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THE FRESHWATER CRABS OF THE GENUS *PSEUDOTHELPHUSA* FROM NORTHERN VENEZUELA AND TRINIDAD (BRACHYURA, POTAMONIDAE)

by

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With 10 text-figures and 7 plates

During a study of collections of Venezuelan *Pseudothelphusa* deposited at the Museum of Biology of the Central University of Venezuela, Caracas, and at the La Salle Museum of Natural History, Caracas, examples of two new forms were discovered; one of these is here described as a new species, the other as a new subspecies of an already described species. In the previous descriptions from Venezuela and Trinidad by Rathbun (1898, 1905, 1919), the male pleopod, which furnishes the most reliable character to distinguish between the various species of this group, was not adequately illustrated. Consequently, considerable difficulty was encountered in comparing my material with these descriptions. It was therefore thought advisable to provide here full descriptions and illustrations not only of the new forms, but also of all the species previously described from this area.

In these descriptions the abbreviations cb. and cl. have been used for "carapace breadth" and "carapace length" respectively. In the paragraph "Material examined" the following abbreviations have been used to indicate the institutions where the material is deposited: LS = La Salle Natural History Museum, Caracas; MB = Museum of Biology of the Central University of Venezuela, Caracas; ML = Rijksmuseum van Natuurlijke Historie, Leiden. I am most grateful to the authorities of the first two institutions for the privilege of studying the freshwater crabs in their collections.

I am greatly indebted to Dr. Julian Kenny for his assistance in obtaining specimens from Trinidad, and to Mr. Andrés Eloy Esteves for his kind cooperation in all phases of the work. I am furthermore very thankful to Dr. L. B. Holthuis for his valuable suggestions and criticisms.

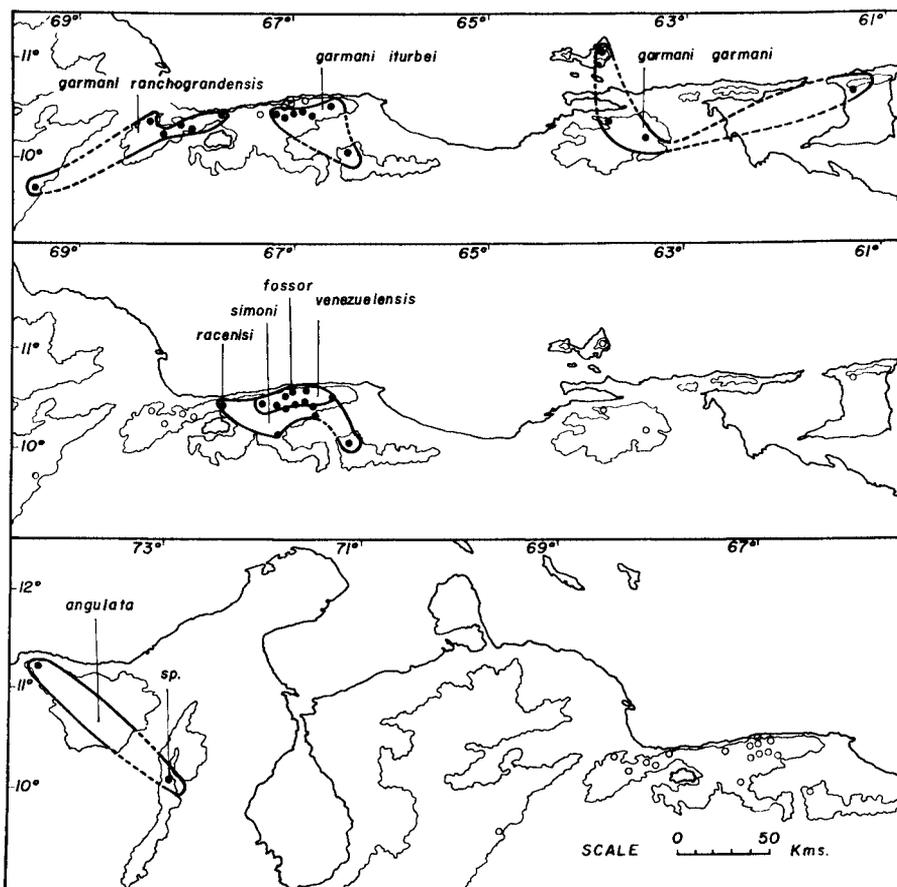


Fig. 1. Distribution of *Pseudothelphusa* in northern Venezuela. Contour lines enclose mountainous areas above 700 meters of altitude.

***Pseudothelphusa venezuelensis* Rathbun (text-fig. 2; pl. 1)**

Pseudothelphusa fossor (part.) Rathbun, 1898: 520, 534, 537.

Pseudothelphusa venezuelensis Rathbun, 1905: 281, pl. 13 fig. 6.

Description. — The upper border of the front in this species is rounded and not marked by a well-defined ridge. In some specimens the sides of the upper border are rounded and without traces of tubercles, but the center is deep and the upper border projects over the surface of the front in this area. In other specimens the center is shallow and some tubercles are faintly indicated on all parts of the upper border. The lower frontal ridge is marginate, almost straight in some specimens, bilobed in others and lies in front of the upper border. The carapace is convex in both directions;

however, the gastric region is more elevated than the branchial and thus the outline of the carapace in frontal view is not a regular arch. The postfrontal lobes are almost absent, except for a shallow depression in front of the place where these lobes should be. The carapace between these shallow depressions and the front is deflexed, the median groove is only indicated by a shallow notch in the middle of the upper border of the front. The cervical groove is sinuous, very deep and wide toward the middle of its

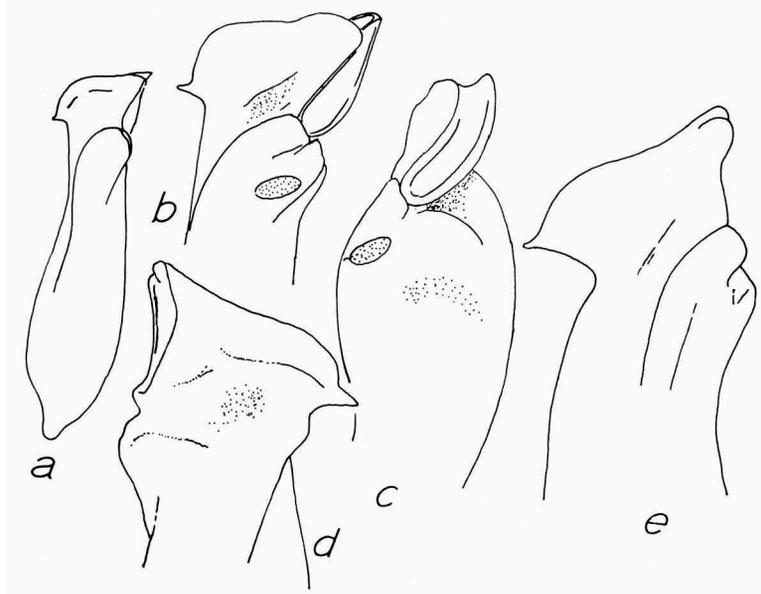


Fig. 2. *Pseudothelphusa venezuelensis* Rathbun, first male pleopod, left, specimen from Altos de Pipe, Miranda State, May 1965 (MB). a, total view, posterior; b, detail of tip, posterior; c, postero-external; d, external; e, internal.

course, becoming indistinct near the anterolateral margin of the carapace. In some specimens there is a shallow notch just behind the orbit, while in others this place is occupied by one or two small tubercles. Between these tubercles or notch and the incision of the cervical groove there are 3 to 5 small teeth that become blunt with age. Behind the cervical incision there are 14 to 18 small acute teeth. The upper surface of the carapace is covered by closely placed flattened minute tubercles, more prominent near the anterior portion, but always so inconspicuous that at first view the carapace seems to be perfectly smooth. In the younger specimens these tubercles are directed anteriorly and sometimes are coalescent.

The third maxilliped has the outer margin of the merus and ischium of

the endognath regularly convex, with a shallow excavation on the anterolateral margin of the merus. The exognath is less than one-third the length of the margin of the ischium. The chelipeds, when fully developed, are very unequal. The larger cheliped is swollen; the hand and fingers at first view are smooth, except for a row of small tubercles on the lower margin of the manus and scattered punctae over the entire surface. On closer examination it can be observed that the outer surface is covered by papillae similar to those on the carapace. The palm does not possess the large tubercles that are present at the base of the fingers in some species. When the cheliped is not fully developed, the small tubercles of the lower margin of the manus are less distinct and similar tubercles are present on the upper margin near the articulation of the carpus. The carpus of the chelipeds has an acute large tooth near the middle of the internal margin and 3 to 5 spines behind this. In the younger specimens these spines are more prominent and the border in front of the large tooth, as well as the anterior border, is crenulated.

The first pleopod of the male possesses a superior lobe with an upper expansion, whose sinuous border is transversely truncated, ending anteriorly in a tooth, with the lower border directed normally to the axis of the appendage. This tooth is equivalent to the anterior lobe present in other species of this area (*P. fossor*, *P. simoni* and *P. garmani*), but in *P. venezuelensis* it is not clearly separated from the superior lobe. The posterior surface of the superior lobe is formed by an elongated cavity, transversely directed from left to right. The internal border of this cavity is continuous with the border of the upper expansion. On the internal side there is a recurved process formed by a folding of the appendage, the apex of which ends at the base of the posterior surface of the superior lobe.

Colour. — In life the younger specimens of this species have the carapace and chelipeds of the same colour, brown or cream. In the adults the chelipeds are usually of a lighter colour than the carapace.

Size. — This is one of the smallest species of the genus. The largest specimen examined by me is a female with marsupial young, cb. 31.5 mm, cl. 19 mm. The type specimen has 25 mm cb.

Material examined. — El Junquito, Federal District, Venezuela; May 10, 1952; H. Gines. — 2 males, cb. 19 and 21.5 mm, cl. 12.5 and 13.5 mm; 1 female, cb. 16 mm, cl. 10 mm (LS no. 327).

Las Canoas, Federal District, Venezuela; 1500 m altitude; August 8, 1951; A. Gamero. — 1 female, cb. 26 mm, cl. 16 mm (MB).

Agua Fria Dam, Miranda State, Venezuela; August 24, 1951; F. Martin. — 1 male, cb. 17 mm, cl. 11 mm (LS no. 330).

La Hedionda Creek, Sebucan, Miranda State, Venezuela; April 14, 1956; A. Hiller. — 2 males, cb. 20 and 24 mm, cl. 12.5 and 15 mm; 1 female, cb. 18 mm, cl. 11 mm (MB).

El Tanque, Curupao, Miranda State, Venezuela; 1000 m altitude; May 21, 1948; A. Ciferri. — 1 male, cb. 28.5 mm, cl. 17 mm (MB).

Altos de Pipe, Miranda State, Venezuela; 1300 m altitude; December, 1963; G. Rodríguez. — 4 males, cb. 17, 18, 18.5 and 25 mm, cl. 11.5, 12, 12 and 16.5 mm; 3 females, cb. 14, 15 and 19 mm, cl. 9.5, 10 and 12 mm (MB).

Altos de Pipe, Miranda State, Venezuela; 1300 m altitude; May, 1965; J. Patzek. — 1 male, cb. 24 mm, cl. 16 mm; 1 female cb. 31.5 mm, cl. 19 mm, with 24 marsupial young (ML).

San Antonio de los Altos, Miranda State, Venezuela; May 31, 1953; L. Pojan. — 1 male, cb. 11.5 mm, cl. 7.5 mm (LS no. 302).

Rancho Grande, Aragua State, Venezuela; July 21, 1949. — 1 male, cb. 24 mm, cl. 15 mm (MB).

Type. — The holotype of this species is a female collected by E. Simon in 1888 and deposited in the Paris Museum. The species has not been reported in the literature since. The type locality is Colonia Tovar. Our record nearest to the type locality is from El Junquito, 25 km to the east of Colonia Tovar.

Pseudothelphusa fossor Rathbun (text-fig. 3; pl. 2)

Pseudothelphusa fossor Rathbun, 1898: 520, 534, 537, fig. 11a, b, c, (not d, e); Rathbun, 1905: 290, text-fig. 82.

Description. — The upper border of the front has a row of faintly indicated flat tubercles which do not project over the surface of the front. Laterally the front joins the orbital margin in an acute angle. In frontal view this upper frontal ridge is inclined toward the middle, and consequently the front is higher toward the extremities. In dorsal view it is convex and bilobed. The lower frontal ridge lies slightly in front of the upper. It is marginate, sinuous and with faint indications of papillae. The surface of the front between these ridges is more excavated toward the extremities.

The carapace is convex in both directions, with the branchial region swollen. The gastric region is not more elevated than the branchial and thus the outline of the carapace in frontal view is a regular arch. The postfrontal lobes are narrow; though visible, they are not always very distinct. Their anterior margins are not well-defined. The region between these lobes and the front is deflexed. A shallow median groove extends from the postfrontal lobes to the upper frontal margin. There is a depression where this groove meets the margin, but not a deep incision. The cervical groove is straight, shallow and almost reaches to the lateral margin of the carapace. The anterolateral margin reaches sometimes to the orbit, but in some specimens it stops just before it. In younger specimens the anterolateral margin of the carapace shows 8 to 10 small, blunt teeth between the orbit and the incision of the cervical groove, and 20 to 22 small acute teeth behind the cervical incision. In the older specimens the teeth between the orbit and

the incision of the cervical groove are often hardly visible, and those behind the cervical incision are reduced, at least at the beginning of the series. The upper surface of the carapace is covered by numerous closely placed, flattened, minute tubercles, so inconspicuous that at first view the carapace of adult specimens seems to be perfectly smooth. These tubercles are more distinct in the younger specimens.

The shape of the third maxilliped is as described and figured by Rathbun (1898) for the type. The merus and ischium of the endognath are regularly convex, with a shallow excavation in the anterolateral margin of the merus.

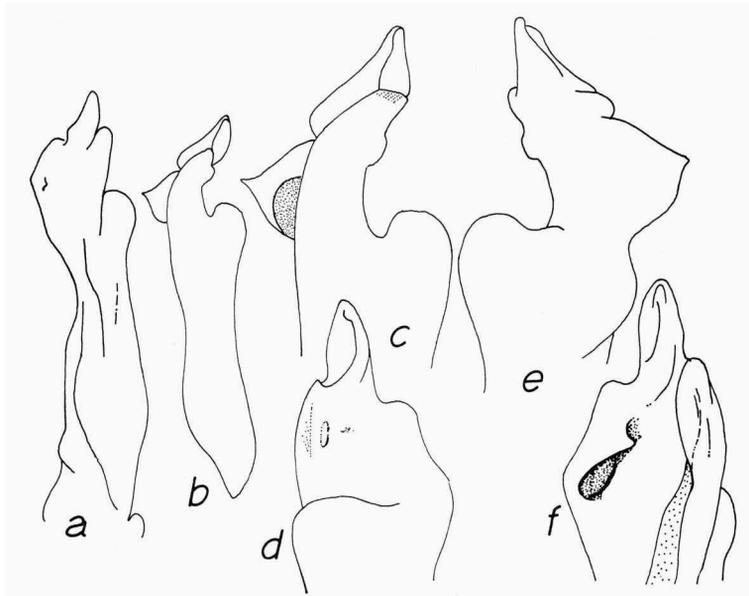


Fig. 3. *Pseudothelphusa fossor* Rathbun, first male pleopod, left, specimen from Camurí Grande River, Federal District, May 10, 1965 (MB). a, total view, postero-internal (the position shown is the same as that in Rathbun, 1905, fig. 82); b, total view, posterior; c, detail of tip, posterior; d, external; e, antero-external; f, anterior.

The ischium has its greatest width in the distal half. The merus is not much wider than long. The exognath is less than one-third the length of the outer margin of the ischium. The chelipeds, when fully developed, are very unequal. The larger cheliped is swollen, with a row of small tubercles on the lower margin of the manus and a group of 3 to 5 on the outer surface near the articulation of the carpus; except for these small tubercles and for scattered punctae, the outer surface is smooth and does not possess the large tubercles at the base of the fingers, present in some species. When the larger cheliped is not fully developed it has numerous small papillae of darker colour irregularly placed over the entire outer surface of the palm

and fingers. The carpus of the chelipeds has an acute, large tooth near the middle of the internal margin and 3 to 5 small spines behind this. These spines are more prominent in the younger specimens.

The sixth article of the male abdomen is 1.4 times as broad as long. The external border of the first pleopod of the male ends in a rounded sub-terminal process. At the apex of the appendage there is a superior lobe, with the upper border transversely truncated and the external surface excavated with raised borders. On the posterior side of this superior lobe there is a recurved process with a small and elongated pimple on the internal (concave) side. Anteriorly there is a rounded lobe, ending in an acute tooth which is bent internally.

Size. — This is a small species. The largest specimen examined by me is a male, cb. 33 mm, cl. 19.5 mm. The type specimen has 28.7 mm cb.

Colour. — In life the specimens of this species have a dark brown, light brown or reddish carapace, with the sides and chelipeds light coloured, almost white in the full-grown specimens. This is probably the reason why Robinson, cited by Rathbun (1898), described these as "little whitish crabs".

Material examined. — Camurí Grande River, Federal District, Venezuela; 2.5 km from the sea, 100 m altitude; May 10, 1965; A. Esteves and G. Rodríguez. — 4 males, cb. 21, 29, 32.5 and 33 mm, cl. 13, 18, 20 and 20.5 mm; 5 females, cb. 17.5, 20, 31, 32 and 33 mm, cl. 11, 12.5, 19, 19 and 19.5 mm (MB and ML).

Type. — The holotype of this species is a female collected in 1895 by W. Robinson and deposited in the United States National Museum under the number 18818. Under the same name Rathbun (1898) listed the following additional material: one male and three females collected by Gollmer in Caracas, and deposited in the Berlin Museum under the numbers 375, 378, 384 and 385, one male and three females collected by Simon in Venezuela and deposited in the Paris Museum; one male, deposited in the United States National Museum, and two females, deposited in the Kiel Museum, collected by Dr. Claudius and labelled "Antilles"; one female collected by Simon in Colonia Tovar and deposited in the Paris Museum.

In her revision of 1905 Rathbun retained in *P. fossor* the female from La Guaira, and added three males and two females collected in the type locality by W. Lyon and W. Robinson. The supplementary material listed in 1898 was distributed in two new species, *P. simoni* and *P. venezuelensis*.

The type locality of this species is a stream 1.2 km from the sea, near the port of La Guaira. Although I searched very carefully in this stream, no crabs could be found. However, they were very abundant in the sandy banks of another stream, 20 km to the east of the type locality.

Pseudothelphusa simoni Rathbun (text-fig. 4; pl. 3)

Boscia dentata-Gerstaecker, 1856: 145 (not *B. dentata* Milne Edwards).

Pseudothelphusa fossor (part.) Rathbun, 1898: 520, 534, 537, fig. 11d, e (not fig. 11 a, b, c).

Pseudothelphusa simoni Rathbun, 1905: 291.

Pseudothelphusa chacei Crane, 1949: 26, 27, fig. 2B, 2C, 3.

Pseudothelphusa simoni-Weibe Zahn, 1952: 68, fig. 1.

Pseudothelphusa chacei-Weibe Zahn, 1952: 70, fig. 3.

Description. — The upper frontal ridge is well marked by a row of distinct tubercles, approximately 10 on each side, which are wide and sometimes coalescent. The row of tubercles is interrupted in the middle where the median groove of the carapace meets the front; laterally it runs parallel to the orbital margin. In frontal view the upper frontal ridge is concave; in dorsal view it is bilobed. The lower frontal ridge lies directly below the upper, it is marginate, convex and only slightly sinuous. The surface of the front between these ridges is of the same height and equally excavated throughout.

The carapace is convex in both directions, with the branchial region swollen; however, the gastric region is more elevated than the branchial and thus the carapace in frontal view is not a regular arch. The postfrontal lobes are rounded and small. The region between these lobes and the front is deflexed and slightly concave. The median groove of the carapace is almost obsolete, except for a shallow sinus in the upper frontal ridge. The cervical groove is sinuous, curving backwards when it approaches the anterolateral margin of the carapace.

The anterolateral margin of the carapace, between the orbit and the incision of the cervical groove, has a shallow notch followed by 4 or 5 rounded teeth, and 16 to 20 small acute teeth behind the cervical incision. The upper surface of the carapace is covered by numerous, closely placed, flattened, minute tubercles.

The third maxilliped has the outer margin of the merus and ischium of the endognath regularly convex, with a shallow excavation on the anterolateral margin of the merus. The exognath is less than one-third the length of the ischium of the endognath. The chelipeds when fully developed are very unequal. The large cheliped is swollen. The hands and fingers at first view are smooth, except for scattered punctae, which sometimes are dark brown, and small tubercles on the lower margin of the manus that become larger proximally. On closer examination it can be observed that the outer surface is covered by small papillae, similar to, but less conspicuous than those on the carapace. The palm does not possess

the large tubercles present at the base of the fingers that occur in some species of this genus. The carpus of the cheliped has an acute large tooth near the middle of the internal margin and 3 to 5 spines behind this. In the younger specimens these spines are more acute and the border in front of the large tooth, as well as the anterior border, is crenulated.

The superior lobe of the first pleopod of the male has the upper border perpendicular to the axis of the appendage, with the posterior surface excavated. On the anterior side there is a triangular lobe directed upwards

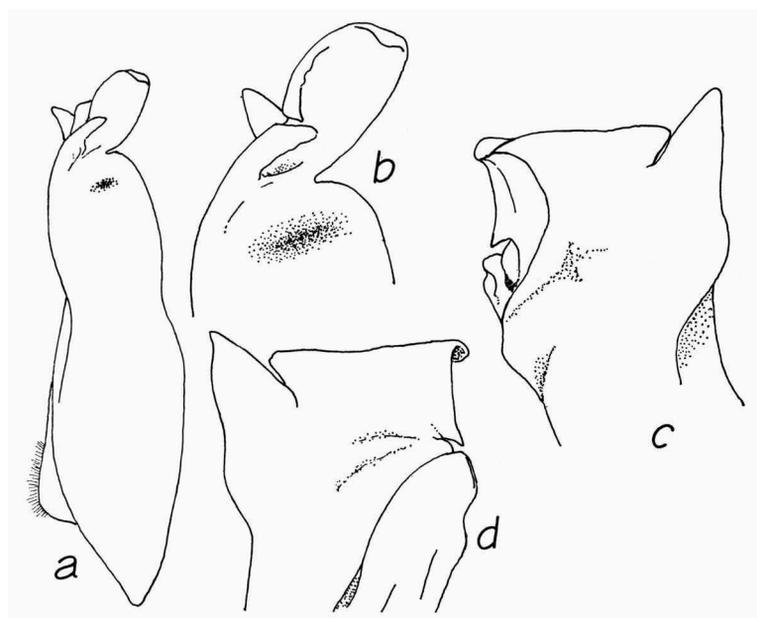


Fig. 4. *Pseudothelphusa simoni* Rathbun, first male pleopod, left, specimen from Quebrada El Encantado, Baruta, Miranda State, October 12, 1949 (LS no. 31). a, total view, posterior; b, detail of tip, posterior; c, external; d, internal.

and separated from the superior lobe by a deep notch. On the internal side there is a recurved process, with the apex bent towards the excavated surface of the superior lobe.

Colour. — In my spirit specimens the carapace is pale brown with irregular areas of a lighter colour. The chelipeds and walking legs are usually cream.

Size. — This is a species of moderate size. The largest specimen examined by me is a female, cb. 45 mm, cl. 27 mm. The type has 25.4 mm cb. The largest specimen of *P. chacei* recorded by Crane (1949) is a female of 24 mm cl.

Material examined. — Sabaneta, Tacagua, Federal District, Venezuela; March 10, 1956. — 1 male, cb. 32 mm, cl. 19 mm (LS).

At the foot of Mt. Avila, Caracas, Federal District, Venezuela; February 22, 1948. — 1 male, cb. 13.5 mm, cl. 8.5 mm (MB).

Quebrada El Encantado, Baruta, Miranda State, Venezuela; 980 m altitude; October 12, 1949. — 1 male, cb. 38 mm, cl. 23 mm (LS no. 31; identified by Chace as *P. simoni*).

Quebrada El Encantado, Baruta, Miranda State, Venezuela; 980 m altitude; October 12, 1949; R. Urbano. — 1 male, cb. 22 mm, cl. 14 mm (LS no. 30; identified by Chace as *P. simoni*).

Turgua, Miranda State, Venezuela; 1100 m altitude; September 11, 1949; F. Martin. — 2 males, cb. 41 mm, cl. 25 mm both; 1 female, cb. 39 mm, cl. 25 mm (LS no. 22; identified by Chace as *P. chacei*).

Turgua, Miranda State, Venezuela; 1100 m altitude; November 11, 1949; F. Martin. — 3 males, cb. 16, 21, and 32 mm, cl. 11, 14 and 20 mm; 1 female, cb. 19 mm, cl. 13 mm (LS no. 24; identified by Chace as *P. chacei*).

Turgua, Miranda State, Venezuela; 1100 m altitude; November 11, 1949; F. Martin. — 1 male, cb. 24 mm, cl. 15 mm; 8 juveniles (LS no. 25; identified by Chace as *P. chacei*).

La Providencia, Turgua, Miranda State, Venezuela; 950 m altitude; December 28, 1949; C. Alemán. — 1 female, cb. 42 mm, cl. 25 mm (LS no. 27; identified by Chace as *P. simoni*).

La Providencia, Turgua, Miranda State, Venezuela; 950 m altitude; July 15, 1950; A. Kolzow. — 1 female, cb. 45 mm, cl. 27 mm (LS no. 63; identified by Chace as *P. simoni*).

Turgua, Miranda State, Venezuela; 950 m altitude; July 15, 1948; J. Méndez. — 1 male, cb. 18 mm, cl. 11 mm (LS no. 11).

La Providencia, Turgua, Miranda State, Venezuela; 950 m altitude; October 21, 1951. — 1 male, cb. 20 mm, cl. 13 mm; 1 female, cb. 19 mm, cl. 12 mm (LS no. 432).

Los Guayabitos, Miranda State, Venezuela; August 26, 1951; A. Musso and E. Valladares. — 1 female (LS no. 216).

Los Guayabitos, Miranda State, Venezuela; 1000 m altitude; September 13, 1949; A. Kolzow. — 2 male juveniles, 2 female juveniles (LS no. 32; identified by Chace as *P. simoni*).

Tiara, Miranda State, Venezuela; February 1, 1956; A. Musso. — 2 males, cb. 16 and 31 mm, cl. 11 and 20 mm; 1 female, cb. 19 mm, cl. 13 mm (LS).

Tiara, Miranda State, Venezuela; April 27, 1956; A. Febres. — 1 male (LS).

Rancho Grande, Aragua State, Venezuela; 1170 m altitude; March 1, 1951; J. Roze. — 1 male, cb. 22 mm, cl. 15 mm; 1 female, cb. 17 mm, cl. 11 mm (MB no. 2107).

Rancho Grande, Aragua State, Venezuela; August 18, 1949. — 2 males, cb. 23 and 26 mm, cl. 15 and 17 mm (MB no. 2104).

Rancho Grande, Aragua State, Venezuela; June 19, 1960. — 1 female, cb. 34 mm, cl. 20 mm, with 16 young (MB).

Altos de Guatopo, Guárico State, Venezuela; 1400 m altitude; May 11, 1952; J. Roze. — 1 male, 1 female (MB no. 26).

Type. — Rathbun (1898) listed as types one male and two females collected by E. Simon and deposited in the Paris Museum. The type locality is Colonia Tovar, Venezuela. In addition she listed one female from the type locality, one male and 5 females from Caracas, and one male and two females from "Antilles".

Remarks. — *Pseudothelphusa chacei* was described by Crane (1949) on

material collected in the Rancho Grande National Park, Aragua State, central Venezuela. In the diagnosis of this species she stated that the "superior border of the front is distinct and tuberculate, but not carinate". However, in a note from Dr. Chace that she included along with her description it is stated that the species "is very close to Miss Rathbun's *P. simoni*. The male abdominal appendages agree very well with her figure of that species, but your specimens have a somewhat less concave carapace and a sharply carinate upper frontal margin which is completely lacking in *P. simoni*".

I have examined specimens labelled by Dr. Chace as *P. chacei* and others labelled by him as *P. simoni*, and reported upon by Weibezahn (1952). The male appendages are very similar in all our material but the tubercles of the upper frontal margin in some specimens are more prominent than in others. I do not think that these slight variations, often encountered in other species of this genus, warrant the recognition of a separate species.

Pseudothelphusa racenisi new species (text-fig. 5; pl. 4)

Description. — The upper frontal ridge is well marked by a row of distinct tubercles, approximately 12 on each side, which are wide and sometimes coalescent. The row of tubercles is interrupted in the middle where the median groove of the carapace meets the front. Laterally it joins the orbital margin in an acute angle. In frontal view this upper frontal ridge is straight, in dorsal view it is slightly convex. The lower frontal ridge lies well in front of the upper ridge. It is strongly sinuous, marginate and marked by tubercles. The surface of the front between these ridges is excavated and of equal height throughout.

The carapace is flat, with the branchial and gastric regions elevated. The postfrontal lobes are small, elevated, almost rounded, and marked anteriorly by a small depression. Laterally they are continued in a faint ridge to a point behind the base of the eye. The carapace between the postfrontal lobes and the front is flat and almost horizontal. The median groove is only marked by a shallow and wide depression that separates the postfrontal lobes. The cervical groove is straight, very deep and wide on the proximal portion. The lateral margin of the carapace has a notch behind the orbit and faint indications of another shallow notch just before the termination of the cervical groove. The lateral margin behind the end of the cervical groove has 15 small rounded teeth. The carapace is covered by numerous, closely placed, flattened, minute tubercles, not visible to the naked eye. There are a few larger tubercles scattered over the surface of the frontal lobes and the area just behind the orbits.

The third maxilliped has the outer margin of the merus and ischium of the endognath regularly convex. The anterolateral margin of the merus just before the articulation of the palp has a very shallow depression. The exognath is less than one-third the length of the margin of the ischium. The chelipeds are unequal. The outer and inner surfaces of the palm are smooth except for numerous punctae. The lower border has a few small tubercles near the articulation of the carpus. The fingers have a row of small dark points. The proximal tooth of the movable finger is strongly swollen. The

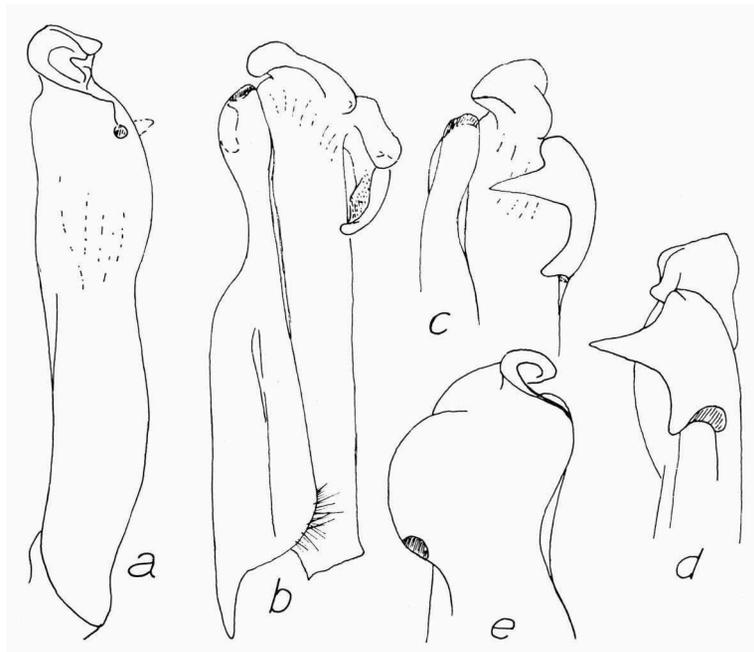


Fig. 5. *Pseudothelphusa racenisi* new species, first male pleopod, left, holotype specimen from Rancho Grande, Aragua State, August 5, 1949 (MB no. 1071). a, total view, posterior; b, internal; c, detail of tip, postero-external; d, anterior; e, internal.

palm does not possess the large tubercles at the base of the fingers that are present in some species. The carpus of the chelipeds has a prominent tooth near the middle of the inner border and 4 ill-defined small indentations behind these. The border in front of the prominent tooth has a few ill-defined papillae. The anterior border of the carpus is entire. The first pleopod of the male possesses an anterior lobe with a large and acute tooth directed internally and another inferior tooth recurved downwards. It has a superior lobe bent in the upper margin to form a posteriorly directed cavity and an antero-internal lobe.

Colour. — The holotype is preserved in alcohol. The carapace is brown with the cervical groove darker. The walking legs and the inferior portion of the body are light brown. The chelipeds are brown, of a darker shade on the upper border and with the tips of the fingers tinged with dark brown.

Types. — The holotype is a male, cb. 44 mm, cl. 27 mm, from Rancho Grande National Park, Aragua State, Central Venezuela, collected on August 5, 1949, by Dr. Juan Racenis and deposited at the Museum of Biology, Central University of Venezuela, Caracas, cat. no. 1071. Paratype is a male, cb. 42 mm, cl. 25 mm, deposited in the Rijksmuseum van Natuurlijke Historie, Leiden (Reg. No. Crust. D. 21760).

Pseudothelphusa garmani garmani Rathbun (text-fig. 6; pl. 5)

Pseudothelphusa garmani Rathbun, 1898: 522 (part.), text-fig. a, b, f, g, not c, d, e; Rathbun, 1905: 298 (part.), not text-fig. 91.

Description. — The upper frontal ridge is sharp, marked on each side by about 12 well-defined tubercles that project over the surface of the front. It has a deep incision in the middle. Laterally it curves backwards and for some distance runs parallel to the orbital margin before joining it. In front view it is almost straight or only slightly concave, and in dorsal view it is convex and bilobed. The lower frontal ridge lies somewhat in front of the upper. It is prominent, granular and sinuous.

The carapace is flat, with the branchial region slightly swollen and the gastric region more elevated than the branchial. The postfrontal lobes are wide and prominent, and are continued laterally in a faint ridge to a point behind the base of the eye. The anterior margin of these lobes is well-defined by an oblique depression. The carapace between the postfrontal lobes and the front is flat and almost horizontal. The median groove is deep, it sharply divides the postfrontal lobes and becomes wider and shallower behind these. The cervical groove is straight, deep and continued nearly to the lateral margin. In most specimens the lateral margin of the carapace has a wide notch behind the orbit and faint indications of another shallow notch just before the end of the cervical groove. The lateral margin behind the end of the cervical groove has 18 to 20 acute teeth. The upper surface of the carapace is covered by numerous closely placed flattened minute tubercles, that sometimes are coalescent, and are barely visible to the naked eye. The surface of the postfrontal lobes and the area just behind the front is covered by conspicuous tubercles, clearly visible to the naked eye.

The merus and ischium of the third maxilliped have a convex outer margin. The anterolateral margin of the merus, just before the articulation of the palp, has a shallow depression. In our specimens the ischium has its greatest width some distance behind the distal end. The exognath is less

than one-third the length of the margin of the ischium. The chelipeds, when fully developed, are unequal. The larger cheliped is heavy. The lower margin of the manus and fixed finger has a row of small dark, irregularly placed tubercles which become larger near the articulation of the carpus. There are also small dark tubercles irregularly placed over the entire upper border of the hand and two small rounded tubercles near the middle of the inner surface of the hand. The fingers have longitudinal rows of dark points. At the base of the union of the fingers there is a very large, rounded, and dark tubercle and a small acute one above this. In the specimens from Margarita Island and the mainland of Venezuela the large tubercle can be

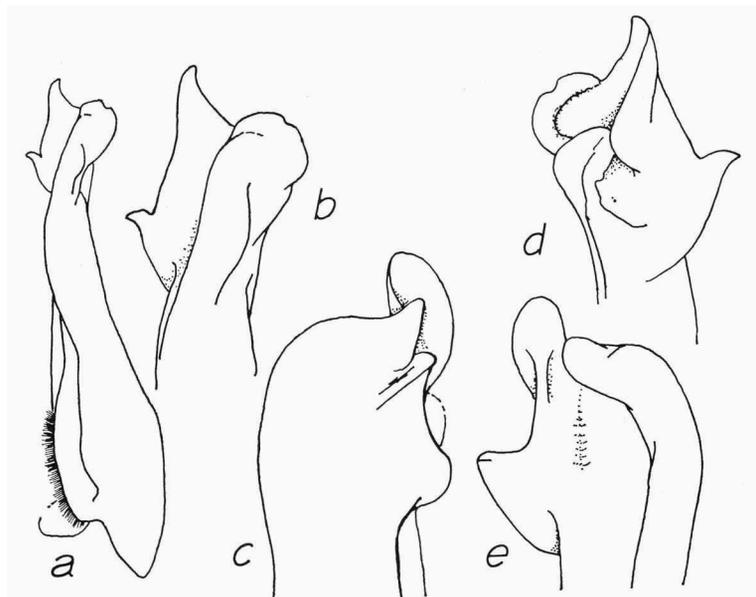


Fig. 6. *Pseudothelphusa garmani garmani* Rathbun, first male pleopod, left, specimen from Maracas River, Trinidad, April 5, 1965 (MB). a, total view, posterior; b, detail of tip, posterior; c, external; d, anterior; e, postero-internal.

wide and smooth or narrow and acute. In a few cases it is bifid. In the specimens from Trinidad Island it is less conspicuous. The smaller chela has an ornamentation similar to the large, but the tubercle at the base of the union of the fingers is less conspicuous and the smaller tubercle above this is more prominent. The carpus of the chelipeds has a large tooth near the middle of the inner border, three smaller spines behind this and a few faintly indicated papillae in front of it. The superior lobe of the first pleopod of the male is narrow and directed upward. Its external surface is cup-shaped, with the apex rounded, never notched. The anterior border is concave. The

upper border of the anterior lobe is short and directed transversely to the axis of the appendage; the lower border is sinuous. It resembles the extended thumb of a human hand. On the anterior side there is keeled, recurved process that ends at the side of the external surface of the superior lobe.

Colour. — In life the carapace, ambulatory legs and chelipeds are dark brown, except for the internal surface of the palm which is of a lighter colour.

Size. — This is the largest form of *Pseudothelphusa* in this area. The largest specimen examined by me is a male, cb. 95 mm, cl. 57 mm. The type specimen has a cb. of 26.8 mm.

Material examined. — Maracas River, 6 miles from the University, Trinidad, BWI; 200 m altitude; April 5, 1965; A. Esteves and J. Kenny. — 2 males, cb. 65 and 84 mm, cl. 40 and 52 mm; 1 female with 282 young, 2 immature males and 2 immature females (MB and ML).

Serranía El Copey, Margarita Island, Venezuela; December 13, 1951; J. Méndez. — 1 male, cb. 73 mm, cl. 46 mm; 1 female, cb. 77 mm, cl. 48 mm (LS no. 219).

Serranía El Copey, Margarita Island, Venezuela; December 13, 1951. — 1 female, cb. 84 mm, cl. 52 mm (LS no. 218).

Cerro El Copey, Margarita Island, Venezuela; 920 m altitude; August 31, 1956; F. Matos. — 1 female, cb. 74 mm, cl. 46 mm (LS no. 625).

Serranía El Copey, Margarita Island, Venezuela; December 13, 1951; J. Méndez. — 1 male, cb. 33 mm, cl. 22 mm (LS no. 223).

Serranía El Copey, Margarita Island, Venezuela; December 13, 1951. — 2 females, cb. 38 mm, cl. 25 mm in both. (LS no. 221).

San Juan River, Margarita Island, Venezuela; August 26, 1951. — 1 female, cb. 57 mm, cl. 35 mm (LS no. 229).

San Juan River, Margarita Island, Venezuela; August 26, 1956; L. Jordán. — 1 female, cb. 22 mm, cl. 14 mm (LS no. 701).

La Asunción River, Margarita Island, Venezuela; December 15, 1951; E. Valladares. — 1 male, cb. 64 mm, cl. 40 mm (LS no. 222).

La Asunción River, Margarita Island, Venezuela; September 1, 1956; G. González. — 1 male, cb. 27 mm, cl. 18 mm (LS no. 587).

Salamanca, Margarita Island, Venezuela; December 13, 1951; J. Roze. — 1 female, cb. 78 mm, cl. 48 mm (LS no. 225).

Salamanca, La Asunción, Margarita Island, Venezuela; August 18, 1956; L. Jordán and G. González. — 1 female, cb. 19 mm, cl. 13 mm (LS no. 591).

Matasiete River, Matasiete, Margarita Island, Venezuela; August 19, 1951; G. González. — 1 male, cb. 55 mm, cl. 35 mm; 1 female, cb. 70 mm, cl. 43 mm (LS no. 618).

Matasiete, Margarita Island, Venezuela; April 1, 1956. — 2 males, cb. 36 and 69 mm, cl. 23 and 42 mm; 3 females, cb. 32, 32, and 71 mm, cl. 20, 21 and 45 mm (LS no. 6).

Cerro Palma Real, Margarita Island, Venezuela; August 22, 1953; C. Porras. — 1 male, cb. 70 mm, cl. 44 mm (LS no. 755).

Hacienda 80, Margarita Island, Venezuela; February 3, 1949; L. Carbonell. — 1 female, cb. 85 mm, cl. 52 mm (LS no. 59).

Serranía de Mariguitar, Sucre State, Venezuela; December 20, 1959; L. Ojasti. — 1 female, cb. 92 mm, cl. 54 mm (MB).

El Guácharo, Monagas State, Venezuela; August 26, 1951; E. Foldats. — 1 male, cb. 95 mm, cl. 57 mm (MB).

El Guácharo, Monagas State, Venezuela; August 5, 1951; J. Roze. — 1 male, cb. 70 mm, cl. 42 mm (MB).

Type. — The type specimen is an immature female collected in 1879 by S. Garman and deposited in the Museum of Comparative Zoology, no. 5101. The type locality is Trinidad. Rathbun added as supplementary material two males and four females from Caracas, one female from "Antilles" and, in 1905, one male from San Esteban and one male from Macuto, near La Guayra. The first pleopods of male specimens recently collected in Trinidad — the type locality — are similar to those of the specimens collected in Margarita Island and on the mainland of eastern Venezuela, and also are similar in characters of the carapace and other appendages. However, the specimens from central Venezuela differ from these specimens in the shape of the male pleopod and the large tubercle at the base of the fingers, and I treat them in the present paper as distinct subspecies of *P. garmani*. It is possible that Rathbun's additional specimens (all of them from central Venezuela) are also different from the type female.

Pseudothelphusa garmani iturbei Rathbun (text-fig. 7; pl. 6)

Pseudothelphusa iturbei Rathbun, 1919: 5.

Pseudothelphusa iturbei-Weibezahn, 1952: 68, fig. 2.

Description. — The front resembles that of *P. garmani garmani*, but the upper frontal ridge in front view is inclined towards the middle and the surface between the upper and lower ridges is noticeably narrower. The carapace is flat, the gastric and branchial regions are equally elevated. The postfrontal lobes are similar to those of *P. garmani garmani* but the anterior margin is not as well-marked. The carapace between these lobes and the front is flat and directed obliquely downwards anteriorly. The median groove is deep, sharply divides the postfrontal lobes and becomes shallower and wider behind. The cervical groove is sinuous, deep and very wide towards the middle of its course, and clearly ends before the lateral margin.

The third maxilliped closely resembles that of *P. garmani garmani*. It is in the shape of the chelipeds and of the first pleopod of the male that most differences are found between *P. garmani garmani* and *P. garmani iturbei*. In *P. g. iturbei* the chelipeds are unequal when fully developed. There is not a large tubercle at the base of the fingers, but there is an acute lobe above the place where this tubercle is in *P. garmani garmani*. There are also two prominent tubercles on the external surface of the two largest teeth of the fixed fingers. The lower margin of the manus and fixed finger has a row of small, irregularly placed tubercles which become larger near the articulation of the carpus. There are also small, irregularly placed tubercles over the entire upper border of the hand and several small tubercles near the middle

of the inner and outer surfaces of the hand. The fingers have longitudinal rows of dark points. The outer surface of the palm has a clearly marked darker, reticulated pattern; in the upper portion the lighter spaces left by the reticulation correspond with depressions in the surface. The carpus of the chelipeds has a large tooth near the middle of the inner border and 3 or 4 smaller spines of unequal size behind this. The other borders of the carpus are unarmed. The depressions of the reticulated pattern, already present in the hand, are more marked on the outer surface of the carpus.

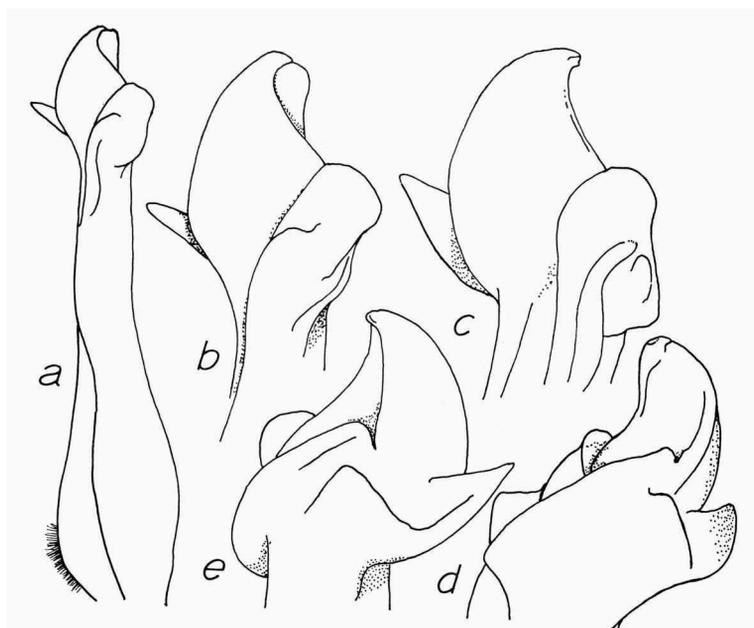


Fig. 7. *Pseudothelphusa garmani iturbei* Rathbun, first male pleopod, left, specimen from Quebrada Ojo de Agua, Baruta, Miranda State, October 22, 1949 (LS no. 26). a, total view, posterior; b, detail of tip, posterior; c, postero-internal; d, external; e, antero-internal.

The superior lobe of the first pleopod of the male is wide and directed upwards. Its external surface is excavated with raised borders, and the apex is notched. The anterior margin is convex. The anterior lobe is long and subtriangular, with the upper border directed transversely to the axis of the appendage, and the lower border arched. On the posterior side there is a keeled, recurved process whose apex ends by the side of the external surface of the superior lobe.

Colour. — In some cases the carapace and chelipeds are brown-black. The younger specimens have a lighter colour.

Size. — This is a large form of *Pseudothelphusa*. One of the females examined by me has cb. 83 mm and cl. 51 mm. The type specimen of *P. iturbei* has cb. 64 mm.

Material examined. — Colinas de Carrizal, Miranda State, Venezuela; 1100 m altitude; September 1961; F. Weibezahn. — 1 male, cb. 80 mm, cl. 48.5 mm (MB).

Curupao, El Tanque, Miranda State, Venezuela; 1100 m altitude; May 21, 1948; A. Ciferri. — 2 males, cb. 67 and 77 mm, cl. 42 and 48 mm (MB no. 2113).

Turgua, Miranda State, Venezuela; 1100 m altitude; September 11, 1949; F. Martin. — 3 females, cb. 53, 78 and 80 mm, cl. 34, 47 and 50 mm (LS no. 20; identified by Chace as *P. iturbei*).

Ojo de Agua Creek, Baruta, Miranda State, Venezuela; 1010 m altitude; October 22, 1949; E. Valladares and A. Kolzow. — 2 males, cb. 29 and 50 mm, cl. 18 and 30 mm; 1 female, cb. 34 mm, cl. 21 mm (LS no. 26; identified by Chace as *P. iturbei*).

Ojo de Agua Creek, Baruta, Miranda State, Venezuela; 1010 m altitude; December 26, 1949; E. Valladares and A. Kolzow. — 1 female, cb. 34 mm, cl. 22 mm (LS no. 28; identified by Chace as *P. iturbei*).

Turgua, Miranda State, Venezuela; 1100 m altitude; November 11, 1949; F. Martin. — 1 female, cb. 83 mm, cl. 51 mm (LS no. 21; identified by Chace as *P. iturbei*).

La Providencia Creek, Turgua, Miranda State, Venezuela; 950 m altitude; November 4, 1949; F. Martin. — 2 females, cb. 19 and 24 mm, cl. 12 and 15 mm (LS no. 33; identified by Chace as *P. iturbei*).

Jesus Creek, Turgua, Miranda State, Venezuela; 950 m altitude; December 3, 1949; E. Valladares and A. Kolzow. — 3 females, cb. 15, 19 and 26 mm, cl. 10, 13 and 17 mm (LS no. 29; identified by Chace as *P. iturbei*).

Las Minas River, draining to Tuy River, 1 km East of Santa Teresa, Miranda State, Venezuela; 198 m altitude; March 25, 1950; F. Martin. — 1 female, cb. 31 mm, cl. 19 mm (LS no. 45).

Guatopo, Guárico State, Venezuela; August 1, 1957; J. Scorza. — 2 females, cb. 52 and 77 mm, cl. 31 and 48 mm (MB).

Type. — The type specimen is an adult male collected in 1918 by Dr. Juan Iturbe and deposited in the U. S. National Museum, no. 53310. The type locality is Rio Guaire, near Caracas.

***Pseudothelphusa garmani ranchograndensis* new subspecies**

(text-fig. 8; pl. 7 fig. 1)

Pseudothelphusa garmani Rathbun, 1905: 298 (part.), text-fig. 91 a, b.

Pseudothelphusa garmani-Crane, 1949: 26, text-fig. 1A, B, C, 2A.

Description. — The front resembles that of *P. garmani garmani*, but the upper frontal ridge, in frontal view, is more inclined toward the middle. The carapace is similar to that of *P. garmani garmani*, although the frontal lobes and the median and cervical grooves are somewhat less marked. There are small tubercles on the anterior portion of the carapace which are visible to the naked eye, but less conspicuous than in *P. garmani garmani*.

The third maxilliped corresponds closely in both subspecies. In *P. garmani ranchograndensis* the large tubercle at the base of the fingers of the chelipeds

is more prominent and the two larger teeth of the fixed fingers are more swollen. The shape of the first male pleopod is clearly distinct from that of *P. garmani garmani* and resembles more the appendage of *P. garmani iturbei*. The superior lobe is wide, although not as wide as in *P. garmani iturbei*; its external border is excavated, with raised borders, with the apex notched. The anterior margin is convex. The anterior lobe is long and subtriangular, with the upper margin perpendicular to the axis of the appendage and the lower border straight. On the posterior side there is a keeled, recurved process, the apex of which ends by the side of the external surface of the superior lobe.

Colour. — In live animals the carapace, chelipeds and ambulatory legs are dark or light brown.

Types. — Holotype is a male, cb. 42 mm, cl. 30 mm, from Rancho Grande National Park, Aragua State, central Venezuela, collected August 18, 1949 by Dr. Juan Racenis and deposited at the Museum of Biology, Central University of Venezuela, Caracas, cat. no. 2105.

Additional material examined. — Rancho Grande, Aragua State, Venezuela; August 3, 1949; J. Racenis. — 1 male, cb. 39 mm, cl. 24 mm (MB no. 2106).

Rancho Grande, Aragua State, Venezuela; 1200 m altitude; June 23, 1951. — 4 males, cb. 24, 25, 29 and 37 mm, cl. 16, 17, 18 and 23 mm (LS no. 335).

Rancho Grande, Aragua State, Venezuela; September 12, 1949; J. Racenis. — 1 female, cb. 83 mm, cl. 50 mm (MB no. 1981).

El Ahogado Creek, Montalban District, Carabobo State, Venezuela; 700 m altitude; A. Ciferri and J. Cruxent. — 1 male, cb. 54 mm, cl. 33 mm; 1 female, cb. 62 mm, cl. 38 mm (MB).

Rancho Grande River, Carabobo State, Venezuela; 1090 m altitude; October 6, 1949; A. Ciferri and F. Fernandez. — 1 female, cb. 44 mm, cl. 27 mm (LS no. 43).

Hacienda Mizonga, Valencia, Carabobo State, Venezuela; February 25, 1952; L. Ocando. — 1 female, cb. 24 mm, cl. 16.5 mm (LS no. 481).

Las Dos Bocas, Sierra de Carabobo, Carabobo State, Venezuela; April 13, 1954. — 1 female, cb. 19 mm, cl. 13 mm (LS no. 490).

Bumbis River, near Aparición, Portuguesa State, Venezuela; April 8, 1955; S. Perez-Salas. — 1 male, cb. 27 mm, cl. 17 mm (MB).

Pseudothelphusa angulata Rathbun (text-fig. 9; pl. 7 fig. 2)

Pseudothelphusa angulata Rathbun, 1915: 98.

Description. — The upper frontal ridge is well-marked by a row of tubercles which are more distinct near the middle, and project over the surface of the front. This ridge is divided into two halves by a broad, median V-shaped sinus and these two halves are arched and inclined toward the middle. The lower frontal ridge lies slightly behind the upper ridge. It is strongly sinuous, and the surface between the upper and the lower ridges is also strongly sinuous.

The carapace is flat, with the branchial and gastric regions equally elevated. The postfrontal lobes are wide and well-marked. The carapace between the postfrontal lobes and the front is anteriorly inclined toward the middle and downward. The median groove is only indicated by a shallow depression that separates the postfrontal lobes. The cervical groove is sinuous, shallow and narrow. It reaches almost to the lateral margin of the carapace. The lateral margin of the carapace has a notch behind the orbit. Between this notch and the end of the cervical groove there are 5 ill-defined lobes. Behind this point the lateral margin is divided into 14 small acute teeth that decrease in size posteriorly. In my male specimen the upper surface is covered by

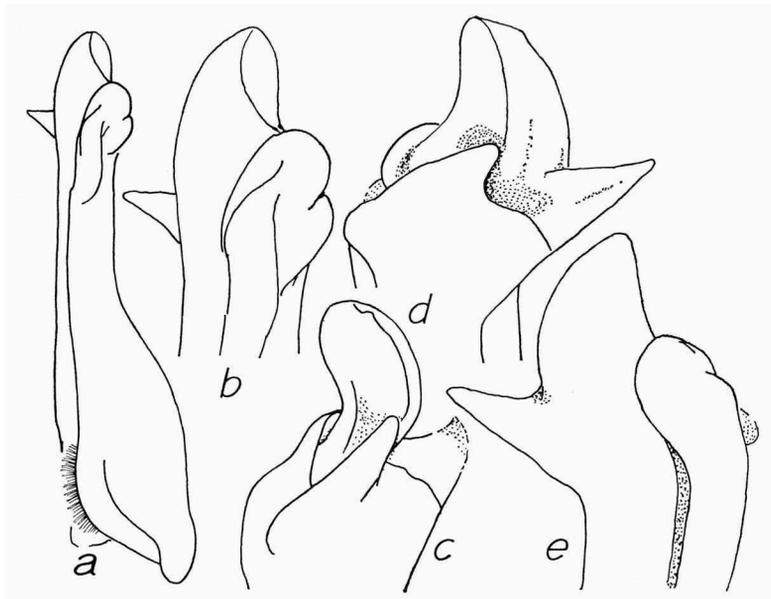


Fig. 8. *Pseudothelphusa garmani ranchograndensis* new subspecies, first male pleopod, left, holotype specimen from Rancho Grande, Aragua State, (MB no. 1205). a, total view, posterior; b, detail of tip, posterior; c, external; d, antero-internal; e, postero-internal.

numerous, closely placed, flattened minute tubercles. In the anterior and lateral regions larger tubercles are visible among the smaller. There are also numerous punctae, each usually bearing a single hair. In my female specimen, which is larger and older, both types of tubercles are almost absent, but the punctae persist.

The merus of the third maxilliped is subtriangular. Its outer margin is concave and forms at its union with the anterior margin a very prominent angle or lobe. The exognath is one fourth the length of the ischium. The

chelipeds are unequal. The palm does not possess large tubercles and the teeth of the fingers are not swollen. The fingers have longitudinal rows of dark points. The carpus of the chelipeds has a sharp and prominent spine near the middle of the inner border and two small indentations behind this. The border in front of the prominent tooth as well as the anterior border of the merus are entire. The first pleopod of the male is recurved. It has a large lobe near the end of the posterior border, with small crenulations on the upper surface. The tip of the appendage is subcircular with raised borders enclosing a small papilla.

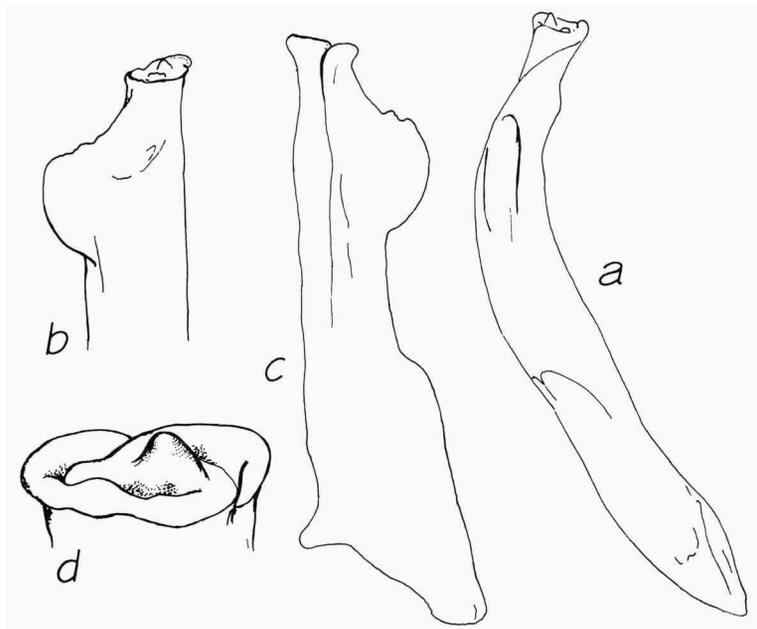


Fig. 9. *Pseudothelphusa angulata* Rathbun, first male pleopod, left, specimen from Perijá Range, Zulia State, December 12, 1949 (LS no. 65). a, total view, postero-internal; b, detail of tip, posterior; c, internal; d, antero-external; e, external; f, postero-external.

Material examined. — Kunana, Perijá Range, Zulia State, Venezuela; 1200 m altitude; December 12, 1949; A. Kolzow. — 1 male, cb. 39 mm, cl. 25 mm (LS no. 65; identified by Chace as *P. angulata*).

Cuna Creek, Kunana, Perijá Range, Zulia State, Venezuela; 1200 m altitude; December 27, 1959; A. Kolzow. — 1 female, cb. 72 mm, cl. 46 mm (LS no. 67; identified by Chace as *P. angulata*).

Type. — The type is an adult male collected in 1913 and deposited in the Museum of Zoology, University of Michigan, Ann Arbor, Michigan, no. 45 880. The type locality is above Minca, Santa Marta Mountains, Colombia, 960 m altitude.

Remarks. — *P. angulata* is very close to *P. monticola* Zimmer (1912). In the latter “the outer margin of the merognath is not concave and the antero-external angle not as well marked or as advanced” (Rathbun, 1915). The first pleopods of the male are very similar in both species. The posterior lobe is more evenly rounded, not subtriangular, in *P. monticola*. The present locality (Perija Range) is situated between the type locality of *P. monticola* (near Bogotá and near Medellin) and the type locality of *P. angulata* (Santa Marta Range).

Pseudothelphusa sp. (text-fig. 10; pl. 7 fig. 3, 4)

Among the material from the Perija Range in the collections of the La Salle Museum there are 2 males, 1 young male and 1 juvenile female labeled *Pseudothelphusa* sp. by Dr. Fenner A. Chace. Four specimens were deposited by him in the United States National Museum, Washington, under the accession number 191795. This species is quite characteristic, but the material I have at hand is not in good condition. Thus, it does not seem advisable to describe it as a new species.

The front is very low, its surface and lower border being only visible when the animals are seen in ventral view. The upper border of the front is marked by a sinuous ridge which is more pronounced in the middle. This ridge, however, is not formed by well-defined tubercles and it is not interrupted in the middle. The lower border is sinuous, sunken in the middle, and devoid of tubercles. The postfrontal lobes are only indicated by an elongated depression. From this depression the carapace strongly curves downward anteriorly until it meets at the upper frontal ridge. In dorsal view the outline of this curve is seen, but not the upper border of the front, which is hidden behind it. The median groove is only faintly indicated by a shallow depression.

The carapace is convex in both directions with all the regions equally elevated. The cervical groove is straight and very shallow. It reaches almost to the lateral margin of the carapace. The lateral margin of the carapace does not have a notch behind the orbit. It has 6 or 7 small papillae between the orbit and the end of the cervical groove, and 16 to 18 small acute spines behind this point. These teeth and papillae form a continuous ridge that overhangs the sides of the carapace.

The merus of the third maxilliped is narrow anteriorly. Its outer margin is not regularly convex, but has a projection in the middle. The exognath is more than half as long as the margin of the ischium. The chelipeds do not possess large tubercles on the palm, and none of the teeth of the fingers is swollen. The apex of the first pleopod of the male has on the

external side a long finger-like projection directed upward and supported by a smaller one which is subtriangular. The internal lobe is bent upward to form a cup-shaped expansion that surrounds the fingerlike projection.

Material examined. — Kunana, Rio Negro, Perija Range, Zulia State, Venezuela; 1500 m altitude; December 19, 1950; F. Martin. — 2 males, cb. 21.3 and 21.8 mm, cl. 15.5 and 12.3 mm; 2 juveniles (LS no. 69).

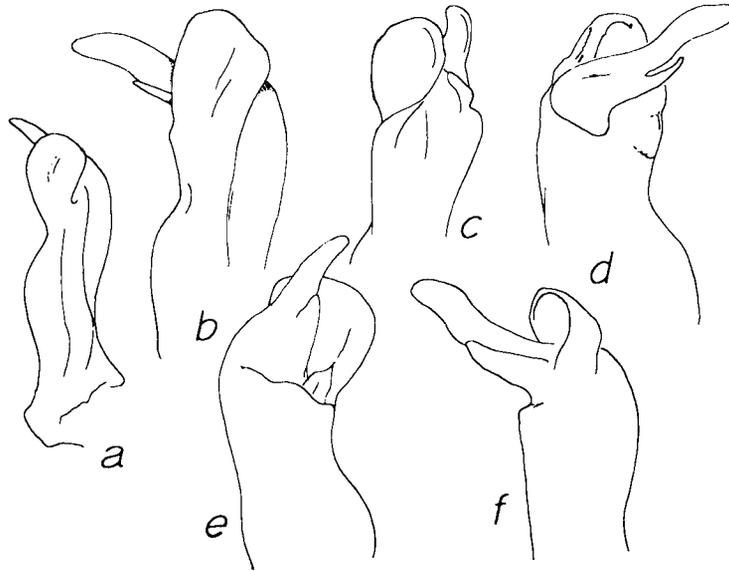


Fig. 10. *Pseudothelphusa* sp., first male pleopod, left, specimen from Perijá Range, Zulia State, December 19, 1950 (LS No. 69). a, total view, postero-internal; b, detail of tip, posterior; c, internal; d, antero-external; e, external; f, postero-external.

MORPHOMETRIC RELATIONS

An attempt was made to evaluate the apparent differences in the carapace and pereopods in *Pseudothelphusa fossor*, *P. garmani garmani*, *P. garmani iturbei*, *P. garmani ranchograndensis*, *P. venezuelensis* and *P. simoni*.

The measurements used in the carapace are as follows: carapace length (cl.) from the frontal notch to the articulation with the abdomen; carapace breadth (cb.) in the widest part, between the anterolateral angles; front-orbital width (fow.) from the exterior angle of the right orbit to the exterior angle of the left orbit; length of the cardiac-intestinal region (cil.) measured from the pair of slit-like orifices that open behind the metagastric region, to the articulation with the abdomen. The total length of the third pereopod (TL) was taken as the sum of the length of every article; the length of the merus (LM) and the length of the dactylus (LD) were taken along the longest border and the width of the merus (WM) in the widest part.

The results are expressed in tables 1 and 2, where N° is the number of specimens measured and CV is the Coefficient of Variation (Standard Deviation \times 100/Mean). All the characters measured vary little within the species and thus the CV only rarely attains 10%. If the mean of any relation is compared in the several species, the differences observed are not statistically significant.

TABLE 1
Morphometric relations in the carapace

| | N° | cb. cl. | CV | fow. cb. | CV | cil. cl. | CV |
|-------------------------------|----|------------|------|-------------|-------|-------------|------|
| <i>P. fossor</i> | 9 | 1.62 | 2.78 | 0.64 | 4.84 | 0.44 | 2.02 |
| <i>P. venezuelensis</i> | 18 | 1.56 | 3.71 | 0.67 | 1.64 | 0.46 | 5.22 |
| <i>P. simoni</i> | 28 | 1.57 | 4.65 | 0.65 | 6.15 | 0.47 | 7.66 |
| <i>P. g. garmani</i> | 25 | 1.59 | 3.77 | 0.62 | 8.06 | 0.48 | 3.02 |
| <i>P. g. iturbei</i> | 19 | 1.60 | 3.56 | 0.61 | 11.07 | 0.47 | 4.26 |
| <i>P. g. ranchograndensis</i> | 14 | 1.57 | 5.60 | 0.63 | 7.90 | 0.47 | 4.26 |

TABLE 2
Morphometric relations in the third pereiopod

| | N° | LM TL | CV | LD TL | CV | LM WM | CV |
|-------------------------------|----|----------|-------|----------|------|----------|------|
| <i>P. fossor</i> | 7 | 0.35 | 2.86 | 0.27 | 3.11 | 2.93 | 5.12 |
| <i>P. venezuelensis</i> | 7 | 0.35 | 6.39 | 0.28 | 6.07 | 2.72 | 8.82 |
| <i>P. simoni</i> | 8 | 0.36 | 7.50 | 0.29 | 6.90 | 2.50 | 7.48 |
| <i>P. g. garmani</i> | 22 | 0.36 | 7.06 | 0.28 | 6.68 | 2.49 | 9.44 |
| <i>P. g. iturbei</i> | 13 | 0.36 | 10.00 | 0.28 | 6.40 | 2.40 | 8.33 |
| <i>P. g. ranchograndensis</i> | 12 | 0.37 | 3.51 | 0.27 | 6.30 | 2.54 | 7.80 |

LITERATURE CITED

- CRANE, JOCELYN, 1949. Fresh-water crabs of the genus *Pseudothelphusa* from Rancho Grande, Venezuela. — *Zoologica*, New York **34**: 25-30, fig. 1-3.
- RATHBUN, MARY J., 1898. A contribution to a knowledge of the freshwater crabs of America. The *Pseudothelphusinae*. — *Proc. U.S. Nat. Mus.* **21**: 507-537, fig. 1-18.
- , 1905. Les crabes d'eau douce (Potamonidae). Pt. 2. — *Nouv. Arch. Mus. Hist. nat. Paris* (4) **7**: 159-321, text-fig. 38-108, pl. 13-22.
- , 1915. New fresh-water crabs (*Pseudothelphusa*) from Colombia. — *Proc. biol. Soc. Washington* **28**: 95-100.
- , 1919. Three new South American river-crabs. — *Proc. biol. Soc. Washington* **32**: 5-6.
- WEIBEZAHN, FRANZ H., 1952. Contribución al estudio de los cangrejos dulceacuicolas de la región Baruta-El Hatillo. — *Mem. Soc. Cienc. Nat. La Salle* **12**: 67-70, fig. 1-3.
- ZIMMER, C., 1912. Beiträge zur Kenntniss der Süßwasser-Dekapoden Kolumbiens. — *Mem. Soc. Neuchateloise Sci. nat.* **5**: 1-8, text-fig. 1-15, pl. 1.

EXPLANATION OF THE PLATES

Pl. 1

Pseudothelphusa venezuelensis Rathbun, male from Altos de Pipe, Miranda State, May 1965 (MB). 1, dorsal view, $\times 1.7$; 2, ventral view, $\times 1.9$; 3, detail of the front, $\times 8.8$.

Pl. 2

Pseudothelphusa fossor Rathbun, male from Camuri Grande River, Federal District, May 10, 1965. 1, dorsal view, $\times 1.2$; 2, ventral view, $\times 1.4$; 3, detail of the front, $\times 8.7$.

Pl. 3

Pseudothelphusa simoni Rathbun, male from Turgua, Miranda State, September 11, 1949 (LS no. 22). 1, dorsal view, $\times 1.3$; 2, ventral view, $\times 1.3$; 3, detail of the front, $\times 6.7$.

Pl. 4

Pseudothelphusa racenisi new species, male holotype from Rancho Grande National Park, Aragua State, August 5, 1949 (MB no. 1071). 1, dorsal view, natural size; 2, ventral view, natural size; 3, detail of the front, $\times 6.5$.

Pl. 5

Pseudothelphusa garmani garmani Rathbun, male from El Guacharo, Monagas State, August 26, 1951 (MB). 1, dorsal view, $\times 0.5$; 2, ventral view, $\times 0.4$; 3, detail of the front, $\times 3.2$.

Pl. 6

Pseudothelphusa garmani iturbei Rathbun, male from Colinas de Carrizal, Miranda State, September 1961 (MB). 1, dorsal view, $\times 0.6$; 2, ventral view, $\times 0.6$; 3, detail of the front, $\times 3.7$.

Pl. 7

1. *Pseudothelphusa garmani ranchograndensis* new subspecies, male holotype from Rancho Grande National Park, Aragua State, August 18, 1949 (MB no. 2105), detail of the front in frontal view, $\times 5.4$.

2. *Pseudothelphusa angulata* Rathbun, male from Perija Range, Zulia State, December 12, 1949 (LS no. 65), detail of the front in frontal view, $\times 7.2$.

3, 4. *Pseudothelphusa* sp, male from Perija Range, Zulia State, December 19, 1950 (LS no. 69). 3, anterior portion of the carapace in dorsal view, $\times 7.1$; 4, detail of the front in ventral view, $\times 13.7$.

