

***Alloeopagurodes spiniacicula*, a new genus and new species of hermit crab (Decapoda: Anomura: Paguridae) from Japan**

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Abstract. — A new genus and new species of pagurid hermit crab, *Alloeopagurodes spiniacicula*, is described from the Pacific coast of northeastern Honshu, Japan. The new genus appears close to *Pagurodes* Henderson, 1888, and *Icelopagurus* McLaughlin, 1997, but differs from all known pagurid genera in having the spinose antennal acicles and the presence of an assemblage of spines on the anterolateral portion of the posterior branchiostegite.

Introduction

The family Paguridae in recent years has been the subject of major revisionary studies that have established new generic boundaries and proposed a number of new genera (McLaughlin, 1981; 1986; 1988; 1994; 1997; McLaughlin & Haig, 1996; McLaughlin & Forest, 1997; McLaughlin & de Saint Laurent, 1998). During the recent deep-water sampling off Boso Peninsula, central Japan, conducted in April 1995 on board the RV "Tansei-Maru" of the Ocean Research Institute, University of Tokyo (KT95-5 cruise), an important collection of decapod crustaceans was obtained, amongst which included specimens of an unusual species of Paguridae. Additional specimens of the same species were subsequently collected from Funakoshi Bay, Iwate, northeastern Honshu, during a benthic faunal study around the Otsuchi Marine Center, Ocean Research Institute, University of Tokyo. Close examination reveals that the undescribed species cannot be referred to any of

the known pagurid genera; it is described and illustrated here as *Alloeopagurodes spiniacicula* new genus, new species. This new taxon appears close to *Pagurodes inarmatus* Henderson, 1888 and *Icelopagurus crosnieri* McLaughlin, 1997.

The holotype and part of the paratypes are deposited in the Natural History Museum and Institute, Chiba (CBM, with a code of ZC); the remaining paratypes are deposited in the following institutions: National Museum of Natural History, Smithsonian Institution (USNM); and Museum national d'Histoire naturelle, Paris (MNHN). The general terminology used in the description follows that of McLaughlin (1974), with the exception of the posterior carapace (see Lemaitre, 1995), the fourth pereopod (see McLaughlin, 1997) and gill structure (see McLaughlin & de Saint Laurent, 1998). The abbreviation sl indicates shield length measured from the tip of the rostrum to the midpoint of the posterior margin of the shield. The drawings were made with the aid of a drawing tube mounted on a Leica MZ8 stereomicroscope.

Systematic account

Family Paguridae

Alloeopagurodes new genus

Diagnosis.— Eleven pairs of biserial gills (lamellae of arthrobranches on seventh thoracic somite occasionally with shallow distal cleft or indentation). Shield weakly to somewhat vaulted and generally well calcified, with anterolateral regions

slightly depressed. Rostrum triangular, well produced. Posterior branchiostegite with anterolateral portion well calcified, with assemblage of prominent spines. Posterior carapace with posteromedian plate calcified in anterior half; submedian regions defined by cardiac sulci and additional line, extending from each posterolateral corner of accessory portion of shield, moderately well calcified; sulci cardiobranchiales vestigial; remainder of posterior carapace membranous; anterior branchiostegal wall membranous. Ocular acicles subovate, not elongate. Antennal peduncle with supernumerary segmentation; antennal acicle with row of prominent spines on mesial margin. Maxillule with external lobe of endopod small, subtriangular. Crista dentata of third maxilliped well developed, with strong accessory tooth. Chelipeds grossly unequal, right cheliped lengthening with growth in male. Propodi of ambulatory pereopods each with rows of ventral spines distally; meri each with shallow sulcus on distal 0.3 of ventral surface of merus. Fourth pereopods semichelate; propodal rasp composed of single row of corneous scales; dactyl lacking preungual process. Fifth thoracic sternite broadly subrectangular, with distinct median groove; anterior margin with median concavity. Anterior lobe of sixth thoracic sternite broadly rectangular, with row of small spines or spinulose tubercles on anteroventral margin in adult males, with few very small tubercles or smooth in young males and females; posterior lobe with deep median groove.

Coxae of fifth pereopods in adult males asymmetrical, right with stout, relatively short sexual tube directed mesially; left with very short sexual tube; 3 unequally biramous unpaired left pleopods. Females with paired gonopores; no paired pleopods, unpaired left pleopods on second to fifth abdominal somites (fourth pleopod greatly reduced).

Telson with distinct lateral indenta-

tion; posterior lobes separated by distinct median cleft; terminal margins rounded; lateral margins not forming chitinous plate.

Etymology.— From the Greek *alloios* (different) plus *Pagurodes*, and referring to the suggested taxonomic relation to the genus *Pagurodes* Henderson, 1888. Gender: masculine.

Type species.— *Alloeopagurodes spiniacicula* new species.

Remarks.— As indicated in the derivation of its name, *Alloeopagurodes* is most similar to *Pagurodes* Henderson, 1888 (revised by McLaughlin, 1997; type species: *P. inarmatus* Henderson, 1888). Both taxa are monotypic, and their type species share elongate chelipeds and ambulatory legs, well calcified shields that tend to be somewhat vaulted, short, stout ocular peduncles, and, in males, with a short sexual tube arising from the coxa of the right fifth pereopod and a very short tube from the left. However, the presence of an assemblage of spines on the anterolateral portion of the posterior branchiostegite, and the spinose antennal acicle immediately separate the new genus from not only *Pagurodes* but also other pagurid genera. Further, in *Alloeopagurodes*, the corneal region of the ocular peduncles are noticeably dilated; the external lobe of the maxillary endopod is small but distinct; the gills are biserial; and the posterior lobes of the telson are rounded with 5–8 moderately small spines. In contrast, *Pagurodes* has ocular peduncles with the corneal regions not dilated; the antennal acicles are not spinose; the external lobe of the maxillule endopod is completely absent; the gills are quadriserial; and the posterior lobes of the telson are acutely subtriangular with strongly oblique terminal margins armed with 3 or 4 small spines.

Alloeopagurodes also resembles the monotypic *Icelopagurus* McLaughlin, 1997 (type species: *I. crosnieri* McLaughlin, 1997). The short ocular acicles, the pres-

ence of ventral rows of spines on the propodi of the ambulatory pereopods, the absence of a preungual process from the dactyl of the fourth pereopod immediately separate *Alloeopagurodes* from *Icelopagurus*. Additionally, *Icelopagurus* is characteristic in having very long corneous spines, rather than small calcareous spines, on the posterior lobes of the telson.

The pattern of calcification of the posterior carapace in this new genus may be characteristic. In addition to the moderately calcified anterolateral portion of the posterior branchiostegite, the submedian areas lateral to the posteromedian plate, defined by the cardiac sulci and the additional lines extending from the posterolateral corner of the accessory portions, are also moderately well calcified. The remaining part of the posterior carapace, excepting the strongly calcified anterior part of the posteromedian plate, is membranous. This partial calcification of the posterior carapace may be an adaptation of the species to the specialized gastropod habitat with only the abdominal protection. The genus *Labidochirus* Benedict, 1892, which have more advanced calcification of the posterior carapace, is also known to have similar gastropod habitat (McLaughlin, 1974; personal observation).

Alloeopagurodes spiniacicula

new species

(Figs. 1–4)

Type material.— Holotype. Off Taito-saki, Boso Peninsula, central Japan, 35°16.3'N, 140°41.3'E, 115–120 m; RV "Tansei-maru", KT95-5, stn TB-11; 21 Apr 1995; dredge; coll. T. Komai; male (sl 3.8 mm); CBM-ZC 4430.

Paratypes. Data as for holotype; 2 subadult males (sl 2.8, 3.2 mm), 2 males (sl 3.3, 3.5 mm), 2 females (sl 2.1, 2.6 mm); CBM-ZC 4431.—Off Taito-saki, 35°17.51'n, 140°37.0'E, 53–55 m; RV Tansei-maru, KT95-5, stn TB-10; 21 Apr 1995; dredge; coll. T. Komai; 2 subadult

males (sl 1.7, 2.2 mm), 1 ovig female (sl 1.9 mm); CBM-ZC 4432; 1 male (sl 2.7 mm); MNHN Pg 5696.—Funakoshi Bay, Iwate, northeastern Honshu, 39°23.38'N, 141°59.78'E, 82 m; 25 May 1995; dredge; coll. T. Komai; 1 subadult male (sl 2.0 mm); CBM-ZC 4433.—Same locality, 38°23.631'N, 141°59.200'E, 66 m; 25 May 1995; dredge; coll. T. Komai; 1 subadult male (sl 2.9 mm); CBM-ZC 4434.—Same locality, 39°23.634'N, 141°59.191'E, 66 m; 25 May 1995; dredge; coll. T. Komai; 1 subadult male (sl 2.2 mm), 3 females (sl 2.0–2.4 mm); CBM-ZC 4435; 1 subadult male (sl 2.8 mm); USNM 260889.

Description.—Eleven pairs of biserial gills (Fig. 1A), but some lamellae of arthrobranchs on seventh thoracic somite (fourth pereopods) with distal indentation or cleft (Fig. 1B).

Shield (Fig. 1C) as long as broad or slightly broader than long, well calcified, weakly to somewhat vaulted, with anterolateral regions weakly depressed; cervical groove deep; anterior margin between rostrum and lateral projections nearly straight, weakly oblique, with row of moderately long stiff setae; anterolateral margins sloping; posterior margin truncate; dorsal surface with paired short, setose, transverse ridges laterally, occasionally denticulate; lateral faces with scattered minute tubercles or granules. Rostrum triangular, terminally blunt, far overreaching lateral projections, dorsal surface with weak median ridge. Lateral projections obsolete, usually with small marginal spine. Accessory portions of shield (Fig. 1D) each with obtuse ridge posteriorly, bearing row of stiff setae. Posterior carapace with posteromedian plate well calcified in anterior half, but posterior half membranous; cardiac sulci concave, divergent posteriorly, not extending to posterior margin; areas lateral to posteromedian plate, defined by cardiac sulci and lines extending from each posterolateral corner of accessory portion, moderately well calcified, each with ves-

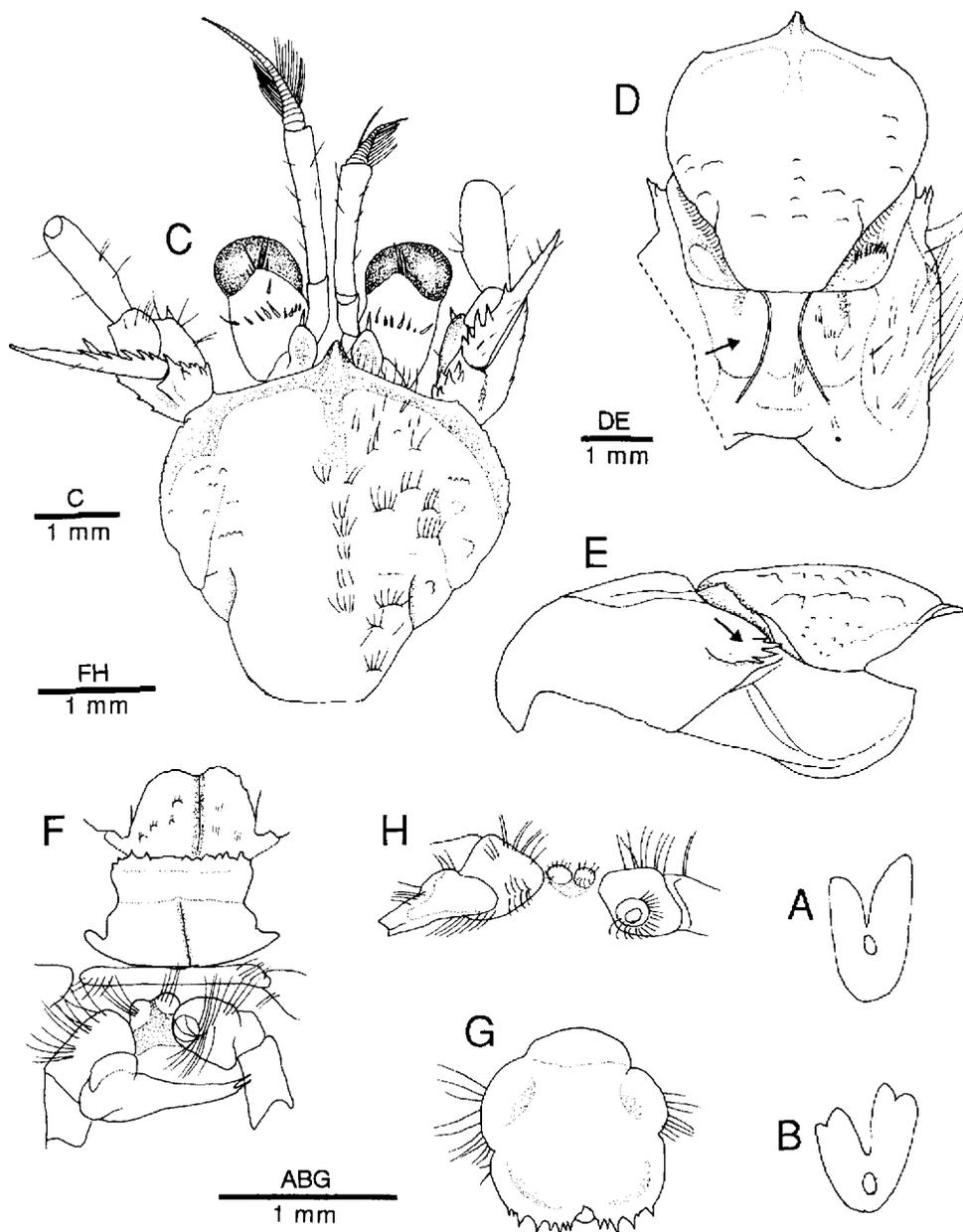


Fig. 1. *Alloepagurodes spiniacicula*, new genus, new species. A–G, holotype male (sl 3.8 mm; CBM-ZC 4430) from off Taito-saki, Boso Peninsula; H, paratype subadult male (sl 3.3 mm; CBM-ZC 4434) from Funakoshi Bay, Iwate. A, B, gill lamellae dissected from arthrobranch on seventh thoracic somite; C, shield and cephalic appendages, dorsal, setae omitted on left; D, carapace, dorsal, left branchiostegite removed, setae partially omitted; E, same, right lateral, setae omitted; F, fifth to eighth thoracic sternites and coxae of fifth pereopods, ventral; G, telson, dorsal; H, coxae of fifth pereopods and eighth thoracic sternite, ventral. Arrows indicate calcified portions.

tige of short sulcus cardiobranchialis; anterolateral portion of posterior branchiostegite (Fig. 1D, E) moderately well calcified, with assemblage of 3–5 weak to strong spines; remainder part of posterior carapace membranous, with scattered tufts of moderately short to long setae. Anterior branchiostegite membranous.

Ocular peduncles (Fig. 1C) very short and stout, dorsal surface with tuft of stiff setae at base of cornea and transverse row of bristles at midlength; corneae large, occupying 0.25–0.33 length of peduncle, somewhat dilated. Ocular acicles subovate, with strong terminal submarginal spine; dorsal surface concave, without setae; separated basally by entire to 1.2 basal width of one acicle.

Antennular peduncles (Figs. 1C, 2A), when fully extended, overreaching ocular peduncles by full length of ultimate segment. Ultimate segment 1.6 times longer than penultimate segment, with 2 rows of setae on dorsal surface; ventral surface with few setae. Penultimate segment with few setae on dorsodistal corner. Basal segment unarmed.

Antennal peduncles (Fig. 1C) overreaching ocular peduncles by nearly full length of fifth segment. Fifth and fourth segments with few setae. Third segment with prominent spine at ventrodistal corner. Second segment with dorsodistal lateral angle strongly produced, reaching distal margin of fourth segment, terminating in simple or bifid spine and with small accessory spines on lateral margin; dorsomesial distal angle with prominent spine, followed by double row of prominent spines on dorsal surface. First segment with spine on lateral surface, ventromesial margin produced in strong spine. Antennal acicle moderately long, overreaching ocular peduncle, but not reaching distal margin of fifth segment; terminating in acute spine; mesial margin with row of 5 or 6 strong spines at least in proximal half and few stiff setae. Antennal flagellum

long, overreaching tip of outstretched right cheliped, proximal articles with few very short setae, distal articles nearly naked.

Mandible (Fig. 2B) with few obtuse teeth on mesial margin. Maxillule (Fig. 2C) with subquadrate proximal endite; endopod with weakly produced, subtriangular external lobe, internal lobe with 2 bristles (1 apical and 1 subapical). Maxilla (Fig. 2D) with endopod reaching distal margin of scaphognathite. First maxilliped (Fig. 2E) with exopodal flagellum; exopod broadened proximally. Second maxilliped (Fig. 2F) with incomplete basis-ischium fusion. Third maxilliped (Fig. 2G) with carpus bearing strong distolateral spine; merus with strong dorsodistal and ventromesial spines; ischium (Fig. 2I) with crista dentata composed of row of moderately small corneous teeth becoming larger proximally, accessory tooth strong; basis-ischium fusion incomplete; basis with few denticles on mesial margin.

Chelipeds grossly unequal, right lengthening with growth in males. Right cheliped (Fig. 3A–C) with chela 2.0–2.2 times longer than wide in adult males. Dactyl 0.65–0.80 times as long as palm; dorsomesial margin not delineated, dorsal, mesial and ventral surfaces unarmed, but with scattered tufts of moderately long setae and with row of longer setae adjacent to cutting edge; cutting edge with bidentate strong calcareous tooth about at midlength and row of small corneous teeth on distal part, terminating in small corneous claw; leaving hiatus proximally between dactyl and fixed finger when closed. Palm shorter than or equal to carpus in females and young males, slightly longer in large males, with lateral and mesial margins subparallel; dorsomesial margin not delineated, dorsal surface weakly convex, minutely spinulose or granular, with scattered tufts of short setae, dorsolateral margin nearly straight or slightly convex, indicated by row of

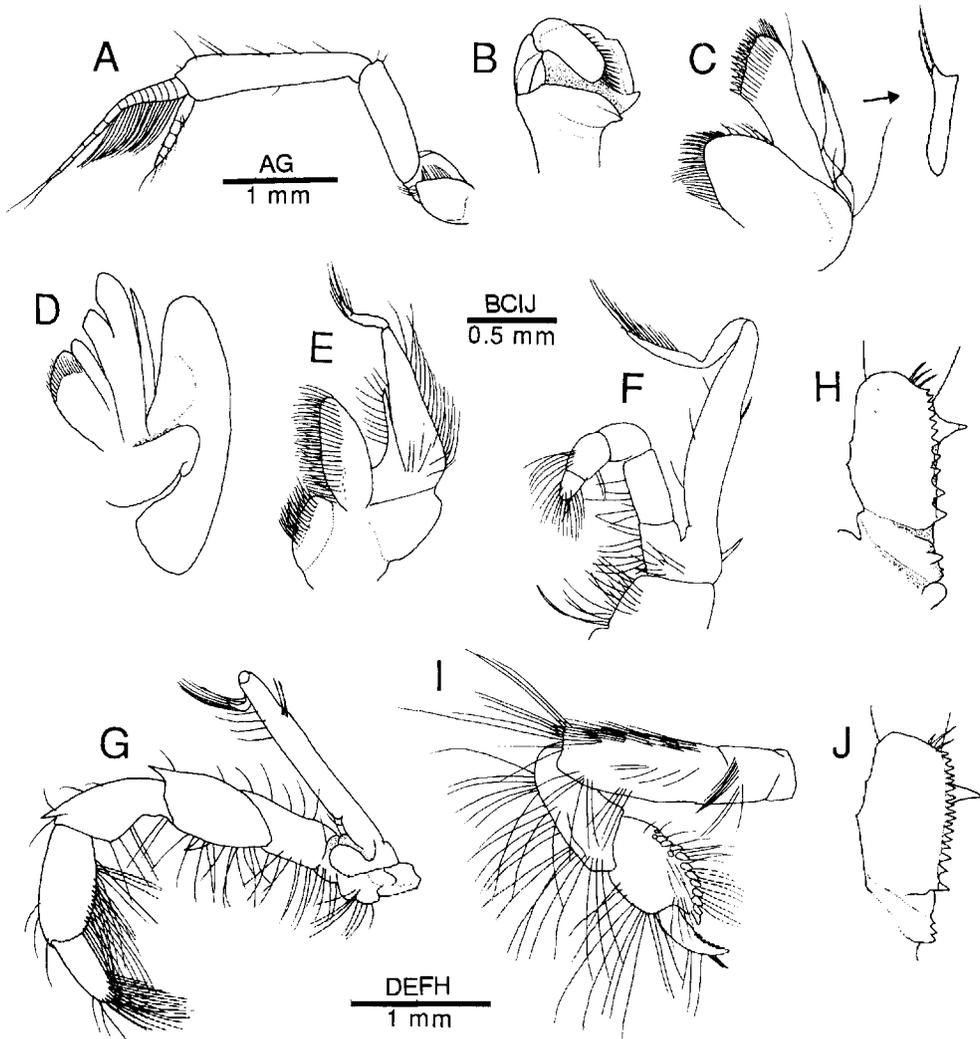


Fig. 2. *Alloepagurodes spiniacicula*, new genus, new species. A-I, holotype male (sl 3.8 mm; CBM-ZC 4430) from off Taito-saki, Boso Peninsula; J, paratype subadult male (sl 3.3 mm; CBM-ZC 4434) from Funakoshi Bay, Iwate. Left appendages. A, antennule, lateral; B, mandible, internal; C, maxillule, external; inset, endopod, lateral; D, maxilla, external; E, first maxilliped, external; F, second maxilliped, external; G, third maxilliped, lateral; H, J, same, basis and ischium, dorsal (internal); I, fourth pereopod, lateral.

spinules, not extending onto fixed finger; lateral and mesial faces minutely spinulose, with scattered short setae; ventral surface weakly convex, unarmed, with numerous tufts of long setae. Fixed finger with 2 rows of tufts of moderately long setae on dorsal surface; cutting edge with

3 rounded strong calcareous teeth on proximal half and minute calcareous teeth on distal half, terminating in moderately strong corneous claw. Carpus appreciably broadened distally; dorso-mesial and dorsolateral margins distinct, each armed with irregular double row of

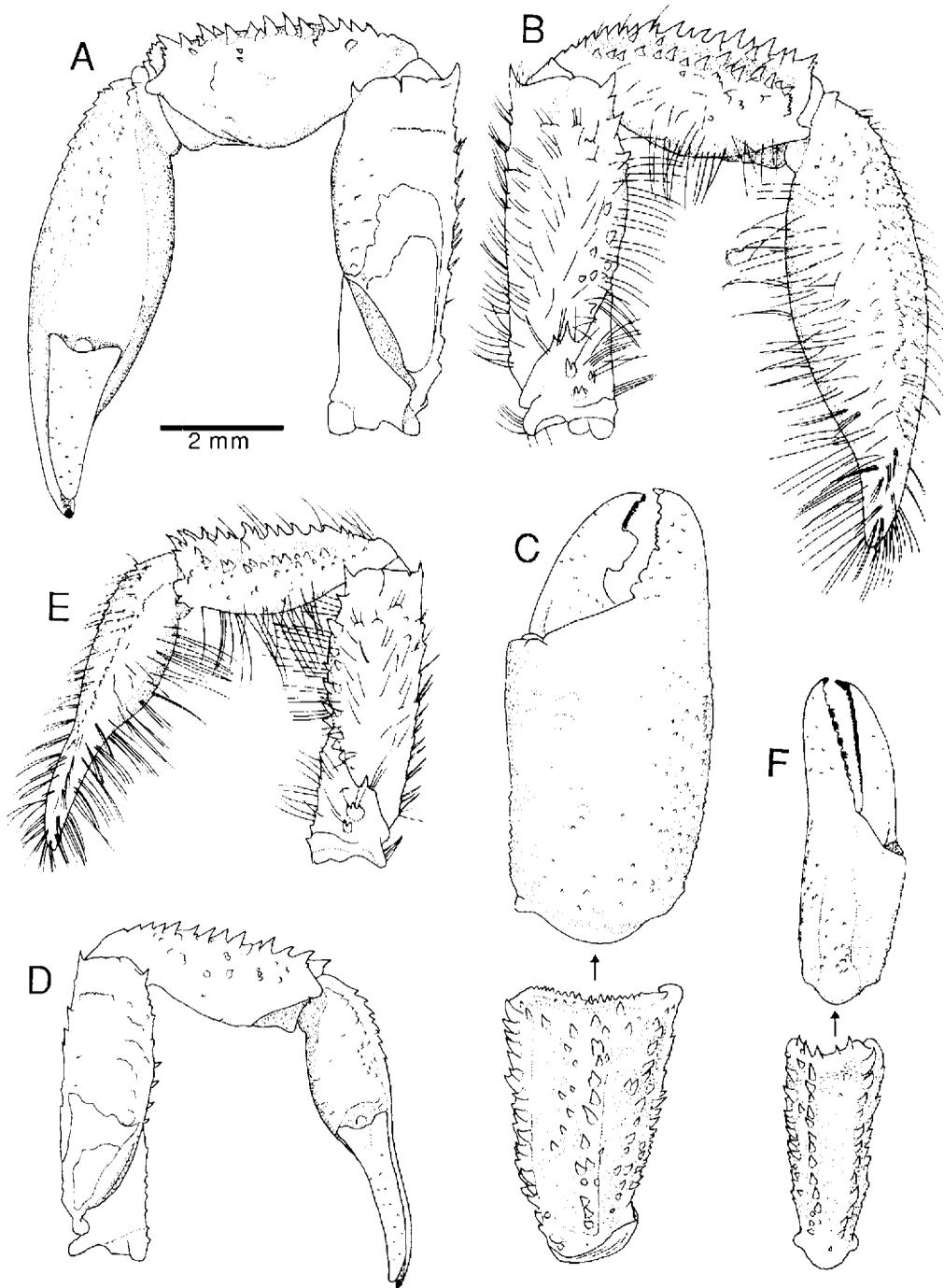


Fig. 3. *Alloeopagurodes spiniacicula*, new genus, new species. Holotype male (sl 3.8 mm; CBM-ZC 4430) from off Taito-saki, Boso Peninsula. A, right cheliped, mesial, setae omitted; B, same, lateral; C, same, dorsal, setae omitted; D, left cheliped, mesial, setae omitted; E, same, mesial; F, same, dorsal, setae omitted.

moderately small spines or spinulose tubercles; dorsal surface unarmed or armed with smaller spines and few setae, distal margin with row of numerous small spines or spinules; lateral surface with row of small spines, dorsolateral surface slightly concave, occasionally with few spines, ventrolateral surface with short transverse, minutely denticulate ridge adjacent to distal margin, scattered spinulose tubercles and tufts of short setae; mesial surface with few scattered spinulose tubercles dorsally and tufts of setae; ventral surface unarmed, but with tufts of longer setae. Merus with short transverse ridges bearing stiff setae on dorsal surface, dorsodistal margin with 1 prominent spine; mesial surface with vertical ridge bearing stiff setae near distal margin, scattered spinulose tubercles ventrally and tufts of setae; lateral surface with few small spines or spinulose tubercles ventrally and scattered tufts of setae, ventrolateral margin with row of spines becoming noticeably strong distally; ventral surface with spinulose tubercles laterally and scattered tufts of long setae. Ischium without row of denticles on ventromesial margin; lateral surface with simple or bifid spines, distal margin with 1 or 2 prominent spines; ventral surface with tufts of moderately long setae; dorsal surface deeply notched. Coxa with 2 or 3 small spines on ventrolateral distal margin.

Left cheliped (Fig. 3D-F) with chela about 3.2 times longer than wide. Dactyl 1.1-1.2 times longer than palm; dorso-mesial margin not delineated, dorsal, mesial and ventral surfaces unarmed, but with scattered tufts of setae (setae on lateral and ventral faces longer); cutting edge with row of small corneous teeth, terminating in long corneous claw. Palm distinctly shorter than carpus; dorso-mesial margin with row of small spinulose tubercles proximally, almost unarmed distally, dorsal surface weakly elevated proximally in midline, bearing 2 or 3

irregular rows of spinules, minutely spinulose laterally, with scattered short setae; dorsolateral margin slightly sinuous, with row of minute spinules and spinulose tubercles, not extending onto fixed finger; lateral and mesial faces minutely spinulose, with scattered short setae; ventral surface weakly convex, unarmed, with numerous tufts of long setae. Fixed finger with tufts of setae on all surfaces (setae on lateral and ventral surfaces longer); cutting edge with row of small corneous teeth interspersed by row of small calcareous teeth, terminating in moderately strong corneous claw. Carpus weakly broadened distally; dorsomesial and dorsolateral margins distinct, each armed with row of moderately small spines or spinulose tubercles, becoming stronger distally; dorsal surface unarmed or armed with few minute spinulose tubercles, distal margin with row of moderately strong spines; lateral surface with row of small spines, dorsolateral surface occasionally with few spines, ventrolateral surface with small simple or bifid spinulose tubercles and short setae; mesial surface with scattered spinulose tubercles dorsally and short setae; ventral surface unarmed, but with tufts of longer setae. Merus with short transverse ridges bearing stiff setae on dorsal surface, dorsodistal margin with 1 prominent spine; mesial surface with vertical ridge bearing stiff setae near distal margin, small spinulose tubercles ventrally and few tufts of stiff setae, ventrolateral margin with row of small spines distally; lateral surface with few spinulose tubercles and scattered tufts or simple setae, ventrolateral margin with row of moderately small spines, becoming stronger distally; ventral surface with few spinulose tubercles and scattered tufts of long setae. Ischium with row of sparse denticles on ventral margin; lateral surface with simple or bifid spines and tufts of stiff setae, distal margin with 1 or 2 prominent spines; mesial face weakly

inflated, with few tufts of setae; dorsal surface deeply notched. Coxa with 2 or 3 small spines on ventrolateral distal margin.

Ambulatory pereopods (Fig. 4) long and slender, generally similar from right to left, but right slightly longer than left. Second pereopods overreaching outstretched right cheliped by half to entire length of dactyls. Dactyls long, slender, weakly curved ventrally, and slightly twisted distally; 0.9–1.1 times as long as propodi; dorsal surfaces weakly protuberant in second, nearly smooth in third, with row of minute corneous spinules and sparse setae and distally with long, slender bristles; lateral faces each with few scattered setae; mesial faces of second pereopods each with row of corneous spinules near dorsal margin, unarmed on third; ventral surfaces each with 5–7 corneous spinules mesially. Propodi narrowed distally, with irregular double row of spinulose protuberances and tufts of stiff setae on dorsal surfaces (protuberances more prominent on second than on third); lateral faces with tufts or single short setae ventrally, bearing row of small protuberances dorsally in proximal half on second pereopods, nearly unarmed on third pereopods; mesial faces coarsely spinulose dorsally; second pereopods in adult males armed with triple row of moderately short to long corneous spines in distal 0.3 of ventral surfaces, divided distally in lateral (double row) and mesial (single row) rows, and with row of sparse tufts of short setae in proximal 0.7; second pereopods in young males and females and third pereopods both with row of paired or single small corneous spines on distal 0.2 of ventral surfaces, extending distally to ventromesial margins. Carpi with single or double row of small spines, becoming stronger distally, and few moderately short setae on dorsal surfaces; lateral faces each with submedian row of small spinulose tubercles and tufts of stiff setae on second and right third pereopods,

with median row of tufts of short setae on left third; ventral surfaces without setae. Meri with short, occasionally spinulose, transverse ridges bearing row of moderately long setae on dorsal surfaces (ridges weaker in third than in second); lateral faces each with scattered moderately short setae or tufts of short setae; ventral surfaces shallowly sulcate in distal 0.3, with row of small to moderately small spines laterally and row of long setae, occasionally with additional smaller spines or spinulose tubercles on lateral surfaces adjacent to ventral margin. Ischium minutely protuberant on dorsal and ventral margins in second and right third, unarmed in left third; lateral faces each with tufts of setae.

Fourth pereopods semichelate, with long setae on dorsal surfaces of distal three segments. Dactyl weakly curved, lacking preungual process. Propodus with moderately convex ventral margin; propodal rasp composed of single (occasionally doubled proximally) row of moderately large corneous scales. Merus with short transverse rows of long setae on dorsal surface.

Fifth pereopods chelate. Right coxa in adult males with moderately long sexual tube, directed from right to left, and not reaching beyond coxa of left fifth pereopod, tapering distally, with few apical filaments; right sexual tube in young or subadult males short, directed posterolaterally, without apical filament. Left coxa with very small sexual tube partially obscured by row of setae.

Third thoracic sternite with small spine on either side of shallow median notch on anterior margin. Fifth thoracic sternite broadly subrectangular, with distinct median groove; ventral surface with few tufts of setae; anterior margin with median concavity, occasionally with small tubercle at anterolateral corner. Anterior lobe of sixth thoracic sternite broadly rectangular with convex lateral margins, bearing row of small spines or

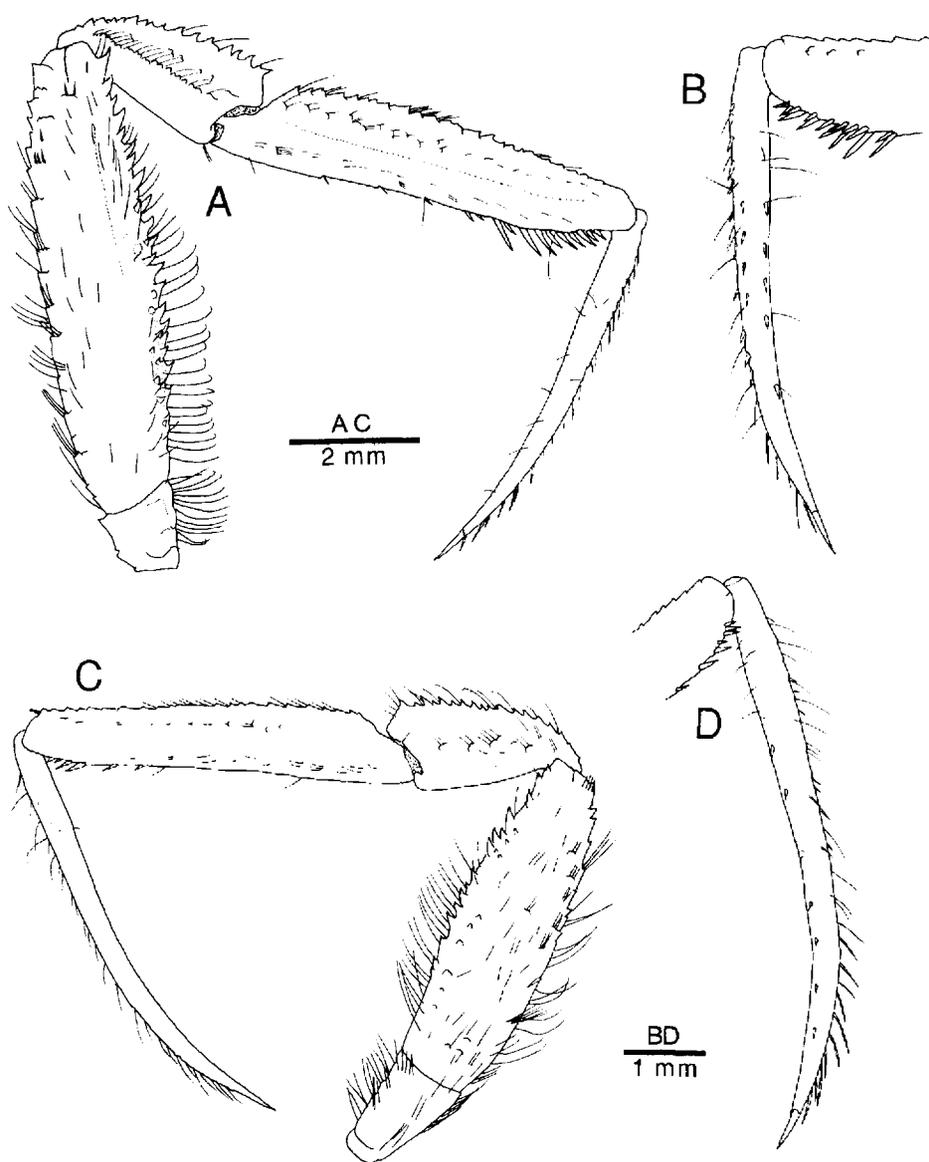


Fig. 4. *Alloeopagurodes spiniacicula*, new genus, new species. Holotype male (sl 3.8 mm; CBM-ZC 4430) from off Taito-saki, Boso Peninsula. A, right second pereopod, lateral; B, same, dactyl and distal part of propodus, mesial; C, left third pereopod, lateral; D, same, dactyl and distal part of propodus, mesial.

spinulose tubercles on anteroventral margin in adult males, spines obsolete or absent in young males and females; posterior lobe with deep median groove.

Abdomen coiled. Males with 3 unpaired

unequally biramous pleopods, third and fourth with endopod about half length of exopod, fifth with endopod about 0.3 length of exopod. Females with 4 unpaired pleopods, second to fourth pleopods well

developed, but fifth pleopod greatly reduced; anterior three pleopods each with endopod subequal in length to exopod, fifth pleopod with endopod much shorter than exopod. Uropods distinctly asymmetrical.

Telson with small median cleft separating slightly asymmetrical posterior lobes; rounded terminal margins each with 5–7 prominent spines; lateral indentation distinct but not very deep.

Color.— In life. Shield mottled brown. Ocular peduncles and antennular peduncles light brown, without distinct marking. Chelipeds generally brown, dactyls and fixed fingers white. Dactyls of second and third pereopods with tinges of brown at proximal and middle parts on nearly transparent back-ground; propodi generally transparent, each with band of brown around midlength and three brown longitudinal lines on lateral surface, proximal part brown; carpi with patches of brown; meri generally brown, sometimes darker around middle part.

In preservative. Faded to straw color entirely.

Variation.— This new species exhibits considerable growth-related variation. The right sexual tube in males shows noticeable variation in length and direction. In the holotype (CBM-ZC 4430, sl 3.8 mm) and three paratypic males (CBM-ZC 4431, sl 3.3, 3.5 mm; MNHN Pg 5696, sl 2.7 mm), it is mesially directed from right to left and bears apical filaments (Fig. 1F). In the other eight paratypic males (CBM-ZC 4431, sl 2.8, 3.2 mm; CBM-ZC 4432, sl 1.7, 2.2 mm; CBM-ZC 4433, sl 2.0 mm; CBM-ZC 4434, sl 2.9 mm; CBM-ZC 4435, sl 2.2 mm; USNM, sl 2.8 mm), it is shorter and is directed posterolaterally or posteriorly, without apical filaments (Fig. 1H). From the development of the sexual tube, it is assumed that the former represents a mature condition. It should be noted that the difference of the development of the right sexual tube does not appear to necessarily be a function of body size. The shield becomes more strongly

vaulted with increase of the body size. The spines on the calcified anterolateral parts of the posterior carapace are more prominent in adult males than in subadult males and females. The dorsal surface of the carpus of the right cheliped is usually armed with scattered small spines or spinulose tubercles in adult males, while it is less spinose or almost unarmed in subadult males and females. The spines or spinulose tubercles on the anterior margin of the sixth thoracic sternal lobe are less prominent or absent in subadult males and females. The corneous teeth of the crista dentata of the third maxilliped seems to become fewer and more spaced with growth (cf. Fig. 2H and 2G). The female seems to attain maturity at size much smaller than male (at least sl 1.9 mm).

Distribution.— Pacific coast of north-eastern Honshu mainland of Japan, at depths of 66–120 m.

Habitat and symbiotic association.— This new species was collected from coarse sand bottom mixed with shell fragments at depths of 66–120 m. The specimens, when alive, were found using a small gastropod shell occasionally covered with a colony of an unidentified hydroid. The shell covered only the abdomen.

Etymology — From the Latin *spinus* meaning spinose and *acicula* meaning needle, referring to the spinose antennal acicle, which is uncommon in the Paguridae. Used as a noun in apposition.

Acknowledgments

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