Zoologica Scripta, Vol. 17, No. 1, pp. 69–75, 1988
Printed in Great Britain

0300–3256/88 $3.00 + .00
Pergamon Journals Ltd.

Three new species of *Paralomis* (Crustacea, Decapoda, Anomura, Lithodidae) from the Pacific and Antarctic Oceans

ENRIQUE MACPHERSON

Accepted 6 February 1987

Macpherson, E. 1988. Three new species of *Paralomis* (Crustacea, Decapoda, Anomura, Lithodidae) from the Pacific and Antarctic Oceans.—*Zool. Scr. 17:* 69–75.

Three new species of the lithodid genus *Paralomis* from the Sulawesi (Celebes) Islands, *P. ochthodes* sp.n., Chilean coast, *P. tuberipes* sp.n., and Antarctic Ocean, *P. birsteini* sp.n., are described and illustrated. The first two species have features that set them well apart from other species of the genus. Characters are also given to distinguish *P. birsteini* from the closely allied *P. spectabilis* Hansen (North Atlantic).

E. Macpherson, Instituto de Ciencias del Mar, P° Nacional s/n, E-08003 Barcelona, Spain.

Introduction

During a visit to the National Museum of Natural History (Smithsonian Institution), Washington, D.C., I examined, through the courtesy of Dr R. B. Manning, several unidentified lithodid specimens from the Pacific and Antarctic Oceans collected by the *Albatross* Expedition to the Philippines, the U.S.A. Fishery Mission to Chile and the United States Antarctic Research Program (USARP).

A total of three species is dealt with here, all being new. One of the species was also collected by the Soviet vessel *Ob* during a cruise off Scott Island in 1958.

The type material is deposited in the National Museum of Natural History (Smithsonian Institution) (USNM) and the Zoological Museum of the University of Moscow (ZMUM). Measurements given refer to the length of carapace, excluding rostrum (LC), and the maximum width of carapace (MW). All measurements were taken to 1 mm using a dial caliper.

Paralomis ochthodes sp.n. (Fig. 1)

Holotype. USNM 228831, ♂; LC = 72 mm; MW = 78 mm. *Albatross*, Philippine Expedition, Sta. 5651, 17 Dec. 1909, Gulf of Boni, 04°43.5′S, 121°23.2′E, 1281 m.

Description

Carapace somewhat pentagonal in its contour, slightly broader than long. Carapace, abdominal segments, chelipeds and ambulatory legs thickly covered with spinulous tubercles, with dense stiff setae on summit. Gastric region convex, with 5 spines: 1 median, 2 laterals near hepatic margin and 2 near gastro-cardiac furrow. Each spine on a rounded protuberance.

Cardiac region separated from gastric one by deep transverse furrow. Center of this area occupied by a rounded prominence, subdivided into 4, each with 1 spine on summit. Branchial regions with 2 rounded protuberances, one median, with 1 spine on summit, and second near posterior border, with 2 spines. Intestinal area with 2 spines. Pterygostomian region with 1 spine on terminal angle.

Rostrum composed of 2 lateral superior spines and 1 lower median spine. Latter weakly curved upwards, with some granules on ventral border.

Carapace margin with post-orbital spine not surpassing end of eyes. First antero-lateral spine smaller than postero-orbital. One small hepatic spine and 2 spines at level of gastro-cardiac furrow. One rounded protuberance, with 1 spine on summit, near posterior angle.

Eye stalk armed dorsally with small granules and with 1 spinule near cornea. First segment of antennal peduncle with 1 small terminal spine on outer border. Second segment with 1 strong spine and 3–4 smaller ones on outer margin, longest surpassing base of last segment of antennal peduncle and three spines on the inner side. Acicle with long median spine, surpassing end of antennal peduncle. Three long spines on outer margin, 4 smaller on inner side and 2–3 spinules on dorsal surface.

Chelipeds subequal in length, right stouter than left. Merus with long spines on terminal border. Carpus with 5 well developed spines on anterior margin. Palm with 5–6 anterior spines and several tubercles on external side. Fingers with some tufts of hairs.

Walking legs slender. Third leg almost 3 times length of carapace. First and second ambulatory legs subequal in length, longer than third. Basis with granules on terminal border. Ischium with spines on posterior margin. Merus of third leg almost 5 times as long as broad, 8 spines present on anterior border, 7 on posterior margin, one small spine on dorsal surface. Carpus 0.5 times length of merus, anteriorly furnished with a row of 5 spines, 2 on dorsal side and 3–4 on the posterior edge. Propodus 4 times as long as broad and 0.75 as long as merus. Anterior margin with a row of 10–11 spines and 11–12 spines on posterior border. Dactylus as long as propodus. Some spines on proximal margins. Two rows of tufts of hairs on anterior border.

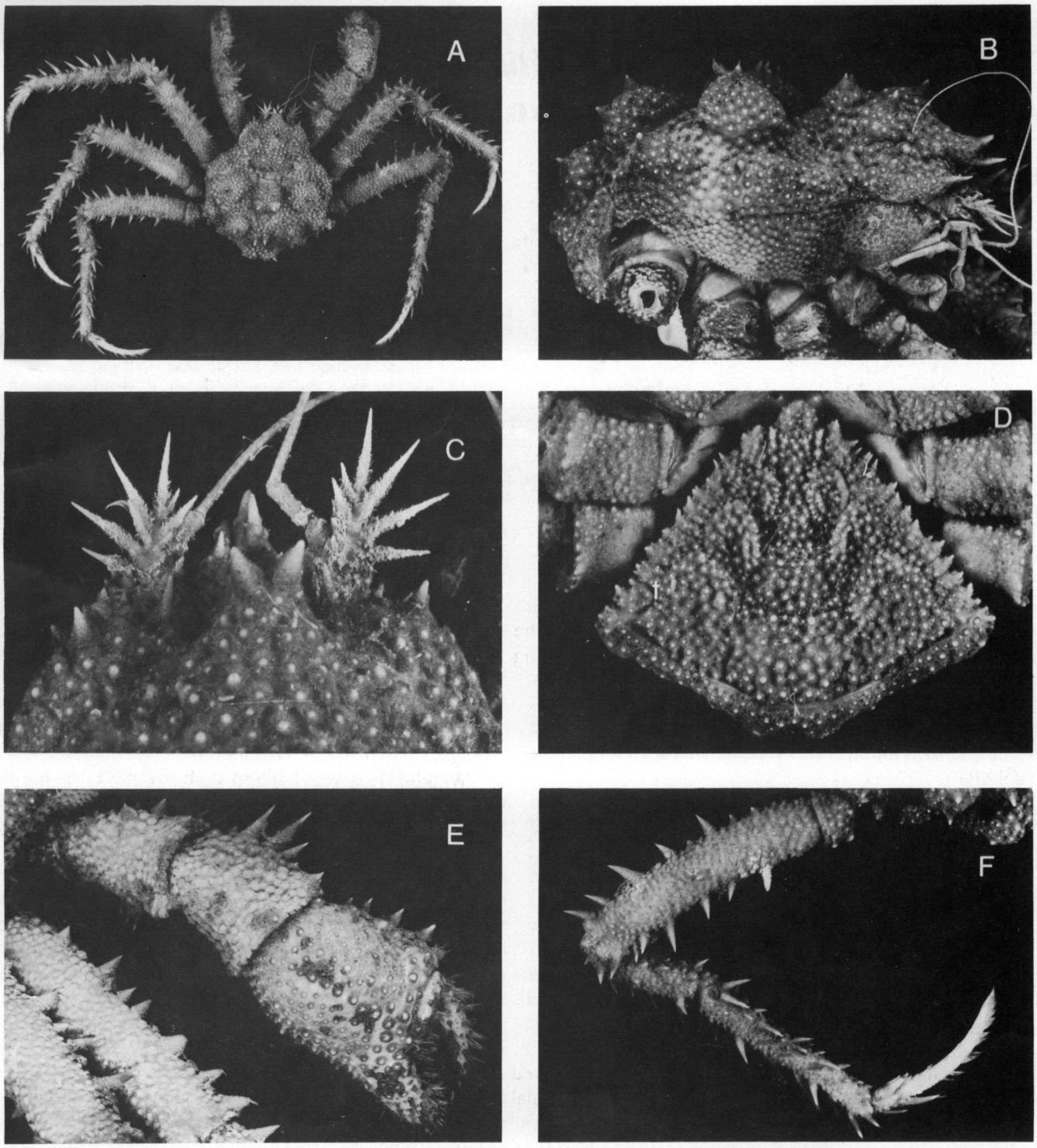

Fig. 1. Paralomis ochthodes sp.n., holotype, ♂.—*A*. Dorsal view.—*B*. Carapace, lateral view.—*C*. Acicle and anterior part of the carapace.—*D*. Abdomen.—*E*. Right cheliped.—*F*. Third left ambulatory leg.

Second (basal) abdominal segment fused into a single plate. Segments 3–5 with median plate entire, lateral plates distinct and paired and marginal plates subdivided and not fused with laterals.

Etymology. From the Greek "ochthos", hilly, any elevation.

Remarks

Paralomis ochthodes is the first occurrence of the genus in Indonesian waters and has features that set it well apart from other species of the genus. No other known member of *Paralomis* possess the peculiar armature of carapace, abdominal segments and pereiopods. Other Indo-Pacific species with a tuberculate carapace, such as *P. pacifica* Sakai, *P. medipacifica* Takeda, *P. haigae* Eldredge, *P. seagranti* Eldredge, *P. investigatoris* Alcock & Anderson, *P. indica* Alcock & Anderson and *P. dofleini* Balss are covered with large or small rounded tubercles, but without rounded protuberances on the carapace.

Only *P. japonica* Balss has some obtuse processes on the dorsal surface of the carapace. These processes are covered with clusters of tubercles of different sizes. On the other hand, ambulatory legs are armed with conical

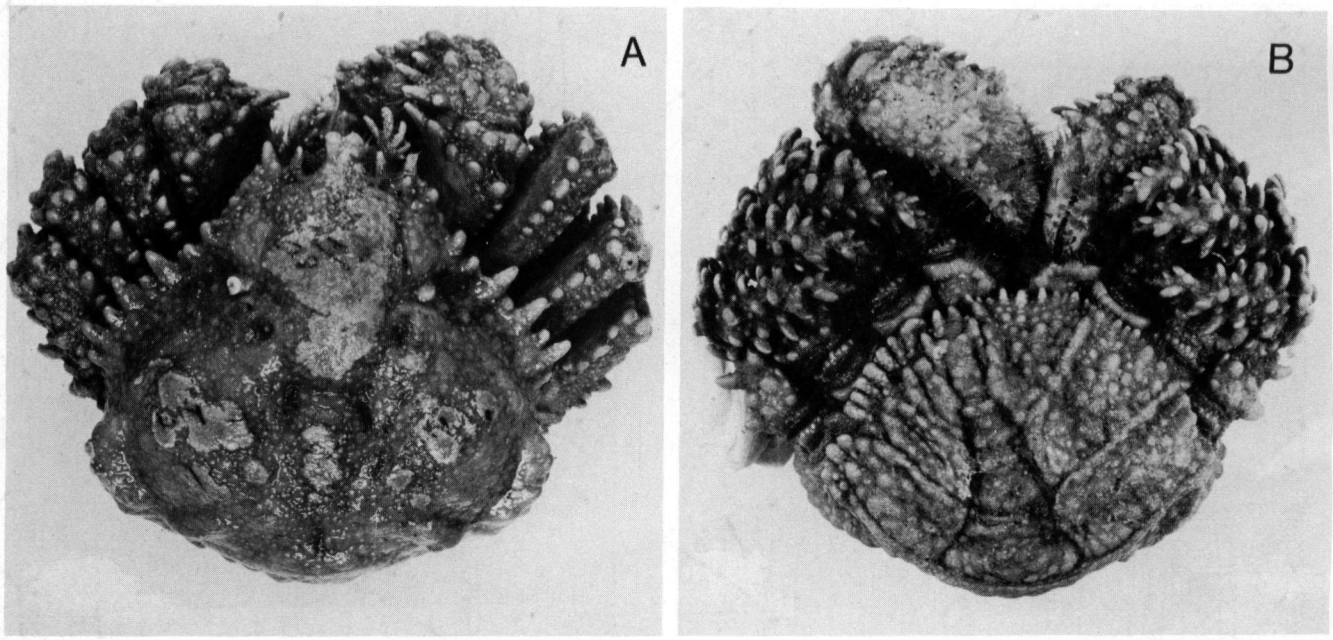

Fig. 2. Paralomis tuberipes sp.n., holotype, ♀ ov.—*A*. Dorsal view.—*B*. Ventral view.

processes. Among other differences, in the new species the number and size of protuberances is different and the tubercles are not clustered. Furthermore, the walking legs have rows of spines, without conical processes.

***Paralomis tuberipes* sp.n.** (Figs. 2, 3a–c)

Holotype. USNM 228829, ♀ ov.; LC = 41 mm, MW = 47 mm. U.S.A. Fishery Mission to Chile 1944–1945, Sta. 42388, 25 Jan. 1945, Huichas Islands (Puerto Aguirre), 45°10.3′S, 73°33′W, no depth recorded.

Description

Carapace pentagonal, a little broader than long, covered with granules of different sizes without setae over summit. Gastric area moderately convex, slightly more prominent than cardiac and branchial regions. Cardiac area more or less triangular, as prominent as branchials, separated from gastric one by transverse deep furrow. Branchial regions separated from cardiac one by distinctive grooves.

Rostrum terminating in 1 median inferior and 2 lateral superior spines, latter rounded and covered with small granules. Dorsally, 1 median granule just proximal to lateral spines. Latter pair reaching end of eyes. Underside of inferior spine with small granules. Post-orbital spine not surpassing eyes and slightly shorter than first antero-lateral one. 9–10 rounded spines on antero-lateral border of carapace. Postero-lateral and posterior margins without spines, covered with granules of different sizes. A prominent crescentic rounded ridge on each postero-lateral margin.

Eye stalks with some dorsal granules and 1 small spinule near cornea. First segment of antennal peduncle with 1 small spine on outer border. Second segment with 1 long spine surpassing end of penultimate segment, and 1–2 tubercles on outer margin. Acicle with 1 terminal spine surpassing end of antennal peduncle, 3 spines on outer margin and 2–3 on inner side.

Chelipeds subequal in length, right slightly stouter than left. Tubercles on dorsal and terminal borders of merus. Outer and dorsal margins of carpus and palm armed with granules and rounded spines, more acute on dorsal edge. Fingers with tufts of soft hairs.

Walking legs short. Third ambulatory leg as long as greatest width of carapace. First and second leg slightly longer than third. Merus of third leg more than 2 times as long as broad and 1.2 times as long as carpus. Propodus as long as carpus and 1.6 times as long as dactylus. Long rounded spines on anterior, posterior and dorsal margins of merus, carpus and propodus, being larger on the latter. Ventral margins smooth. Dactylus slightly curved, with some small rounded spines on proximal margins and tufts of hairs on terminal half.

Abdominal segments covered with small granules of variable size. Marginal plates on somite 3 fused to laterals.

Etymology. From the Latin "tuber", tubercle, and "pes", foot.

Remarks

The species is distinguished from all other described species of *Paralomis* by the armature of the carapace, chelipeds and walking legs, except for the long rounded spines of the legs, which are similar to those of *Phyllolithodes papillosus* Brandt. Of the species of the genus from the southeast Pacific, *P. granulosa* Jacquinot, *P. chilensis* Andrade, *P. inca* Haig and *P. papillata* (Benedict) (see Haig 1974; Andrade 1980; del Solar 1981; Takeda *et al.* 1984), the closest relative is *P. granulosa* (Figs. 3d, e). However, it differs chiefly in the following respects.

—The granulation on the carapace is very different. *P. granulosa* is covered by clustered granules, whereas in the new species the granules are simple. On the other hand, in

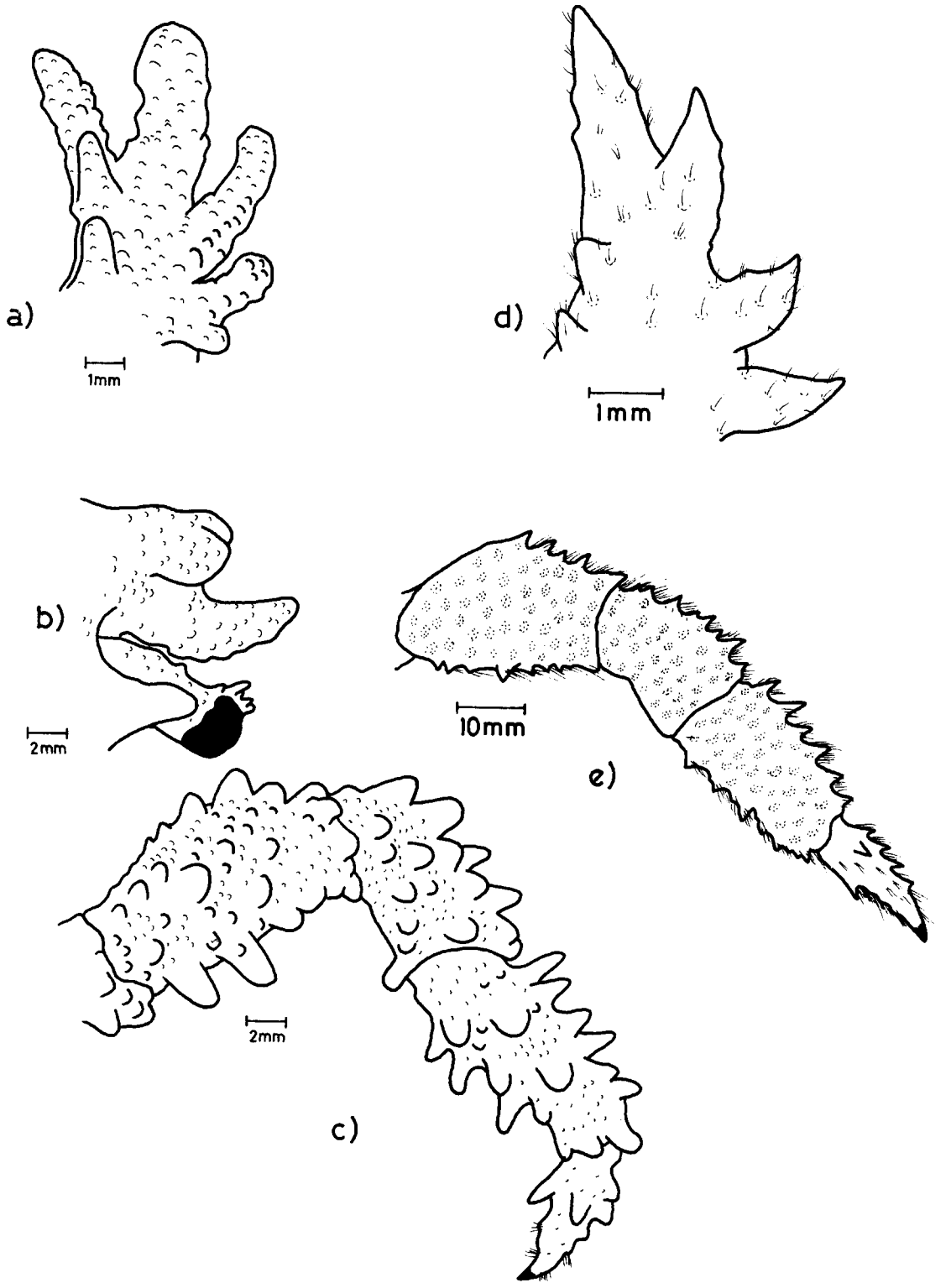

Fig. 3.—a–c. Paralomis tuberipes sp.n., holotype ♀ ov.—*a*. Right antennal acicle.—*b*. Rostrum, lateral view.—*c*. Third right ambulatory leg.—*d–e. Paralomis granulosa* (Jacquinot), ♀, Beagle Channel, LC = 76 mm, MW = 82 mm.—*d*. Right antennal acicle.—*e*. Third ambulatory leg.

P. tuberipes the granules are more prominent and numerous than in *P. granulosa*.

—The spines of the rostrum and antero-lateral border of the carapace are rounded in the new species, whereas they are more acute in *P. granulosa*.

—The chelipeds and ambulatory legs are covered with clustered granules and have acute spines in *P. granulosa*, whereas in the new species they are covered only with long rounded spines.

—The acicles are different. The spines are rounded in the new species but acute in *P. granulosa*. On the other hand, in *P. tuberipes* the acicle has 3 long rounded spines on the inner margin, whereas that of *P. granulosa* has 2–4 small acute spines.

***Paralomis birsteini* sp.n.** (Figs. 4, 5a–e)

Paralomis spectabilis; Birstein & Vinogradov 1967, p. 390, figs. 1, 2 (not Hansen, 1908).

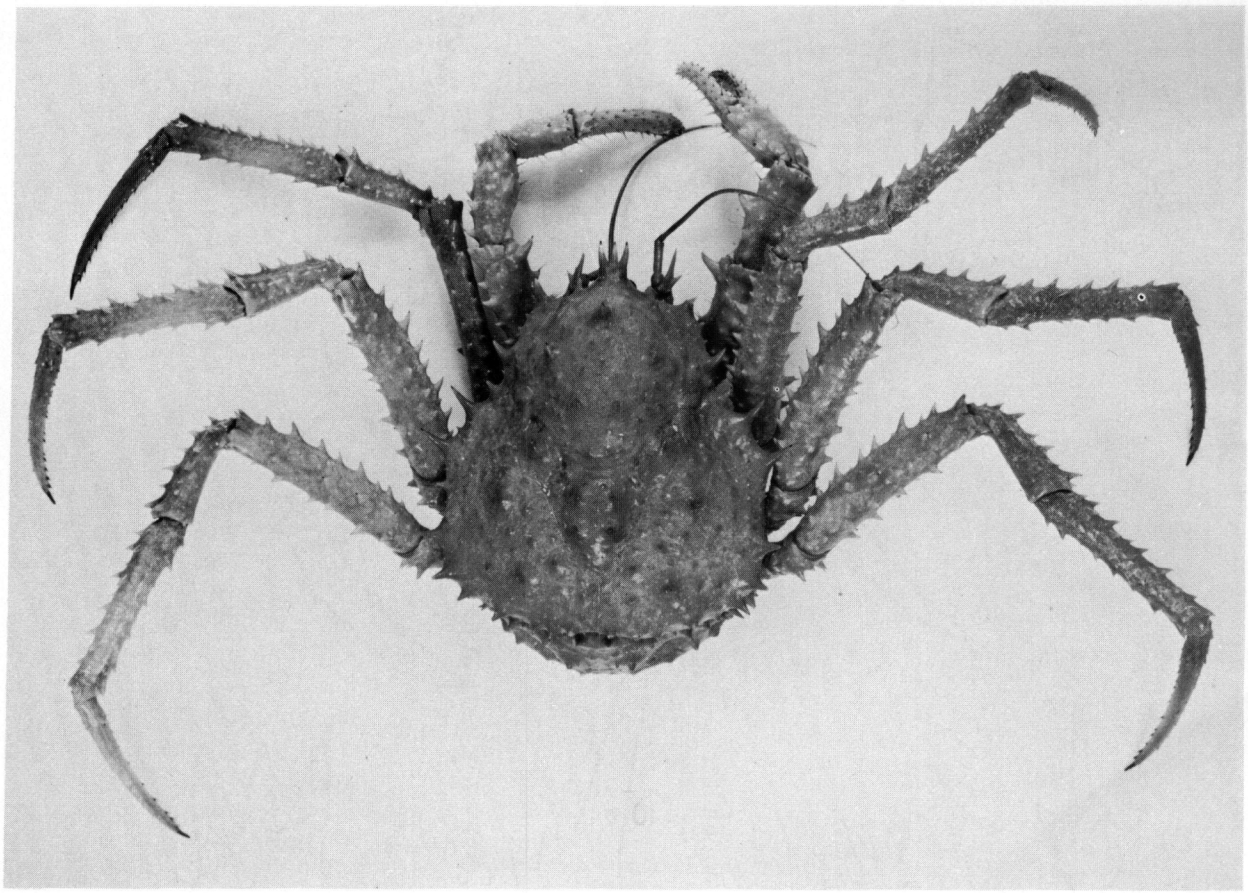

Fig. 4. Paralomis birsteini sp.n., holotype, ♀, dorsal view.

Holotype. USNM 228830, ♀; LC = 55 mm; MW = 53 mm. USARP, Eltanin Cruise 27, Sta. 1946, 2 Feb. 1967, 67°29′S, 179°55′W, 1080 m.

Paratypes. ZMUM 2518, 2 ♂♂; LC = 67, 78 mm; MW = 67, 74 mm; 3 ♂♂ (broken). R/S Ob, Sta. 377, 1 Apr. 1958, 67°23′S, 179°53′W, 500–900 m.

Description

Carapace somewhat pentagonal in its contour, as long as broad, dorsal surface covered with granules of small size and several spines. Gastric region convex, more prominent than other areas. One unpaired spine in front of central portion, 3 pairs of shorter spines out towards lateral margins. Cardiac region, separated from gastric one by deep transverse furrow, with 2 pairs of small spines. Branchial region with 1 small spine near cervical groove, 1, more acute, in center of area, and 2 near postero-lateral angle.

Rostrum terminating in 1 median inferior and 2 lateral superior spines, surpassing end of eyes. Median lower spine weakly curved upward, without granules on its ventral side; dorsal pair more curved and directly obliquely upward.

Post-ocular spine small, not surpassing end of eyes. First antero-lateral spine strong. Carapace margins with 5–6 spines of different sizes on anterior half and 4 on postero-lateral angle. Some small spines on posterior margin.

Eye stalks with several dorsal granules near cornea. First segment of antennal peduncle with 1 small spine on outer border. Second segment with 1 strong spine and 1 small tubercle on outer margin. Acicle with single strong terminal spine, not surpassing end of antennal peduncle. One or two smaller spines on outer margin and 1–2 very small spinules on inner side.

Chelipeds subequal in length, right stouter than left. Merus and carpus armed with several spines, stronger on dorsal margin. Hands with small spines on dorsal edge. Several granules on surface of articles. Tufts of hairs on fingers.

Walking legs long, slender and depressed. Third leg more than 2 times length of carapace, shorter than first and second. Merus of third leg 1.7 times as long as carpus and 4–5 times as long as broad. About 10–12 distinct spines present on anterior margin, 6–8 smaller on posterior edge. Carpus only with a row of spines (9–10) on anterior margin. Propodus usually 5 times as long as broad and 0.8 times length of merus, with 9–11 spines on anterior border and 6–7 on posterior one. Several spines on dorsal surface of merus, carpus and propodus, being smaller on last article. Ventral margins smooth. Dactylus longer than propodus, with small spines on proximal portion and a row of 12–15 spinules on posterior margin.

Abdominal segments covered with granules of different sizes. Small spines on external edges of second segment. One small dimple on either side of median line. Marginal plates of segments 3–5 not subdivided, not fused with lateral ones.

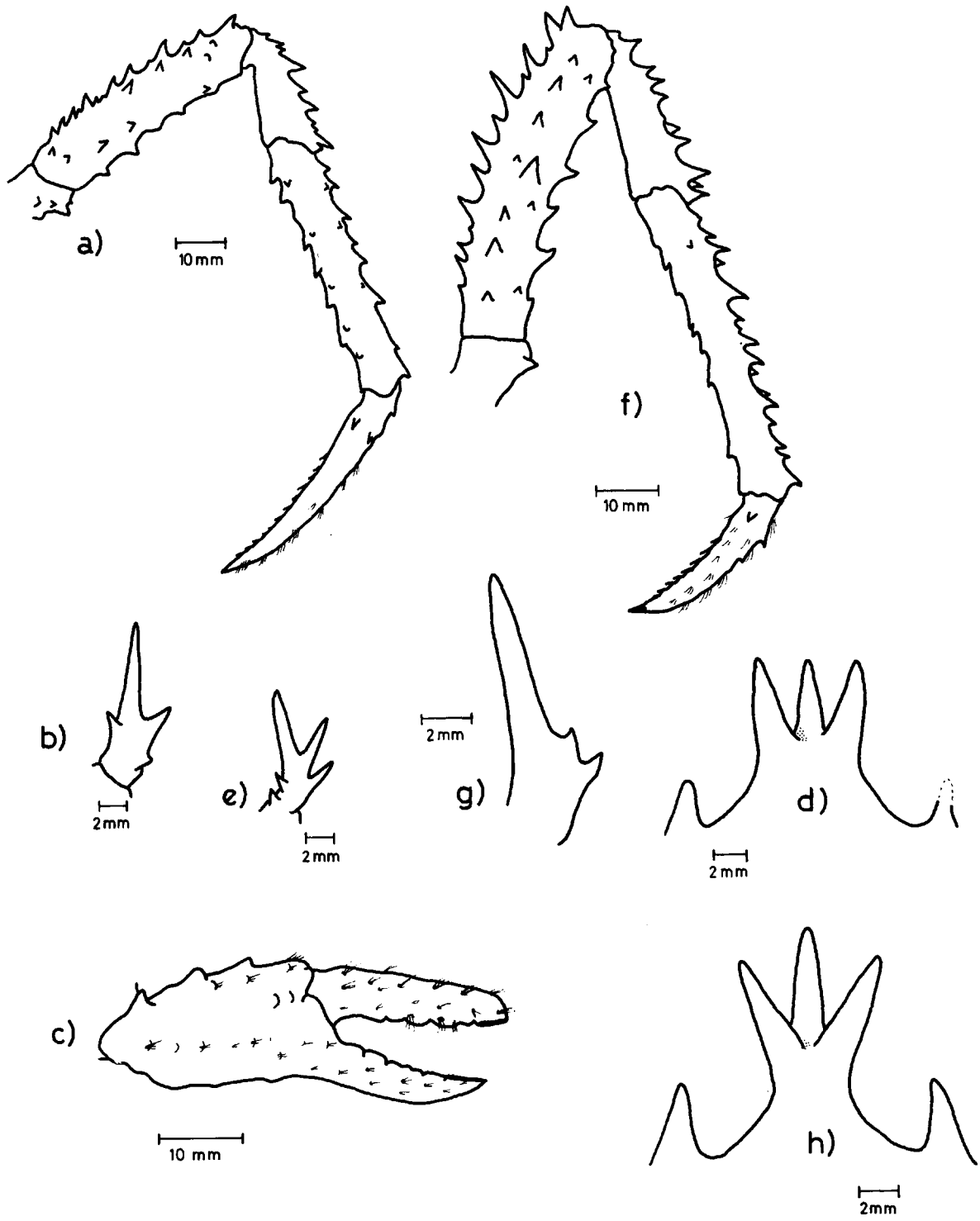

Fig. 5.—a–e. Paralomis birsteini sp.n.—*a–d.* Holotype, ♀.—*a.* Third right ambulatory leg.—*b.* Right antennal acicle.—*c.* Right cheliped.—*d.* Rostrum, dorsal view.—*e.* Paratype, ♂, LC = 67 mm. Right antennal acicle.—*f–h. Paralomis spectabilis* Hansen, lectotype, ♀ ov., LC = 47 mm, MW = 45 mm, Danish Ingolf Exp., Sta. 96.—*f.* Third right ambulatory leg.—*g.* Right antennal acicle.—*h.* Rostrum, dorsal view.

Etymology. This species is dedicated in homage to Dr Y. A. Birstein from the Department of Invertebrate Zoology of the State University of Moscow, for his important contributions to the knowledge of the Lithodidae.

Remarks

Among the known species of the genus, *P. spectabilis* Hansen, 1908 (North Atlantic) is the closest kin of the new species. *P. spectabilis* is, however, distinguished from *P. birsteini* in the following ways.

In *P. spectabilis* (1) the rostrum is slightly pedunculated, (2) the dactylus of the walking legs is shorter than the propodus and (3) the acicle has the inner border smooth (Figs. 5f–h). In contrast to these features, in *P. birsteini* (1) the rostrum is not pedunculated, (2) the ambulatory legs are much more slender and the dactylus is longer than the propodus and (3) the acicle has 1–2 small spines on the inner margin.

Acknowledgements

I am grateful to Dr R. B. Manning (USNM) for offering me the

opportunity and facilities to study these interesting specimens and for the revision of the manuscript and to Dr Y. Geptner (ZMUM) for his assistance during my visit to Moscow. Thanks are also extended to Dr T. Wolff from the Zoological Museum of Copenhagen for the loan of the type material of *P. spectabilis*. The photographs were taken by J. Biosca. This study has been supported by the U.S.A.–Spain Scientific Cooperative Program and the Comissio Interdepartamental de Recerca i Innovacio Tecnologica (CIRIT).

References

Andrade, H. 1980. Nueva especie de *Paralomis* en aguas de Chile: *Paralomis chilensis* n. sp.—*Boln Mus. nac. Hist. nat. Chile 37:* 269–273.

Birstein, Ya. & Vinogradov, L. G. 1972. Occurrence of *Paralomis spectabilis* Hansen (Crustacea, Decapoda, Anomura) in the Antarctic. Explorations of the fauna of the sea. IV (XII).—*Biol. Res. Soviet Antarct. Exped. 3:* 390–398 (Israel Program for Scientific Translations).

Del Solar, E. 1981. Lithodidae, nueva familia de cangrejos gigantes en el Peru.—*Boln Lima 14:* 1–16.

Haig, J. 1974. Observations on the lithodid crabs of Peru, with description of two new species.—*Bull. Sth. Calif. Acad. Sci. 73:* 152–164.

Takeda, M., Hiramoto, K. & Suzuki, Y. 1984. Additional material of *Paralomis cristata* Takeda and Ohta (Crustacea, Decapoda) from Suruga Bay, Japan.—*Bull. biogeogr. Soc. Japan 39:* 27–31.