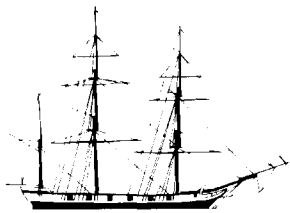


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THOR SPINIPES SP. NOV., A NEW HIPPOLYITID SHRIMP FROM THE COBOURG PENINSULA, NORTHERN AUSTRALIA

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ABSTRACT

A new species of hippolytid shrimp, *Thor spinipes* sp. nov., from the Cobourg Peninsula, Northern Australia, is described and illustrated. The species is most closely related to *T. paschalis* Heller and is a cryptically coloured, free-living species. A key for the identification of the species of *Thor* known from Australian waters is presented.

INTRODUCTION

Six species of the hippolytid genus *Thor* Kingsley, 1878, have been described from the Indo-West Pacific region, with a further three species known from the western Atlantic region. One species, *T. amboinensis*, occurs in both regions. The discovery of an undescribed species on the Cobourg Peninsula of the Northern Territory raises to four the number of species known from Australian waters. Of the six previously described Indo-West Pacific species, three are known to be associated with other marine invertebrates and three are apparently free-living. All occur in shallow or intertidal waters. The

present new species possesses a well developed supraorbital spine which distinguishes it immediately from all Indo-West Pacific species except *T. spinosus* Boone and *T. maldivensis* Borradaile, which have not yet been recorded from Australian waters but could well occur, as well as from the West Atlantic species. Keys for the identifications of most of the Indo-West Pacific species of *Thor* have been provided by Holthuis (1945) and Bruce (1976). Miyake and Hayashi (1966) and Hayashi and Miyake (1968) discuss the species occurring in Japanese and western Pacific waters.

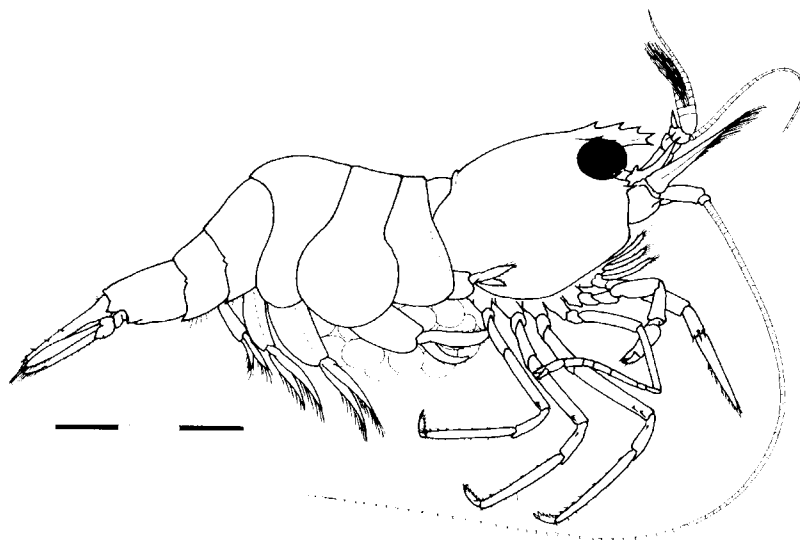


Fig. 1. *Thor spinipes* sp. nov., ovigerous female. Scale in millimetres.

***Thor spinipes* sp. nov.**
(figs.1-6)

Material examined — 3♂, 7 ovig. ♀, 1♀, 2 juv.; Burford Island, Cobourg Peninsula, Northern Territory, Australia; Stn. CP/14, 11°29.3'S, 131°57.5'E; muddy reef flat pools at LWS tide, 13 October 1981, coll. A. J. Bruce.

Description — Small sized, rather stout bodied hippolytid shrimp, with body subcylindrical, glabrous, without plumose setae. Carapace smooth with short slender compressed rostrum equal to about half postorbital carapace length, horizontal, reaching to about level of distal border of proximal segment of antennular peduncle, bearing three acute dorsal teeth and one distal ventral tooth, (one specimen has a rostral dentition of 4/1), lateral carina feebly developed. Acute supraorbital spines present, epigastric and hepatic spines absent; inferior orbital angle slightly produced, subacute; antennal spine acute, slender, submarginal, close below and

exceeding inferior orbital angle, anterolateral angle of carapace broadly rounded, unarmed orbital angle.

Abdomen smooth, with third segment slightly produced posterodorsally; pleura of first three segments broadly rounded, fourth and fifth with posteroventral angles acutely produced; sixth segment about 1.4 times longer than deep and about 1.8 times length of fifth segment, posterolateral and posteroventral angles acute. Telson about 1.3 times length of sixth segment, sides straight or slightly concave, posteriorly convergent, about 2.1 times longer than wide with narrow rounded posterior margin, without median point, equal to 0.25 of the anterior width; three pairs of small subequal dorsal spines at about 0.55, 0.70, and 0.85 of telson length; three pairs of posterior marginal spines, with lateral spines subequal to dorsal spines, intermediate spines about four times as long and submedian spines three times longer and plumose.

Eyes with large globular cornea, wider than eyestalk.

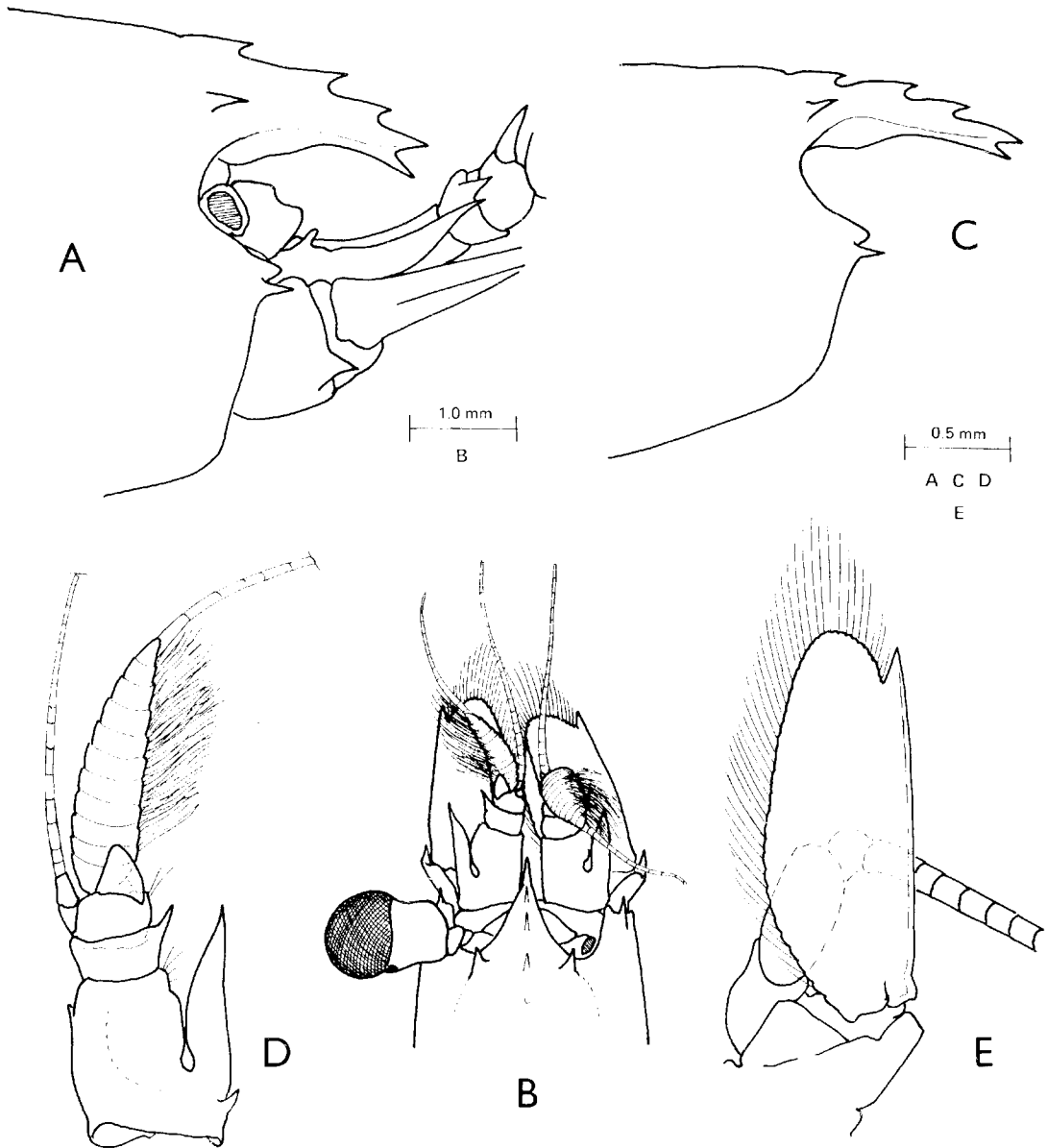


Fig. 2. *Thor spinipes* sp. nov., ovigerous female. A. anterior carapace and antennal peduncles, lateral. B. anterior carapace and antennal peduncles, dorsal. D. antennule. e. antenna. Male: C anterior carapace, lateral.

Antennular peduncle with long slender acute stylocerite reaching beyond intermediate peduncular segment, with small acute tooth at proximal end of lateral margin; statocyst obsolete; intermediate segment with acute distolateral tooth; distal segment with triangular mobile

scale distodorsally: upper flagellum biramous with rami fused, proximal portion stout, 10-12 segments, with dense masses of aesthetascs, distal portion slender: lower flagellum filiform.

Antenna with basicerite bearing acute ventrolateral tooth; scaphocerite far outreaching antennular peduncle, about 2.5

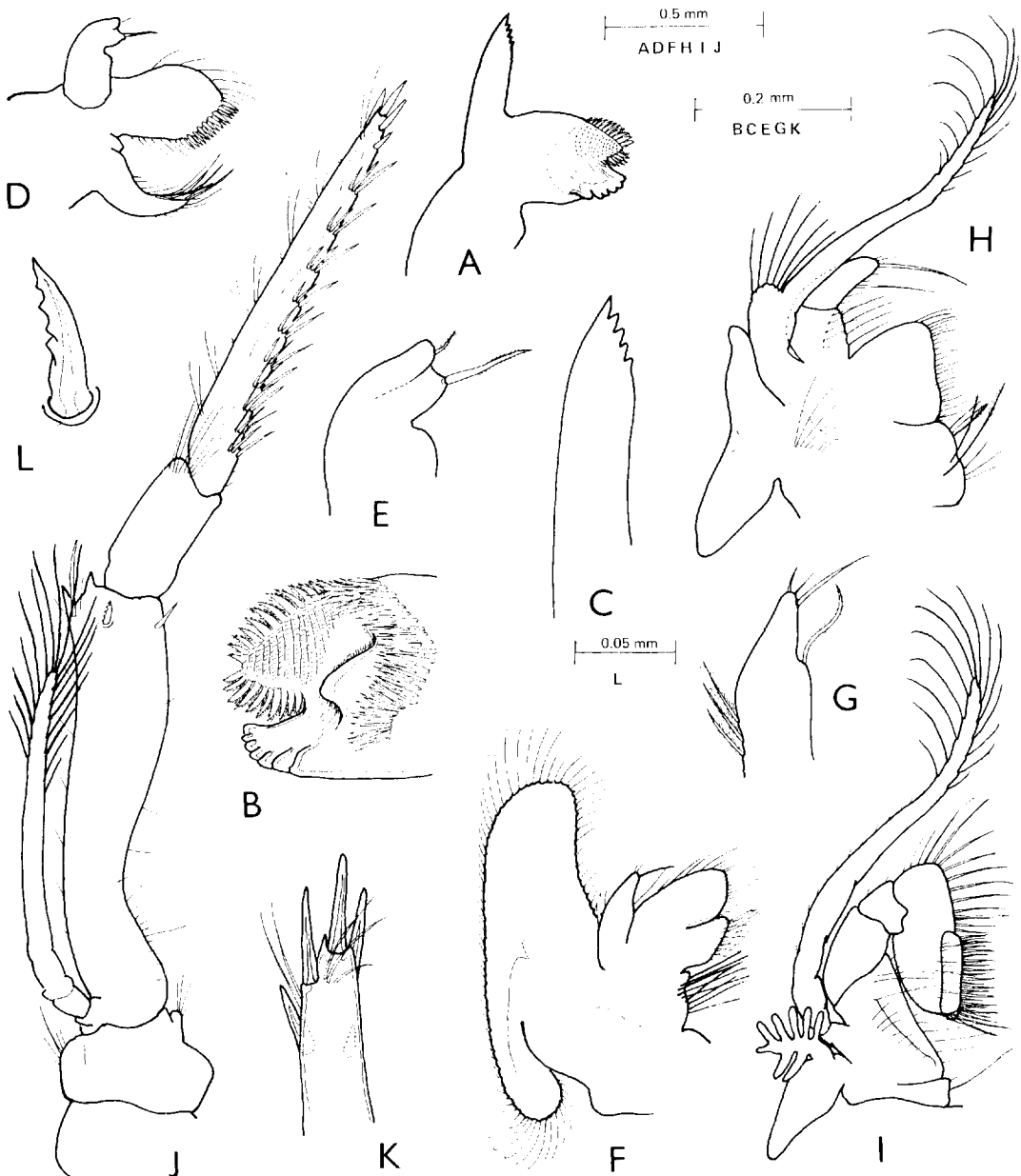


Fig. 3. *Thor spinipes* sp. nov., ovigerous female. A, mandible. B, molar process. C, incisor process. D, maxillula. E, *idem*, palp. F, maxilla. G, *idem*, palp. H, first maxilliped. I, second maxilliped. J, third maxilliped. K, *idem*, tip of distal segment. L, *idem*, distal ischiomerale spine.

times longer than wide, lateral border straight with strong distolateral tooth, not exceeding rounded anterior margin of lamella; carpocerite robust, reaching middle of scaphocerite, with well developed slender flagellum.

Mouthparts normal. Mandible with corpus robust, without palp; molar process stout with complex masticatory surface (fig. 3b); incisor process slender, distally oblique with five small acute teeth. Maxillula with bilobed palp, lower lobe with long serrulate

setae and upper lobe with short plumose seta; upper lacinia broad, obliquely truncate distally with about 15 short stout spines, ventrally setose; lower lacinia slender tapering with numerous long spiniform setae. Maxilla with short stout palp, bearing a pair short simple terminal setae, a longer preterminal seta with one plumose seta on medial border and three on lateral border; distal endite deeply bilobed, finely setose; proximal endite reduced, coarsely setose; scaphognathite three times longer than broad, anterior lobe large and rounded, posterior lobe small. First maxilliped with palp robust, two segmented with two long setae and numerous short setae along medial and ventral borders; basal endite broad, medially setose; coxal endite also broad, sparsely setose; exopod with flagellum well developed with numerous plumose distal setae; caridean lobe small with six short marginal plumose setae;

epipod large, bilobed. Second maxilliped normal; distal segment small and narrow, densely spinose; propod broad, about 2.2 times longer than broad, twice as long as width of dactylar segment, with slender spines on the distomedial angle; flagellum well developed; epipod triangular with small podobranch. Third maxilliped with slender endopod extending beyond antennular peduncle by one third of length of distal segment; distal segment, slender, tapering, about 7.5 times longer than wide with cornified spines distally and numerous groups of short spines ventromedially, penultimate segment robust, about 0.3 of length of distal segment; antepenultimate segment robust, bowed, with two small distodorsal teeth, a dentate spine laterally and a distoventral spine; flagellum well developed; epipod rounded, small, without arthrobranch.

Table 1
Pereiopodal spinulation in *Thor spinipes* sp. nov.

| C.L., | | Merus, L/R | | | Carpus, | | | L/R |
|---------|-----|------------|-----|-----|---------|-----|-----|-----|
| | mms | P3 | P4 | P5 | P3 | P4 | P5 | |
| Spm. | | | | | | | | |
| Ovig. ♀ | 2.7 | 5/5 | 2/1 | 1/1 | 1/1 | 1/1 | 0/1 | |
| Ovig. ♀ | 2.4 | 4/4 | 1/1 | 1/1 | 1/1 | 1/1 | 0/0 | |
| Ovig. ♀ | 2.0 | 4/4 | 1/1 | 0/0 | 1/1 | 1/1 | 0/1 | |
| Ovig. ♀ | 2.6 | 3/3 | 1/1 | 1/1 | 1/1 | 1/1 | 1/1 | |
| Ovig. ♀ | 2.2 | 1/2 | 1/1 | 1/1 | 1/1 | 1/1 | 0/0 | |
| Ovig. ♀ | 2.0 | 2/3 | 1/1 | 1/1 | 1/1 | 1/1 | 0/- | |
| Ovig. ♀ | 1.9 | 3/- | 1/- | 1/1 | 1/- | 1/- | 1/1 | |
| ♀ | 1.9 | 2/3 | 1/1 | 0/0 | 1/1 | 1/1 | 0/0 | |
| ♂ | — | 2/3 | -/1 | 0/0 | 1/1 | -/1 | 0/0 | |
| ♂ | 1.6 | 2/2 | 1/1 | 0/0 | 1/1 | 1/1 | 0/0 | |
| ♂ | 1.6 | -/- | 1/- | 0/- | -/- | 1/- | 0/- | |
| juv. ♀ | 1.6 | 2/3 | 1/1 | 1/1 | 1/1 | 1/1 | 0/1 | |
| juv. | 1.5 | 3/4 | 1/1 | 0/0 | 1/1 | 1/1 | 0/0 | |

First pereiopods, equal, similar, short and robust, extending anteriorly to level of distal carpopocrite; chela with palm subcylindrical, slightly compressed, twice as long as deep; fingers feebly subspatulate, half length of

palm, slender, tapering with strongly cornified distal spines, carpus robust, unarmed, feebly expanded distally, slightly longer than palm; merus slightly longer than carpus, 2.2 times longer than wide with

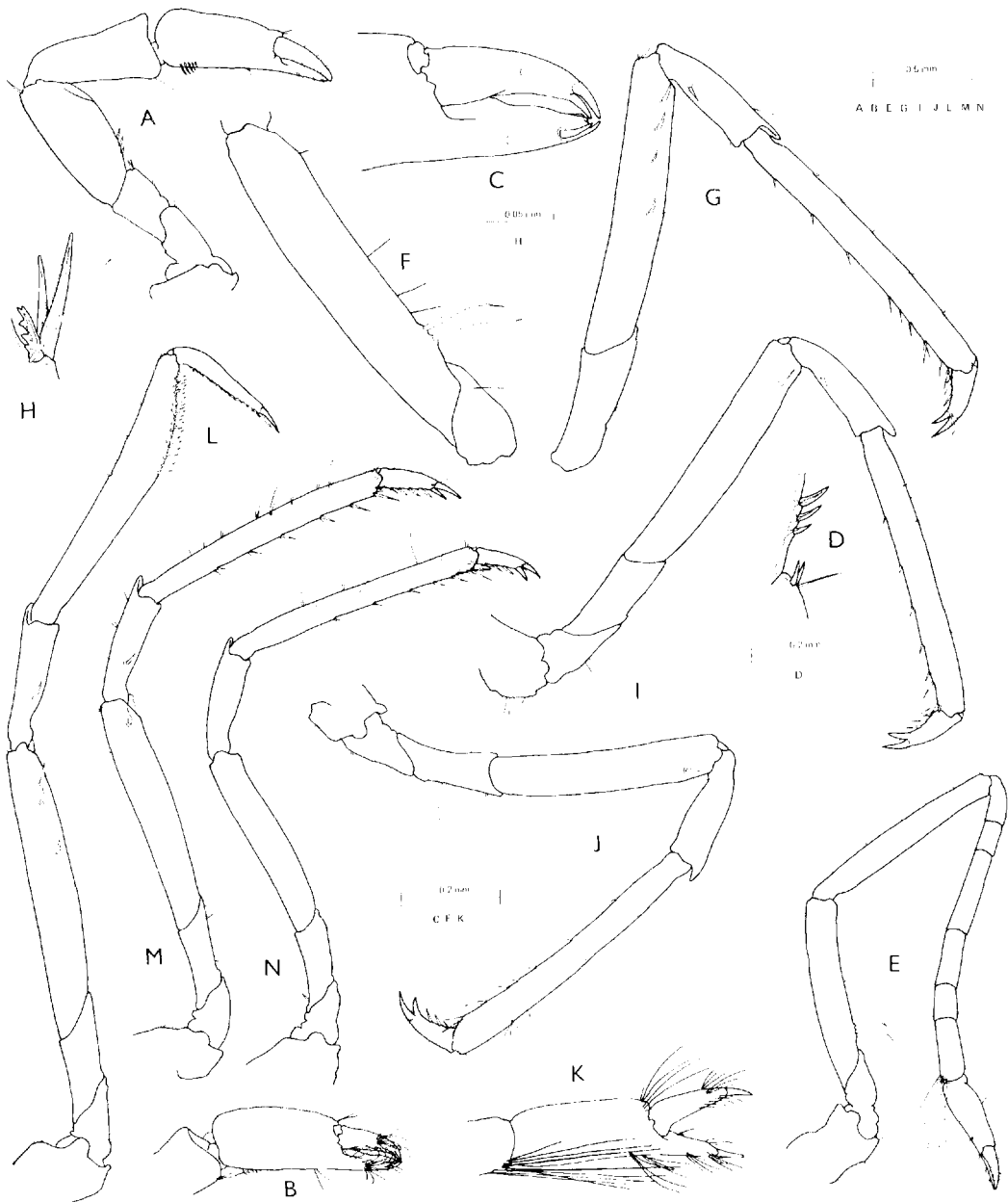


Fig. 4. *Thor spinipes* sp. nov., ovigerous female. A. first pereiopod. B. *idem* chela. C. *idem* fingers of chela, setae omitted. D. *idem*, meral and ischial spines. E. second pereiopod. F. *idem*, ischium. G. third pereiopod. H. distoventral spines of propod of fourth pereiopod. I. fourth pereiopod. J. fifth pereiopod. Male: K. chela of second pereiopod. L. third pereiopod. M. fourth pereiopod. N. fifth pereiopod.

three short spines on proximal ventral border; ischium short, half length of merus, pereiopods slender, extending beyond tip of antennal scale; chela with palm about twice as long as deep, 1.3 times length of fingers, slender, tapering, acute; carpus

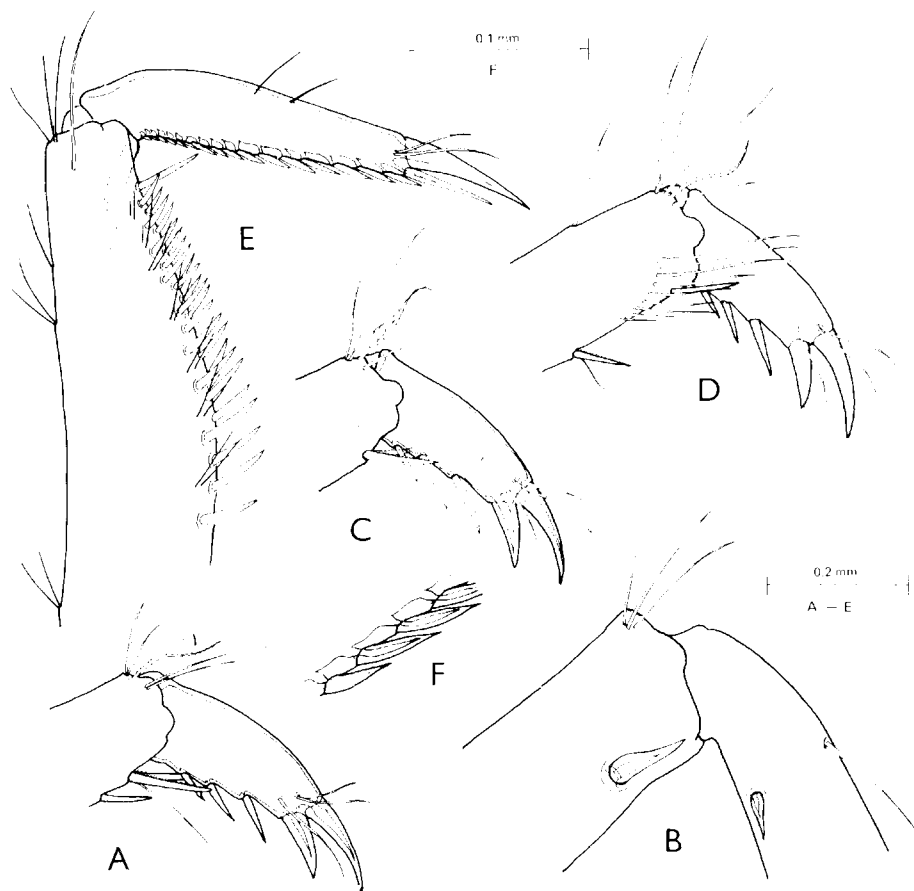


Fig. 5. *Thor spinipes* sp. nov., ovigerous female. A, third pereiopod, dactyl. B, *idem*, carpo-meral joint. C, fourth pereiopod dactyl. D, fifth pereiopod, dactyl. Male: E, third pereiopod, dactyl. F, *idem*, spines on cutting edge of propod.

six-segmented, decreasing in segment order 3, 6, 4, 1, 5, 2, about 2.7 times length of chela; merus eight times longer than wide, equal to length of first four carpal segments; ischium more robust, six times longer than wide, slightly shorter than merus, with a pair of slender ventral spines proximally; basis and coxa normal. Third pereiopods, female, moderately slender, exceeding antennal scale by distal fourth of propod; dactyl biunguiculate with unguis longer and more slender than accessory spine, equal to half corpus length, ventral border with three slender spines of decreasing size proximally, propod about 3.5 times length of dactyl, 10.0 times longer than wide, with a pair of

serrulate distoventral spines and eight spines along ventral border; carpus more robust, 0.4 of propod length, with a single spine on proximal lateral aspect; merus slightly shorter than propod, 6.0 times longer than wide, with 1-5 mobile spines (usually 2-3) (see Table 1) along distal half of lateral aspect, longer spines distally; ischium, basis and coxa normal, unarmed. Fourth and fifth pereiopods similar, less robust, propod of fourth pereiopod with small distoventral pectinate spine; carpus with single proximal lateral spine, merus with single lateral spine distally, (one specimen with two); fifth pereiopod with cleaning setae distally on propod, with or

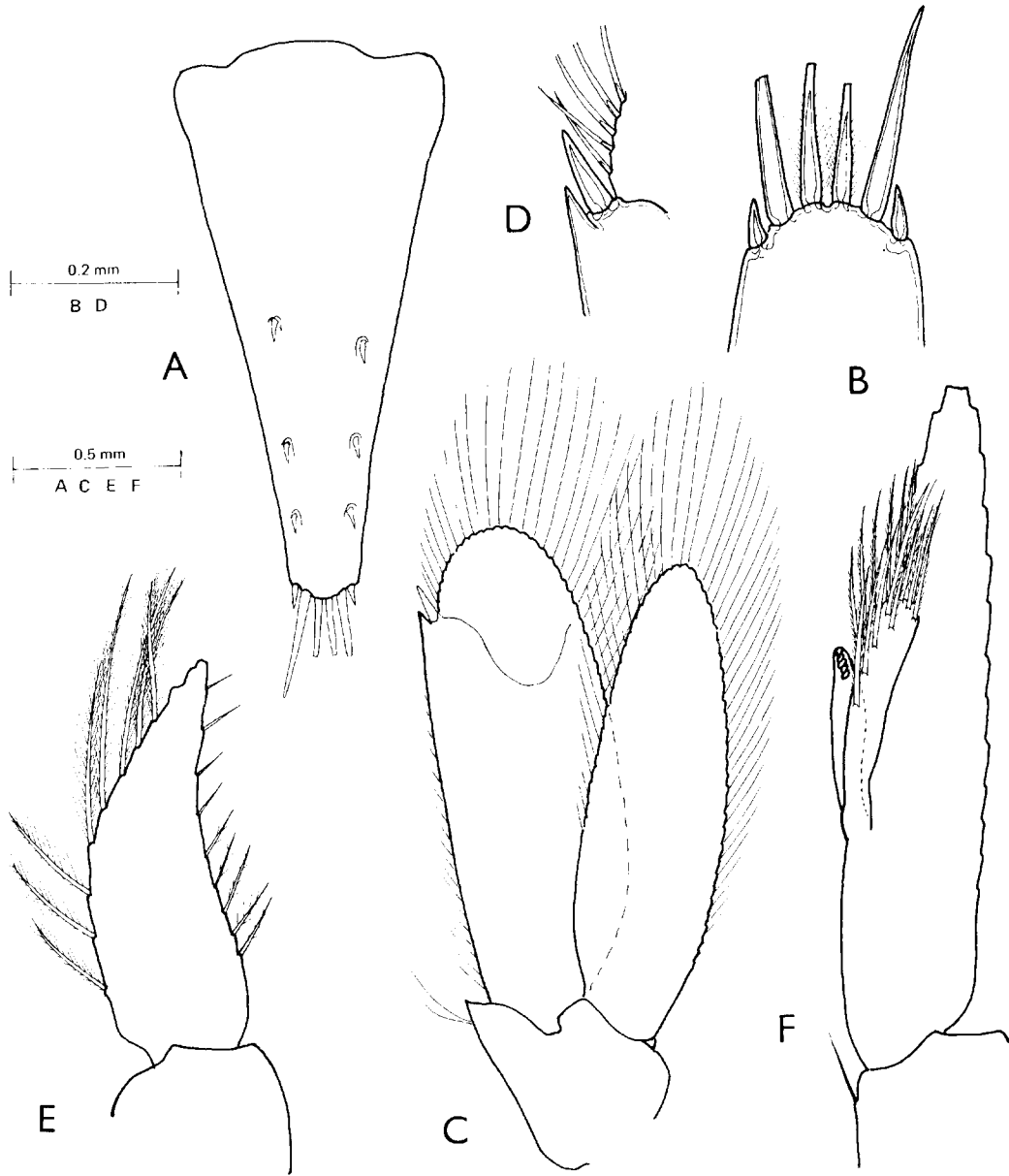


Fig. 6. *Thor spinipes* sp. nov., ovigerous female. A, telson. B, *idem*. posterior spines. C, uropod. D, *idem* distolateral spine of exopod. Male: E, endopod of first pleopod. F, endopod of second pleopod.

without lateral spines on carpus and merus. Third pereiopod of male prehensile, subchelate, with dactyl slender, palm 2.3 times length of unguis, 4.5 times longer than wide, with about 16 closely adpressed similar ventral spines, of increasing size distally; propod expanded at 0.6 of length

with ventral border distally tapering, bearing about 25 erect spines: in other features male pereiopods generally similar to female but both carpus and merus may be unarmed.

Endopod of male first pereiopod three times longer than wide, tapering to point,

medial border with short feebly plumose setae proximally and simple setae distally, lateral border with longer plumose setae. Appendix masculina exceeding appendix interna, carpus about 5.0 times longer than wide with numerous, about 15, finely serrulate setae distally and ventrally. Exopod of uropod extending beyond telson tip; protopod posterolaterally acutely produced; exopod 2.9 times longer than wide, lateral border straight, ending with small distolateral tooth, larger mobile spine medially; endopod 3.4 times longer than wide, slightly shorter than exopod.

Types—An ovigerous female, postorbital carapace 2.9 mm is selected as holotype, NTM Cr. 00083/a; male allotype NTM Cr. 00083/b. Paratypes are deposited in the collections of the Australian Museum and the Rijksmuseum van Natuurlijke Historie, Leiden.

Measurements —Post-orbital carapace lengths, ♂ 1.6 mm, ♀ 1.9 mm, ovigerous ♀ 1.9-2.7 mm, juveniles 1.5-1.6 mm.

Colouration—Semitransparent but heavily mottled with superficial and deep patches of dull yellow-brown on body and appendages, with reddish markings on the third

maxillipeds and pereopods.

Systematic Position—The only Indo-west Pacific species of the genus *Thor* with acute supraorbital spines are *T. maldivensis* Borradaile and *T. spinosus* Boone (Bruce 1976). *T. spinipes* may be readily distinguished from both these species by the presence of a small spine on the proximal lateral aspect of the carpus of the third and fourth, and often also fifth, pereopods. The merus of these appendages is also much more strongly spinulate in *T. spinipes*. In the form of the rostrum *T. spinipes* is more similar to *T. spinosus*, but that species lacks a distinct ventral rostral tooth. In *T. maldivensis* the rostrum is typically very short, almost styliform and with only a single dorsal rostral tooth. The rostrum in *T. spinipes* is most similar to that of *T. paschalis*, which lacks supraorbital spines, and these two species have similar cryptic colour patterns and are not known to be associated with any specific host animals, unlike *T. spinosus*, which has an ornate colour pattern and is associated with *Millepora* hydroids. *T. spinipes* in general appears to be most closely related in both morphology and biology to *T. paschalis*.

DISCUSSION

The discovery of *T. spinipes* in the Northern Territory, raises to four the number of species of the genus *Thor* known to occur in Australian waters. In addition four other forms are known to occur in the Indo-West Pacific region but are yet to be recorded from Australia. The Australian species may be distinguished by the following key:—

Key to the Australian species of the Genus *Thor* Kingsley, 1878

1. Supraorbital spines present *T. spinipes* sp.nov.
- Supraorbital spines absent 2
2. Stylocerite with a small acute proximal lateral tooth 3
- Stylocerite without proximal lateral tooth *T. paschalis* Heller
3. Rostral lamina typically slender, with simple acute tip; meral spinulation of third to fifth pereopods usually 1:1:0 *T. amboinensis* De Man
- Rostral lamina typically deep, with truncated trifid tip; meral spinulation of third to fifth pereopods usually 3-4:2:0 *T. marguitae* Bruce

The species *T. amboinensis* and *T. marguitae* are commensal associated of coelenterates, the former with a wide variety including actiniarians, alcyonarians and scleractinians, but the latter has only been found in association with the coral *Porites andrewsi* at Heron Island, Queensland. (Bruce, 1978), *T. amboinensis* is widely distributed throughout the Indo-West Pacific region. *T. paschalis* is a cryptically colour species, apparently free-living, like *T. spinipes*, and found among algae in intertidal pools.

RESUMÉ

Une nouvelle espèce de crevette du genre *Thor* Kingsley, 1878, [Hippolytidae] est décrite et illustrée. Des spécimens nombreux ont été trouvés dans les flaques du rëcif intercotidale à Coral Bay, Port Essington, Cobourg Peninsula, Northern Territory, Australie. Cette nouvelle espèce porte à quatre le nombre des espèces de *Thor* connues dans les eaux australiennes. Une clé pour leur détermination est pourvue.

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