Decapoda, Caridea

MARTIN & HANEY (2005) listed 52 species of nine families of caridean shrimp from the vicinity of hydrothermal vents and cold seeps, although several of them have not been identified to species level. Of them species of the family Alvinocarididae are endemic to such reduced environments, whereas the occurrence of most of other families is considered to be rather opportunistic. It is highly likely that pelagic or demersal species (particularly species of Oplophoridae) will be further recorded from waters around vent sites by future studies. *Periclimenes thermohydrophilus* of the Palaemonidae is associated with the tubeworm *Lamellibrachia satsuma*, and such commensalism is rather unique among the shrimp species known from the chemosynthetic communities.

This book may give an impression that inventory of the caridean fauna of the hydrothermal vents or cold seeps is nearly completed. Indeed, in particular, thanks to the recent studies, progress on the taxonomy of the Alvinocarididae has been made, but there are still some species to be described (MARTIN & HANEY, 2005). For example, in spite of the revision by KOMAI & SEGONZAC (2005) and subsequent work by KOMAI et al. (2005), the taxonomic identity of some species of *Alvinocaris* remain unclear. There is a tendency that oceanographic researchers publish lists of vent or seep communities based on identification made in a rather preliminary manner and that the voucher material is stored at universities or personal freezers or other non-recognized repositories. This makes access to the specimens, as well as accurate assessment of specific identities, difficult. It is advisable to send specimens for accurate identifications to relevant specialists and to deposit voucher specimens in museums or other appropriate institutions.

Below, some important points are given:

1. Juveniles of congeneric species of Alvinocarididae are very similar in morphology and sometimes it is impossible to identify them without locality data. In case of the occurrence of more than one congeneric species sympatrically, identification should only be done to genus level.

2. Adults of alvinocaridids often exhibit a high degree of polymorphism in the morphology of the chela and ambulatory legs. Therefore careful observations of various characters is necessary for accurate identification.

3. Some species of alvinocaridids, for example, species of *Rimicaris*, shows dramatic ontogenetic change after postlarval stages. Therefore, it is strongly recommended that a formal description of new species is based on adult specimen(s).

4. For any work including results of identification of species, it is recommended that voucher specimens are deposited in a recognized museum collection. For morphological studies, specimens preserved in 70–75% ethanol is recommended, although formalin fixed specimens are also useful. However, 70–75% ethanol or formalin may be not adequate for DNA extraction. Therefore, it is advisable to preserve specimens in two different concentration of ethanol according to further treatment.

5. Color in life is sometimes very useful in discriminating caridean species, particularly hippolytids. It is advisable to take color photographs just after capture of specimens.

6. There is little doubt that new species are likely to be discovered by new expeditions even at "well-known" or "well-collected" sites.

References:

KOMAI T. & M. SEGONZAC (2005) Journal of Natural History **39**(15): 1111-1175.
KOMAI T. SHANK T.M. & C.L. VAN DOVER (2005) Zootaxa **1019**: 27-42.
MARTIN J.W. & T. HANEY (2005) Zool. J. Linn. Soc. **145**: 445-522.

Nematocarcinus burukovskyi Komai & Segonzac 2005

Size: Carapace length 25.2 mm, total length ca. 74 mm.

Color: In life, body light orange, yellowish hepatopancreas visible through integument. Cornea of eye brown, but reflective; eye-stalk dark orange. Pereopods nearly colorless.

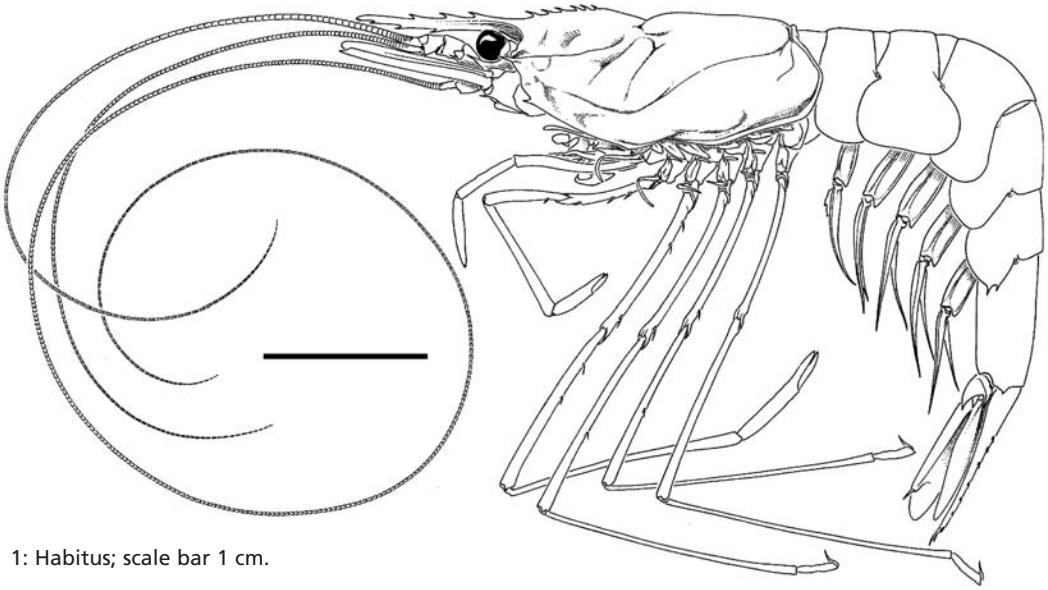
Morphology: Body surface smooth. Rostrum slender, slightly falling short of anterior margin of antennal scale, about 0.6 of carapace length; dorsal margin armed with three fixed teeth; ventral margin with four fixed teeth. Carapace relatively well sculptured with distinct postorbital, cervical, post-cervical, hepatic, branchiocardiac grooves; postrostral median ridge with six teeth clearly separated from three teeth on rostrum proper, at least some of them with basal suture. Abdomen dorsally smooth; fifth somite with one or two acute posteroventral teeth; inner pleural ridge on fifth somite low; sixth somite with two rows of setae on ventral surface, but devoid of paired posteroventral spots. Telson with six pairs of small dorsolateral spines; all dorsolateral spines aligned; terminal margin with three pairs of spines, second pair longest. Eye with well developed, distinctly faceted cornea. Second pereopod longest among pereopod. Third to fifth pereopods markedly elongate, but still relatively short and stout for nematocarcinids; propodi very short, subcylindrical. Exopods on third and fourth pereopods very short, particularly that on fourth pereopod rudimentary.

Remarks: This species can be confused in situ with *Nematocarcinus ovalis*, whose a female ovigerous carapace length 27.5 mm, collected a few tens of meters above the hydrothermal sites East Pacific Rise: 13°N, 2600 m, presents a similar color. This species is observed on the active sites, but also in the abyssal milieu at several hundred meters of sites.

Biology: Live around the active chimneys diffusing milky fluid at low temperature between 2 and 7°C, above beds of the mytilid *Bathymodiolus* spp., close to siboglinid tubeworm *Riftia pachyptila*, crabs *Bythograea* spp., and galatheid crabs *Munidopsis* spp. Necrophagous feeder.

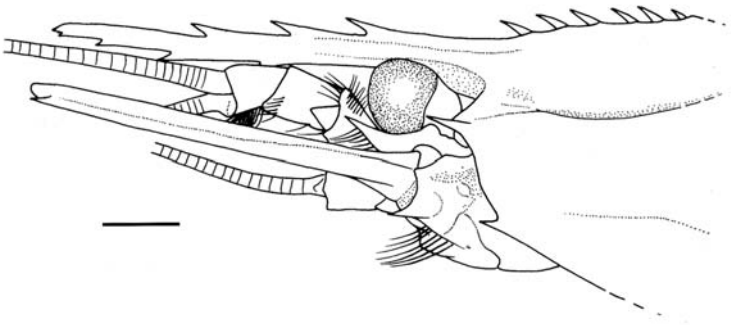
Distribution: Southern East Pacific Rise: 17°S, 23°S and 31°S.

1, 3-5: Holotype, subadult male carapace length 18.6 mm, from Wormwood vent site, Southern East Pacific Rise: 17°S © J.-F. Dejouannet/IRD.

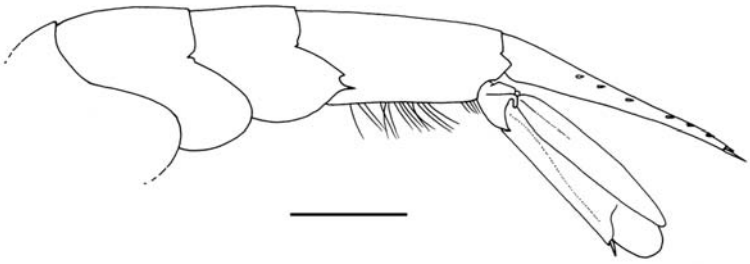


1: Habitus; scale bar 1 cm.

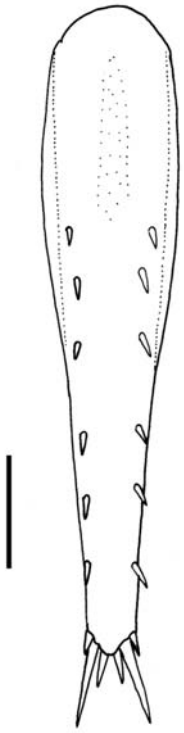
2: Individual in situ, taken at Fred's Fortress vent site, Southern East Pacific Rise: 31°S; cruise PAR 5; on mussel bed of *Bathymodiolus* sp., with bythograeid crabs (*Bythograea vrijenhoeki*); by R. Vrijenhoek © MBARI.



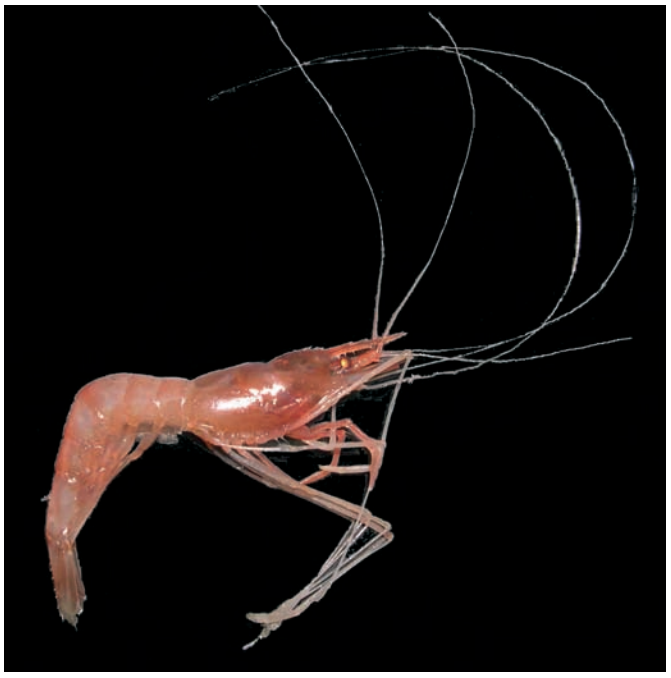
3: Rostrum, anterior part of carapace and cephalic appendages, lateral view; scale bar 5 mm.



4: Posterior part of third abdominal somite to telson and left uropod, lateral view; scale bar 5 mm.



5: Telson, dorsal view; scale bar 2 mm.



6: Holotype taken on board, just after collection; cruise Biospeedo; P. Briand © Ifremer.

7: Paratype juvenile carapace length 13.8 mm, rostrum, anterior part of carapace and cephalic appendages, taken on board, just after collection; Southern East Pacific Rise: 31°S; cruise PAR 5; G. Rouse © Australia.

Reference:

Komai T. & M. Segonzac (2005) Zoosystema **27**(2): 343-364.

Alvinocaris brevitelsonis KIKUCHI & HASHIMOTO, 2000

Size: Only the ovigerous female holotype is known: carapace length 13.8 mm, total length ca. 57 mm.

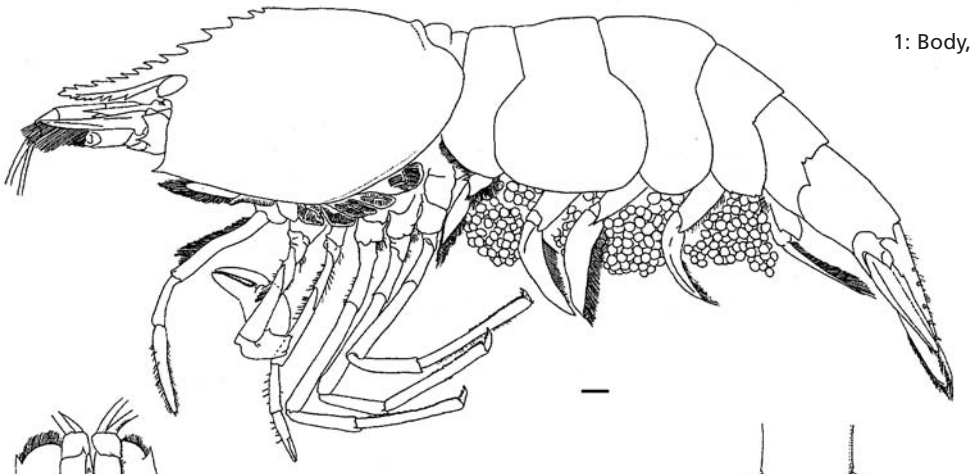
Color: Ivory to dull ivory white.

Morphology: Rostrum directed forward, slightly curved dorsally, 0.55% of carapace length, reaching distal margin of second segment of antennular peduncle; dorsal margin armed with 13 teeth, including eight teeth on rostrum proper and five relatively large teeth on carapace posterior to orbital margin, posteriormost tooth arising from 0.38% of carapace length; ventral margin armed with seven small teeth on anterior 0.60%. Carapace 0.7 times as wide as long; postrostral ridge relatively high, dorsal angle about 150°; branchial region not notably inflated, slightly convex; pterygostomian tooth relatively weak. Fourth abdominal pleuron with three tiny teeth on posteroventral margin. Fifth abdominal pleuron with strong posteroventral tooth and one additional tooth on posterior margin. Telson falling short of posterior margin of uropodal endopod, armed with six or seven dorsolateral spines; posterior margin moderately convex, armed with six pairs of spines (second pair longest and third pair shortest) and two pairs of plumose setae subequal in length to longest second spine. Eye with small spiniform tubercle on anterior surface. Antennular peduncle with second segment 1.8 times longer than wide. Antennal scale half length of carapace, 1.87 times longer than wide. Third to fifth pereopods moderately slender; dactyli each with single row of accessory spinules; meri armed with spines on ventrolateral surfaces; ischia also with spines at least in third and fourth pereopods. No epipods on third maxilliped to fourth pereopod. Second to fourth pereopods each with slender, cincinnulate appendix interna.

Remarks: *A. brevitelsonis* is represented only by the holotype. The possession of more than two pairs of spines on the posterior margin of the telson links *A. brevitelsonis* to *A. lusca* and *A. stactophila*. As KIKUCHI & HASHIMOTO (2000) correctly pointed out, the shorter telson, which falls short of the posterior end of the uropod, distinguishes *A. brevitelsonis* from *A. lusca*. *A. dissimilis* and *Shinkaicaris leurokolos* occurred sympatrically.

Biology: This species occurs at a hydrothermally influenced area.

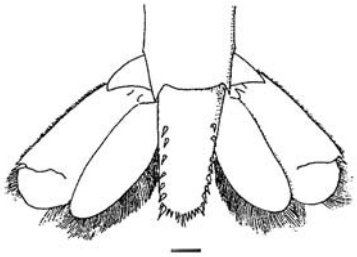
Distribution: Okinawa Trough: Minami-Ensei Knoll.



1: Body, lateral.

1-3: Holotype ovigerous female (carapace length 13.8 mm) from Minami Ensei Knoll, Mid-Okinawa Trough; scale bars 1 mm; by T. Kikuchi.

2: Anterior part of carapace and cephalic appendages, dorsal.



3: Telson and left uropod, dorsal.

References:

KIKUCHI T. & J. HASHIMOTO (2000) Species Diversity **5**: 135-148.
KOMAI T. & M. SEGONZAC (2005) J. Nat. Hist. **39**(15): 1111-1175.

Alvinocaris dissimilis Komai & Segonzac, 2005

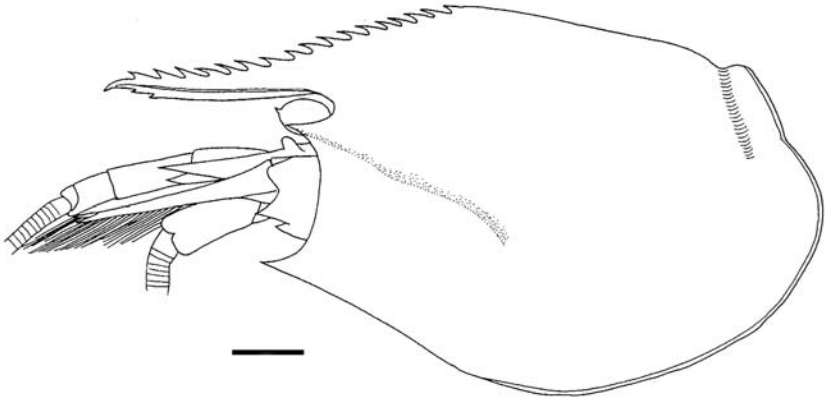
Size: Largest male carapace length 8.4 mm, largest female carapace length 9.8 mm, ovigerous females carapace length 7.3-9.8 mm. Maximal total length 41 mm.

Morphology: Rostrum directed forward, straight or very slightly curved dorsally, usually reaching to second segment of antennular peduncle; dorsal margin armed with 13-17 teeth, including 8-10 teeth on rostrum proper and 5-8 relatively small teeth on carapace posterior to orbital margin; ventral margin armed with one or two small subdistal teeth. Carapace width 0.65-0.80 of length; dorsal angle about 155°. Fourth abdominal pleuron with small posteroventral tooth and additional one or two teeth on posterior margin. Fifth abdominal somite similarly armed with strong posteroventral tooth and additional 1-5 tiny teeth on posterior margin or ventral margin. Telson not reaching posterior margin of uropodal endopod; armed with 5-8 dorsolateral spines; posterior margin convex (rarely shallowly notched medially), armed with two pairs of spines at lateral corners and 12-14 plumose setae all longer than mesial pair of lateral spines.

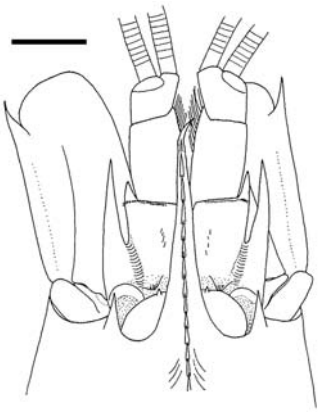
Remarks: *Alvinocaris dissimilis*, *A. markensis*, *A. muricola* and *A. longirostris* are morphologically very similar to one another. These four species share the rostrum reaching at least to the second segment of the antennular peduncle and armed usually with one or more ventral teeth, relatively high postrostral median ridge on the carapace, and the posterior margin of the telson with long plumose setae and two lateral pairs of spines. These characters should be used with caution, as most of them are useful only for adult specimens.

Biology: This recently described species occurs in a hydrothermally active area. *Alvinocaris brevitelsonis* and *Shinkaicaris leurokolos* occurred sympatrically with this species.

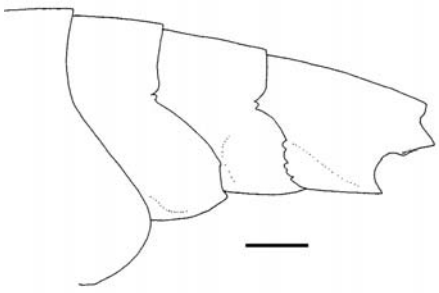
Distribution: Known only from Minami-Ensei Knoll, Mid-Okinawa Trough, 705 m.



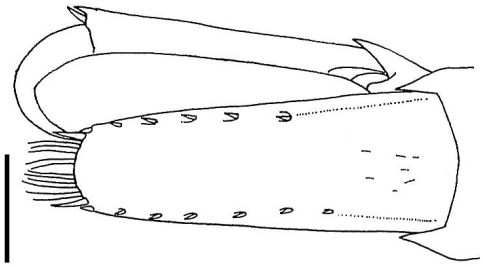
1: Carapace and cephalic appendages, lateral.



3: Anterior part of carapace and cephalic appendages, dorsal.



2: Third to sixth abdominal somites, lateral.



4: Telson and left uropod, dorsal (marginal setae on uropod omitted).

1-4: Holotype ovigerous female (carapace length 11.9 mm) from Minami-Ensei Knoll, Mid-Okinawa Trough; by T. Komai.

References:

Kikuchi T. & J. Hashimoto (2000) Species Diversity **5**: 135-148.
Komai T. & M. Segonzac (2005) J. Nat. Hist. **39**(15): 1111-1175.

Alvinocaris longirostris Kikuchi & Ohta, 1995

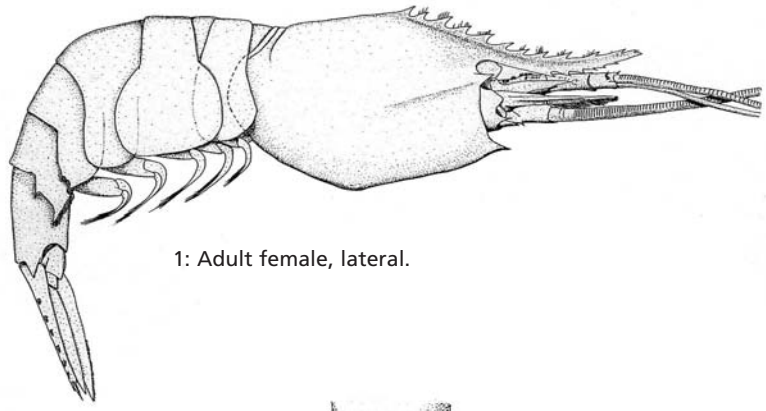
Size: Largest female 16.9 mm. Maximal total length ca. 85 mm.

Color: Ivory to dull ivory white.

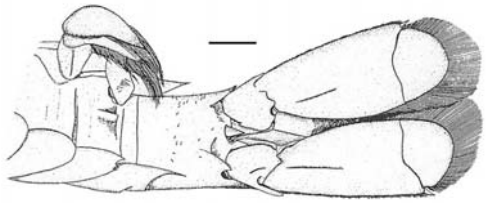
Morphology: Rostrum slightly descending or directed forward, straight or weakly curved dorsally, 0.64-1.26 of carapace length in females, usually overreaching distal margin of antennular peduncle, armed with 9-15 teeth including 5-10 relatively large teeth on carapace posterior to orbital margin, posteriormost tooth arising 0.38-0.48 of carapace length; ventral margin armed with 4-9 small teeth on anterior 0.30-0.50. Carapace width 0.65-0.72 of length; postrostral median ridge relatively high, dorsal angle about 150°; branchial region not notably inflated, slightly convex; pterytostomial tooth relatively strong. Fourth abdominal pleuron with 1-4 posterolateral teeth. Fifth abdominal pleuron similarly armed with strong posteroventral tooth and additional 2-5 small teeth. Telson not reaching to posterior margin of uropodal endopod, distinctly narrowed posteriorly, armed with 5-7 dorsolateral spines; posterior margin convex, armed with two pairs of spines at lateral angle and 12-14 plumose setae all longer than mesial pair of lateral spines. Eye with small spiniform tubercle on anterior surface. Antennular peduncle with second segment 1.58-1.69 times longer than wide. Antennal scale about half lengh of carapace and 1.72-1.90 times longer than wide. Third to fifth pereopods moderately slender; dactyli each with single row of accessory spinules; meri armed with spines on ventrolateral surfaces; ischia also with spines at least in third and fourth pereopods. No epipods on third maxilliped to fourth pereopod. Second to fourth pereopods each with slender, cincinnulate appendix interna.

Biology: Usually associated with hydrothermal vents. Fujikura et al. (1995) reported the occurrence of *A. longirostris* at cold seeps on off Hatsushima site, Sagami Bay.

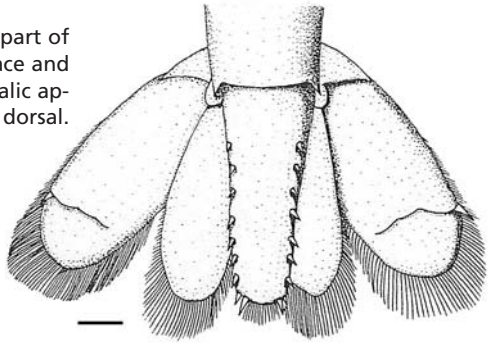
Distribution: Okinawa Trough: Iheya Ridge and Hatoma Knoll; Japan: Sagami Bay, off Hatsushima site; Kermadec-Arc: Brothers Seamount Caldera.



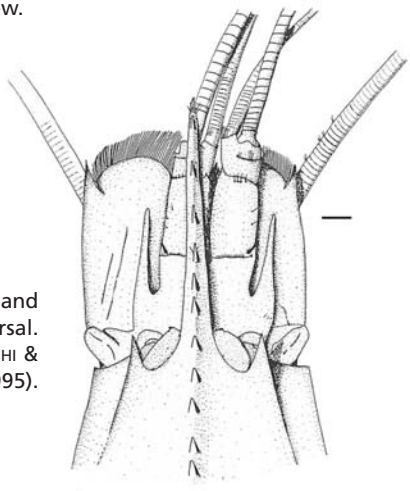
1: Adult female, lateral.



2: Posterior part of abdomen and uropods in ventral view.



3: Anterior part of carapace and cephalic appendages, dorsal.



4: Telson and uropod, dorsal.
1-4: from Kikuchi & Otha (1995).

References:

Fujikura K., Hashimoto J., Fujiwara Y. & T. Okutani (1995) JAMSTEC J. Deep-Sea Res. **11**: 227-241.
Kikuchi T. & S. Ohta (1995) J. Crustac. Biol. **15**: 219-240.
Watabe H. & H. Miyake. (2000) JAMSTEC J. Deep-Sea Res. **17**: 29-34.
Webber W.R. (2004) Zootaxa **444**: 1-26.

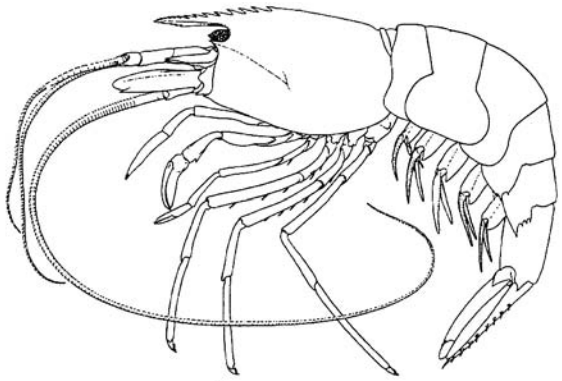
Alvinocaris lusca Williams & Chace, 1982

Size: Carapace length largest male 7.3 mm; largest female 13.5 mm. Maximal total length ca. 85 mm.

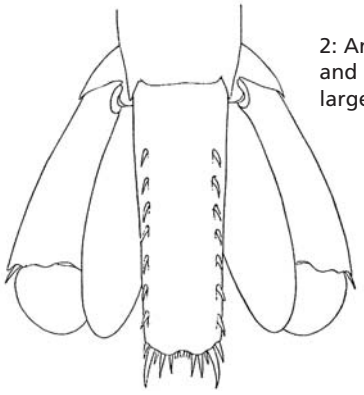
Morphology: Rostrum slightly descending or directed forward, straight, 0.37-0.44 times of carapace length, usually reaching second segment of antennular peduncle, armed with 10-14 teeth including 4-6 moderately large teeth on carapace posterior to orbital margin, posterior tooth arising 0.32-0.39 of carapace length; ventral margin armed with three or four small teeth on anterior 0.20-0.40. Carapace width 0.55-0.67 of length; postrostral median ridge relatively low, dorsal angle about 170°; branchial region weakly convex; pterytostomial tooth relatively weak. Fourth abdominal pleuron with 1-5 (most frequently four) posterolateral teeth. Fifth abdominal pleuron similarly armed with strong posteroventral tooth and additional 1-5 small teeth. Telson not reaching to slightly overreaching posterior margin of uropodal endopod, very slightly narrowed posteriorly, armed with 7-9 dorsolateral spines; posterior margin shallowly notched medially or slightly convex, armed with 5-7 spines (mesial 3-5 spines unequal in length, but third spine from lateral shorter than others) and one or two short plumose setae on either side of median notch. Eyes with small spiniform tubercle on anterior surface. Antennular peduncle with second segment 2.00-2.20 times longer than wide. Antennal scale about half lengh of carapace and 2.20-2.60 times longer than wide. Third to fifth pereopods moderately slender; dactyli each with single row of accessory spinules; meri armed with spines on ventrolateral surfaces; ischia also with spines at least in third and fourth pereopods. No epipods on third maxilliped to fourth pereopod. Second to fourth pereopods each with slender, cincinnulate appendix interna.

Biology: This species is associated with the vestimentiferan worm *Riftia pachyptila*, and could be nourished from its biological production. Van Dover et al. (1985) described planktotrophic larval develoment.

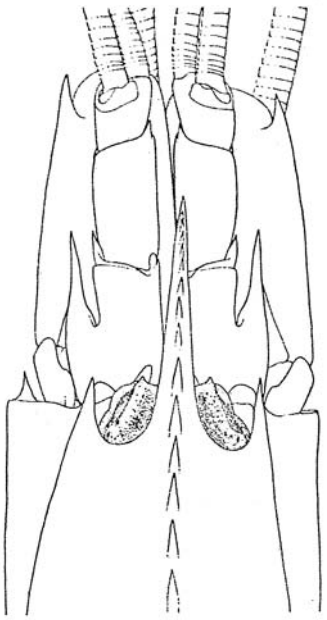
Distribution: Known with certainty only from the Galapagos Spreading Center: Rose Garden area and East Pacific Rise: 9°N.



1: Body, lateral; enlargement x5.



2: Anterior part of carapace and cephalic appendages; enlargement x10.



3: Telson and uropods, dorsal; enlargement x10.
1-3: from Williams & Chace (1982).

References:

Komai T. & M. Segonzac (2005) J. Nat. Hist. **39**(15): 1111-1175.
Van Dover C.L., Factor J.R., Williams A.B. & C.J. Berg (1995) Bull. Biol. Soc. Wash. **6**: 223-227.
Williams A.B. & F.A. Chace (1982) J. Crustac. Biol. **2**(1): 136-147.

Alvinocaris markensis Williams, 1988

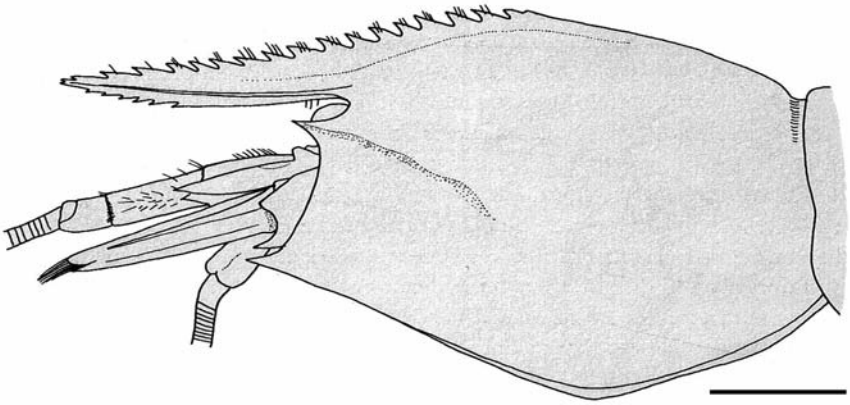
Size: Carapace length largest male 12.9 mm; largest female 22.3 mm, ovigerous female 13.0 mm. Maximal total length ca. 82 mm.

Color: In situ red-orange, abdomen paler.

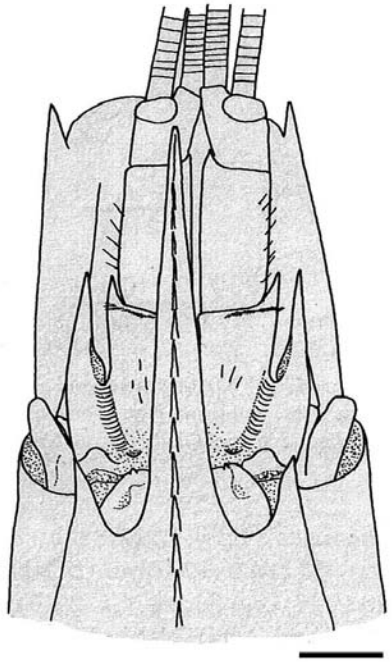
Morphology: Rostrum directed forward or slightly descending, nearly straight or slightly curved dorsally, armed with 14-19 teeth, including 8-12 on rostrum proper and 5-7 moderately large teeth on carapace posterior to level of orbital margin, posteriormost tooth arising from 0.24-0.31 of carapace length; ventral margin armed with 6-9 small teeth. Carapace 0.52-0.65 times as wide as long; postrostral median ridge relatively high, dorsal angle about 150°; pterygostomial tooth relatively strong; branchial region not particularly inflated, slightly convex. Fourth abdominal pleuron with 1-4 (most frequently two or 3) teeth posteriorly. Fifth abdominal pleuron similarly armed with one strong posterolateral tooth and 1-3 additional teeth on posterior margin. Telson narrowed posteriorly, not reaching or reaching posterior margin of uropodal endopod, armed with 6-8 dorsolateral spines; posterior margin always convex, armed with two pairs of lateral spines and 12-14 plumose setae all longer than mesial pair of lateral spines. Antennular peduncle moderately stout, second segment 1.79-2.05 times longer than wide. Eye with small spiniform tubercle on anterior surface. Antennal scale 1.91-2.04 times longer than wide. Third to fifth pereopods moderately slender; dactyli each with single row of accessory spinules; meri armed with spines on ventrolateral surfaces; ischia also with spines at least in third and fourth pereopods. No epipods on third maxilliped to fourth pereopod. Second to fourth pereopods each with slender, cincinnulate appendix interna.

Biology: This species always lives more or less solitary at the base and on walls of active chimneys, close to aggregates of *Rimicaris exoculata*, or on mussel beds. The trophic mode is necrophagous, as captures of the shrimps by baited traps indicate. However, the gut contents examined generally contained mainly mineral particles. Ovigerous females collected in August.

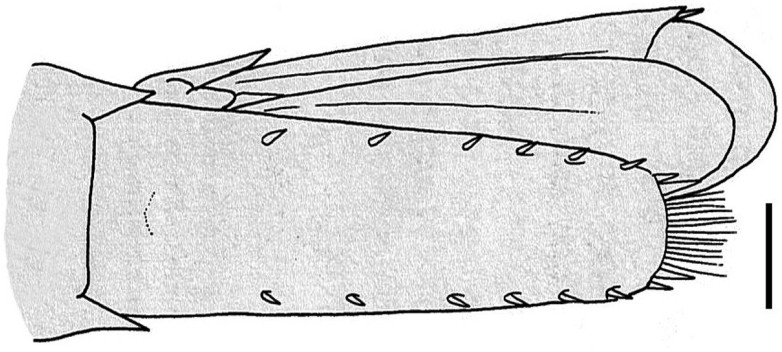
Distribution: The occurrence of this species is confirmed at several locations at Mid-Atlantic Ridge: TAG, Snake Pit, Broken Spur, Logatchev, Rainbow, and Lucky Strike.



1: Female (carapace length 16.7 mm) from site Les Ruches, Snake Pit, MAR; carapace and cephalic appendages, lateral; scale bar 5 mm.



2: Anterior part of carapace and cephalic appendages, dorsal; scale bar 2 mm.



3: Telson and right uropod, dorsal; scale bar 5 mm.

4: Fresh specimen taken on board; from Briand © Ifremer.

5: In situ at the base of hot vent on the site Les Ruches, Snake Pit. The shrimp is seen in profile; one notes the camber cephalothorax/abdomen, characteristic of this species. Surrounded by *Chorocaris chacei* shrimps. Cruise Hydrosnake © Ifremer. 1-5: by T. Komai (from Komai & Segonzac 2005).

References:

Komai T. & M. Segonzac (2005) J. Nat. Hist. **39**(15): 1111-1175.

Segonzac M., Saint Laurent M. de & B. Casanova (1993) Cah. Biol. Mar. **34**: 535-571.

Shank T., Black M.B., Halanych K.M., Lutz R.A. & R.C. Vrijenhoek (1999) Mol. Phylogenet. Evol. **13**: 244-255.

Van Dover C.L. (1995) in Parson L., Walker C.L. & D.R. Dixon (Eds) Hydrothermal Vents and Processes: 257-294.

Williams A.B. (1988) J. Crustac. Biol. **2**(1): 136-147.

Williams A.B. (1988) Fish. Bull. **86**(2): 263-287.

Alvinocaris niwa Webber, 2004

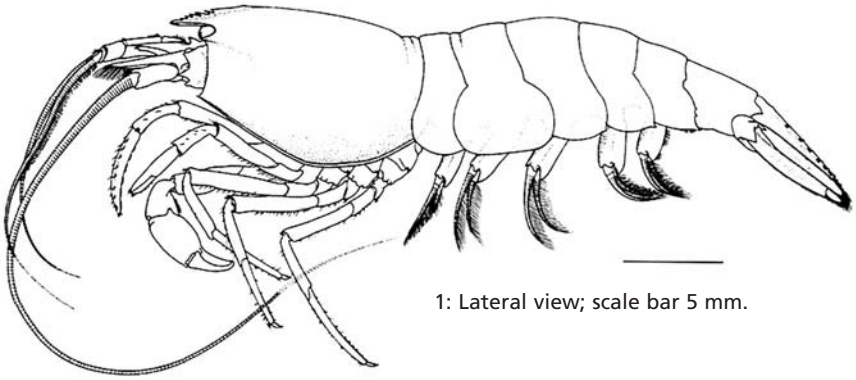
Size: Male holotype carapace length 15.38 mm, total length ca. 57 mm.

Morphology: Rostrum short, not reaching distal margin of first segment of antennular peduncle, directed forward, weakly compressed laterally, terminating acutely, dorsal margin sharply carinae, armed with 5-17 teeth including 4-12 on rostrum proper and 0-6 on anterior part of carapace posterior to level of orbital margin; ventral margin usually unarmed or rarely with one tiny subterminal tooth. Carapace somewhat compressed laterally, with sharp postrostral ridge reaching anterior 0.2 of carapace length; antennal spine acuminate; no conspicuous lobe mesial to antennal spine; pterygostomial angle weakly to somewhat produced in adults, reaching or distinctly overreaching antennal spine, terminating in sharp spine. Abdomen smooth dorsally; pleuron of third somite usually smooth, those of fourth and fifth somites at least with posterolateral tooth and frequently with additional small teeth ventrally and/or posteriorly. Telson with six or seven dorsolateral spines arranged in sinuous row on either side; posterior margin convex, with 1-3 small spines at each lateral angle and row of numerous long plumose setae. Eyestalks degenerated, broadly fused mesially, cornea unfacetted; anterior surface unarmed. Chela of first pereopod without fine row of long submarginal setae on outer surface along cutting edges of fingers. Third to fifth pereopods moderately slender; dactyli armed with two or more rows of accessory spinules on ventral surface; meri usually unarmed; ischia of third and fourth pereopods armed usually with two lateral spines. No strap-like epipods on third maxilliped and pereopods. Appendices internae on second to fourth pereopods slender, without coupling hooks.

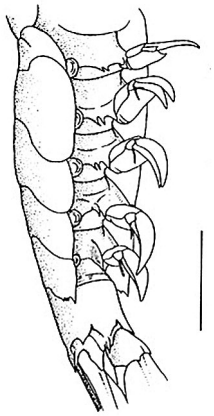
Remarks: The reduced dorsal rostral series, the reduced armature of the meri of the third to fifth pereopods and the possession of two or more rows of accessory spinules on the ventral surface of each dactylus of the third to fifth pereopods set this species apart from *Alvinocaris*, and link it to a group composed of *Shinkaicaris*, *Opaepele*, *Chorocaris* and *Rimicaris*.

Biology: This species is associated with hydrothermal springs on active submarine volcanoes, among mytilid bivalve *Gigantidas gladius*, but also abundant bathyal fauna (coral, barnacles, asteroid echinoderms).

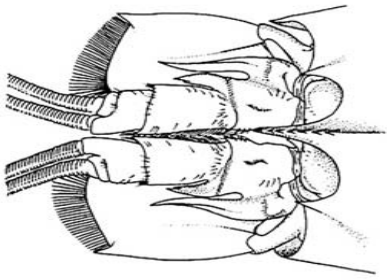
Distribution: Kermadec-Arc: Brothers Seamount Caldera and Rumble V Seamount.



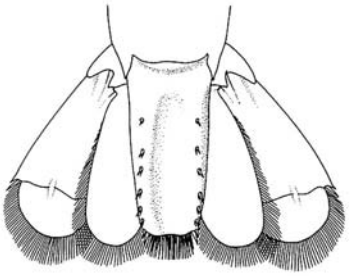
1: Lateral view; scale bar 5 mm.



2: Abdomen, ventrolateral view; scale bar 5 mm.



3: Front, dorsal view.



4: Telson and uropods, dorsal view.
1-4: Holotype, carapace length 15.38 mm; from Webber (2004).

References:

Webber W.R. (2004) Zootaxa **444**: 1-26.
Webber W.R. & N.L. Bruce (2002) Biodiversity Update **5**: 6-7.

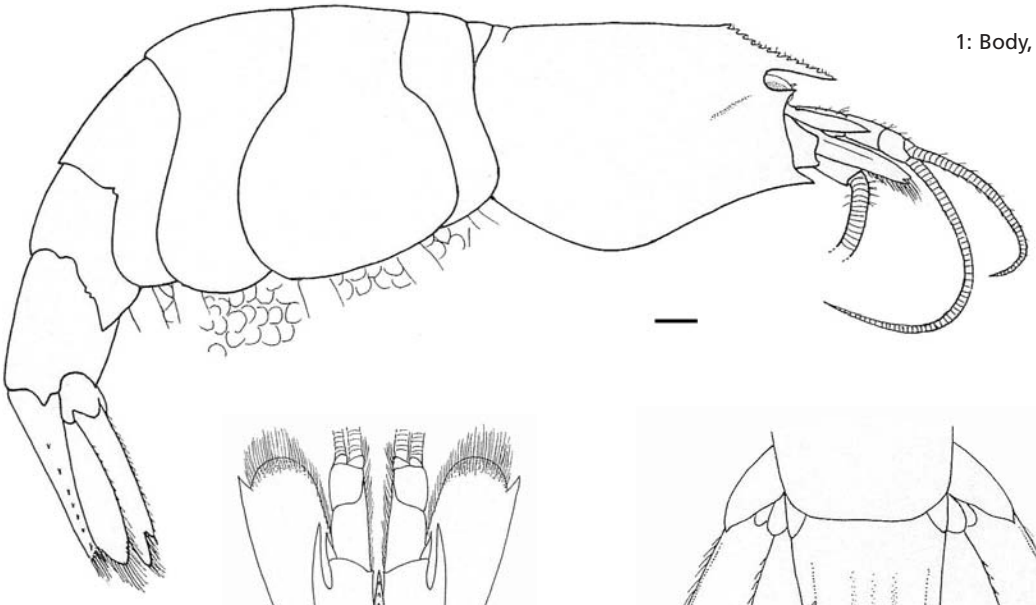
Alvinocaris williamsi Shank & Martin, 2003

Size: Largest male carapace length 6.1 mm; largest female 10.3 mm, ovigerous female 5.8 mm.

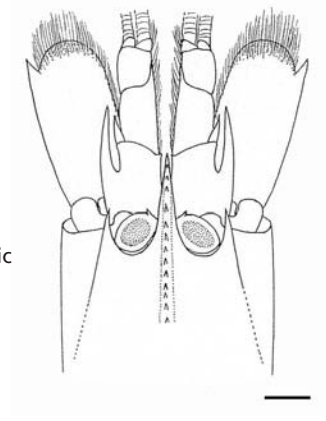
Morphology: Rostrum directed forward, straight or slightly downward, not reaching or reaching distal margin of first segment of antennular peduncle, 0.27-0.37 of carapace length; dorsal margin armed with 10-15 teeth, including 5-9 teeth on rostrum proper and 4-8 small to moderately large teeth on carapace posterior to orbital margin, posteriormost tooth arising from 0.13-0.20 of carapace length; ventral margin usually unarmed. Carapace about 0.70 times as wide as long, postrostral median ridge relatively low, with dorsal angle about 150°; branchial region not notably inflated, slightly convex; branchiostegal tooth moderately strong. Fourth abdominal pleuron rounded or with small posteroventral tooth. Fifth abdominal pleuron armed with strong posteroventral tooth and 2-4 additional tiny teeth on posterior margin. Telson not reaching posterior margin of uropodal endopod; armed with six or seven dorsolateral spines arranged in straight or slightly convex line; posterior margin broadly rounded, armed with two pairs of spines at posterolateral angles and 14-16 plumose setae all longer than mesial pair of lateral spines. Eye with small tubercle on anterior surface. Antennular peduncle very stout, with second segment 1.05-1.11 times longer than wide. Antennal scale about 0.4 of carapace length, 1.40-1.50 times longer than wide. Third to fifth pereopods moderately slender; dactyli each with single row of accessory spinules; meri usually armed with spines on ventrolateral surfaces in third and fourth; ischia also with spines at least in third and fourth pereopods. No epipods on third maxilliped to fourth pereopod. Second to fourth pereopods each with slender, cincinnulate appendix interna.

Biology: The specimens were collected from the mussel beds of the mytilid *Bathymodiolus azoricus*.

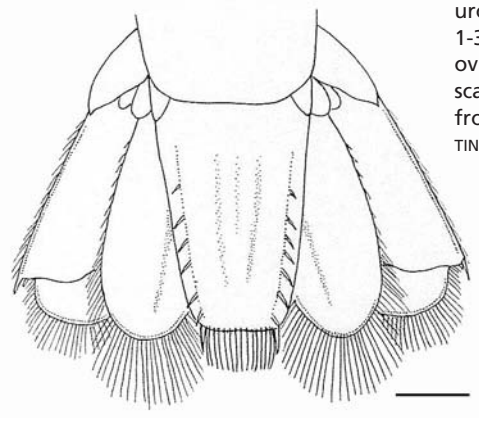
Distribution: Known only from Mid-Atlantic Ridge: Menez Gwen.



1: Body, lateral.



2: Anterior part of carapace and cephalic appendages, dorsal.



3: Telson and left uropod, dorsal.
1-3: Holotype, ovigerous female; scale bar 1 mm; from Shank & Martin (2003).

References:

Komai T. & M. Segonzac (2005) J. Nat. Hist. **39**(15): 1111-1175.
Shank T.M. & J.W. Martin (2003) Proc. Biol. Soc. Wash. **116**: 158-167.

Chorocaris chacei (Williams & Rona, 1986)

Size: Female, max. carapace length 17.4 mm; total length 55 mm.

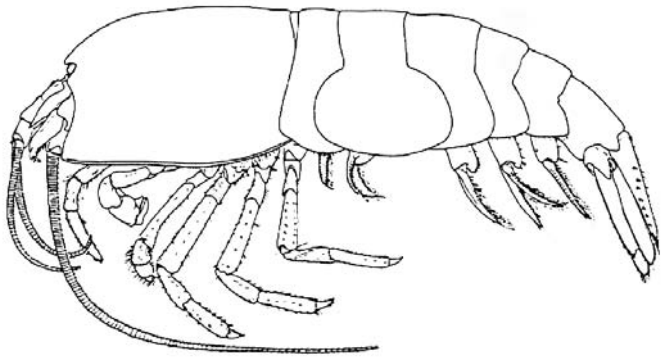
Color: Cephalothorax red orange, abdomen paler.

Morphology: Rostrum broadly rounded, flattened dorsoventrally, reaching or overreaching antennal spines; no dorsal or ventral teeth; ventral surface convex. Carapace somewhat compressed laterally, rounded dorsally; antennal spine blunt; pterygostomial angle strongly produced, terminating bluntly. Fourth abdominal pleuron blunt angular posteroventrally; fifth pleuron with subacutely pointed posterolateral angle. Telson narrowed posteriorly, bearing row of 6-8 dorsolateral spines arranged in sinuous row on either side; posterior margin broadly convex, with 1-3 spines at each lateral angle and with row of numerous plumose setae. Eye-stalks degenerated, broadly fused mesially without trace of median separation; no distinct spine or tubercle on anterior surface. Chela of first pereopod without fine row of long submarginal setae on outer surface along cutting edges of fingers. Third to fifth pereopods moderately slender to stout; dactyli armed with two or more rows of accessory spinules on ventral surface; meri and ischia unarmed. Third maxilliped and first to fourth pereopods without strap-like epipods. Appendices internae on second to fourth pereopods simple, slender, without cincinnuli. Protopod of endopod tapering distally, terminating subcautely or acutely.

Remarks: A single female specimen collected at the site Eiffel Tower on Lucky Strike differs from typical series of C. *chacei* in having an acuminate rostrum and acuminate antennal and pterygostomial spines on the carapace. We regard that the specimen is an abnormal individual of C. *chacei*, because it was collected along with individuals of typical C. *chacei* and we have not encountered such a form in other collections from the Lucky Strike.

Biology: This species is much less abundant (2-3 ind./dm^2, by places) than *Rimicaris exoculata*. It is present close to chimneys and on sulfide blocks, mostly where fluid emissions are weak.

Distribution: Mid-Atlantic Ridge: TAG, Snake Pit, Logatchev, Rainbow, and Lucky Strike.



1: Holotype, lateral view; enlargement x5.2; from Williams & Rona (1986).

2: Specimen taken on board; cruise Exomar © Ifremer.

3: Cephalothorax of a single aberrant specimen collected at Lucky Strike in July 2001 (American cruise DiversExpedition) by P. Briand © Ifremer.

4: Anterior part of carapace and cephalic appendages, dorsal; cruise Exomar © Ifremer.

5: Telson and uropods, dorsal; cruise Exomar © Ifremer.

References:

Ramirez Llodra E.,Tyler P.A. & J.T.P. Copley (2000) J. Mar. Biol. Ass. U.K. **80**: 473-484.
Segonzac M., Saint Laurent M. de & B. Casanova (1993) Cah. Biol. Mar. **39**(15): 1111-1175.
Williams A.B. & P.A. Rona (1986) J. Crustac. Biol. **6**: 446-462.

Chorocaris paulexa Martin & Shank, 2005

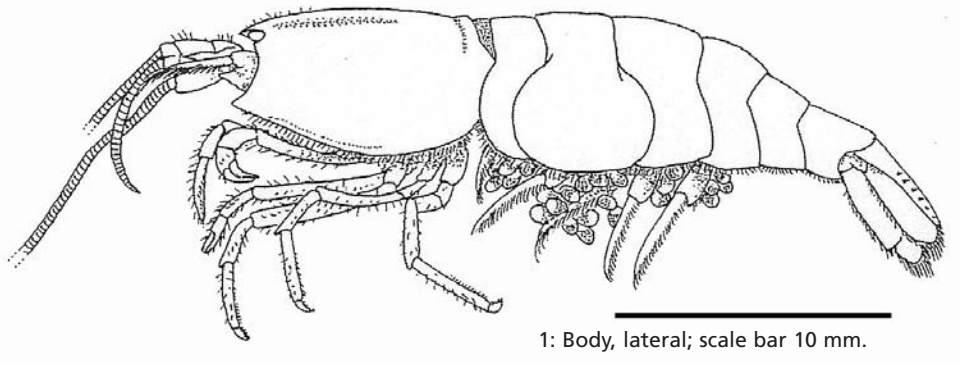
Size: Female, carapace length 9.6 mm

Color: Live shrimp mostly pale translucent white to slightly pink on posterior and dorsal surfaces of carapace and abdomen.

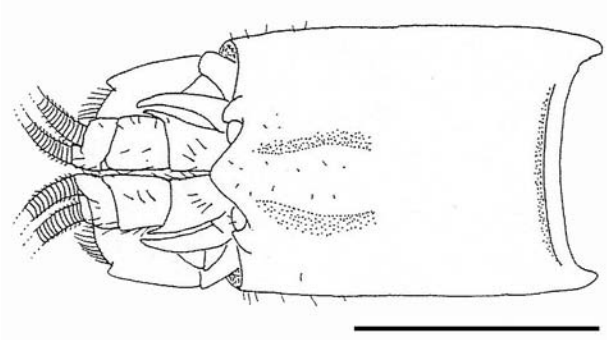
Morphology: Rostrum broadly triangular, flattened dorsoventrally, overreaching antennal spines; no dorsal or ventral teeth; ventral surface convex. Carapace somewhat compressed laterally, rounded dorsally; spawning female with very shallow depression on either side of midline in anterior half; antennal spine blunt; pterygostomial angle strongly produced as relatively narrow triangular projection, terminating subacutely. Fourth abdominal pleuron bluntly angular posteroventrally; fifth pleuron with subacutely pointed posterolateral angle. Telson slightly narrowed posteriorly, bearing row of 6-8 dorsolateral spines arranged in sinuous row on either side; posterior margin broadly convex, with 1-3 spines at each lateral angle and with row of numerous plumose setae. Eye-stalks degenerated, broadly fused mesially without trace of median separation; no distinct spine or tubercle on anterior surface. Chela of first pereopod without fine row of long submarginal setae on outer surface along cutting edges of fingers. Third to fifth pereopods moderately slender to stout; dactyli armed with two or more rows of accessory spinules on ventral surface; meri and ischia unarmed. Third maxilliped and first to fourth pereopods without strap-like epipods. Appendices internae on second to fourth pereopods simple, slender, without couppling hooks. Protopod of endopod tapering distally, terminating in blunt tooth.

Biology: Living directly on the black smokers in numbers up to 47 individuals per half meter square.

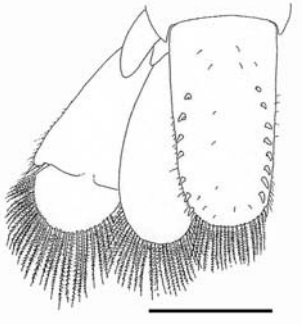
Distribution: Southern East Pacific Rise: 17°S.



1: Body, lateral; scale bar 10 mm.



2: Anterior part of carapace and cephalic appendages, dorsal; scale bar 5 mm.



3: Telson and left uropod, dorsal; scale bar 2 mm.
1-3: from Martin & Shank (2005).

Reference:

Martin J. & T. Shank (2005) Proc. Biol. Soc. Wash. **118**(1): 183-198.

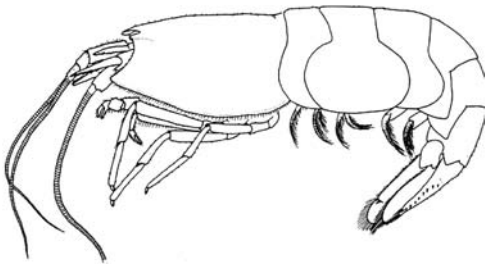
Chorocaris vandoverae (Martin & Hessler, 1990)

Size: Female carapace length 13.4 mm.

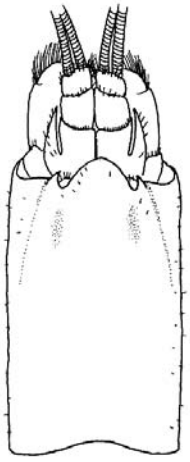
Morphology: Rostrum broadly rounded, flattened dorsoventrally, overreaching antennal spines; no dorsal or ventral teeth; ventral surface convex. Carapace somewhat compressed laterally, rounded dorsally; antennal spine blunt; pterygostomial angle strongly produced, terminating bluntly. Fourth abdominal pleuron bluntly angular posteroventrally; fifth pleuron with subacutely pointed posterolateral angle. Telson slightly narrowed posteriorly, bearing row of 6-8 dorsolateral spines arranged in sinuous row on either side; posterior margin broadly convex, with 1-3 spines at each lateral angle and with row of numerous plumose setae. Eye-stalks degenerated, broadly fused mesially without trace of median separation; no distinct spine or tubercle on anterior surface. Chela of first pereopod without fine row of long submarginal setae on outer surface along cutting edges of fingers. Third to fifth pereopods moderately slender to stout; dactyli armed with two or more rows of accessory spinules on ventral surface; meri and ischia unarmed. Third maxilliped and first to fourth pereopods without strap-like epipods. Appendices internae on second to fourth pereopods simple, slender, without cincinnuli. Protopod of endopod slightly tapering and rounded distally.

Biology: Living in profusion at vents or adjacent rocks.

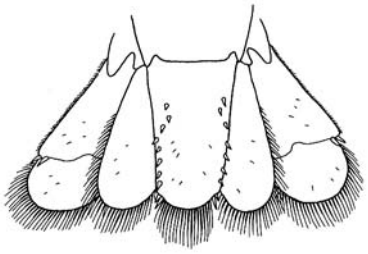
Distribution: Mariana, Manus, North Fiji and Lau Back-Arc Basins.



1: Habitus, lateral view; by J. Martin.



2: Dorsal view of carapace and bases of antennae; by J. Martin.



3: Telson and uropods; by J. Martin.

4: In situ view of two specimens among gastropods (*Alviniconcha hessleri*); Mariana Back-Arc Basin; by courtesy of R.R. Hessler.

References:

Martin J.W. & R.R. Hessler (1990) Nat. Hist. Mus. Los Angeles Cty **417**: 1-11.
Williams A.B. & P.A. Rona (1986) J. Crustac. Biol. **6**: 446-462.

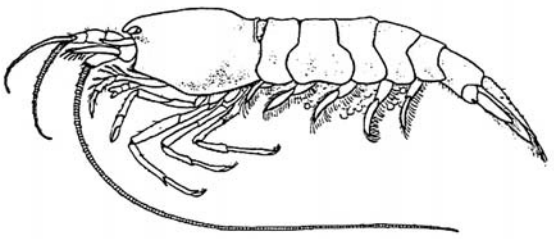
Mirocaris fortunata (Martin & Christiansen, 1995)

Size: Females carapace length 3.3-8.7 mm, males carapace length 3.8-7.2 mm.

Morphology: Rostrum triangular, terminating bluntly or subacutely in dorsal view, flattened dorsoventrally, reaching to slightly overreaching antennal spine; no dorsal or ventral teeth. Carapace somewhat compressed laterally, with short transverse (vertical) rows of minute to short setae on lateral parts; dorsal surface rounded in males and non-ovigerous females, broadly carinate in ovigerous females, general outline in lateral view faintly sinuous to weakly convex; in ovigerous females, submedian areas very shallowly depressed and ornamented with numerous longitudinal striae; antennal spine acute; pterygostomial angle weakly produced, terminating subacutely. Fourth abdominal pleuron rounded posteriorly; fifth pleuron with subacutely pointed posterolateral angle. Telson barely narrowed posteriorly, bearing row of 7-9 dorsolateral spines arranged in sinuous row; posterior margin broadly convex, occasionally with shallow median emargination, bearing 12-19 spines in total; 1-3 spines at posterolateral angle shorter than mesial spines, simple, while remaining mesial spines elongate, bearing minute marginal setules. Eye-stalks rather large but degenerated, broadly fused mesially without trace of median separation; no distinct spine or tubercle on anterior surface. Chela of first pereopod with fine row of long submarginal setae on outer surface along cutting edges of fingers. Third to fifth pereopods moderately slender to stout; dactyli armed with single row of accessory spinules on ventral margin; meri unarmed; ischia with spines in third, usually unarmed in fourth and fifth. Third maxilliped and first to fourth pereopods with strap-like epipods. Appendices internae on second to fourth pereopods rudimentary or absent.

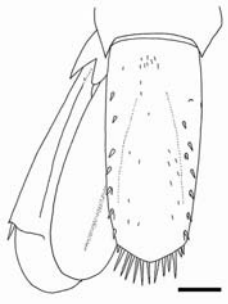
Biology: Lives in close proximity to vent openings or in shimmering water from crevices with diffuse flow, among numerous *Bathymodiolus* bivalves. Numerous ovigerous females in the June-July samples. This species was found in the enteron of *Candelabrum phrygium* (Cnidaria, Hydrozoa) which lives in the same area.

Distribution: Known from hydrothermal vent sites along the Mid-Atlantic Ridge between 38°N and 14°N: Menez Gwen, Lucky Strike, Rainbow, Broken Spur, TAG, Snake Pit, Logatchev.



1: Body, lateral; by J.W. Martin & J.C. Christiansen.

2: Anterior part of carapace and cephalic appendages, dorsal (setae partially omitted; right antenna removed); scale bar 2 mm; by T. Komai.



3: Telson and left uropod, dorsal (setae omitted), scale bar 1 mm; by T. Komai.

4: In situ aggregation on crevice of suphide edifice, Lucky Strike site during Exomar cruise © Ifremer.

References:

Komai T. & M. Segonzac (2003) Cah. Biol. Mar. **44**: 199-215.
Martin J.W. & J.C. Christiansen (1995) Proc. Biol. Soc. Wash. **108**(2): 220-227.
Segonzac M. & W. Vervoort (1995) Bull. Mus. Natl. Hist. Nat., Paris, 4e sér. **17**: 31-64.

Mirocaris indica Komai, Martin, Zala, Tsuchida & Hashimoto, in press

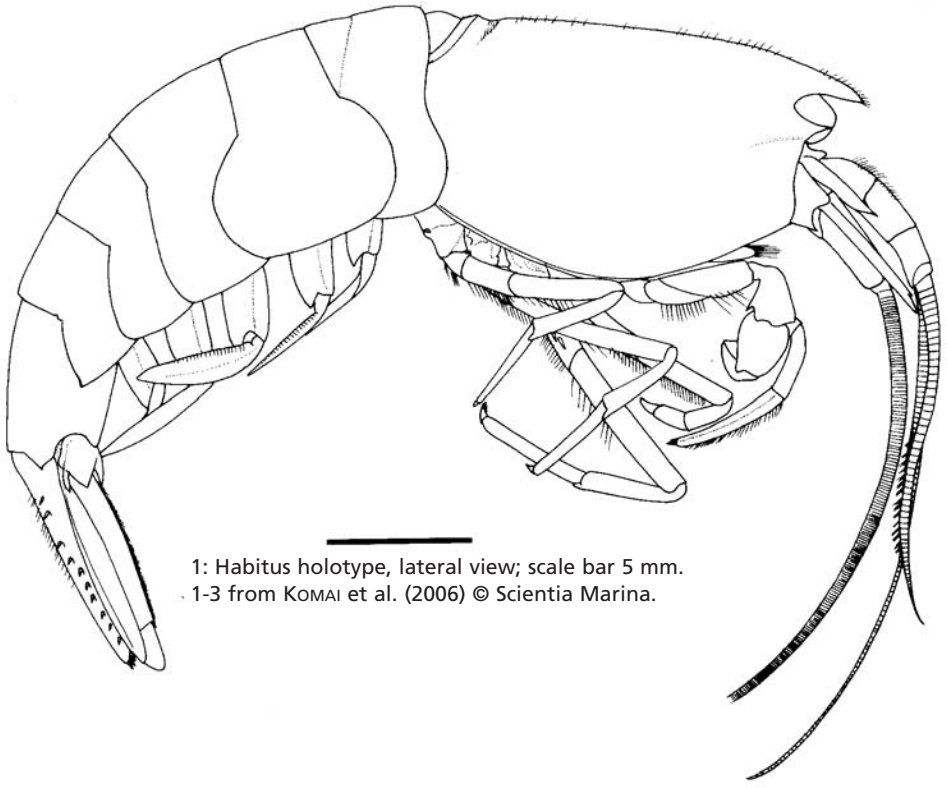
Size: Carapace length 9.2-13.8 mm (females), 4.6-10.2 mm (males).

Color: In life, body and appendages generally white, but dorsal surface of carapace and anterior two abdominal somites reddish; eye yellowish.

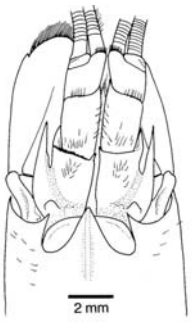
Morphology: Rostrum triangular, terminating bluntly or subacutely in dorsal view, flattened dorsoventrally, reaching to slightly overreaching antennal spine; no dorsal or ventral teeth. Carapace somewhat compressed laterally, with short transverse (vertical) rows of minute to short setae on lateral parts; dorsal surface rounded, general outline in lateral view slightly convex; antennal spine acuminate; pterygostomial angle weakly produced, terminating subacutely. Fourth abdominal pleuron rounded posteriorly; fifth pleuron with subacutely pointed posterolateral angle. Telson barely narrowed posteriorly, bearing row of 7-9 dorsolateral spines arranged in sinuous row; posterior margin broadly convex, occasionally with shallow median emargination, bearing 12-19 spines in total; 1-3 spines at posterolateral angle shorter than mesial spines, simple, while remaining mesial spines elongate, bearing minute marginal setules. Eye-stalks rather large but degenerated, broadly fused; no distinct spine or tubercle on anterior surface. Chela of first pereopod without submarginal row of setae on outer surface along cutting edges of fingers. Third to fifth pereopods moderately slender to stout; dactyli armed with single row of accessory spinules on ventral margin; meri unarmed; ischia with spines in third, usually unarmed in fourth and fifth. Third maxilliped and first to fourth pereopods with strap-like epipods. Appendices internae on second to fourth pereopods rudimentary or absent.

Biology: The collection sites were an active vent field that included black smoker complexes with dense patches of vent associated animals, including *Rimicaris kairei*, *Bathymodiolus* mussel, *Alviniconcha* snail, *Austinograea* crab, *Marianactis* anemone.

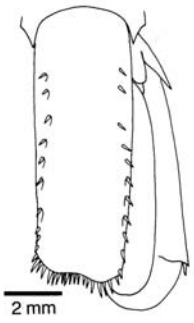
Distribution: Central Indian Ridge, Kairei Field, Edmond Vent Field.



1: Habitus holotype, lateral view; scale bar 5 mm.
1-3 from Komai et al. (2006) © Scientia Marina.



2: Front, dorsal view.



3: Telson and right uropod, dorsal view (setae omitted).

References:

Komai. T., Martin J.W., Zala K., Tsuchida S. & J. Hashimoto (in press) Scientia Marina **70**(1).

Nautilocaris saintlaurentae Komai & Segonzac, 2005

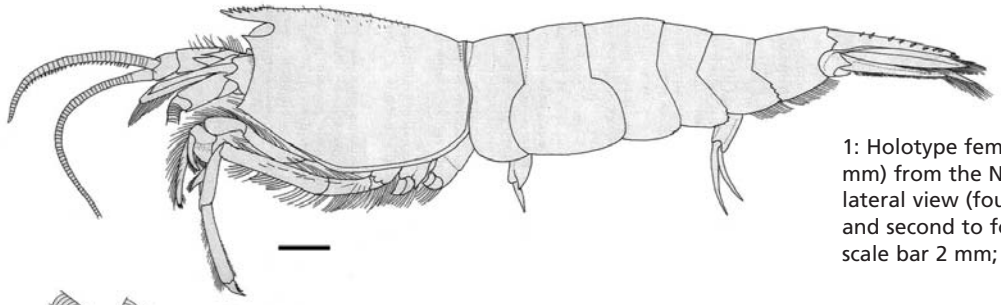
Size: Largest male carapace length 5.6 mm, largest female carapace length 7.8 mm. Maximal total length ca. 35 mm.

Color: Generally whitish; matured female gonads reddish, visible throughout cuticle.

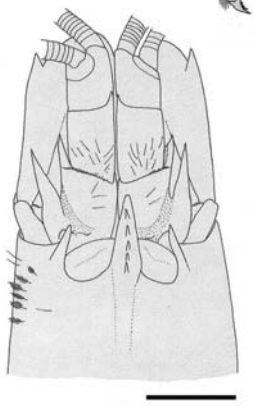
Morphology: Rostrum carinate and dentate dorsally, reaching distal margin of basal segment of antennular peduncle; ventral surface unarmed. Carapace somewhat compressed laterally; postrostral median carina low, blunt, restricted to anterior 0.15 of carapace; antennal tooth acuminate; pterygostomial angle weakly produced anteriorly, extending as far as antennal spine, terminating in sharp tooth. Third to fifth pleonal pleura dentate posteroventrally. Telson with 7-9 dorsolateral spines arranged in slightly sinuous row; posterior margin convex, bearing 12-19 spines in total, 1-3 spines at each posterolateral corner shorter than mesial spines, simple, while remaining mesial spines elongate, bearing minute marginal setules. Eyes rather large but degenerate, broadly fused mesially; anterior surface smooth; no trace of pigment. Antennal scale broadly oval, with distinct dorsolateral tooth. Chela of first pereopod with fine row of long submarginal setae on outer surface along cutting edges of fingers. Third to fifth pereopods moderately slender to stout; each dactylus armed with single row of accessory spinules on ventral margin; meri unarmed; ischia with spines in third, usually unarmed in fourth and fifth. Third maxilliped to fourth pereopods with strap-like, terminally hooked epipods, corresponding to setobranchs above first to fifth pereopods; appendices internae on second to fourth pereopods rudimentary.

Biology: This species lives around black smokers where the fluids are percolating at temperatures between 5 and 33°C, among molluscan beds. The similarity in the mouthparts and chela morphology suggests that the shrimps ingest free bacteria, mollusc pseudo-faeces, or other detritus, as most other species of the family. Some ovigerous females were collected in May 2005 (American cruise PAR 5).

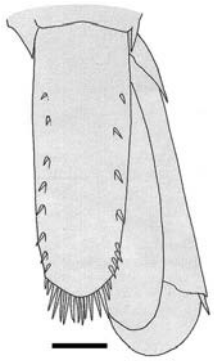
Distribution: North Fiji and Lau Back-Arc Basins.



1: Holotype female (carapace length 7.3 mm) from the North Fiji Basin; habitus, lateral view (fourth and fifth pereopods and second to fourth pleopods missing); scale bar 2 mm; by T. Komai.



2: Anterior part of carapace and cephalic appendages, dorsal view; scale bar 0.5 mm; by T. Komai.



3: Telson, dorsal view (setae omitted); scale bar 1 mm; by T. Komai.

4: Several individuals in situ on sulphide wall; cruise TUIM07.

References:

Desbruyères D., Alayse-Danet A.-M. & S. Ohta (1994) Mar. Geol. **116**: 227-242.
Komai T. & M. Segonzac (2005) J. Nat. Hist. **39**(15): 1111-1175.

Opaepele loihi Williams & Dobbs, 1995

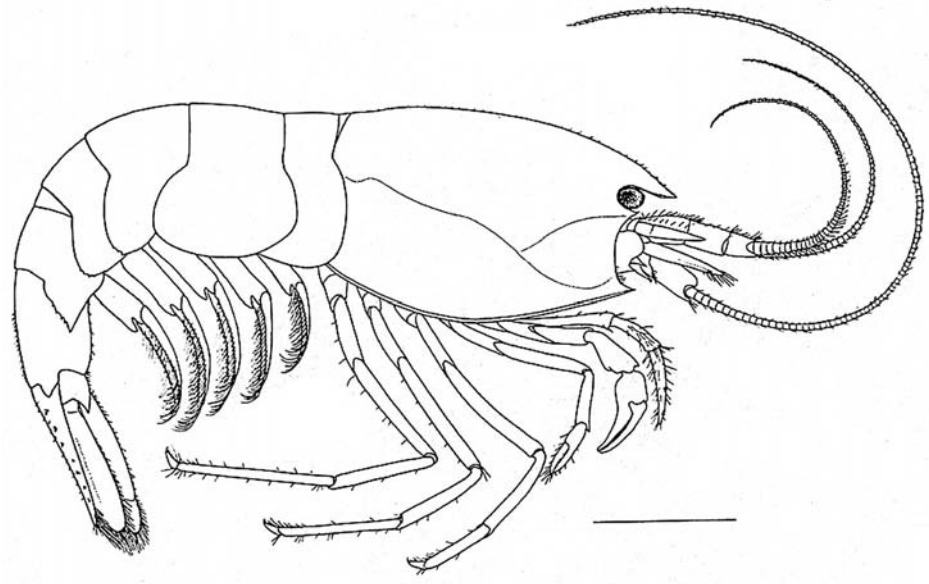
Size: Male carapace length 13.6 mm.

Color: When collected, intensely orange, with orange to yellowish deposit on abdomen (iron oxyhydroxide particles).

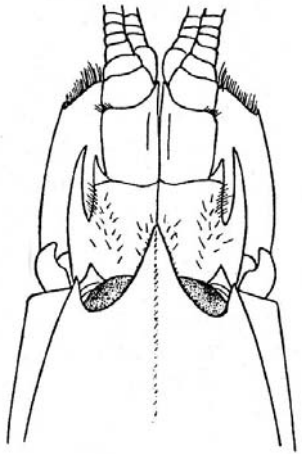
Morphology: Rostrum short, not reaching distal margin of first segment of antennular peduncle, directed forward or slightly downward, somewhat depressed dorsoventrally, terminating acutely, triangular in dorsal view; dorsal surface bluntly carinae in midline, unarmed or armed with minute denticles in adults, armed with up to six very small teeth in juveniles; ventral surface flat or slightly elevated in midline, unarmed. Carapace somewhat compressd laterally, rounded dorsally; antennal spine acute; no conspicuous lobe mesial to antennal tooth; pterygostomial angle somewhat produced in adults, distinctly exceeding antennal tooth, terminating in sharp tooth. Abdomen smooth dorsally; pleura of third and fourth somites smooth or faintly denticulate posteriorly, posterolateral angle of fourth pleuron rounded or sharply pointed; fifth pleuron with marginal denticles posteriorly and sharply pointed posteroventral angle. Telson with 6-8 dorsolateral spines arranged in sinuous row on either side; posterior margin convex, with 1-3 small spines at each lateral angle and row of long plumose setae. Eyestalks degenerated, broadly fused mesially, cornea unfacetted, poorly organized retinal pigment evident; anterior surface unarmed. Chela of first pereopod without fine row of long submarginal setae on outer surface along cutting edges of fingers. Third to fifth pereopods moderately slender; dactyli armed with two or more rows of accessory spinules on ventral surface; meri and ischia unarmed. No strap-like epipods on third maxilliped and pereopods. Appendices internae on second to fourth pereopods slender, without coupling hooks.

Biology: Lives on the flank of small volcano, among numerous vents which discharge fluids at 37°C (ambiant water, 4°C). The fluid is clear. At Loihi Seamount, no other animal live there.

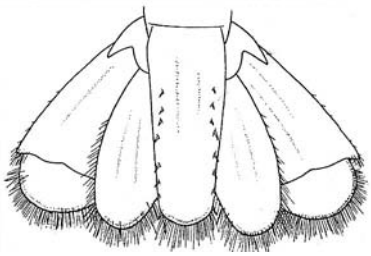
Distribution: So far known only from Hawaii, Loihi Seamount.



1: Female holotype, lateral view; scale bar 5 mm.



2: Female paratype, anterior region, dorsal view.



3: Female paratype, telson and uropods, dorsal view.
1-3: from Williams & Dobbs (1995).

Reference:

Williams A.B. & F.C. Dobbs (1995) Proc. Biol. Soc. Wash. **108**(2): 228-237.

Rimicaris exoculata Williams & Rona, 1986

Size: Carapace length 22.0 mm; total length up to 55 mm.

Morphology: Rostrum strongly reduced to very low, broadly rounded lobe. Carapace with branchial region very strongly inflated, distinctly wider than abdomen; dorsal surface rounded; antennal spine modified as broadly rounded lobe; pterygostomial angle somewhat produced anteriorly, broadly rounded; surface with scattered puntae each bearing tuft of short setae. Third abdominal pleuron with posterolateral margin forming light angle. Fourth and fifth pleura with posterolateral angles subacutely or blunly pointed. Telson barely narrowed posteriorly, bearing row of 6-8 dorsolateral spines arranged in sinuous row on either side; posterior margin broadly convex, with 1-3 spines at each lateral angle and with row of numerous plumose setae. Eye-stalks greatly reduced and modified into broad ocular plate. Chela of first pereopod always slender, without fine row of long submarginal setae on outer surface along cutting edges of fingers. Third to fifth pereopods stout, becoming markedly shorter toward posterior; dactyli armed with several rows of accessory spinules on ventral surface; propodi of third and fourth pereopods with covering of numerous spinules on ventral surfaces; meri and ischia unarmed. No strap-like epipods on third maxilliped to fourth pereopods. Appendices internae on second and fourth pereopods simple, slender, without coupling hooks, those of fourth and fifth pleopods normally developed, with coupling hooks.

Biology: Shrimp highly mobile occurring in swarms reaching densities of about 2500 ind./m^2 on active chimney walls where temperatures range from 10-30°C. Primary consumer, eating bacteria "cultivated" on the mouthparts, and on the mineral particles ingested. Very few ovigerous females collected, between August and November.

Distribution: Mid-Atlantic Ridge: TAG, Snake Pit, Rainbow, very few at Lucky Strike.

1: Specimen taken onboard, dorsal view; cruise Exomar by P. Briand © Ifremer.

2: In situ aggregation of adults and juveniles or subadults (red cephalothorax) specimens; TAG; cruise Exomar © Ifremer.

References:

Martin J.W. & R.R. Hessler (1990) Nat. Hist. Mus. Los Angeles C. **417**: 1-11.
Segonzac M., Saint Laurent M. de & B. Casanova (1993) Cah. Biol. Mar. **34**: 535-571.
Williams A.B. & P.A. Rona (1986) J. Crustac. Biol. **6**: 446-462.
Zbinden M. & M.-A. Cambon-Bonavita (2003) FEMS Microbiol. Ecol. **46**: 23-30.

Rimicaris kairei Watabe & Hashimoto, 2002

Size: Up to 21.6 mm in carapace length.

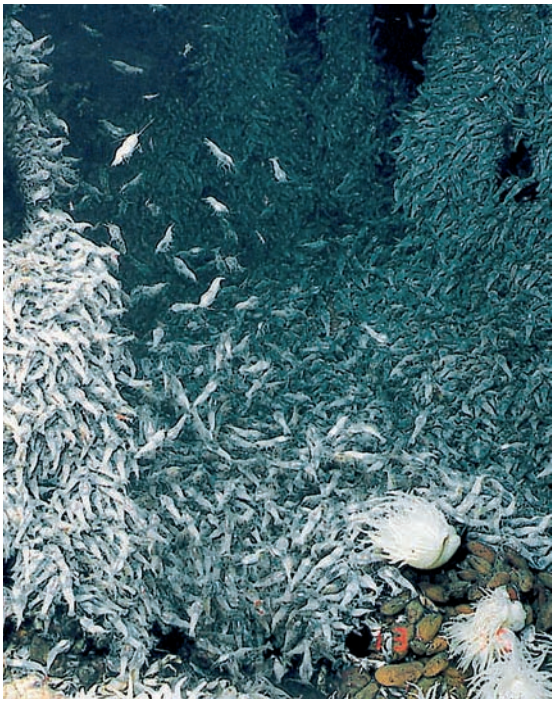
Morphology: Integument completely spineless, almost membranous on branchiostegite. Carapace longitudinally oval in dorsal view, sparsely pitted by shallow punctuations without any setae. Rostrum and eyestalks completely absent in adult. Antennal and antennular flagella strongly developed. Antennal scale enlarged, completely filling anterior margin of carapace. First and second pereopods chelate, usually hidden beneath branchiostegite. Third to fifth pereopods well developed, stout.

Remark: Comparing the sequence of gene coding for mitochondrial cytochrome oxydase subunit one, Van Dover et al. (2001) found a small divergence (0.9%) from *R. exoculata*.

Biology: Swarming with extremely high density on the surface of active chimneys and diffuse vents. Like *R. exoculata*, symbiosis with chemoautotrophic bacteria.

Distribution: Central Indian Ridge: Kairei and Edmond Vent Fields, near the Rodriguez Triple Junction.

1: Two specimens taken onboard; scale bar 5 mm; by courtesy of J. Hashimoto.



2: In situ aggregation of adult specimens at the Kairei Vent Field; below right, sea anemone *Marianactis* cf. *bythios*, and mytilid bivalves *Bathymodiolus* sp.; cruise ROV Kaiko © JAMSTEC.

References:

Hashimoto J., Ohta S., Gamo T., Chiba H., Yamaguchi T., Tsuchida S., Okudaira T., Watabe H., Yamanaka T. & M. Kitazawa (2001) Zool. Sci. **18**(5): 717-721.

Van Dover C.L., Humphris S.E., Fornari D., Cavanaugh C.M., Collier R., Goffredi S.K., Hashimoto J., Lilley M.D., Reysenbach A.L., Shank T.M., Von Damm K.L., Banta A., Gallant R.M., Götz D., Green D., Hall J., Harmer T.L., Hurtado L.A., Johnson P., McKiness Z.P., Meredith C., Olson E., Pan I.L., Turnipseed M., Won Y., Young III C.R. & R.C. Vrijenhoek (2001) Science **294**: 818-823.

Watabe H. & J. Hashimoto (2002) Zool. Sci. **19**(10): 1167-1174.

Shinkaicaris leurokolos (Kikuchi & Hashimoto, 2000)

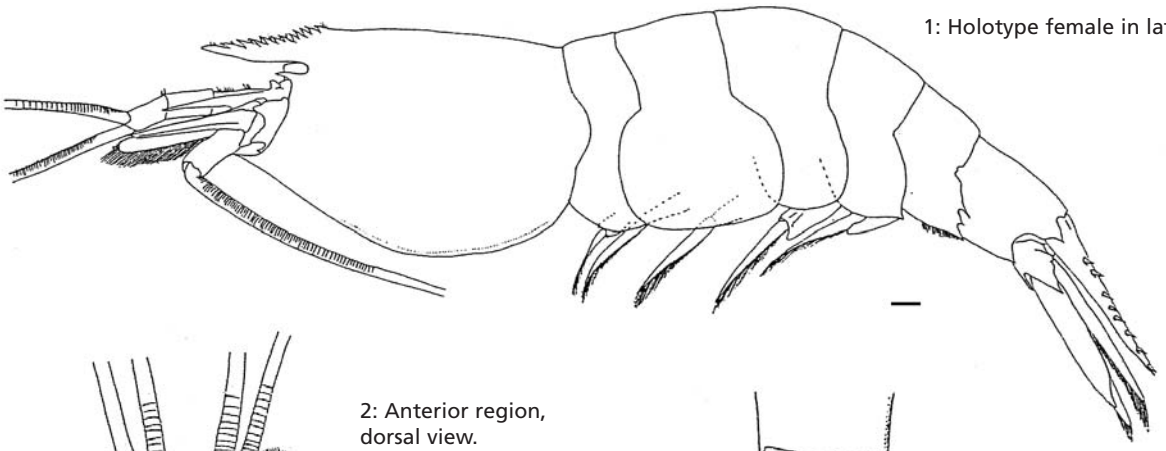
Size: An ovigerous female carapace length 12.5 mm.

Color: Ivory to dull ivory white.

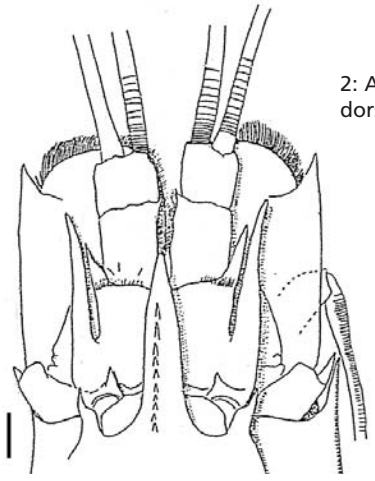
Morphology: Integument of body thin, but not membranous, surface shining. Rostrum compressed laterally, reaching distal margin of first segment to midlength of second segment of antennular peduncle; dorsal margin armed with 7-10 teeth slightly diminishing in size anteriorly, including 6-9 on rostrum proper and 1-3 on carapace. Carapace somewhat compressed laterally; postrostral median ridge relatively low, rather blunt; antennal tooth sharp, distinctly buttressed, margin inferior to antennal tooth forming small rounded lobe. Strong median sternal spine between coxae of fifth pereopods. Abdomen smooth dorsally; pleural margin of anterior two somites broadly rounded, that of third somite broadly rounded or with one small posteroventral tooth; pleuron of fourth somite with acute posterolateral tooth and occasionally with additional 1-3 acute teeth on posterior margin; pleuron of fifth somite with 2-4 posterior teeth including posteroventral tooth. Telson elongate subrectangular, with 5-7 dorsolateral spines arranged in a sinuous row; posterior margin convex, with two pairs of lateral spines (mesial pair longer than lateral) and 22-24 long plumose setae. Eyes on basally separated, movable stalks broadly fused mesially; division of corneal region and stalk unclear; corneal region, unfaceted, with irregular, scattered pigment-like masses within stalk; anteromedial face flat, sloping to anterolateral face, without spiniform tubercle on anterior surface. Dorsolateral flagellum longer than carapace; ventromesial flagellum somewhat longer. Antennal flagellum longer than body. Uropod with rami subequal in length, exopod with small movable spine mesial to smaller distolateral tooth and sinuous diaeresis.

Biology: This species occurs in a thermally influenced area.

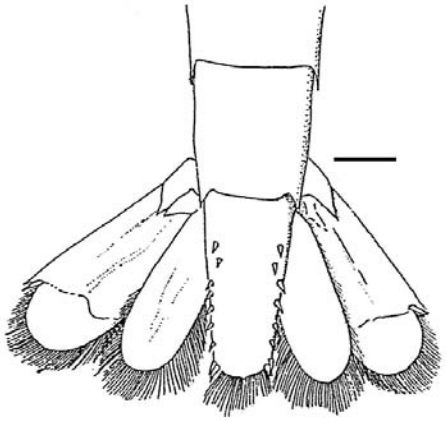
Distribution: Known only Okinawa Trough: Minami-Ensei Knoll, 705 m.



1: Holotype female in lateral view.



2: Anterior region, dorsal view.



3: Telson and uropods, dorsal view.
1-3: Scale bar 1.0 mm; from Kikuchi & Hashimoto (2000).

References:

Kikuchi T. & J. Hashimoto (2000) Species Diversity **5**: 135-148.
Komai T. & M. Segonzac (2005) J. Nat. Hist. **39**(15): 1111-1175.

Lebbeus carinatus Zarenkov, 1976

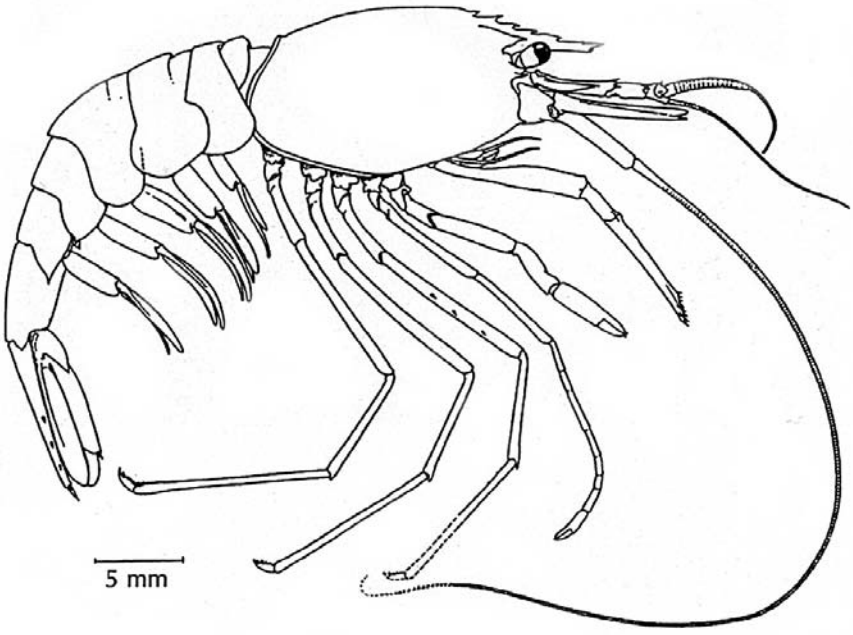
Size: Maximum carapace length 17 mm.

Morphology: Rostrum short, not reaching distal margin of first segment of antennular peduncle; dorsal margin armed with 4-6 teeth including 2-4 on rostrum proper and two on carapace posterior to orbital margin, posteriormost tooth arising about 0.15 length of carapace; ventral blade poorly developed; ventral margin with 1-3 small teeth subdistally. Carapace with small supraorbital spine; broad V-shaped notch just below supraorbital spine; orbital margin depressed, forming shallow concavity accommodating eye-stalk; suborbital lobe acutely triangular, somewhat upturned, slightly exceeding antennal spine; anterolateral margin between antennal spine and pterygostomial angle strongly sinuous; pterygostomial spine small; dorsal surface strongly convex in spawning females, not inflated in males. Abdomen rounded dorsally; fourth pleuron broadly rounded, fifth pleuron with strong posteroventral tooth. Telson with 4-6 dorsolateral spines on either side; posterior margin slightly convex or truncate, with two pairs of spines at lateral angle and one or two pairs of plumose setae. Eye small, corneal diameter 0.09–1.00 of carapace length; cornea semispherical, darkly pigmented and clearly faceted. Antennule with stylocerite not reaching distal margin of first segment of peduncle; first peduncular segment armed with two or three spines on dorsodistal margin laterally; second and third segments each with one dorsodistal spine; flagella sexually dimorphic, those of males elongate, particularly ventral flagellum of male exceeding 1.5 length of carapace. Antennal scale moderately broad; distolateral tooth falling short of or reaching rounded distal lamella. Third maxilliped overreaching antennal scale by half length of ultimate segment. First pereopod chelate. Second pereopod also chelate, carpus divided into seven articles. Third to fifth pereopods slender, third overreaching antennal scale by full length of propodus; merus of third and fourth pereopods with four or five spines on lateral surface; that of fifth unarmed or armed with one spine; dactyli short, 0.10-0.13 length of propodi, each with four or five accessory spinules on ventral margin. Third maxilliped and first and second pereopods each with strap-like epipod.

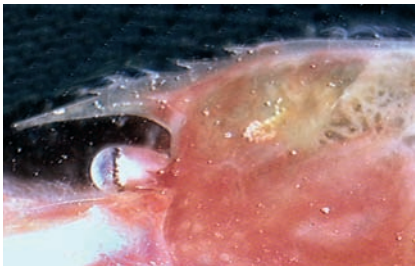
Remark: This species is easily distinguished from *L. washingtonianus* of Kikuchi & Ohta (1995), the other congeneric species occurring at hydrothermal vents, by the absence of a strap-like epipod on the third pereopod and the more slender, elongate third to fifth pereopods. Another different species was described by Saint Laurent (1984) under the same name. It differs mainly from the other caridean species associated with hydrothermal vents by the well developed eyes and the carpus of the second pereopod divided in seven articles.

Biology: This species live among the tubeworm *Riftia pachyptila* and mussel beds of *Bathymodiolus* spp.

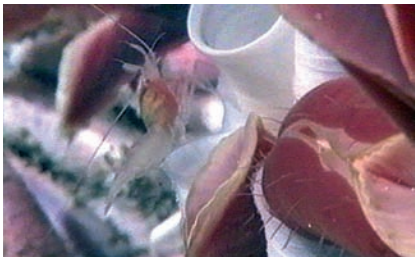
Distribution: Known with certainty only from the East Pacific Rise: 13°N.



1: Body, lateral view; from N. Zarenkov (1976).



2: Cephalothorax, lateral view; from East Pacific Rise 13°N, cruise Hope 99; by P. Briand © Ifremer.



3: Specimen in situ, among tubeworms (*Riftia pachyptila*), from East Pacific Rise 13°N, cruise Hope 99 © Ifremer.

References:

Kikuchi T. & S. Ohta (1995) J. Crustac. Biol. **15**: 219-240.
Saint Laurent M. de (1984) C. R. Acad. Sc., Paris **299**(9), sér. III: 355-360.
Zarenkov N.A. (1976) J. Mar. Biol. **5**: 277-285.

Thymopides laurentae Segonzac & Macpherson, 2004

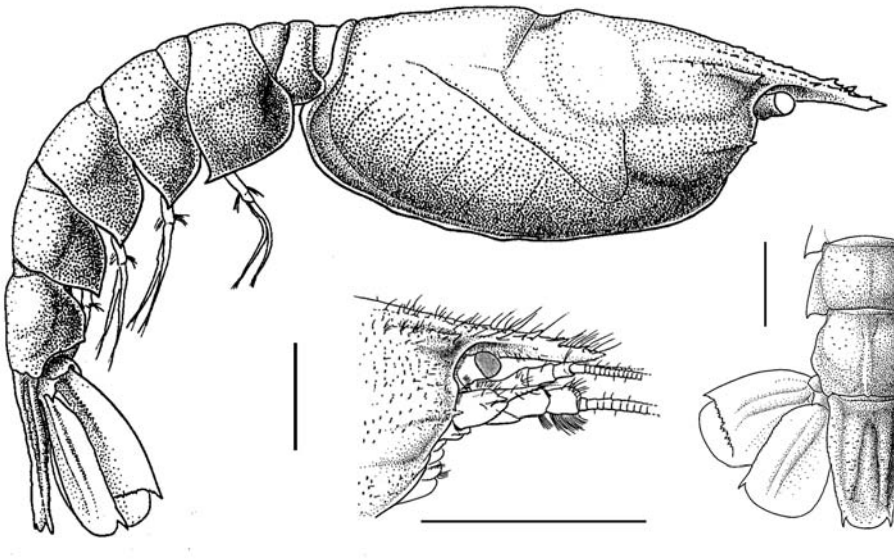
Size: Carapace length 45 mm; total length 97 mm.

Morphology: Carapace smooth, rostrum slender, nearly 0.3 of carapace length, overreaching antennular and antennal peduncles. Abdomen without longitudinal median carina and palm of first chela distinctly longer than wide. Telson 1.7 times longer than wide and longer than abdominal somite 6. Eyes small, unpigmented, cornea as wide as ocular peduncle.

Biology: Lives on the slope of the Snake Pit vent area, near the black smoker edifice Beehive, among galatheid crab *Munidopsis exuta*, and chaetopterid polychaetes.

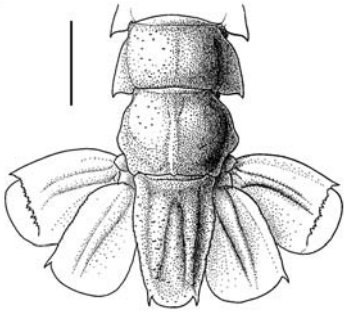
Distribution: Mid-Atlantic Ridge: near the Snake Pit hydrothermal area.

1–4: Scale bar 1 cm; drawings by M. de Saint Laurent.

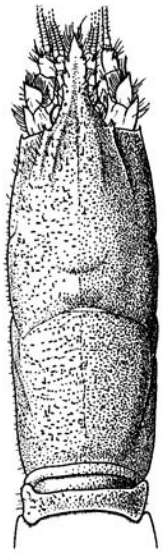


1: Body, lateral view.

2: Carapace, anterior part and cephalic appendages, lateral view.

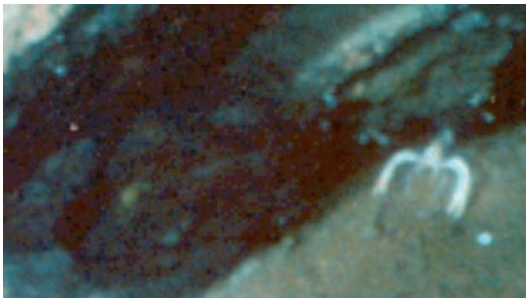


3: Fifth and sixth abdominal somites and tail fan with telson, dorsal view.



4: Carapace dorsal view.

5: Photograph taken on board, after sampling © Ifremer



6: In situ of one lobster (probably *T. laurentae*) taken from the submersible at Snake Pit field; cruise Hydrosnake © Ifremer

References:

Mèvel C., Auzende J.-M., Cannat M., Donval J.-P., Dubois J., Fouquet Y., Gente P., Grimaud D., Karson J.A., Segonzac M. & M. Stievenard (1989) C. R. Acad. Sci., Paris **308**(II): 545-552.

Segonzac M. (1992) C. R. Acad. Sci., Paris **314**(III): 593-600.

Segonzac M. & E. Macpherson (2004) Cah. Biol. Mar. **44**: 361-367.

Arthropoda: Decapoda, Anomura

Worldwide, there are over 2500 species of anomouran crabs, which comprise ca 5% of all crustacean species. The Infraorder Anomura represents a paraphyletic group that includes the superfamilies Lomisoidea, Hippoidea, and the much more diverse Galatheoidea and Paguroidea. Species of these taxa are commonly found living from the intertidal zone to the abyssal plain >2000 m, including one terrestrial representative. Morphologically they have little in common, some are like crabs (e.g. Lithodidae) and others are like hermit crabs (e.g. Paguridae). They only share one character: the small fifth pereiopod. Molecular studies have shown that Galatheoidea and Paguroidea are more related to each other than to Hippoidea, although more work is needed to completely resolve these relationships.

Munidopsis sp. (probably *M. lauensis*); cruise TUIM 07; by C.R. Fisher.

The vent fauna contains representatives of the superfamilies Galatheoidea and Paguroidea, including species of four families and a recent new family (Kiwaidae). Despite their ecological importance and high diversity, many aspects of their systematics and distribution are still poorly known.

The anomurans exhibit a considerable diversity of reproduction modes, life cycles and capacities for dispersal. The vast majority of species have relatively small pelagic eggs, with the exception of some representatives of the families Galatheidae and Chirostylidae, and a pelagic larval phase, which enhances their capacity for dispersal. There is evidence for prolonged brooding periods. Usually they produce only a few large eggs, probably related to an abbreviated or direct larval development. Most species are not restricted to hydrothermal vents and cold seeps. They usually occur in low densities, although there are some interesting exceptions (e.g. *Munidopsis lentigo*, *Shinkaia crosnieri*). The abundance of anomurans in vent and seep environments probably reflects the benefit derived from the organic matter produced by the chemosynthetic community inhabiting these zones. In general, their abundance increased in the vicinity of active hydrothermal sites. In the center of hydrothermal activity, however, abundance decreases.

Information on the geographic distribution and taxonomy of the different species is still limited and incomplete. Most species have a broad geographic distribution, as has been shown for a number of deep-sea taxa. There appears to be some interchange among the different communities separated by long distances, associated with high dispersal capabilities, although a high degree of local endemism can also exist. Unfortunately, mechanisms for colonization by vent organisms remain largely unknown for most of the mid-ocean ridge systems. Therefore, additional studies on molecular data and larval dispersal processes are desirable.

References:

Martin J.W. & G.E. Davis (2001) Nat. Hist. Mus. Los Angeles Cty, Sci. Ser. **39**: 1-124.

Martin J.W. & T.A. Haney (2005) Zool. J. Linn. Soc. **145**: 445-522.

Morrison C.L., Harvey A.W., Lavery S., Tieu K., Huang Y. & C.W. Cunningham (2002) Proc. R. Soc. Lond., B **269**: 345-350.

Peréz-Losada M., Jara C.G., Bond-Buckup G., Porter M.L. & K.A. Crandall (2002) J. Crustac. Biol. **22**: 661-669.

Paragiopagurus ventilatus LEMAITRE, 2004

Size: Shield length 5.8 mm max. (male); 4.9 mm max. (ovigerous female).

Color: In life, shield and cephalic appendages cream with some faded pink areas. Chelipeds and ambulatory legs red or pink.

Morphology: Gills biserial. Ocular acicles subtriangular, terminating in strong, simple spine (rarely bifid) with transverse striae. Outer faces of basis and ischium of third maxillipeds, chelipeds, and second and third pereopods, with plumose, bacteriophore setae. Chelipeds markedly dissimilar; proportions and armature of right strongly affected by size and sex, with that of males considerably longer and more elongate than in females. Dactyls of second and third pereopods with irregular rows of spines on ventromesial margins. Propodal rasp of fourth pereopod with one row of scales. Anterior lobe of sternite XII (third pereopods) with bifid spine. Telson asymmetrical; posterior margin separated by broad, shallow cleft, into rounded projections armed with few short, corneous spines often ventrally curved. Males lacking first pleopods; with unpaired rudimentary left pleopod.

Biology: Specimens collected by beam-trawl among other species newly described as mytilid and lucinid bivalves (BOUCHET & COSEL 2004), and numerous grapsid crabs (NG et al. 2000). At this area, diffuse gas seepage from the bottom. The specimens live in gastropod shells of the buccinid *Siphonalia*. Probably not part of the "obligate" vent fauna. Ovigerous females found in May 2001.

Distribution: Okinawa Arc: Northeastern Taiwan, Tashi fishing grounds.

1: Male in vivo; by courtesy of T. Yam Chan.

2: Female in vivo; by courtesy of T. Yam Chan.

References:

BOUCHET P. & R. VON COSEL (2004) Zool. Stud. **43**: 704-711.
LEMAITRE R. (2004) Cah. Biol. Mar. **45**: 325-334.
NG N.K., HUANG J.F. & P.H. HO (2000) Nat. Taiwan Mus., Spec. Publ. Ser. **10**: 191-199.

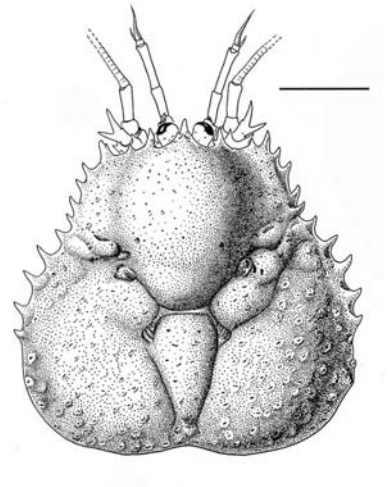
Paralomis hirtella de Saint Laurent & Macpherson, 1997

Size: Up to 59 mm carapace length.

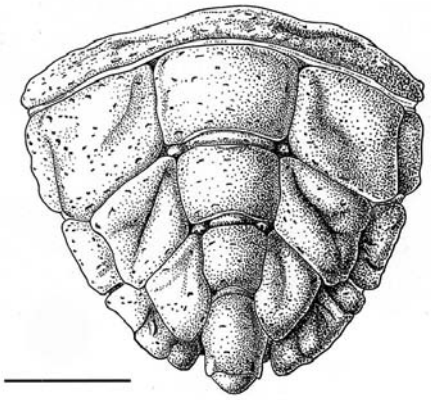
Morphology: Carapace more or less hexagonal. Dorsal surface smooth, with few scattered small granules. Numerous tuft of setae of different length scattered on carapace surface. Rostrum with basal spine and two small dorsal spines. Chelipeds bearing thick spines and acute granules. Walking legs moderately long, with some thick spines on dorsal border of merus, carpus and propodus, dactylus slightly curved, with corneous spinelets along ventral margin. Scattered tuft of setae on posterior surface, dorsal and ventral margins of articles.

Biology: Lives in few numbers around active chimneys and on mussel beds.

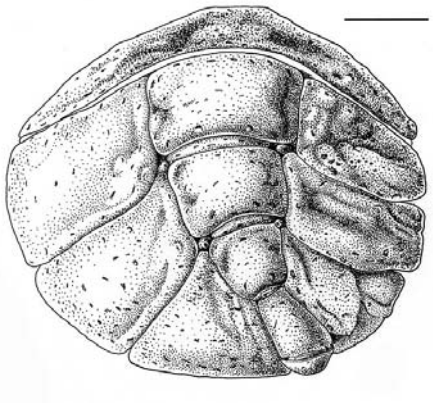
Distribution: North Fiji Back-Arc Basin: White Lady vent field; Lau Back-Arc Basin: Hine Hina vent field.



1: Holotype male, 32 x 35 mm, habitus, dorsal view; scale 10 mm; by M. de Saint Laurent & E. Macpherson.



2: Holotype, abdomen; scale bar 10 mm; by M. de Saint Laurent & E. Macpherson.



3: Other specimen 44 x 45 mm, abdomen of ovigerous female; scale bar 10 mm; by M. de Saint Laurent & E. Macpherson.

4: Specimen collected at Lau Back-Arc Basin: Hine Hina site; by P. Briand © Ifremer.

5: Two specimens in situ on gastropod bed of *Ifremeria nautilei* at North Fiji Back-Arc Basin: White Lady site; cruise Starmer 2 © Ifremer.

References:

Desbruyères D., Alayse-Danet A.-M. & S. Ohta (1994) Mar. Geol. **116**: 227-242.
Saint Laurent M. de & E. Macpherson (1997) Zoosystema **19**: 721-727.

Paralomis verrilli (Benedict, 1895)

Size: Up to 110 mm carapace length.

Morphology: Carapace more or less hexagonal, as long as wide. Dorsal carapace surface covered with small granules of various size. Granules usually with several setae. Regions well-defined. Gastric region rather more prominent than other regions, with a thick spine on apex. Cardiac region clearly less prominent than branchial regions, with four thick granules in square pattern. Each branchial region with one median spiniform granule and two smaller thick granules near intestinal region. Basal spine of rostrum more or less horizontal, slightly overreaching end of cornea, with spiniform tubercles on ventral side; two divergent dorsal spines, upwardly directed, extending well past end of cornea. External orbital spine slightly shorter than eyes. Anterolateral spine slightly shorter than external orbital. Chelipeds bearing thick spines on mesial border of merus, carpus and hand. Walking legs moderately long, with well-developed spines along dorsal and ventral margins of meri and propodi, dactyli as long or longer than propodi.

Distribution: North Pacific, from Japan, Bering Sea to California, 850-2379 m. Collected on vent sites of Juan de Fuca Ridge: Axial Seamount.

1: Specimen among siboglinid tubeworms and microbial mats on side of sulphide edifice; from R/V Thomas G. Thompson, cruise TN149 (Zooarium vent field, Explorer Ridge; 31 July 2002) © NOAA.

References:

Dawson E.W. (1989) N.Z.O.I Misc. Publ. **101**: 1-338.
Ikeda H. (1998) The Deep-sea Crabs of Sagami Bay, Imamoto Printing: 1-180.
Macpherson E. (2001) Zoosystema **23**: 797-805.
Zaklan S.D. (2002) Alsk. Sea Grant Coll. Progr.: 751-845.

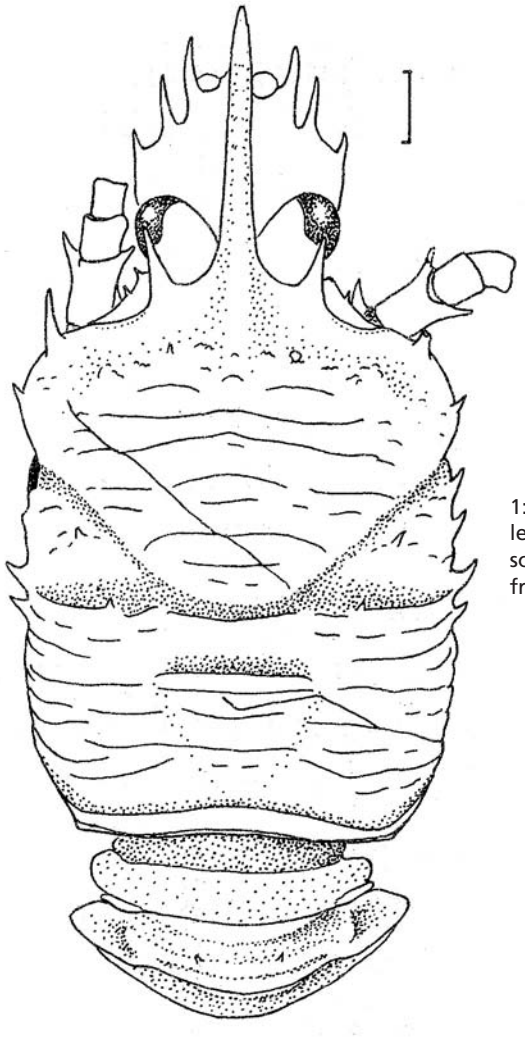
Munida magniantennulata Baba & Türkay, 1992

Size: Up to 12.8 mm carapace length.

Morphology: Dorsal carapace surface smooth, with epigastric spines. Lateral branchial margins with five small spines. First lateral spine of carapace near anterolateral angle, second spine clearly smaller than first. Second abdominal segment with transverse row of small spines, other segments unarmed. Corneae small, width equal to or less than distance between than distance between sinus formed by supraocular spines and rostrum. Basal segment of antennular peduncle unusually large. Distomesial spine of first antennal article very small, never reaching midlength of second article. Merus of third maxilliped with only one spine on flexor margin. Chelipeds moderately massive, about three times carapace length. Walking legs slender.

Biology: No data. Collected by grab TV from an area close to active sites.

Distribution: Lau Back-Arc Basin: Hine Hina area.



1: Holotype male, carapace length 7.2 mm; dorsal view; scale bar 1 mm; from Baba & Türkay (1992).

References:

Baba K. (1994) Mem. Qld. Mus. **35**: 1-21.
Baba K. (2005) Galathea Report **20**: 1-317.
Baba K. & M. de Saint Laurent (1992) Sci. Mar. **56**: 321-332.
Baba K. & M. Türkay (1992) Senckenb. Marit. **22**: 203-210.

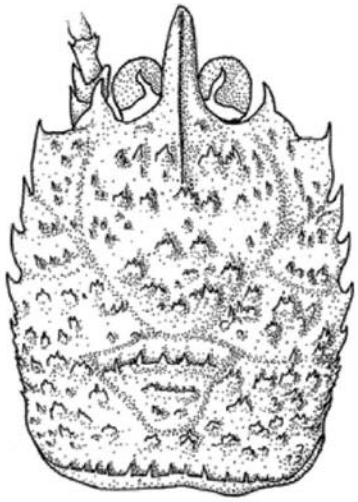
Munidopsis acutispina Benedict, 1902

Size: Up to 8.0 mm carapace length.

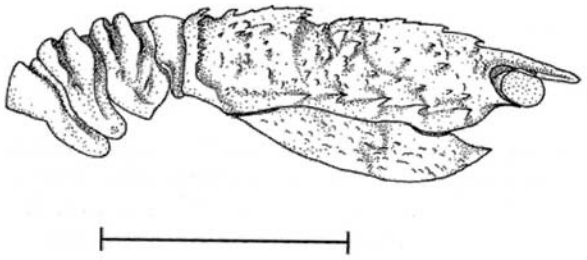
Morphology: Carapace with numerous pointed tubercles. Rostrum narrow triangular, horizontal and dorsally carinated. Front margin convex, antennal spine small. Abdomen unarmed. Cornea well exposed, visible in dorsal view, eye spine mesial and small. Fixed finger of chelipeds without denticulate carina on distolateral margin. Walking legs not reaching end of chelipeds. Propodi of walking legs of uniform width, with distinct spines. Epipods absent from pereopods.

Biology: Occurs in both hydrothermal and cold seep areas.

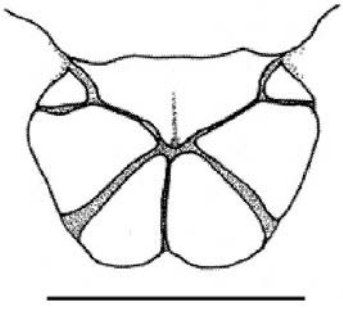
Distribution: Mid-Atlantic Ridge: Lost City vent field, and Eastern Mediterranean Sea, Kazan mud volcano, cold seep, 2030 m. Known as well off Western North Africa and the Azores Islands, between 698 and 845 m, and from the Mediterranean Sea (W Tyrhenian Sea, Sardinia) between 374 and 1036 m.



1: Carapace, dorsal view; male, carapace length 8.0 mm; from Froglia et al. (2002).



2: Carapace and abdomen, lateral view; scale bar 5 mm; male; from Froglia et al. (2002).



3: Telson; scale bar 5 mm; from Froglia et al. (2002).

4: Specimen from Lost City; cruise Exomar; by P. Briand © Ifremer.

References:

Froglia C., Mura, M. & A. Bonfitto (2002) Crustac. Int. J. Crustac. Res. **75**: 375-382.

Gebruk A.V., Galkin S.V., Krylova E.M., Vereshchaka A.L. & G.M. Vinogradov (2002) InterRidge News **11**(2): 18-19.

Macpherson E. & M. Segonzac (2005) Zootaxa **1095**: 1-60.

Olu-Le Roy K., Sibuet M., Fiala-Médioni A., Gofas S., Salas C., Mariotti A., Foucher J.-P. & J. Woodside (2004) Deep-Sea Res. I **51**: 1915-1936.

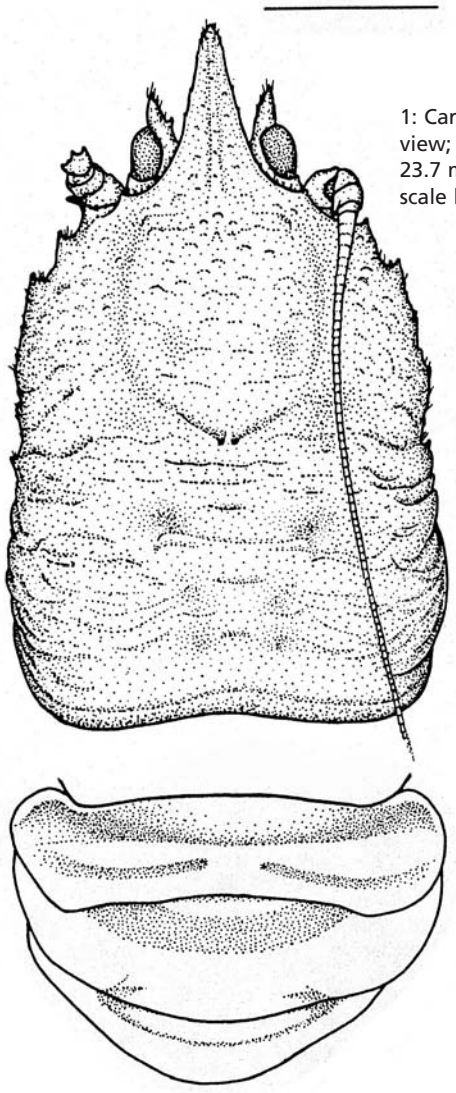
Munidopsis alvisca Williams, 1988

Size: Up to 27.9 mm carapace length.

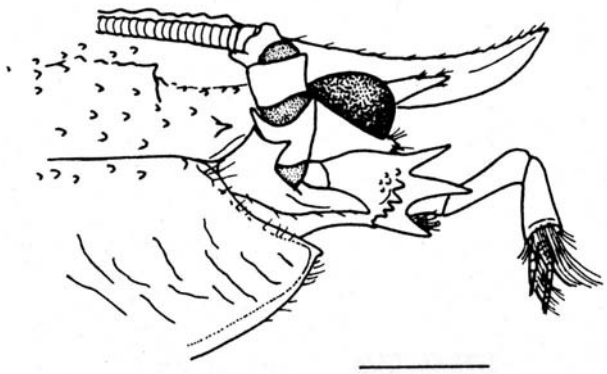
Morphology: Dorsal carapace surface without spines, covered by scale-like rugosities. Rostrum unarmed, broad at base, distally narrowed and upturned, weakly carinated dorsally. Front margin oblique, small antennal spine present. Abdomen unarmed. Eyes not movable, eyespine well developed, cornea relatively large, clearly wider than eyespine. Chelipeds with several spines on merus and carpus, palm spineless, fixed finger of chelipeds without denticulate carina on distolateral margin. First walking leg reaching nearly tip of cheliped, dorsal crest of merus and carpus with row of spines along dorsal border; dactylus smoothly narrowed distally, flexor margin slightly curving, bearing low spines. Epipods absent from pereopods.

Biology: Living around hydrothermal vent sites.

Distribution: Explorer Ridge: Magic Mountain; Juan de Fuca Ridge; Guaymas Basin.



1: Carapace and abdomen, dorsal view; holotype carapace length 23.7 mm (including rostrum); scale bar 5 mm; by A.B. Williams.



2: Carapace, lateral view; scale bar 5 mm; by A.B. Williams.

References:

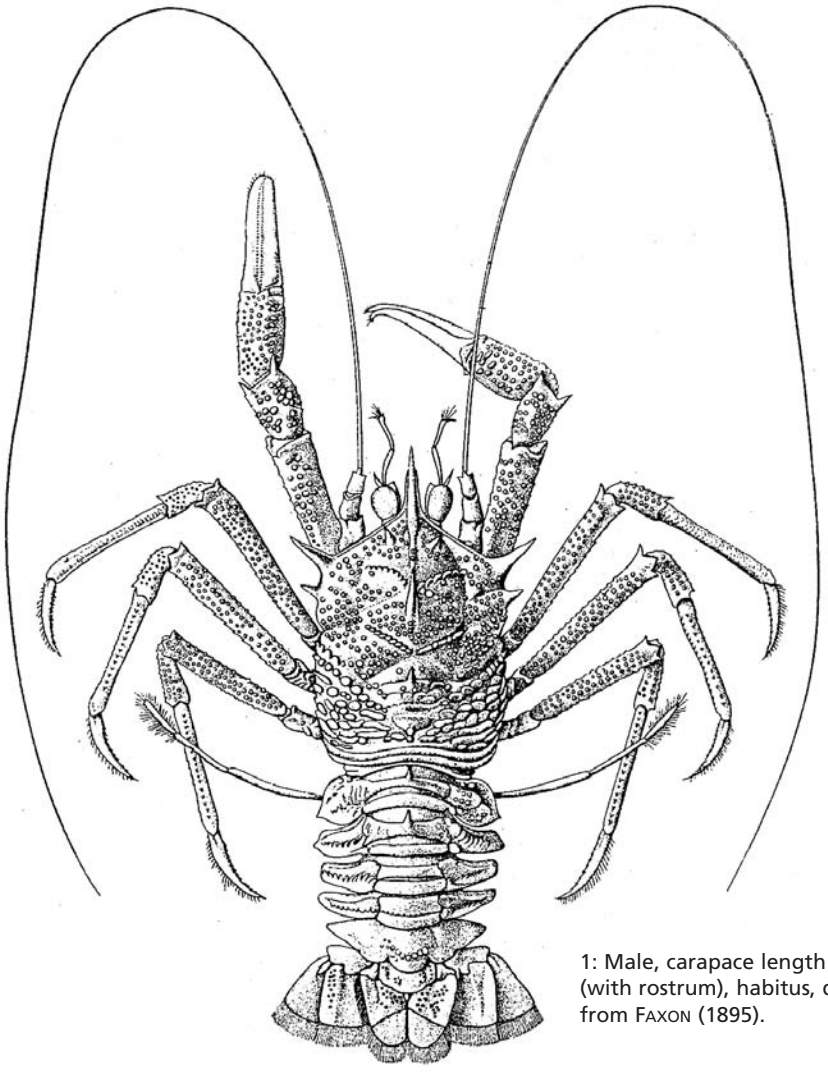
Baba K. (2005) Galathea Report **20**: 1-317.
Khodkina I.V. (1991) Zool. Zh. **70**: 71-76.
Williams A.B. (1988) Fish. Bull. **86**: 263-287.

Munidopsis diomedeae (FAXON, 1893)

Size: Up to 30 mm (with rostrum).

Morphology: Carapace covered with tubercles, dorsally armed with two well-developed epigastric, one extremely strong laterally compressed mesogastric, and one moderately large cardiac spine, with two lateral spines. Dorsal carapace surface smooth, without spines. Rostral spine upturned distally. Second to fourth abdominal tergites each with prominent median spine. Eyes movable and spineless, corneae subglobular. Chelipeds covered with granules, nearly spineless. Walking legs long, slender, with numerous granules, subcylindrical. First walking leg overreaching chelipeds. Dactyli compressed laterally, flexor border moderately curving, bearing proximally diminishing low spines. Epipods present on chelipeds and first and second walking legs.

Distribution: East Pacific Rise. The species has been sampled in Eastern Pacific, from the Gulf of California to Chile, between 768 and 2026 m.



1: Male, carapace length ca. 30 mm (with rostrum), habitus, dorsal view; from FAXON (1895).

References:

BABA K. (2005) Galathea Report **20**: 1-317.
FAXON W. (1895) Mem. Mus. Comp. Zool. Harvard Coll. **18**: 1-292.
HAIG J. & M. WICKSTEN (1975) Bull. South Calif. Acad. Sci. **74**: 100-105.
KHODKINA I.V. (1991) Zool. Zh. **70**: 71-76.

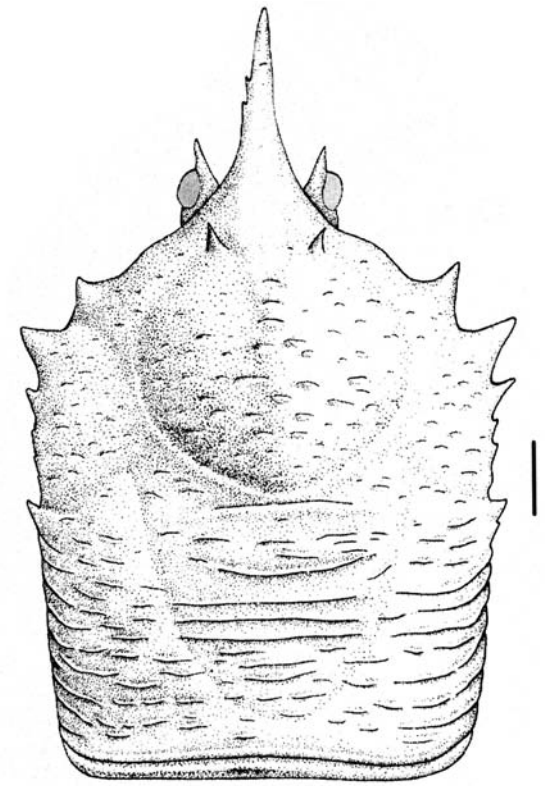
Munidopsis exuta MACPHERSON & SEGONZAC, 2005

Size: Up to 39.5 mm carapace length.

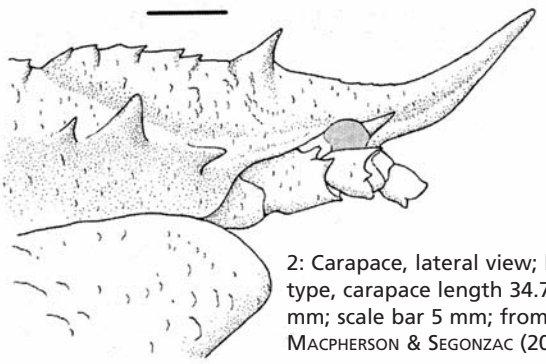
Morphology: Carapace with pair of epigastric spines, sometimes 2-3 additional small spines, covered by scale-like rugosities. Rostrum broad at base, distally narrowed and upturned, weakly carinated dorsally. Front margin oblique, antennal spine absent. Abdomen unarmed. Eyes not movable, cornea relatively large, clearly wider than eyespine. Chelipeds with several spines on merus and carpus, palm spineless, fixed finger moderately ridged along distal third of lateral margin. First walking leg slightly exceeding cheliped, dorsal crest of merus and carpus with row of spines along dorsal border; dactylus smoothly narrowed distally, flexor margin slightly curving, bearing low spines. Epipods on chelipeds, not on walking legs. The species was identified as M. *subsquamosa* by SAINT LAURENT (1985) and M. *crassa* by SEGONZAC (1992).

Biology: This species occurs in both abyssal (Gulf of Biscay, 2860 m) and hydrothermal vent environments (Mid-Atlantic Ridge: Snake Pit, Elan). It has been collected by baited trap together with a nephropid lobster *Thymopides laurentae* SEGONZAC & MACPHERSON, and a macrurid fish *Coryphaenoides armatus* (HECTOR), at the base of the active edifice, on sulphide rocks, among scattered sea anemones, chaetopterid tubeworms and alvinocaridid shrimps. The species has also been collected at the base of inactive chimney complex, among dead mytilid bivalves. An additional specimen (unfortunately lost) was collected during the cruise BRIDGE 1993 at the Mid-Atlantic Ridge hydrothermal vent site Broken Spur site (dive Alvin 2625, 27.06.1993, E. Southward, personal communication).

Distribution: Mid-Atlantic Ridge: Snake Pit, TAG, probably Broken Spur, and Logatchev; Gulf of Biscay.



1: Carapace, dorsal view; holotype, carapace length 34.7 mm; scale bar 5 mm; from MACPHERSON & SEGONZAC (2005).



2: Carapace, lateral view; holotype, carapace length 34.7 mm; scale bar 5 mm; from MACPHERSON & SEGONZAC (2005).

3: Specimen from Snake Pit; cruise Hydrosnake; by P. Briand © Ifremer.

References:

MACPHERSON E. & M. SEGONZAC (2005) Zootaxa **1095**: 1-60.
SAINT LAURENT M. DE (1985) in Ifremer Brest (Ed.) Peuplements Profonds du Golfe de Gascogne: 469-478.
SEGONZAC M. (1992) C. R. Acad. Sci. Paris III **314**: 593-600.

Munidopsis lauensis Baba & de Saint Laurent, 1992

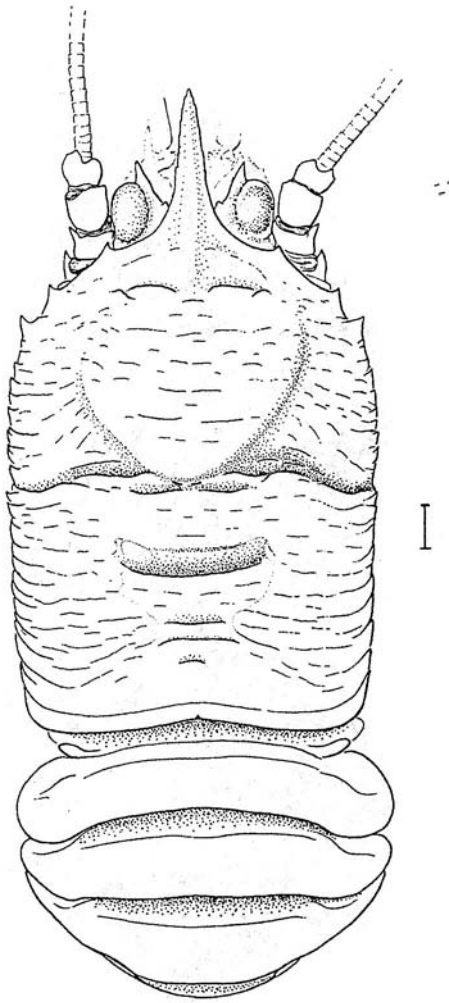
Size: Up to 12.4 mm carapace length.

Color: Generally white, but some rare specimens are blackish, due to a manganese deposit.

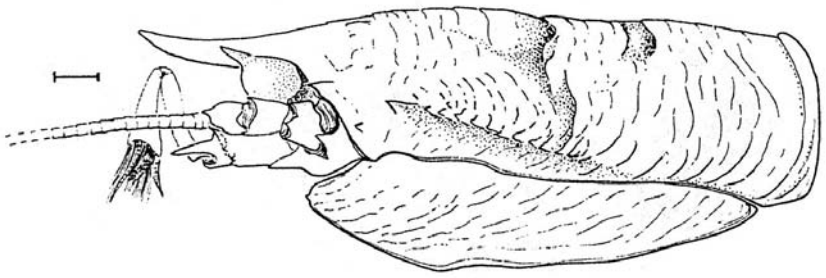
Morphology: Carapace without dorsal spines or tubercles. Rostrum spiniform, horizontal and unarmed. Eye with small mesial spine, cornea large. Abdomen unarmed. Sixth abdominal segment having posteromedian margin transverse, exceeded by lateral lobes. Epipods absent from pereopods. First walking legs overreaching chelipeds. Fixed finger of chelipeds without denticulate carina on distolateral margin. Chelipeds and walking legs, with few small spines. Dactylus of walking legs with spines along entire flexor border.

Biology: On active hydrothermal sites, often in high density.

Distribution: North Fiji Back-Arc Basin: White Lady vent field; Lau Back-Arc Basin: Valu Fa Ridge, Hine Hina vent fields.



1: Carapace and abdomen, dorsal view; holotype male, carapace length 10.8 mm; scale bar 1 mm; by K. Baba & M. de Saint Laurent.



2: Carapace, lateral view; holotype male, carapace length 10.8 mm; scale bar 1 mm; by K. Baba & M. de Saint Laurent.

3: *Munidopsis* sp. (probably *M. lauensis*); cruise TUIM 07; by courtesy of C.R. Fisher.

References:

Baba K. (2005) Galathea Report **20**: 1-317.
Baba K. & M. de Saint Laurent (1992) Sci. Mar. **56**: 321-332.
Desbruyères D., Alayse-Danet A.-M. & S. Ohta (1994) Mar. Geol. **116**: 227-242.

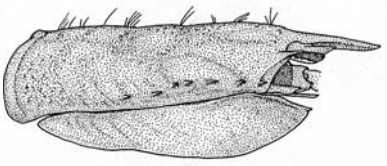
Munidopsis lentigo Williams & van Dover, 1983

Size: Up to 12.8 mm carapace length.

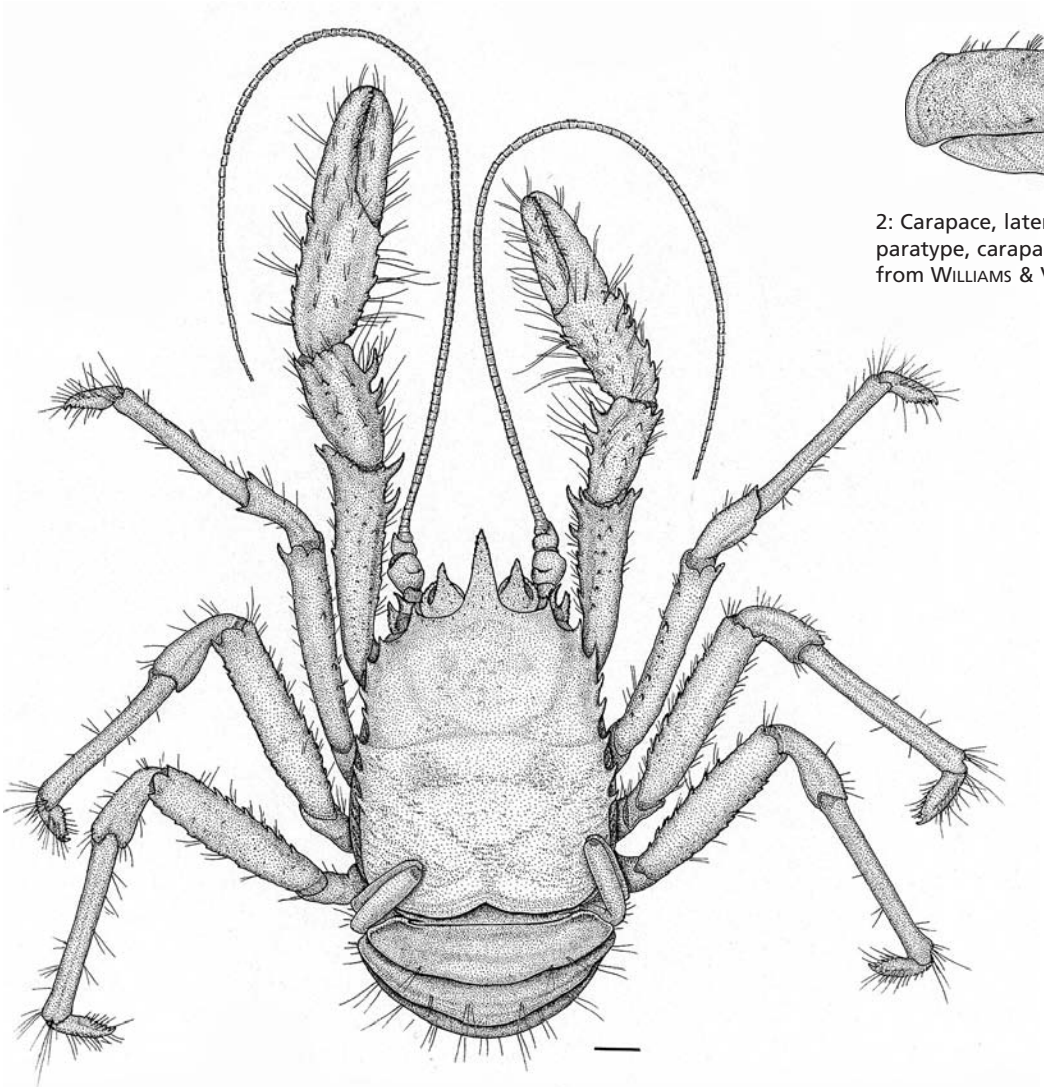
Morphology: Dorsal carapace surface smooth, without spines. Rostrum unarmed, broad triangular and horizontal, not carinated dorsally. Front margin transverse, antennal spine present. Abdomen unarmed. Flattened eyes, depressed cornea, large median eyespine present. Chelipeds with several spines on merus and carpus, and palm, fixed finger of chelipeds without denticulate carina on distolateral margin. Lenticular-shapped, flattened light brown spot on ventral surface of chela. First walking leg reaching nearly tip of cheliped, dorsal crest of merus with row of small spines; dactylus short, flexor margin bearing low spines. Epipods absent from pereopods.

Biology: Lives around the hydrothermal vents.

Distribution: East Pacific Rise: 21°N; south of Baja California.



2: Carapace, lateral view; female paratype, carapace length 11.9 mm; from Williams & Van Dover (1983).



1: Habitus, dorsal view; scale bar 1 mm; female paratype, carapace length 11.9 mm; from Williams & Van Dover (1983).

References:

Baba K. (2005) Galathea Report **20**: 1-317.
Williams A.B. & C. Van Dover (1983) Proc. Biol. Soc. Wash. **96**: 481-488.

Munidopsis marianica Williams & Baba, 1989

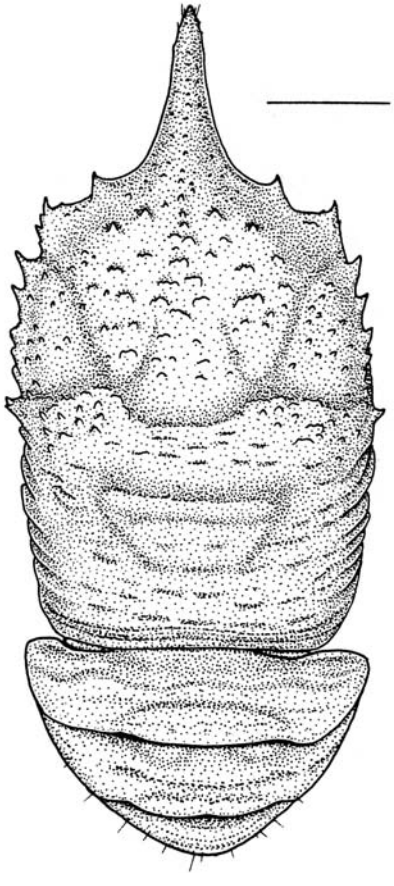
Size: Up to 38.0 mm carapace length.

Morphology: Dorsal carapace surface without spines, covered by scale-like rugosities. Rostrum unarmed, broad triangular and horizontal, weakly carinated dorsally. Front margin oblique, small antennal spine present. Abdomen unarmed. Eyes movable, large mesial eyespine small lateral eyespine, cornea relatively large, wider than mesial eyespine. Chelipeds with several spines on merus and carpus, palm spineless, fixed finger of chelipeds without denticulate carina on distolateral margin. First walking leg reaching nearly tip of cheliped, dorsal crest of merus and carpus with row of spines along dorsal border; dactylus smoothly narrowed distally, flexor margin nearly stright, bearing low spines. Epipods present on chelipeds.

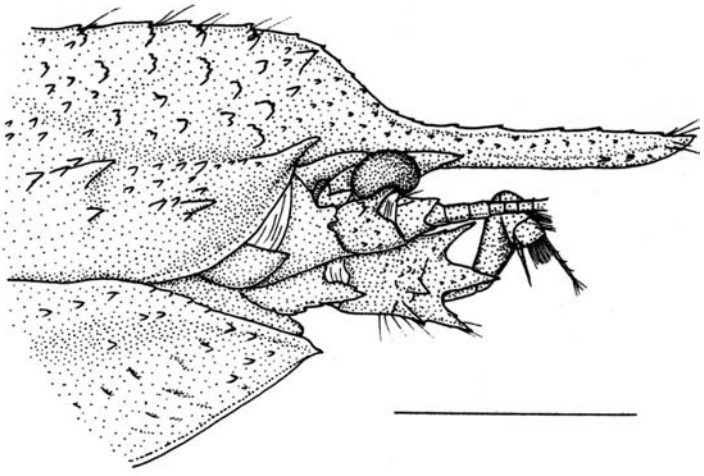
Biology: Lives at both vent and non vent areas.

Distribution: Western Pacific Ocean, Mariana Back-Arc Basin.

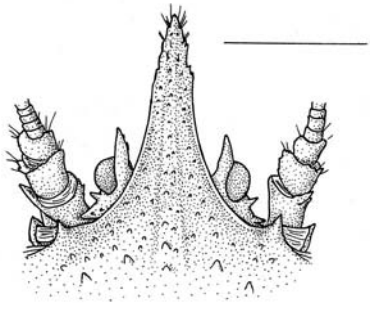
1-4: Female holotype, carapace length 38.0 mm; scale bar 10 mm; by A.B. Williams & K. Baba.



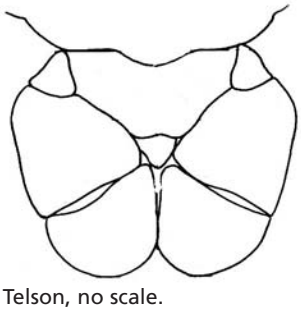
1: Carapace and abdomen, dorsal view.



3: Anterior part of carapace, lateral view.



2: Rostrum and anterior part of carapace, dorsal view.



4: Telson, no scale.

References:

Baba K. (2005) Galathea Report **20**: 1-317.
Williams A.B. & K. Baba (1989) Fish. Bull. **87**: 899-910.

Munidopsis sonne Baba, 1995

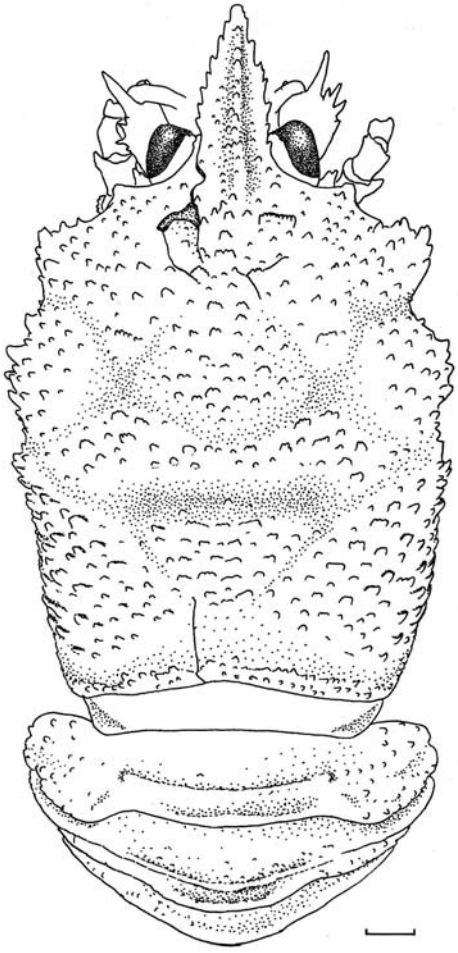
Size: Up to 12.8 mm carapace length.

Morphology: Dorsal carapace surface covered with numerous tubercle-like setiferous processes, gastric region with pair of epigastric processes. Rostrum nearly triangular, nearly horizontal, lateral margins serrate. Front margin with antennal acute process. Anterolateral angle produced. Abdomen unarmed; sixth abdominal segment with weak posterolateral lobe, posterior margin not produced. Eyes immovable, cornea narrowed distally. Antennular basal segment cristate dorsolaterally, with row of several spines. Chelipeds subcylindrical, covered with tubercular processes and blunt short spines, longer than second walking legs; fixed finger without denticulate carina on distolateral margin. Walking legs diminishing in length posteriorly; dactyli rather straight in first and second legs, more curving on third; setae along distal two-thirds of flexor border. Epipods present on chelipeds, first and second walking legs.

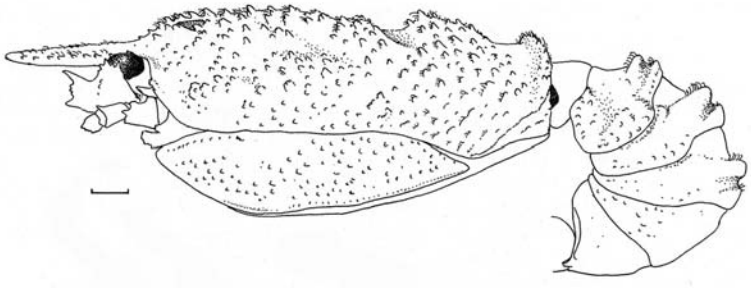
Biology: Lives around hydrothermal vents.

Distribution: North Fiji Back-Arc Basin.

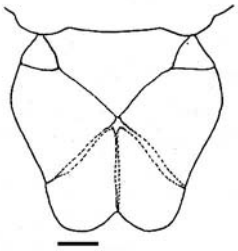
1-3: Ovigerous female holotype, carapace length 10.5 mm; scale bar 1 mm; by K. Baba.



1: Carapace and abdomen, dorsal view.



2: Carapace and abdomen, lateral view.



3: Telson.

References:

Baba K. (1995) Crustac. Res. **24**: 188-193.
Baba K. (2005) Galathea Report **20**: 1-317.

Munidopsis starmer Baba & de Saint Laurent, 1992

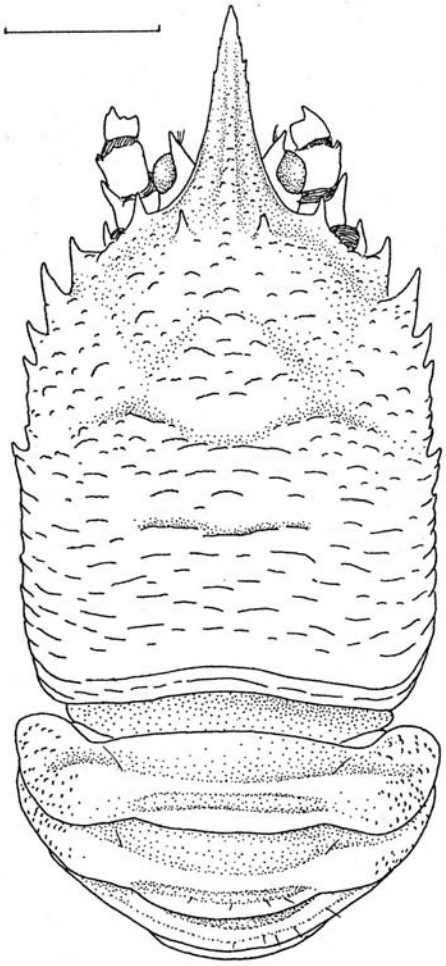
Size: Up to 33.4 mm carapace length.

Morphology: Carapace with two epigastric spines, dorsal surface smooth. Rostrum spiniform, upwards directed, unarmed. Eye with small mesial spine, cornea large. Abdomen unarmed. Sixth abdominal segment having posteromedian margin transverse, exceeded by lateral lobes. Epipods absent from pereopods. First walking legs overreaching chelipeds. Fixed finger of chelipeds without denticulate carina on distolateral margin. Chelipeds and walking legs, with few small spines. Dactylus of walking legs with spines along entire flexor border.

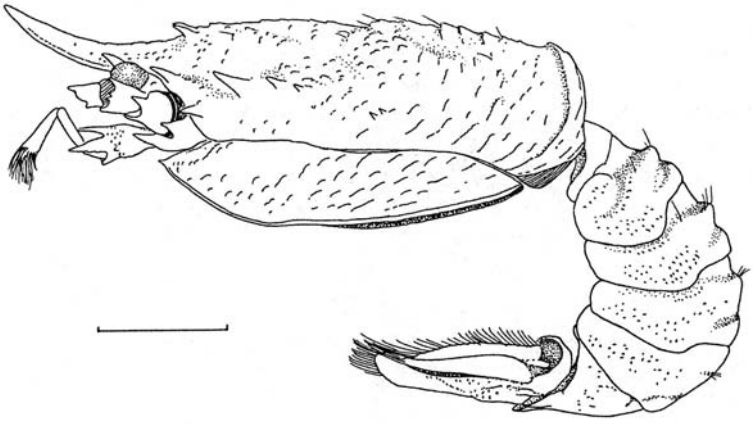
Biology: Lives on active hydrothermal vents.

Distribution: North Fiji Back-Arc Basin: site White Lady.

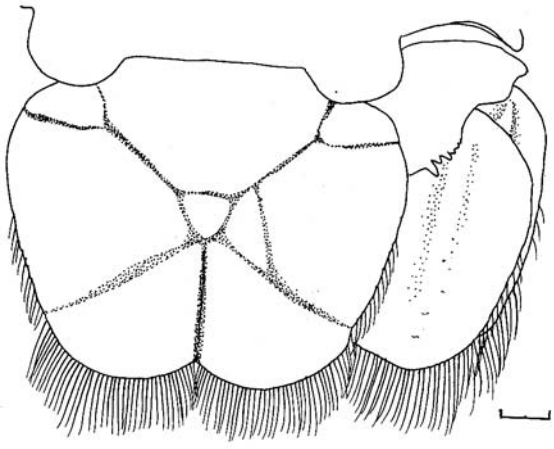
1-3: Female holotype, carapace length 31.4 mm; by K. Baba & M. de Saint Laurent.



1: Carapace and abdomen, dorsal view; scale bar 10 mm.



2: Carapace and abdomen, lateral view; scale bar 10 mm.



3: Telson; scale bar 1 mm.

References:

Baba K. (2005) Galathea Report **20**: 1-317.
Baba K. & M. de Saint Laurent (1992) Sci. Mar. **56**: 321-332.
Desbruyères D., Alayse-Danet A.M., Ohta S. & the Scientific Parties of Biolau and Starmer Cruises (1994) Mar. Geol. **116**: 227-242.

Munidopsis Whiteaves, 1874

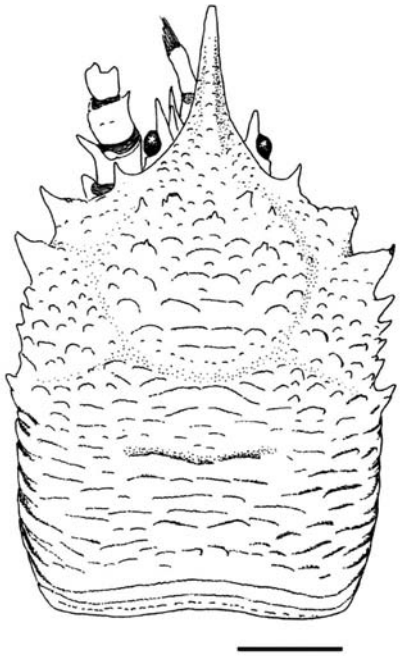
Size: Up to 45 mm carapace length.

Morphology: Carapace with gastric region having group of spines including two epigastric spines and some additional small spines or tubercular spines on scale-like ridges. Lateral margin having first spine (anterolateral) distinctly larger than antennal spine, directed anterolateral, second spine stronger than first. Rostrum subtriangular in proximal half, distally narrowed, slightly upcurved, dorsally carinated. Front margin oblique, antennal spine small. Abdominal segments unarmed, sixth segment having posteromedian margin slightly convex, not produced. Telson composed of 10 plates, midlateral plate produced on anterolateral margin. Ocular peduncles broad at base, distomesially with eye-spine distinctly longer than cornea; cornea relatively small, as broad as eye-spine. Fixed finger of chelipeds without denticulate carina on distolateral margin. First walking leg exceeding chelipeds; palm shorter than fixed finger, bearing a few spines along mesial margin; fingers spooned at tip. Dactyli of walking legs smoothly narrowed distally, flexor margin bearing ultimate denticle equidistant between penultimate denticle and end of article. Epipods present on chelipeds.

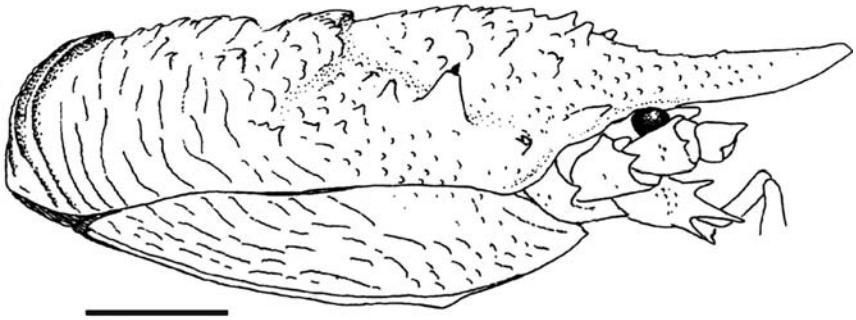
Remarks. This species has been reported from the hydrothermal vents of the Galapagos Spreading Center under the name of *M. subsquamosa* Henderson, 1885, but it belongs to a different species, probably undescribed. A more careful examination, including molecular analyses, of the specimens from different localities will clarify the systematic status of this species.

Biology: Occurrences around the hydrothermal vents may be revised.

Distribution: Galapagos Spreading Center, East Pacific Rise.



1: Carapace, dorsal view; scale bar 5 mm; from Baba (2005).



2: Right, carapace, lateral view; bar 5 mm; from Baba (2005).

Reference:

Baba K. (2005) Galathea Report **20**: 1-317.

Shinkaia crosnieri Baba & Williams, 1998

Size: Up to 43.7 mm carapace length (Taiwanese specimen 45 mm, 58.9 mm with rostrum).

Morphology: Dorsal carapace surface smooth, lateral margins bearing many small spines. Rostrum prominent, flattened dorsally, triangular, not carinated dorsally. Orbital margin concave, antennal spine present. Pterygostomian flap anteriorly produced, covering greater part of antennal peduncle. Dense long plumose setae on sternum, pterygostomian flap and ventral surface of pereopods. Abdomen unarmed. Flattened eyes, with dorsally flattened projection. Chelipeds strong, broad, depressed, with numerous short spines. Walking legs stout and moderately flattened. Epipods present on chelipeds, first and second walking legs.

Distribution: Western Pacific: Edison Seamount; Okinawa Trough, Iheya Ridge, North Iheya Knoll; off NE Taiwan, 1200-1500 m.

1: Male carapace length 45 mm, dorsal view; by T.-Y. Chan.

References:

Baba K. (2005) Galathea Report **20**: 1-317.
Baba K. & A.W. Williams (1998) Zoosystema **20**: 143-156.
Chan T.Y., Lee D.-A. & C.S. Lee (2000) Bull. Mar. Sci. **67**(2): 799-804.
Fujikura K. & T. Okutani (2002) Benthos Research **57**: 21-30.
Watabe H. (2000) JAMSTEC J. Deep-Sea Res. **17**: 29-34.

Kiwa hirsuta MACPHERSON, JONES & SEGONZAC, 2005 "yeti crab"

Size: Carapace length 51.5 mm (58.6 mm with rostrum), total length 88.4 mm.

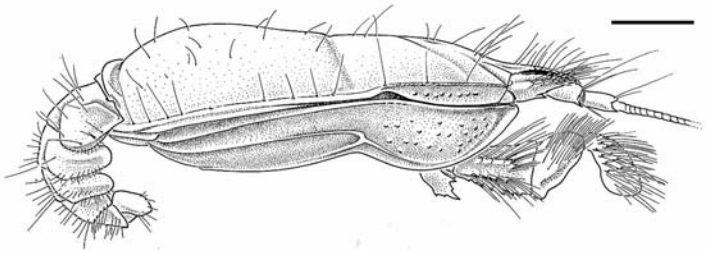
Color: Uniformly white, with yellow corneous tip at the extremity of the chelipeds 1.

Morphology: Carapace, excluding rostrum, 1.3 times longer than broad, dorsal surface smooth. Front margin slightly oblique, with small tooth near rostrum; anterolateral angle rounded. Rostrum broadly triangular, horizontal, slightly concave dorsally, lateral borders granulated, with long uniramous setae; ventral side slightly carinated. Insertion of fifth pereopod not visible and situated below sternal plastron. Eyes strongly reduced, membranous remains, without pigment. Antennal scale absent. Antennal peduncle without scaphocerite. Flagellum as long as carapace without rostrum. Chelipeds and walking legs with dense mat of setae. Telson as wide as long, median transverse suture separating anterior and posterior portions. Chelipeds and walking legs with numerous rows of spines, each spine with yellow corneal tip and tuft of long and dense plumose setae, only absent in cheliped fingers, setae denser and longer in mesial and ventral sides than in lateral and dorsal sides. Chelipeds nearly symmetric, slightly more than twice as long as carapace including rostrum. Fingers somewhat triangular, without setae, having numerous spines decreasing in size distally, distal areas of fingers unarmed; slightly gapping, and distally spoon-shaped; movable finger with proximal large denticulate tooth followed by cutting margin bordered with smooth, low, corneous scales, ending in acute corneous point; fixed finger with some proximal small teeth, followed by cutting edge similar to movable finger and ending in acute corneous point, additional row of mesial granules ending in acute corneous point; fingers distally crossing, corneous tip of movable finger crossing between two corneous tips of fixed finger. Paired pleopods present.

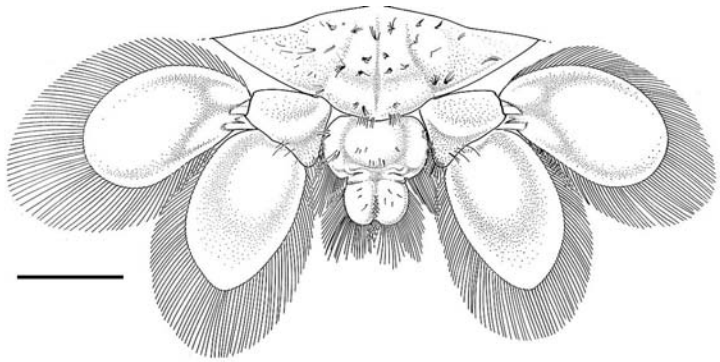
Setae: the pereopods, and in particular the chelipeds, are densely covered with flexible setae (ca. 15 mm) having clusters of filamentous bacteria, mainly at distal part. Other rigid chitinous setae (ca. 13 mm) are barbed in the distal part, ending in a rigid spine, and they are regularly inserted in pairs mainly on the merus of the chelipeds. They are deprived of bacteria.

Biology: Occurs at densities of one to two individuals per 10 m^2, more or less regularly spaced on the zone of pillow basalt surrounding active hydrothermal vents, and at the base of chimneys among vent mussels *Bathymodiolus* sp., crabs bythograeid spp. and ophidiid fish. Omnivorous.

Distribution: Pacific-Antarctic Rise: German Flats, 38°S. This animal was first observed (and noted as "type Shinkaiinae", but not collected), in 2001 by the German cruise Sonne SO-157 (STECHER et al. 2002).



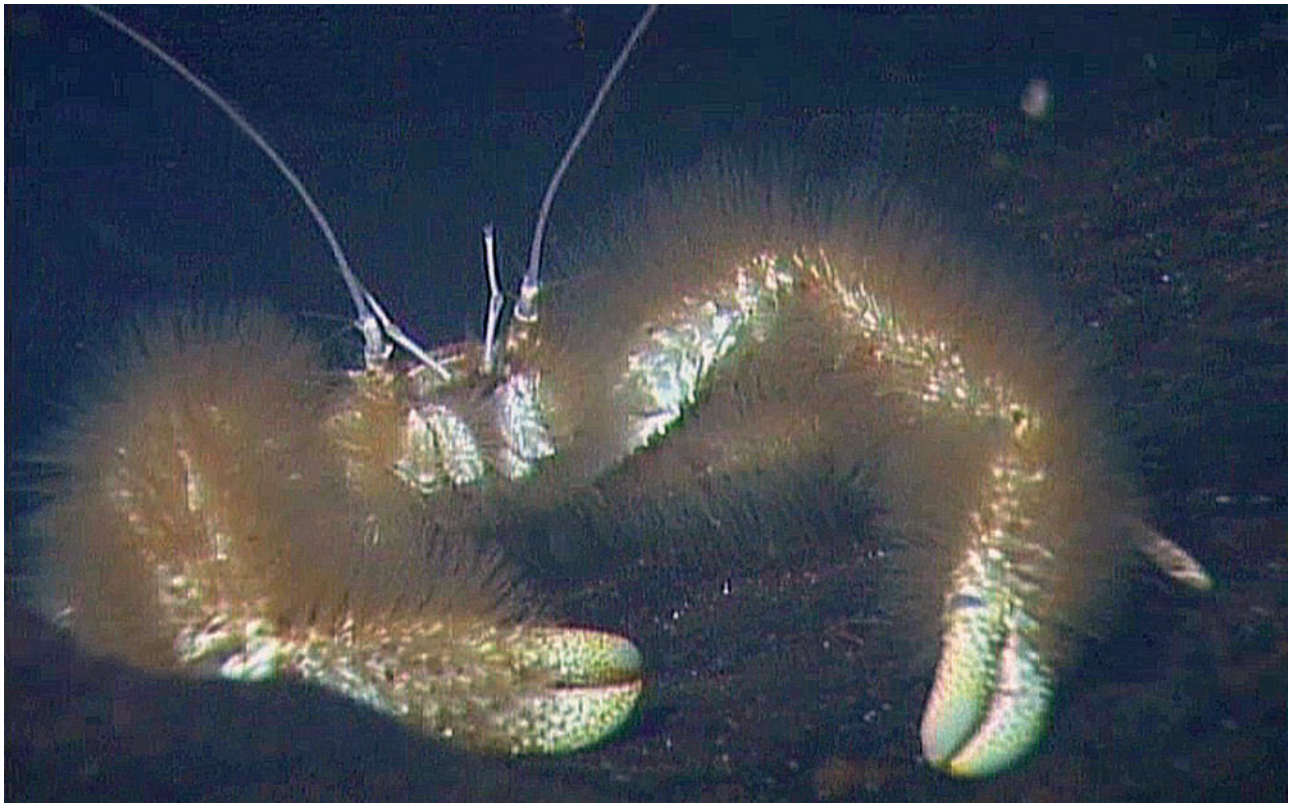
1: Carapace and abdomen, lateral view; scale bar 10 mm; by J.-F. Dejouannet © IRD.



2: Sixth segment of abdomen, telson and uropods, dorsal view; scale bar 5 mm; by J.-F. Dejouannet © IRD.

3: Two specimens on mussel bed, among bythograeid crabs on vent site Annie's Anthill (Southern East Pacific Rise); cruise PAR 5; by courtesy of R. Vrijenhoek © MBARI.

4: Male holotype, dorsal view; by A. Fifis © Ifremer.



5: One specimen on pillow lava, taken on the site Pâle Etoile (Southern East Pacific Rise); cruise, PAR 5; by courtesy of R. Vrijenhoek © MBARI.

References:

Macpherson E., Jones W.J. & M. Segonzac (2005) Zoosystema **27**(4): 709-723.
Stecher J., Türkay M. & C. Borowski (2002) Cah. Biol. Mar. **43**: 271-274.

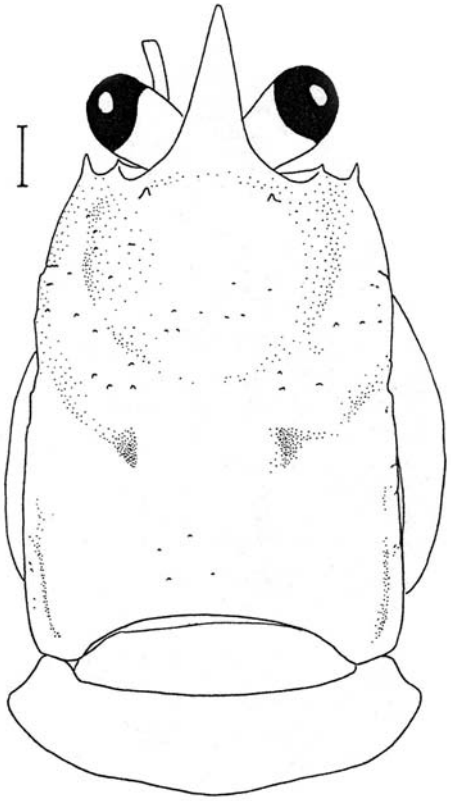
Uroptychus bicavus Baba & de Saint Laurent, 1992

Size: Up to 7.5 mm carapace length.

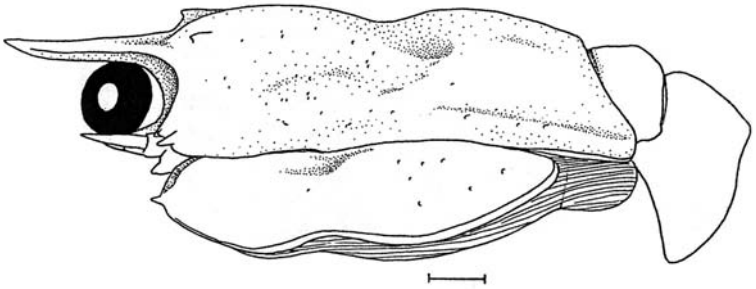
Morphology: Carapace smooth, lateral margin without distinct spine other than anterolateral spine. Epigastric spines on dorsal surface. Rostrum moderately broad triangular, slightly upturned apically. Fourth sternite rounded on anterolateral corner. Antennal scale barely reaching midlength of fifth antennal article. Propodus of first walking legs slightly longer than carpus. Dactylus of walking legs with flexor marginal spines not contiguous to flexor margin.

Biology: Living in low number among vent community.

Distribution: North Fiji Back-Arc Basin: site Mussel Valley.



1: Habitus, dorsal view; holotype male, carapace length 7.5 mm; scale bar 1 mm; by K. Baba & M. de Saint Laurent.



2: Habitus, lateral view; holotype male, carapace length 7.5 mm; scale bar 1 mm; by K. Baba & M. de Saint Laurent.

References:

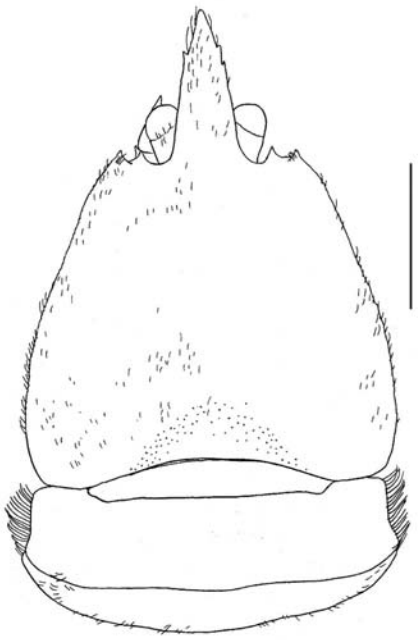
Baba K. (2005) Galathea Report **20**: 1-317.
Baba K. & M. de Saint Laurent (1992) Sci. Mar. **56**: 321-332.
Desbruyères D., Alayse-Danet A.-M. & S. Ohta (1994) Mar. Geol. **116**: 227-242.

Uroptychus edisonicus Baba & Williams, 1998

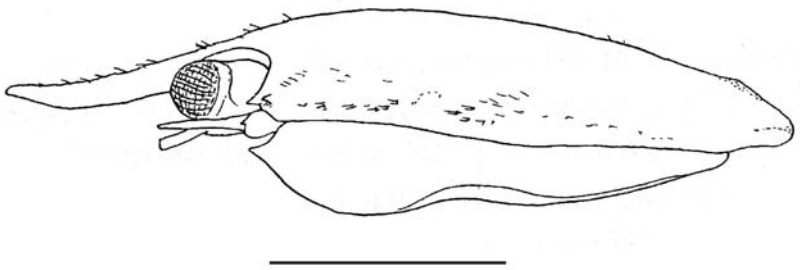
Size: Up to 8.4 mm carapace length.

Morphology: Carapace smooth, lateral margin without distinct spine other than anterolateral spine, not laterally serrate. Epigastric spines absent. Rostrum narrow triangular, weakly curving dorsad distally. Fourth sternite relatively narrow on anterolateral corner. Antennal scale overreaching end of penultimate segment. Propodus of walking legs unarmed on dorsal crest, with spines on distal portion of flexor margin, distal-most remotely separated from distal second, and situated near juncture with dactylus; propodus with convex flexor distal margin. Dactylus of second walking leg with two distal spines remotely separated from proximal group of spines.

Distribution: Western Pacific: Bismarck Archipelago, Edison Seamount, near Lihi Island.



1: Ovigerous female holotype, carapace length 6.2 mm; dorsal view; scale bar 3 mm; by K. Baba & A.B. Willians.



2: Ovigerous female holotype, carapace length 6.2 mm; lateral view; scale bar 3 mm; by K. Baba & A.B. Willians.

References:

Baba K. (2005) Galathea Report **20**: 1-317.
Baba K. & A.B. Williams (1998) Zoosystema **20**: 143-156.

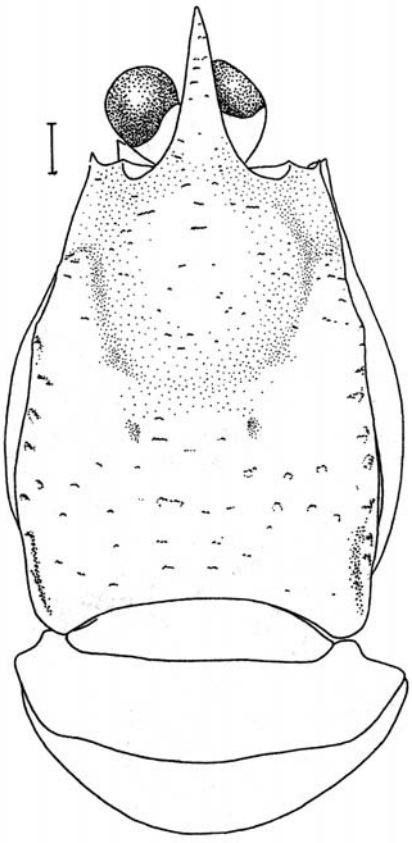
Uroptychus thermalis Baba & de Saint Laurent, 1992

Size: Up to 8.4 mm carapace length.

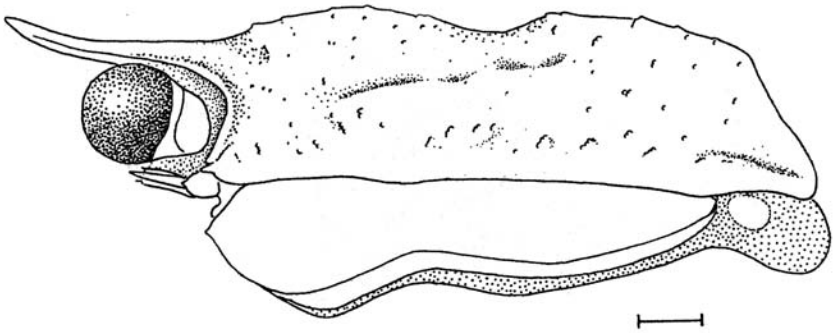
Morphology: Carapace smooth, lateral margin without distinct spine other than anterolateral spine. Epigastric spines absent. Rostrum narrow triangular, weakly curving dorsad distally. Fourth sternite relatively narrow on anterolateral corner. Antennal scale overreaching end of penultimate segment. Propodus of walking legs with spines on distal portion of flexor margin, distal-most remotely separated from distal second, and situated near juncture with dactylus; propodus without convex flexor distal margin. Dactylus of second walking leg with two distal spines remotely separated from proximal group of spines.

Biology: Living in few number among vent community.

Distribution: North Fiji Back-Arc Basin: White Lady. Known also from Queensland, at 1497 m.



1: Habitus, dorsal view; male holotype, carapace length 8.4 mm; scale bar 1 mm; from Baba & Saint Laurent (1992).



2: Habitus, lateral view; male holotype, carapace length 8.4 mm; scale bar 1 mm; from Baba & Saint Laurent (1992).

References:

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Baba K. (2005) Galathea Report **20**: 1-317.
Baba K. & M. de Saint Laurent (1992) Sci. Mar. **56**: 321-332.