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**Contributions to the Knowledge of the
Alpheid Shrimp of the Pacific Ocean**

**PART XIII. TWO SPECIES OF ALPHEID SHRIMP, ONE NEW,
COMMON IN THE PRAWN TRAWLS OF MORETON BAY,
QUEENSLAND, AUSTRALIA**

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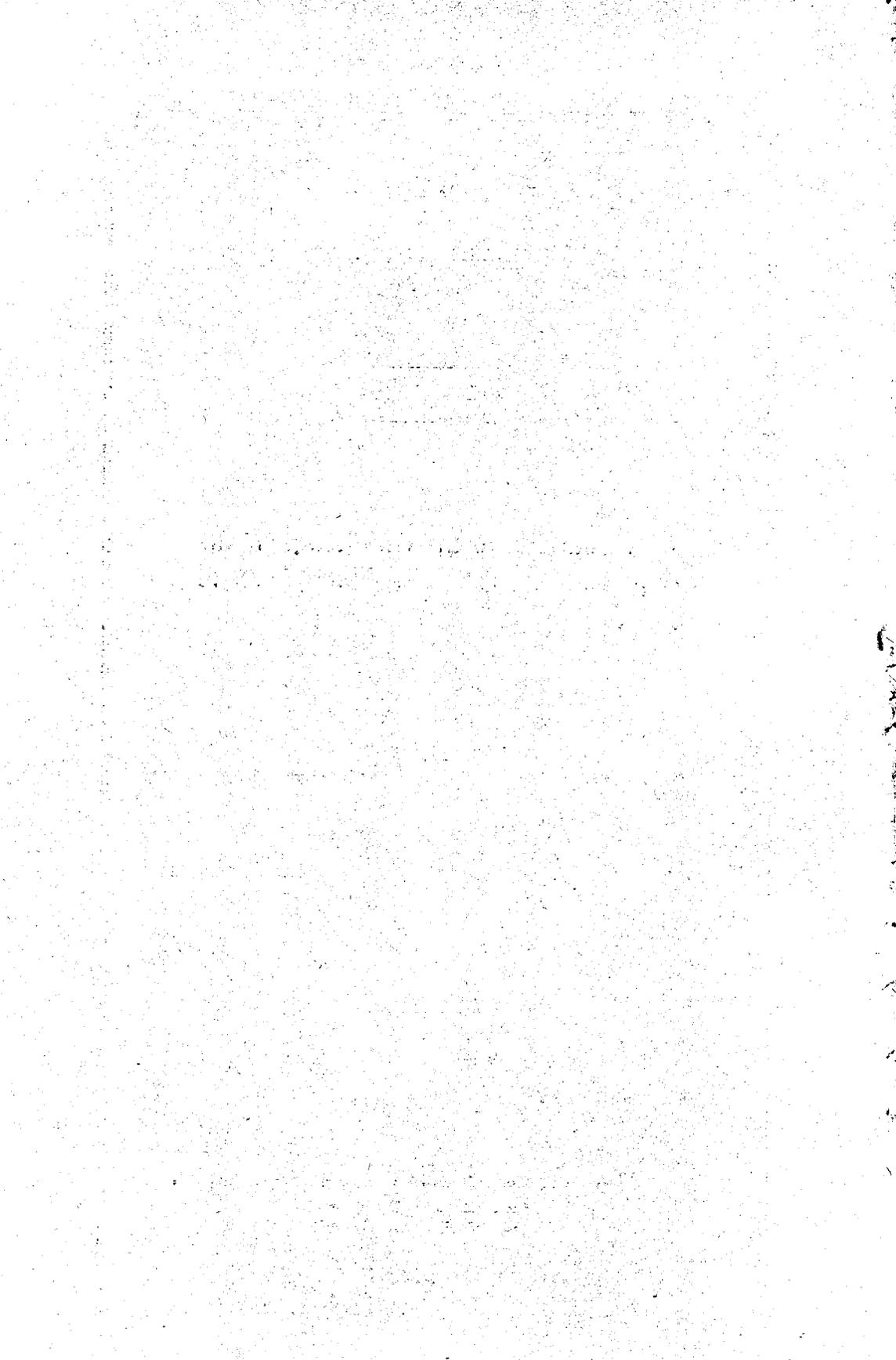
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CONTRIBUTIONS TO THE KNOWLEDGE OF THE ALPHEID SHRIMP OF THE PACIFIC OCEAN

PART XIII. TWO SPECIES OF ALPHEID SHRIMP, ONE
NEW, COMMON IN THE PRAWN TRAWLS OF
MORETON BAY, QUEENSLAND, AUSTRALIA.¹

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(With three text-figures)

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SYNOPSIS

Two large species of alpheid shrimp, *Alpheus stephensoni* sp. nov. and *A. distinguendus* de Man are described from Moreton Bay, Queensland. They belong to the *brevirostris* group and are related to those species without a transverse groove near the base of the dactylus of the large chela. Both species are caught at depths ranging from 5 to 10 fathoms on sandy mud substrates, though *A. stephensoni* also occurs on mud. The large "clacking shrimp", which are caught consistently on summer nights in commercial prawn trawls in Moreton Bay, are likely to be one or both of these species.

INTRODUCTION

Two large species of alpheid shrimp, *Alpheus stephensoni* sp. nov. and *A. distinguendus*, consistently occur in the prawn trawls during summer nights in parts of Moreton Bay. Occasionally, a night's effort will catch over 100 lbs of large snapping shrimp, though usually they are thrown back with the trash. *Alpheus distinguendus* de Man has also been collected from several other localities around Australia and presumably *Alpheus stephensoni* sp. nov. will also be found in other prawn trawling areas. The junior author has made colour notes on our present two species and reports on their distribution (Text-figure 1).

DESCRIPTIONS

Alpheus stephensoni sp. nov.
(Text-figure 2)

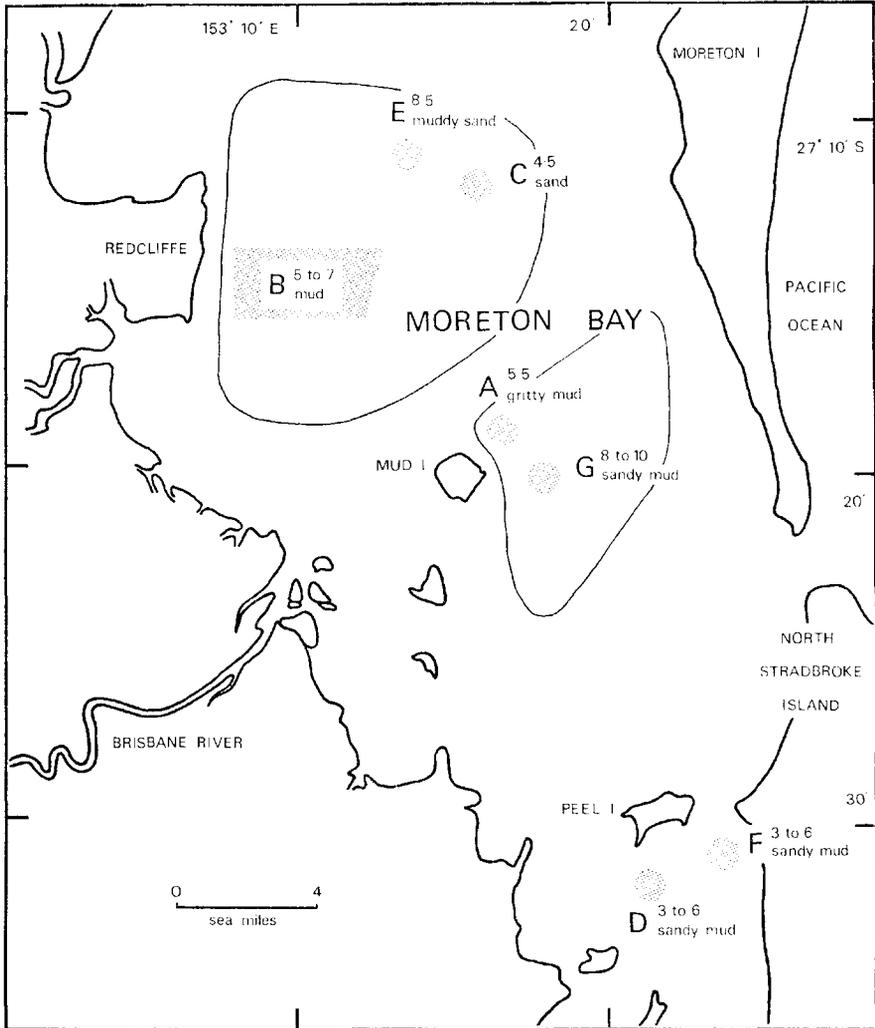
Type specimen: 70 mm. male coll. W. Stephenson 10/xi/61; locality C. Female chela drawn from 64 mm. specimen coll. C. R. Smalley 7/ii/68; locality A.

Description: Rostrum acute, awl-shaped, reaching past end of first antennular article. Rostral carina pronounced, knife-edged, disappearing abruptly at 0.4 length of carapace. Orbital hoods inflated, forming moderately deep grooves between hoods and high rostral carina. Orbito-rostral area set off distinctly from lateral regions of carapace, more narrow in relation to carapace than usual for *Alpheus*. Carapace covered with small bosses. Second article of antennular peduncle 3 times as long as broad. Visible part of first

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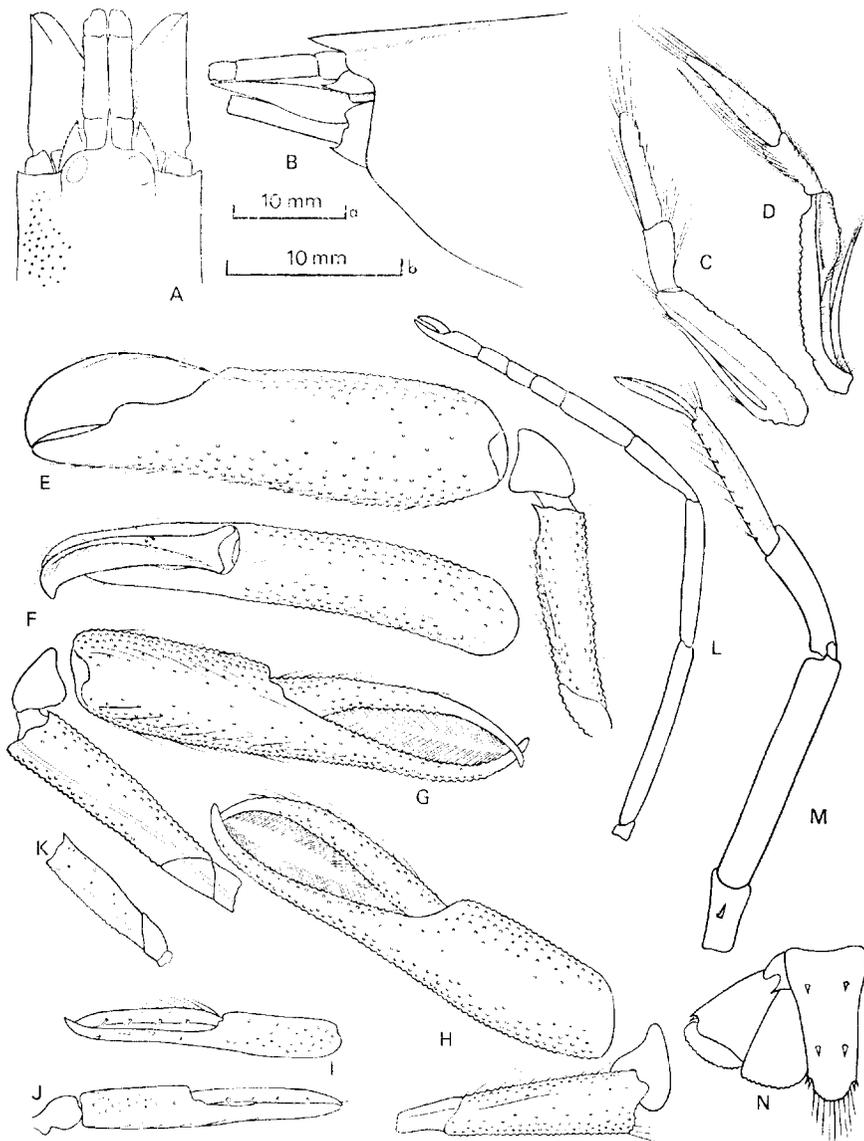


Text-figure 1.—Moreton Bay showing collecting areas of the two species. The substrate type and the depth (in fathoms) are indicated at each locality.

A fine line delimits areas where large snapping shrimp (presumably these two species) are trawled in large numbers by commercial prawn fishermen (L. Wale, personal communication).

article and third article sub-equal, first article about one-third as long as second. Lateral margins of antennular peduncles beset with dense, fine hair. Antennular flagella somewhat shorter than body length; antennal flagella somewhat longer than body. Lateral margin of scaphocerite straight, lateral spine only slightly longer than squamous portion. Squamous portion narrow distally. Carpocerite reaching to end of second antennular article, antennae long, often as long as entire shrimp. Stylocerite acute, reaching to end of first antennular article, lateral margin fringed with fine hairs. Basicerite with strong lateral spine. Tip of third maxilliped reaching beyond end of antennular peduncles when extended.

Large chela compressed 3.7 times as long as broad. Palm covered with small bosses, less abundant near distal end; superior margin rounded, bearing towards the inner face a row of forward-sweeping hairs; inferior margin flattened and bearing rows of hairs similar to superior margin; inner face flat;



Text-figure 2.—*Alpheus stephensoni* sp. nov. A, B, Anterior region, dorsal and lateral aspect; C, third maxilliped, lateral face; D, third maxilliped, inner face; E, large cheliped, inner face; F, large chela, superior aspect; G, small cheliped, inner face; H, small cheliped outer face; I, J, small chela, female, inner and outer face; K, merus small chela female, inner face; L, second leg; M, third leg; N, telson and uropods.
A, B, E, F, G, H, I, J, K, scale a.
C, D, L, M, N, scale b.

outer face a little rounded toward the superior margin but longitudinally slightly grooved near the inferior margin; groove not extending into finger. Dactylus 0.38 as long as entire chela, superior margin slightly flattened bearing a row of fine setae on inner margin of flattened portion. Fingers slightly crossing; surfaces with a few long setae, but no bosses. Merus 3.7 times as long as broad, surface covered with small bosses. Distal end of superior margin not armed, inferior internal margin bearing row of fine hairs, distal end with strong, acute tooth. Inner face bearing a shallow longitudinal groove near superior margin. Large chela of female slightly smaller than male chela.

Small chela of male highly compressed 4.8 times as long as broad, entire surface covered with small bosses. Fingers only slightly longer than palm. Inner face of chela beset with forward sweeping hairs, superior and inferior margins rounded. Superior margin of dactylus with sharp crest. Fingers bearing dense fringe of setae along lateral margins of opposing faces. Fingers gaping, tips crossing. Merus 3.6 times as long as broad, surface covered with small bosses. Infero-internal margin bearing fine hairs, distal end armed with pronounced tooth. Inner face bearing a narrow longitudinal groove near superior margin, similar to groove on merus of large chela.

Small chela of female highly compressed, about one-third as large as that of male, 6.5 times as long as broad, fingers a little longer than palm. Dactylus slightly shorter than fixed finger. Fingers with patches of short stiff setae near opposing surfaces, but no fringe of setae as found in male. Palmar surface with bosses similar to large chelae. Inner face partially covered with forward-sweeping setae set into the superior and inferior margins. Merus similar to that for large chela with tooth on the infero-distal margin and a slight narrow groove longitudinally near the superior margin.

Carpal articles of second leg with ratio: 10:8:3:3:3.

Ischium of third leg with small spine. Merus 6 times as long as broad, unarmed. Carpus almost half as long as merus. Propodus 0.6 as long as merus, without movable spinules but with 3 longitudinal rows of stiff setae. Dactylus spatulate 0.3 as long as merus.

Telson 3.2 times as long as posterior margin is broad. Posterior margin strongly arcuate with rounded tip extending well beyond lateral spines.

This species is named in honor of Professor W. Stephenson of the University of Queensland who gave the first specimen to the senior author and who has been a source of encouragement and help to the junior author.

Discussion: The following variations were found in a group of 17 specimens from Moreton Bay. The ratio of the total length of the large chela to the fingers varied from 3.0 to 5.0. The small chela varied from 5.3 to 7.0 times as long as broad. The length-breadth ratio of the merus of the third leg varied from 6.2 to 9.2. None of these variations could be correlated with sex, and the variations were independent and presented a more or less continuous spectrum precluding the possibility of morphologically separate forms.

This species is a member of the *brevirostris* group and within that group is related to those species without a transverse groove near the base of the dactylus of the large chela. From *A. distinguendus* de Man (1909: 155) it is separated by the palm of the small chela being longer than high, from *A. halesii* Kirk (1887: 194) by the lack of a pronounced keel on the outer face of the palm of the large chela. From *A. rapacida* de Man (1911: 394) and *A. lepidus* de Man (1908: 106), it may be separated by the longer rostrum and the longer and more slender second article of the antennular peduncles. From *A. siboga* de Man (1908: 107), *A. acutocarinatus* de Man (1908: 105), and *A. macrosceles* Alcock & Anderson (1894: 133) it is separated by a heavier palm of the small chela which is only twice as long as broad in this species and at least 3 times as long as broad in the other three.

Localities: See Text-fig. 1. Several specimens coll. W. Stephenson 10/xi/61; locality C. Also the following coll. the junior author: 22 specimens, male and female, 7/ii/68, locality A; 8 specimens, male and female, 25-26/iii/68, locality A; 70 specimens, male and female, 2-3/v/68, locality B. This species is also known from locality G.

Ecological Notes: 5-10 fm.; bottom generally mud to sandy mud; caught in prawn trawls at night, particularly in summer; few are caught by day. Probably remain deep in burrows during winter. Specimens caught in early spring often heavily encrusted with hydroids and tubeworm cases. All alpheidids caught on muddy grounds east of Redcliffe are likely to be this species.

Colour Notes: Carapace blue-green dorsally; rostral carina brown. Abdomen olive dorsally, and often red laterally; along lower edges of pleura is a white band continuous with the white branchiostegites. Tergum markings usually include brown transverse band along posterior edge of each tergum, various small colourless patches assuming bilateral symmetry, and a median colourless line on anterior of first tergum and on sixth tergum continuing posteriorly on telson. Telson also with two white patches proximally and a white spot around base of each of the four spines.

Antennules and antennae mostly brown, but blue-green at bases. Inner faces of large and small chelipeds with proximal ends of fingers, palm, and carpus, and distal end of merus all olive mottled on pale pink background, but for blue inferior internal edge of palm; most of fingers blue over pale pink with extreme tips white. Outer faces of chelae purplish or pink. Uropods reddish with blue and brown borders. Other appendages red distally, white proximally.

Alpheus distinguendus de Man

(Text-figure 3)

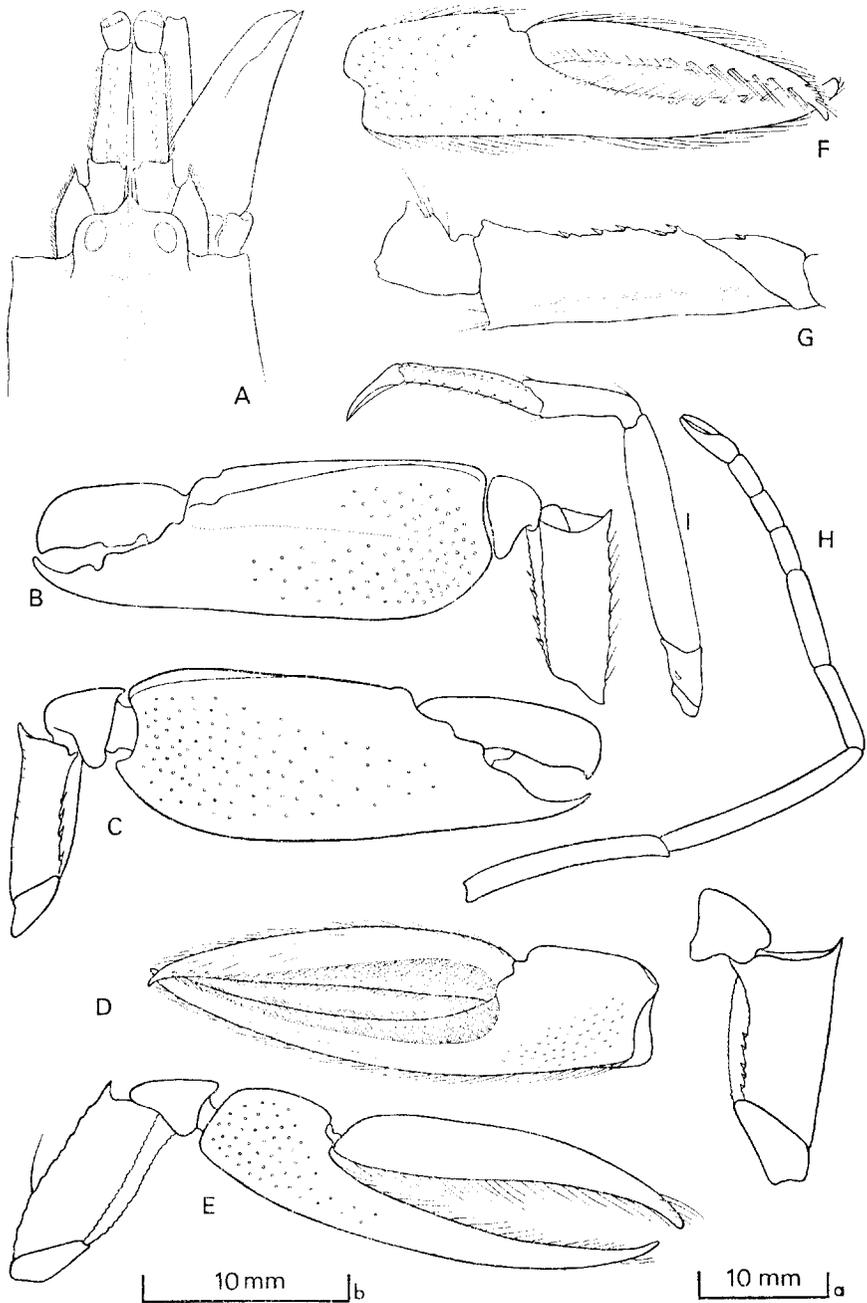
Alpheus rapax de Haan, 1849. Fauna Japonica p. 177, pl. 45, fig. 2
[nec *Alpheus rapax* Fabricius]

Alpheus distinguendus de Man, 1909. Soc. Zool. France, Mem. 22: 155, pl. 7, figs. 9-14.

Specimen drawn: 74 mm. male Botany Bay, New South Wales, 15 ft. of water, coll. D. Lelliot, June, 1962. Female cheliped from 70 mm. specimen coll. by C. R. Smalley 7/ii/68; locality A.

Description: Rostrum awl-shaped, reaching near to end of first antennular article. Dorsal carina knife-like, extending into carapace beyond orbits. Eye hoods inflated forming broad deep grooves between eye hoods and dorsal carina. Visible part of first antennular article equal to third. Second article 3 times as long as third article and 3 times as long as wide. Stylocerite reaching to end of first antennular article, acute tip not directed inward. Lateral margins of stylocerite and antennules beset with row of dense, fine setae. Scaphocerite with outer margin curved, tip of lateral spine slightly longer than squamous portion. Basicerite bearing small acute tooth. Carpocerite as long as antennular peduncle.

Large chela compressed, 3 times as long as wide, with fingers occupying the first 0.3. Superior margin without transverse groove, but bearing along its entire length a flattened area that slants toward the outer face at the distal end of the palm. Inner edge of flattened area bearing fine hairs directed forward. Outer face bearing a diffuse longitudinal ridge about the middle of the face. Inner face flat. Inferior margin of chela knife like, and bearing fine hairs directed forward along its entire length. Entire chela bearing fine bosses. Merus 2.7 times as long as broad. Superior margin terminating in an acute tooth. Infero-internal margin lightly serrate and bearing 4 movable spinules, terminating distally in an acute tooth. Infero-external margin without spinules, but bearing fine serrations along margin.



Text-figure 3.—*Alpheus distinguendus* de Man. A, Rostral front, dorsal view; B, large cheliped, outer face; C, large cheliped inner face; D, small cheliped, male, inner face; E, small cheliped, male, outer face; F, small chela, female, inner face; G, merus of small chela, female, inner face; H, second leg; I, third leg. A, B, C, D, E, H, I, scale a. F, G, scale b.

Small chela of male slender, 4.5 times as long as wide, palm covered with minute bosses. Fingers 2.8 times as long as palm, fingers crossing at tips. Dactylus longer than fixed finger. Opposing margins of fingers bearing brush of forward directed hairs. Outer faces of fingers show gape only near the distal end when closed, but inner face shows wide arched gape along its entire length giving an excavate appearance. Opposing faces of fingers heavily hirsute. Merus similar to that of large chela.

Small chela of female about half the size of the male small chela. Fingers 1.7 times as long as palm, fingers slightly gaping, crossing at tips. Opposing margins bearing slight row of criss-crossing hairs. Patches of setae on lateral margins of fingers. Superior and inferior margins beset with long, fine, forward sweeping hairs. Merus similar to that for the male but slightly more slender.

Ratio of carpal articles of second leg 10:10:5:4:4.

Ischium of third legs with movable spine. Merus of third leg 7 times as long as wide, without spines. Carpus half as long as merus; propodus a little longer than carpus, bearing only sparse hairs on its inferior margin. Dactylus spatulate.

Telson 2.5 times as long as posterior margin is broad, proximal margin 1.5 times wider than distal. Distal margin broadly rounded, arcuate.

Discussion: This species agrees very well with the careful diagnosis by de Man made in 1909 when he found that the specimen that de Haan had labelled *Alpheus rapax* was indeed a different species. He gave it the name *Alpheus distinguendus*. This species can be easily separated from *A. rapax* Fabricius (1798: 405) because of the lack of transverse groove on the large chela. This species can also be confused with *Alpheus brevisirostris* (Olivier) (1811: 664), but it can be distinguished also by the lack of transverse groove on the large chela and by the carpocerite which reaches to the end of the third antennular article in this species, but in *A. brevisirostris* only to the middle of the second antennular article.

De Man and de Haan did not mention the fact that the movable dactylus overhung the immobile dactylus and it may be that this character will separate the Australian species from de Man's; however until specimens from Japan, the type locality, are redescribed, we must consider these specimens to be *A. distinguendus*. Seventeen male specimens were compared in the length-breadth ratio of the large and small chela. In the large chela the ratio of the total length to the palmar width varied from 2.5 to 3.0. In the small male chela the relationship of fingers to palm varied from the fingers being 2.5-3.5 times as long as the palm.

Localities: Text-fig. 1. 32 specimens coll. C. R. Smalley 7/ii/68; locality A. Also known from localities D, E, F, G.

Ecological Notes: 5-10 fm., bottom generally sandy mud, caught in prawn trawls particularly in summer. Distribution wider than *A. stephensoni*, particularly to the south of the Bay, with overlap around Mud I.

Colour Notes: Dorsal of carapace olive anteriorly, with brown rostral carina; brown posteriorly. Sides of carapace light blue with two oblique brown bands posteriorly, running forwards from dorsal brown patch; a cream flash anterior to the end of the upper band.

Terga olive with darker posterior borders; dorsally down midline of abdomen is a fine brown streak, and on either side of brown streak, discontinuous white streaks form into two longitudinal rows; fourth abdominal tergum with large black spot on either side; also, posterior margin of each tergum-pleuron border marked with white spot. Pleura pale blue with upper longitudinal brown band continuous with lower thoracic band, and running length of abdomen. Telson olive with colourless median dorsal streak, two white patches proximally, and white spot around each spine.

Antennules and antennae green dorsally, pale blue ventrally. Inner face of large cheliped: fingers orange distally, olive proximally; extreme proximal end of palm, together with carpus and distal of merus, olive; rest of inner face of palm: olive, with small yellow patch, superiorly; orange inferiorly. Inner face of small cheliped: fingers orange with indistinct purple band across bases; palm olive with yellow spots. Outer face of both chelae with fingers having similar but lighter colour to corresponding inner face; palm white. Second thoracic leg purple distally. Third to fifth thoracic legs with blue band subdistally on merus and red from carpus to dactylus except for yellow articulations. Uropods olive but exopodite with a blue and a yellow patch distally.

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