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A New King Crab of the Genus *Lithodes* Latreille, 1806 (Crustacea, Decapoda, Anomura, Lithodidae) from Indonesia

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Abstract A female king crab of the genus *Lithodes* Latreille, 1806 (Crustacea, Decapoda, Anomura, Lithodidae) from the Indonesian depths (Ceram Sea, 1,000–1,500 m deep) is described as new to science under the name of *L. ahyongi*. The new species is close to *L. richeri* Macpherson, 1990 from the South Pacific (Vanuatu, New Caledonia, and eastern Australia, 860–1,220 m deep), in having the long rod–like rostrum, but characterized by the wider carapace with much stronger dorsal and marginal tubercles.

Key words: Lithodidae, *Lithodes*, king crab, new species, Ceram Sea, Indonesia.

Introduction

Takeda and Nagai (2004) recorded four crustacean species of enormous sizes from the depths of 1,000–1,500 m in the Ceram Sea, Indonesia, *Acanthacaris tenuimana* Bate, 1888 (Macrura, Nephropidae), *Lithodes ceramensis* sp. nov. and *L. richeri* Macpherson, 1990 (Anomura, Lithodidae), and *Chaceon karubar* Manning, 1993 (Brachyura, Geryonidae). Of them, the identification of a female king crab as *L. richeri* was rather tentative, as the carapace contour is somewhat different from those of the type specimens, four males from New Caledonia. Later, Ahyong (2010) suggested that the difference in the carapace contour is not individual and developmental, but specific, with the comparative examination of many specimens of different sizes referable to *L. richeri*.

The female specimen reported by Takeda and Nagai (2004) as *L. richeri* was reexamined following the suggestion of Ahyong (2010), and the specific validity was confirmed. The purpose of this paper is to describe the Indonesian deep-sea specimen from the Ceram Sea as a new species. In the following description of the new species, the terminology basically follows Ahyong (2010), except that the words of tubercles are adopted for definite image instead of the words of spines.

The holotype is in the collections of the National Museum of Nature and Science, Tokyo (NSMT).

Family Lithodidae
Genus ***Lithodes*** Latreille, 1806
Lithodes ahyongi sp. nov.

(Figs. 1–2)

Lithodes richer: Takeda and Nagai, 2004, p. 15, figs. 5–6. [Not *L. richeri* Macpherson, 1990]

Material examined. Off Wahai, Ceram Island, Moluccas, Indonesia, 1,000–1,500 m deep; female (holotype), NSMT–Cr 15694; October 1993, coll. by local fisherman. The specimen was once dried, and later restored and kept in 70% ethanol following the method for restoring dried crustacean specimens with ethylene glycol reported by Thompson *et al.* (1966).

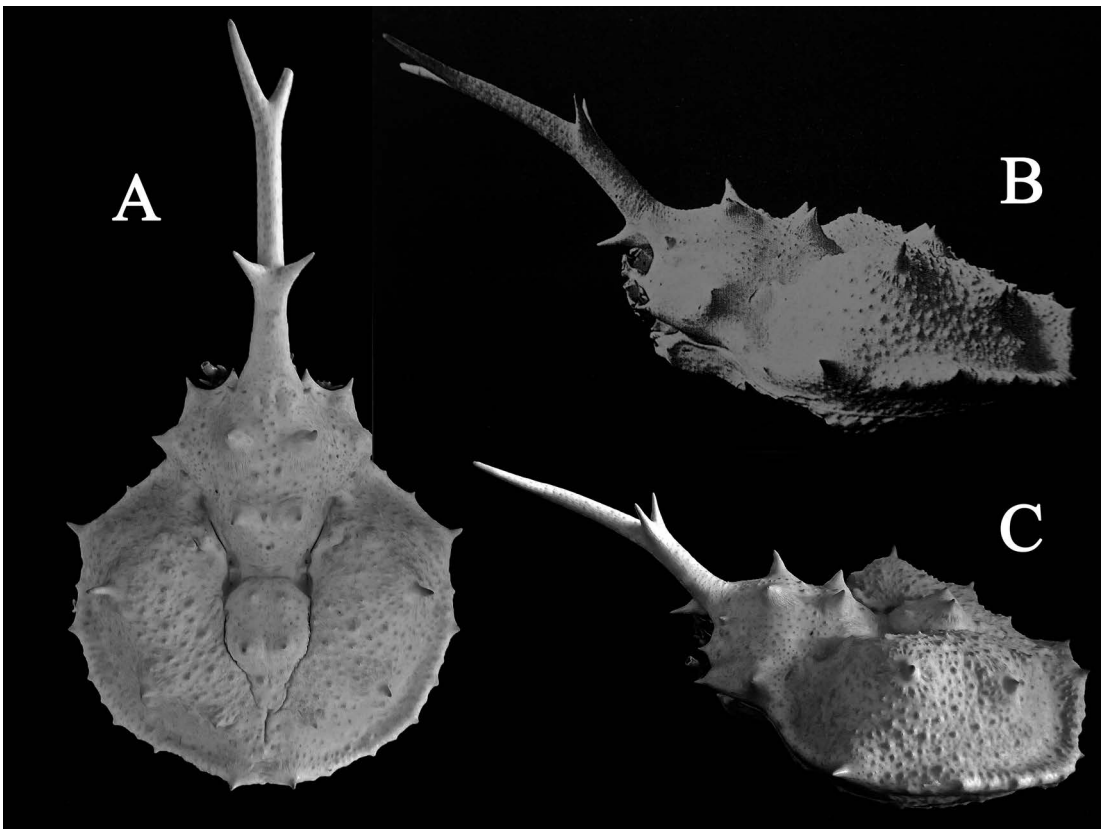

Fig. 1. *Lithodes ahyongi* sp. nov., holotype, female (NSMT–Cr 15694), 175 mm in postorbital carapace length. A–C: Carapace in different angles to show the contour and tuberculation (B: after Takeda and Nagai, 2004, fig. 6A).

Measurements. Postorbital carapace length, 175 mm; rostral length including distal branch, 134 mm; carapace width excluding marginal branchial spines, 165 mm; greatest width of carapace including marginal branchial spines (between first primary marginal branchial spines of both sides), 175 mm. Total length of left first ambulatory legs, 415 mm (ischium + merus, 155 mm; carpus, 75 mm; propodus, 120 mm; dactylus, 65 mm); total length of left second ambulatory leg, 445 mm (ischium + merus, 165 mm; carpus, 75 mm; propodus, 135 mm; dactylus, 70 mm).

Diagnosis. Species close to *Lithodes richeri* Macpherson, 1990. Rostrum long, rod–like, more than two thirds as long as postorbital carapace. Postorbital carapace length equal to greatest breadth of carapace between first primary marginal branchial spine of both sides. Gastric, hepatic and branchial regions distinct, strongly convex dorsally, each with some symmetrically arranged papillate tubercles.

Description of holotype. Carapace (Figs. 1, 2A–B, F): Postorbital carapace hardly longer than carapace width between base of first primary marginal branchial spine of both sides, and strictly equal to greatest width of carapace between tip of first primary marginal brnchial spine of both sides; hepatic margin shallowly concave, weakly divergent toward hepatic tubercle; right hepatic tubercle abnormal in shape, with a big swell; left branchial tubercle swollen at base, sharply pointed at tip, directed laterally; posterior slope of hepatic tubercle and anterior

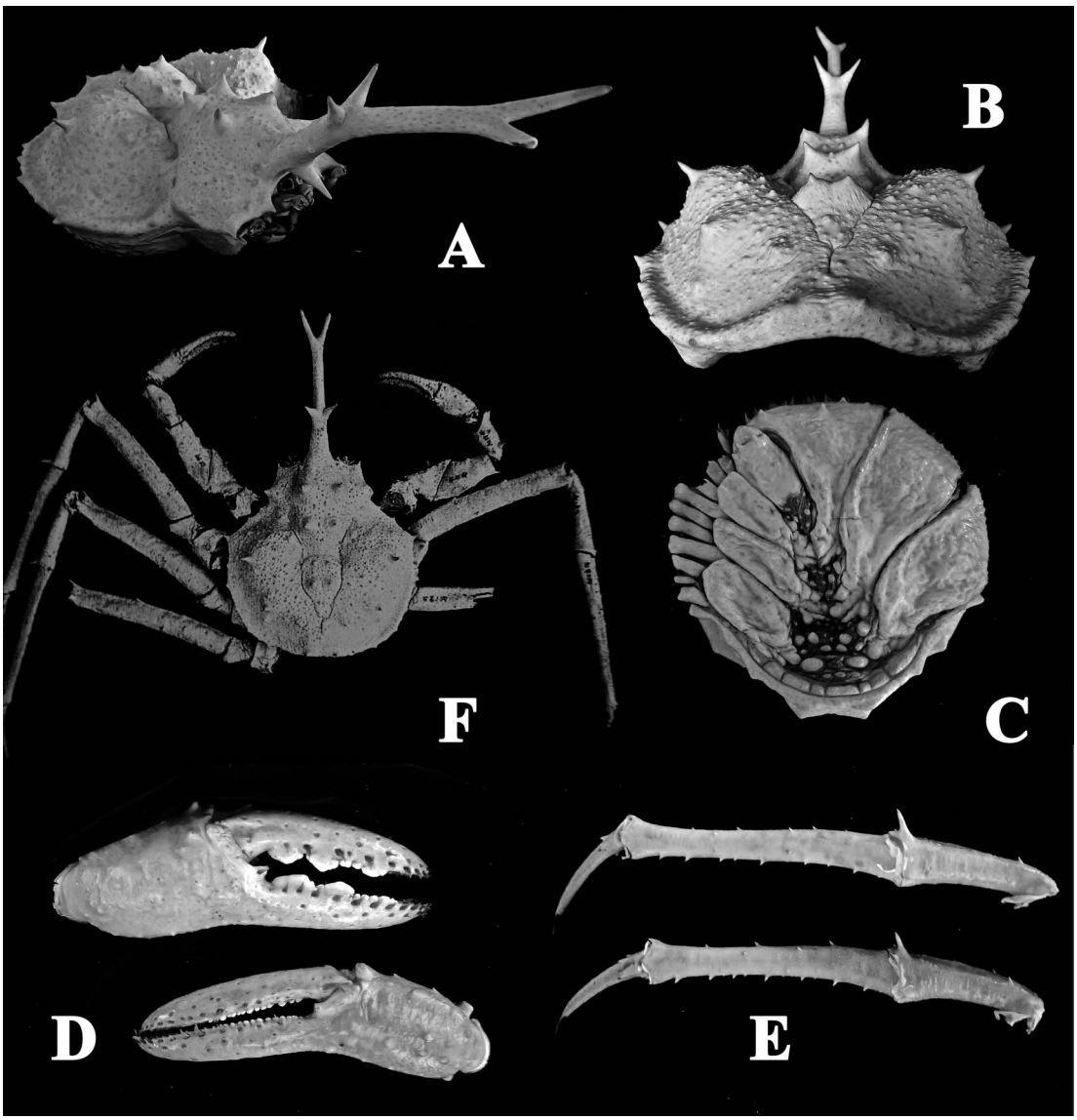

Fig. 2. *Lithodes ahyongi* sp. nov., holotype, female (NSMT–Cr15694), 175 mm in postorbital carapace length. A, B: Carapace in different angles. C: Abdomen. D: Both chelae in outer view. E: Distal three articles of left first and second ambulatory legs. F: Carapace with detached chelipeds and ambulatory legs (after Takeda and Nagai, 2004, fig. 6B).

branchial margin right-angled; anterior branchial margin straight, obliquely divergent toward first primary marginal branchial spine, taking one fourth as long as whole branchial margin; lateral and posterior branchial margins of both sides and intestinal margin distinctly subcircular in outline, thickened with submarginal depression, armed with several equidistant, small marginal tubercles; first primary marginal branchial spine wide at base, spiniform distally, making an anterolateral angle of branchial margin; second primary marginal branchial spine not prominent, hardly larger than other marginal tubercles.

Gastric, hepatic, cardiac and branchial regions

convex, covered with small warty, uniformly scattered granules of various sizes giving appearance of rough surface. Gastric region prominent, as high as branchial regions, oblong, armed with two pairs of stout, more or less papillate tubercles with sharp tip; anterior pair of tubercles slightly larger than the posterior; left tubercle of anterior pair obtuse at tip, tip of right side directed obliquely forward and outward; both tubercles of posterior pair suberect or weakly directed outward and backward, with distance between two tubercles being narrower than that of anterior pair.

Cardiac region armed with a pair of conical or somewhat papillate tubercles side by side, with sharp tip; anterior slope armed with a pair of small, but sharp subsidiary tubercles side by side closer to a deep transverse depression between cardiac and gastric regions; a longitudinal linear furrow sharply delimits boundary of cardiac and branchial regions at each side, extending anteriorly along posterior half of gastric region toward constriction between hepatic and branchial margins; liner furrows of both sides of cardiac region parallel to each other, strongly converging posteriorly to form an posterior appendix region.

Intestinal region rather depressed, not distinctly delimited, divided into two with a median longitudinal linear furrow from cardiac posterior appendix region along anterior half; intestinal carapace margin with a small spine–tipped tubercle at each lateral end; distance between tips of both spines wider than that of cardiac spines, and subequl to that of posterior pair of gastric spines.

Branchial region inflated most strongly at anterior spine; anterior branchial spine directed obliquely outward, arising from a broad papillate base; posterior spine short, with a small base, being placed at posterior one third, obliquely behind anterior spine; third spine small, tubercular, placed close to posterior end of cardiac region.

Rostrum (Figs. 1, 2A–B, F): Rod–like, more than two thirds of postorbital carapace length, directed obliquely upward, bifid at tip, armed with a pair of dorsolateral spiniform tubercles; proximal part to dorsolateral spines, about at basal one third, more strongly directed upward; distal branch about one and half times as long as dorsolateral spine, straight, directed obliquely downward; distal half of right branch broken off; a small tubercle at each side of base of rostrum. Outer orbital spine tubercular, directed forward; anterolateral spine tubercular, sharp at tip, directed obliquely forward, with tip reaching slightly behind level of tip of outer orbital spine.

Chelipeds (Fig. 2D, F): Slender, with the right being slightly larger. Ischium armed with two strong tubercles arranged fore and aft along lower margin, the former being twice as long as the posterior; lower margin of ischium slightly longer than lower margin of merus, about half as long as upper margin of merus. Merus armed with one strong terminal tubercle and three or four small tubercles on upper margin, two indistinct tubercles on outer surface, and one strong and some accessory tubercles on lower margin. Carpus as long as lower margin of merus, with several tubercles; two on distal margin and two on outer part stronger, the outer proximal one being the longest. Palm armed with some small tubercles on outer margin and on median part of outer surface; those on outer surface more or less arranged in two rows. In right (larger) chela, upper margin of palm two thirds as long as upper margin of movable finger; fingers weakly curved inward, with inner surfaces excavated, armed with two or three sharp teeth on cutting edges and many tufts of bristles along cutting edges. In left (smaller) chela, movable finger twice as long as upper margin of palm; fingers armed with a series of minute teeth, without large teeth.

Ambulatory legs (Fig. 2E–F): Incomplete except for first and second pairs. Both pairs slender, second pair longer than the first. Each ischium armed with two tubercles, one on outer surface and the other on subdistal part of lower margin. Each merus armed with three spines on upper margin, the proximalmost being smaller and becoming obsolete; terminal spine of upper margin strongly developed; outer surface armed with several scattered small tubercles mainly on

proximal half. Carpus slender, armed with a small tubercle close to proximal part of upper margin and a long subterminal spine that is directed obliquely outward and forward and as long as terminal spine of upper margin of merus. Propodus slender, slightly narrowing distally, armed with three or four small tubercles on upper margin and several on lower margin; two or three tubercles each on upper and lower surfaces; terminal tubercle of upper margin distinct. Dactylus slender, weakly curved, with anteroposteriorly depressed distal claw; four proximal tubercles, viz., two on upper and two on lower surfaces weakly developed so as to be tubercular and directed distally.

Abdomen (Fig. 2C): Well developed, covers whole sternal surface, twisted as usual.

Remarks. This species was recorded as *Lithodes richeri* Macpherson, 1990, by Takeda and Nagai (2004), with a little hesitation. The sole female specimen (postorbital carapace length, 175 mm) that was described as the holotype of the new species is much larger than, and its carapace contour differs somewhat from, the holotype male (postorbital carapace length, 83 mm) of *L. richeri*. As noted by Takeda and Nagai (2004), the carapace, the detached somewhat fragmentary chelipeds and ambulatory legs, and the abdomen are available for study. They were arranged to show the size balance (Takeda and Nagai, 2004, Fig. 6B; reproduced as Fig. 2F in this paper). The holotype is kept in good preservation state, but the distal half of the right branch of rostral bifurcation is broken off (Figs. 1, 2A–B).

It is well known that in the family Lithodidae, the shape, areolation and tuberculation of the carapace are remarkably variable according to the size in most of the genera, not only *Lithodes* but also *Paralithodes*, *Paralomis* and the related genera. Considering these variations, Takeda and Nagai (2004) concluded and made a comment that in due time the large specimens from New Caledonia and the small specimens from the Ceram Sea will contribute to the definite identification of the female in question.

In the monographic studies on the Lithodidae of New Zealand, Australia and the Ross Sea, Ahyong (2010) examined a long series of the *L. richeri* specimens and clearly indicated with detailed description and many photographs that the size of *L. richeri* is extended up to 143 mm in the postorbital carapace length, the carapace contour is consistently narrow pyriform and different from the Ceram Sea specimen, and that the dorsal tubercles are much smaller and not so strong as in the Ceram Sea specimen. Following the suggestion that the Ceram Sea specimen possibly represents an undescribed species, the specimen from the Ceram Sea in the collections of the National Museum of Nature and Science, Tokyo, is reexamined and the specific validity was confirmed. The present new species is 30th in the genus *Lithodes*.

Etymology. This species is dedicated to Dr. Shane T. Ahyong of the Australian Museum. Without his contribution to the Lithodidae in 2010, this species has been known under the misidentified name by Takeda and Nagai (2004).

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