

terminal article considerably shorter (approximately 1/2) than first, slightly recurved, subtriangular and acuminate, with few denticles.

Type and distribution

Mexico, Chiapas State: Tila (COTTARELLI & ARGANO, 1977, holotype).

Rodriguezia villalobosi (Rodríguez & Manrique, 1967)

Fig. 23G-H.

Trichodactylus villalobosi Rodríguez & Manrique, 1967, p. 183, fig. 1, Pl. 1.

Description

Carapace suborbicular; upper surface with pores and small granules, not visible to naked eye, rest smooth and polished; gastric region more prominent than rest, hepatic slightly elevated; frontal region concave, progressively sloping downwards to margin of front; postfrontal lobes inconspicuous; cardiac, branchio-urogastric and urogastric grooves wide and shallow; oval metagastric region defined by these grooves. Lateral margins angled, devoided of teeth; postero-lateral ridge of carapace bent mesially in posterior end, continuing in thinner ridge parallel to posterior margin. Front moderately bilobed.

All abdominal segments distinct in male and female; male abdomen subtriangular, wide, outer margin slightly concave, last segment triangular, pointed.

Chelipeds strongly unequal, largest with palm swollen, inferior margin sinuous; fingers gaping, with rows of dark points on external surface; merus with strong distal spine on the upper border. Legs not slender, dactylus covered by felt-like pubescence, with longer hairs over internal margin; propodus with similar pubescence over distal external portion.

First gonopod straight, wider in basal portion, constricted at middle, slightly expanded distal half, with strong conical spines over distal portion; gonopore long, suboval. Second gonopod considerably shorter than first (approximately 1/2), terminal article considerably shorter (approximately 1/2) than first, proximally wide, long acuminate distally.

Type and distribution

Mexico. Chiapas State: Rancho La Esperanza (type) and San Juan Bosque (RODRÍGUEZ & MANRIQUE, 1967).

Avotrichodactylus Pretzmann, 1968

Trichodactylus (*Avotrichodactylus*) Pretzmann, 1968b, p. 71.

Avotrichodactylus Pretzmann, 1978b, p. 54.- PRETZMANN, 1980, p. 661.

Carapace with 2-5 lateral teeth behind external orbital angle; front slightly bilobed; postgastric pits absent; abdominal segments with sutures 3-5 partially obsolete; third maxilliped with merus trapezoidal, not conspicuously narrow, distal external spine not reduced; first gonopod conical, progressively tapering to very narrow opening; gonopore very small, subcircular, open disto-caudally; second gonopod considerably shorter (0.6) than first, distal article shorter (0.25) than first.

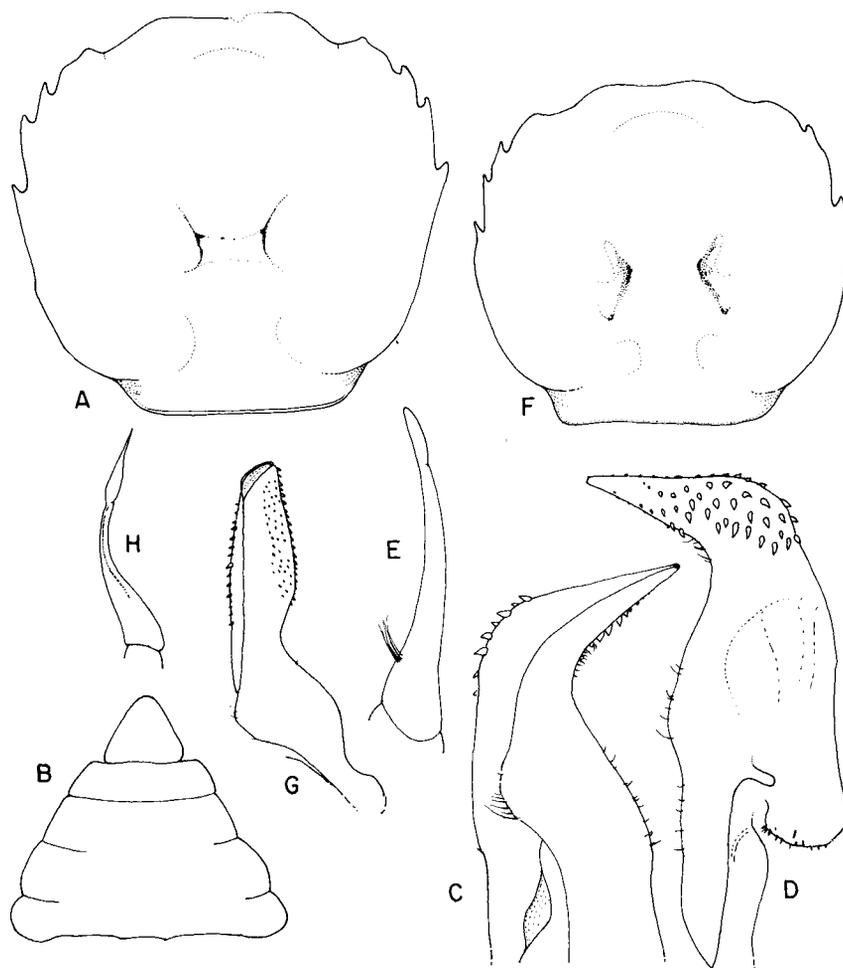


FIGURE 23

Avotrichodactylus constrictus (Pearse), A-E, male specimen, cl 20.2 mm, from Lago Catemaco: A, outline of carapace; B, abdomen; C, first male gonopod, left, caudal; D, same, cephalic; E, second male gonopod; *Avotrichodactylus bidens* (Bott), F, female specimen cl 14.2 mm from Cueva del Azufre: outline of carapace; *Rodriguezia villalobosi* (Rodríguez & Manrique), G, H, male holotype, cl 14.5 mm: G, first male gonopod, left, caudal; H, second male gonopod.

Type species.- *Trichodactylus constrictus* Pearse, 1911.

Distribution

Southern Mexico, rivers in the States of Veracruz, Oaxaca, Tabasco and Chiapas draining into the Gulf of Mexico.

Key to the species of *Avotrichodactylus*

1. First male gonopod sinuous, only slightly bent caudo-laterad; gonopore caudal; 4-5 spines on lateral side.....*oaxensis*
– First male gonopod with distal half bill-like, strongly bent laterad and forming a “knee” covered by short, stout spines; gonopore terminal.....2
2. Antero-lateral margin with 3 spines.....*constrictus*
– Antero-lateral margin with 2 spines.....*bidens*

Avotrichodactylus bidens (Bott, 1969)

Fig. 23F

Trichodactylus bidens Bott.1969, p. 25, pl. 24, fig. 68, 69.- COTTARELLI & ARGANO, 1977, p. 207, fig. 3, 4.

Description

Carapace suborbicular; upper surface moderately irregular; in frontal view regularly arched; frontal and orbital regions excavated; lobes distinct, not prominent; branchio-urogastric and anterior portion of branchio-cardiac grooves deep, well marked, urogastric and posterior part of branchio-cardiac groove indicated by flat depressions. Postgastric pits absent. Antero-lateral margin with 2 small, spiniform teeth of approximately equal size behind external orbital angle; interdental space approximately twice space between outer orbital angle and 1st tooth; postero-lateral ridge of carapace, not bent mesially in posterior end as in other species, but parallel to lower ridge located over 5th coxa, ends away from postero-lateral angles of carapace. Margin of front slightly concave. Orbits suborbicular; orbital suture absent or represented by small depression; lower orbital margin papillated; inner orbital angle blunt; occlusive orbital tooth rounded, small, located close to inner orbital angle, but not continuous with it; outer orbital not prominent, its border in contact with orbital margin; margin between outer orbital angle and first tooth of carapace forms rounded lobe; buccal angle smooth. Front advanced, hiding epistome in dorsal view; anterior surface of front sunk, low in middle, thin on sides; margin over each antennular fossa more or less straight; antennular septum sunken; epistome moderately high, inclined forwards.

Third to fifth abdominal segments fused in both male and female.

Basal article of antenna with outer lobe prominent and narrow; ischium of third maxilliped with deep groove. Chelipeds strongly unequal; larger chela of male with upper border of hand strongly arched and lower sinuous, fingers with elongated gap between them, teeth small, regularly placed along cutting edges; carpus with inner margin produced in sharp hooked spine; merus with apical spine on upper border, another at distal angle of latero-inferior margin and another at inner margin. Legs with long coarse hairs on lower margin of dactylus; similar hairs cover all the lower margin of propodus in 5th, 3/4 in 2nd, 1/2 in third and only distal angle in 4th pereopod; upper margin of propodus and dactylus with shorter sparse hairs, rest of surface covered by felt-like pubescence; claws of dactyli very short, with indistinct longitudinal carinae, 1 upper, 2 lateral and 2 inferior.

First and second gonopods, as illustrated by COTTARELLI & ARGANO (1977), similar to those of *Avotrichodactylus constrictus*.

Material examined

Mexico. Cueva del Azufre, 100 m above sea level, Tapijulapa, Teapa, Tabasco State; 1 February 1982; M. W. WILKENS; 1 female, cl 14.3 mm, cb 15.5 mm (MH). Cueva de la Cascada Azufre, 3 km of Tapijulapa, Tabasco State; 15 June 1975; A. GRUBBS; 1 juvenile male (USNM 230083).-

Type and distribution

BOTT (1969) designated as holotype a male from "Arroyo del Solfo" near Tapijulapa, Tabasco, which is almost certainly the same as, or an extension of, the "Cueva del Azufre" where the specimens mentioned above were collected. COTTARELLI & ARGANO (1977) call this species troglophile. It certainly seems restricted to this cave and has not been collected elsewhere.

Remarks

The species is closely related to *Avotrichodactylus constrictus* and their gonopods are identical. The female specimen recorded above (Fig. 23F), has a supplementary tooth intercalated in the left side, and a rounded lobe intercalated on the right side, thus suggesting a continuity of characters with *A. constrictus*. However, the teeth in *A. bidens* are smaller and less prominent. The specimens always are pale colored, a character obviously associated with cave dwelling, whereas all specimens of *A. constrictus* which I have examined, even those associated with caves, are brown-black.

Avotrichodactylus constrictus (Pearse, 1911)

Fig. 2A; 10I; 12F; 23A-E

Trichodactylus constrictus Pearse, 1911, p. 111, fig.4.- RODRÍGUEZ & MANRIQUE, 1967, p. 183.

Trichodactylus (Trichodactylus) constrictus, COIFMANN, 1939, p. 111.

Trichodactylus (Avotrichodactylus) constrictus, PRETZMANN, 1968b, p. 71.

Trichodactylus (Rodriguezia) constrictus, BOTT, 1969, p. 26.- COTTARELLI & ARGANO, 1977, p. 210.

Avotrichodactylus constrictus, PRETZMANN, 1980, p. 661, pl. 14, fig. 61-63.- RODRÍGUEZ & HOBBS, 1989, p. 399.

Description

Carapace suborbicular; upper surface moderately irregular; regularly arched in frontal view; frontal and orbital regions strongly excavated, and consequently epigastric lobes well delimited; branchio-urogastric and anterior portion of branchio-cardiac grooves deep and well marked, urogastric and posterior part of branchio-cardiac groove indicated by flat depressions. Postgastric pits barely visible. Antero-lateral margin with 3 teeth behind external orbital angle, subequal in size, with wide base, directed laterally; 1st and 2nd teeth nearer than 2nd and 3rd; postero-lateral ridge of carapace not bent mesially in posterior end as in other species, but parallel to lower ridge located over 5th coxa, ends away from postero-lateral angles of carapace. Margin of front slightly concave. Orbits suborbicular; orbital suture absent or represented by small depression; lower orbital margin smooth, continuous; inner orbital angle prominent, pyramidal; occlusive orbital tooth rounded, small, located close to inner orbital angle, but not continuous with it; outer orbital angle forming triangular tooth, border in contact with orbital margin; margin between outer orbital angle and first carapace tooth forms sinuous lobe; buccal angle smooth. Front advanced, hiding epistome in dorsal view; anterior surface of front sunk and low in middle, thin on sides, with 2 distinct middle pillars separated by U-shaped sinus which forms deep recess; margin over each antennular fossa sinuous and slightly projected; antennular septum sunken; epistome moderately high, inclined forwards.

First abdominal tergite of male separated from tergite 2 + 3 by straight ridge; tergites 2 + 3 with depression on both sides. Third to 5th abdominal segments fused in both male and female; male abdomen subtriangular, wide at base, outer margin almost straight; last segment with sides slightly concave, approximately 0.7 as long as broad.

Basal article of antenna with outer lobe prominent, narrow; ischium of third maxilliped with deep groove. Chelipeds strongly unequal, smaller chela unusually small; larger chela of male with upper border of hand strongly arched and lower sinuous, fingers with elongated gap between them, teeth small, regularly placed along cutting edges; carpus with inner margin produced in sharp hooked spine; merus with apical spine on upper border, another in distal angle of the latero-inferior margin and another in inner margin. Legs with lower margin of dactylus thickly clothed with long coarse hairs; similar hairs cover all lower margin of propodus in 5th, 3/4 in 2nd, 1/2 in 3rd, and only distal angle in 4th pereopod; upper margin of propodus and dactylus thickly clothed by shorter hairs evenly distributed, not arranged in parallel longitudinal rows, rest of surface covered by felt-like pubescence; claws of dactyli very short, with indistinct longitudinal carinae, 1 upper, 2 lateral and 2 inferior.

First gonopod conical, base expanded, distal half bill-like, strongly bent laterally and forming "knee" covered by short, stout spines; gonopore very small, terminal. Second gonopod very short, flagellum reduced to short stump.

Material examined

Mexico. Playa Hermosa, Lago Catemaco, Veracruz State; 3 August 1966; L. B. HOLTHUIS, J. CABRERA & F. MANRIQUE; 1 male, 1 female (IB-UNAM). 1 km N of Palenque, Chiapas State; 25 July 1973; J. REDDELL, N. KAWAKATSU, D. DENTON & S. R. MITCHELL; 2 males, cl 19.8 and 12.5 mm, cb 17.9 and 12.9 mm (USNM 230085).

Type and distribution

Mexico. Veracruz State: Lago Catemaco (PEARSE, 1911, holotype; RODRÍGUEZ & MANRIQUE, 1967); Rio Tepalapan, Santiago Tuxtla; Arroyo del Pital, Ciudad Alemán (RODRÍGUEZ & MANRIQUE, 1967).- Chiapas State: Rio Michol, S of Palenque (RODRÍGUEZ & MANRIQUE, 1967). The species is sometimes associated with caves (RODRÍGUEZ & HOBBS, 1989).

Avotricbodactylus oaxensis new species

Fig. 3C; 4G; 6G; 12G; 15C; 24A-H

Description

Carapace suborbicular; upper surface moderately irregular; regularly arched in frontal view; frontal and orbital regions strongly excavated, and consequently epigastric lobes well delimited; branchio-urogastric and anterior portion of branchio-cardiac grooves deep and well marked, urogastric and posterior part of branchio-cardiac groove indicated by flat depressions. Postgastric pits not distinguishable from other irregularities of carapace. Antero-lateral margin with 4-5 teeth of approximately equal size behind other orbital angle, with narrow base and directed transversely upwards; third interdental space smaller than other, and thus the 3rd and 4th teeth closer to each than others; first three teeth subequal, fourth tooth is smaller than other 3, 5th when present very small, usually replaced by small papilla or indentation; postero-lateral ridge of carapace not bent mesially in posterior end as in other species, but parallel to lower ridge located over 5th coxa, ends away from the postero-lateral angles of carapace. Margin of front slightly concave. Orbits suborbicular; orbital suture absent or represented by small depression; lower orbital margin with 4-5 acute, triangular teeth on proximal half,

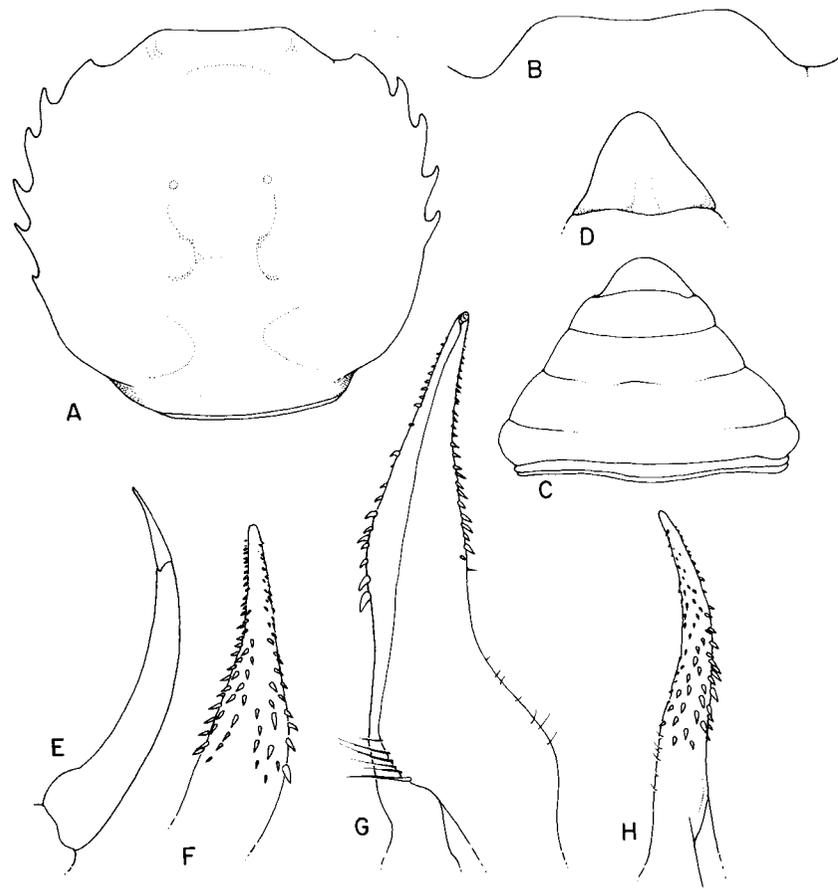


FIGURE 24

Avotrichodactylus oaxensis, new species, male holotype, cl 21.2 mm: A, outline of carapace; B, front; C, male abdomen; D, 7th abdominal segment; E, second male gonopod; F, first male gonopod, left, cephalic; G, same, caudal; H, same, lateral.

smooth on distal half; inner orbital angle with acute and prominent spine; occlusive orbital tooth rounded, small, located close to inner orbital angle, but not continuous with it; outer orbital angle obtuse, not projected as spine, its border in contact with orbital margin, or discontinuous in some small specimens; margin between outer orbital angle and first tooth of carapace forms a rounded lobe; buccal angle smooth. Front advanced, hiding epistome in dorsal view; anterior surface of front sunk and very high in middle, lower on sides, with middle pillars not distinct and without U-shaped middle sinus; margin over each antennular fossa forms rounded lobe; antennular septum sunken; epistome moderately high, inclined forwards.

First abdominal tergite of male separated from tergite 2 + 3 by straight ridge; tergites 2 + 3 with depression on both sides. Third to 5th abdominal segments fused in both male and female; male abdomen subtriangular, wide at base, outer margin slightly concave; last segment with sides slightly sinuous, approximately 0.7 as long as broad.

Basal article of antenna with outer lobe prominent and narrow; ischium of 3rd maxilliped with deep groove. Chelipeds strongly unequal, smaller chela unusually small; larger chela of male with upper border of hand strongly arched, lower sinuous; teeth small, regularly placed along cutting edges; carpus with inner margin produced in sharp hooked spine; merus with apical spine on upper border, another at distal angle of latero-inferior margin and another at inner margin. Legs with lower margin of dactylus thickly clothed with long coarse hairs; similar hairs cover all lower margin of propodus in 5th, 3/4 in 2nd, 1/2 in 3rd and only distal angle in 4th; upper margin of propodus and dactylus thickly clothed by shorter hairs evenly distributed, not arranged in parallel longitudinal rows; rest of surface of dactylus and propodus covered by felt-like pubescence; claw of dactylus very short, with indistinct longitudinal carinae, 1 upper, 2 lateral and 2 inferior.

First gonopod slender, progressively tapering to very narrow tip; distal part moderately bent cephalo-laterad; in caudal view narrow triangular, slightly widened at middle; in lateral view narrow and sinuous; distal third of cephalic surface covered by spines which strongly diminish in size distally and tend to form four rows proximally, leaving naked band over mid-line of appendage; gonopore very small, open on caudal surface. Second gonopod very short, flagellum reduced to short, acute stump.

Material examined

Mexico. Cañada Acatlan, Rio San Antonio, Oaxaca State; 2 February 1988; H. WILKENS; 1 male holotype, cl 21.2 mm, cb 22.8 mm, 5 males paratypes, cl 18.0, 16.8, 16.5, 11.9, 11.3 mm, cb 19.0, 17.2, 18.3, 12.3 and 12.0 mm, 1 immature female paratype, cl 11.4 mm, cb 12.4 mm (MP).

Subfamily DILOCARCININAE Pretzmann, 1978

Postgastric pits present; abdominal segments with sutures 3-5 obsolete; penial groove not overlapped by 8th tergite and sternal lobe; first gonopod conical, elongate, apical setae long, conspicuous; second gonopod moderately or considerably longer than first.

Tribe HOLTTHUISIINI

Carapace suborbicular, strongly arched, surface smooth, 3-5 lateral teeth behind external orbital angle (sometimes obsolescent in large males), median grooves usually deep; abdomen trapezoidal; first gonopod with basal portion expanded laterally, or with middle lateral lobe provided with conical spines; gonopore V-shaped, open caudal; second gonopod much longer than first, rolled-over.

Type and only genus.- *Sylviocarcinus* H. Milne Edwards, 1853

Sylviocarcinus H. Milne Edwards, 1853

Sylviocarcinus H. Milne Edwards, 1853, p. 215.

Holthuisia Pretzmann, 1968b, p. 74.

Holthuisia Pretzmann, 1968b, p. 74; PRETZMANN, 1983b, p. 321.

Carapace suborbicular, strongly arched, surface smooth, with the regions ill-defined and the grooves shallow or obsolescent, but median grooves usually deep; 3-5 lateral spines (sometimes obsolescent in large males), in addition to spiniform external orbital angle; front bilobed; buccal area usually with yugal and orbital prominences as blunt teeth, exceptionally spiniform; first gonopod with the basal portion expanded laterally, or with a middle lateral lobe provided with conical spines; gonopore V-shaped, open caudal; second male gonopod considerably longer than first, usually twisted as a question mark (except in *Sylviocarcinus* sp.).

Type species.- *Sylviocarcinus devillei* H. Milne Edwards, 1853.

PRETZMANN (1968b, p.74) erected the genus *Holthuisia*, which in the same page of that publication and in PRETZMANN (1983b) he spelled *Holthuisia*, with *Dilocarcinus pictus* H. Milne Edwards, 1853, as the type species. Later (PRETZMANN, 1983b) he gave as his reason to discard the genus *Sylviocarcinus* and replace it with *Holthuisia* (= *Holthuisia*) the fact that the type species of the former genus, *S. devillei*, is a female specimen. However, *S. devillei* is easily recognized by the somatic characters, without recourse to male gonopods (see Remarks under *S. devillei*).

Distribution

The genus *Sylviocarcinus* is widely distributed in the Amazon River and its Andean affluents, Magdalena River basin, Lake Maracaibo basin and Paraguay River basin. It is occasionally present in the Guiana basins, but absent from the Orinoco and the Atlantic basins of Brazil, except for the record of *S. pictus* from the Poty river (RATHBUN, 1906). As here understood it is divided into 6 taxa, well defined geographically as follows. (1) *S. pictus* (H. Milne Edwards, 1853) (syn. *pardalinus* Gerstäcker, 1856), widely distributed in the Amazon basin and its tributaries, as well as in the nearby basin of the Paraguay, is easily distinguished from the other species by the acute spines surrounding the mouth area. (2) *S. maldonadoensis*, known only from Puerto Maldonado, Perú, is almost identical with *S. pictus*, except for the absence of the 2 buccal spines. (3) *S. piriformis* Pretzmann, 1968, with a disjunct distribution in the Maracaibo basin and the Magdalena valley, show a characteristic growth pattern, with a progressive obsolescence of the lateral spines and an increase in width of the posterior section of carapace. Another species, (4) *S. devillei* H. Milne Edwards, 1853, characterized by the spinulation of the rostral lobes, is distributed in the Amazon and its affluents of Colombia and northern Perú. The species has been recorded in the literature under several synonyms, the most recent of them *S. gigas* Smalley & Rodríguez, 1972. (5) *S. sp.* superficially resembles *S. pictus*, but in fact differs from all other species of the genus in its short second gonopod. The records of this species include specimens from the Amazon and northern Argentina.

Key to the species of *Sylviocarcinus*

1. Two acute hooked spines on buccal angle, 1 on inner orbital angle and 2 or 3 similar one on the lower orbital margin
.....*pictus*

- Buccal angle with a large spine or tubercle, followed by several smaller tubercles or papillae. Inner orbital angle formed by a pyramidal prominence, followed on the lower orbital margin by a series of papillae2
- 2. Second male gonopod slightly longer than first, S-shaped.....sp.
- Second male gonopod considerably longer than first, usually twisted as a question mark.....3
- 3. First gonopod not wide basally, without a well developed lateral lobe on the proximal half.....4
- First gonopod very wide basally, with a conspicuous lateral lobe on the proximal half. Margin of front without large granules.....*piriformis*
- 4. Gonopod with a conspicuous lateral "hump" on distal quarter. Margin of front often with large granules or spines ..*devillei*
- Gonopod without a conspicuous lateral "hump" on distal quarter. Margin of front without large granules or spines*maldonadoensis*

Sylviocarcinus devillei H. Milne Edwards, 1853

Fig. 4H; 5C; 7F; 9B; 13A; 25A-F

Sylviocarcinus devillei H. Milne Edwards, 1853, p. 215.- H. MILNE EDWARDS, 1854, p. 176, pl. 14, fig. 1a-2.- LUCAS, 1857, p. 6, pl. 2, fig. 1.- SMITH, 1869, p. 36.- A. MILNE EDWARDS, 1869, p. 174.- GÖLDI, 1886, p. 33.- NOBILI, 1896, p. 2.- YOUNG, 1900, p. 231.- BOTT, 1969, p. 28 (part.).- RODRÍGUEZ, 1981, p. 48.

Trichodactylus (Valdivia) devillei, RATHBUN, 1906, p. 51, pl. 17, fig. 2.

Sylviocarcinus peruvianus A. Milne Edwards, 1869, p. 174.-NOBILI, 1896, p. 3.- MOREIRA, 1901, p. 44.

Trichodactylus (Valdivia) peruvianus, RATHBUN, 1906, p. 51, pl. 17, fig. 1.- DEL SOLAR *et al.*, 1970, p. 31.

Orthostoma peruvianum, ORTMANN, 1897, p. 327.

Holthuisia peruviana peruviana, PRETZMANN, 1983b, p. 323, pl. 4, fig. 7, 8, pl. 5, fig. 9, 10, 11.

Dilocarcinus spinifrons Kingsley, 1880, p. 35.

Dilocarcinus margaritifrons Ortmann, 1893, p. 492, pl. 17, fig. 11.- YOUNG, 1900, p. 231.

Orthostoma margaritifrons, ORTMANN, 1897, p. 327.

Trichodactylus (Valdivia) margaritifrons, RATHBUN, 1906, p. 44.- PRETZMANN, 1968b, p. 71.- DEL SOLAR *et al.*, 1970, p. 31.

Holthuisia peruviana margaritifrons, PRETZMANN & MAYTA, 1980, p. 141, fig. 9, 10.

Sylviocarcinus gigas Smalley & Rodríguez, 1972, p. 48, fig. 6-7, 21-22.-RODRÍGUEZ, 1981, p. 48.- CAMPOS, 1985, p. 270.

Description

Carapace suborbicular; upper surface slightly irregular; in frontal view forms irregular arch; gastric region slightly more prominent than adjacent epibranchial regions; metabranchial region slightly more prominent than adjacent cardiac and intestinal; epigastric lobes very prominent and well delimited anteriorly; frontal region strongly concave in frontal view; branchio-urogastric and urogastric grooves wide and shallow, branchio-cardiac groove almost absent. Postgastric pits lunulate, placed across urogastric groove. Lateral margins angled and directed obliquely upwards, except in large males where they become rounded; postero-lateral ridge of carapace bent mesially in posterior end, ending in elongated swelling over postero-lateral angles of carapace; antero-lateral margin with 3-4 prominent, evenly spaced, acute spines; last spines smaller; lateral teeth becomes obsolescent in large males. Margin of front bilobed, with 13 to 19 spines which become papilliform and obsolescent with age. Orbits oblong, orbital suture absent or indicated by inconspicuous depression; lower orbital margin with 7-9 papillae; inner orbital angle prominent, pyramidal, topped by prominent and acute spine or rounded tubercle; occlusive orbital tooth rounded, small, fused to inner orbital angle; outer orbital angle spiniform, prominent particularly in females and young specimens, represented by stump in old males; buccal angle with large acute spine followed laterally by smaller one, or large tubercle followed by one or two smaller ones. Front advanced, hiding epistome in dorsal view; anterior surface of front inclined backwards, moderately high in the middle, lower on sides, middle pillars short and thick, widely separated, sometimes not distinct,

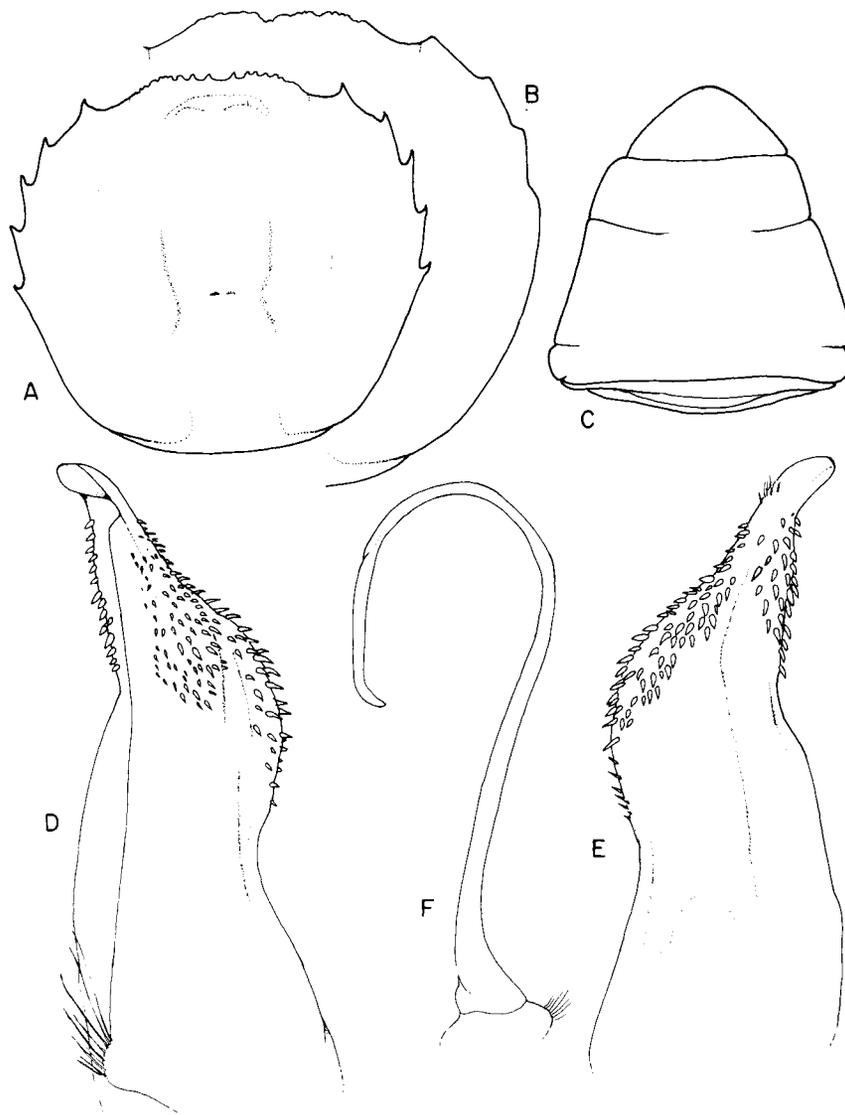


FIGURE 25

Sylviocarcinus devillei (H. Milne Edwards), specimens from Caquetá, Colombia: A, B, outline of carapace; C, abdomen; D, first male gonopod, left, caudal; E, same, cephalic view; F, second male gonopod. A, female, cl 45.5 mm, B-F, male, cl 55.7 mm.

margin over each antennular fossa slightly thickened, but not projected, antennular septum sunken; epistome high, inclined forwards; mid-point of epistome acute, in ventral view appearing as a triangular spine.

First abdominal tergite of male separated from tergite 2 + 3 by suture or deep depression, tergite 2 + 3 with very shallow depression on both sides. Third to 5th abdominal segments fused in both male and female; suture 5/6 very well marked, suture 4/5 only as a thin line and suture 3/4 visible only near lateral margins and on mid-line; 7th segment freely movable; male abdomen elongated, narrow at base, outer margin almost straight, last segment with sides straight, approximately 0.5 as long as broad.

Basal article of antenna with outer lobe prominent and narrow; ischium with shallow longitudinal depression. Chelipeds unequal; upper border of chela strongly arched, lower almost straight or slightly concave; teeth alternatively large and small; acute spine on upper distal angle of hand, above articulation of finger; inner margin of carpus produced in sharp hooked spine; apical spines on upper border and latero-inferior margin of merus. Legs with lower margin of dactylus and lower margin of propodus of 5th pereopod thickly clothed with band of coarse hairs; these pubescence absent from other pereopods, except for inferior distal angle of 2nd; upper margin of propodus and dactylus thickly clothed with shorter hairs arranged more or less in 2 parallel longitudinal rows, more extensive in 2nd and 3rd; claws of dactyli with 5 longitudinal carinae, 1 upper, 2 lateral and 2 inferior.

First gonopod sinuous, tapering strongly to narrow apex, which is directed mesiad; lateral margin of appendage with strong constriction at middle and conspicuous "hump" on distal half; lateral lobe undivided; field of terminal spines extends proximally along posterior margin, lateral margin ("hump") and cephalo-mesial surface, forming 3 distinct patches; brush of long setae on lateral side of apex; gonopore slit-like, open on caudal side. Second gonopod considerably longer than first, bent mesially in form of question mark.

Color

The carapace is mottled with red specks, which in some specimens are restricted to the distal half, the anterior portion being uniformly reddish.

Size

The largest male on record of this species, cl 88.2 mm (SMALLEY & RODRIGUEZ, 1972) is also the largest known specimen of Trichodactylidae.

Material examined

Colombia. Florencia, Caquetá Department; H. NICEFORO MARIA; 1 male, 1 female (Ivic).- Perú. Upper Rio Marañon, between Jaen and San Ignacio; 15 November 1979; Ministry of Fisheries of Perú; 1 male (Ivic). Puerto Maldonado; 7 November 1972; E. DEL SOLAR; 1 male (MHNL).

Type and distribution

The type is a small (cl 32.8 mm) female (MP), collected by the count Francis de CASTELNAU and Mr Emile DEVILLE, this last an employee of the Paris Museum, at Salinas, on the Rio Crixas Açu, affluent of the Rio Araguaia, where they stayed from May 14 to June 10, 1844, during their expedition across South America (PAPAVERO, 1971).

The other records of the species in the literature are the following. Brazil. Amazonas State: Lago Manacapuru near Manaus (BOTT, 1969); ?Rio Madeira (MOREIRA, 1901). Colombia. Caqueta Department: Rio Ortegua, near Venecia (type *S. gigas*). Putumayo Department: Rio Putumayo, Puerto Asis (SMALLEY & RODRÍGUEZ, 1972). Ecuador. Rio Bobonaza-Pastaza (PRETZMANN, 1983b, as *Holthuisia peruviana peruviana*). Peru. Rio Ucayali (type of *Dilocarcinus margaritifrons* Ortman, 1893). Guyallaga (type of *S. peruvianus* A. Milne Edwards, 1869). Upper Rio Marañon (present record).

Remarks

There is considerable confusion in the literature concerning the specific status of the specimens of *Sylviocarcinus* with spinous fronts, but it is almost sure that all of them could be grouped under *Sylviocarcinus devillei*. The female holotype (cl 32.8 mm) of *S. devillei* was satisfactorily described by LUCAS (1857) and supplemented by RATHBUN (1906); illustrations were provided by H. MILNE EDWARDS (1854), LUCAS (1857) and RATHBUN (1906). The diagnostic characters of the species are the carapace suborbicular; the front almost horizontal, advanced, with the margin of front bilobed and armed with tubercles; the antero-lateral margin with 5 teeth which do not stand out and have a wide base, the last spiniform; an elevated line over the postero-lateral margin; the lower orbital margin tuberculated, with an obtuse spine over the internal orbital angle; buccal angle with a large acute spine followed laterally by smaller one; abdominal segments incompletely fused in the female.

S. peruvianus, described by A. MILNE EDWARDS (1869) from a female holotype (cl 59 mm) agrees in all characters with the holotype of *devillei*, except that the margin of the front has blunt spines rather than tubercles. *Dilocarcinus spinifrons* described by KINGSLEY (1880) from a young specimen (cl 18 mm), only differs from the holotype of *S. devillei* in that the internal spine of the buccal angle is long and acute and the external is rudimentary, a character undoubtedly connected with the immaturity of the specimen.

Dilocarcinus margaritifrons Ortmann, 1893 is known from the type locality only, Rio Ucayali, Perú, where REISS collected the holotype, a male with cl approximately 40 mm, in 1874. RATHBUN (1906) and PRETZMANN (1968b) considered this a valid species, but BOTT (1969) synonymized it with *Sylviocarcinus pictus*. However, the moderately bilobed front, bordered with large tubercles, the spinulation of the lower orbital margin and the stump-like lateral spines are characteristics of *S. devillei*. Furthermore, the specimen of *S. devillei* from Rio Marañon recorded above approaches the area of distribution of this species to the type locality of *Dilocarcinus margaritifrons*.

The large male (cl 76 mm) of *S. devillei* described and illustrated by MOREIRA (1901) agrees in all characters with the female holotype, (except that the lateral spines are reduced), as do the specimens from Manaus and Santarem recorded by BOTT (1969). More recently, SMALLEY & RODRÍGUEZ (1972) described a large species, *S. gigas* whose characters coincide with those of the specimens mentioned above, including its relative large size.

Sylviocarcinus maldonadoensis (Pretzmann, 1978)

Fig. 4I; 7B; 9D; 26A-F

Holthuisia picta maldonadoensis Pretzmann, 1978a, p. 7.- PRETZMANN, 1983b, p. 322, pl. 3, fig. 6, 7, 8.

Description

Carapace suborbicular; upper surface slightly irregular, in frontal view forms an irregular arch, flattened on top; gastric region more prominent than adjacent epibranchial regions and metabranchial region, not more prominent than adjacent cardiac and intestinal; epigastric lobes well delimited anteriorly; frontal region concave in frontal view; oblique elevation runs over anterior region, from level of 2nd lateral tooth to mid-line of carapace; mesogastric, branchio-urogastric and branchio-cardiac groove almost obsolete, represented only by shallow depression; urogastric groove absent. Front, orbits and lateral margins of carapace, including lateral spines, bordered by flat, elongated papillae arranged in single line; upper surface of carapace covered by small, rounded, closely set papillae, particularly over anterior and lateral regions. Postgastric pits slit-like, placed in

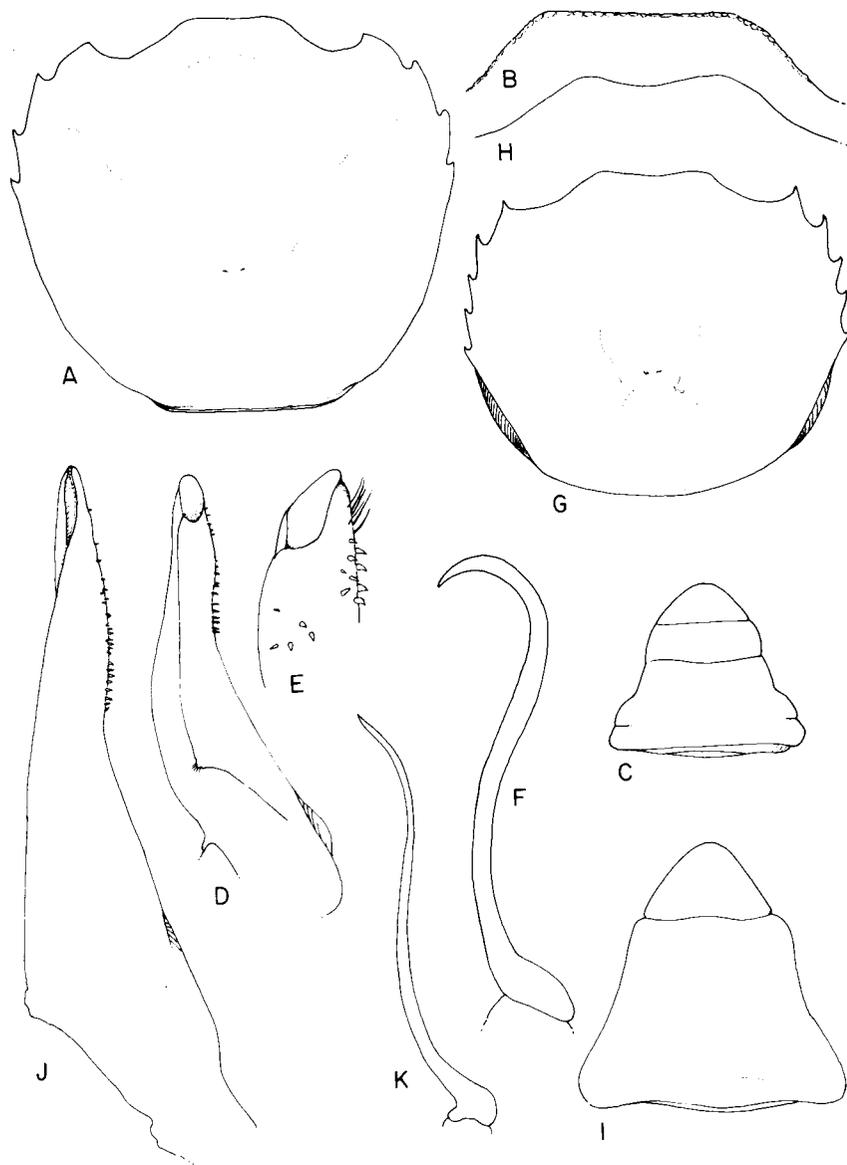


FIGURE 26

Sylviocarcinus maldonadoensis (Pretzmann), A-F, male specimen from Puerto Maldonado, Perú, cl 20.4 mm: A, outline of carapace; B, front; C, abdomen; D, first male gonopod, left, caudal; E, same, detail of apex, latero-caudal; F, second male gonopod. *Sylviocarcinus* sp., G-K, specimen from Lago Grande de Santarem, Brazil, cl 25.5 mm: G, outline of carapace; H, front; I, abdomen; J, first male gonopod, left, caudal; K, second male gonopod.

front of urogastric sulcus. Lateral margins angled and directed obliquely upwards; postero-lateral ridge of carapace bent mesially at posterior end; antero-lateral margin with 3 broad based teeth behind external orbital angle, directed forward and slightly upwards; first interdental space longer than second. Margin of front almost straight. Orbits oblong, orbital suture represented by shallow depression; lower orbital margin with 8 papillae; inner orbital angle pyramidal, obtuse. Occlusive orbital tooth rounded, small, located close to inner orbital angle; outer orbital angle triangular, blunt; buccal angle with 5-6 ill-defined papillae. Front advanced, hiding epistome in dorsal view; anterior surface of front inclined backwards, moderately high in middle, lower on sides, middle pillars short and thick, widely separated, not distinct, margin over each antennular fossa thickened, not projected, antennular septum sunken; epistome high, inclined forwards.

Third to 5th abdominal segments fused in male and female; male abdomen elongated, narrow at base, outer margin sinuous, last segment with sides slightly convex, approximately 0.6 as long as broad.

Basal article of antenna with outer lobe narrow, projected forward; ischium of third maxilliped with very shallow longitudinal depression. Chelipeds unequal; largest chela slender, with upper border arched, lower almost straight or slightly convex; fingers slightly gaping, with well marked carinae; inner margin of carpus produced in sharp hooked spine; merus with terminal spines on upper margin. Lower margin of dactylus of legs thickly clothed with patches of long coarse hairs; these patches cover all lower margin of propodus in 5th, 3/4 in 2nd, 1/2 in 3rd and only distal angle in 4th pereopod; upper margin of propodus and dactylus thickly clothed by shorter hairs arranged more or less in 2 parallel longitudinal rows, more extensive in 2nd and 3rd; claws of dactyli with 5 longitudinal carinae, 1 upper, 2 lateral and 2 inferior.

First male gonopod slender, with straight margin; single patch of heavy spines extending proximally on lateral edge; brush of long setae on lateral side of apex. Gonopore open on caudal side. Second gonopod considerably longer than first, bent mesially in form of question mark.

Material examined

Perú. Puerto Maldonado, Laguna Valencia, Rio Madre de Dios; 7 November 1972; 1 male, 1 mature female, 1 ovigerous female with 125 eggs under the abdomen (MHL).

Type and distribution

The holotype specimen, a female, lc 28 mm (Naturhistorisches Museum Wien No 4179), was collected by Dr Enrique M. DEL SOLAR, at Puerto Maldonado. The specimens recorded above under Material examined belong to the same lot used by PRETZMANN (1978a, 1983b) for his original description. The species is known from the type locality only.

Remarks

Although *Sylviocarcinus maldonadoensis* resembles *S. pictus*, it is not conspecific with it, since it lacks some of the distinctive characters of this latter species, among others, the spinulation of the buccal and suborbital ridges, the deeply bilobed front and the spiniform outer orbital angle. The specimens preserved in alcohol do not show the characteristic pattern of coloration of *S. pictus*. PRETZMANN's (1978a, 1983b) holotype is a female, but in the male examined by me (cl 20.4 mm), although not fully mature, the gonopod resembles the appendage of *S. pictus*.

Sylviocarcinus pictus (H. Milne Edwards, 1853)

Fig. 4J; 5D; 7E; 9F; 13C; 27A-H

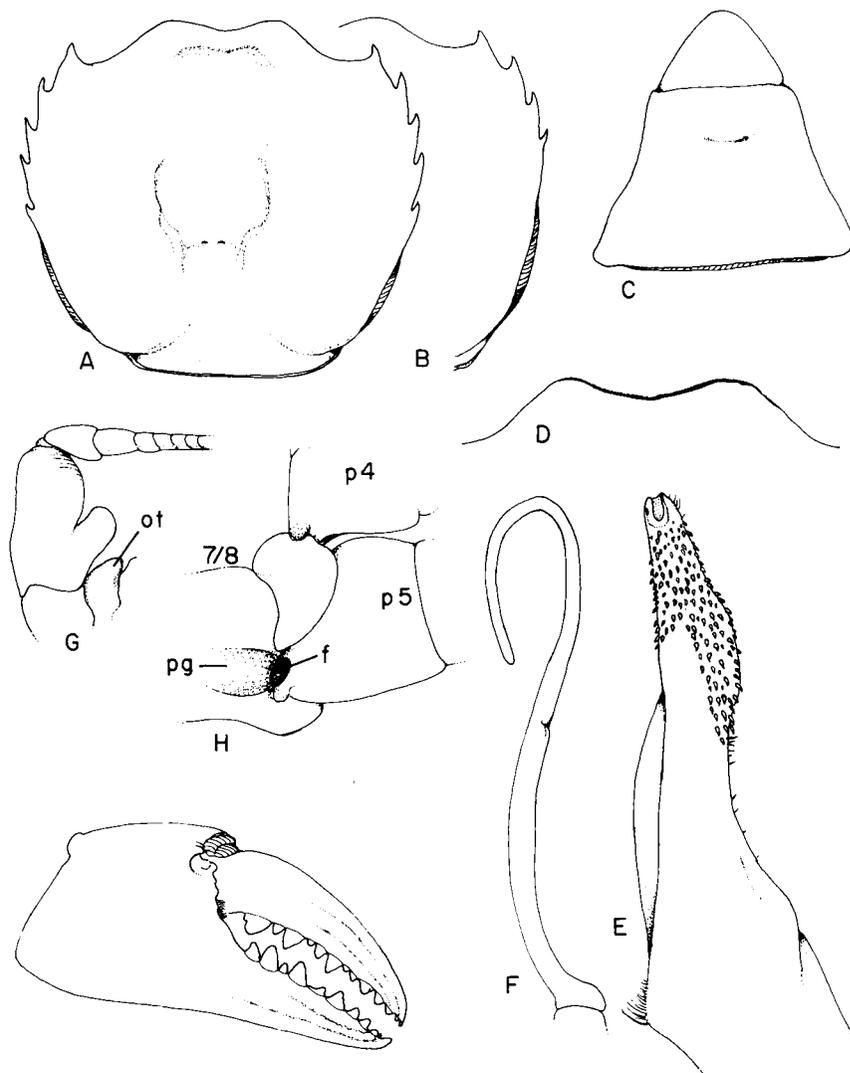


FIGURE 27

Syviocarcinus pictus (H. Milne Edwards). Specimens from Manaus, Brazil: A,B, carapace; C, abdomen; D, frontal lobes; E, first male gonopod, left, caudal; F, second male gonopod; G, antennal peduncle and occlusive tooth; H, fifth coxa and left side of 8th abdominal tergite showing penial groove. A, C-H, male, cl 19.0 mm, B, female, cl 19.2 mm. f, foramen; ot, occlusive tooth; pg, penial groove; p4, fourth coxa; p5, fifth coxa; 7/8, suture between 7th and 8th sternites.

Dilocarcinus pictus H. Milne Edwards, 1853, p. 216.- H. MILNE EDWARDS, 1854, p. 181, pl. 14, fig. 2.- GERSTÄCKER, 1856, p. 148.- LUCAS, 1857, p. 7, pl.2, fig. 3.- A. MILNE EDWARDS, 1869, p.177.- SMITH, 1870, p. 36.- NOBILI, 1896, p. 1.- YOUNG, 1900, p. 231.- MOREIRA, 1901, p. 44.- MOREIRA, 1913, p. 19, pl. 6, fig. 1-3.- COLOSI, 1920, p. 16.- RINGUELET, 1949, p. 102, pl. 7.

Dilocarcinus picta, STIMPSON, 1861, p. 373.

Trichodactylus (Dilocarcinus) pictus, RATHBUN, 1906, p. 62, pl. 19, fig. 9.- MOREIRA, 1912, p. 150, pl. 6, fig. 9-11.- RINGUELET, 1949, p. 102, pl. 7.

Orthostoma pictum, ORTMANN 1897, p. 327.- NOBILI, 1898, p. 11.

Sylviocarcinus pictus pictus, BOTT, 1969, p. 31, pl. 12, fig. 22a, b, pl. 21, fig. 53.

Sylviocarcinus pictus, SMALLEY & RODRÍGUEZ, 1972, p. 48, fig. 8.- RODRÍGUEZ, 1981, p. 48.- CAMPOS, 1985, p. 270.

Holthuisia picta picta, PRETZMANN, 1983b, p. 321, pl. 1, fig. 1, 2, pl. 2, fig. 3-5.

Holthuisia picta rionegrensis Pretzmann, 1968b, p. 74.

Holthuisia picta collastinensis Pretzmann, 1968b, p. 74.

Dilocarcinus pardalinus Gerstäcker, 1856, p. 148.- A. MILNE EDWARDS, 1869, p. 177.- KINGSLEY, 1880, p. 35.- NOBILI, 1896, p. 1.- MOREIRA, 1901, p. 44.- RODRÍGUEZ, 1981, p. 48.

Orthostoma pardalinus, ORTMANN, 1897, p. 327.

Trichodactylus (Valdivia) pardalinus, RATHBUN, 1906, p. 46.

Sylviocarcinus pictus pardalinus, BOTT, 1969, p. 13, p. 32, fig. 23a, b, pl. 21, fig. 54.

Description

Carapace suborbicular; upper surface slightly irregular, in frontal view forms irregular arch, flattened on top; gastric region not more prominent than adjacent epibranchial regions, and metabranchial region slightly more prominent than adjacent cardiac and intestinal; epigastric lobes well delimited anteriorly; frontal region slightly concave in frontal view; branchio-urogastric and branchio-cardiac grooves very shallow, urogastric groove almost absent. Postgastric pits slit-like, placed in front of urogastric sulcus. Lateral margins angled and directed obliquely upwards; postero-lateral ridge of carapace bent mesially in posterior end; antero-lateral margin with 4 equally spaced prominent acute teeth behind external orbital angle (see below under Remarks), directed forward and slightly upwards, and sometimes fifth smaller one placed farthest from rest. Margin of front deeply bilobed covered with minute papillae. Orbits oblong, orbital suture absent; lower orbital margin with 2-3 spines directed mesially and decreasing in size laterally, followed by 3-4 papillae; inner orbital angle has sharp, hooked well-developed spine directed ventrally. Occlusive orbital tooth rounded, small, fused to inner orbital angle; outer orbital angle spiniform; buccal angle with 2 well-developed hooked spines. Front advanced, but leaving exposed the lower angle of epistome in dorsal view; anterior surface of front vertical, moderately high in middle, lower on sides, middle pillars short and triangular, widely separated, sometimes not distinct, margin over each antennular fossa thickened, not projected, antennular septum sunken; epistome high, inclined forward.

First abdominal tergite of male separated from tergite 2 + 3 by shallow depression, tergite 2 + 3 with very shallow depression on both sides. Third to 6th abdominal segments fused in both male and female; male abdomen elongated, narrow at base, outer margin concave, last segment with sides straight or slightly convex, approximately 0.6 as long as broad.

Basal article of antenna with outer lobe prominent and narrow; ischium of third maxilliped with very shallow longitudinal depression. Chelipeds unequal; largest chela slender, with upper border arched, lower almost straight or slightly convex; fingers not gaping, with well marked carinae at least in young specimens, teeth alternating large and small; inner margin of carpus produced in sharp hooked spine; merus with terminal spines on upper and inner margins; spine on the latero-inferior margin of this segment in largest chela and two in smaller one. Lower margin of dactylus of legs thickly clothed with patches of long coarse hairs; these patches cover all lower margin of propodus in 5th, 3/4 in 2nd, 1/2 in 3rd and only distal angle in 4th; upper margin of propodus and dactylus thickly clothed by shorter hairs arranged more or less in 2 parallel longitudinal rows, more extensive in 2nd and 3rd; claws of dactyli with 5 longitudinal carinae, 1 upper, 2 lateral and 2 inferior.

First male gonopod slender, with straight margin; lateral edge in caudal view has curve at 4/5 length of gonopod from base, forming slight constriction, followed by strong outward curve, and ending in slender tip; single patch of heavy spines, extending proximally on lateral edge; brush of long setae on lateral side of apex. Gonopore slit-like and open on caudal side. Second gonopod considerably longer than first, bent mesially in form of question mark.

Colour

Carapace light brown, with scattered red spots persistent in alcohol.

Material examined

Colombia. Leticia, on the Amazon River, Department of Amazonas; H. NICEFORO MARIA; 1 male (LSB).- Brazil. Sistema Janavaca, South of Manaus, Amazon River; July 1978; 2 males, 2 females (Ivic).- Venezuela. Caño Sin Nombre, left bank of Rio Cuyuni, near Isla Jacobo, Bolivar State; 26 January 1977; F. MAGO; 1 soft shell male (Ivic).- Paraguay. Concepcion, Rio Ipore at ferry crossing, approximately 2.0 km S by dirt road of Belen (which is 18 km ESE of Concepcion); Rio Paraguay drainage; 9 October 1979; J. N. TAYLOR, B. SMITH, E. KOON & R. MYERS; Lat/Long: 23° 27' 18" S - 57° 27' W; Field Number P79-110 (USNM Accession No 341275); 1 specimen. Canendiyu, Rio Jejui-Guazú, bridge approximately 14 km S of Ygatimi on dirt road and approximately 29.5 km N of Curuguaty; Rio Paraguay drainage; 7 July 1979; R.M. BAILEY, J. N. TAYLOR & T. W. GRIMSHAW; Lat/Long: 24° 14' 12" S - 55° 37' 30" W; Field Number P79-43 (USNM Accession No 341275); 1 specimen. Amambay Department, Rio Apaca approximately 0.5 km upstream (=E) of bridge between Brazil & Paraguay in Bella Vista, Paraguay; Rio Paraguay drainage; 27 July 1979; J. N. TAYLOR, T. W. GRIMSHAW & R. MYERS; Lat/Long: 22° 6' 30" S - 56° 30' 36" W; Field Number P79-65A (USNM Accession No 341275); 1 specimen.

Type and distribution

The types are two females (MP) collected by the count Francis de CASTELNAU and Mr Emile DEVILLE at Loreto, Colombia, where they stayed from December 25 to 28, 1846, on their way back from their expedition across South America (PAPAVERO, 1971). The other records of the species in the literature are the following. Perú. Nauta (RATHBUN, 1906); Rio Siamiria (BOTT, 1969); 25 km W of Iquitos (PRETZMANN, 1983b). Colombia. Rio Arara, Leticia, on the Amazon River (SMALLEY & RODRÍGUEZ, 1972). Brazil. Manaus; Villa Bella, 600 km upriver Amazonas; Poty, Piauhy State (RATHBUN, 1906); Solimoes, Fonte Boa; Rio Negro, Ponta Arara; Rio Tapajos; Rio Mulata (BOTT, 1969). Bolivia. Rio Chimpire, Rio Chapare (BOTT, 1969). Paraguay. Rio Paraguay, near Puerto Max, North Paraguay (BOTT, 1969); Colonia Risso, Rio Apa (RATHBUN, 1906). Argentina. Buenos Aires (probably Buenos Aires Province); Candelaria, Misiones (RATHBUN, 1906). French Guiana. Rivière Camopi; Haut Carsevenne (RATHBUN, 1906). The specimens from Rio Parana Mini, in front of La Invernada island, Reconquista Department, Santa Fe Province, Argentina reported by RINGUELET (1949) probably belong to the *Sylviocarcinus* sp., described below. As *Sylviocarcinus pictus pardalinus*, it has been recorded from the following localities in Brazil. Peixe Boi near Para; entrance of the Igarape into the Rio Tapajos; Ducke Reserve; Rio Guamá at Ourem; Rio Aripuana at Beneficiente; Rio Cupari at Goiabal; Rio Irapiri; Rio Marauia at Cachoeira; all these records by BOTT (1969) come from the lower Amazon and its affluents. As *Dilocarcinus pardalinus* it has been recorded from Paraguay, Rio Apa (NOBILI, 1896).

Remarks

As shown in Fig. 48, the area of distribution of the species covers a very large territory comprising the basins of the Amazon and its tributaries, the Parana-Paraguay basin, and the Atlantic basins of the Guianas. This wide,

scattered distribution rises doubts about the cohesion of the species and have led BOTT (1969) and PRETZMANN (1968b, 1977a) to segregate some specimens into distinct subspecies.

The type specimen of *Dilocarcinus pardalinus* is a female from an unknown locality. The species was later recorded from Rio Apa, Upper Paraguay by NOBILI (1896). BOTT (1969) considered this a subspecies of *Sylviocarcinus pictus* and recorded it as such from the lower Amazon. The only character with diagnostic value given by BOTT (1969) to separate it from the typical form *S. pictus*, besides the form of the red dots of the carapace concentrated "as in the leopard" (GERSTÄCKER, 1856), is the presence of 3 lateral teeth instead of 4, behind the spiniform external orbital angle. This character, however, is variable as shown by specimens collected in the same locality. Thus, in 4 specimens from Manaus, 3 males had 4 lateral teeth and 1 female had 3 (Fig. 27a, b); in three females from Paraguay River, 1 specimen had 3 teeth on each side, 1 had 3 teeth on each side and an indentation on the right side, and 1 specimen 4 teeth on each side. On the other hand the specimens from the Paraguay River also present some variability in the characteristic pair of buccal spines which in this case could be present or replaced by a large and a smaller one, or even by a single spine.

PRETZMANN (1968b, 1978a) described three subspecies of *Sylviocarcinus pictus* as follows.

(1) *Holthuisia picta rionegrensis* Pretzmann, 1968, based on an immature male (cl 20.2 mm), from the mouth of Rio Negro (i. e. near Manaus). The specimens I have examined from Manaus (see above), cannot be differentiated from typical *S. pictus*.

(2) *Holthuisia picta collastinensis* Pretzmann, 1968, from Collastine, based on a female from Santa Fe. SMALLEY & RODRÍGUEZ (1972), suggest that *collastinensis* refers to the city of Clatine, formerly called Collatina, 50 km north of Vitoria, Spirito Santo State, Brazil, but this locality lies outside the area of distribution of *S. pictus*. Another possibility is that Santa Fe refers to the Santa Fe Province in Argentina where RINGUELET (1949) has recorded *S. pictus*.

(3) *Holthuisia picta maldonadoensis* Pretzmann, 1978. As stated before, the characters displayed by this taxon are enough to give it specific rank.

Sylviocarcinus piriformis (Pretzmann, 1968)

Fig. 3I; 4K, M; 5B; 7A, C; 9C, G; 13B; 15D; 28A-G; 29A-F

Valdivia (Valdivia) piriformis Pretzmann, 1968b, p. 73.- SCHMITT, 1969, p. 98, fig. 3, a-e, f-i.

Sylviocarcinus piriformis, SMALLEY & RODRÍGUEZ, 1972, p. 45, fig. 5.- RODRÍGUEZ, 1980, p. 340, fig. 97.- RODRÍGUEZ, 1981, p. 48.- VON PRAHL, 1982, p. 23, fig. 1.- VON PRAHL, 1988, p. 13.

Valdivia (Valdivia) torresi Pretzmann, 1968b, p. 72.

Sylviocarcinus torresi, SMALLEY & RODRÍGUEZ, 1972, p. 44, fig. 3, 4.- RODRÍGUEZ, 1981, p. 48.

Description

Carapace suborbicular in smaller specimens, widest between fourth lateral teeth; in larger specimens becoming subquadrate to piriform, widest behind 4th lateral teeth due to swelling of lateral wall of branchial chamber; finally in largest specimens becoming orbicular with posterior lateral walls considerably swollen. Upper surface slightly irregular, in frontal view forms irregular arch, gastric region slightly more prominent than adjacent epibranchial regions; metabranchial region slightly more prominent than adjacent cardiac and intestinal; epigastric lobes well delimited anteriorly; frontal region concave in frontal view; branchio-urogastric and branchio-cardiac grooves wide and shallow, urogastric groove almost absent. Postgastric pits lunulate, placed in front of urogastric sulcus. Lateral margins angled and directed obliquely upwards, except in large

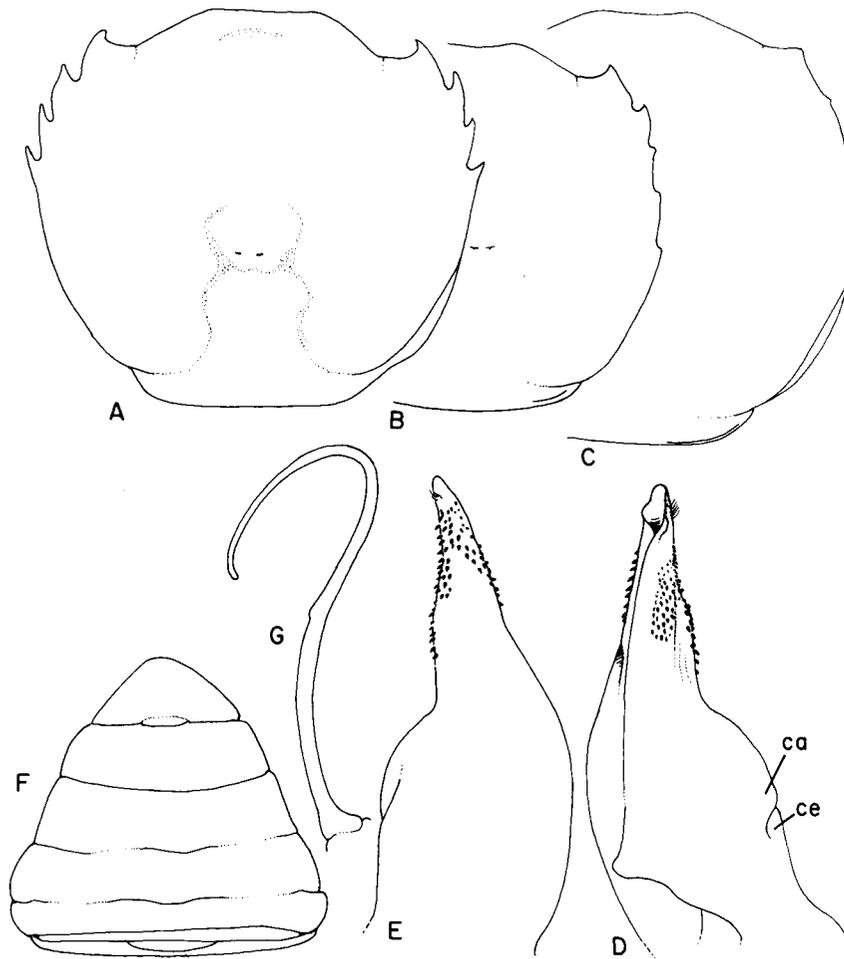


FIGURE 28

Syviocarcinus piriformis (Pretzmann). Specimens from several localities in the Maracaibo basin: A, B, C, carapace; D, first male gonopod, left, caudal; E, same, cephalic; F, male abdomen; G, second male gonopod. A, female from Mene Grande, cl 25.0 mm; B, F, male from Caño Chamiras, cl 47.3 mm; C, male from Rio Curarigua, cl 52.6 mm; D, E, G, male from Rio Guasare, cl 74.7 mm. ca, lateral lobe, caudal segment; ce, lateral lobe, cephalic segment.

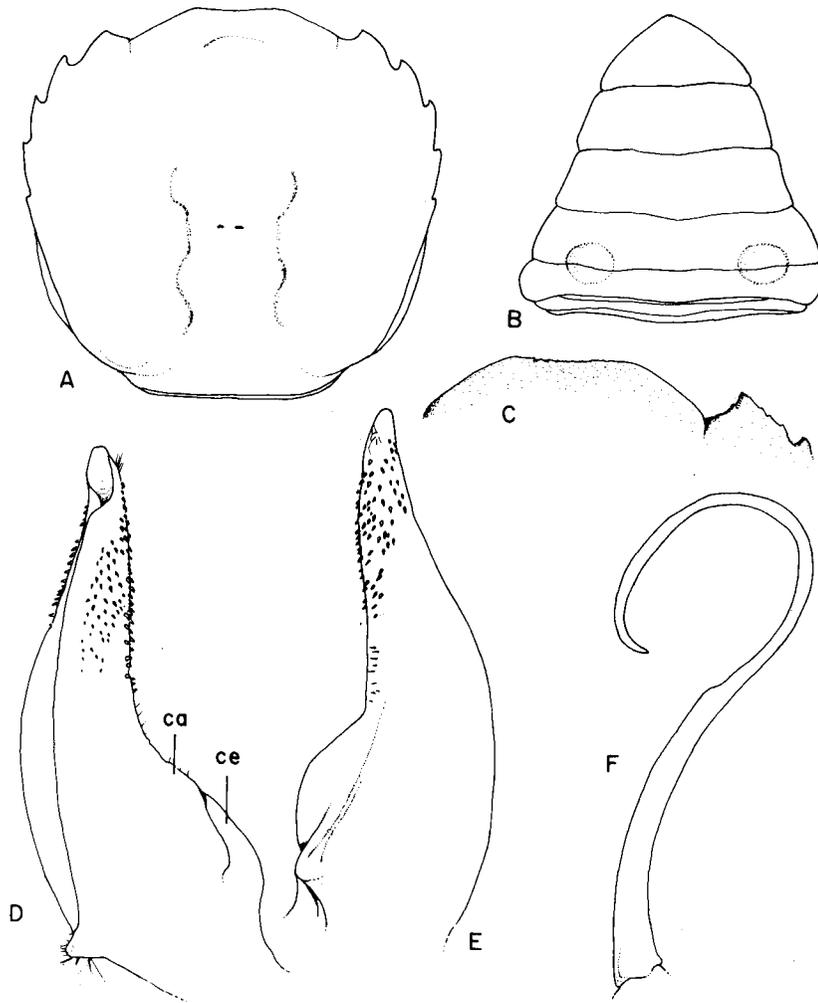


FIGURE 29

Sylviocarcinus piriformis (Pretzmann). Specimens from the Magdalena Valley, Colombia: A, carapace; B, abdomen; C, right margin of orbit and front; D, first male gonopod, left, caudal; E, same, cephalic; F, second male gonopod. A, B, D-F, male from Rio Fundación, cl 53.7 mm; C, male from Rio Gualanday, cl 51.5 mm. ca, lateral lobe, caudal segment; ce, lateral lobe, cephalic segment.

males where become rounded; postero-lateral ridge of carapace bent mesially in posterior end, ending in elongated swelling over postero-lateral angles of carapace; antero-lateral margin with 4 prominent acute teeth behind external orbital angle, the last smaller and placed farthest from the rest; in large males (cb > 45 mm) lateral teeth become obsolescent. Margin of front slightly concave, covered with minute papillae. Orbits oblong, orbital suture absent or indicated by inconspicuous groove; lower orbital margin with 6-8 papillae which decrease in size laterally; inner orbital angle prominent, pyramidal; occlusive orbital tooth rounded, small, located close to inner orbital angle; outer orbital angle spiniform, prominent in females and young specimens, represented by stump in old males; buccal angle with large triangular tooth followed laterally by 4-5 denticles or papillae. Front advanced, hiding epistome in dorsal view; anterior surface of front inclined backwards, moderately high in middle, lower on sides, middle pillars short and thick, widely separated, sometimes not distinct, margin over each antennular fossa thickened, slightly projected, antennular septum sunken; epistome high, inclined forward.

First abdominal tergite of male separated from tergite 2 + 3 by suture or deep depression, tergite 2 + 3 with very shallow depression on both sides. Third to 5th abdominal segments fused in both male and female; male abdomen elongated, narrow at base, outer margin slightly concave, last segment with sides straight, approximately 0.6 as long as broad.

Basal article of antenna with outer lobe prominent and narrow; ischium of third maxilliped devoided of grooves or depressions. Chelipeds strongly unequal; upper border of chela strongly arched, lower almost straight or slightly concave; teeth alternatively large and small; young specimens with inner margin of carpus produced in sharp hooked spine; apical spines on upper border and latero-inferior margin of merus; in old males larger chela becomes enormously developed, hand > 1.5 as long as carapace, the spines of carpus and merus become obsolescent and fingers often, but not always, have large gap between them. Lower margin of dactylus of legs thickly clothed with patches of long coarse hairs; these patches cover all lower margin of propodus in 5th, 3/4 in 2nd, 1/2 in 3rd and only distal angle in 4th pereopod; upper margin of propodus and dactylus thickly clothed by shorter hairs arranged more or less in 2 parallel longitudinal rows, more extensive in 2nd and 3rd; claws of dactyli with 5 longitudinal carinae, 1 upper, 2 lateral and 2 inferior.

First male gonopod very wide basally, tapering strongly to narrow apex; basal expansion regularly convex mesially; laterally more irregular, with accessory elongated lobe on caudal surface; field of terminal spines extends proximally along posterior margin, lateral margin and cephalo-mesial surface, forming 3 distinct patches; brush of long setae on lateral side of apex; gonopore slit-like and open on caudal side. Second gonopod considerably longer than first, bent mesially in form of question mark.

Material examined

Venezuela. River between San Pedro and San Juan, 10 km of Mene Grande, Zulia State; 2 February 1968; G. RODRÍGUEZ; 3 males, 3 females (IVIC). Caño Chamiras, Zulia State; 11 September 1968; DISCA; 1 male, 1 female (MB XI 1539). Rio Guasare, Zulia State; 1 September 1957; 1 male (Ivic). Rio Curarigua, affluent of Rio Tocuyo, near Curarigua, Lara State; 21 May 1978; L. AGUANA & F. MAGO; 3 males (MB). Quebrada Chipuen, 1 km from Chimpire, between Pampanito and Valera, Trujillo State; 14 February 1966; G. RODRÍGUEZ; 3 males, 1 female (Ivic). Rio Buena Vista, near town of Buena Vista, 150 m alt, Trujillo State; 14 February 1964; G. RODRÍGUEZ; 1 female (Ivic). Rio Onia, tributary Rio Escalante, 5 km from the highway El Vigia-San Cristobal, Merida State; 23 April 1964; F. MAGO & J. MOSCO; 1 male (MB). Represa El Isiro, Falcón State; F. AGUIRRE; 2 males (Ivic).- Colombia. Rio Fundación, Santa Marta, Magdalena Department; 18 November

1967; A. ZAMORA; 1 male (Ivic). Rio Gualanday, Tolima Department; M. CAMPOS; 1 male (Ivic). Quebrada Lumbi, Mariquita, Tolima Department, 550 m alt; 20 September 1983; M. CAMPOS; 1 male (ICN-MHN-CR 451).

Type and distribution

Colombia. Norte de Santander Department: Cúcuta (PRETZMANN, 1968b, type; SMALLEY & RODRÍGUEZ, 1972); Rio Sardinata; Puerto Santander (SMALLEY & RODRÍGUEZ, 1972). Bolivar Department: La Regla (PRETZMANN, 1968b, type of *Valdivia (Valdivia) torresi* Pretzmann, 1968). Magdalena Department: Rio Fundación, Rio Aracataca, and Rio Sevilla, near Santa Marta; Rio Cesar, 10 km south of Valledupar (SMALLEY & RODRÍGUEZ, 1972). Venezuela. Zulia State: Mene Grande; Rio Negro, south and west of Machiques (SMALLEY & RODRÍGUEZ, 1972). Falcón State: Represa El Isiro (SMALLEY & RODRÍGUEZ, 1972). Merida State: Rio Onia, near El Vigía (SMALLEY & RODRÍGUEZ, 1972). Trujillo State: Quebrada Chipuen, near Valera; Rio Buena Vista, near Buena Vista (SMALLEY & RODRÍGUEZ, 1972). Lara State: see above.

Remarks

Originally *Sylviocarcinus torresi* and *S. piriformis* were described as two distinct species, occupying respectively the Magdalena and the Maracaibo basins. The distinction between both species, according to SMALLEY & RODRÍGUEZ (1972), was based on the fact that the carapace in the older specimens of *Sylviocarcinus piriformis* is always wider in the posterior portion, the lateral wall becoming swollen with age and producing a pear-shaped appearance; juvenile specimens are almost impossible to separate. However, VON PRAHL (1982, 1988) has recorded the presence of *Sylviocarcinus piriformis* in the middle Magdalena Valley, and consequently the disjunction of the areas cannot be used as an argument for the specific separation of the populations in both basins.

In the specimen from Rio Gualanday recorded above, the posterior orbital margin is bent at the orbital suture, and the margin from this place to the external angle of front is somewhat produced.

Sylviocarcinus sp.

Fig. 4L; 7D; 9E; 13C; 26G-K

Sylviocarcinus devillei, BOTT, 1969, p. 28 (part.).

Sylviocarcinus pictus, LOPRETTO, 1976, p. 81.

The first and second gonopods of Argentinian specimens illustrated and reported by LOPRETTO (1976) under *Sylviocarcinus pictus* do not belong to this species, but to a new, undescribed form to which belong also a male specimen reported by BOTT (1969, p. 29) under *Sylviocarcinus devillei*, from Lago Grande de Santarem, Brazil.

This form closely resembles *S. pictus*, even in the colour of the carapace and pereiopods, which are brown-reddish, with faint scattered red spots persistent in alcohol. However, it can be clearly distinguished from this species by the following characters: (1) the front is less strongly bilobed and consequently more of the oral area is exposed in dorsal view, (2) the first male gonopod is more slender, it has only a very slight lateral lobe, and the terminal spines are very small, very few, and scattered, (3) the second gonopod is only slightly longer than the first gonopod and S-shaped.

Material examined

Brazil. Lago Grande de Santarem; January 1957; A. MESCHKAT; 1 male, cl 25.5 mm, cb 28.5 mm (Hamburg Museum K27047).

Tribe VALDIVIINI Pretzmann, 1978

Carapace hexagonal, upper surface moderately arched, exceptionally strongly arched, transbranchial ridge on each side, 2-6 lateral teeth behind external orbital angle; median grooves usually deep; first gonopod with strong lateral lobe on proximal half, bordered with setae; gonopore terminal, slit-like; second gonopod moderately longer than first, sinuous (except in *Valdivia camerani*).

Type genus.- *Valdivia* White, 1847.

Key to the genera of VALDIVIINI

1. Carapace not regularly arched in frontal view, but orbital, frontal, hepatic and epibranchial regions excavated; distal half of gonopod ending in straight-sided narrow tube*Valdivia*
- Carapace forms regular arch and antero-lateral regions are only slightly excavated; distal half of gonopod forming conspicuous bulb and directed laterad.....*Forsteria*

Valdivia White, 1847

Valdivia White, 1847a, p.31 (*nomen nudum*).- WHITE, 1847b, p. 206.- DANA, 1852b, p. 292.- H. MILNE EDWARDS, 1853, p. 214.-

PRETZMANN, 1968b, p. 71 (part.).- BOTT, 1969, p. 36 (part.).

Trichodactylus (Valdivia) Rathbun, 1906, p. 43 (part.).

Valdivia (Rotundovaldivia) Pretzmann, 1968b, p. 73 (part.).- PRETZMANN, 1983b, p. 326.

Rotundovaldivia Pretzmann, 1978a, p. 168; 1983b, p. 325 (part.).

Carapace hexagonal, upper surface moderately arched, very uneven, with frontal, orbital, hepatic and epibranchial regions conspicuously excavated and antero-lateral margin forming thin edge directed transversely upwards, epigastric lobes crossed by transverse granular striae visible under microscope, 2 lobes on protogastric region delimited anteriorly by thin, lunular ridges, transverse ridge in front of mesogastric region and extending laterally for short distance across metabranchial regions, usually continued on cardiac region by another transverse ridge, median grooves deep, lateral margin armed with 4 or 5 teeth behind external orbital angle, equally spaced, decreasing in size posteriorly; front straight, or slightly concave; first gonopod wide at base, with well developed lateral lobe with long setae on margin; exceptionally, in *V. camerani*, first gonopod tapers gradually and has poorly developed lateral lobe.

Type species.- *Valdivia serrata* White, 1847.

Distribution

The Amazon seems to be a dividing line for the species of *Valdivia*, with *V. serrata* restricted to the north, and *V. gila* and *V. camerani* to the south. The localities of *V. harttii* are nested within the area of *V. serrata*.

Key to the species of *Valdivia*

1. Carapace with 4 small spiniform teeth, last two usually obsolescent or absent. Larger chela unusually developed in adult males.....*gila*

- Carapace with 4-6 well developed lateral teeth. Chelae moderately unequal in adult males.....2
- 2. First gonopod slender, tapering regularly to point. Second gonopod much longer, crosier shaped*camerani*
- First gonopod not very wide proximally, strangled near distal part. Second gonopod slightly longer.....3
- 3. First gonopod sickle-shaped, strongly curved outwards.....*latidens*
- First gonopod bottle-shaped, not strongly curved outwards.....4
- 4. Distal part of first gonopod short tube with parallel sides; proximal lateral lobe wide*hartii*
- Distal part of gonopod slender tube with convergent sides; proximal lateral lobe elongated*serrata*

Valdivia camerani (Nobili, 1896)

Fig. 2C; 4N; 5F; 8D; 13F; 15E; 30A-H

Sylviocarcinus camerani Nobili, 1896, p. 2.- MOREIRA, 1901, p. 44.- COLOSI, 1920, p. 17.

Orthostoma camerani, NOBILI, 1898, p. 15.

Dilocarcinus camerani, NOBILI 1899, p. 3.

Trichodactylus (Valdivia) camerani, RATHBUN, 1906, p. 54, pl. 15, fig. 2, text-fig. 116.- RINGUELET, 1949, p. 105, pl. 9, fig. 3, pl. 10.

Trichodactylus (Trichodactylus) camerani, BOTT, 1969, p. 24, pl. 17, fig. 32a, b.- MANNING & HOBBS, 1977, p. 159.

Trichodactylus camerani, RODRÍGUEZ, 1981, p. 48.

Valdivia (Rotundovaldivia) camerani, PRETZMANN, 1968b, p. 73.

Trichodactylus (Trichodactylus) cameranoi, LOPRETTO, 1976, p. 68.

Description

Carapace hexagonal; upper surface very irregular; high papillated ridge across mesogastric region extending transversely backwards between meso- and metagastric regions; less conspicuous transverse ridge across epibranchial regions; protogastric region with two lobes almost as elevated as mesogastric ridge; metabranchial region moderately convex; surface between these ridges excavated; frontal region flat; urogastric, branchio-cardiac and branchio-urogastric grooves thin but well defined. Postgastric pits lunulated, placed in front of urogastric groove. Lateral margins angled, armed with 5 acute, prominent teeth behind external orbital angle, 1-4 very large, last one very small; interdental spaces approximately equal; small lobe between outer orbital angle and first tooth; postero-lateral ridge of carapace bent mesially in posterior end, ending in elongated swelling over postero-lateral angles of carapace; posterior margin delimited by high carina which hides first abdominal segment. Frontal margin almost straight, sinus very shallow. Orbits suboval; orbital suture thin, but long and well defined; lower orbital margin with acute tooth on inner angle, followed laterally by gap and few large tubercles; occlusive orbital tooth absent; outer orbital angle dentiform; buccal angle smooth. Front advanced, hiding epistome in dorsal view; anterior surface of front vertical, moderately high in middle, lower on sides, middle pillars not distinct, slightly elongated elevation over middle of each antennular fossa; antennular septum slightly sunken; epistome high, vertical or slightly bent backwards. Eyes of normal size, eyestalk not reduced.

Abdominal tergites of male densely covered by pits largest in tergites 1-3, given them eroded aspect under microscope; when closed, abdomen is sunk and tergite in front forms ridge; abdominal tergites 1-3 has excavation anteriorly and 2 on sides, and consequently space between them forms conspicuous Y-shaped ridge in front of last abdominal segment. First abdominal segment hidden behind posterior margin of carapace; 3rd to 5th fused, sutures barely visible; male abdomen narrow, lateral margins conspicuously concave; last segment broadly triangular, apex evenly rounded, approximately 0.6 as long as broad.

Chelipeds moderately unequal, conspicuously rugous or even eroded; middle surface of palm with long longitudinal rugosities; acute, hooked spine on upper distal margin; upper surface of carpus eroded and with

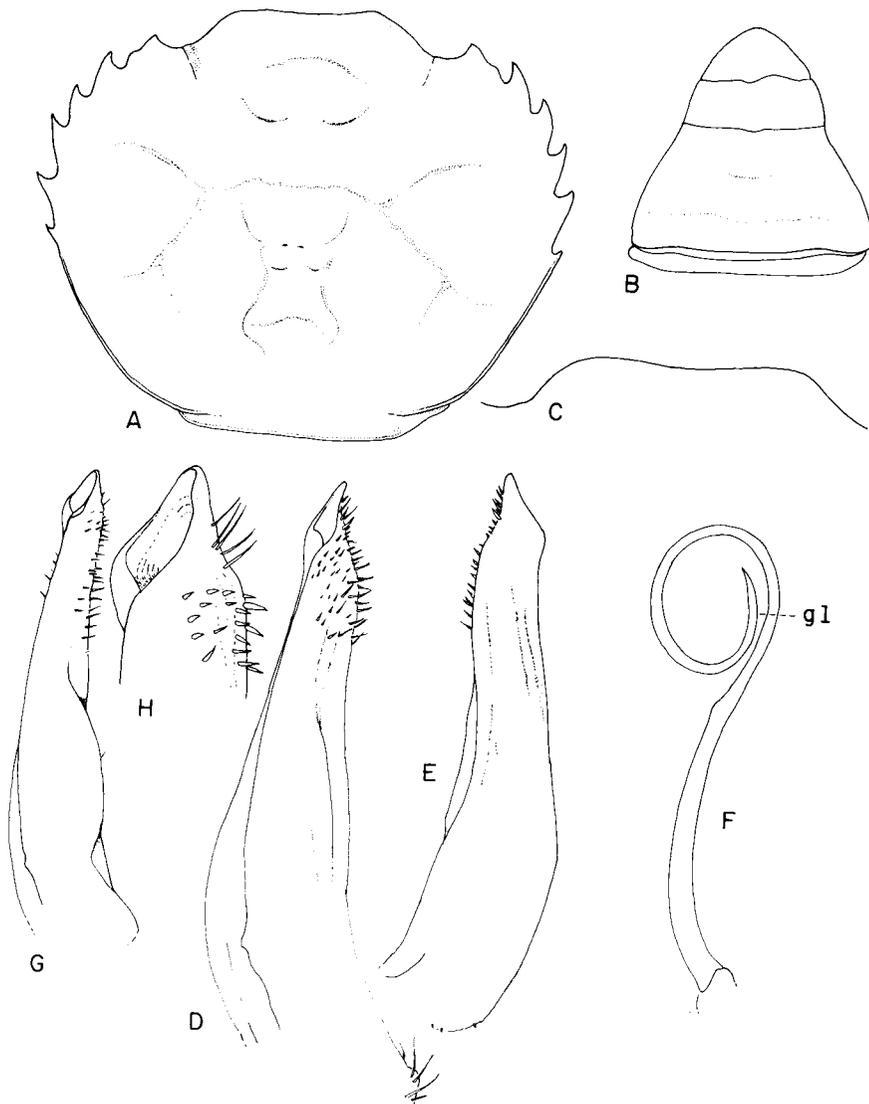


FIGURE 30

Valdivia camerani (Nobili), A-F, male specimen from Rio Beni, Bolivia, cl 22.8 mm: A, outline of carapace; B, abdomen; C, front; D, first male gonopod, left, caudal; E, same, cephalic; F, second male gonopod. G-H, specimen from Rio Paraguay, Paraguay, cl 19.9 mm: G, first male gonopod, caudal; H, detail of apex, caudal. gl, level of gonopore of first gonopod.

long hooked spine on distal margin; merus with upper subterminal spine and a smaller one on lateral distal angle. Legs long and slender; merus of 3rd pereopod 4 times as long as broad; propodus of 5th widened, 2 times as long as broad (measured on the anterior border); dactylus 1.5 - 1.75 times as long as propodus; two rows of long hairs on lower margin of dactyli.

First gonopod long and slender, tapering regularly to point, with few longitudinal ridges, particularly on cephalic side; apex acuminate; gonopore long and narrow, directed mesially; patch of setae on distal quarter of appendage arranged irregularly on lateral side and extending to margin and tip of appendage; setae long, not spiniform as in other species. Second gonopod considerably longer than first, crossier-shaped, apex long and acuminate.

Material examined

Bolivia. Trinidad, Rio Mamoré, Beni Province; 1 male (MNHNP B.19121).- Paraguay. Concepcion Department, Rio Aquidaban at Paso Horqueta, approximately 24 km NNW of Loreto; Rio Paraguay drainage; 9 May 1979; J. N. TAYLOR, T. W. GRIMSHAW, B. SMITH, E. KOON & R. MYERS; Lat/Long: 23° 03' 48" S - 57° 23' 24" W; Field Number P79-107 (USNM Accession No 341275); 1 specimen.

Type and distribution

The type material is from Paraguay, Rio Apa, near the Brazilian border. This species is fairly rare: I detected only one specimen in a sample of more than 50 specimens of Trichodactylidae from Trinidad, Bolivia, and another specimen in more than 64 specimens of Trichodactylidae collected in Rio Paraguay. Aside from the type locality, it is known from 2 more localities only, covering a vast area: Argentina, Reconquista, Rio Parana Mini, Santa Fe Province (RINGUELET, 1949); Bolivia (see under material examined).

Remarks

The gonopore of this species is intermediate between that of Trichodactylinae and *Sylviocarcinus*, and the more typical *Valdivia*; it opens distally, but in a diagonal plane and the proximal part is V-shaped. The gonopods of my specimen of *V. camerani* from rio Mamoré, a tributary of the rio Madeira and the Amazon, differ from those of Argentinian specimens illustrated by LOPRETTO (1976): the first has fewer apical spines and the second has a double row rather than a single one.

Valdivia gila Pretzmann, 1978

Fig. 4P; 8F; 10A; 13F; 15G; 31A-I

Rotundovaldivia hartii (sic) *gila* Pretzmann, 1978a, p. 168, fig. 11.- PRETZMANN, 1983b, p. 318, 326 (by implication).

Valdivia (*Rotundovaldivia*) *hartii* (sic) *gila*, PRETZMANN, 1983a, p. 309, pl. 1, fig. 4, pl. 2, fig. 6, pl. 3, fig. 9, pl. 4, fig. 16, pl. 5, fig. 18.- PRETZMANN, 1983b, p. 319.

Valdivia (*V.*) *hartii* (sic) *gila*, PRETZMANN, 1983b, p. 319.

Valdivia (*Valdivia*) *hartii* (sic) *gila*, PRETZMANN, 1983b, p. 326.

Valdivia (*Rotundovaldivia*) *hartii* (sic) *gila*, PRETZMANN, 1983b, p. 326.

Description

Carapace hexagonal; upper surface very uneven; frontal, orbital, hepatic and epibranchial regions conspicuously excavated; epigastric region consists of 2 transverse lobes not clearly delimited, which under microscope appear crossed by transverse granular striae; protogastric region also bilobular, each lobe delimited anteriorly by thin, lunular ridge; branchio-cardiac and branchio-urogastric grooves wide and shallow,

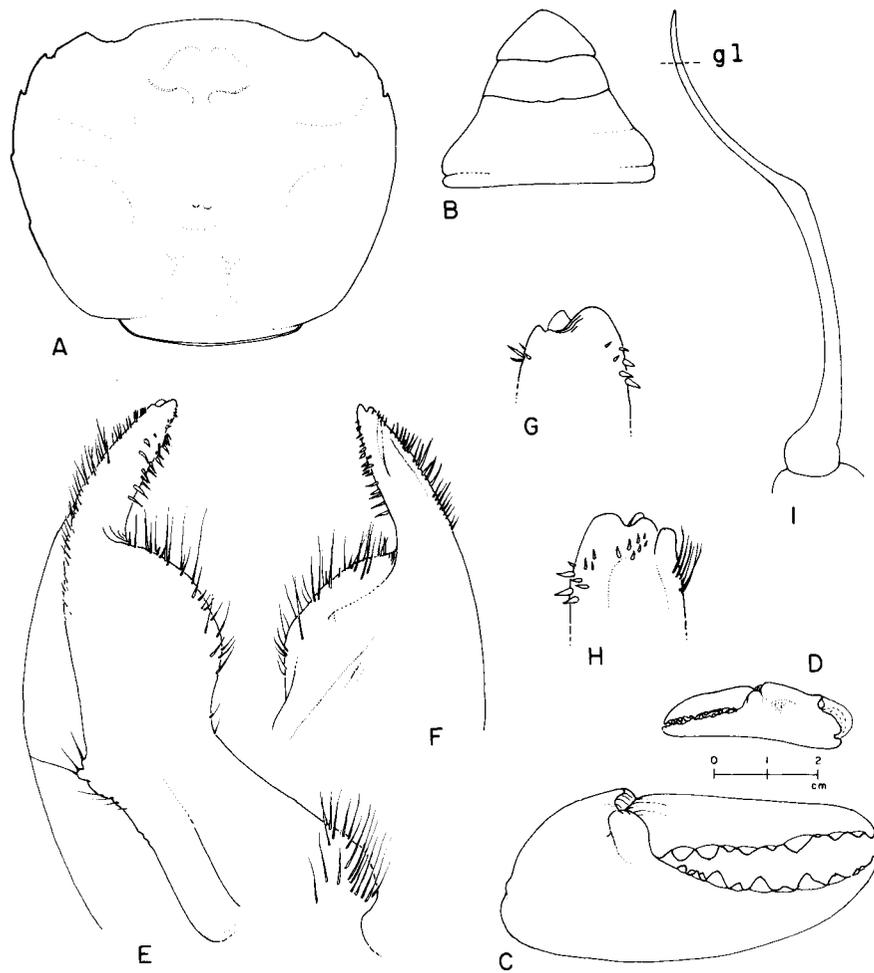


FIGURE 31

Valdivia gila Pretzmann, male specimen from Pakitza, Perú, cl 40.6 mm: A, outline of carapace; B, abdomen; C, larger chela; D, smaller chela; E, first male gonopod, left, caudal; F, same, cephalic; G, same, detail of apex, caudal; H, same, cephalic; I, second male gonopod. gl, level of gonopore of first gonopod.

obsolescent; other grooves of mesial regions not present; wide and elevated ridge separates epi- and mesogastric regions; cardiac region rhomboidal, with transverse ridge across; intestinal region slightly convex. Posterior gastric pits present. Lateral margin armed with 2 small, widely spaced spines, placed on antero-lateral portion of margin and usually followed by 2 wide lobes or indentations (2 small spines in holotype); margin between external orbital angle and first tooth forms a convex, or more generally concave lobe; postero-lateral ridge of carapace bent mesially in posterior end, ending in elongated swelling over postero-lateral angles of carapace; posterior margin delimited by high ridge. Surface of carapace smooth and shiny to naked eye. Frontal margin straight, incurved upwards; orbits more or less rounded, small, eyes completely fill orbital cavity; orbital fissure indicated only by inconspicuous notch or shallow groove in small specimens; lower orbital margin entire or with a small tooth followed by crenulations; inner orbital angle pyramidal, not prominent, topped by a tubercle; conspicuous wide recess between this angle and rest of lower orbital margin; occlusive orbital tooth small, not dentiform, but forming rounded ridge by external side of basal portion of antenna and not concealed by it; outer orbital angle blunt, triangular; buccal angle entire or crenulated. Front advanced, hiding epistome in dorsal view; anterior surface of front sunk, high particularly in middle, with 2 distinct middle pillars separated by U-shaped sinus which forms deep recess, thin ridge over middle of antennular fossae; antennular septum slightly sunk; epistome high, slightly bent backwards.

The abdominal tergites of male covered by pits and rugae which are largest in tergites 1-3 (but not so conspicuously as in *harttii*); abdomen sunk when closed, tergite in front of it forms ridge; abdominal tergites 1-3 only slightly excavated. First abdominal segment of male and female partly hidden by posterior margin of carapace; segments 3-5 fused in male and female; segments 6 and 7 mobile in male, ankylosed in female; male abdomen relatively wide basally, not bulging strongly on each side of segments 2 and 3; outer margin concave, last segment widely triangular, approximately 0.65 as long as broad.

Chelipeds strongly unequal in mature males; when fully developed largest chela unusually large (length of hand/cb=1.5), very deep, particularly at base of fingers (depth/length at this point = 0.4); narrow in dorsal view (breadth/depth = 0.5) and strongly curved; fingers moderately gaping, teeth alternately large and small; cutting edge of finger with 4 small proximal teeth forming square; surface of chela smooth, without longitudinal grooves, excavated on both sides at base of fixed finger and on upper portion of palm; smaller chela considerably smaller, length of palm 0.45 length of larger. Upper surface of carpus excavated, irregular, with pattern of thin ridges clearly visible under the microscope; carpus with strong spine on inner margin; merus with acute apical spine on upper border and tubercle on inner margin. Lower margin of dactylus of legs thickly clothed with long coarse hairs; similar patches of hairs cover lower border of propodus in approximately 68% of 2nd, 38% of 3rd, 24% of 4th, and 95% of 5th pereopod; upper margin of propodus and dactylus thickly clothed by shorter hairs arranged more or less in 2 parallel longitudinal rows, more extensive in 2nd and 3rd; sides of dactylus covered with felt-like pubescence.

Gonopod forms regular curve directed laterad; very wide in meso-lateral plane in proximal 3/4 and then narrows to short tube with parallel sides; mesial border regularly curved; lateral border with conspicuous rounded lobe; gonopod conspicuously spinuous and hairy; row of long spines arranged in row on distal half of margin, patch of stout distal spines on lateral surface, which increase in length proximally, and long, irregularly placed setae over lateral lobe. Second gonopod moderately longer than first, with basal portion more or less straight and distal portion bracket-shaped.

Color

Pereiopods and dorsal side of carapace light brown; pereiopods with small red spots which forms amottled pattern; these spots form a reticle over the carpus of chelipeds and are less visible on the upper surface of carapace.

Material examined

Perú. Pakitza, Madre de Dios Department, Manabi Province; 17 October 1987-22 September 1988; 5 males, 4 females (MHN Lima).

Type and distribution

The species was previously known from the single type specimen collected in a hole near the University of Pucallpa (PRETZMANN, 1978a; PRETZMANN, 1983a). PRETZMANN, 1983b, mentions that "*the largest chela known ... is from Bobonaza (=Rio Bobonaza) and is 12.9 cm long*", but he does not precisely states whether this belongs to *V. gila*. These previous records are from the Ucayali-Maranon basin; our specimens are from the Madre de Dios-Madeira system. These basins are widely separated at their junctions with the Amazon, but their headstreams (Rio Urubamba and Rio Piedras, respectively) are very close, particularly in the southernmost end of the Loreto Department.

Remarks

PRETZMANN (1978a, 1983a, b) considered this taxon a subspecies of *Valdivia harttii*. However, *V. gila* differs from other species of the genus in the reduction in size and number of the lateral teeth. The strong chelar dimorphism of the male and the shape and armature of the first gonopod are unique to this species within the genus.

Valdivia harttii Rathbun, 1906

Fig. 4Q; 5H; 8E; 13E; 32A-J

Trichodactylus (Valdivia) harttii Rathbun, 1906, p. 55, pl. 17, fig. 9. - BOTT, 1969, p. 42. - RODRÍGUEZ, 1981, p. 42.

Description

Carapace hexagonal; upper surface very uneven; frontal, orbital, hepatic and epibranchial regions conspicuously excavated; epigastric region consists of 2 transverse low lobes, not clearly delimited, which under microscope appear crossed by transverse granular striae; protogastric region also bilobular, each lobe delimited anteriorly by U-shaped, irregular, eroded ridge; branchio-cardiac and branchio-urogastric grooves wide and well marked; other grooves of mesial regions not present; inconspicuous ridge between hepatic and epibranchial regions, and similar one between epi- and mesobranchial regions; conspicuous transverse elevation across metabranchial regions; cardiac region rhomboidal, with transverse ridge across it; intestinal region slightly convex. Posterior gastric pits present. Lateral margin with postorbital lobe or small tooth followed by 4-5 equally spaced spines, 1st and 2nd interdental spaces half length of others; last spine considerably smaller, but acute and well defined, followed by 4 or 5 large squamiform tubercles; postero-lateral ridge of carapace bent mesially at posterior end, followed by elongated swelling over postero-lateral angles of carapace; posterior margin delimited by high carina. Surface of carapace eroded, with small warts and pits visible to naked eye. Frontal margin straight or slightly concave, incurved upwards, orbits oblong, orbital fissure indicated by notch and thin transversal ridge; lower orbital margin with 4 or 5 hooked (at least 1st) spines, which decreases in size laterally, inner orbital angle with hooked spine or long cylindrical tubercle; conspicuous U-shaped recess between this angle and lower orbital margin; occlusive orbital tooth small, not dentiform, forming rounded ridge by external side of basal portion of antenna and not concealed by it; outer orbital angle triangular, prominent; buccal angle with small acute spine followed laterally by crenulated ridge. Front advanced, hiding epistome in dorsal view; anterior surface of front vertical, covered by small papillae, high particularly in middle, with 2

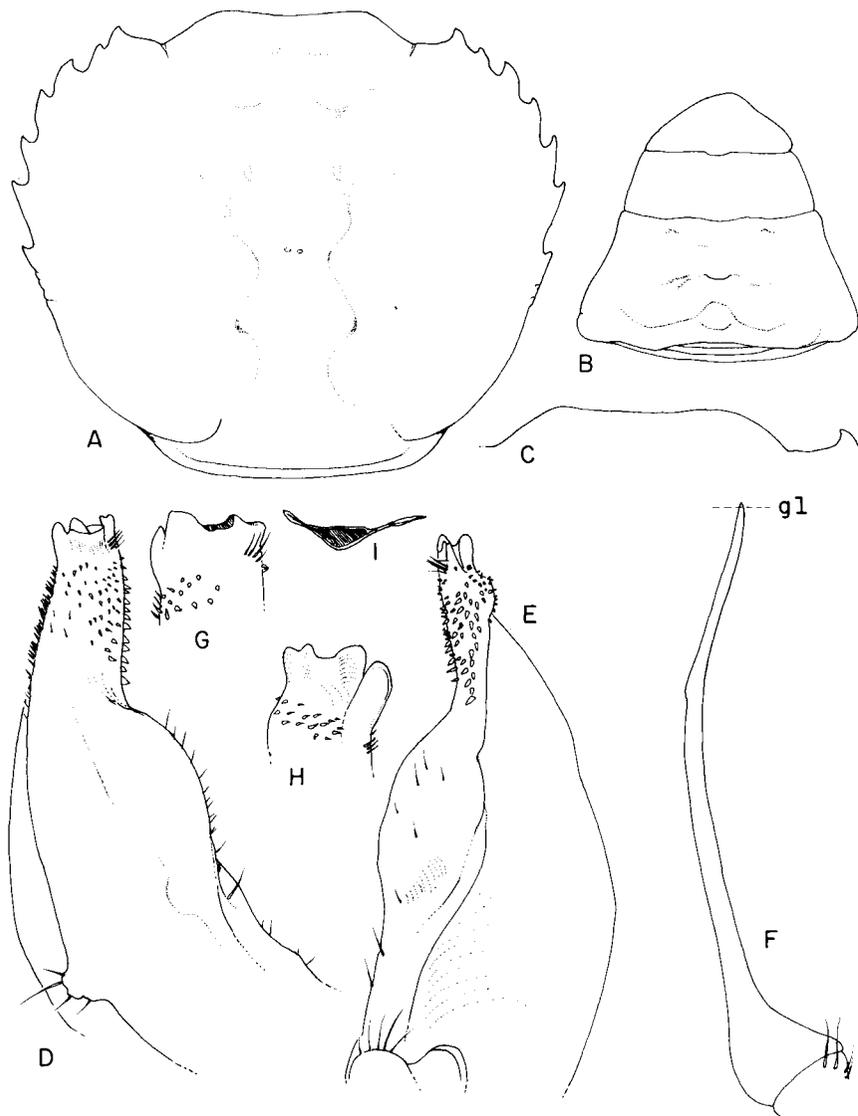


FIGURE 32

Valdivia barttii Rathbun, male from San Carlos de Rio Negro, Venezuela, cl 39.8 mm:
 A, outline of carapace; B, abdomen; C, outline of front; D, first male gonopod, left, caudal;
 E, same, cephalic; G, same, detail of apex, caudal; H, same, cephalic; I, same, distal;
 F, second male gonopod. gl, level of gonopore of first gonopod.

distinct middle pillars separated by U-shaped sinus which forms deep recess, and dentiform ridge over middle of antennular fossae; these ridges partially visible in dorsal view; antennular septum not sunk; epistome high, vertical or slightly bent backwards.

Abdominal tergites of male densely covered by pits, largest in tergites 1-3, which give them eroded aspect under microscope; abdomen sunk when closed, tergite in front of it forms ridge; abdominal tergites 1-3 with one excavation in front, one excavation on each side; space between excavations forms conspicuous Y-shaped ridge. First abdominal segment of male and female partly hidden by posterior margin of carapace; segments 3-5 fused in male and female; segments 6 and 7 mobile in male, ankylosed in female; male abdomen elongated, bulging strongly on each side of segments 2 and 3; outer margin concave, last segment widely rounded, approximately 0.5 as long as broad.

Chelipeds unequal, smallest very small, but largest not extraordinarily developed; hand of largest cheliped with tiny acute teeth on upper margin near articulation of dactylus, large, low tubercle covered by red spot, on side near articulation of fingers; fingers slightly gaping, teeth subequal in size; upper surface of carpus eroded; strong hooked spine on inner margin; merus with acute apical spines on upper border and on distal angle of latero-inferior margin. Lower margin of dactylus of legs thickly clothed with long coarse hairs; these patches cover all lower margin of propodus in 5th, 3/4 in 2nd, 1/2 in 3rd and only distal angle in 4th pereopod; upper margin of propodus and dactylus thickly clothed with shorter hairs arranged more or less in 2 parallel longitudinal rows, more extensive in 2nd and 3rd; sides of dactylus with felt-like pubescence.

First gonopod very wide at base in latero-mesial direction, very narrow in caudo-cephalic direction, regularly tapering to apex, more evident in caudo-lateral view; base with wide lateral lobe; terminal half narrow, with parallel sides in caudal and cephalic views; apical margin truncate, gonopore terminal, narrow and slit-like in outline, flanked on lateral, mesial and caudal sides by 3 corneous projections; patch of corneous spines on caudal and lateral sides, long band of short translucent setae on mesial side and brush of long slender setae on lateral side near gonopore. Second gonopod longer than first, basal portion more or less straight, distal portion bracket-shaped.

Material examined

Venezuela. San Carlos de Rio Negro, Amazonas Federal Territory; 8 September 1976; 2 males (Ivic). San Carlos de Rio Negro, Amazonas Federal Territory; 9 April 1979; K. CLARK; 1 spent female (Ivic). Rio Siapa, Amazonas Federal Territory; 27 March 1988; R. ROYERO; 1 male, 1 female with marsupial youngs (Ivic).

Type and distribution

Brazil. Tefé; Rio Tapajos (RATHBUN 1906, type); Rio Negro (BOTT, 1969). Venezuela. Rio Negro (present records).

Valdivia latidens (A. Milne Edwards, 1869)

Sylviocarcinus latidens A. Milne Edwards, 1869, p. 175.- NOBILI, 1896, p. 3.- MOREIRA, 1901, p. 44.

Orthostoma latidens, ORTMANN, 1897, p. 326, 328.

Trichodactylus (Valdivia) latidens, RATHBUN, 1906, p. 49, pl. 17, fig. 4, text-fig. 112.

Rotundovaldivia latidens, PRETZMANN 1983b, p. 326, pl. 8, fig. 18, 19, pl. 9, fig. 20-22.

?*Trichodactylus (Valdivia) bourgeti* Rathbun, 1906, p. 56, pl. 16, fig. 4, text-fig. 118.

Trichodactylus (Valdivia) bourgeti falcipenis Pretzmann, 1968a, p. 5.

Rotundovaldivia falcipenis, PRETZMANN, 1983b, p. 326, pl. 10, fig. 23, 24.

Type and distribution

The holotype, a male deposited at the Museum of Natural History in Paris, came from an undetermined locality in the upper Amazon. PRETZMANN's material of the species and the holotype of his *Rotundovaldivia falcipenis* are from the Ucayali River, Perú.

Remarks

The first gonopod of this species is very characteristic, and for this reason PRETZMANN (1968b) separated it into the subgenus *Rotundovaldivia* (genus in PRETZMANN, 1983b). However, the first gonopod of *Valdivia gila* (fig. 31E), although not so strongly falcate, is intermediate between this species and the more typical *Valdivia*. Notwithstanding slight differences in gonopod morphology and in the number of lateral teeth, *Rotundovaldivia falcipenis* is conspecific with *Valdivia latidens*. Very possibly, *Trichodactylus (Valdivia) bourgeti*, described from a small (cl 21 mm) female holotype from Tabatinga, Brazil, also belongs here.

Valdivia serrata White, 1847

Fig. 1F; 3H; 4R; 5E; 8C; 10B; 13F; 15F; 33A-L

Valdivia serrata White, 1847a, p.31 (*nomen nudum*).- WHITE, 1847b, p. 200.- H. MILNE EDWARDS, 1853, p. 214.- SMALLEY & RODRÍGUEZ, 1972, p. 50, fig. 11, 12.- RODRÍGUEZ, 1980, p. 342.- RODRÍGUEZ, 1981, p. 48.

Trichodactylus (Valdivia) serratus, RATHBUN, 1906, p. 47, pl. 17, fig. 7, 8, text-fig. 111.- COIFMANN, 1939, p. 94.- HOLTHUIS, 1959, p. 210, fig. 49, 50a.

Valdivia (Valdivia) serrata serrata, PRETZMANN, 1968b, p. 71 (by implication).- BOTT, 1969, p. 39.

Valdivia (Valdivia) serrata, SCHMITT, 1969, p. 98.

Valdivia (Valdivia) serrata surinamensis Pretzmann, 1968b, p. 72.

?*Valdivia (Valdivia) serrata haraldi* Bott, 1969, p. 40, pl. 7, fig. 12a, b, pl. 19, fig. 42.

Valdivia (Valdivia) serrata cururuensis Bott, 1969, p. 41, pl. 7, fig. 13a, b, pl. 19, fig.43.

Trichodactylus (Valdivia) bourgeti novemdentatus Pretzmann, 1968a, p. 5.

Description

Carapace hexagonal; upper surface very uneven; frontal, orbital, hepatic and epibranchial regions conspicuously excavated; epigastric region consists of 2 low lobes, not clearly delimited, which under microscope appear crossed by transverse granular striae; protogastric region also bilobular, each lobe delimited anteriorly by thin, lunular ridge; branchio-cardiac and branchio-urogastric grooves wide, well marked; other grooves of mesial regions not present; transversal ridge runs in front of the mesogastric region and extends laterally for short distance across metabranchial regions, usually continued laterally by low branchial ridge; cardiac region rhomboidal, with a transverse ridge across; intestinal region slightly convex. Posterior gastric pits present. Lateral margin armed with 4 or 5 teeth behind external orbital angle, equally spaced, decreasing in size posteriorly; last, when present, small spine or minute squamiform tooth, in some specimens only a notch in this place, followed in some cases by 4 or 5 squamiform tubercles; postero-lateral ridge of carapace bent mesially in its posterior end, followed by elongated swelling over postero-lateral angles of carapace; posterior margin delimited by high carina. Frontal margin straight, incurved upwards; orbits more or less rounded, small, eyes completely fill orbital cavity; orbital fissure indicated by inconspicuous notch; lower orbital margin with 7 or 8 acute tubercles which decrease in size laterally, inner orbital angle pyramidal, prominent, acute; conspicuous U-shaped recess between this angle and lower orbital margin; occlusive orbital tooth small, not dentiform, forming a rounded ridge by external side of basal portion of antenna, not concealed by it; outer orbital angle triangular, projected, followed posteriorly by prominent sinuous lobe which leaves semicircular recess in front of first

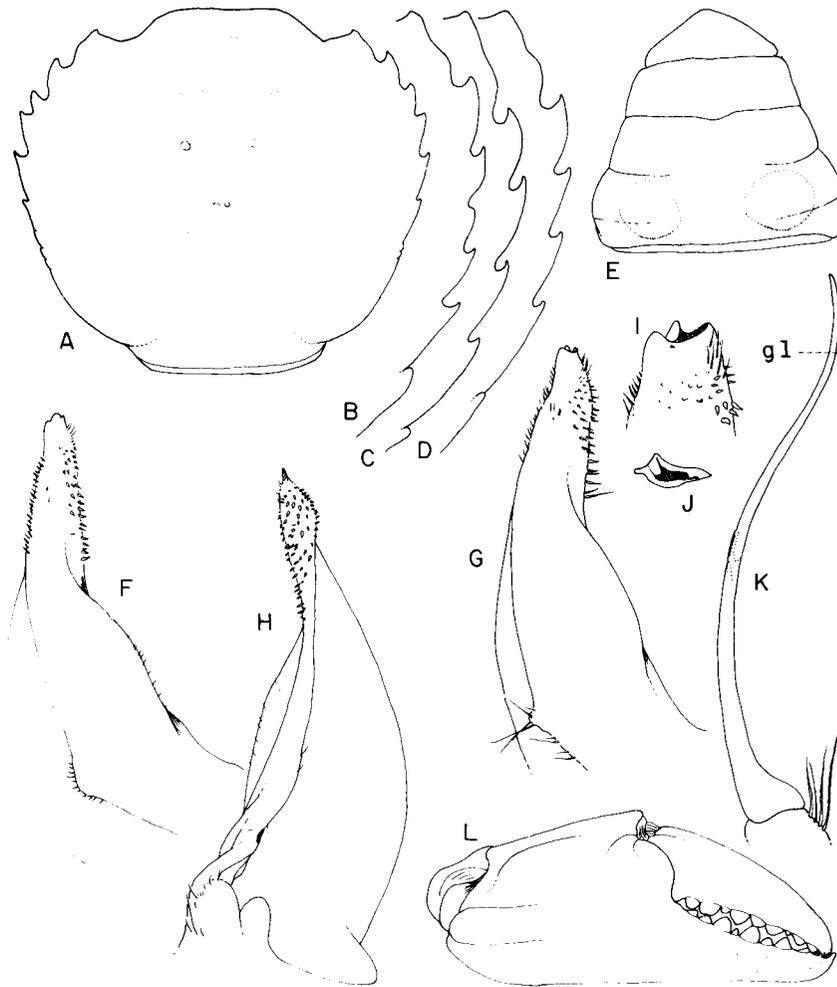


FIGURE 33

Valdivia serrata White: A, outline of carapace; B-D, detail of lateral spines; E, male abdomen; F, G, first male gonopod, left, caudal; H, same, cephalic; I, detail of apex, caudal; J, same, distal; K, second male gonopod; L, largest cheliped. A, E, F, H, male from Alto Caño Rueda, Venezuela, cl 31.8 mm; B, G, I, J, K, male from La Esmeralda, Venezuela, cl 36.3mm; C, L, male from Leticia, Colombia, cl 41.0 mm; D, male from Loreto, Ecuador, cl 39.1 mm. gl, level of gonopore of first gonopod.

lateral tooth; buccal angle crenulated or with 4 ill-defined tubercles. Front advanced, hiding epistome in dorsal view; anterior surface of front vertical, high particularly in middle, with 2 distinct middle pillars separated by U-shaped sinus which forms deep recess, and dentiform ridge over middle of antennular fossae; antennular septum not sunk; epistome high, vertical or slightly bent backwards.

Abdominal tergites of male densely covered by pits, largest in tergites 1-3, giving them eroded aspect under microscope; abdomen sunk when closed, tergite in front of it forms ridge; abdominal tergites 1-3 with one excavation in front, one excavation on each side; space between excavations forms conspicuous Y-shaped ridge. First abdominal segment of male and female partly hidden by posterior margin of carapace; segments 3-5 fused in male and female; segments 6 and 7 mobile in male, ankylosed in female; male abdomen elongated, bulging strongly on each side of segments 2 and 3; outer margin concave, last segment widely rounded, approximately 0.5 as long as broad.

Chelipeds unequal, smallest very small, largest not extraordinarily developed; hand with longitudinal carina in middle of external surface, surface between this carina and upper margin excavated, particularly in smaller chela; acute teeth on upper margin near articulation of dactylus (absent or reduced in some large specimens), and large low tubercle often covered by red spots, on external side near articulation of fingers; fingers slightly gaping, teeth large, subequal, interspaced with smaller ones; upper surface of carpus eroded, with pattern of thin ridges clearly visible under microscope; strong hooked spine on inner margin; merus with acute apical spine on upper border and another on distal angle of latero-inferior margin. Lower margin of dactylus in legs thickly clothed with long coarse hairs; these patches cover all lower margin of propodus in 5th, 3/4 in 2nd, 1/2 in 3rd and only the distal angle in 4th pereopod; upper margin of propodus and dactylus thickly clothed by shorter hairs arranged more or less in 2 parallel longitudinal rows, more extensive in 2nd and 3rd; sides of dactylus with felt-like pubescence.

First gonopod very wide at base in latero-mesial direction, very narrow in caudo-cephalic direction, regularly tapering to apex, more evident in caudo-lateral view; base with elongated lateral lobe; terminal half narrow, with convergent sides in caudal and cephalic views, bulbiform in latero-cephalic view; apical margin truncate, gonopore terminal, narrow and slit-like in outline, flanked on lateral, mesial and caudal sides by 3 corneous projections; patch of corneous spines on caudal and lateral sides, long band of short translucent setae on mesial side and brush of long slender setae on lateral side near gonopore. Second gonopod longer than first, basal portion more or less straight, distal portion bracket-shaped.

Color

Pereopods and dorsal side of carapace covered with red spots, which sometimes are elongated and thin, forming a symmetrical pattern; these spots form a reticle over the carpus of cheliped. The background color varies from light to dark brown, reddish or even black.

Material examined

Venezuela. Alto Caño Rueda, Atures, 22 km from Puerto Ayacucho, Amazonas Federal Territory; 30 October 1965; P. ANDUZE; 1 male (Ivic). Carinagua, Puerto Ayacucho, Amazonas Federal Territory; 5 December 1977; 2 juvenile females (Ivic). Id.; 29 November 1978; 3 immature females, 1 juvenile male (Ivic). La Esmeralda, Caño Iguapo, Amazonas Federal Territory; 19 February 1966; J. PULIDO & L. DUQUE; 5 males, 2 females (MB XI-0671). Id.; 450 m alt; 1 March 1968; J. A. RIVERO; 1 female (Ivic). San Pedro de Cataniapo, 100 m alt, Amazonas Federal Territory; 23 August 1981; O. PACHANO; 1 female (LS 1120). Same locality; 25 August 1981; R. FEO; 1 male (LS 1045). Rio Tucuragua, affluent of the Orinoco, between Cuchivero and Caura rivers, Bolivar State; 7 April 1981; G. RODRÍGUEZ; 1 juvenile male (Ivic). Rio Tauca, affluent of the Rio

Caura, Bolivar State; 7 May 1981; G. RODRÍGUEZ; 1 juvenile male (Ivic). Caño Chorro de Agua, Las Bateas, Los Pijiguaos, Bolivar State; 27 April 1988; C. LASSO & G. COLONNELLO; 1 male (LS 1143). Quebrada Trapichote, road to El Jobal, Los Pijiguaos, Bolivar State; 28 April 1988; C. LASSO & G. COLONNELLO; 2 immature females (LS 1137). La Solanera, Los Pijiguaos, Bolivar State; 26 April 1988; C. LASSO & G. COLONNELLO; 1 female (LS 1136).- Colombia. Leticia, Amazonas Department; 1 April 1957; H. NICEFORO MARIA; 1 male (Ivic). Rio Hacha, Florencia, Caquetá Department; 4 January 1954; H. NICEFORO MARIA; 1 male (Ivic). Quebrada La Yuca, Florencia, Caquetá Department, 10 March 1954; H. NICEFORO MARIA; 1 female (Ivic). San Juan de Arama, Meta Department, 500 m alt; 20 September 1987; M. R. CAMPOS; 1 male (ICN-MHN-CR 808).- Ecuador. Loreto, slopes of Monte Sumaco, 450 m alt, Napo Province; 1 June 1968; M. OLALLA; 2 males (Ivic).

Type and distribution

The type specimen is a female and the type locality is unknown. The species occupies an extensive area between the Orinoco and the Amazon, but it does not extend north of the first river neither south of the second. The records in the literature are the following: Brazil. Tabatinga; Tefé (RATHBUN, 1906); Brazilian Guiana, Serra de Tumucumaque, Rio Parú and Rio Parú Superior; Quatipuru, near Rio Toboa; Rio Parú do Oeste; Rio Marauia, Cachoeira San Antonio, type of *Valdivia (Valdivia) serrata haraldi* Bott, 1969, and near Tupuruquara, at the junction of Rio Marauia and Rio Negro; at the junction of the Rio Kenebiit-Tabiri and the Rio Cururú, type of *Valdivia (Valdivia) serrata cururuensis* Bott, 1969. Venezuela. See records above. Colombia. Caquetá Department: Rio Orteguzza, near Venecia; Putumayo Department: Puerto Limon, Rio Caquetá (SMALLEY & RODRÍGUEZ, 1972); Puerto Asis (SCHMITT, 1969); Amazonas Department: Rio Arara. See other records above. Ecuador. Napo Province: Loreto, foothills of Mount Sumaco, 450 m alt (SMALLEY & RODRÍGUEZ, 1972). Suriname. Paramaribo; near Republiek; Zanderdij; Sectie O, 70 km S of Paramaribo; Litani River, upper reaches of the Marowijne River basin (HOLTHUIS, 1959); Paramaribo, type of *Valdivia (Valdivia) serrata surinamensis* Pretzmann, 1968.- Guyana. Demerara River (COIFMANN, 1939).

Remarks

The species displays considerable variations in the number and development of the lateral teeth of carapace, as can be observed in specimens from Venezuela, Colombia and Ecuador (fig. 33A, B, C, D). The gonopod also presents variations in the shape of the lateral lobe, thickness of the distal tube and convexity of the mesial outline, which can be observed even in specimens from localities close to each other (fig. 33G, H). Most of the subspecies of *Valdivia serrata* described by PRETZMANN (1968a, b) and BOTT (1969) are based on these characters of the carapace and gonopod. *Valdivia (Valdivia) serrata surinamensis* Pretzmann, 1968, and *Valdivia (Valdivia) serrata cururuensis* Bott, 1969 cannot be distinguished from the more typical *Valdivia serrata*. On the other hand the inclusion of *Valdivia (Valdivia) serrata haraldi* under this species is doubtful. In this subspecies the lateral teeth of carapace are identical to those of *V. serrata*, but the first gonopod is more recurved laterad, resembling more that of *Valdivia gila* than the one of *V. serrata*.

Trichodactylus (Valdivia) bourgeti novemdentatus Pretzmann, 1968, from the Rio Negro, probably should be grouped under *Valdivia serrata* and not under *V. bourgeti* (= *V. latidens*), since the dentition of the carapace falls within the variation displayed by the former species.

Valdivia (Valdivia) serrata oronensis Pretzmann, 1968 (see PRETZMANN, 1968b, p. 72), described from male and female types from Rio Paraguay, R. d. Oro [Rio de Oro, Chaco province, Argentina], according to his diagnosis (front deeply bilobed, carapace strongly arched, without sculpturing, gonopod without lateral lobe), does not belong to the genus *Valdivia* but to the genus *Zilchiopsis*.

Forsteria Bott, 1969

Valdivia (*Forsteria*) Bott, 1969, p. 37.

Carapace hexagonal, upper surface strongly arched, smooth, frontal and orbital regions excavated, but regions not delimited, antero-lateral margin angled, exceptionally rounded in all males, median grooves not deeply marked, 3 lateral teeth behind external orbital angle, obsolescent in old males, front straight; first gonopod widened at base, with long setae on lateral margin, distal half strongly bent laterad, apex bulbous.

Forsteria venezuelensis (Rathbun, 1906)

Fig. 1G; 4S; 5G; 8A; 9H; 13D; 15I; 34A-H

Trichodactylus (*Valdivia*) *venezuelensis* Rathbun, 1906, p. 47, pl. 17, fig. 10.- COIFMANN, 1939, p. 112.

Valdivia venezuelensis, SMALLEY and RODRÍGUEZ, 1972, p. 50, fig. 13, 14.- RODRÍGUEZ, 1980, p. 343, fig. 99.- RODRÍGUEZ, 1981, p. 48.

Valdivia (*Forsteria*) *venezuelensis venezuelensis*, BOTT, 1969, p. 37, pl. 5, fig. 9a, b.

Valdivia (*Forsteria*) *venezuelensis edentata* Bott, 1969, p. 38, pl. 6, fig. 10a, b, pl. 19, fig. 40.

Holthuisisia venezuelensis, PRETZMANN, 1968b, p. 74.

Trichodactylus (*Valdivia*) *ornatifrons* Pretzmann, 1968a, p. 3.

Valdivia (*Valdivia*) *ornatifrons*, PRETZMANN, 1968b, p. 71.

Description

Carapace hexagonal; upper surface slightly irregular, in frontal view forms regular arch, only metabranchial region slightly more prominent than adjacent cardiac and intestinal regions; frontal and orbital regions excavated, epigastric lobes well delimited; branchio-urogastric groove weakly marked, urogastric groove almost absent, branchio-cardiac groove indicated by flat depressions. Lateral margins angled, except in largest males where it becomes rounded; postero-lateral ridge of carapace bent mesially in posterior end, followed by elongated swelling over postero-lateral angles of carapace; antero-lateral margin with 3 teeth behind external orbital angle which decrease in size posteriorly; 2nd and 3rd teeth nearer than 1st and 2nd; in the largest males (cb=>40 mm) lateral teeth become obsolete, or only first remains, represented by small tubercle. Margin of front straight, covered with small tubercles. Orbits suborbicular; orbital suture absent, although position sometimes indicated by small depression; lower orbital margin with blunt teeth or papillated tubercles; inner orbital angle prominent, pyramidal; occlusive orbital tooth rounded, small; outer orbital angle forming triangular tooth, border in contact with orbital margin; buccal angle papillated, not armed. Front advanced, hiding epistome in dorsal view; anterior surface of front vertical, moderately high in middle, lower on sides, middle pillars not distinct, margin over each antennular fossae sinuous, slightly projected; antennular septum slightly sunk; epistome high, vertical or slightly bent backwards.

First abdominal tergite of male separated from tergite 2 + 3 by suture or deep depression; tergites 2 + 3 with very shallow depression on both sides. Third to 5th abdominal segments fused in both male and female; male abdomen elongated, narrow at base, outer margin slightly concave; last segment with sides concave, approximately 0.5 as long as broad.

Basal article of antenna with outer lobe prominent and narrow; ischium of third maxilliped devoided of grooves or depressions. Chelipeds strongly unequal in both male and female; upper border of chela strongly arched and lower almost straight, fingers do not gap; teeth small, regularly placed along cutting edges and

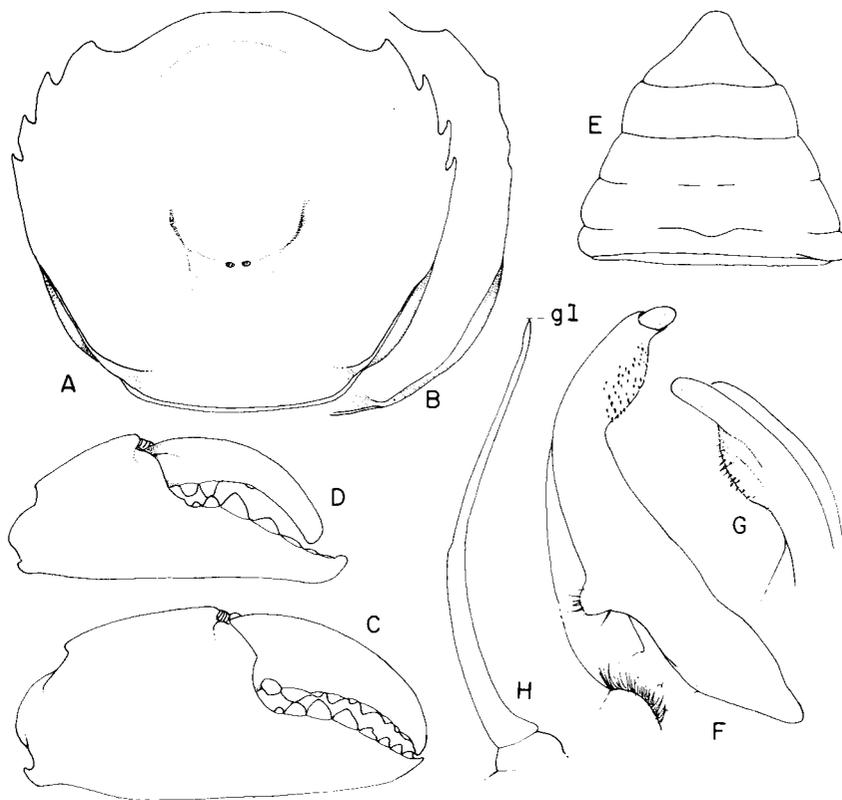


FIGURE 34
Forsteria venezuelensis (Rathbun) : A, B, outline of carapace; C, D, larger chela;
 E, abdomen; F, first male gonopod, left, caudal; G, same, apex, cephalic; H, second
 male gonopod. A, C, E-H, male specimen from Rio Taguay, cl 34.4 mm; B, D,
 male specimen from Rio Guarapiche, cl 41.4 mm. gl, level of gonopore of first gonopod.

regularly diminishing in size distally; carpus with inner margin produced in sharp hooked spine; merus of young specimens with or without apical spine on upper border and another at distal angle of latero-inferior margin; in oldest males largest chela becomes enormously developed, hand > 1.5 as long as carapace, fingers strongly unequal, with dactylus considerably shorter than fixed finger and devoided of teeth in its distal part, and spines of merus obsolete or represented by small tubercles. Lower margin of dactylus of legs thickly clothed with long coarse hairs; these patches cover all lower margin of propodus in 5th, 3/4 in 2nd, 1/2 in 3rd and only the distal

angle in 4th pereopod; upper margin of propodus and dactylus thickly clothed by shorter hairs arranged more or less in 2 parallel longitudinal rows, more extensive in 2nd and 3rd; claws of dactylus with 5 longitudinal carinae, 1 upper, 2 lateral and 2 inferior.

First gonopod with proximal half conical, strongly widened at base and directed mesially; distal half strongly bent laterad, lateral globular expansion covered by short thick setae, arranged in several parallel rows; gonopore overreached by distal corneous expansion. Second gonopod of equal length than first, bracket-shaped, apex flat, lanceolate.

Material examined

Venezuela. Rio Taguay, Aragua State; 12 December 1967; J. PULIDO; 3 males, 2 females (Ivic). Paraima, Guárico State; 31 March 1950; 1 female (Ivic). Caicara, Rio Guarapiche, Monagas State; 8 September 1968; 1 male, 1 female (Ivic). Rio Chiviripa, between La Urbana and Caicara, Bolivar State; 1 April 1958; G. MEDINA; 1 female (Ivic).- Venezuela, without data; 1 female (Ivic).

Type and distribution

Type specimens are 2 females from the Orinoco River (MHNP). The species has been recorded from the Orinoco and many of the rivers draining to it: Ciudad Bolivar (BOTT, 1969); Rio Orinoco (SMALLEY & RODRÍGUEZ, 1972); affluent of the Rio Apure (RATHBUN, 1906); Rio Cura and Rio Taguay, both affluents of Rio Guárico (SMALLEY & RODRÍGUEZ, 1972); Rio Chiviripa, draining on the right margin of the Orinoco, near Caicara (SMALLEY & RODRÍGUEZ, 1972); Rio Guarapiche, draining to Rio San Juan and the Gulf of Paria (SMALLEY & RODRÍGUEZ, 1972).

Remarks

The species have been described under several synonyms in the literature (SMALLEY & RODRÍGUEZ, 1972). The characters given for *Trichodactylus (Valdivia) meekei* Pretzmann, 1968, and moreover the illustrations of the carapace, chela, pereopods and first gonopod given in PRETZMANN (1983a), closely correspond with the characters of *Forsteria venezuelensis*, but I have not examined the holotype of the first species.

Tribe DILOCARCININI

Carapace suborbicular, wider anteriorly, upper surface strongly arched, smooth, front bilobed, partially or completely retracted, exposing epistome; first gonopod expanded laterally at base, with long plumose setae on lateral margin, apex bulbiform; gonopore slit-like, apical; second gonopod moderately longer than first, sinuous, exceptionally much longer and bent as question mark.

Type genus.- *Dilocarcinus* H. Milne Edwards, 1853

Key to the genera of Dilocarcinini

1. 3-4 teeth on lateral margin*Zilchiopsis*
– 6-10 teeth on lateral margin.....2
2. Distal part of first gonopod rounded or bulbiform*Dilocarcinus*
– Distal part of first gonopod strongly twisted sinistrally, apex with very few small conical spines*Fredilocarcinus*

Zilchiopsis Bott, 1969

Carapace hexagonal or suborbicular, upper surface strongly arched, median grooves deeply marked, front bilobed, advanced, exposing epistome in dorsal view, lower orbital margin directed downwards at inner orbital angle, 3-4 teeth on lateral margin, often minute or obsolescent; abdomen triangular-rounded or trapezoidal, third maxilliped with merus conspicuously narrow; first gonopod wide basally, strongly reduced in distal half.

Type species.- *Zilchiopsis sattleri* Bott, 1969.

Distribution

The four species of the genus are distributed in the tributaries of the Amazon, in four successive and non-overlapping areas, through an extensive territory on the west and south sides of South America: (a) Venezuela, Colombia and Ecuador (*Z. emarginatus*); (b) Ecuador (*Z. chacei*); (c) Perú (*Z. cryptodus*); and (d) Bolivia (*Z. sattleri*). An exception to this distribution is the record of *Z. sattleri* in the Rio Paraguay (BOTT, 1969), which is not an affluent of the Amazon.

Remarks

The carapace morphology of the species grouped under this genus, although transitional between the Valdiviini and the Dilocarcinini, displays the same basic characters in all the species. On the other hand, there is considerable variability in gonopodal morphology. The simple first gonopod of *Z. chacei* resembles that appendage in some *Sylviocarcinus*, particularly *S. pictus* and *S. sp.*, whereas in *Z. emarginatus* it is more akin to *Valdivia*. The morphology of this appendage in *Z. sattleri* and *Z. cryptodus* departs from any of the types found in other genera. However, to avoid an excessive generic splitting, the four species are kept in one genus inside the Tribe Dilocarcinini. To this genus probably belongs also *Trichodactylus (Valdivia) boliviensis* a species from Misiones Molletones, Bolivia, not examined by me.

Key to the species of *Zilchiopsis*

1. First gonopod almost straight, regularly tapering to apex.....*chacei*
– First gonopod regularly bent laterad, strongly constricted at middle2
2. A well defined basal lobe on mesial side of first gonopod; apical tube relatively wide*emarginatus*
– Basal portion of first gonopod widened but not forming defined lateral lobe; apical tube narrow.....3
3. Apical tube regularly tapering to terminal gonopore.....*cryptodus*
– Distal portion of apical tube reduced to a filament*sattleri*

Zilchiopsis chacei (Pretzmann, 1968)

Trichodactylus (Trichodactylus) chacei Pretzmann, 1968a, p. 3.

Zilchiopsis chacei, PRETZMANN, 1983b, p. 327, pl. 11, fig. 25, 26, pl. 12, fig. 27, 28.

Zilchiopsis chacei ecuadoroides Pretzmann, 1978b, p. 7.-PRETZMANN, 1983a, p. 310, pl. 6, fig. 21-24.- PRETZMANN 1983b, p. 327, not pl. 6, fig. 21, 22.

As described and illustrated by PRETZMANN (1968a, 1983b), this species has in common with the other three members of the genus the strongly convex carapace, with rounded lateral margins provided with small, obsolescent teeth, and the bilobed front, but it is well differentiated from them by its simple almost smooth gonopod, moderately widened at base and regularly tapering from the middle, with its lateral side slightly sinuous.

BOTT (1969) synonymized this species with *Zilchiopsis cryptodus*. The carapace of both are almost identical, except for the front less deeply bilobed in *Z. chacei*. However the gonopod of both species are different.

Type and distribution

The holotype of *Trichodactylus (Trichodactylus) chacei* is a male specimen, cl 30.4 mm, from Chichirota, Pastaza Province, east Ecuador, and the holotype of *Zilchiopsis chacei ecuadoroides* a male, cl 30.1 mm, from Sevilla del Oro, between Mendez and Paute, Ecuador. Thus the two taxa come from different drainage basins: Bobonaza-Pastaza rivers and Santiago-Marañon rivers; these two localities are approximately 230 km apart (Appendix 2).

Zilchiopsis cryptodus (Ortmann, 1893)

Dilocarcinus cryptodus Ortmann, 1893, p. 493.

Zilchiopsis cryptodus, BOTT, 1969, p. 35, pl. 25a, b, pl. 22, fig. 75.- RODRÍGUEZ, 1981, p. 48.- PRETZMANN, 1983b, p. 327.-

Trichodactylus (Dilocarcinus) emarginatus, RATHBUN, 1906, p. 69 (part.).-

This species, as redescribed and illustrated from the holotype specimen in the Strassburg Museum by BOTT (1969), is well characterized by the suborbicular strongly convex carapace, with the upper surface smooth, the lateral margin with 2-3 minute, blunt teeth behind external orbital angle, and the triangular gonopod densely covered by long setae on the lateral margin, with the apex very thin and directed laterad.

Type and distribution

Zilchiopsis cryptodus was described from 1 male specimen, cl 27 mm, from Rio Ucayali, Perú (ORTMANN, 1893; BOTT, 1969).

Zilchiopsis emarginatus (H. Milne Edwards, 1853)

Fig. 3G; 40 T; 5M; 7H; 8B; 9I; 10C; 13G, H; 35A-E; 36A-H

Dilocarcinus emarginatus H. Milne Edwards, 1853, p. 216.- H. MILNE EDWARDS, 1854, p. 181, pl. 14, fig. 4.- LUCAS, 1857, p. 7, pl. 2, fig. 3.- A. MILNE EDWARDS, 1869, p. 176, 178.- SMITH, 1869, p. 36.- YOUNG, 1900, p. 231, 232.- MOREIRA, 1901, p. 44.

Trichodactylus (Dilocarcinus) emarginatus, RATHBUN, 1906, p. 64, pl. 18, fig. 2.

Orthostoma emarginatus, ORTMANN, 1897, p. 326, 328.

Zilchiopsis emarginatus, BOTT, 1969, p. 35, pl. 21, fig. 56.

Valdivia ecuadoriensis Pretzmann, 1968a, p. 3.

Valdivia ecuadoriensis (sic), PRETZMANN, 1968b, p. 71.

Zilchiopsis ecuadoriensis, SMALLEY & RODRÍGUEZ, 1972, p. 49, fig. 9, 10.-PRETZMANN, 1983b, p. 328, pl. 13, fig. 29, 30, pl. 14, fig. 31, 32.

Zilchiopsis ecuadoriensis (sic), RODRÍGUEZ, 1981, p. 48.

Description

Carapace hexagonal at least in larger specimens (cl > 30 mm); upper surface irregular; strongly convex from front to back, almost flat in frontal view; mesogastric region less prominent than epibranchial; hepatic region excavated; frontal region flat on middle, convex laterally; triangular prominence on each side, in area of contact of epi-, mesobranchial and mesogastric regions, with transverse cervical groove in front of each prominence; metabranchial regions flattened, not more prominent than cardiac and intestinal; branchio-urogastric and

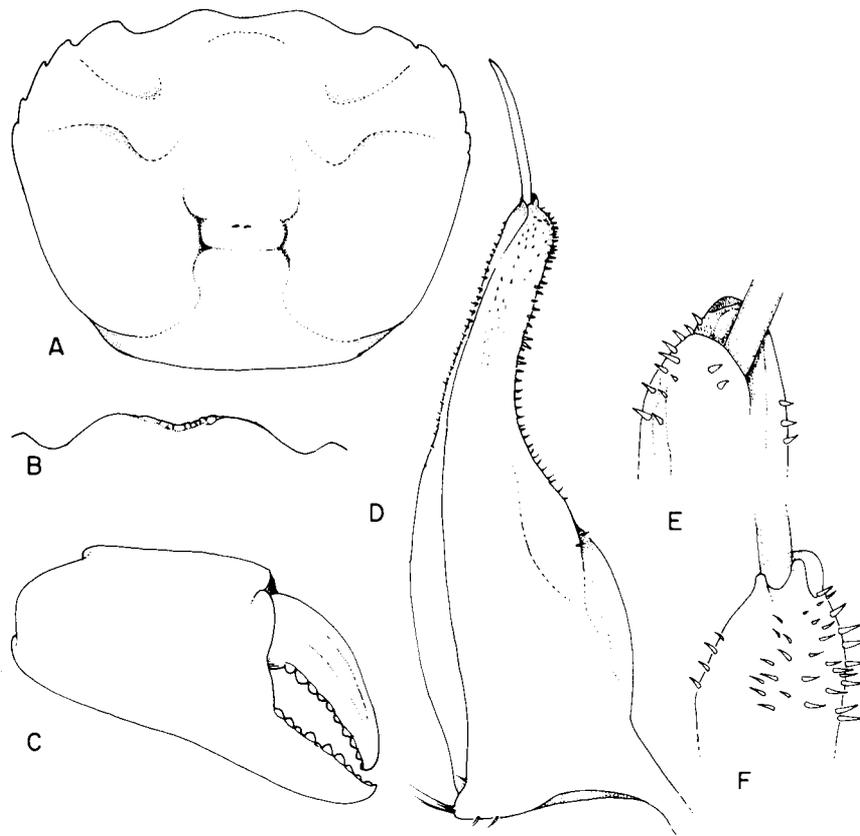


FIGURE 35
Zilchiopsis emarginatus (H. Milne Edwards), male specimen, cl 31.0, from Villavicencio:
 A, outline of carapace; B, front; C, larger cheliped; D, first male gonopod, left, caudal,
 with second gonopod in position; E, same, apex, medial; F, same, apex, caudal.

branchio-cardiac grooves thin, well marked, urogastric groove indistinct; postgastric pits triangular, small, close to each other or confluent. Carapace in smaller specimens with upper surface almost smooth, strongly convex from front to back, regularly arched in frontal view, all regions equally elevated, not delimited, carapace grooves not well marked. Lateral margins angled, forming thin ridge directed laterad; postero-lateral ridge of carapace bent mesially in posterior end near postero-lateral margin of carapace, then continued meso-proximally by arched ridge bordering metabranchial region; antero-lateral margin armed with 4, rarely 5, teeth behind external orbital angle, 1st and 2nd well spaced, spiniform or blunt, not projected outside outline of carapace, 3rd and 4th very close, papilliform. Front strongly bilobed with margin of middle sinus papillated and upturned. Orbits subquadrate, very large in vertical direction, eyes very small, disproportionate to orbital cavity; orbital suture absent; mesial end of lower orbital margin directed downwards rather than upwards as in other species, consequently lower portion of orbit very large, expanded, and inner orbital angle absent; this lower margin divided into 10-12 triangular or bead-like tubercles which diminish in size laterally; behind first two, floor of

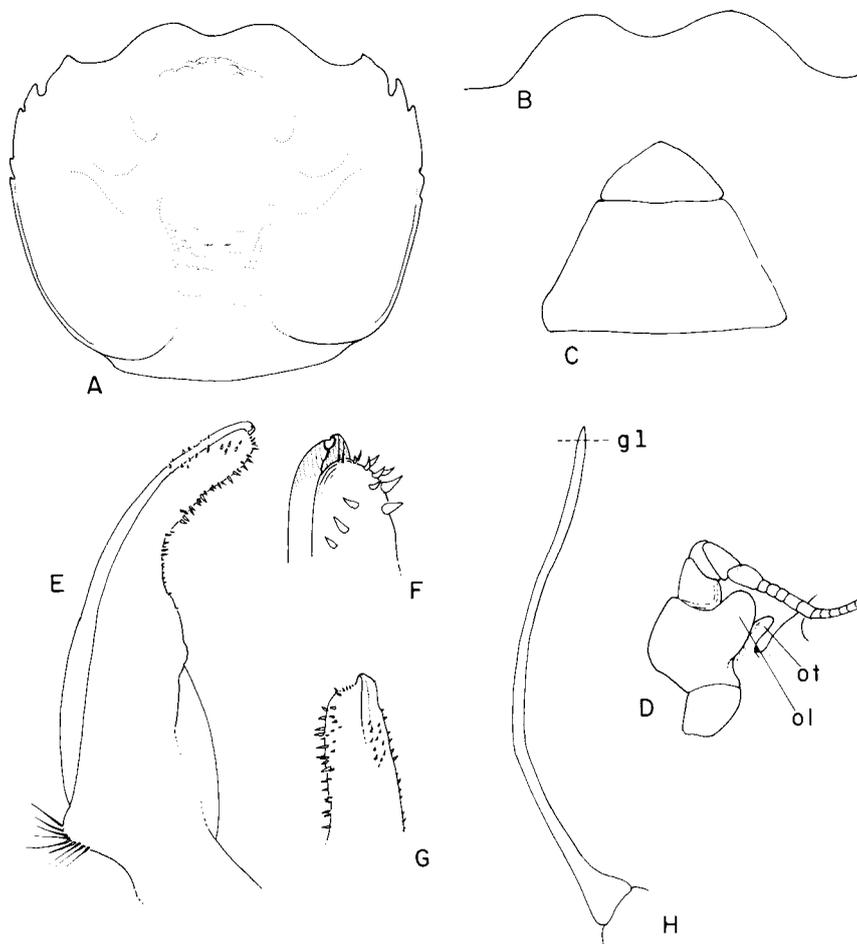


FIGURE 36

Zilchiopsis emarginatus (H. Milne Edwards), young male specimen from Loreto, Ecuador, cl 19.9 mm: A, outline of carapace; B, outline of front; C, abdomen; D, antenna; E, first male gonopod, left, caudal; F, same, detail of apex, caudal; G, same, caudal; H, second male gonopod. gl, level of gonopore of first gonopod; ol, lateral lobe of basal antennal article; ot, occlusive orbital tooth.

orbital cavity has strong tuberculated ridge; occlusive orbital tooth small, spiniform or bead-like; outer orbital angle triangular, blunt; buccal angle entire or faintly papillated. Frontal lobes slightly advanced, but middle sinus retracted, leaving exposed middle portion of epistome; anterior surface of front almost vertical or slightly

inclined forward, moderately high in middle, lower on sides, middle pillars short and thick, widely separated, margin over each antennular fossa slightly thickened, not projected, antennular septum not sunk; epistome high, divided by transverse middle suture into larger upper portion, almost vertical, and lower small portion, projected forward and ending in single mid-point, this continued into buccal cavity by 2 divergent ridges.

First and 2nd + 3d abdominal tergites of male without deep depressions. Third to 6th abdominal segments fused in both male and female; male abdomen very wide, outer margin convex, last segment with sides rounded, approximately 0.57 as long as broad.

Basal article of antenna with outer lobe prominent and narrow; ischium of third maxilliped broad. Chelipeds unequal; larger male cheliped with fingers short, narrow, widely gaping, with small, closely set teeth, fingers with longitudinal ridges and upper distal angle of palm projected or with spine, more conspicuous in smaller male chela and in both female chelae; inner margin of carpus with sharp, hooked spine; merus of male without spines; merus of female with sharp spines on distal angle of upper and inner borders, 2-4 smaller spines on lower margin. Lower margin of dactylus of legs thickly clothed with rows of long hairs, on lower margin of propodus these patches cover 84% of 2nd, 62% of 3rd, 60% of 4th, and 45% of 5th pereopod; upper margin of dactylus, propodus and carpus with a thick row of short hairs.

First male gonopod slender, small as compared to size of species, wide basally, very narrow distally after middle constriction; basal expansion regularly convex mesially, laterally more irregular, with accessory elongated lobe on cephalic surface; distal portion with subparallel sides, strongly bent laterad; terminal spines small, arranged as thick band on lateral side and diminishing in thickness proximally, forming a single row on mesial side; apical portion rounded on lateral side, straight on mesial side where forms thin lamella which surpasses gonopore; gonopore terminal, small, slit-like. Second male gonopod sinuous, moderately longer than first.

Material examined

Colombia. Tres Esquinas, Rio Orteguzza, Caquetá Department; May 1954; H. NICEFORO MARIA; 1 male, 1 female (LSB 44-45). Vereda Vanguardia, Villavicencio, 500m alt, Meta Department; 29 March 1984; M. CAMPOS; 1 male (ICN-MHN-CR0566).- Venezuela. Caño Carinagua, near Puerto Ayacucho, Amazonas Federal Territory; 29 November 1978; 2 females (Ivic). Alto Rio Cuao, Amazonas Federal Territory; November 1986; S. ZENDT; 1 male, 2 females (Ivic). Las Pavas, Rio Cataniapo, Amazonas Federal Territory; 28 September 1981; R. ROYERO; 2 females (MB XI-1640).- Ecuador. Loreto, in the foothills of mount Sumaco, Napo Province, 450 m alt; June 1968; M. OLALLA; 2 males, 1 spent female (Ivic).

Type and distribution

Colombia. Loreto, upper Amazon (H. MILNE EDWARDS, 1853, type). Perú. Rio Ucayali (ORTMANN, 1893). Ecuador. Napo Province (PRETZMANN, 1968a, type of *Valdivia ecuadoriensis*). The present records extend the distribution of the species towards the north to the Colombian llanos, towards the west to the foothills of the Andes (Loreto, in Napo Province, not Loreto in Colombia, see Appendix), and towards the east to the Venezuelan Guiana.

Remarks

The species presents considerable variability in relation to the sculpturing and convexity of the upper surface of the carapace. In the young specimen from Ecuador (Fig. 36) and Colombia it is more flattened, excavated near the margins, with the grooves well marked, thus resembling the species of *Valdivia*. In the young specimens of the Venezuelan Guiana, it is smooth and more evenly arched, approaching the characters of *Dilocarcinus*.

Fig. 3J; 4U; 5I; 7I; 9J; 13H; 37A-H

Zilchiopsis sattleri Bott, 1969, p. 34, pl. 13, fig. 24a, b, pl. 21, fig. 55.- MANNING & HOBBS, 1977, p. 160.- RODRIGUEZ, 1981, p. 48.

Description

Carapace suborbicular, wider than long; upper surface slightly irregular; in frontal view forms an irregular arch; gastric region slightly more prominent than adjacent epibranchial regions; metabranchial region slightly more prominent than adjacent cardiac and intestinal; epigastric lobes very prominent, well delimited anteriorly; frontal region slightly concave or almost flat in frontal view; branchio-urogastric, branchio-cardiac and branchio-intestinal grooves wide and deep, urogastric groove may be absent or present. Postgastric pits slit-like, placed in front of urogastric groove. Lateral margins angled and directed obliquely upwards, except in large males where become rounded; postero-lateral ridge of carapace bent mesially in posterior end, ending in elongated swelling over postero-lateral angles of carapace; antero-lateral margin with 4 spines behind external orbital angle, prominent, evenly spaced, acute; last spines smaller; in large males lateral teeth becomes obsolescent. Margin of front bilobed. Orbits oblong, orbital suture absent or indicated by inconspicuous depression; eyes completely fill orbits; lower orbital margin in young specimens with 3 acute, widely spaced spines (including the one at inner orbital angle), followed laterally by approximately 7 small papillae; inner orbital angle prominent, pyramidal, topped by prominent and acute spine or rounded tubercle; occlusive orbital tooth rounded, small, located close to inner orbital angle; outer orbital angle spiniform, prominent in females and young specimens, represented by stump in old males; buccal angle with large acute spine followed laterally by smaller one, or large tubercle followed by one or two smaller ones. Front advanced, hiding epistome in dorsal view; anterior surface of front inclined almost vertical or slightly inclined forward, moderately high in middle, lower on sides, middle pillars short and thick, widely separated, margin over each antennular fossa slightly thickened, but not projected, antennular septum not sunk; epistome high, inclined forward.

First abdominal tergite of male separated from tergite 2 + 3 by deep depression, tergite 2 + 3 with similar depression on both sides. Third to 6th abdominal segments fused in both male and female; male abdomen elongated, narrow at base, outer margin concave, last segment with sides concave, approximately 0.65 as long as broad.

Basal article of antenna with outer lobe prominent and narrow; ischium of third maxilliped with shallow longitudinal depression. Chelipeds unequal; upper border of chela strongly arched, lower almost straight or slightly concave; teeth alternatively large and small; acute spine on upper distal angle of hand, above articulation of finger; inner margin of carpus produced in sharp hooked spine, apical spines on upper border and latero-inferior margin of merus. Lower margin of dactylus of legs thickly clothed with patches of long coarse hairs; these patches cover all lower margin of propodus in 5th, 3/4 in 2nd, 1/2 in 3rd and only distal angle in 4th; upper margin of propodus and dactylus thickly clothed by shorter hairs arranged in 2 parallel longitudinal rows, more extensive in 2nd and 3rd; claws of dactylus with 5 longitudinal carinae, 1 upper, 2 lateral and 2 inferior.

First gonopod very wide basally on latero-mesial plane, strongly constricted on distal third, tapering to very thin apex directed slightly cephalad; well developed elongated lobe on latero-cephalic surface on proximal 3/4 of appendage; lateral and mesial surfaces of apex covered by very small spines, forming 2 distinct patches; gonopore slit-like and open distally, major axis directed along cephalo-caudal plane. Second gonopod slightly longer than first, strongly arched, but terminal portion straight.

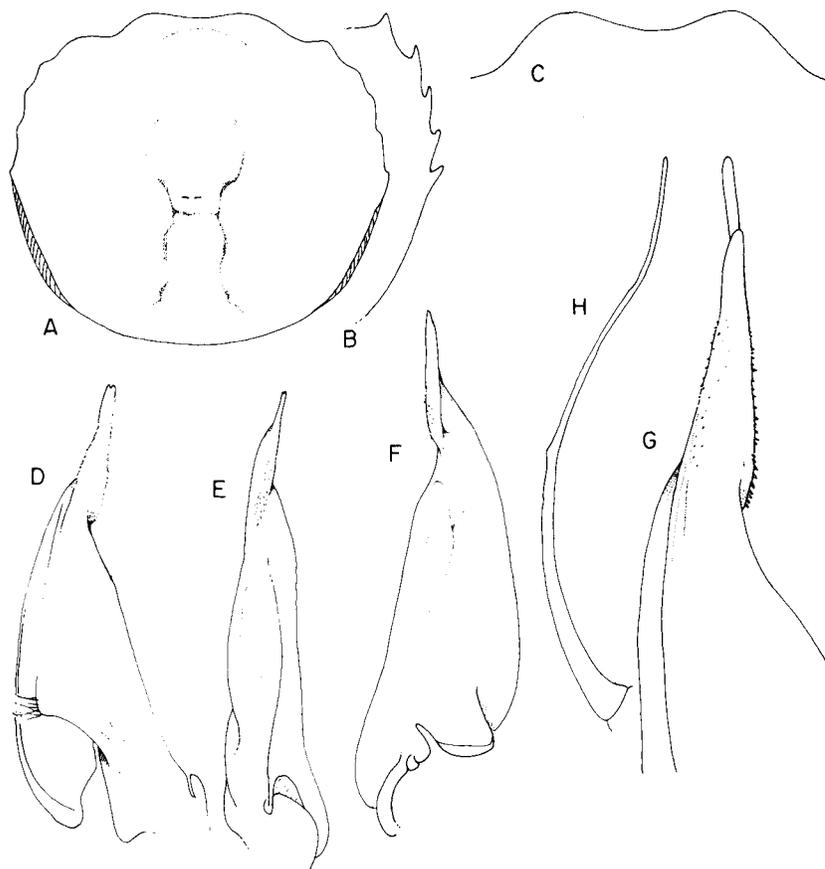


FIGURE 37

Zilchiopsis sattleri Bott, specimens from Trinidad, Beni: A, B, outline of carapace; C, front; D, first male gonopod, left, caudal; E, same, lateral; F, same, cephalic; G, same, apex, caudal; H, second male gonopod. A, C-H, male, cl 41.2 mm; B, female, cl 18.6 mm.

Material examined

Bolivia. Trinidad, Beni Department; G. LOUBENS; 2 males, 1 immature female (MNHNP B.12815); 1 male, 6 juveniles (MNHNP B.19122). This locality is approximately 100 km north from the type locality and on the same river system.

Type and distribution

Bolivia. Rio Chapare, affluent of Rio Grande (type, BOTT, 1969). Paraguay. Chaco, Rio Paraguay (BOTT, 1969).

Dilocarcinus H. Milne Edwards, 1853

Dilocarcinus H. Milne Edwards, 1853, p. 215.

Carapace suborbicular, upper surface strongly arched, smooth, regions not delimited and median grooves shallow or obsolete, bearing 6 to 10 lateral spines behind spiniform external orbital angle, first or second interdental space longer, forming conspicuous U-shaped sinus, lower orbital margin directed downwards at inner orbital angle, front strongly bilobed and retracted, epistome advanced, ending in two well spaced points of mid-gutter; openings of efferent channels strongly arched, forming two well defined spouts: as consequence all buccal area, including yugal and suborbital margins, visible in dorsal view; yugal and orbital prominences spiniform; abdomen triangular-rounded or trapezoidal; basal article of antenna without outer lobe; 3rd maxilliped with merus conspicuously narrow, or wide, with antero-mesial angle produced into triangular tooth located near articulation of palp; first gonopod expanded laterally at base, moderately reduced on distal half, with long plumose setae on lateral margin, apex bulbiform; gonopore slit-like, apical, flanked by corneous expansion; second gonopod slightly longer than first, sinuous, or much longer and bent as a question mark.

Type species.- *Dilocarcinus spinifer* H. Milne Edwards, 1853.

Distribution

According to its distribution and apparent abundance, the species of *Dilocarcinus* can be separated into two distinct groups: 1. a first group comprises *Dilocarcinus pagei*, widely distributed and abundant from the Amazon to Bolivia and northern Argentina, and *niceforei*, *dentatus*, *spinifer*, and *argentinianus*, locally abundant in the basins of Maracaibo, Orinoco-Guianas, Surinam, and Paraná-Paraguay respectively; 2. a second group of species, widely scattered over South America, seems to be rather scarce, since only the type material or a few specimens are known. This is the case of *Dilocarcinus medemi*, *D. septemdentatus*, *D. bulbifer*, *D. truncatus*, *D. castelnaui*, and *D. laevifrons*, collected at isolated localities in the rivers Sinu, lower Amazon, Madre de Dios, Beni, upper Parana, and Cuieiras, respectively.

Key to the species of *Dilocarcinus*

1. Front armed with spines or blunt tubercles2
- Front unarmed.....4
2. Front armed with approximately 4 spines restricted to interlobular sinus*niceforei*
- Front armed with approximately 16 spines covering both frontal lobes3
3. Gonopod curves and diminishes in size gradually.....*dentatus*
- Gonopod curving slightly laterad, narrowing abruptly at about midpoint of distal segment of gonopod*medemi*
4. Distal margin of 3rd abdominal segment in both sexes bears strong acute ridge directed forward, which covers suture 3/4*pagei*
- Distal margin of the 3rd abdominal segment without strong acute ridge.....5
5. Lateral margin of carapace with 8-9 lateral teeth, not including orbital*laevifrons*
- Lateral margin with 7 or less lateral teeth, not including orbital.....6
6. Gonopod apex slender7
- Gonopod apex robust, conical, with or without lateral lobe.....9
7. Gonopod apex not bulbiform, caudal surface twisted cephalad*castelnaui*
- Gonopod apex with small lateral bulbiform lobe; caudal surface not twisted cephalad8
8. Gonopod apex directed laterad following main axis of appendage*spinifer*

- Gonopod apex geniculate due to strong laterad bent*septemdentatus*
- 9. Gonopod apex simple, without conspicuous lateral lobe*argentinianus*
- Gonopod apex with strong rounded lateral lobe11
- 10. Outline of apical lobe continuous with gonopore.....*truncatus*
- Outline of apical lobe separated from gonopore by deep cleft or U-shaped sinus*bulbifer*

Dilocarcinus argentinianus Rathbun, 1906

Fig. 14D; 38A-F

Trichodactylus (Trichodactylus) argentinianus Rathbun, 1906, p. 60, pl. 18, fig. 5, 6, text-fig. 120.

Dilocarcinus argentinianus apaluensis Pretzmann, 1968b, p. 75.

Poppiana argentinianus, BOTT, 1969, p. 52 (part.), pl. 12, fig. 21a, b, pl. 21, fig. 52.- RODRÍGUEZ, 1981, p. 48.

Poppiana argentiniana, MANNING & HOBBS, 1977, p. 159.- PRETZMANN, 1979, p. 592, pl. 3, fig. 6-10.

Dilocarcinus (Poppiana) argentinianus, LOPRETTO, 1976, p. 88, fig. 30-33.

Dilocarcinus septemdentatus, NOBILI, 1896, p. 1 (part.).

Trichodactylus (Dilocarcinus) bachmayeri Pretzmann, 1968a, p. 4.

Dilocarcinus bachmayeri, PRETZMANN, 1968b, p. 75.

Poppiana bachmayeri, PRETZMANN 1979, p.591, pl. 1, fig. 1, 2, pl.2, fig. 3-5.

Description

Carapace suborbicular; upper surface very convex, the convexity more pronounced along antero-posterior axis, forming regular arch; regions not differentiated; epigastric lobes obsolescent, delimited anteriorly only by depression of frontal surface; front bilobed, inclined downwards; urogastric, branchio-urogastric, branchio-cardiac and branchio-intestinal grooves faintly indicated; dorsal surface of carapace smooth, polished, covered by small papillae barely visible to naked eye. Postgastric pits lunulated, well marked. Anterolateral margin with 6 subtriangular teeth or acute spines behind external orbital angle, directed anteriorly, approximately of equal size, last spine smaller; interdental spaces of equal length except first which is longer, sinuous; ridge in postero-lateral margin starts at lateral side of last lateral spine, curves inwards at middle and ends at some distance of ridge on the postero-lateral angle of carapace. Orbits subquadrate in frontal view, large, and eyes relatively small, leaving ample empty space in orbital cavity; orbital suture obsolete or indicated by slight groove. Lower orbital margin with 5 acute spines curved inwards followed by 5 low papillae, innermost spine larger and forming inner orbital angle. Occlusive orbital tooth rounded and small, implanted inside orbit, away from inner orbital angle and partially concealed by basal antennal article; floor of orbit is elevated behind outer orbital angle, forming, with basal antennal article and occlusive tooth, a shallow channel; outer orbital angle with subtriangular spine directed forward, similar to other on antero-lateral margin of carapace; buccal angle armed with approximately 5 conical small spines or low papillae. Front retracted leaving epistome completely exposed in dorsal view; anterior margin of frontal lobes lamellar, not forming distinct surface; epistome strongly advanced, points of the mid-gutter well spaced; opening of efferent channels strongly arched.

Abdominal segments 3-6 fused in both sexes, but suture 3/4 still slightly visible in males; male abdomen triangular, wide at base; outer margins straight; last segment widely triangular with outer margin straight, approximately 0.5 as long as broad, proximal margin slightly shorter than distal margin of penultimate segment.

Basal article of antenna without outer lobe. Shallow depression along ischium of 3rd maxilliped. Chelipeds strongly unequal in male, subequal in female; larger chela of male high and short, with upper border strongly arched, lower border almost straight, with conspicuous swelling on external surface at base of fingers; fingers very high and thick, strongly gaping; larger teeth of cutting edges interspaced by 1 or 2 smaller; carpus with

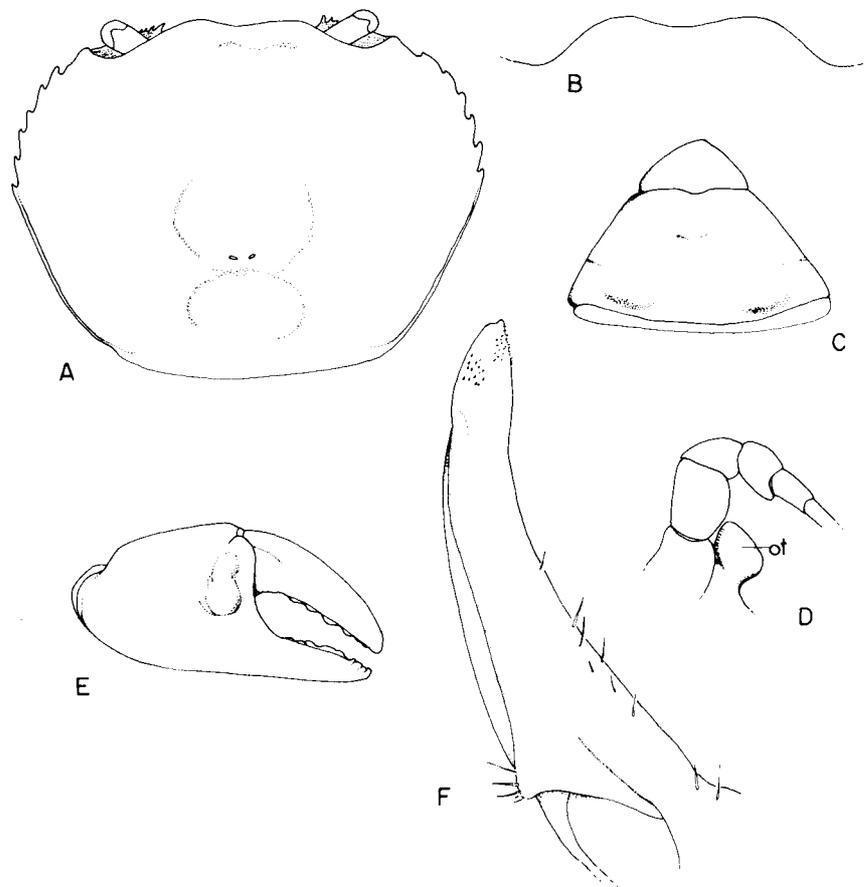


FIGURE 38
Dilocarcinus argentinianus (Rathbun), male specimen, cl 20.0 mm, from Rio Paraguay: A, outline of carapace; B, front; C, abdomen; D, basal article of antenna; E, larger chela; F, first male gonopod, left, caudal. ot, occlusive tooth.

large hooked spine on inner margin, merus with indistinct large tubercles on lateral distal, upper border and middle of latero-inferior margins. Propodus and dactylus of legs devoided of long hairs on lower and upper margins; claws of dactylus with 5 longitudinal carinae, 1 upper, 2 lateral and 2 inferior.

First gonopod simple, conical, regularly tapering to apex in caudal view, bracket-shaped, bent laterad; apex with slight caudo-lateral swelling, with few short conical spines, but no conspicuous lateral lobe. Second gonopod slightly longer than first, sinuous, terminal article incurved mesiad.

Material examined

Paraguay. Rio Paraguay; 1 male, cl 20.0 mm, cb 24.8 mm (ZSM 1091/1).

Type and distribution

Argentina. Las Garzas, 25 km from Ocampo, Santa Fe (type). Chaco: Resistencia (RATHBUN, 1906). Buenos Aires. Paraguay. Puerto Max (BOTT, 1969). The type locality of *Trichodactylus (Dilocarcinus) bachmayeri* PRETZMANN, 1968, Ignavi (=Ingavi), is uncertain, since PRETZMANN (1968a) located it in the Chaco, but latter changed its position to 11°S - 67°W, (PRETZMANN, 1979). These coordinates correspond to Ignavi, in the Pando Province, Bolivia, on the Rio Orton, affluent of the Rio Beni, but there is, however, an homonymous locality (Fortin Ingavi) in northern Paraguay (19° 55' 00' S - 61° 45' 00' W), in the Rio Paraguay basin.

Remarks

The first gonopods from the Paraguayan specimens closely correspond with those of Argentinian specimens illustrated by LOPRETTO (1976). The spinulation of the suborbital border resembles that of *Dilocarcinus bulbifer* and *Fredilocarcinus musmuschiae*, but the spines are conspicuously smaller (Fig. 2E, F)

Dilocarcinus truncatus, new species

Fig. 3K; 8G; 13I; 14C; 39A-E

Poppiana argentinianus, BOTT, 1969, p. 52 (part.).

Description

Carapace suborbicular; upper surface moderately convex, convexity more pronounced along antero-posterior axis, forming an arch slightly flattened on top, with regions not differentiated, epigastric lobes slightly indicated; frontal region flattened; front strongly bilobed inclined downwards; hepato-epibranchial, branchio-uogastric, branchio-cardiac and branchio-intestinal grooves indicated by faint depressions; uogastric groove absent. Dorsal surface of carapace smooth and polished, covered by small papillae not visible to naked eye. Postgastric pits confluent in middle. Anterolateral margin with 6 acute spines behind external orbital angle, directed anteriorly, except first two closer, other equally spaced; last spine smaller; postero-lateral margin marked by well defined ridge throughout, which begins at lateral side of last lateral spine, straight in middle and parallel to ridge on postero-lateral angle of carapace. Orbits subquadrate in frontal view; orbital suture indicated by very faint line; orbits large and eyes relatively small, leaving ample empty space in orbital cavity. Lower orbital margin with 3 or 4 acute spines curved inwards, followed by 8-10 papillae or crenulations; innermost spine fused at base with spine of inner orbital angle. Occlusive orbital tooth reduced to small triangular projection directed laterad, implanted inside orbit, away from inner orbital angle, partially concealed by basal antennal article; notwithstanding reduction of inner orbital angle, a slight elevation behind it forms deep channel with basal antennal article; outer orbital angle with hooked spine directed forward, similar to other on antero-lateral margin of carapace; rounded lobe between outer orbital angle and first lateral angle; buccal angle armed with 4 small spines. Front retracted leaving epistome completely exposed in dorsal view; the anterior margin of the front does not form distinct surface, but rather rounded-off regularly, with the exception of the semicircular middle pillars; epistome strongly advanced, points of the mid-gutter well separated; opening of efferent channels strongly arched, forming two well defined spouts delimited below by second maxillipeds; surface delimiting the

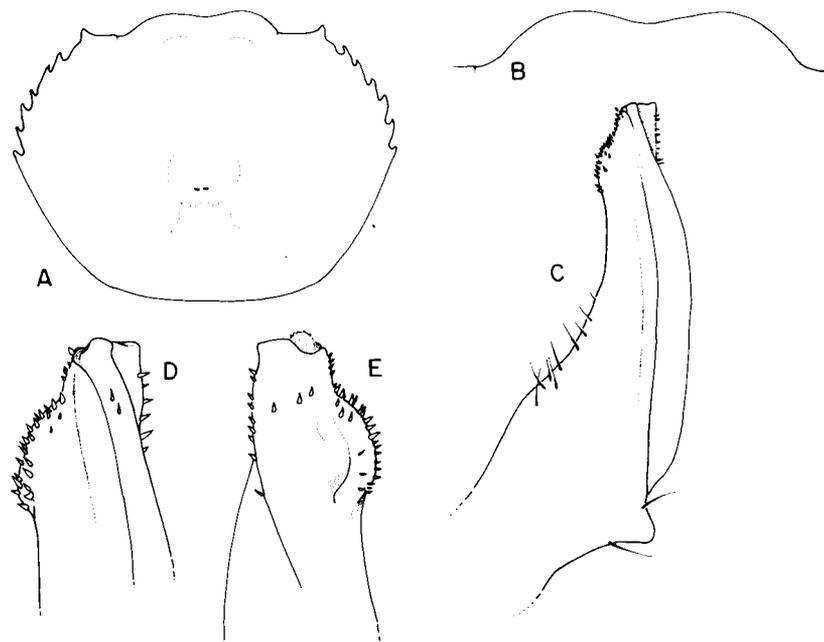


FIGURE 39
Dilocarcinus truncatus, new species, male holotype, cl 23.7 mm: A, outline of carapace; B, front; C, first male gonopod, right, caudal; D, same, apex, caudal; E, same, apex, cephalic.

channels laterally rounded and separated from buccal crest. All buccal area, including yugal and suborbital spines, visible in dorsal view; spines at each side of the epistome define two external respiratory channels, one between yugal spines and suborbital spines, another inside orbits and delimited below by suborbital spines and facilitated by relative reduction of eyes.

Male abdomen triangular, wide at base, outer margins slightly sinuous; last segment with outer margins slightly sinuous, approximately 0.55 as long as broad, proximal margin of approximately same length as distal margin of penultimate segment; segments 3-6 fused, articulation between 6 and 7 segments, although well marked, not movable.

Basal article of antenna without outer lobe. Shallow depression along ischium of 3rd maxilliped. Chelipeds moderately unequal in male, larger with fingers slender, not gaping, swelling on external side of palm near base of fixed fingers; tubercle on upper distal angle; fingers with longitudinal grooves on both chelipeds, more conspicuous on smaller chela; carpus with large conical spine on inner margin; lateral distal margin of merus with spine, latero-inferior margin of same with tubercle in middle and small acute spine on distal angle. Dactylus of legs with row of long hairs on lower margin and 2 rows on upper margin, claws with 5 longitudinal carinae, 1 upper, 2 lateral and 2 inferior; propodus covered with a row of long hairs on upper margin and similar row covering the following proportions of lower margin: 2nd, 95%; 3rd, 40%; 4th, 37%; 5th 90%.

First gonopod strong and stocky, wide at base, gently decreasing distally, mesial border almost straight, lateral border concave; distal part has conspicuous lateral rounded lobe, excavated on caudal surface, covered laterally with short spines, and mesial side slightly convex, also covered with short spines ending distally in thin translucent lamella; terminal portion of margin forms prominent dorsal longitudinal ridge, which reaches gonopore, with transverse row of 4 short dorsal spines; gonopore directed cephalad. Second gonopod longer than first (distal part missing in holotype).

Material examined

Bolivia. Riberalta, Rio Beni, 11° S; 27 August 1909; A. WINKELMANN; 1 male holotype, cl 23.6 mm, cb 28.1 mm (MH 3682).

Remarks

The type specimen was determined by BOTT (1969) as *Poppiana argentinianus*, but it can be easily distinguished from this species, and all other within the genus, by the characters of the first gonopod, particularly the rounded distal lobe on the lateral side. *Dilocarcinus truncatus* resembles *Dilocarcinus pagei* in most characters, but it lacks the strong abdominal carina characteristic of this species.

Dilocarcinus bulbifer, new species

Fig. 2E; 4X; 8H; 10K; 13I; 14E; 40A-H

Description

Carapace suborbicular; upper surface convex along antero-posterior axis, moderately convex and forming regular arch in frontal view, regions not differentiated, except for semicircular epigastric lobes and slight depressions between protogastric and epibranchial regions; frontal region flat, over antero-posterior axis, concave behind inner orbital angle; front strongly bilobed, inclined downwards; branchio-urogastric, branchio-cardiac and branchio-intestinal grooves shallow and wide, urogastric groove absent. Dorsal surface of carapace smooth and polished, covered by small papillae barely visible to naked eye. Postgastric pits lunulated, well marked. Antero-lateral margin with 6 acute spines behind orbital angle, directed anteriorly and slightly inwards, 2nd with base wider, last smaller; postero-lateral margin with well defined ridge which begins at lateral side of last spine, curves inwards at middle and stops at some distance of ridge on postero-lateral angle of carapace. Orbits subquadrate in frontal view; orbital suture absent; orbits large and eyes relatively small, leaving ample empty space in orbital cavity. Lower orbital margin with 5 or 6 acute spines conspicuously curved inwards, innermost, also curved downwards, forms inner orbital angle. Occlusive orbital tooth reduced to small triangular projection, implanted inside orbit away from inner orbital angle and partially concealed by basal antennal article; notwithstanding reduction of inner orbital angle, strong ridge behind it forms deep channel limited by basal antennal article; outer orbital angle with hooked spine directed forward, similar to other on antero-lateral margin of carapace; buccal angle armed with 5 or 6 small spines or acute papillae. Front moderately retracted, leaving epistome partially exposed in dorsal view; anterior margin of front does not form distinct surface, but rather rounded-off regularly, except for semicircular middle pillars; epistome strongly advanced, points of mid-gut well separated; opening of efferent channels strongly arched, forming two well defined spouts delimited below by second maxillipeds; the surface delimiting the channels laterally forms a triangular tooth which is separated from, and more advanced than, buccal crest; buccal area, including yugal and suborbital spines, visible in dorsal view, but not as projected as in other species of genus; spines at each side of epistome define 2 external

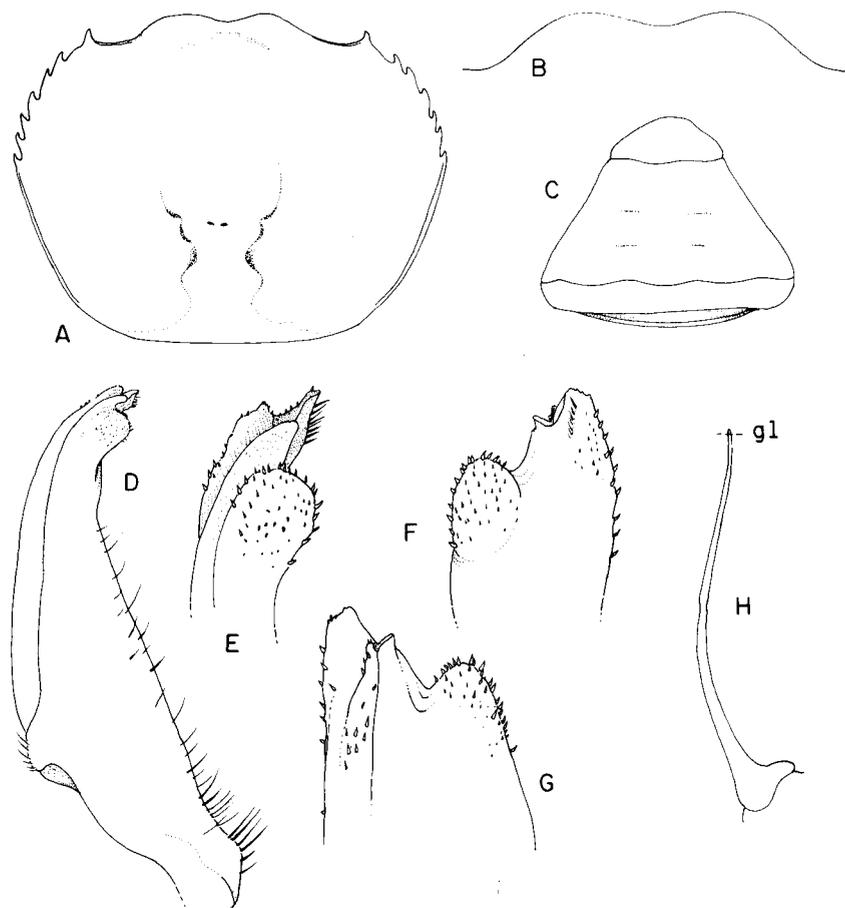


FIGURE 40
Dilocarcinus bulbifer, new species, male holotype, cl 22.7 mm: A, outline of carapace; B, front; C, abdomen; D, first male gonopod, caudal; E, same, apex, caudal; F, same, apex, latero-cephalic; G, same, apex, caudo-mesial; H, second male gonopod. gl, level of gonopore of first gonopod.

respiratory channels, one between yugal spines and suborbital spines, another inside orbits delimited below by suborbital spines.

Male abdomen with segments 3-6 fused, suture 3/4, and partially suture 4/5, still visible, triangular, wide at base; outer margins sinuous; last segment with outer margins sinuous, approximately 0.5 as long as broad, basal border of approximately same length as distal border of penultimate segment. Basal article of antenna without outer lobe. Shallow depression along ischium of 3rd maxilliped. Lower margin of dactylus of legs with row of long hairs; similar hairs cover 72% of 2nd, 39% of 3rd, 39% of 4th and 93% of 5th; dactylus and propodus with rows of smaller hairs on upper margin; claws of dactylus with upper and lower carinae.

First male gonopod wide at base, strongly narrowing distally, apex incurved laterad, mesial border straight, lateral border transverse, provided with row of long plumose setae along proximal 3/4; apical portion consists of conspicuous bulb covered by rows of small conical spinules, marginal process with spinules irregularly arranged on its surface, and corneous awl shaped lamella overreaching other apical processes, provided with row of long setae on caudal surface and small conical spinules on mesial border. Second male gonopod slightly sinuous, of equal length, or slightly longer than first.

Material examined

Perú. Aguajal, Manú Province, Madre de Dios Department; 9 September 1988; H. ORTEGA; 1 male holotype, cl 22.7 mm, cb 26.8 mm, 1 male paratype, cl 20.0 mm, cb 23.5 mm (MHN Lima).

Remarks

Dilocarcinus bulbifer is well characterized by the shape of the gonopod, and in particular by the conspicuous subapical bulb. The dilocarcinian characters are not well developed in this species: the carapace is only moderately convex, the front not strongly retracted, the epistome not completely exposed. The abdomen is wider than in other species of the genus. Our type specimens lacks both chelipeds.

Etymology

The specific name is from the Latin *bulbus* (bulb) and *fero* (I bear) in reference to the conspicuous apical lobe.

Dilocarcinus castelnaui H. Milne Edwards, 1853

Fig. 40A-J

Dilocarcinus castelnaui H. Milne Edwards, 1853, p. 216.- H. MILNE EDWARDS, 1854, p. 182, pl. XIV, fig. 5, (not fig. 4, fide BOTT, 1969).- LUCAS, 1857, p. 8, pl. 11, fig. 4.- A. MILNE EDWARDS, 1869, p. 176, 178.- SMITH, 1869, p. 36.

Dilocarcinus septemdentatus, GERSTÄCKER, 1856, p. 148 (part.).- GOLDI, 1886, p. 28, (part.).- MOREIRA, 1901, p. 44, 49, 109 (part.).

Orthostoma septemdentatum, ORTMANN, 1897, p. 326, 327 (part.).- NOBILI, 1898, p. 9 (part.).

Trichodactylus (Dilocarcinus) castelnaui, RATHBUN, 1906, p. 61, pl. 18, fig. 9, 10.

Dilocarcinus (Goyazana) castelnaui, BOTT, 1969, p. 48, pl. 10, fig. 18a, b, c, pl. 20, fig. 49.

Dilocarcinus castelmani (sic), YOUNG, 1900, p. 231, 233.

Description

Carapace suborbicular; upper surface very convex, more pronounced along the antero-posterior axis, regularly arched; regions not differentiated; epigastric lobes forming semicircular raised surface, delimited anteriorly by conspicuous step; surface of frontal region flat, continuous with surface of protogastric region; front strongly bilobed, inclined downwards; branchio-urogastric, branchio-cardiac and branchio-intestinal grooves defined by few discontinuous depressions; branchio-intestinal grooves indicated in larger specimens by discontinuous line of punctae; urogastric groove absent; dorsal surface of carapace covered by small papillae barely visible to naked eye, and large punctae which form reticular pattern at middle of carapace. Postgastric pits lunulated, well marked. Antero-lateral margin with 6 acute spines behind external orbital angle, directed anteriorly and approximately of equal size, last spine smaller; these spines replaced by blunt large tubercles in old males; interdental spaces approximately equal, first one forming sinuous or angled lobe; postero-lateral ridge from side of last lateral spine, curves inwards at middle, ends at some distance of ridge on the postero-lateral

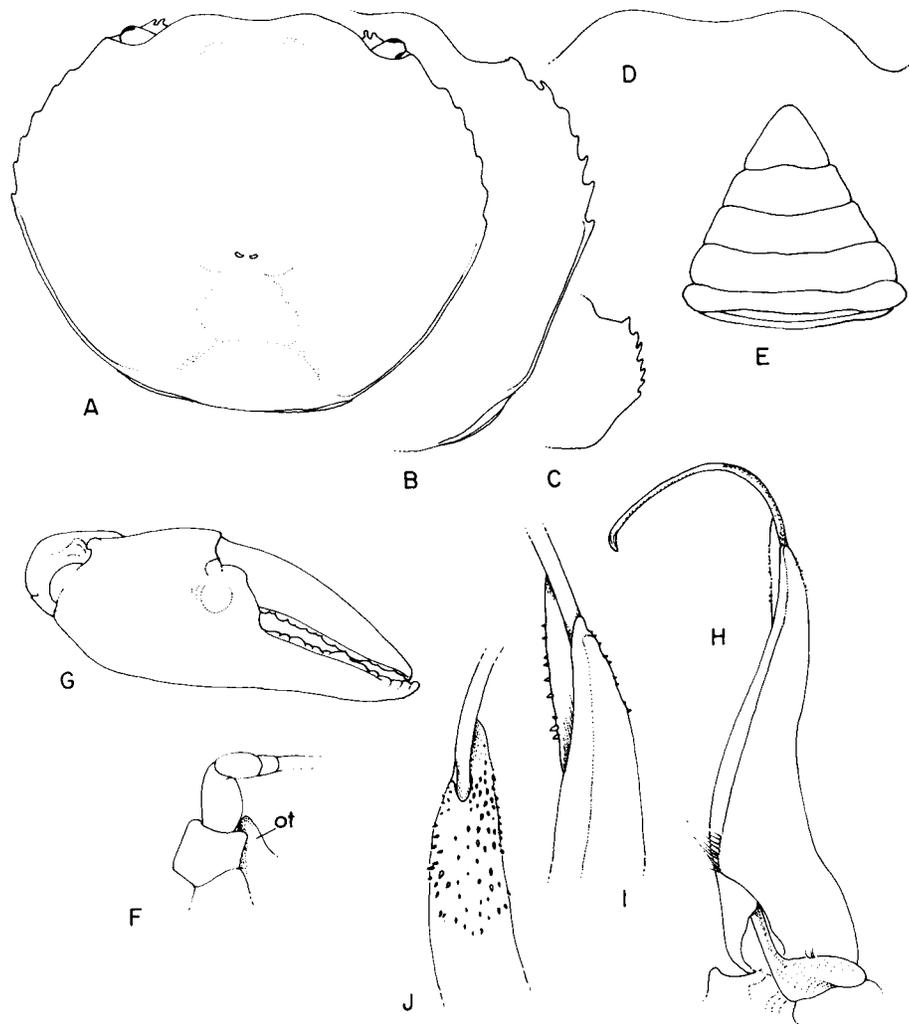


FIGURE 41

Dilocarcinus castelnaui H. Milne Edwards, specimens from Rio Parana, Brazil: A-C, outline of carapace; D, front; E, abdomen; F, basal article of antenna; G, larger chela; H, first and second male gonopods, left, caudal; I, same, apex, caudal; J, same, apex, cephalic. A, D-J, male specimen, cl 40.9 mm; B, female; C, juvenile. ot, occlusive tooth.

angle of carapace. Orbits subquadrate in frontal view, very large in vertical direction, eyes small, leaving ample space in orbital cavity; orbital suture obsolete or indicated by slight groove. Lower orbital margin with 9 acute spines directed inwards and downwards, diminishing in size laterally; innermost long, forms inner orbital angle; last three of series papilliform. Occlusive orbital tooth consists of large ovoid blade, extending anteriorly beyond distal margin of basal antennal article. Orbital floor elevated behind outer orbital angle, forming shallow channel with basal antennal article and occlusive tooth; outer orbital angle with acute spine directed forward, similar to other on antero-lateral margin of carapace, often broken and worn out; buccal angle armed with 4-5 hooked spines. Front retracted leaving epistome completely exposed in dorsal view; anterior margin of frontal lobes lamellar, not forming distinct surface; epistome strongly advanced, points of the mid-gutter well spaced; opening of efferent channels strongly arched, forming 2 well defined spouts delimited below by 2nd maxillipeds; surface delimiting channels laterally forms rounded lobe; all buccal area, including yugal and suborbital spines, visible in dorsal view; spines at each side of epistome define 2 external respiratory channels, one between yugal spines and suborbital spines, another inside orbits, delimited below by suborbital spines.

Sutures between abdominal segments 3-6 clearly visible in both sexes; male abdomen triangular, lateral margins of 3rd and 4th segments rounded and expanded, general outline of the abdomen straight or slightly concave; last segment with outer margin slightly concave, approximately 0.6 as long as broad, proximal margin shorter than distal margin of penultimate segment.

Basal article of antenna without outer lobe. Shallow depression along ischium of 3rd maxilliped. Chelipeds moderately unequal; larger chela elongated with upper border moderately convex, lower border almost straight; a large flat tubercle on external surface, at base of fingers; fingers slightly gaping; lower margin of merus of female and small males with 3 median and 1 terminal spine; internal margin with median spine; upper margin with distal spine; carpus with large spine on internal margin; smaller spines on external and upper margins near articulation of palm; legs with row of long hairs on lower margin of propodus and dactylus, and inner and outer distal margin of carpus; two rows of smaller hairs on upper margin of dactylus and similar internal row on propodus; claws of dactylus with 5 longitudinal carinae, 1 upper, 2 lateral and 2 inferior.

First gonopod simple, slender, slightly sinuous, progressively tapering to apex, devoided of distal lateral lobe; distal portion of margin bent laterad, shorter than cephalic surface; gonopore large, opening laterad; apical spines very small, forming continuous patch over lateral, cephalic and mesial surfaces. Second gonopod considerable longer than first, bent mesially in form of question mark.

Material examined

Brazil. Paraná River, lagoon near Fundao, 32 km upriver from Puerto Tiberica [Pôrto Tibiriça]; December 1938; SCHINDLER; 1 male, cl 40.9 mm, cb 46.5 mm, 1 female, cl 37.7 mm, cb 41.5 mm, with 180 marsupial youngs (ZSM 1088-1). Highlands of Goias, near Brasilia; 10 August 1965; SCHULTZ; 1 young male, cl 10.8 mm, cb 18.7 mm (ZSM 1088-2).

Type and distribution

The types are two small males (largest cl 16.8 mm) and 1 female (MP), collected by the count Francis de CASTELNAU and Mr Emile DEVILLE, at Salinas, on the Rio Crixas Açu, affluent of the Rio Araguaia, where they stayed from May 14 to June 10, 1844, during their expedition across South America (PAPAVERO, 1971). RATHBUN (1906) excluded from the type material the smallest male, which she placed under *D. spinifer*, but BOTT (1969) kept all the type specimens under *D. castelnaui*. BOTT (1969) recorded 3 males and 3 females from the Xingu river basin, and 1 male and 1 female from the Paraná River (see above under material examined). Thus the area of distribution of the species is located on both sides of the South American water divide formed by the Serra das Divisoas.

Fig. 1H; 2D; 4Y; 5N; 8J; 10L; 13J; 14B; 15H; 42A-I

Orthostoma dentata Randall, 1839, p. 122, pl.5, fig. 1-3.- H. MILNE EDWARDS, 1853, p. 215.- ORTMANN, 1897, p. 326.

Dilocarcinus dentatus, YOUNG, 1900, p. 231, pl. 5, 6.- MOREIRA, 1901, p. 44.- PRETZMANN, 1968b, p. 75.- SMALLEY & RODRÍGUEZ, 1972, p.52, fig. 17, 18.- RODRÍGUEZ, 1980, p. 344, fig. 100.- RODRÍGUEZ, 1981, p. 48.

Trichodactylus (Dilocarcinus) dentatus, RATHBUN 1906, p. 65, pl. 18, fig. 4.- HOLTHUIS, 1959, p. 214, fig. 50b, 51.- CHACE & HOBBS, 1969, p. 152, fig. 44.

Poppiana dentata, BOTT, 1969, p. 50, pl. 11, fig. 19a, b, pl. 20, fig. 50, text-fig. 2.

Dilocarcinus dentatus cayennensis Pretzmann, 1968b, p. 75.

Dilocarcinus dentatus trinidadensis Pretzmann, 1968b, p. 76.

Dilocarcinus multidentatus von Martens, 1869a, p. 5, pl. 1, fig. 2.

Description

Carapace suborbicular; upper surface very convex, the convexity more pronounced along antero-posterior axis, forming regular arch; regions not differentiated; epigastric lobes semicircular, not well delimited; surface of frontal region continuous with surface of protogastric region; front moderately bilobed, inclined downwards, with 16 to 21 acute triangular spines on its margin; branchio-urogastric, branchio-cardiac and branchio-intestinal grooves faintly indicated; urogastric groove absent; dorsal surface of carapace smooth, polished, covered by small papillae barely visible to naked eye. Postgastric pits lunulated, well marked. Antero-lateral margin with 8-10 acute spines behind external orbital angle, directed anteriorly, approximately of equal size, last spine smaller; teeth replaced by semicircular lobes in some specimens; interdental spaces slightly increase posteriorly, 2nd longest, forming conspicuous U-shaped sinus; ridge in postero-lateral margin starts at lateral side of last lateral spine, curves inwards at middle and ends at some distance of ridge on postero-lateral angle of carapace. Orbits subquadrate in frontal view; orbital suture obsolete or indicated by slight groove. Lower orbital margin with 7 to 11, usually 9, acute spines, innermost forming inner orbital angle. Occlusive orbital tooth reduced to slender spine implanted inside orbit, away from inner orbital angle; floor of orbit elevated behind outer orbital angle, forming with basal antennal article and occlusive tooth a shallow channel; outer orbital angle with hooked spine directed forward, similar to other on antero-lateral margin of carapace; buccal angle armed with 5 to 8, usually 6, small spines. Front retracted leaving epistome completely exposed in dorsal view; anterior margin of frontal lobes lamellar, not forming distinct surface; epistome strongly advanced, points of mid-gutter well spaced; opening of efferent channels strongly arched, forming 2 well defined spouts limited below by 2nd maxillipeds; all buccal area, including yugal and suborbital spines, visible in dorsal view; spines at each side of epistome define 2 external respiratory channels, one between yugal spines and suborbital spines, another inside orbits, delimited below by suborbital spines.

Abdominal segments 3-6 fused in both sexes, but suture 3/4 still visible in males; male abdomen triangular, wide at base; outer margins slightly concave; last segment with outer margin sinuous, approximately 0.6 as long as broad, margin of approximately same length as distal margin of penultimate segment.

Basal article of antenna without outer lobe. Shallow depression along ischium of 3rd maxilliped. Chelipeds strongly unequal in male, subequal in female; chela of male with upper border strongly arched, lower border slightly sinuous; fingers very high and thick, not gaping; larger teeth of cutting edges interspaced by 1 or 2 smaller; chelae in both sexes with swelling on external surface at base of fingers; carpus with large conical spine on inner margin, merus with spine on latero-distal margin, another on distal half of upper border and sometimes in middle of latero-inferior margin; female chelae and smaller chela of male with small acute spine on distal upper angle of palm, distal angle of carpus and infero-distal margin of ischium, respectively; 2- 4 spines on the

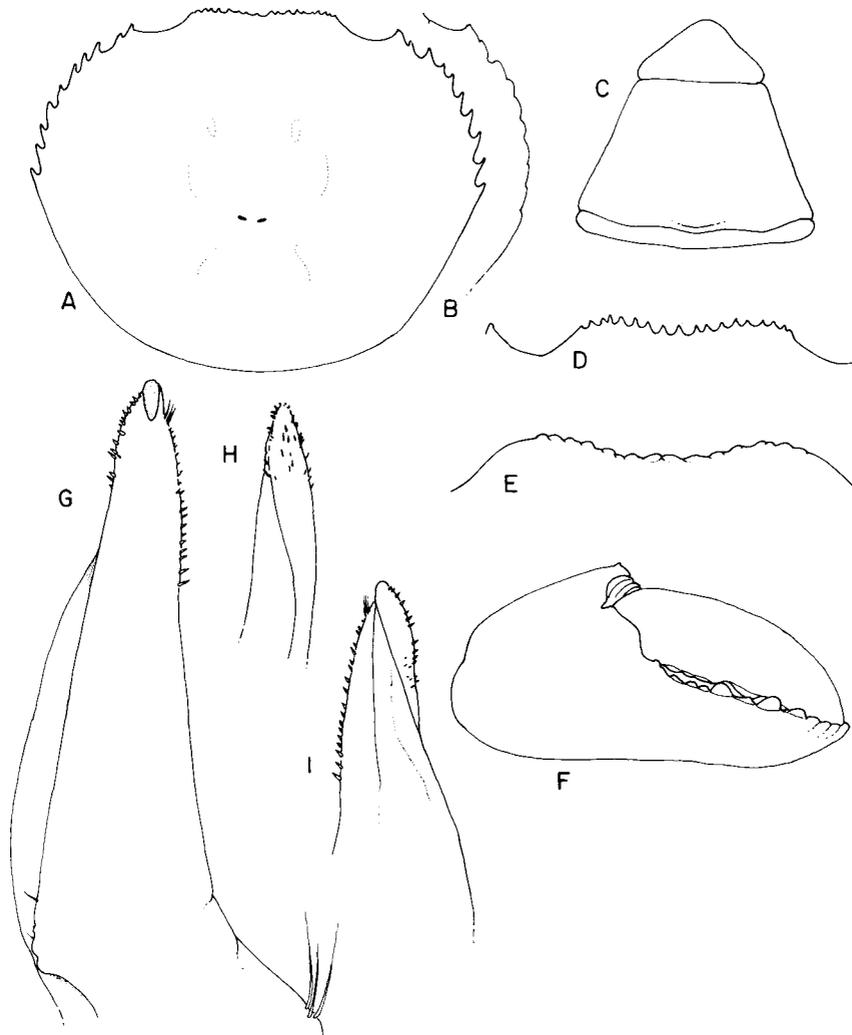


FIGURE 42

Dilocarcinus dentatus (Randall) : A, B, outline of carapace; C, abdomen; D, E, front; F, larger chela; G, first male gonopod, left, caudal; H, same, apex, mesial; I, same, apex, cephalic. A, C, D, F-I, male specimen, cl 39.4 mm, from Agua Negra; B, E, male specimen, cl 33.8 mm, from El Callao.

lower margin of merus. Propodus and dactylus of legs with row of long hairs on lower margin, upper margin with 2 rows of shorter hairs on dactylus and similar internal row on propodus; claws of dactylus with 5 longitudinal carinae, 1 upper, 2 lateral and 2 inferior.

First gonopod curved, directed laterad, progressively tapering to apex; distal portion of margin is bent mesially, emerging on anterior surface; basal lateral prominence poorly developed, with long, conspicuous lateral surface, implanted in small pit; gonopore U-shaped, open distally, with thin corneous ridge on lateral side. Second gonopod longer than first, curved mesiad as incomplete semicircle.

Color

In life the color appears to be brown or cream colored (SMALLEY and RODRÍGUEZ, 1972). Specimens preserved in alcohol are very variable, more commonly reddish brown, but sometimes grey or pale brown.

Material examined

Venezuela. Agua Negra, 80 m alt, Yaracuy State; 3 January 1971; O. CHACON; 3 males, 2 females (LS 1044). Agua Negra, Yaracuy State; 23 February 1971; B. ROMAN, 2 males, 3 females (LS 1037). Laguna de Tacarigua, Falcón State; 26 June 1967; E. VALLADARES (LS). Hato La Marrereña, Las Mercedes, Guárico State, 220 m alt; 15 January 1971; D. LOUEIRO (LS). Finca Vuelta Larga, 100 km by road SE of Guaraúnos, Sucre State; 14 August 1987; H. CASTELLANOS, 1 female (LS 1039). Parque Cachamay, Puerto Ordaz, Rio Caroní, Bolívar State; 4 March 1978; J. CLINE, 1 male (Ivic). Caño Onoto, El Callao, Bolívar State; 1 male (Ivic). Hato Terecay, near El Manteco, Bolívar State; 7 June 1977; S. GORZULA; 1 male, 2 females (females captured while walking on gravel road under heavy rain) (Ivic). 70 km SSE from El Manteco, Bolívar State, 250 m alt; 1 female (Ivic). Lago de Guri, Bolívar State; June 1985; 1 male (LS 1043). Quebrada Trapichote, at railway crossing, Los Pijiguaos, Bolívar State; 3 May 1988; C. LASSO & G. COLONNELLO; 1 ovigerous female (LS 1140). Road to El Dorado, Santa Elena, km 88, Bolívar State; 25 February 1988; M. LENTINO; 1 female, 3 males, 3 juveniles (LS 871).- Colombia. Between Cartagena and Bayunca, Bolívar Department; 1 September 1972; P. CALA; 1 male, 1 female (ICN MHN CR 50). Confluence of the Rio Merguia and Rio Cobugón, southern extremity of the Norte de Santander Department; October 1968; B. NICEFORO MARIA; 1 female (LSB).- Trinidad. Mitán; 27 March 1980; A. E. ESTEVES; 28 males, 1 female (Ivic).- Other specimens from Venezuela examined by me are recorded in SMALLEY & RODRÍGUEZ (1972).

Type and distribution

Suriname. Paramaribo (type locality by designation, HOLTHUIS, 1959); Corantijn and Coppename Rivers (HOLTHUIS, 1959). Guyana. Berbice (YOUNG, 1900). French Guiana (RATHBUN, 1906). Venezuela. Very common in the llanos, in rivers discharging into the Orinoco, in the states of Portuguesa, Cojedes, Calabozo, Apure, Guárico, Aragua, Monagas, Bolívar and Delta Amacuro (SMALLEY & RODRÍGUEZ 1972). Trinidad (HOLTHUIS, 1959).

Remarks

PRETZMANN, 1968b, p. 75-76 described two subspecies, *Dilocarcinus dentatus trinidadensis* based on a male cl 35.6 mm, from Trinidad and *D. dentatus cayennensis* on a male specimen cl 44.3, from French Guiana. The characters given for the first subspecies (carapace narrower, flatter, 10 blunt lateral teeth, finger of larger chela gaping, with shorter dactylus, gonopod wider, more recurved, color dark brown) are all very variable in the large series of specimens examined by me from Trinidad, and are also very variable in the specimens which I have examined from the continental part of the range of the species. A similar situation occurs with the second subspecies.

The specimen from Cartagena reported above is completely isolated from the area of distribution of the species. However, it coincides in all characters with those from the Orinoco basin.

Dilocarcinus laevifrons Moreira, 1901

Dilocarcinus laevifrons Moreira, 1901, p. 48, pl. 1, fig. 2.

Trichodactylus (Dilocarcinus) laevifrons, RATHBUN, 1906, p.66.

Poppiana laevifrons, BOTT, 1969, p. 51, pl. 11, fig. 20a, b, pl. 21, fig. 51.- RODRÍGUEZ, 1981, p. 48.

Type and distribution

This species was described from a single female specimen whose typical locality is not well established ("we found it in a jar with several crustaceans coming from Pernambuco; we believe accordingly that this species lives in the rivers of that state", MOREIRA, 1901, p. 49). BOTT (1969) assigned to this species one small male (cl 17 mm) from Rio Cuieiras.

Dilocarcinus medemi Smalley & Rodríguez, 1972

Fig. 43A-F

Dilocarcinus medemi Smalley & Rodríguez, 1972, p. 53, fig. 19, 20, 23.- RODRÍGUEZ, 1981, p. 48.

Description

Carapace suborbicular; upper surface very convex, convexity more pronounced along antero-posterior axis, forming regular arch; regions not differentiated; semicircular epigastric lobes not well delimited; frontal and postorbital regions depressed; front moderately bilobed, inclined downwards, with 13 acute triangular spines on its margin; branchio-urogastric, branchio-cardiac and branchio-intestinal grooves faintly indicated; urogastric groove absent; dorsal surface of carapace smooth and polished, covered by small papillae barely visible to naked eye. Postgastric pits lunulated, well marked. Anterolateral margin with 7 spines behind external orbital margin, sharp, conical, directed anteriorly and approximately of equal size; 1st interdental space longest, forming conspicuous U-shaped sinus; postero-lateral margin, with well defined ridge from lateral side of last lateral spine, curves inwards at middle and stops at some distance of ridge on postero-lateral angle of carapace. Orbits subquadrate in frontal view; orbital suture obsolete or indicated by slight groove. Lower orbital margin with 6 or 7 acute spines of unequal size, innermost forming inner orbital angle. Occlusive orbital tooth reduced to rounded lobe implanted inside orbit, away from inner orbital angle; orbital floor elevated behind outer orbital angle, forming shallow channel with basal antennal article and occlusive tooth; outer orbital angle with hooked spine directed forward, similar to other on antero-lateral margin of carapace; buccal angle armed with 5 small spines. Front retracted leaving epistome completely exposed in dorsal view; anterior margin of frontal lobes lamellar, not forming distinct surface; epistome strongly advanced, points of mid-gutter well spaced; opening of efferent channels strongly arched, forming well defined spouts delimited below by 2nd maxillipeds; surface delimiting channels laterally forming rounded lobe; all buccal area, including yugal and suborbital spines, visible in dorsal view; spines at each side of epistome define 2 external respiratory channels, one between yugal spines and suborbital spines, another inside orbits and delimited below by suborbital spines.

Abdominal segments with all sutures distinct at least in males; male abdomen trapezoidal, wide at base; outer margins concave; last segment with outer margin conspicuously concave.

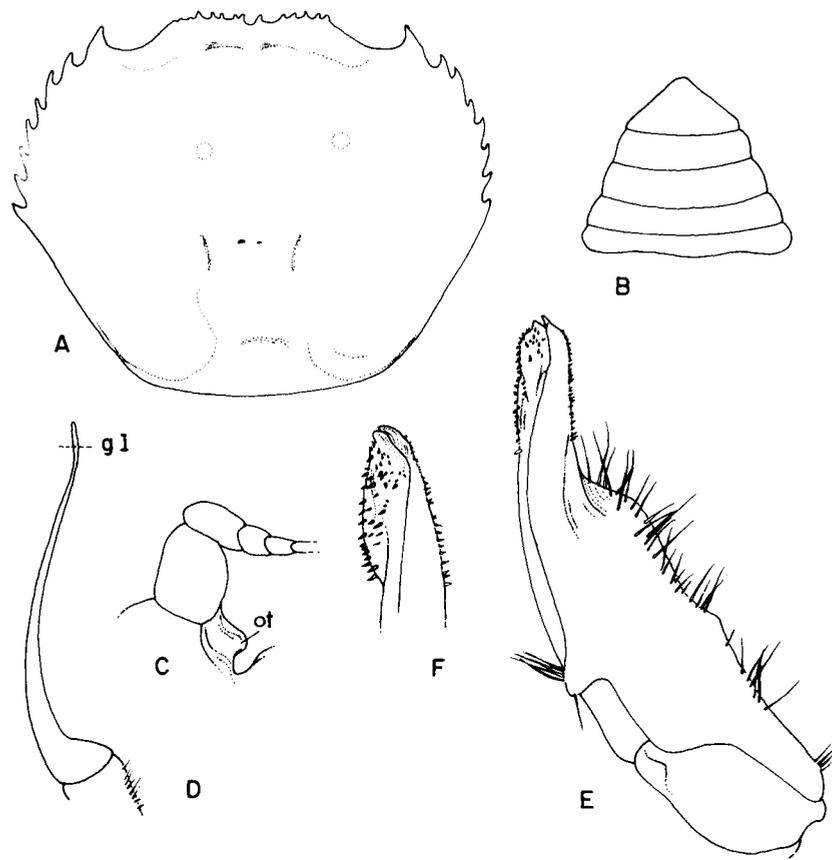


FIGURE 43

Dilocarcinus medemi Smalley and Rodríguez, male paratype, cl 31.7 mm: A, outline of carapace; B, abdomen; C, basal article of antenna; D, second male gonopod; E, first male gonopod, left, caudal; F, same, apex, lateral. gl, level of gonopore of first gonopod; ot, occlusive tooth.

Basal article of antenna without outer lobe. Shallow depression along ischium of 3rd maxilliped. Chelipeds unequal in male, larger chela of male with upper border arched, lower border slightly sinuous; fingers moderately gaping, with large and small tooth alternating on cutting edges, proximal tooth of fixed finger large, small tooth on innerside of large terminaltooth; small acute spine on distal upper angle of palm; distal part of carpus with 3 dorsal spines, median and outer spines small, inner spine very long, curved outwards; merus with long, slender curved dorsal spine, outer margin with 2-3 small, sharp spines, small tubercles grouped near center of merus; inner ventral angle with large spine at center, small spine at anterior corner. Lower margin of propodus and dactylus of legs with row of long hairs, upper margin with 2 rows of shorter hairs on dactylus and a similar internal row on propodus; claws of dactylus with 5 longitudinal carinae, 1 upper, 2 lateral and 2 inferior.

First gonopod with proximal half wide in meso-caudal view, mesial border curved laterad, lateral border forming sinuous, lamelliform lobe provided with long, stiff setae; basal lobe prominent, subtriangular, bearing long stiff marginal setae; at distal quarter gonopod becomes abruptly narrowed and bent laterad; sides of distal part nearly parallel, with slight expansion at tip; lateral process hook-shaped at tip, slightly exceeding mesial process; distal part of gonopod bears lateral and mesial patches of small conical spines; no apical tuft of setae. Second gonopod sinuous, slightly longer than first.

Material examined

Colombia. Quebrada Tinajón, Rio Sinú drainage, near Montería, Córdoba Department; April 1962; C. A. VELÁZQUEZ and R. CAMACHO; 1 male paratype, cl 31.7 mm, cb 38.7 mm (USNM 139123, ex Tulane University Collections 4870).

Type and distribution

The species is known only from the two type specimens (SMALLEY and RODRÍGUEZ, 1972).

Remarks

The species closely resembles *Dilocarcinus dentatus*, but could be clearly differentiated from it by the shape of the gonopod.

Dilocarcinus niceforei (Schmitt & Pretzmann, 1968)

Fig. 4Z; 8K; 13I; 14I; 44A-C

Trichodactylus (Valdivia) niceforei Schmitt and Pretzmann, 1968, p. 6.

Valdivia (Rotundovaldivia) niceforei, PRETZMANN, 1968b, p. 73.- SCHMITT, 1969, p. 93, fig. 1.

Valdivia (Rotundovaldivia) niceforei cucutensis Pretzmann, 1968b, p. 73.

Dilocarcinus (Dilocarcinus) niceforei, SMALLEY & RODRÍGUEZ, 1972, p. 51, fig. 15, 16.

Dilocarcinus niceforei, RODRÍGUEZ, 1981, p. 48.

Description

Carapace suborbicular; upper surface very convex, more pronounced along the antero-posterior axis, regularly arched; regions not differentiated; semicircular epigastric lobes not well delimited; surface of frontal region continuous with surface of proto-gastric region; front strongly bilobed, inclined downwards, with interlobular space bearing 2 to 5 teeth (8 in *cucutensis*) with additional tubercles or papillae; branchio-urogastric, branchio-cardiac and branchio-intestinal grooves defined by thin continuous line, partially obsolescent in small specimens; branchio-intestinal groove indicated in larger specimens by 2 parallel sulci; urogastric groove absent; dorsal surface of carapace covered by small papillae barely visible to naked eye, also large punctae. Postgastric pits lunulated, well marked. Antero-lateral margin with 7 acute spines behind external orbital angle, directed anteriorly and approximately of equal size, last spine smaller; interdental spaces approximately equal, first one longer, forming conspicuous U-shaped sinus; postero-lateral ridge, from side of last lateral spine, curves inwards at middle, ends at some distance of ridge on the postero-lateral angle of carapace. Orbits subquadrate in frontal view; orbital suture obsolete or indicated by slight groove. Lower orbital margin with 5 to 8 acute spines which diminish in size laterally, innermost forming inner orbital angle. Occlusive orbital tooth reduced to low lobe implanted inside orbit, away from inner orbital angle; orbital floor

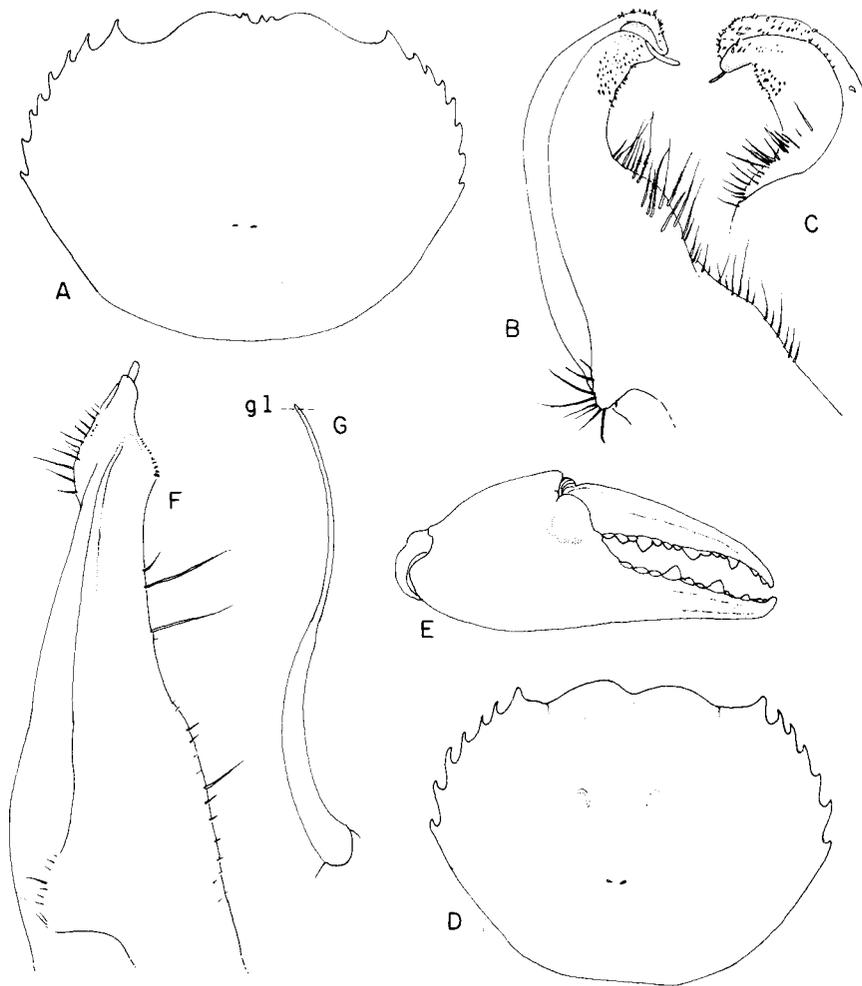


FIGURE 44
Dilocarcinus niceforei (Schmitt & Pretzmann), A-C, male specimen, cl 34.8 mm, from Rio Apon; A, outline of carapace; B, first male gonopod, left, caudal; C, same, apex, cephalic; *Dilocarcinus pagei* Stimpson, D-G, male specimen, cl 44.7 mm, from Trinidad, Beni: D, outline of carapace; E, larger chela; F, first male gonopod, left, caudal; G, second male gonopod. gl, level of gonopore of first gonopod.

elevated behind outer orbital angle, forming shallow channel with basal antennal article and occlusive tooth; outer orbital angle with acute spine directed forward, similar to other on antero-lateral margin of carapace; outer margin of this spine concave or with notch in middle; buccal angle armed with 5 or 6 small spines. Front retracted leaving epistome completely exposed in dorsal view; anterior margin of frontal lobes lamellar, not forming distinct surface; epistome strongly advanced, points of mid-gutter well spaced; opening of efferent channels strongly arched, forming 2 well defined spouts delimited below by 2nd maxillipeds; surface delimiting

channels laterally forms rounded lobe; all buccal area, including yugal and suborbital spines, visible in dorsal view; spines at each side of epistome define 2 external respiratory channels, one between yugal spines and suborbital spines, another inside orbits, delimited below by suborbital spines.

Sutures between abdominal segments 3-6 clearly visible in both sexes; male abdomen triangular, lateral margins of 3rd and 4th segments rounded and expanded, general outline of abdomen conspicuously concave; last segment with outer margin concave, approximately 0.6 as long as broad, margin of approximately same length as distal margin of penultimate segment.

Basal article of antenna without outer lobe. Shallow depression along ischium of 3rd maxilliped. Chelipeds moderately unequal; lower margin of merus with 3 median and 1 terminal spine; internal margin with median spine; upper margin with distal spine; carpus with large spine on internal margin; smaller spines on external and upper margins near articulation of palm; lower margin of propodus and dactylus of legs with row of long hairs, upper margin with 2 rows of smaller hairs on dactylus and similar internal row on propodus; claws of dactylus with 5 longitudinal carinae, 1 upper, 2 lateral and 2 inferior.

First gonopod with proximal 3/4 wide in meso-caudal view, mesial border slightly curved laterad, lateral border sinuous, provided with long, stiff setae, at least some plumose, projected in lateral view as a sinuous ridge; prominent basal lobe bearing long stiff marginal setae, subtriangular; gonopod becomes abruptly narrowed and strongly bent laterad at distal quarter; apical portion strongly recurved, margin twisted to proximal position and mesial border to distal position, forming two rounded lobes with gonopore in between, directed laterad; distal part of gonopod bears lateral and mesial patches of prominent spines, recurved at different angles, irregular in appearance; apical tuft of setae absent. Second gonopod slightly longer than first, extruded from gonopore as small tongue-like appendage.

Material examined

Venezuela. Rio El Quebradón, near Aguas Calientes, Zulia State; 7 May 1965; captured with Pronox-Fish, bottom sand-gravel, water temperature 28.6° C; F. MAGO; 1 male (MB). Swamp near Bobures, Zulia State; captured with Pronox-Fish, bottom mud with decomposing organic matter, water temperature 30.8° C; 6 June 1965; F. MAGO; 1 male, 1 immature female (MB).- Rio Apon, near Machiques, Zulia State, 90 m alt; 17 August 1978; L. GAMBA; 1 male (Ivic).

Type and distribution

The holotype is a male from Pamplona, Colombia (SCHMITT and PRETZMANN, 1968), collected by H. NICEFORO MARIA; SCHMITT (1969) fixed the holotype designation to a male, cl 34 mm, in the USNM 112117. The holotype and only specimen of *Valdivia (Rotundovaldivia) niceforei cucutensis* is a male from Cúcuta, Colombia, in the Basel Museum, N° 763-b (PRETZMANN, 1968b). Both localities are 50 km apart, in the same river basin (SMALLEY & RODRÍGUEZ, 1972). In addition to the type material, the species have been reported by SMALLEY & RODRÍGUEZ (1972), RODRÍGUEZ (1980) & CAMPOS (1985) from many localities in the rivers of the Lago Maracaibo drainage in Venezuela and Colombia.

Dilocarcinus pagei Stimpson, 1861

Fig. 1B; 4AA; 8I; 13J; 14D; 44D-G

Dilocarcinus pagei Stimpson, 1861, p. 373.- RODRÍGUEZ, 1981, p. 48.

Dilocarcinus (Dilocarcinus) pagei, LOPRETTO, 1981, p. 23.

Dilocarcinus (Dilocarcinus) pagei pagei, BOTT, 1969, p.46, pl. 9, fig. 16a, b, pl. 20, fig. 47.- LOPRETTO, 1976, p. 84, fig. 26-29.-

MANNING & HOBBS, 1977, p. 159.- LOPRETTO, 1981, p. 22.

Dilocarcinus pagei cristatus Bott, 1969, p. 47, pl. 9, fig. 17a, b, pl. 20, fig. 48.- LOPRETTO, 1976, p. 86, fig. 14, 17.- LOPRETTO, 1981, p. 22.

Dilocarcinus (Dilocarcinus) pagei enriquei Pretzmann, 1978a, p. 168; PRETZMANN, 1983b, p. 324.

Dilocarcinus (Dilocarcinus) pagei enricei [sic], PRETZMANN, 1983b, p. 318.

Trichodactylus (Dilocarcinus) orbicularis, RATHBUN, 1906, p. 58, pl. 18, fig. 6, text-fig. 119 (part.).- MOREIRA, 1913, p. 19, pl. 7, fig. 1, 2.- BALSS, 1914, p. 409.- RINGUELET, 1949, p. 101, pl. 9, fig. 2.

Trichodactylus (Dilocarcinus) septemdentatus, HOLTHUIS, 1959, p. 218 (part.).

Orthostoma septemdentatum, NOBILI, 1898, p. 9 (part.).

Description

Carapace suborbicular; upper surface very convex, convexity more pronounced along antero-posterior axis, regularly arched, with regions not differentiated, except for semicircular epigastric lobes and slight depressions between protogastric and epibranchial regions; frontal region slightly convex over antero-posterior axis, concave behind inner orbital angle; front strongly bilobed, inclined downwards; hepato-epibranchial, branchio-urogastric, branchio-cardiac and branchio-intestinal grooves indicated by thin, obsolescent lines; urogastric groove absent; a short incision in middle of epigastric lobes. Dorsal surface of carapace smooth and polished, covered by small papillae barely visible to naked eye. Postgastric pits lunulated, well marked. Anterolateral margin with 6 acute spines behind external orbital angle, directed anteriorly and slightly inwards; interdental spaces slightly increasing posteriorly; last spine smaller; postero-lateral margin marked by well defined ridge throughout, which begins at lateral side of last lateral spine, curves slightly inwards in middle and stops at some distance of ridge on postero-lateral angle of carapace in female, running parallel to it in male. Orbits subquadrate in frontal view; orbital suture indicated by well marked groove; orbits large and eyes relatively small, leaving ample empty space in orbital cavity. Lower orbital margin with 6 or 7 acute spines curved inwards, innermost pair fused at base to form inner orbital angle. Occlusive orbital tooth reduced to small triangular projection, implanted inside orbit away from inner orbital angle, partially concealed by basal antennal article; strong ridge behind inner orbital angle forms deep channel limited by basal antennal article; outer orbital angle with hooked spine directed forward, similar to other on antero-lateral margin of carapace; buccal angle armed with 5 or 6 small spines or acute papillae. Front retracted leaving epistome completely exposed in dorsal view; anterior margin of front not forming distinct surface, regularly rounded-off; epistome strongly advanced, points of the mid-gutter well separated; opening of efferent channels strongly arched, forming two well defined spouts delimited below by 2nd maxillipeds; surface delimiting channels laterally forms triangular tooth separated from, and more advanced than, buccal crest; yugal and suborbital spines visible in dorsal view; spines at each side of epistome define 2 external respiratory channels, one between yugal spines and suborbital spines, another inside orbits, limited below by suborbital spines.

Abdominal segments 3-6 fused in both sexes; distal margin of 3rd abdominal segment with strong acute ridge directed forward and covering suture 3/4; male abdomen triangular, wide at base; outer margins slightly concave; last segment with outer margin sinuous, approximately 0.6 as long as broad, margin of same length as distal margin of penultimate segment.

Basal article of antenna without outer lobe. Shallow depression along ischium of 3rd maxilliped. Chelipeds strongly unequal in male, subequal in female; chela of male with upper border strongly arched, lower border slightly sinuous; fingers strongly gaping, each cutting edge with approximately 3 larger teeth interspaced by groups of 3 smaller; both chelae in both sexes with large, flat tubercle or swelling on external surface, at base of fingers; carpus with large conical spine on inner margin, merus with spines on distal margin, distal half of upper border and middle of latero-inferior margin; female chelae and smaller chela of male with small acute spine on distal upper angle, distal angle of carpus, infero-distal margin of ischium, respectively; 4 spines on lower margin of merus forming continuous row with ischial and infero-distal spine of merus. Propodus of legs with row of

long hairs on lower margin except on proximal quart, another row on upper margin, dactylus with row on lower margin and 2 rows on upper margin; claws of dactylus with 5 longitudinal carinae, 1 upper, 2 lateral and 2 inferior.

First gonopod with basal portion flattened and expanded on meso-lateral plane; apex directed cephalad, with mesial margin rounded and provided with long hairs, lateral side oblique, with short spines; awl-shaped terminal portion bearing dorsal longitudinal carina, overreaching gonopore; gonopore directed cephalad. Second gonopod slightly longer than first, curved in proximal half, straight or more or less sinuous in distal half.

Material examined

Brazil. Sistema de Janavaca, Amazonas; 19 males, 1 female (Ivic). San Luis de Caceres, Mato Grosso; 27 June 1947; J. JANSEN; 3 males, 1 female (USU 203). Fazenda Nhumirim, Nhecolandia, Pantanal do Mato Grosso; 24 July 1948; F. FERREIRA LOURIVAL; 1 male, 1 female (USU 201). Rio Cuiba, Varzea Grande, Mato Grosso; 15 July 1982; M. CATARINO; 1 male (USU 160).- Perú. Rio Tombopata, Madre de Dios Department; 27 October 1972; H. ORTEGA; 1 male (MHNL).-Bolivia. Trinidad, Beni Department; March 1982 - July 1984; G. LOUBENS; 32 specimens (MNHNP B.12813, 12813, 12814, 12816, 12817, 19119, 19120). Arroyo San Juan, Trinidad; 9 January 1982; collected by Orstom (MP B-19116). Laguna Suarez, near the University, Trinidad; 19 October 1981; collected by Orstom (MP B-19118).- Paraguay. Bridge over stream 7 km E of Luque on dirt road to Areguá; Lago Ypacará; 17 May 1979; J. N. TAYLOR, T. W. GRIMSHAW & J. K. CREIGHTON; Lat/Long: 25° 18' 30" S - 57° 22' 48" W; Field Number P79-1 (USNM Accession No 341275); 3 females. Overflow inlet along E shore of Rio Paraguay approximately 1 km (=down stream) from Puente Remanso bridge; Rio La Plata drainage; 21 May 1979; J. N. TAYLOR, T. W. GRIMSHAW & J. K. CREIGHTON; Lat/Long: 25° 12' 30" S - 57° 33' W; Field Number P79-4 (USNM Accession No 341275); 1 female. Flooded pastures and river banks along E shore of Rio Paraguay approximately 1 km S of Puente Remanso bridge; La Plata drainage; 6 November 1979; R. BAILEY & J. N. TAYLOR; Lat/Long: 25° 12' 30" S - 57° 33' 00" W; Field Number P79-19B & P79-19C (USNM Accession No 341275); 1 male, 1 female, 1 juvenile. Overflow areas adjacent to Rio Salado (near mouth) at bridges 5.4 and 5.85 km N of Limpio via dirt road, Rio Paraguay; 16 June 1979; R. BAILEY & J. N. TAYLOR; Lat/Long: 25° 08' 42" S - 57° 25' 12" W; Field Number P79-22B (USNM Accession No 341275); 3 females and 2 juveniles. 32.4 km W of turn off to Curuguaty; 21 July 1979; J. N. TAYLOR & T. W. GRIMSHAW; Lat/Long: 24° 22' 54" S - 55° 56' 24" W; Field Number P79-55 (USNM Accession No 341275); 2 females and 2 juveniles. Caaguazu, Arroyo Tobatiry at bridge on dirt highway approximately 22 km N of junction with route 2 in Coronel Oviedo; Rio Manduvira drainage; 29 July 1979; J. N. TAYLOR & T. W. GRIMSHAW; Lat/Long: 25° 16' 54" S - 56° 24' 00" W; Field Number P79-69 (USNM Accession No 341275). Presidente Hayes department; large lagoon above dam (and adjacent small pools below dam) approximately 34.8 km NW toll booth at Puente Remanso bridge; 8 July 1979; G. R. SMITH & J. N. TAYLOR; Lat/Long: 25° 04' 54" S - 57° 36' 00" W; Field Number P79-77A (USNM Accession No 341275); 1 male.- Presidente Hayes Department, Rio Pilcomayo and adjacent overflow pools at bridges (=Puerto Falcon) to Argentina, approximately 12 km WSW Chaco-i; Rio Paraguay; 29 August 1979; J. N. TAYLOR, T. W. GRIMSHAW & B. SMITH; Lat/Long: 25° 15' 48" S - 57° 42' 36" W; Field Number P79-98 (USNM Accession No.341275).

Type and distribution

The holotype is a female collected by Captain PAGE in Paraguay (USNM), Rio Paraguay (STIMPSON, 1861, type; BOTT, 1969). The species have been frequently reported from Brazil, Bolivia, Paraguay and Argentina (RATHBUN, 1906; BOTT, 1969; LOPRETTO, 1981; RINGUELET, 1949). To this species probably belong the specimens recorded under *Orthostoma septemdentatum* by NOBILI (1898) from Beni, Bolivia and Alto Rio Paraguay, under *Trichodactylus (Dilocarcinus) orbicularis* by RATHBUN (1906) from Paraguay, and Moreira