

## A NEW SPECIES OF CHIROSTYLID CRUSTACEAN (DECAPODA: ANOMURA) FROM OFF THE WEST COAST OF NORTH AMERICA

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*Abstract.*—A new chirostyliid, *Gastroptychus iaspis*, is described from depths of 600–1189 m off Mexico, California and Oregon. Its affinities to *Gastroptychus defensa* (Benedict, 1902) from the Galapagos Islands are discussed based on examination of two syntypes of that species. This is the fifth species of the genus in the eastern Pacific.

In the course of studying benthic communities of deep hard bottom seamounts Dr. Amatzia Genin of the Hebrew University of Jerusalem, then of the Scripps Institution of Oceanography, has observed specimens of an anomuran crustacean belonging to the chirostyliid genus *Gastroptychus* on Jasper Seamount off Baja California. According to him, this chirostyliid was a very important member of the seamount community at the 600 to 1100 m depth interval, usually seen on gorgonians and antipatharians (A. Genin, pers. comm.). Two specimens of this chirostyliid were collected; one is deposited in the Smithsonian Institution (USNM) and the other in the Allan Hancock Foundation (AHF). The specimens were made available for study by the courtesy of Dr. Genin and Dr. Austin B. Williams of the National Marine Fisheries Service. In the meantime one of us (JH) found that the following specimens were identical with those from the Jasper Seamount: four AHF specimens taken in 950–1189 m off California, and reported by Wicksten (1982:245) as *Chirostylus* sp.; 12 USNM specimens on loan to AHF, collected off Oregon in 914 m by the *Commando*, U.S. Bureau of Commercial Fisheries—AEC Project; and material from British Columbia and Washington described and illustrated as *Chirostylus* sp. by Hart (1982:166, fig. 65). Their identity was confirmed also by K. Baba during a visit

to the Allan Hancock Foundation in 1989 and they represent an undescribed species. The measurements of the specimens examined are given in parentheses under "Material," indicating postorbital carapace lengths.

*Gastroptychus iaspis*, new species  
Figs. 1, 2

*Chirostylus* sp. Wicksten, 1982: 245 (in Table 1).

*Chirostylus* sp. Hart, 1982: 166, fig. 65.

*Type material.*—MEXICO: 1 ovig. ♀ (17.7 mm), holotype, AHF 861, Jasper seamount off Baja California (30°25.6'N, 122°43.7'W to 30°25.5'N, 122°44.3'W), 950–840 m, rock dredge, 1 Nov 1986, *Seatomado* Expedition Sta 12; 1 ♂ (26.5 mm), USNM 234412, Jasper Seamount (30°25'N, 122°45'W), 600–800 m, dredge, 20 Oct 1984. CALIFORNIA: 1 ♂ (30.0 mm), 2 ovig. ♀ (24.0, 25.5 mm), AHF 787, W of Tanner Bank (32°46'41"N, 119°59'23"W), 950 m, baited fish traps, 1978, coll. commercial fishing boat; 1 ovig. ♀ (25.0 mm), AHF 7720, off (inside) San Clemente Island (approx. 33°N, 118°W), 1189 m, sablefish trap, 25 July 1977, coll. boat *Pete Boy*. OREGON: 7 ♂ (11.9–18.5 mm), 3 ovig. ♀ (19.8–21.0 mm), 2 ♀ (15.0, 15.4 mm), USNM 243911, SW of Columbia River mouth (46°02.7'N, 124°57.3'W), 914 m, 72-foot shrimp trawl,

30 May 1964, coll. *Commando*, U.S. Bureau of Commercial Fisheries-AEC Project.

*Description.*—Rostrum nearly one-third to barely one-fourth as long as postorbital carapace length, rostral base laterally ridged, rostral spine curving dorsad. Outer orbital angle rounded. Carapace, excluding rostrum, 1.1–1.2 times as long as its greatest width. Lateral margins strongly convex in posterior two-thirds of length, with distinct constriction at one-third from anterior end, bearing spines as figured (Fig. 1a, b), anterolateral spine much pronounced. Gastric region convex, distinctly separated from cardiac region by wide depression (cervical groove), indistinctly from anterior branchial region, bearing 6 prominent spines in hexagonal arrangement with another spine in center (left posterior spine of hexagon set well back from level of right posterior one in holotype), occasionally accompanied by few additional smaller spines inside, beside or behind hexagon. Mid-cervical groove slightly anterior to midlength of carapace. Anterior branchial region with 2 convexities bordered by deep groove, each with 1 or 2 pronounced central spines, occasionally with small accompanying spine, anterior convexity weakly elevated and indistinctly separated from gastric region, posterior convexity well elevated and bordered by deep posterior groove. Cardiac region indistinctly defined, with pair of prominent anterior spines, usually followed by few small or somewhat pronounced spines. Branchial and intestinal spines as figured (Fig. 1a); elevation along posterior margin of carapace with several erect spines. Pterygostomian flap spinulose, anterior end with prominent spine, occasionally accompanied by second smaller spine behind it.

First segment of abdomen bearing posterior transverse elevation with 5–11 spines (usually 5, 6 or 7, rarely 8, 9 or 11), lacking pleura. Second segment having tergum with low hump-like elevations in transverse line, each elevation with few simple or pointed granules, occasionally lacking granules,

pleuron separated by deep groove from tergum, tapering, transversely hollowed, bearing elevation with 1–5 small dorsal spines along anterolateral margin. Third and fourth segments similar, terga feebly elevated, pleura more weakly tapering than preceding; pleuron of third segment with 1 or 2, or, rarely 3 or 4 small posterior marginal spines in addition to terminal one, rarely spineless; that of fourth segment usually tapering, occasionally rounded, with 2 or 3 (rarely 1 or 4) posterior marginal spines or without spines. Fifth segment having pleuron ending in rounded margin, bearing 1–7 (usually 2 or 3) small spines on posterolateral margin, occasionally with 1 or 2 small spines on surface; tergum unarmed. Tergum of sixth segment usually with 3 prominent posterior marginal and 6 dorsal spines, rarely with few more spines; pleuron usually spineless, rarely with few (on surface) to 7 or 8 spines (on posterolateral margin). Telson divided into anterior and posterior lobes, posterior lobe slightly wider than, and barely twice as long as anterior lobe, fully twice as wide as long.

Eyes barely reaching end of rostral spine, cornea dilated and distinctly wider than remaining eyestalk.

Basal segment of antennule simple, spineless. Antennal peduncle having second segment with small distolateral spine, ultimate segment about 3 times as long as penultimate, bearing slender distoventral spine, penultimate segment with tiny distoventral spine; antennal scale rudimentary.

Third maxilliped having coxa with slender but prominent ventral spine; ischium half as long as merus, with 12–22 (average 16) denticles on mesial ridge; merus with dorsodistal spine; carpus with distinct distolateral spine; propodus shorter than merus, with ventral margin somewhat expanded on distal portion.

Sternite at base of third maxilliped bluntly produced on anteromedian margin, usually with pair of small, low spines somewhat posterior to anterior end, rarely with 3 ad-

ditional spines: 2 on anterior margin and 1 somewhat posterior to left anterior ventral spine. Next sternite at base of cheliped with 2 pairs of strong spines on anterolateral margins, pair of very tiny, tubercle-like spines between first lateral pair, and another pair of larger spines between posterior limits of posterolateral margins.

Chelipeds 5 times as long as carapace, subcylindrical, sparsely provided with long coarse setae. Coxa ventrally bearing well developed distomesial spine and few tubercular processes. Merus with 6 regular rows of spines. Carpus equalling length of palm, with lines of spines continued from merus. Palm, exclusive of spines, 7 times longer than wide, 1.3 times as long as movable finger, bearing 7 regular rows of spines: 2 dorsal, 1 mesial, 1 lateral, 1 ventromesial, and 2 ventral. Fingers largely gaping, slender, subcylindrical; opposable margins with line of tubercular teeth, prominent truncate basal tooth on movable finger opposed to 2 somewhat smaller ones on fixed finger; mesial margin of movable finger with few tiny spines proximally.

Walking legs slender, laterally compressed distally, sparsely provided with stiff setae. First walking leg falling short of end of carpus of cheliped when extended forward; coxa with 2 prominent mesial marginal spines near ventral surface; merus about twice as long as carpus, 1.5 times as long as propodus, bearing 6 rows of spines continued onto carpus; propodus with dorsal, mesial and dorsolateral spines in rows, all small and fixed, dorsolateral ones less numerous; ventral margin with more than 20 movable slender, closely set spinules including distal pair; dactylus distinctly less than one-third length of propodus, terminating in acute curved corneous claw, ventrally bearing 11 or 12 slender spinules. Second walking leg similar to first, third walking leg with longer propodus.

Diameters of ova measuring 1.7 mm in holotype, 1.1–1.2 mm in paratypes.

Male with 2 pairs of gonopods similar to

those illustrated for *G. hawaiiensis* Baba, 1977 (see Baba 1977a:fig. 2f, g).

*Etymology.*—The specific name is a noun in apposition from the Greek “iaspis,” jasper, alluding to the type locality.

*Remarks.*—From the eastern Pacific Ocean four species of *Gastroptychus* are known (Baba 1977b:205). The new species resembles *G. defensa* (Benedict, 1902) from the Galapagos Islands in the arrangement of the gastric spines and the less spinose terga of the abdominal segments. Although the original description of the latter species is brief, the following characters seem unique to *G. defensa*: 1) the carapace has more prominent spines than in *G. iaspis* and fewer interspersed small ones on the posterior dorsal surface; 2) the second abdominal segment bears prominent spines on the tergum, and the next three segments bear distinct spines on the pleura; 3) the telson has a longer posterior lobe (if Benedict's figure 44 is correctly depicted); and 4) the branchial region of the carapace bears less numerous but prominent dorsal spines. In addition, Chace's notes on *G. defensa* (see Haig 1968: 276) concerning the sternite at the base of the cheliped that lacks tubercles between the lateral spines, and the chelipeds that have the spination widely spaced and irregular, also seem helpful to separate it from the new species.

Examination of two syntypes (one male and one female, USNM 20563) of *Gastroptychus defensa* taken from Albatross Station 2818, northeast of Indefatigable Island, Galapagos Islands, in 717 m (392 fms), showed that most of the above characteristics are true in the male (12.9 mm in postorbital carapace length) upon which Benedict's description is based. In the female (8.7 mm), however, the carapace, and its posterior half in particular, bears fewer small dorsal spines interspersed among prominent ones; spines on the chelipeds are fewer and widely spaced between spines on rows; the spinules on the abdominal pleura are very reduced in both size and number so as to be discernible only

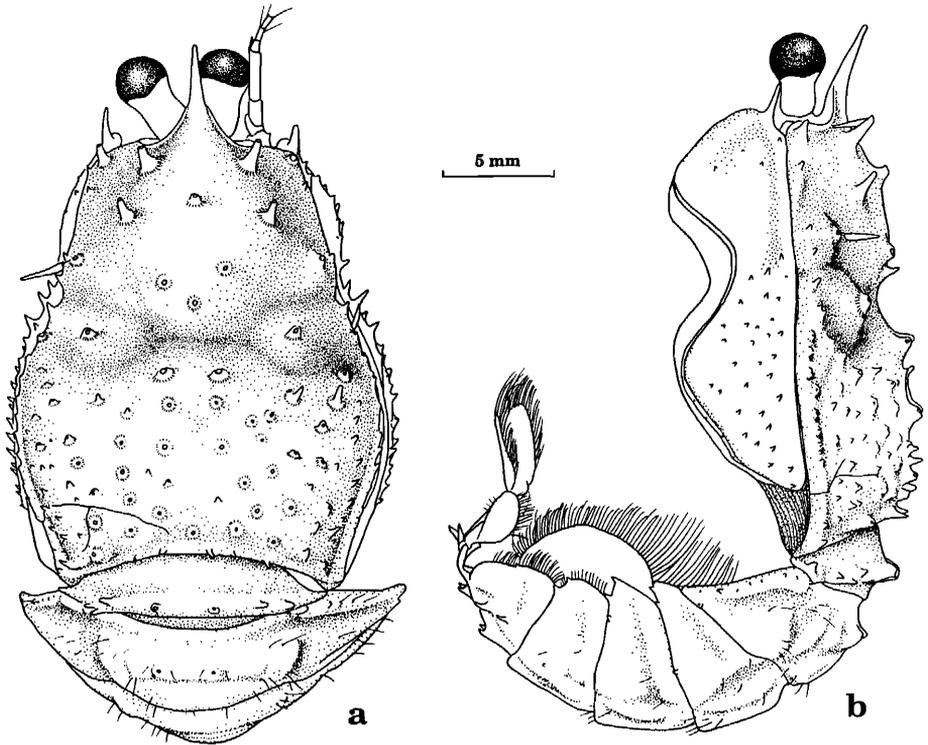


Fig. 1. *Gastroptychus iaspis*, new species, ovigerous female holotype (AHF 861): a, carapace and abdomen, dorsal view; b: same, lateral view.

under high magnification; the terga of the third to fifth segments are elevated from levels of pleura, bearing a distinct spine on the lateral extremity; the sixth abdominal tergum is less spinose; width-length ratio of the posterior lobe of the telson is 1.87 in the female syntype, 1.84 in the male syntype, instead of 2.25 in the new species. In both syntypes, the spination of the carapace is much more pronounced than in the new species; in particular, prominent spines on the posterior half of the carapace are arranged in four longitudinal rows (Fig. 3a, b); chelipeds are comparatively slender, and the spines are arranged more irregularly than in the new species; the carapace is relatively long, the length-width ratios being 1.32 in the male syntype, 1.28 in the female syntype, while 1.18 (average) in the males and 1.13 (average) in the females of the new species.

The hexagonal arrangement of the gastric spines is also known in the Indo-West Pacific *G. hendersoni* (Alcock & Anderson, 1899), though a few additional accompanying spinules are occasionally present within or directly behind the hexagon (Alcock & Anderson 1899: pl. 45: figs. 2, 2a; Baba 1988:14). That species differs from the new species in the very spinose pleura of the abdominal segments.

*Color.*—Hart (1982:166) noted in detail the color of living specimens from British Columbia and Washington. The San Clemente specimen (AHF 7720) when fresh, was dark carrot-orange in color (M. K. Wicksten, pers. comm.).

#### Key to the eastern Pacific species of *Gastroptychus*

1. Abdominal segments very spinose      2

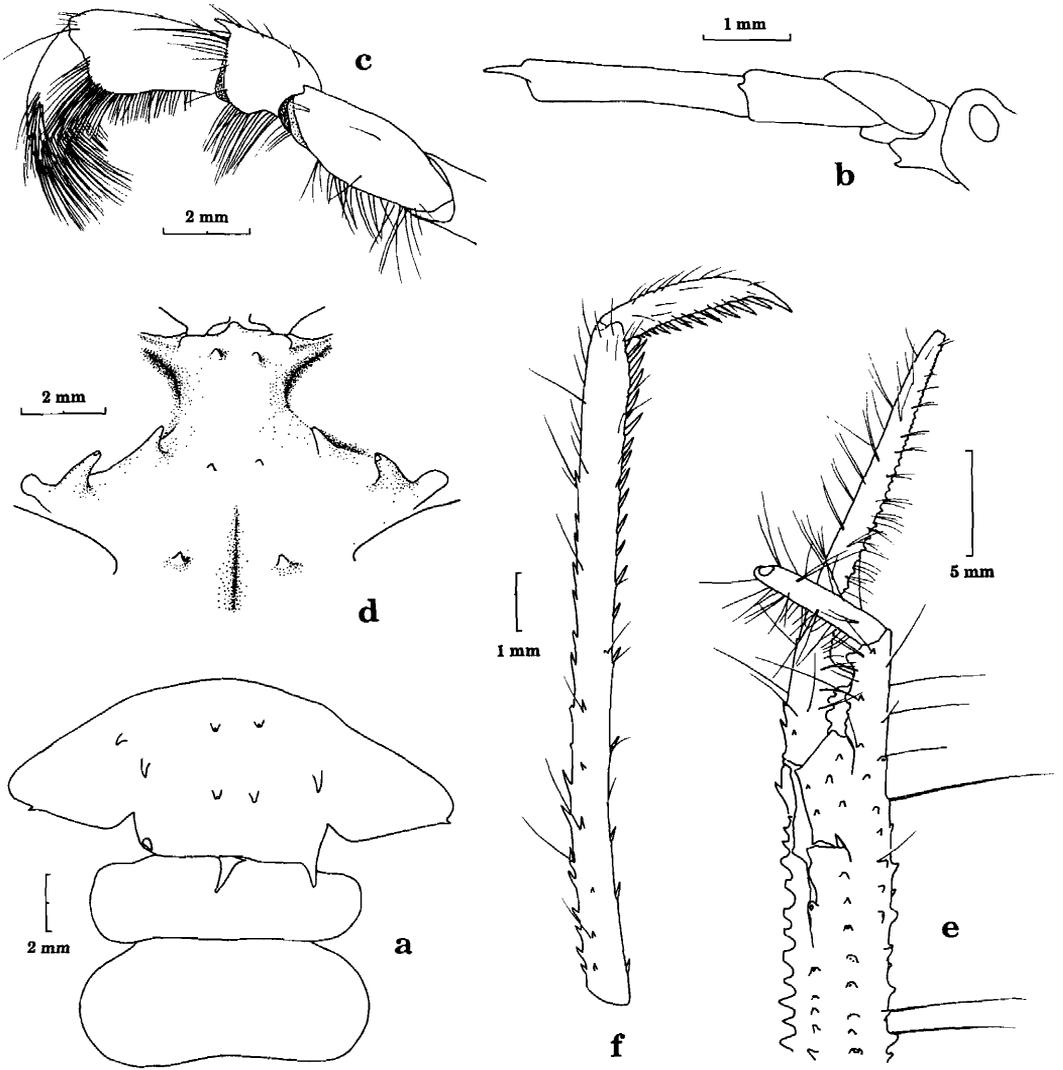


Fig. 2. *Gastroptychus iaspis*, new species, ovigerous female holotype (AHF 861): a, sixth abdominal segment and telson, extended, dorsal view; b, right antennal peduncle, ventral view; c, endopod of left third maxilliped, ischium omitted, lateral view; d, anterior part of sternum; e, distal portion of right chela, dorsal view; f, distal segments of right first walking leg, lateral view.

- At least third and fourth abdominal segments nearly spineless ..... 3
- 2. Propodus of third maxilliped with distinct dorsal spines .....  
 ..... *G. milneedwardsi* (Henderson, 1885:418) (Southern Chile, 732 m)
- Propodus of third maxilliped unarmed *G. cavimurus* Baba, 1977b:202 (Off northern Peru and Ecuador, 388-500 m)
- 3. Carapace with many small spines interspersed among prominent ones; mid-cervical groove distinctly an-

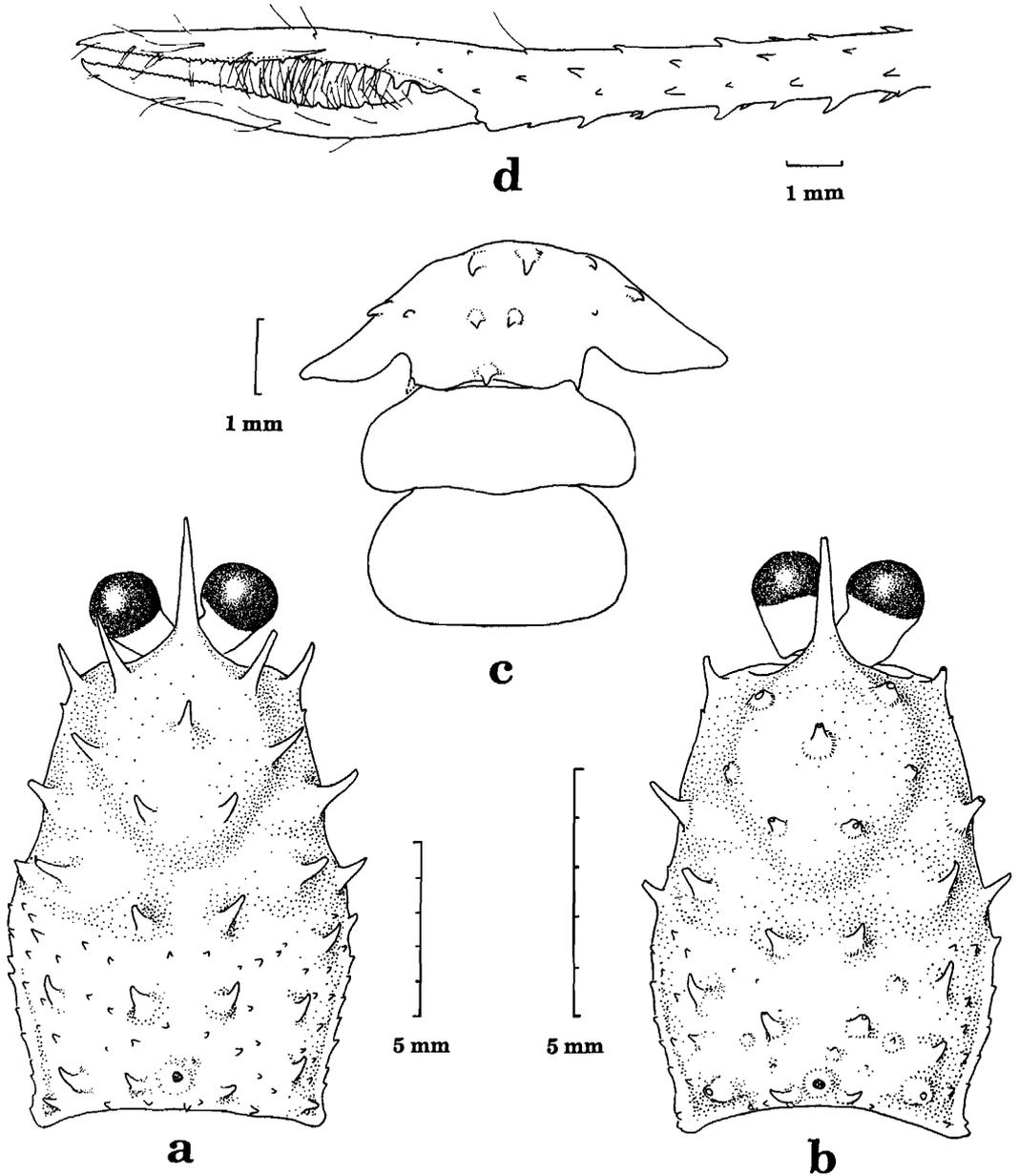


Fig. 3. *Gastroptychus defensa* (Benedict, 1902), syntypes (USNM 20563): a, male carapace, dorsal view; b, female carapace, dorsal view; c, sixth abdominal segment and telson of same, extended, dorsal view; d, distal part of right cheliped of same, dorsal view.

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| <p>terior to midlength of carapace ...<br/>         ..... <i>G. perarmatus</i> (Haig, 1968:272)<br/>         (Off California, 229 m)</p> <p>- Carapace with prominent spines and<br/>         few interspersed ones, gastric region</p> | <p>with prominent spines arranged in<br/>         hexagon with central spine; mid-<br/>         cervical groove about at midlength<br/>         of carapace .....</p> <p>4. Terga of third to fifth abdominal</p> | 4 |
|---|---|---|

segments lacking spines near pleura; sternite at base of cheliped with 2 anterior spines between first lateral marginal spines *G. iaspis*, new species

(Off northern Mexico to British Columbia, 600–1189 m)

– Terga of third to fifth abdominal segments provided with spines at least on lateral extremities near pleura; sternite at base of cheliped lacking spine between first lateral marginal spines . . . . .

. . . . . *G. defensa* (Benedict, 1902:299)  
(Galapagos Islands, 717 m)

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