliфера Miers, *Ann. Mag. Nat. Hist.* (5), V, 1880, p. 112; Kemp, *Mem. Ind. Mus.*, IV, 1, 1913, pp. 106-8, Pl. VII, figs. 84-85, fig. on p. 107.

Hemisquilla styliфера Schmitt, *Allan Hancock Pacific Exped.*, 5, 1940, pp. 182-3; Stephenson, *Mem. Q'ld. Mus.*, 13, 1, 1953, pp. 43-4.

Eleven males, 72-153 mm.; twelve females, 86-130 mm.

N.S. Wales: Off Clarence River, 12/ii/1920, pres. D. G. Stead (State Trawler "Brolga"); off Port Macquarie, 1922, pres. N.S. Wales State Fisheries, 30 fms., ejected from mouth of Flathead (fish) caught by line fishermen; two specimens, off Newcastle Bight ("Thetis" Expd., Stn. 21, 28-40 fms.), Aug. 1898, coll. E. R. Waite; off Newcastle, pres. A. D'Ombraïn, trawled; 12 miles E. of Broken Bay, coll. H. Arnold, seine trawl; Rose Bay, Port Jackson, coll. H. Wright, alive within "blue groper fish", caught in prawn net; 15 miles off Port Jackson, 1936, pres. T. Wright, about 50 fms., hook and line; two specimens, 11-12 miles N.E. of Port Jackson, pres. M. Ward, 75 fms., steam trawler "Durimbee"; E. of Sydney, May 1920, pres. D. G. Stead, State Trawling Industry, 150 fms.; off Botany Bay, 1918, pres. D. G. Stead, 60 fms. (State Trawler "Gunundaal"); two specimens, off Cape Baily, near Botany Bay, 8/ix/1915, pres. D. G. Stead (State Trawler "Gunundaal"); mouth of Port Hacking, Aug. 1943, pres. K. Sheard, C.S.I.R. Fisheries Div., trawled about 50 m., *ex* stomach of Estuarine Flathead (fish); four specimens, off Wattamolla, near Port Hacking, 7/ii/1919, pres. D. G. Stead, State Trawling Industry, 68 fms.; off Burrewarra Point, near Batemans Bay, pres. Capt. K. Möller, trawled 50 fms.; about 18 miles S. of Montague Is., March 1927, pres. A. Ward, 50-60 fms., steam trawler "Bar-ee-mul"; off southern part of N.S. Wales coast, pres. Capt. K. Möller, trawled 40 fms.

Victoria: Bass Strait, pres. Common Fish. Bur. (F.I.S. "Endeavour").

Recorded from near Tasmania (Hale, 1924), from Victoria (Kemp, 1913; Stephenson, 1952, 1954), and from N.S. Wales (Whitelegge, 1900). It is evidently common in moderately deep water off N.S. Wales.

The present specimens possess either one or two lobes between the submedian and intermediate spines of the telson and further invalidate Kemp's (1913) distinction between American and Australian "races".

III. KEYS TO THE AUSTRALIAN STOMATOPODA.

The only published keys to strictly Australian species are those of Hale (1927). These deal only with the southern species, which are a minority of the total fauna. The most comprehensive published keys are those of Kemp (1913) which deal with the entire Indo-Pacific fauna as known at that time. Kemp's keys are, on one hand, not comprehensive enough for modern use because they naturally exclude (*a*) indigenous species which have been discovered or segregated subsequently *viz.*, *Squilla granti*, *S. depressa*, *S. mcneilli*, *S. terrareginensis*, *Lysiosquilla perpasta*, *L. vercoi*, *L. osculans* and *Gonodactylus tweediei*, and (*b*) more widespread species described subsequently which have been recorded from Australia (*e.g.*, *S. anomala*). On the other hand Kemp's keys are possibly unnecessarily comprehensive in including forms which are not likely to be found in Australian waters.

The present keys are based upon Kemp, and include all known Australian and a selection from the non-Australian species. This selection includes species which are morphologically similar to Australian forms and should thereby assist the accurate identification of the latter. It also includes reasonable widespread Indo-Pacific forms which might be recorded from Australian waters when the northern shores are investigated more intensively. Non-Australian genera and species which are included in the keys are given within square brackets, and since they are not otherwise mentioned in the text, are accompanied by author and date. Descriptions, figures, and synonymy of non-Australian species described prior to 1913 are given in Kemp's monograph which should be referred to in all cases of suspected additions to the Australian fauna.

Throughout, when the number of teeth on the raptorial dactylus is given, the terminal tooth is included.

KEY TO GENERA.

1. Raptorial dactylus without teeth on its inner margin; *i.e.*, with only a terminal tooth 2
- Raptorial dactylus with teeth on its inner margin, in addition to a terminal tooth 3
2. (1) Raptorial dactylus basally inflated *Gonodactylus*
- Raptorial dactylus not basally inflated *Hemisquilla*†
- single Australian species *H. styliifera*.
3. (1) Raptorial dactylus basally inflated 4
- Raptorial dactylus not basally inflated 5
4. (3) General surface of telson closely studded with small spires or large tubercles *Coronidopsis* Hansen, 1926]
5. (3) Rostrum bifid *Odontodactylus*
- General surface of telson (excluding carinae) smooth Hansen, 1926]
6. (3) Rostrum bifid 6
- Rostrum entire 7
7. (5) First 5 abdominal somites with longitudinal carinae *Squilla*
- First 5 abdominal somites without longitudinal carinae 7
7. (6) Body dorso-ventrally compressed, no distinct median carina on telson *Lystosquilla*
- Body laterally compressed, a distinct median carina on telson *Pseudosquilla*

Genus *Squilla* Fabricius 1793.

KEY TO SPECIES.

1. Antennal somite very long; about thrice as long as broad [*S. sibogae* Hansen, 1926]
- Antennal somite normal; about as long as broad 2
2. (1) Upper margin of propodus of raptorial claw with large well spaced spines alternating more or less regularly with more numerous, smaller spines (raptorial dactylus with nine, rarely eight teeth) 3
- Upper margin of propodus of raptorial claw with a series of fine and even pectinations in addition to a few movable spines at the proximal end 4
3. (2) Submedian carinae distinct on all abdominal somites, those on the 5th ending in spines; antennular peduncle fully as long as rostrum and carapace combined; ultimate segment of outer uropod jet-black with white midrib; lateral margin of 6th thoracic somite distinctly bilobed [*S. annandalei* Kemp, 1913.]
- Submedian carinae very faint except on the last abdominal somite, those on the 5th not ending in spines; antennular peduncle shorter than rostrum and carapace combined; ultimate segment of uropod lightly suffused with black on its inner longitudinal half only; lateral margin of 6th thoracic somite indistinctly bilobed *S. raphidea*
4. (2) Lateral margin of 5th (first free) thoracic somite seen in dorsal view and composed of a single process, spinous or subacute 5
- Lateral margin of 5th thoracic somite seen in dorsal view and composed of two distinct processes; usually an anterior spine and rounded posterior lobe; rarely with 2 spines 23
5. (4) Cornea of eye very small, its breadth less than greatest breadth of stalk 6
- Cornea of eye small or large, its breadth always greater than greatest breadth of stalk 12
6. (5) First 5 abdominal somites with faint but distinct submedian carinae [several spp.]
- First 5 abdominal somites without a trace of submedian carinae 7
7. (6) Anterolateral angles of carapace rounded [*S. rotundicauda* (Miers, 1880)]
- Anterolateral angles of carapace spinous 8
8. (7) Breadth of cornea about 1/3 total length of eye [*S. chlorida* Brooks, 1886]
- Breadth of cornea about 1/2 total length of eye 9
9. (8) Eye reaching 2/3 the length of the basal segment of the antennular peduncle [*S. microphthalmia* H. M. Edw., 1837]
- Eye barely reaches to 1/2 the length of the basal segment of the antennular peduncle 10
10. (9) Mandibular palp absent *S. granti*
- Mandibular palp present 11
11. (10) Eyestalks divergent from their bases *S. depressa*
- Eyestalks apposed for most of their lengths [*S. choprai* Tweedie, 1935]
12. (5) Numerous sharp longitudinal carinae on either side of median crest of telson 13
- No longitudinal carinae on either side of median crest of telson other than as thickenings of the marginal teeth 17
13. (12) Anterolateral angles of carapace spinous 14
- Anterolateral angles of carapace rounded 16
14. (13) Raptorial dactylus with 4 teeth; rostrum almost twice as long as broad [*S. ambigua* Hansen, 1926]
- Raptorial dactylus with 6 teeth; rostrum only slightly longer than broad 15
15. (14) Spines at the end of the submedian carinae of the telson non-movable; mandibular palp present *S. fasciata*
- Spines at the end of the submedian carinae of the telson movable; mandibular palp absent *S. fallax*
16. (13) Raptorial dactylus with 4 teeth; submedian carinae on first five abdominal segments *S. miles*
- Raptorial dactylus with 6 teeth; no submedian carinae on first five abdominal somites [*S. incerta* Hansen, 1926]
17. (12) Telson with long intermediate marginal teeth 18
- Telson with intermediate marginal teeth of normal length 19
18. (17) Raptorial dactylus with 4 teeth; mandibular palp absent [2 spp.]
- Raptorial dactylus with 5 teeth; mandibular palp present *S. mcneilli*
19. (17) Median carina of carapace absent [several spp. incl. *Sq. armata* H. Milne Edw., 1837 and *S. merguensis* Tiwari & Biswas, 1952]
- Median carina of carapace present, with a clear bifurcation anteriorly [2 spp.]
- Median carina of carapace present but not bifurcated anteriorly 20
20. (19) Mandibular palp present 21
- Mandibular palp absent 22
21. (20) 6 teeth on raptorial claw [*S. bengalensis* Tiwari & Biswas, 1952]
- 5 teeth on raptorial claw *S. terrareginensis*
22. (20) Lateral process of 5th thoracic somite with a large black spot dorsally *S. scorpio*
- Lateral process of 5th thoracic somite without a black dorsal spot [*S. immaculata* Kemp, 1913]
23. (4) First 5 abdominal somites each with more than 8 longitudinal carinae [several spp.]
- First 5 abdominal somites each with 8 longitudinal carinae 24

†The very occasional *monodactyla* forms of *Pseudosquilla* (Bigelow, 1931; Chopra, 1939) would segregate here.

24. (22) Lateral margin of 6th thoracic somite not bilobed 25
Lateral margin of 6th thoracic somite bilobed, the anterior lobe rarely small and inconspicuous 26
25. (24) Raptorial dactylus with 6 teeth; anterior bifurcation of median carina of carapace sharp and distinct ..
S. laevis
Raptorial dactylus with 5 teeth; anterior bifurcation of median carina of carapace absent
[*S. hieroglyphica* Kemp, 1911]
26. (24) Raptorial dactylus with 5 teeth 27
Raptorial dactylus with 6 teeth 29
Raptorial dactylus with 7 or more teeth [2 spp.]
27. (26) Rostrum with median carina; breadth of cornea more than 1/3 median length of carapace; lateral margin of 7th thoracic somite not bilobed [*S. boops* Kemp, 1911]
Rostrum without median carina; breadth of cornea much less than 1/3 of median length of carapace; lateral margin of 7th thoracic somite distinctly bilobed 28
28. (27) Cornea set almost at right angles to eyestalk; outer inferior margin of raptorial merus terminating in a sharp tooth; anterior lobe of 7th thoracic somite short *S. quinquedentata*
Cornea set obliquely on eyestalk; outer inferior margin of raptorial merus not terminating in a tooth; anterior lobe of 7th thoracic somite well developed and more than half as long as posterior lobe
[*S. gonypetes* Kemp, 1911]
29. (26) Cornea not wider than eyestalk; rostrum with short median carina; surface of carapace and abdomen with a coarse mesh-like reticulation *S. foveolata*
Cornea very clearly wider than eyestalk; rostrum without median carina; surface of carapace and abdomen various, but not reticulated 30
30. (29) Cornea set almost at right angles to eyestalk 31
Cornea set obliquely on eyestalk 32
31. (30) Posterior half of median carina of carapace, anterior to cervical groove, simple; submedian carinae of 4th abdominal somite ending in spines *S. nepa*
Posterior half of median carina of carapace, anterior to cervical groove, finely bicarinate throughout its entire length; submedian carinae of 4th abd. somite not ending in spines [*S. holoschista* Kemp, 1911]
32. (30) Lateral carinae of first 5 abd. somites bicarinate [2 spp.]
Lateral carinae of first 5 abd. somites simple, not bicarinate 33
33. (32) Distinct rows of tubercles on either side of median crest of telson [*S. massavensis* Kosman, 1880]
No rows of tubercles on either side of median crest of telson 34
34. (33) Dorsal surface of carapace and abdomen smooth and highly polished; carapace broad, with its breadth behind the anterolateral angles more than half its median length, including the rostrum; anterior margin of ophthalmic somite with a minute median point *S. wood-masoni*
Dorsal surface of carapace and abdomen rarely smooth, never highly polished; carapace narrow, with its breadth behind the anterolateral angles less than half its median length, including rostrum; anterior margin of ophthalmic somite various, but never with a minute point 35
35. (34) Median carina of carapace sharp and distinct throughout its course; dorsal carina of raptorial carpus with 3-5 tubercles [2 spp.]
Median carina of carapace interrupted at base of anterior bifurcation (rarely, the anterior bifurcation is obsolete); dorsal carina of raptorial carpus with less than 3 tubercles 36
36. (35) Margin of longer spine of bifurcate process of uropods, in front of external lobe, convex; dorsal margin of raptorial carpus with 2 tubercles; eyes small *S. interrupta*
Margin of longer spine of bifurcate process of uropods, in front of external lobe, concave 37
37. (36) Dorsal margin of raptorial carpus with 2 tubercles; eyes large [*S. fabricii* Holthuis, 1941]
Dorsal margin of raptorial carpus with an entire carina 38
38. (37) Antennular peduncle long, over twice anterior breadth of carapace; distal segment of exopodite of uropod conspicuously divided into inner blackish and outer light coloured halves *S. inornata*
Antennular peduncle short, considerably less than twice anterior breadth of carapace; distal segment of exopodite of uropod with a blackish suffusion near the base of the inner margin, but with the inner half never entirely blackish *S. anomala*

Genus *Pseudosquilla* Dana 1852.

KEY TO SPECIES.

1. Basal process of uropods terminating in 2 large teeth, its inner margin smooth 2
Basal process of uropods with a single large additional tooth or with a series on its inner margin 3
2. (1) Eyes short and flattened; cornea set transversely on stalk [several spp.]
Eyes long and cylindrical; cornea set very obliquely on stalk *P. ciliata*
3. (1) Raptorial dactylus with 3 teeth [several spp.]
Raptorial dactylus with 4 teeth (submedian carinae of telson with 2 or 3 sharp spines, intermediate with 2 distal spines, first lateral with one) *P. pilaensis*

Genus *Lysiosquilla* Dana 1852.

KEY TO SPECIES.

1. Telson without a transverse row of dorsal spines near the hinder margin 2
Telson with a transverse row of dorsal spines near the hinder margin 6
2. (1) Hinder edge of telson deeply sculptured; raptorial dactylus with 5 teeth, rarely 6 *L. perpasta*
Hinder edge of telson not deeply sculptured; raptorial dactylus with more than 7 teeth 3
3. (2) Shorter ramus of 6th and 7th thoracic limbs linear 4
Shorter ramus of 6th and 7th thoracic limbs broadly ovate 5
4. (3) Rostrum cordiform, at least as wide in front of the base as at the base, and not grooved near margin; raptorial dactylus of male with 10 or 11 teeth *L. maculata*
Rostrum triangular, widest at base, with a deeply incised antero-lateral groove; raptorial dactylus of male with 8 teeth *L. maculata* var. *sulcicrostris* Kemp, 1913*
5. (3) Intermediate tooth of telson much smaller than lateral; raptorial dactylus with 10-21 teeth .. *L. vercoi*
Intermediate tooth of telson about the same size as the lateral; raptorial dactylus with 9 teeth. *L. osculans*

* It seems doubtful if this variety is distinct from the "forma typica".

- 6. (1) 3 dorsal spines in a transverse row on telson in adults [*L. spinosa* Wood-Mason, 1875] 7
- 5 dorsal spines in a transverse row on telson in adults 7
- 7. (6) Median spine on telson simple and acute 8
- Median spine on telson trilobed 11
- 8. (7) Telson with 4 pairs of large marginal teeth [2 spp.] 9
- Telson with 3 pairs of large marginal teeth 9
- 9. (8) Penultimate tooth of raptorial dactylus longer than antepenultimate [L. *biminiensis pacificus* Borradaile, 1899] 10
- Penultimate tooth of raptorial dactylus much shorter than antepenultimate 10
- 10. (9) Raptorial dactylus with two lobes of about equal size at the base of the external margin [*L. acanthocarpus* L. *multifasciata* L. *acanthocarpus* margin with a very large distal and a small proximal lobe at the base of the external margin] 10
- 11. (7) Rostrum more than 1½ times as long as broad; eyes large; a pair of posterior spines on the 6th abdominal somite in addition to those at the posterolateral angles [*L. insignis* Kemp, 1911] 11
- Rostrum broader than long; eyes small; 6th abdominal somite with spines only at posterolateral angles [*L. latifrons* L. *latifrons*] 11

Genus **Odontodactylus** Bigelow 1894.

KEY TO SPECIES.

- 1. Raptorial dactylus with at least 6 teeth on its inner margin 4
- Raptorial dactylus with 2-4 teeth on its inner margin 2
- 2. (1) 6th abdominal somite without carinae, and with 4 posterior spines; telson with only median carina [*O. elegans* Miers (1884) = juv. *O. scyllarus* (L. 1767); *fdæ* Hansen, 1926] 3
- 6th abdominal somite with several carinae, six of them terminating posteriorly in spines; several carinae on either side of median crest of telson 3
- 3. (2) Basal segment of outer uropod shorter than ultimate, with 8 or 9 movable spines on outer edge [*O. cultrifer* O. *cultrifer*] 3
- Basal segment of outer uropod nearly twice as long as ultimate segment, with 11 or 12 movable spines on outer edge [*O. scyllarus* O. *scyllarus*] 3
- 4. (1) Telson with 2 pairs of submedian carinae and 2 pairs of laterals, the second lateral carina running to the apex of the lateral marginal tooth [*O. japonicus* O. *japonicus*] 3
- Telson without the above characters [several spp.] 3

Genus **Gonodactylus** Latreille 1825.

KEY TO SPECIES.

- 1. Anterolateral angles of carapace well in advance of rostral base; basal segment of outer uropod extending at least a little beyond the insertion of the ultimate segment 2
- Anterolateral angles of carapace not in advance of rostral base; basal segment of outer uropod articulating terminally with ultimate segment 9
- 2. (1) Mandibular palp absent [*G. acanthurus* Tattersall, 1900.] 3
- Mandibular palp present 3
- 3. (2) Inner uropod abnormal in shape, usually more or less crescentic in dorsal view or may be strongly arched in lateral view 4
- Inner uropod normal in shape 5
- 4. (3) Dorsal surface of telson with 9, possibly 11, sometimes closely packed keels [*G. spinoso-carinatus* G. *spinoso-carinatus*] 6
- Dorsal surface of telson not possessing 9 closely packed keels [several spp.] 6
- 5. (3) Mid-dorsal portion of telson with 5 long keels 6
- Mid-dorsal portion of telson with 3 long keels 7
- 6. (5) First 5 abdominal somites smooth [*G. falcatus* G. *falcatus*] 8
- First 5 abdominal somites finely grooved transversely and longitudinally [*G. graphurus* G. *graphurus*] 8
- 7. (5) Dorsal surface of telson never with spinules 8
- Dorsal surface of telson beset with spinules [*G. demani* G. *demani*] 8
- 8. (7) No tubercles near the anterior margin of the telson; anterolateral angles of rostrum acute [*G. chiragra* var. *smithi** Pocock, 1893 = *G. acutirostris* de Man, 1898.] 10
- A pair of small tubercles close to the anterior margin of the telson; anterolateral angles of rostrum rounded or subacute [*G. chiragra* G. *chiragra*] 10
- 9. (1) Distal margin of telson divided into right and left halves by a large, wide and deep incision 10
- Distal margin of telson divided by a long, very narrow median fissure with its edges partly in contact with one another 13
- 10. (9) Distal margin of telson with either 2 or 3 sharp teeth on either side of the incision [several spp.] 11
- Distal margin of telson with three blunt teeth on either side of the incision 11
- 11. (10) Dorsal surface of telson hairy [*G. tweediei* G. *tweediei*] 12
- Dorsal surface of telson spiny 12
- 12. (11) Spines on telson recurved, with points directed backwards [*G. hystrix* Nobili, 1899.] 12
- Spines on telson not recurved backwards [several spp.] 12
- 13. (9) Telson with 3 distinct bosses 14
- Telson without 3 distinct bosses, but with longitudinal furrows [*G. hamifer* Odhner, 1923.] 14
- 14. (13) Of the three bosses in the centre of the telson, only the two external ones reach the middle of the telson 15
- Of the three bosses in the centre of the telson, the two external ones reach well beyond the middle of the telson 19
- 15. (14) Median portion of 5th abdominal somite entirely smooth 16
- Median portion of 5th abdominal somite wrinkled 18
- 16. (15) Rostrum sharply trispinous; dorsal process of ophthalmic somite produced into acute anterolateral corners 17
- Rostrum not sharply trispinous; dorsal process of ophthalmic somite not produced anterolaterally [*G. nefandus* Kemp, 1911.] 17

* It is doubtful whether this variety deserves separate segregation (for "var. *platysoura*" see earlier).

17. (16) Telson with 3 elevated bosses bearing hairs *G. pulchellus*
 Telson with 2 or 3 longitudinal rounded ridges on either side of a central boss, the ridges being
 without setae [*G. pulcher* Hansen, 1926.]
18. (15) Rostrum sharply trispinous; external bosses of telson with oval outline *G. trispinosus*
 Anterolateral angles of rostrum acute but not spinous; external bosses of telson circular in outline
 [*G. tuberosus* Pocock, 1893.]
19. (14) 5th abdominal somite smooth mid-dorsally; 6th with six smooth rounded bosses
 [*G. ectypus* Müller, 1886.]
- 5th and 6th abdominal somites grooved in a complicated manner *G. glyptocercus*.
 5th somite symmetrically grooved mid-dorsally. 6th with six dorsal bosses, each with five grooves running
 towards the summit *G. stoliurus*.

IV. SUMMARY AND DISCUSSION.

Kemp's monograph (1913) lists sixteen species of Stomatopoda from Australia. Later work has shown that one of these (*Lysiosquilla miersi*) is relegated to the synonymy. Of another two, one (*Squilla microphthalma*) has become established under the name *S. depressa*, and one (*S. armata*) has proved to be a wrongly determined record based on a species (*S. mcneilli*) which has since been recognized as new to science. The total of species recorded from Australian seas has been considerably increased since Kemp's time. This has resulted from published works by Hale (1924, 1927, 1929a, b); McNeill (1926, 1952); Serène (1950, 1952); and Stephenson (1952, 1953a, b, 1954). A total of forty-one species is now recognized, including the possibly doubtful records of *Squilla scorpio* and *Odontodactylus japonicus*, and excluding the discredited var. *platysoma* of *Gonodactylus chiragra*. This is roughly one-third of the known species of Stomatopoda from the Indian Ocean and West-Pacific Ocean waters.

TABLE 1.

Distribution of Australian stomatopods in the various Australian States; possible doubtful records are indicated by a ?.

Species.	N.T.	Q'ld.	N.S.W.	Vict.	Tas.	S. Aust.	W. Aust.
<i>Squilla raphidea</i> ... ..	+	+	+	...	...	...	...
<i>S. granti</i> ... ..	+	+	...	...	...	...	...
<i>S. depressa</i> ... ..	+	+	...	...	...	...	...
<i>S. fasciata</i> ... ..	+	+	...	...	...	+	...
<i>S. fallax</i> ... ..	...	...	+	...	...	...	...
<i>S. miles</i> ... ..	...	...	...	+	+	+	+
<i>S. mcneilli</i> ... ..	...	...	+	...	...	...	...
<i>S. scorpio</i> ... ..	?	...	...	...	...	...	...
<i>S. terrareginensis</i> ... ..	...	+	...	...	...	...	...
<i>S. laevis</i> ... ..	...	+	+	...	...	+	+
<i>S. quinqueedentata</i> ... ..	+	+	...	...	...	...	...
<i>S. foveolata</i> ... ..	...	+	...	...	...	...	...
<i>S. nepa</i> ... ..	...	+	...	...	...	...	...
<i>S. wood-masoni</i> ... ..	+	+	+	...	...	...	+
<i>S. interrupta</i> ... ..	...	+	+	...	...	...	...
<i>S. inornata</i> ... ..	+	+	...	...	...	+	...
<i>S. anomala</i> ... ..	...	+	...	...	...	...	...
<i>Pseudosquilla ciliata</i> ... ..	...	+	...	...	...	...	...
<i>P. pilaensis</i> ... ..	...	+	...	...	...	...	...
<i>Lysiosquilla perpasta</i> ... ..	...	+	+	+	+	+	...
<i>L. maculata</i> ... ..	...	+	+	...	...	...	+
<i>L. vercoi</i> ... ..	...	+	+	+	+	+	...
<i>L. osculans</i> ... ..	...	...	...	+	...	+	...
<i>L. acanthocarpus</i> ... ..	...	+	...	...	...	...	...
<i>L. multifasciata</i> ... ..	...	+	...	...	...	...	...
<i>L. latifrons</i> ... ..	...	+	...	...	...	...	...
<i>Odontodactylus cultrifer</i> ... ..	...	+	...	...	...	...	...
<i>O. scyllarus</i> ... ..	...	...	...	...	...	...	...
<i>O. japonicus</i> ... ..	...	...	...	...	...	...	?
<i>Gonodactylus spinoso-carinatus</i> ... ..	...	+	...	...	...	...	...
<i>G. falcatus</i> ... ..	...	+	...	...	...	...	+
<i>G. graphurus</i> ... ..	+	+	...	...	...	...	+
<i>G. demani</i> ... ..	...	+	...	...	...	...	...
<i>G. chiragra</i> (incl. var. <i>platysoma</i>) ... ..	+	...	...	...	...	...	+
<i>G. tweediei</i> ... ..	...	+	...	...	...	...	...
<i>G. pulchellus</i> ... ..	...	+	...	...	...	...	...
<i>G. trispinosus</i> ... ..	...	+	...	...	...	...	+
<i>G. glyptocercus</i> ... ..	...	+	...	...	...	...	...
<i>G. stoliurus</i> ... ..	...	...	...	...	...	...	+
<i>Hemisquilla stylifera</i> ... ..	...	+	+	+	+	...	...
Totals	9	30	11	6	4	7	10

The distribution of stomatopod species as summarized in Table I excludes those occurring at Lord Howe Island, located 300 miles east of N.S. Wales. A noticeable feature of the summary is the relative paucity of the faunas of the southern Australian States of Victoria, Tasmania and South Australia. The total stomatopod fauna of southern Australian seas amounts to only eight species. Of these, one (*Hemisquilla stylifera*) is more Pacific Ocean in its distribution than Indo-Pacific or Indo-West-Pacific (Ekman, 1953, pp. 11 *et. seq.*). Its range extends across the mid-Pacific "boundary" to the west coasts of both the North American and South American continents, but the species does not occur in the Indian Ocean. Two others (*Squilla fasciata* and *S. inornata*) are Indo-Pacific species and are apparently far from common in southern Australian waters; each has been recorded only once, from South Australia (Tate, 1883). The remaining five southern Australian species (*S. miles*, *S. laevis*, *Lysiosquilla perpasta*, *L. vercoi* and *L. osculans*) have been recorded only from Australia, and never from its tropical waters. *Squilla miles* and *S. laevis* are common and conspicuous forms, and it seems unlikely that, if they occurred either in the East Indies or in New Zealand, they would have been overlooked. The same argument is more strongly exemplified with the three cited species of *Lysiosquilla*. Therefore it seems legitimate, *pro tem.*, to regard all the five forms as indigenous cold water species, isolated from the main assemblage of the Indo-Pacific stomatopod fauna. As a corollary it seems likely either that they have evolved in an area of semi-isolation (tantamount to a region of speciation) or that they are relict species. The former alternative seems more probable because of the absence of any indications of morphological primitiveness, and in view of a somewhat parallel situation in east South African waters. Here the only indigenous species is the cold water *Lysiosquilla capensis* Hansen, 1895 (see Barnard, 1950, pp. 856-858).

The five distinctive species of the waters of the south-eastern quarter of Australia, plus the wider Pacific Ocean species, *Hemisquilla stylifera*, provide the evidence that three-quarters of the fauna of this region is not, in the strict sense, made up of Indo-Pacific forms. It therefore seems doubtful whether S.E. Australia can be included in the Indo-Pacific area from the aspect of stomatopod biogeography. This applies with greatest force to Tasmania and Victoria, from the waters of which no truly Indo-Pacific species have yet been recorded. The particular region involved in this argument corresponds roughly to the Maugean cold temperate province of Australia proposed by Iredale and May (1916) in their mollusc studies, and later modified by Bennett and Pope (1953) in their work on the common zoning forms of rocky shores. This province is geographically different from Kott's (1952) concept of the Maugean in her tunicate studies.

The stomatopod fauna occurring within the Maugean province extends considerably beyond the limits as defined by previous workers. Thus three of five species in question range north-westward into either the Flindersian province of South Australian waters (see Cotton, 1938; Clark, 1946; Kott, 1952; Bennett and Pope, 1953) or westward to a Baudinian region (Kott, 1952) in far south-western Australia, within the Flindersian province. This diffuse distribution is in contrast with other marine groups such as the molluscs (Hedley, 1904; Iredale, 1914, 1924; Ashby, 1926; Allan, 1950); the echinoderms (Clark, 1938, 1946); and the tunicates (Kott, 1952). Another difference is that south-western Australia is the focus of indigenous species in some groups (*e.g.*, echinoderms—Clark, 1946), while south-eastern Australia is the focus in the stomatopods.

Apart from the species of southern Australian waters, there appear to be five indigenous stomatopods. One (*Squilla mcneilli*) has a limited distribution midway between southern and northern parts, and occurs off the New South Wales coast. Its known distribution is probably limited by the extent of offshore trawl fishing. The remainder (four) occur in the more northerly waters of Australia. Two of them are from such restricted localities that their biogeographical affinities are unknown. These are *Squilla granti* from Moreton Bay, Queensland and *S. terrareginensis* from near Cairns, Queensland. The other two species are *S. depressa* and *Gonodactylus tweediei*. The first of these is known from eastern Queensland and the N. Territory, and is one of the numerous links between the faunas of those widely separated parts. The second has been recorded only from the Capricorn Group, Queensland and from Lord Howe Island, east of N.S. Wales, and is discussed here later.

Of the non-indigenous species, one (*Lysiosquilla latifrons* from New South Wales) is a cold water form recorded also from New Zealand and Japan (see Kemp, 1913). Another is *Hemisquilla stylifera*, from south-eastern Australian waters, including N.S. Wales and, as shown earlier, widely distributed in the south Pacific Ocean. Ekman (1953, p. 196) considered that *Sq. armata* was another non-indigenous cold water form but his comments are unfounded, as previously shown in the systematic section of this study (see *S. mcneilli*).

The remaining non-indigenous species, which dominate the overall picture of Australia's stomatopod fauna, are widespread, warm water, Indo-West-Pacific forms. These constitute the following fractions of the faunas of the various States of Australia: N. Territory, $-\frac{8}{9}$; Queensland, $-\frac{23}{30}$; N.S. Wales, $-\frac{5}{11}$; Victoria, $-\frac{0}{6}$; Tasmania, $-\frac{0}{4}$; Sth. Australia, $-\frac{2}{7}$; West Australia, $-\frac{8}{10}$. The dominance of Indo-Pacific species is proportionately greatest in the N. Territory, but numerically greatest in Queensland. This numerical predominance of Queensland is almost certainly due to more intensive collecting in that State. It seems highly probable that, with the same sort of intensive collecting in the N. Territory, additional widespread Indo-Pacific species will be found. Much the same argument applies to the northern coasts of Western Australia.

Comparison between the stomatopod faunas of the N. Territory and Queensland shows that, of the eight species firmly recorded from the former, seven occur also in Queensland waters, while the eighth (*Lysiosquilla acanthocarpus*) is known in all from only twenty-three specimens collected over a very widespread area, and can be regarded as a chance rarity. The N. Territory and Queensland species (particularly those of North Queensland waters) must be regarded as belonging to a biogeographic entity, which would also embrace species from the north of Western Australia. Stomatopod distribution provides no evidence to support the theory that northern Australia comprises two distinctive biogeographical provinces—Solanderian and Dampierian. These were postulated for the molluscs (Hedley, 1904, 1926) and proved satisfactory for the echinoderms (Clark, 1946). The same provinces are retained for the dominant fauna of rocky shores (Bennett and Pope, 1953), although recent work (Edean, Kenny and Stephenson in MS.) tends to the opposite conclusion.

From north to south, the numbers of Indo-West-Pacific species decline on both the eastern and western coasts of Australia. Material from the western quarter is too fragmentary for detailed consideration, but critical data on that from the eastern coasts are given in Table 2.

TABLE 2.

Southerly limits of warm water Indo-Pacific species on the East Coast of Australia, excluding Lord Howe Island. Latitudes are given to the nearest 30'.

Species.	Locality.	Lat. South.
<i>Gonodactylus pulchellus</i>	Princess Charlotte Bay	14° 30'
<i>G. trispinosus</i>	Michaelmas Cay, Cairns	16° 30'
<i>G. demani</i>	Green Is., Cairns	16° 30'
<i>Lysiosquilla acanthocarpus</i>	Dunk Is.	18° 0'
<i>Squilla quinqueidentata</i>	Townsville	19° 0'
<i>S. nepa</i>	Townsville	19° 0'
<i>S. foveolata</i>	Townsville	19° 0'
<i>Pseudosquilla pilaensis</i>	Bowen	20° 0'
<i>G. spinoso-carinatus</i>	Capricorn Group	23° 30'
<i>G. glyptocercus</i>	Capricorn Group	23° 30'
<i>G. graphurus</i>	Great Sandy Strait	25° 30'
<i>Odontodactylus scyllarus</i>	Noosaville	26° 30'
<i>S. fasciata</i>	Moreton Bay	27° 30'
<i>S. anomala</i>	Moreton Bay	27° 30'
<i>P. ciliata</i>	Moreton Bay	27° 30'
<i>O. cultrifer</i>	Moreton Bay	27° 30'
<i>G. falcatus</i>	Moreton Bay	27° 30'
<i>G. chiragra</i>	Moreton Bay	27° 30'
<i>L. maculata</i>	Port Jackson	34° 0'
<i>S. raphidea</i>	Port Jackson	34° 0'
<i>S. wood-masoni</i>	Port Jackson	34° 0'
<i>S. interrupta</i>	Port Jackson	34° 0'
<i>S. fallax</i>	Port Jackson	34° 0'

The main discontinuity in stomatopod distribution is in southern Queensland. This area has been collected more intensively than any other parts of the Australian waters. It is possible that the concentration of limits is a reflection of the collecting intensity, although it seems more probable that the discontinuity is a real one. Three of the species involved are *Squilla anomala*, *S. fasciata* and *Odontodactylus cultrifer*, which occur fairly commonly in catches of penaeid (commercial) prawns from Moreton Bay (27° 30' S); they are accompanied by the species, *S. laevis*. From the next prawning grounds southward, in N.S. Wales waters (Evans Head, 29° S), a large collection of stomatopods was especially made by Mr. Lane, Fisheries Inspector. It contained only *S. laevis*, and this suggested that the other three species just mentioned must certainly be much rarer there than in Moreton Bay. Another two species involved (*Gonodactylus falcatus* and *G. chiragra*) decline markedly in abundance from tropical to sub-tropical Queensland, and their relative sparsity in Moreton Bay indicates that this locality is very near to their southern limit of distribution. If it is concluded that these stomatopod distribution limits are substantial, Moreton Bay could be accepted as the most likely boundary of tropical dominance in the fauna. This is much further north than Ekman (1952, p. 25) suggested in his "Zoogeography of the Sea". Ekman's boundary has already been criticised by Bennett and Pope (1953) as being ". . . . too far to the south, and most other authors on biogeography to whose work reference has been made, agree."

Unfortunately the habitats of many of the Australian specimens are unknown. It is difficult, for example, to segregate the coral dwelling species. These include many species of *Gonodactylus*, and one would expect their limits of distribution to terminate with the southern extent of coral formations. Two species (*G. spinoso-carinatus* and *G. glyptocercus*) certainly do stop at the Capricorn Group of cay islets at the southern limits of the Great Barrier Reef, while two more (*G. falcatus* and *G. tweediei*) extend

to the most southerly coral formation—Lord Howe Island (31° S). The affinities of stomatopod fauna of this isolated area, if such can be deduced from so sparse a fauna, are definitely with southern Queensland, rather than with the more adjacent N.S. Wales waters, as is also the case with the echinoderms (see Endean, 1953).

Without a more detailed knowledge of habitats, and of exact localities in some cases, it is impossible to segregate a Banksian or coral reef fauna (see Whitley, 1932) from a Solanderian or mainland coastal fauna in Queensland waters. Present indications are that the species of *Squilla* dominate the coastal region, where the habitat is characterized by shallow silted to muddy waters. On the other hand, species of *Gonodactylus* dominate the offshore coral reef area (Banksian), especially in coral breccia, but some are also recovered from dredgings in the shallow inshore water, and occur in the coastal inter-tidal zone under stones.

Apart from the distribution discontinuity in southern Queensland, the only remaining one of note is in the waters of Port Jackson and near vicinity, N.S. Wales (34° S). One suspects that this is again an apparent effect due to high intensity of collecting. The four widespread species involved here are *Squilla raphidea*, *S. wood-masoni*, *S. interrupta* and *Lysiosquilla maculata*. These are evidently amongst the most cold tolerant of the warmer water Indo-Pacific forms. The remainder of the N.S. Wales fauna consists of the indigenous cooler water species *S. laevis*, *L. perpasta* and *L. vercoi*, plus a miscellany including the widespread Pacific species *Hemisquilla stylifera*, a cold water Indo-Pacific species, *Lysiosquilla latifrons*, and a species, *S. mcneilli*, indigenous to local waters. This mixture of faunistic compounds has insufficient homogeneity to justify the acceptance of a Peronian province for the Stomatopoda (see Hedley, 1926; Clark, 1946; Bennett and Pope, 1953; Endean, 1953).

Summarizing the biogeography of the Australian stomatopods, it is that (1) There are two main elements—(a) an indigenous cold water fauna centred in the waters of the south-eastern quarter, with some species extending to Western Australia and southern Queensland, and (b) a much larger Indo-West-Pacific fauna dominating the northern waters, with the limit of dominance on the eastern Queensland coast at about the region of Moreton Bay, and with western limits unknown; (2) these two elements overlap in N.S. Wales, resulting in a fauna of mixed relationships; the same condition possibly holds for South Australia and the southern waters of Western Australia; and (3) the various faunistic provinces or regions recognized by workers in other spheres (*viz.* Solanderian, Banksian, Peronian, Maugean, Flindersian and Baudinian) are inappropriate to the present context.

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The following work arrived in the mail while proofs of the present contribution were being read.—Serène, R., 1954.—Observations Biol. sur les Stomatopodes. *Mém. de L'Inst. Océanographique de Nhatrang*, 8e Mém., pp. 1-93, Pls. 1-10, text figs. 1-15 and map.

The work is primarily biological, without systematic approach to the species dealt with. Several of the specific names, however, are not in agreement with those recorded by us (e.g., *Squilla oratoria*, var. *inornata* and *Gonodactylus platysoma*) but we are fully satisfied about the designations of our various specimens.

Another two works which must be added to the bibliography have also been located. These are.—

Rathbun, Mary J., 1914.—Stalk-eyed Crustaceans collected at the Mone Bello Islands. *Proc. Zool. Soc. London*, 3, pp. 653-64. Contains two additional records for Western Australia—"Protosquilla trispinosa" (now *Gonodactylus trispinosus* Dana), and "*Gonodactylus chiragra*, var. *smithii*" [now relegated to *G. chiragra* (Fabr.)].

Kurién, C. V., 1954. Contributions to the Study of the Crustacean Fauna of Travancore. *Bull. Central Res. Inst., Univ. of Travancore*, Trivandrum, Ser. C., Nat. Sci., III, No. 1, pp. 70-91, text figs. Contains records of *Squilla hieroglyphica* Kemp, *S. nepa* Latr., *S. holoshista* Kemp, *S. wood-masoni* Kemp, and *Lystosquilla maculata* (Fabr.).

EXPLANATION OF FIGURE 1.

1, flagellum of antennule (1st antenna); 2, peduncle of antennule (1st antenna); 3, flagellum of endopodite of antenna (2nd antenna); 4, cornea; 5, tip of ophthalmic somite; 6, eyestalk; 7, antennular somite; 8, dorso-lateral processes of antennular somite; 9, rostrum; 10-12, antenna (10, scale (distal exopodite); 11, proximal segment of exopodite; 12, basal segment); 13-21, carapace (13, anterolateral angle (here spinous); 14, anterior bifurcation of median carina; 15, lateral carina; 16, marginal carina; 17, median carina, position of small pit; 18, intermediate carina; 19, gastric groove; 20, cervical groove; 21, posterior reflected part of marginal carina); 22-27, thoracic somites; (22, lateral processes of 5th (first free); 23, median carina of 6th; 24, submedian carina of 6th; 25, lateral processes of 6th; 26, submedian carina of 7th; 27, submedian carina of 8th); 28-32, 1st and 5th abdominal somites respectively (28, median carina; 29, submedian carina; 30, intermediate carina; 31, lateral carina; 32, marginal carina); 33, convergence of lateral and marginal carinae of 6th abdominal somite; 34-41, telson (34, median carina; 35, prelateral lobe or denticle; 36, lateral tooth; 37, lateral denticles; 38, intermediate denticles; 39, intermediate tooth; 40, submedian denticle; 41, submedian tooth); 42, mandibular palp; 43, mandible; 44, protopodite of raptorial claw; 45, epipodites of raptorial claw; 46, first thoracic appendage; 47-53, raptorial claw (47, ischium; 48, merus; 49, carpus; 50, carina of carpus; 51, movable spines of propodus; 52, immovable spines on upper margin of propodus; 53, dactylus); 54-61, uropod (54, basal segment; 55, bifurcated process of basal segment; 56, proximal segment of exopodite; 57, spines on edge of proximal segment; 58, large spine at end of proximal segment; 59, distal segment of exopodite; 60, endopodite; 61, denticles or teeth on inner side of basal process); 62, swelling on longer of two bifurcated processes, here bordering a concave proximal region; 63, tip of longer bifurcated process; 64, tip of shorter bifurcated process.

Figure 1.

Diagram showing terminology of external features of Stomatopoda with (a) dorsal view of head, thorax and first abdominal somite, (b) lateral view of head and carapace regions, with thoracic appendages deflected ventrally, (c) dorsal view of last two abdominal somites and telson, (d) ventral view of left uropod on a larger scale.

