

**Crustacea Decapoda :**  
***Gelastreutes crosnieri* gen. nov., sp. nov.**  
**(Hippolytidae) from New Caledonia**

*A. J. BRUCE*

Division of Natural Sciences  
 Northern Territory Museum  
 P.O. Box 4646  
 Darwin, Australia 0801

ABSTRACT

A single specimen of a small new hippolytid shrimp, captured between 65-120 m off New Caledonia, is described and illustrated. A new genus, *Gelastreutes*, is designated for its accommodation, indicating its relationship with the genera *Gelastocaris* Kemp, *Latreutes* Stimpson and *Parala-*

*treutes* Kemp. The new species, *G. crosnieri*, is remarkable for its robust, highly calcified body and its similarity in general body form to *Gelastocaris paronae* suggests that it is also probably a commensal species, possibly an associate of sponges.

RÉSUMÉ

**Crustacea Decapoda : *Gelastreutes crosnieri* gen. nov., sp. nov. (Hippolytidae) de Nouvelle-Calédonie.**

Un spécimen unique d'une petite crevette appartenant à la famille des Hippolytidae, capturé entre 65 et 120 m de profondeur dans les eaux de la Nouvelle-Calédonie, est décrit et illustré. Un nouveau genre, *Gelastreutes*, est créé pour l'accueillir ; son nom rappelle les parentés existant entre lui et les genres *Gelastocaris* Kemp, 1914, *Latreutes* Stimpson, 1860, et *Paralatreutes* Kemp, 1925.

La nouvelle espèce, *G. crosnieri*, est remarquable par son corps très robuste et très calcifié, possédant une région

céphalothoracique aplatie ventralement et une dent latérale antérieure fortement saillante sur la carapace, comme chez *Gelastocaris* dont elle diffère par la présence de dents dorsales sur la carapace, par les dactyles ambulatoires sans fortes épines mésiales et latérales articulées, le bord latéral du scaphocécrite non spiculé et les bords ventraux des pleurons abdominaux sans denticule. L'absence d'exopodite sur les troisièmes maxillipèdes distingue, par ailleurs, cette espèce de celles du genre *Latreutes*, tandis que la présence d'une forte dent latérale antérieure sur la carapace et d'une épine antennaire fixe, jointe à un céphalothorax aplati ventralement, la distingue du genre *Paralatreutes*.

The hippolytid shrimp subfamily Latreutinae Ortmann includes at present, only four Indo-West Pacific genera, *Latreutes* Stimpson, 1860; *Tozeuma* Stimpson, 1860; *Gelastocaris* Kemp, 1914 and *Paralatreutes* Kemp, 1925. The capture of a single example an adult latreutinid shrimp, from moderately deep water off New Caledonia, that could not be referred to any of these genera, is therefore of interest and a new genus *Gelastreutes* is now erected for its for accommodation.

#### SYSTEMATIC ACCOUNT

##### *Gelastreutes* gen. nov.

DIAGNOSIS. — Carapace smooth; rostrum well developed, stout, posterior dorsal carina distinct, dentate, anterior carina obsolete, ventral carina deep, lateral carina proximally expanded; supra-orbital and hepatic spines absent; epigastric tooth, antennal spine present, non-articulate, anterior lateral carapace acutely produced, anterolateral carapace spinulate. Abdomen smooth, anterior pleura ventrally produced, rounded; sixth segment with posterolateral angle fixed; telson with 2 pairs of small dorsal spines, 2 pairs small posterior spines. Eye with cornea hemispherical, feebly pigmented, stalk with anterodistal cylindrical process. Antennule without statocyst, stylocerite large, peduncle without mobile distal plate; upper flagellum uniramous. Basicerite with elongate dorsal process, scaphocerite laterally non-denticulate. Mandible without palp and incisor process. First maxilliped with reduced flagellum, caridean lobe large. Second maxilliped with non-setose flagellum, epipod without podobranch. Third maxilliped without exopod, with lateral plate, without epipod. All pereopods without arthrobranchs. First and second pereopods chelate, first pair with robust similar subequal chelae, merus and ischium fused, coxa with epipod; second with subequal chelae, small, carpus 3-segmented. Ambulatory pereopods robust, dactyls compressed, biunguiculate, with additional accessory spines, propods strongly

spinulate; merus with articulated distolateral spine. Uropods normal.

TYPE SPECIES. — *Gelastreutes crosnieri* sp. nov.

ETYMOLOGY. — From the generic names *Gelastocaris* and *Latreutes*, first used by KEMP (1914) and STIMPSON (1860) respectively. Gender: masculine.

SYSTEMATIC POSITION OF THE GENUS *GELASTREUTES*. — The new genus *Gelastreutes* is most closely related to the genera *Gelastocaris* Kemp, 1914, *Latreutes* Stimpson, 1860 and *Paralatreutes* Kemp, 1925, and shares with these genera the following characters: (i) mandible lacking palp and incisor process, (ii) pereopods without arthrobranchs, (iii) carpus of second pereopod with three segments and (iv) posteroventral angle of sixth abdominal segment non-articulate.

*Gelastreutes* resembles *Gelastocaris* in its general body form, i.e. the dorsally hunched carapace, with ventrally flattened cephalothoracic region, with very strongly produced anterolateral angles to the carapace, but differs from that genus in the lack of huge articulated medial and lateral spines on the corpus of the ambulatory dactyls, non-spinulate lateral margin of scaphocerite and the rounded ventral margins of the pleura.

*Gelastreutes* further resembles both *Latreutes* and *Paralatreutes* in the features listed above. Both these genera include shrimps of subcylindrical body form, not distinctly ventrally flattened and both are generally only moderately calcified. Both these genera lack the large acutely produced anterolateral angle of the carapace found in *Gelastreutes*. In addition, *Latreutes* possesses an exopod on the third maxilliped, which is absent in *Gelastreutes*, and *Paralatreutes* has a small post-marginal articulated antennal spine, whereas in *Gelastreutes* the antennal spine is fixed and marginal.

Adapting the key provided by HOLTHUIS (1955), these genera may be separated as follows:

22. Dactyls of the last three pairs of pereopods with corpus bearing large articulated unguis, distoventral, medial and lateral spines; outer margin of scaphocerite spinulate; ventral margin of abdominal pleura denticulate ..... *Gelastocaris*
- Dactyls of last three pairs of pereopods without large articulated medial and lateral spines; outer margin of scaphocerite non-spinulate; ventral margins of abdominal pleura non-denticulate ..... 22a
- 22a. Third maxilliped with exopod ..... *Latreutes*
- Third maxilliped without exopod ..... 23
23. Pereiopods without epipods; anterolateral angle of carapace entire .... *Tozeuma*
- First four pereiopods with epipods; anterolateral angle of carapace denticulate ..... 24
24. Cephalothoracic region strongly ventrally flattened, anterior lateral angle of carapace strongly produced as large flattened toothlike projection; antennal spine fixed ..... *Gelastreutes*
- Cephalothoracic region not strongly flattened ventrally, without anterolateral toothlike projection; antennal spine mobile ..... *Paralatreutes*

*Gelastreutes crosnieri* sp. nov.

Figs 1-4

MATERIAL EXAMINED. — **New Caledonia.** MUSORSTOM 4 : stn 187, 10°08.3' S, 163°29.3' E, 65-120 m, 19 September 1985 : 1 ♀ holotype, cl = 6,1 mm (MNHN-NA 11144).

DESCRIPTION. — A small sized, stoutly built, very strongly calcified shrimp, of generally sub-cylindrical form.

Carapace smooth, glabrous, dorsally convex, ventrally flattened, particularly anteriorly; rostrum well developed, about 1.07 of postorbital carapace length; dorsal carina well developed, posteriorly, broad with five small acute teeth, posterior two rather subacute, situated posterior to level of posterior orbital margin, three teeth situated over posterior third of rostrum, distal two thirds of dorsal carina obsolete, dorsal margin with stout, blunt preterminal tooth; lateral carinae broadly expanded posteriorly over orbital region, lateral margins convex, unarmed, distal margins narrow, tapering to a stout blunt tip; ventral carina well developed, deep, laminar, about 3.0 times longer than proximal depth, tapering distally to broadly rounded tip, ventral margin mainly straight, non-setose, unarmed, posterior angle produced posteriorly to articulate with ventral process of ophthalmic somite; cara-

pace without supraorbital and hepatic spines, epigastric tooth small, stout, at about 0.5 of postorbital carapace length; orbit well developed, dorsally and posteriorly, forming deep fossa, inferior orbital angle well developed, acutely produced, medially curved, forming ventral border of orbit, antennal spine small, acute, fixed, marginal, not exceeding inferior orbital angle, antennal notch deeply concave, lateral angle of carapace strongly produced as large acute flattened tooth extending far anterior to level of inferior orbital angle, overlapping level of posteroventral margin of rostrum; anterolateral margin oblique, with 3-4 small acute marginal teeth; ventral margin of branchiostegite sinuous.

Abdomen smooth, glabrous, segments not produced, without carinae; fifth segment about 0.95 of length of sixth, sixth segment about as long as deep, feebly depressed, posterolateral angle feebly produced, subacute, lateral angle expanded, feebly produced, blunt, ventral margin setose; pleura of first three segments strongly calcified, ventrally produced in blunt rounded lobes, third segment posteriorly bluntly angular, fourth segment posteriorly produced, ventral margin sinuous, fifth segment posteriorly broadly produced, bluntly angular, ventral margin convex; ventral borders of pleura with short plumose setae. Telson about 1.8 times sixth segment length, about 2.7 times longer than anterior

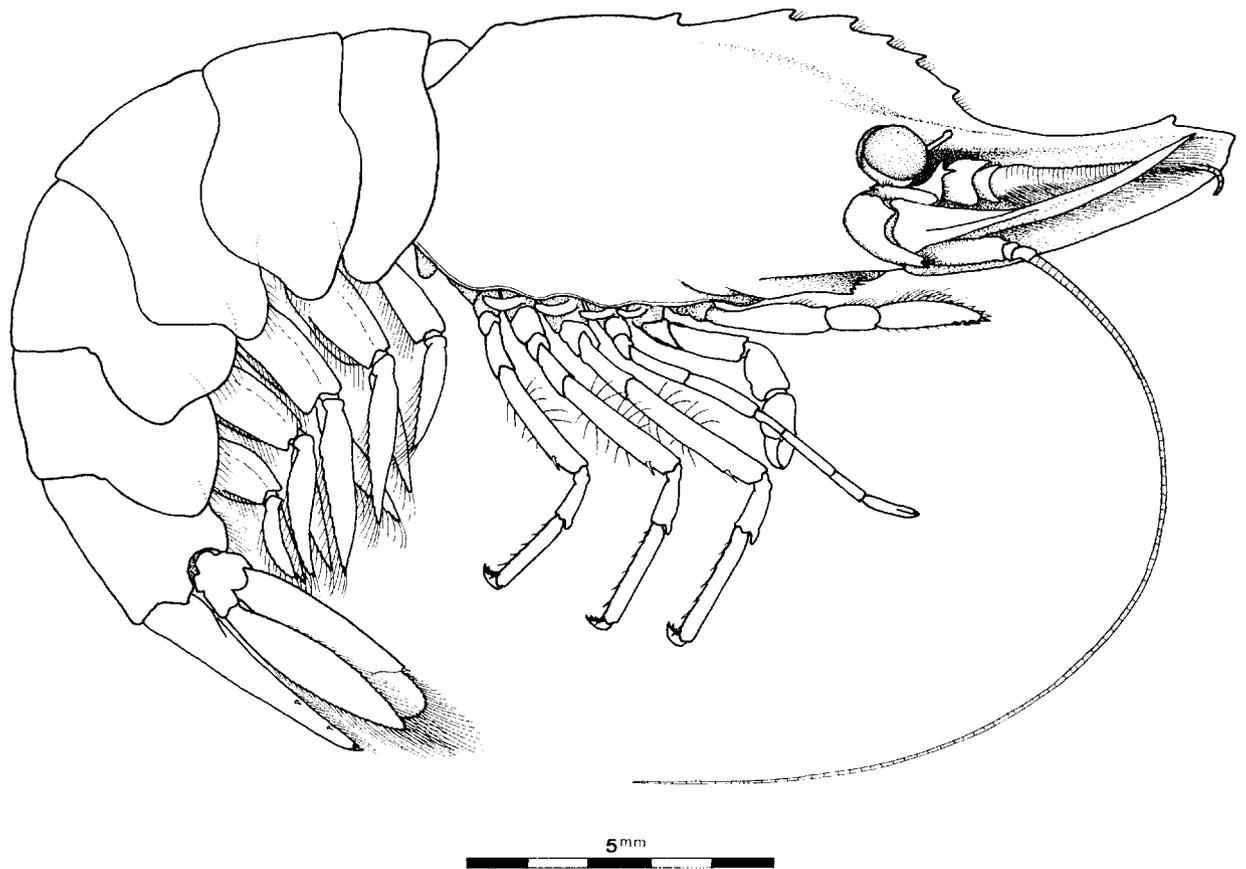


FIG. 1. -- *Gelastreutes crosnieri* gen. nov., sp. nov., holotype female, New Caledonia.

width, strongly concave ventrally, lateral margins straight, posteriorly convergent, distally setose, posterior margin about 0.25 of anterior margin width, strongly produced medially on blunt subtriangular process; two pairs of dorsal spines, lateral spines small, similar to dorsal, medial spines larger, short, stout, blunt, about 0.045 of telson length.

Eye with large globular, feebly pigmented cornea, without accessory pigment spot, slightly oblique; stalk short, stout, about 1.2 times longer than distal width, distal anterior margin with subcylindrical process with expanded tip, extending well beyond corneal margin in lateral view, with globular process with central cavity (?) adjacent ventrally.

Antennule with peduncle extending to about 0.33 of rostral length, flagella slightly exceeding tip of rostrum; proximal segment about 1.1 times longer than proximal width, distodorsal margin

laminar, ventrally concave, with acute dorsolateral marginal tooth, without ventromedial tooth, statocyst obsolete; stylocerite large, triangular, distinctly exceeding anterior margin of cornea, reaching almost to distolateral margin of segment; intermediate segment short, about 1.2 times broader than long, 0.6 of medial length of proximal segment distodorsally concave; distal segment short, subequal to intermediate segment length, triangular in dorsal outline; upper flagellum obliquely articulated with lateral aspect of terminal segment, uniramous, short, feebly separated segments with continuous dense brush of aesthetascs laterally along whole of lateral margin, including four terminal segments; lower flagellum ventrally articulated, slender, simple, subequal to upper flagellum length, about 27 segments.

Antenna with stout basicerite, with elongated ventrolateral process, with rounded ventrolateral

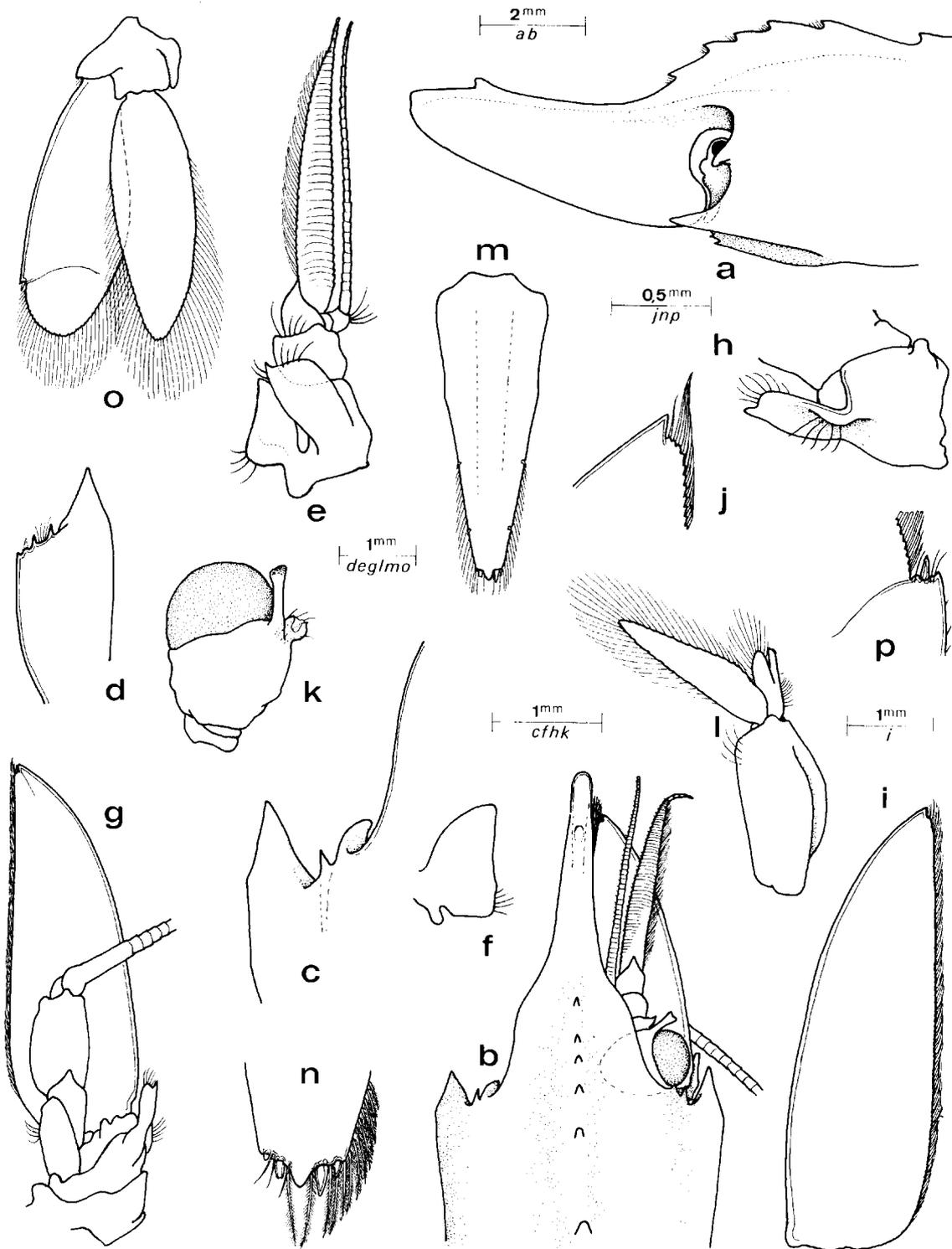


FIG. 2. — *Gelastreutes crosnieri* gen. nov., sp. nov., holotype female : a, anterior carapace and rostrum, lateral aspect ; b, anterior carapace, rostrum, right antenna and eye, dorsal aspect ; c, inferior orbital region, dorsal, left ; d, anterior lateral angle of carapace, left, ventral ; e, antennule ; f, stylocerite ; g, antenna, ventral ; h, basicerite, lateral ; i, scaphocerite, dorsal ; j, same, distolateral tooth ; k, eye ; l, first pleopod ; m, telson ; n, same, posterior spines ; o, uropod ; p, same, exopod, posterolateral angle.

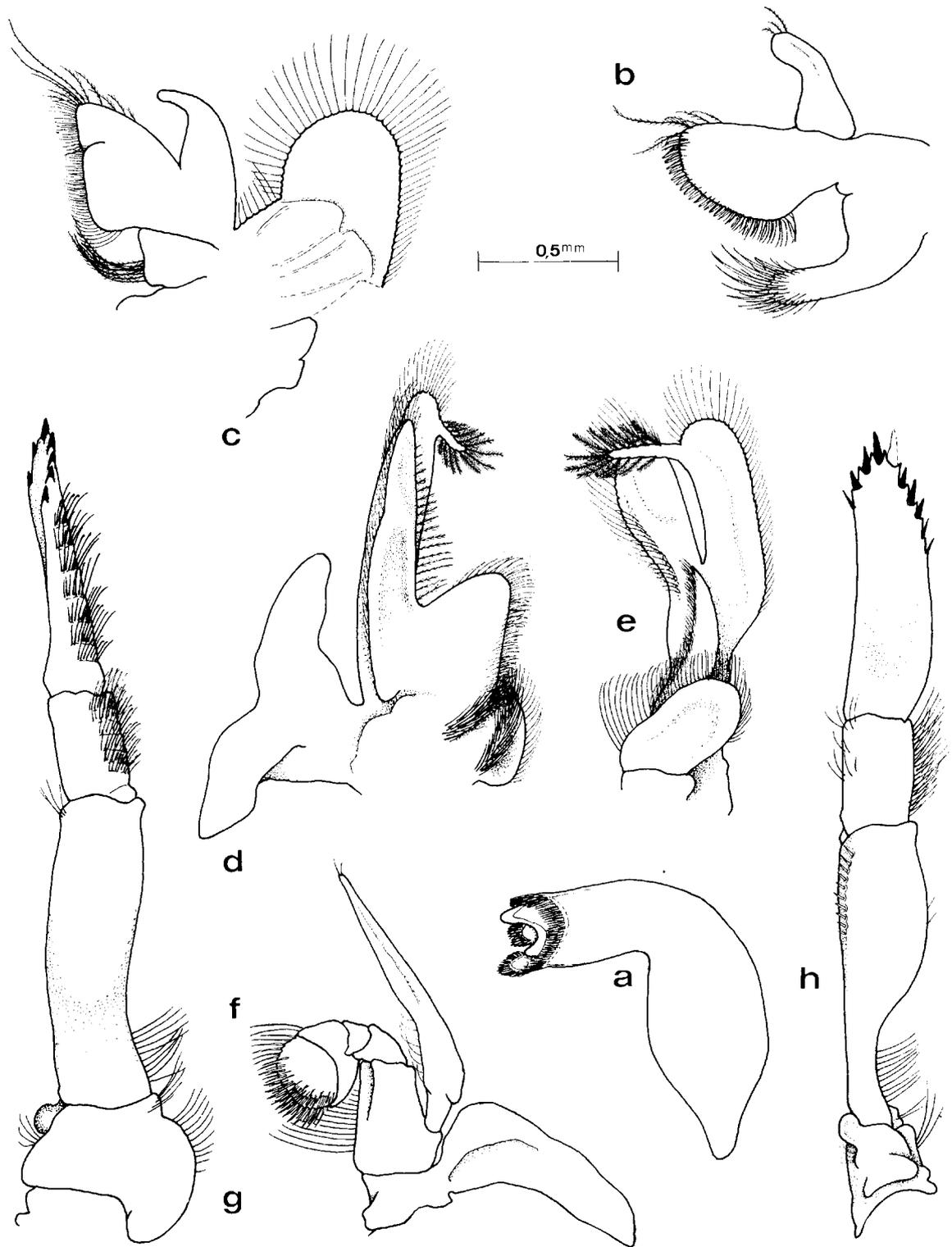


FIG. 3. — *Gelastreutes crosnieri* gen. nov., sp. nov., holotype female : a, mandible ; b, maxillula ; c, maxilla ; d, first maxilliped, dorsal ; e, same, medial ; f, second maxilliped ; g, third maxilliped, dorsal ; h, same, medial.

process, with rounded distodorsal lobe and small distoventral tooth; carpocerite reaching to about 0.33 of scaphocerite length, slightly exceeding distal margin of antennular peduncle, compressed, about 1.7 times longer than central width, flagellum short, slender, about 2.5 times postorbital carapace length; scaphocerite robust, slightly shorter than rostrum, about 0.88 of postorbital carapace length, 3.2 times longer than maximal width, at about 0.25 of length, strongly tapered distally, lateral margin strongly convex, non-spinulate, with short blunt distal tooth, lamina with medial margin straight, densely setose, with ventrally deflected plumose setae, not reduced distally, not exceeding distolateral tooth.

Epistome with small acute median process. Second thoracic sternite with large triangular median tooth, third sternite with broad truncate median plate, fourth broad, unarmed, fifth sternite narrow, coxae of pereopods contiguous, posterior sternites broad, unarmed.

Mandible with corpus stout, without palp; molar process robust, distally truncate with blunt central teeth, dense bands of peripheral setae; incisor process absent. Maxillula with simple palp, angulate, tapering distally, with short plumose distolateral setae; upper lacinia broad, distoventral margin rounded, with numerous short simple spines distally, intergrading to setae proximally, several coarsely plumose setae distodorsally; lower lacinia subcylindrical, short, blunt, with numerous long spiniform setae and slender setae distally. Maxilla with broad tapering, distally narrow, non-setose palp; basal endite large, bilobed, proximal lobe larger than distal, overlapping, densely setose medially, upper lobe with coarsely plumose setae dorsally; coxal endite small, simple, with 7-8 long stout, coarsely plumose setae dorsally; scaphognathite damaged in dissection, anterior lobe short, broad, length about 0.8 of width, medial margin angulate, posterior lobe missing. First maxilliped with large single segmented, distally expanded palp, proximally swollen, with medial aspect concave and posterior border setose, lateral border non-setose, basal endite broad, bluntly angulate distomedially, densely setose medially especially proximally, overlapping coxal ending dorsally; coxal endite large, swollen, medially flattened, concave, glabrous, margins densely setose; exopod with distal flagellum feebly developed with 12-14 plumose setae, proximal flagellum robust,

with large narrow caridean lobe; epipod large, triangular, feebly bilobed. Second maxilliped with feebly developed endopod, dactylar segment subcircular, with numerous spines and setae; propodal segments with few slender spiniform distomedial setae; carpal segment with small subacute medial process, merus short, ischium and basis fused, medially excavate; exopod with slender tapering non-setose flagellum; coxa with small proximal medial process, epipod large, simple, elongate, without podobranch. Third maxilliped with endopod robust, reaching to level of distal margin of antennular peduncle; ischiomerus and basis completely fused, distal portion swollen, proximal portion compressed, markedly narrowed in lateral view, about 3.4 times longer than maximal width, distomedial margin with row of about 10 small spines, proximolateral margin with coarsely plumose setae, penultimate segment short and stout, about 0.33 of proximal segment length, 1.5 times longer than wide, with numerous transverse rows of spiniform setae dorsolaterally, laterally with short paired medial, lateral distoventral spines; terminal segment about 0.8 of proximal segment length, strongly dorsoventrally compressed, about 3.3 times longer than proximal width, slightly narrowed distally, with 7 stout, deeply pigmented distal marginal spines, separated by smaller acute processes, with 7 transverse rows of serrulate spines dorsolaterally and laterally, without exopod; coxal segment stout with small round distomedial plate, large oval plate laterally, without arthrobranch.

First pereopods short, stout, unequal, reaching to about middle of carpocerite length; chela robust, about 0.25 of postorbital carapace length, palms subcylindrical, smooth, slightly compressed, tapering distally, almost 1.5 times longer than proximal depth, with few cleaning setae proximally; fingers about 0.7 of palm length, strongly subspatulate, with sharp lateral cutting edges; dactylus about 2.2 times longer than proximal depth, with four stout deeply pigmented distal spines, groups of serrulate setae distomedially and laterally, fixed finger similar, about 3.0 times longer than deep, with three stout deeply pigmented spines distally; carpus about subequal to palm length, about 1.6 times longer than distal width, distolaterally excavate with strong acute distodorsal tooth, with feeble cleaning setae distoventrally; merus about 0.8 of

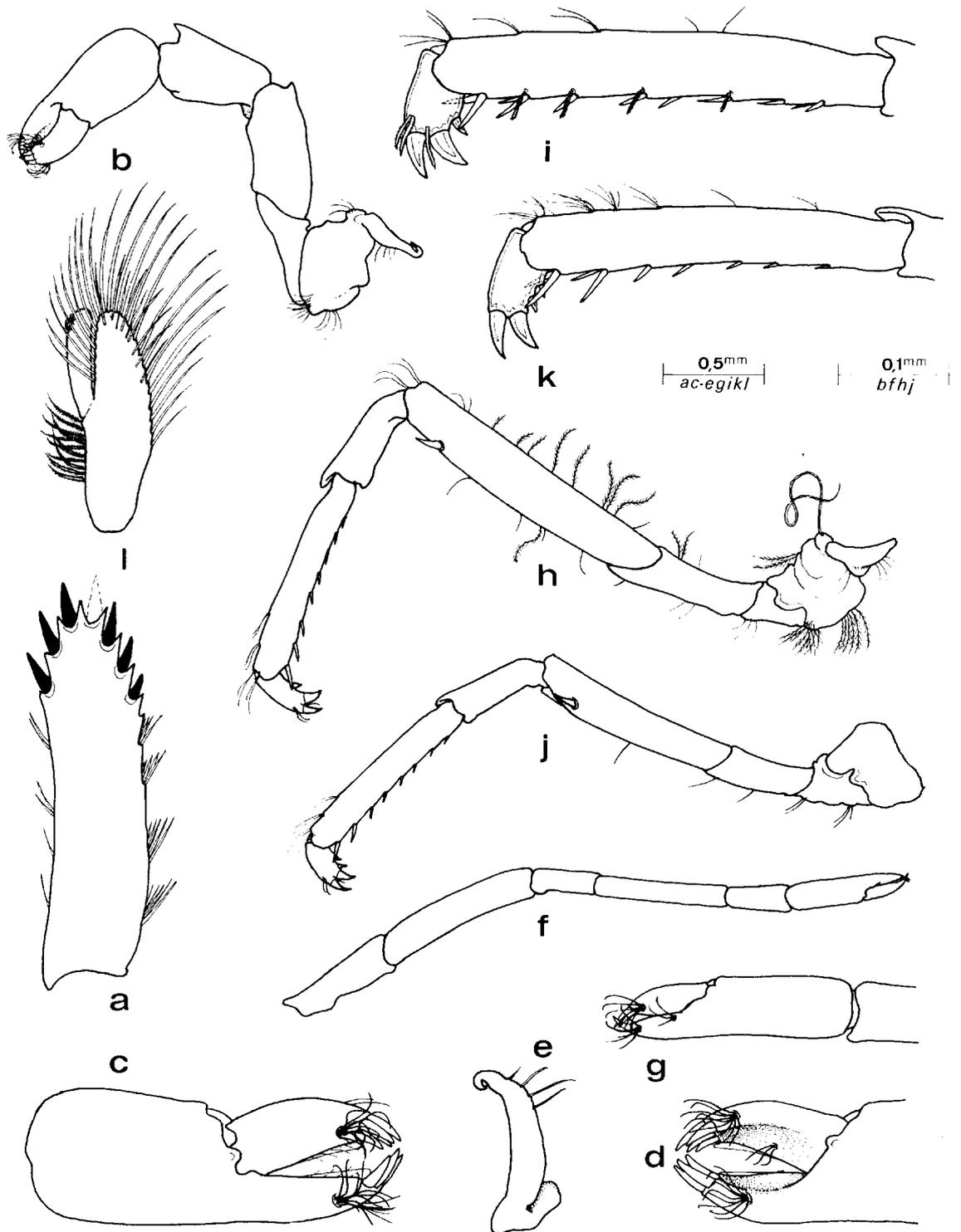


FIG. 4. — *Gelastreutes crosnieri* gen. nov., sp. nov., holotype female : a, third maxilliped, endopod, terminal segment, dorsal ; b, first pereiopod ; c, same, chela ; d, same, fingers, medial ; e, same, epipod ; f, second pereiopod ; g, same, chela ; h, third pereiopod ; i, same, propod and dactyl ; j, fifth pereiopod ; k, same, pereiopod and dactyl ; l, first pleopod, endopod.

chela length, robust, about 2.4 times longer than central width, obliquely articulated with ischium, about 3.2 times longer than ventral width, dorsal border very short, basis dorsally articulated with coxa, possibly fused, without exopod; coxa stout, without median process, with small distally hooked epipod.

Second pereopods similar, short, slender, extending anteriorly to about level of middle of carapocerite; chela with palm subcylindrical, slightly compressed, about 2.25 times longer than proximal depth, fingers compressed, with groups of serrulate setae distomedially and laterally, without sharp cutting edges, dactylus about 2.5 times longer than deep, with two long slender distal spines, fixed finger similar, with single distal spine, spines distinctly pigmented; carpus about 2.1 times length of chela, about 9.0 times longer than distal width, three segmented, segments in ratio approximately 1:2:1; merus about 1.4 times chela length, 5.5 times longer than central width; ischium subequal to chela length, 3.0 times longer than distal width, tapered proximally; obliquely articulated with basis; basis and coxa short, without special features.

Ambulatory pereopods robust. Third pereopod extends distally to about end of carapocerite; dactylus robust, compressed, unguis distinctly articulated, about 0.65 of corpus length, 2.3 times longer than wide, corpus about 1.5 times longer than deep, with large articulated distoventral spine, larger than unguis, with single small articulated ventral spine, with two distodorsal and one distolateral broad serrulate setae; propod about 0.37 of postorbital carapace length, moderately compressed, about 6.5 times longer than central depth, with subterminal pair of stout distoventral spines, one distal ventral pair and 6 single spines along ventral margin, each with short broad serrulate seta laterally; dorsal margin with short sparsely plumose setae; carpus about 0.5 times propod length, with strong distodorsal lobe, unarmed, about 2.25 times longer than distal width; merus stout, about 1.4 times propod length, about 5.8 times longer than central depth, with large articulated preterminal distolateral spine, dorsal margin with numerous long coarsely plumose setae; obliquely articulated with ischium; ischium about 0.5 of merus length, 3.5 times longer than distal width, unarmed; basis about 0.3 of propod length; coxa stout, with monosetal setobranch and epipod.

Fourth and fifth pereopods similar, more slender, fourth propod about 0.94 of third, fifth about 0.85, with more feeble ventral spinulation, fifth pereopod dactyl with large distoventral spine, two smaller spines proximally; fifth pereopod without epipod: dactylar and propodal spines all slightly pigmented.

Branchial formula :	Maxillipeds			Pereopods				
	1	2	3	1	2	3	4	5
Pleurobranchs	—	—	—	+	+	+	+	+
Arthrobranchs	—	—	—	—	—	—	—	—
Podobranchs	—	—	—	—	—	—	—	—
Setobranchs	—	—	—	—	+	+	+	+
Epipods	+	+	—	+	+	+	—	—
Exopods	+	+	—	—	—	—	—	—

Pleopods with protopodites robust. First pleopod with protopodite 2.0 times longer than central width; exopod 4.0 times longer than wide, subequal to protopod length; endopod about 0.4 of exopod length, 3.2 times longer than central width, distal 0.5 of medial margin, 0.7 of lateral margin with long finely plumose setae, distal two thirds of proximal half of medial margin with about 10-12 serrulate setae; appendix interna well developed, at about 0.5 of medial margin length, extending to level of tip of endopod, with distomedial concinnuli only. Posterior pleopods with endopod well developed with appendix interna.

Uropod with lateral lobe of protopodite feebly acute; exopod exceeding tip of telson, about 2.6 times longer than broad, lateral margin feebly convex, with small acute distolateral tooth at about 0.85 length with mobile spine medially, diaeresis feebly distinct; endopod about 0.95 of exopod length, 3.0 times longer than wide.

MEASUREMENTS (mm). — Postorbital carapace length, 6.1; carapace and rostrum, 12.3; total body length (approx.) 30.0.

REMARKS. — In its general morphology, *Gelastreutes crosnieri* agrees closely with the related Indo-West Pacific genera, *Gelastocaris*, *Latreutes*, and *Paralatreutes*, and to the less closely related genus *Tozeuma*. The reduced exopod on the second maxilliped is similar on both left and right sides, suggesting that this is a normal feature and not due to injury or abnormal variation. In *Gelastocaris* this exopod is well developed, divided into a stout, rigid proximal portion and a slender flexible setose flagellar

portion distally. The flagellum on the exopod of the first maxilliped in *Gelastreutes* is also short, but well provided with numerous short plumose setae, but definitely shorter than in *Gelastocaris*. Another feature of unusual interest is the elongated process, of unknown function, extending from the distomedial surface of the eyestalk. The presence of a similar process, described as "a slender process which runs up alongside the cornea and projects slightly beyond it", has been noted in *Paralatreutes bicornis* by KEMP (1925) and

CHACE (1972) has noted a prominent rounded lobe in a similar position in *Latreutes inermis* but no similar process can be discerned in *Gelastocaris paronae*. In *Gelastreutes*, the ophthalmic somite is provided with a ventromedial process that articulates with the posterior margin of the rostrum. In *Gelastocaris paronae* a transverse bar is present in this position, with a small median notch into which the posterior margin of the rostrum fits.

## DISCUSSION

The subfamily Latreutinae Ortmann, 1896, has recently been resurrected by CHRISTOFFERSEN (1987) and includes four genera with species occurring in the Indo-West Pacific region, two of which, *Gelastocaris* Kemp and *Paralatreutes* Kemp, are monospecific and confined to that region. The other genera, *Tozeuma* Stimpson and *Latreutes* Stimpson, both with numerous species, also occur outside the Indo-West Pacific area. The fifth genus, *Trachycaris* Calman, also monospecific, occurs only in the Atlantic region.

The Latreutinae is characterised by the presence of a well developed rostrum, with a very strongly developed ventral lamina, the dorsal lamina often being poorly developed; mandible lacking palp and incisor process; third maxilliped with distal segment of endopod short, flattened, truncate; second pereopod with two or three carpal segments; all pereopods without arthrobranchs; sixth abdominal segment without an articulated posteroventral plate; telson with two pairs of dorsal spines and posterior margin

with a median process. The genus *Gelastreutes* readily fits into the definition, without the necessity of any further modification.

Typically, the Indo-West Pacific species of the various genera of the Latreutinae are intertidal or of shallow-water distribution, and of either free-living or commensal habits. *Latreutes* and *Tozeuma* species may be commensal with other marine invertebrates, particularly coelenterates, or free-living among algae or sea grasses. *Gelastocaris paronae* is a commensal of sponges and the niche occupied by *Paralatreutes bicornis* is uncertain, as the specimens were obtained by trawl from a depth of 6-8 m. The  $\Delta$ -shaped cross section of the cephalothoracic region of *Gelastreutes* closely resembles that of *Gelastocaris*, and implies that it occupies a somewhat similar niche in which it clings closely to some host animal, possibly also a sponge. Its exact depth of capture can not be precisely determined, being anywhere between 60 m and 120 m.

## ACKNOWLEDGEMENTS

I am most grateful to Dr Alain CROSNIER for the opportunity to report on this shrimp, collected through the MUSORSTOM research programme in New Caledonia, and to Dr J. FOREST

for the facilities provided in the Laboratoire de Zoologie (Arthropodes) of the Muséum national d'Histoire naturelle, Paris.

## REFERENCES

- CHACE, F. A., Jr. 1972. — The shrimps of the Smithsonian-Bredin Caribbean Expedition with a summary of the West Indian Shallow-water species (Crustacea : Decapoda : Natantia). *Smithson. Contrib. Zool.*, (98) : 1-179, figs 1-61.
- CHRISTOFFERSEN, M. L., 1987. — Phylogenetic relationships of hippolytid genera, with an assignment of new families for the Crangonoidea and Alpheoidea (Crustacea, Decapoda, Caridea). *Cladistics*, **3** (4) : 348-362, figs 1-8.
- HOLTHUIS, L. B., 1955. — The recent genera of the caridean and stenopodidean shrimps (Class Crustacea, Order Decapoda, Supersection Natantia) with keys to their determination. *Zool. Verhand., Leiden*, **26** : 1-159, figs 1-105.
- KEMP, S., 1914. — Hippolytidae. Notes on crustacea Decapoda in the Indian Museum. V. *Rec. Indian Mus.*, **10** : 81-120, pls 1-7.
- KEMPS, S., 1925. — On various Caridea. Notes on Crustacea Decapoda in the Indian Museum. XVII. *Rec. Indian Mus.*, **27** : 249-343, figs 1-24.
- STIMPSON, W., 1860. — Prodromus descriptionis animalium evertebratorum, quae in Expeditione and Oceanum Pacificum Septentrionalem, a Republica Foederata missa, C. Ringgold et J. Rodgers Ducibus, observavit et descripsit W. Stimpson. Pars VIII : Crustacea Macrura. *Proc. Acad. nat. Sci., Philad.*, 1860 : 22-48.

