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THREE NEW SPECIES OF PSEUDOTHELPHUSA FROM VENEZUELA (CRUSTACEA BRACHYURA POTAMONIDAE)

by

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With 4 text-figures and 3 plates

During a study of the Potamonidae in the collections of the Museum of Biology of the Central University of Venezuela, Caracas, three undescribed species of *Pseudothelphusa* were found. One of these was discovered in material from the Venezuelan Guiana. While the other two probably came from the same area, the labels in the corresponding jars were only marked "Venezuela". The three species are closely related to each other as is suggested by the close similarity in the shape of the first pleopod of the male in each. The lateral teeth of the carapace are larger in these species than in the others described from northern Venezuela (Rodríguez, 1966).

In the following descriptions the abbreviations cb. and cl. are used for "carapace breadth" and "carapace length", respectively. The material is deposited in the Museum of Biology of the Central University of Venezuela, Caracas, for which the abbreviation MB has been used, and in the Rijksmuseum van Natuurlijke Historie, Leiden. I am most grateful to the authorities of the Caracas institute for the privilege of studying these and other fresh-water crabs in their collections.

I am greatly indebted to Mr. Andrés Eloy Esteves for the photographs that illustrate this paper.

Pseudothelphusa orinoccensis new species (text-fig. 1, 2; pl. 1)

The upper border of the front is well marked by a row of approximately 30 flat, square tubercles. In the type specimen this row is continuous, not

interrupted in the middle by the median groove of the carapace, but in other specimens the ridge has a notch in the middle. Laterally the upper border joins abruptly the orbital margin. This upper border is straight in frontal as well as in dorsal view. The lower frontal border lies well behind the upper border, the surface of the front thus being inclined backwards. This lower frontal border is trilobed, with faint indications of a row of tubercles. The surface between these borders is strongly excavated in the middle and towards the extremities, and of unequal height throughout. The eyes are small and do not fill the orbits.

The carapace has the branchial region swollen and the gastric region more elevated than the branchial. The postfrontal lobes are small, almost rounded and not well defined anteriorly. The carapace between the postfrontal lobes and the front is flat, almost horizontal, not inclined towards the middle. The median groove is almost obsolete in the type specimen, but it is a little more pronounced in other specimens. The cervical groove is sinuous, deep

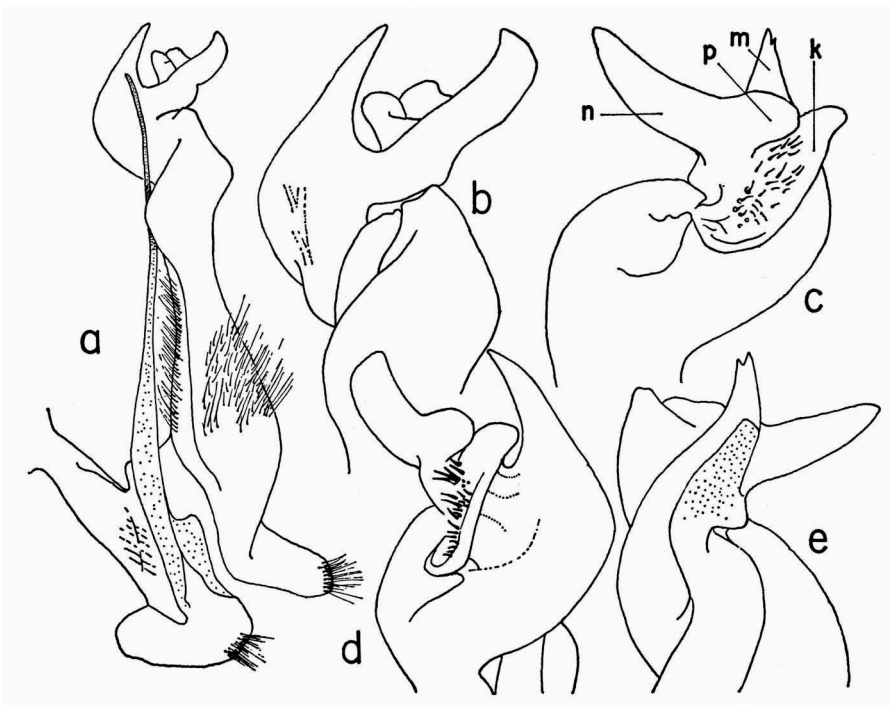


Fig. 1. *Pseudothelphusa orinoccensis* new species, holotype male, left first pleopod. a, posterior view, including the second pleopod; b, detail of tip, posterior view; c, same, antero-external view; d, same, anterior view; e, same, internal view. k, external lobe; m, anterior process; n, posterior process; p, base of the posterior process.

and wide on the proximal portion. The lateral margin of the carapace has a notch behind the orbit and another shallow notch just before the end of the cervical groove. The border between these two notches is divided into four or five lobes. The lateral margin behind the end of the cervical groove has approximately 20 small sharp teeth that become smaller and tuberculiform posteriorly. The carapace is covered by numerous closely placed, flattened tubercles, which become more prominent near the lateral margin. These tubercles are in turn covered by other minute tubercles, not visible to the naked eye. In the type specimen there are a few small sharp tubercles on the subbranchial area, just behind the lateral margin. The number, size and arrangement of these tubercles is variable, but they are present in all the specimens which I have examined.

The third maxilliped has the outer margin of the merus and ischium of the endognath regularly convex. The exognath is less than one-third the length of the margin of the ischium. The chelipeds are unequal. The larger cheliped is heavy. The outer surface of the manus is smooth, without large tubercles at the base of the fingers or on the proximal teeth. Both fingers have rows of small darker points.

The first pleopod of the male has the terminal portion as follows. There is an ear-shaped lobe on the external side, directed upwards and anteriorly. The cavity of this lobe is covered by short, stiff hairs. On the upper border of the lobe there is a long recurved process directed upwards and posteriorly. The upper side of the base of this process is produced over the lateral lobe. On the anterior side of the lateral lobe there is a sharp, curved process directed upwards. This process has a small spine just before the apex.

Colour. — The type specimen, which is preserved in alcohol, has the dorsal side of the carapace and chelipeds light brown. The ventral side is cream colored in both carapace and chelipeds.

Types. — The holotype is a male, cb. 67.2 mm, cl. 42.5 mm, from Cacurí, in the upper reaches of Rio Ventuari, Territorio Amazonas, Venezuela. It was collected on February 24, 1959, by L. Duran and deposited in the Museum of Biology, Central University of Venezuela, Caracas, cat. No. XI-0826. Paratype is a female, cb. 56.1 mm, cl. 36.1 mm, deposited in the same museum.

Additional material examined. — Upper reaches of the Rio Ventuari, Territorio Amazonas, Venezuela; January 1, 1959. 1 male, cb. 55.0 mm, cl. 35.0 mm, 1 female, cb. 67.6 mm, cl. 43.1 mm, deposited in the Rijksmuseum van Natuurlijke Historie (Reg. No. Crust. D 22655).

Ugueto, Río Orinoco, Territorio Amazonas, Venezuela; October, 1951; L. Carbonell; Franco-Venezuelan Expedition to the sources of the Orinoco

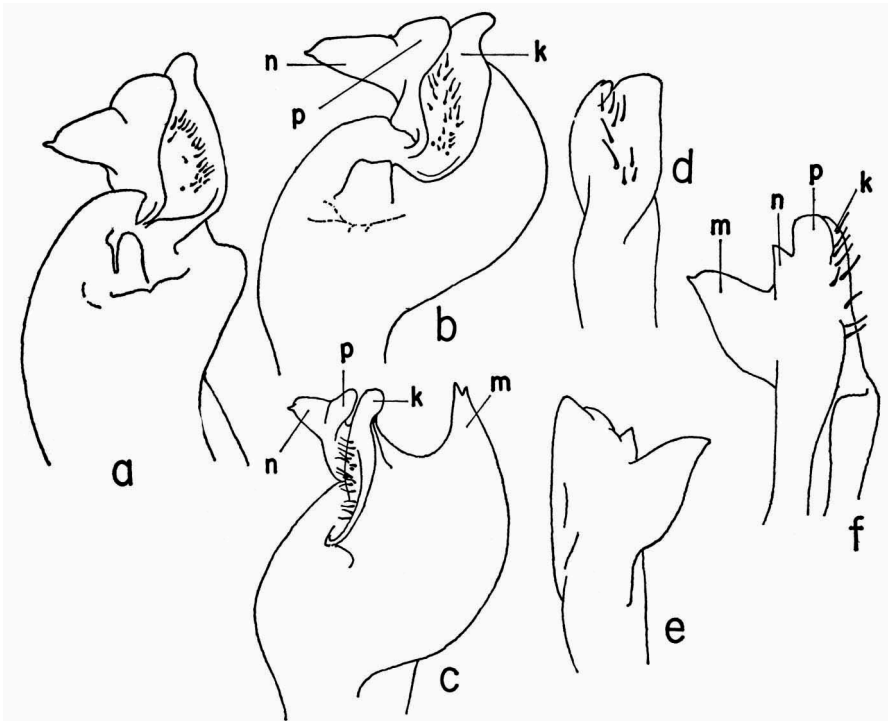


Fig. 2. *Pseudothelphusa orinoccensis* new species, specimens from the Franco-Venezuelan expedition to the sources of the Orinoco River (MB XI-0828), detail of tip of left first male pleopod. a-c, adult, cb. 60.2 mm; d-f, juvenile, cb. 36.5 mm. a, external view; b, antero-external view; c, anterior view; d, posterior view; e, external view; f, internal view. k, external lobe; m, anterior process; n, posterior process; p, base of the posterior process.

River. 5 males, cb. 60.2, 36.5, 25.2 and 25.0 mm, cl. 38.7, 23.1, 16.8 and 16.7 mm, 3 females, cb. 72.3, 60.5 and 28.9 mm, cl. 43.5, 39.3 and 28.9 mm (MB XI-0828).

Venezuela (without other data). 1 male, cb. 47.3 mm, cl. 30.9 mm (MB XI-0829).

Remarks. — The first pleopod of the only well developed male from Ugueto, Río Orinoco, cb. 60.2 mm, is somewhat different from the appendage of the holotype. The process on the upper border of the external lobe is shorter, straight and directed anteriorly, ending abruptly in a sharp spine. The process located on the anterior side of the lateral lobe is shorter than in the holotype.

It is interesting to note the shape of this appendage in a juvenile (cb. 36.5 mm) from the same locality. The process, which in the adult is located on the upper border of the external lobe, is represented only by a

small tooth located laterally, but what is to become later the base of this process is already well developed and partially covers the ear-shaped lobe. The process on the anterior side has the form of a wide and well developed lobe, but is not yet bifid. The appendage becomes twisted in the adult, and thus what in the juvenile is located posteriorly, becomes external in the adult. The resemblance of the structure of this appendage in the juvenile of *Pseudothelphusa orinoccensis* to the same appendage in the adult of *Pseudothelphusa garmani* Rathbun is striking.

***Pseudothelphusa contorta* new species**

(text-fig. 3; pl. 2)

The upper border of the front is marked by a row of approximately 30 tubercles. This row is divided by a notch in the middle. Laterally it curves backwards and for some distance runs parallel to the orbital margin before joining it. In dorsal view this upper border is strongly bilobed. The lower frontal ridge is sinuous, thin, slightly marginate and not marked by tubercles. The center of the front is sunken, while the two lateral portions or lobes are advanced. Thus the center and the extremities are inclined backwards and lie behind the upper border of the front, but the two lateral lobes are inclined forward and lie directly below the upper border. The surface of the front between the two ridges is of unequal height and only moderately excavated.

The two postfrontal lobes are continued laterally in a faint ridge to a point behind the outer angle of the orbit. The anterior margin of these lobes is defined by a sinous depression. The carapace between the postfrontal lobes and the front is flat, slightly inclined downwards, but not inclined towards the middle. The median groove is very shallow. The cervical groove is straight and deep throughout. The lateral margin of the carapace has a notch behind the orbit and another shallow notch just before the end of the cervical groove. Behind the end of the cervical groove the lateral margin has approximately 18 small sharp teeth that become smaller and more tuberculiform posteriorly. The carapace is covered by numerous, closely placed, flattened tubercles, regularly distributed over its surface.

The third maxilliped has the outer margin of the merus and ischium of the endognath regularly convex. The exognath is one-third the length of the margin of the ischium. The chelipeds are unequal. The outer surface of the manus is smooth, without large tubercles at the base of the fingers or on the proximal teeth. Both fingers have rows of small darker points.

The first pleopod of the male has the terminal portion as follows. There

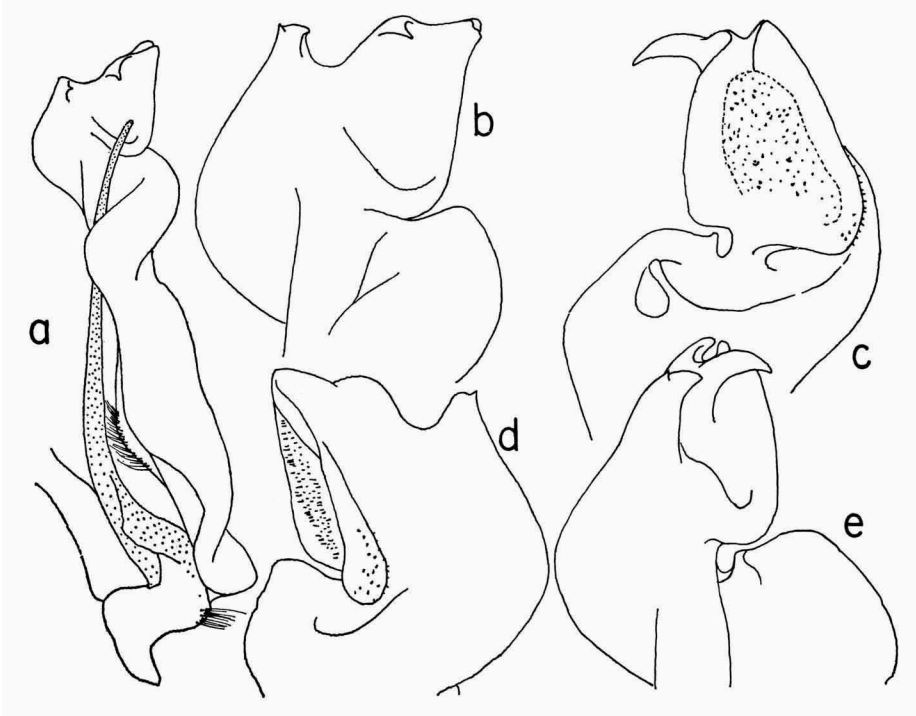


Fig. 3. *Pseudothelphusa contorta* new species, holotype male, left first pleopod. a, posterior view, including the second pleopod; b, detail of tip, posterior view; c, same, external view; d, same, anterior view; e, same, internal view.

is a subtriangular lobe on the external side. The border of the lobe is on top and has the external face covered by short, closely packed hairs. There are also very small spinules on the lower border of the lobe. This lobe is continued on the internal side by a wide expansion which ends in a sharp point, directed upwards and backwards. There is a sharp tooth on the internal border of the expansion, just behind the sharp point. The external lobe is connected to the internal expansion by an upper ridge. On the posterior side of this ridge there is a spinuous process directed backwards.

Colour. — The type specimen, which is preserved in alcohol, is pale brown. The chelipeds are of a lighter brown, with the mobile finger tinged with dark brown in its anterior half.

Type. — The holotype and only specimen is a male, cb. 63 mm, cl. 39.7 mm, marked Venezuela, without any other data and deposited in the Museum of Biology, Central University of Venezuela, Caracas, Cat. No XI-0838. Since the branchial region of the specimen is broken, the cited carapace breadth is only approximate.

Pseudothelphusa estevisi new species

(text-fig. 4; pl. 3)

The upper border of the front is marked by a row of approximately 25 tubercles and is interrupted in the middle by a shallow notch. Laterally the upper border abruptly joins the orbital margin. This upper border is concave in frontal view in the type specimen, but almost straight in the other two specimens. In dorsal view it is straight or obscurely bilobed. The lower frontal border lies well behind the upper border, its surface being inclined backwards. This lower border is thin, with faint indications of tubercles. The surface of the front between these borders is excavated towards the

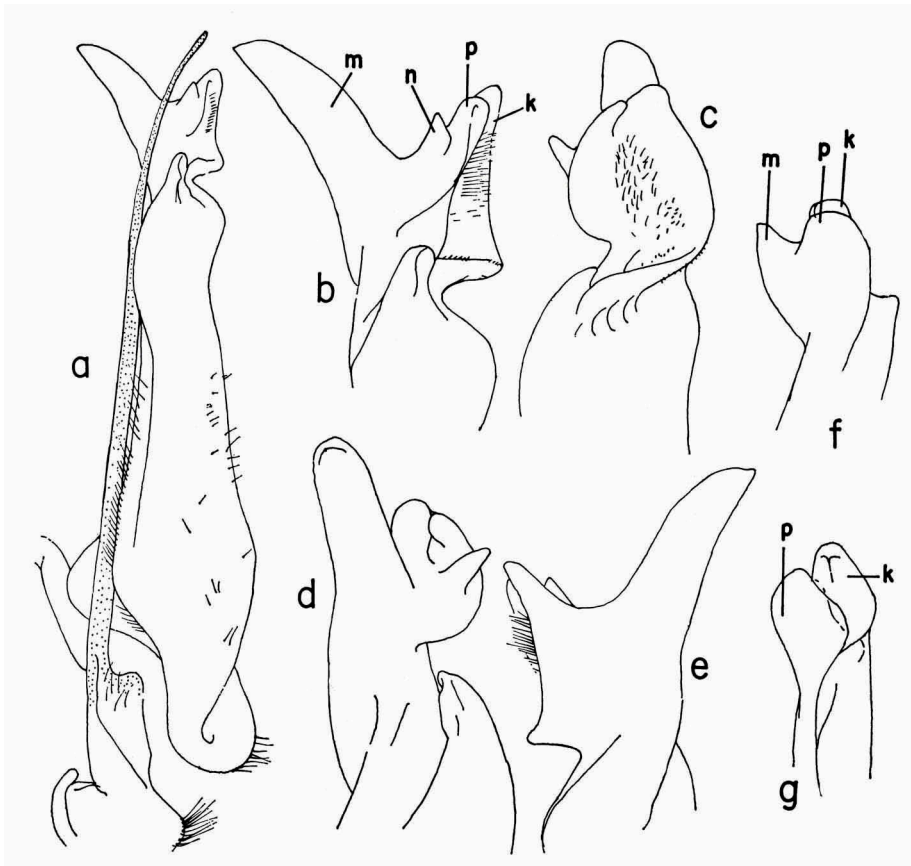


Fig. 4. *Pseudothelphusa estevisi* new species, left first male pleopod. a-e, holotype male; f, g, juvenile male, cb. 17.8 mm from Venezuela (MB XI-0846). a, posterior view, including the second pleopod; b, detail of tip, posterior view; c, same, external view; d, same, anterior view; e, same, postero-internal view; f, same, postero-internal view; g, same, postero-external view.

extremities and of unequal height throughout. The eyes are small and do not fill the orbits.

The postfrontal lobes are continued laterally in a faint ridge to a point behind the base of the eye. The anterior margin of these lobes is defined by a sinuous depression. The carapace between the postfrontal lobes and the front is inclined towards the middle in the holotype, but is almost horizontal in the other specimens. The median groove is very shallow, almost obsolete. The cervical groove is sinuous and wide, and reaches the lateral margin. The lateral margin of the carapace has a shallow notch behind the orbit and another notch just before the end of the cervical groove. The border between these two notches is cut into three or four lobes. The lateral margin behind the end of the cervical groove has approximately 14 small sharp teeth that become smaller and more tuberculiform posteriorly. The carapace is covered by numerous, closely placed, flattened tubercles, regularly distributed over its surface.

The third maxilliped has the outer margin of the merus and ischium of the endognath regularly convex. The exognath is less than one-third the length of the margin of the ischium. The chelipeds are unequal. The outer surface of the manus is smooth, without large tubercles at the base of the fingers or on the proximal teeth. Both fingers have rows of small dark points.

The first pleopod of the male has the terminal portion as follows. There is a cordate lobe on the external side, with its cavity covered by short stiff hairs. This lobe is continued internally by a long finger-like process directed upwards and internally. Between the external lobe and the finger-like process there is a short spine.

Colour. — The holotype, preserved in alcohol, is dark brown. The distal half of both fingers of the chelipeds is brown-black.

Types. — The holotype is a male, cb. 90.0 mm, cl. 55.6 mm, marked Venezuela, without any other data, and deposited in the Museum of Biology, Central University of Venezuela, Caracas, Cat. No XI-0845. The paratype is a male (cb. 71.3 mm, cl. 43.2 mm) of the same lot, deposited in the Rijksmuseum van Natuurlijke Historie (Reg. No. Crust. D. 22654).

Additional material examined. — Venezuela, without any other data. 1 juvenile male, cb. 17.8 mm, cl. 12.0 mm (MB XI-0846).

MORPHOMETRIC RELATIONS

The measurements used for the carapace are as follows: carapace length (cl.) from the frontal notch to the articulation of 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 of the abdomen. The total length of the third pereiopod (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 in the longest border and the width of the merus (WM) in the widest part.

The morphometric relationships of these measurements for the three species are listed in tables 1 and 2. "No" is the number of specimens measured. The coefficient of variation (CV = Standard Deviation \times 100/ Mean) was calculated only for *P. orinoccensis*, in which the number of specimens was adequate.

TABLE 1

Morphometric relations in the carapace of three new species of *Pseudothelphusa*

	No	$\frac{\text{cb.}}{\text{cl.}}$	CV	$\frac{\text{fow.}}{\text{cb.}}$	CV	$\frac{\text{cil.}}{\text{cl.}}$	CV
<i>P. orinoccensis</i>	12	1.57	2.38	0.62	6.85	0.45	3.16
<i>P. estevisi</i>	2	1.65		0.56		0.46	
<i>P. contorta</i>	1	1.59		0.58		0.48	

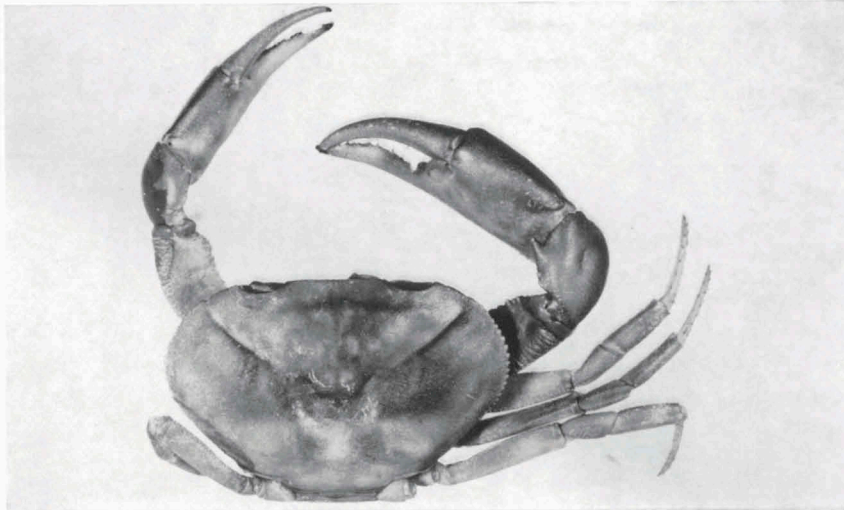
TABLE 2

Morphometric relations in the third pereiopod in two new species of *Pseudothelphusa*

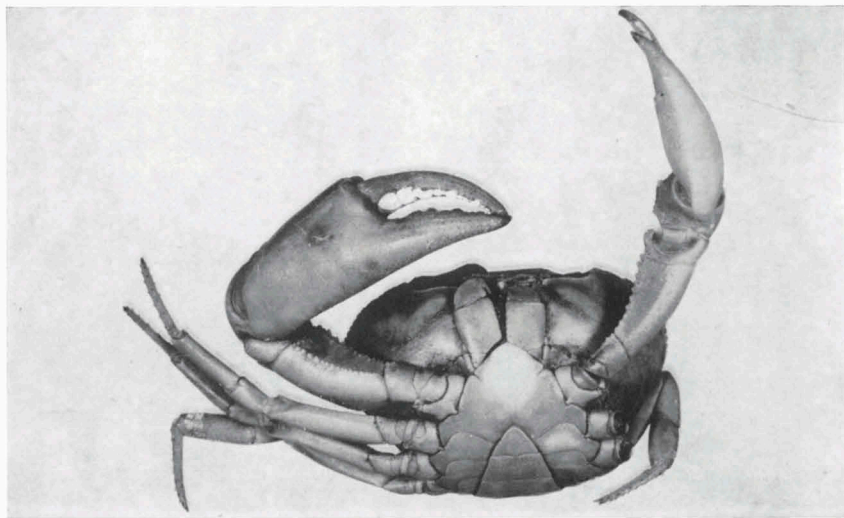
	No	$\frac{\text{LM}}{\text{TL}}$	CV	$\frac{\text{LD}}{\text{TL}}$	CV	$\frac{\text{LM}}{\text{WM}}$	CV
<i>P. orinoccensis</i>	8	0.35	2.55	0.28	2.53	3.20	6.25
<i>P. estevisi</i>	2	0.36		0.26		2.99	

LITERATURE CITED

- RODRÍGUEZ, GILBERTO, 1966. The freshwater crabs of the genus *Pseudothelphusa* from northern Venezuela and Trinidad. — Zool. Meded. Leiden **41**: 111-135, text-fig. 1-10, pl. 1-7.



1

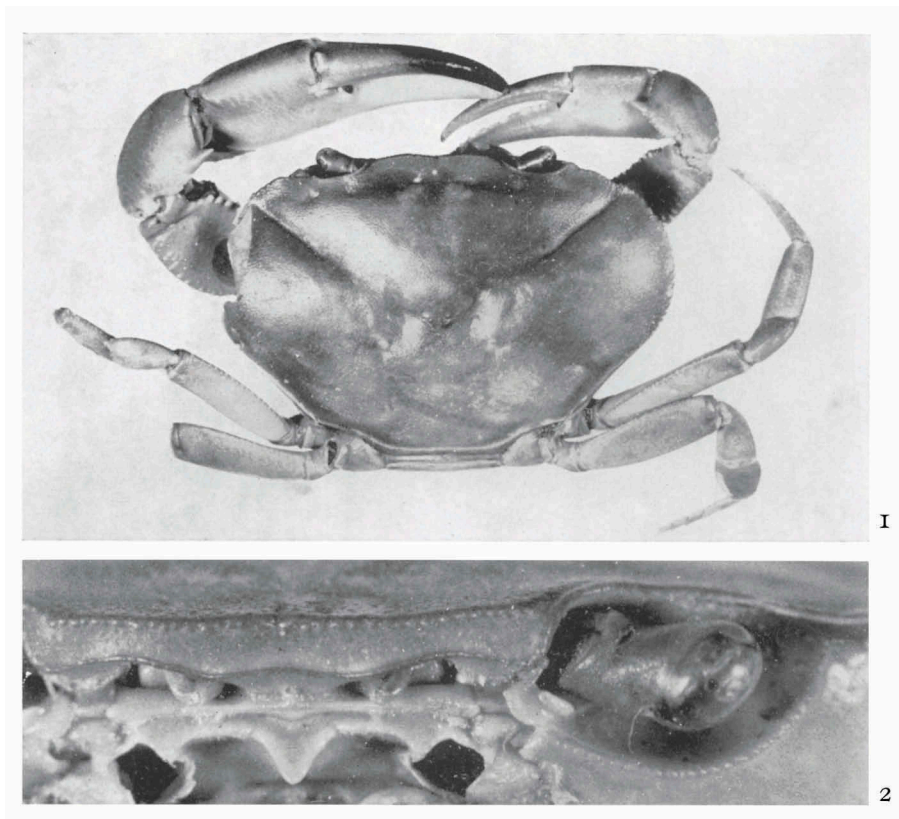


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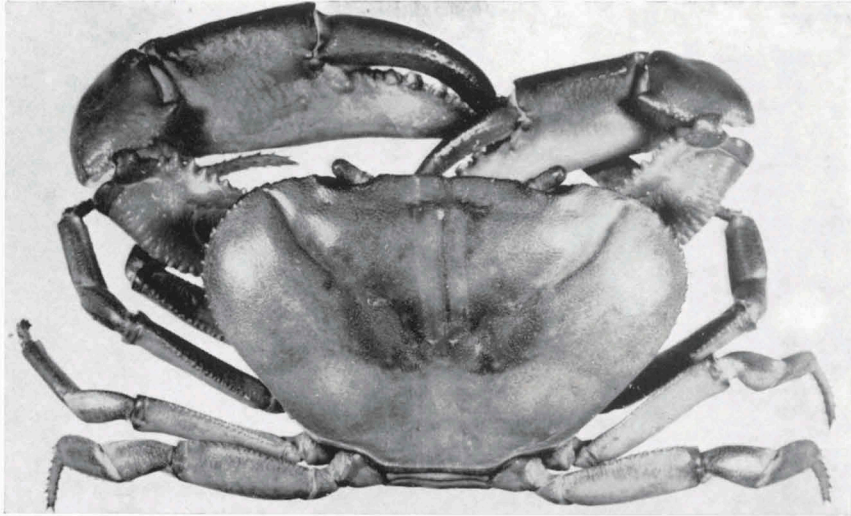


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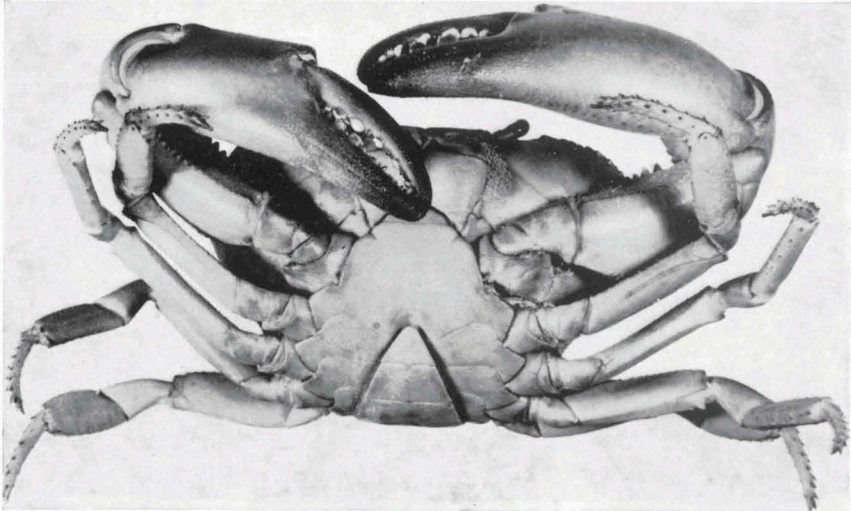
Pseudothelphusa orinoccensis new species, male holotype. 1, dorsal view; 2, ventral view; 3, detail of the front. 1, 2, $\times 0.8$; 3, $\times 3.5$.



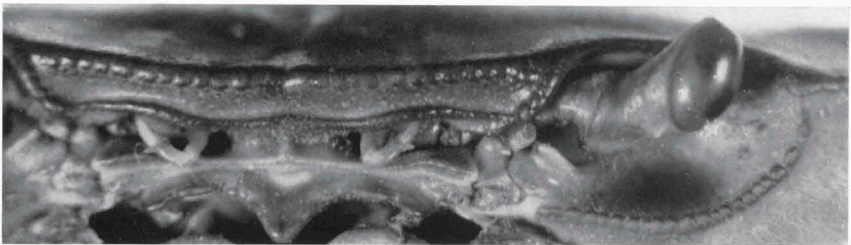
Pseudothelphusa contorta new species, male holotype. 1, dorsal view; 2, detail of the front. 1, $\times 0.7$; 2, $\times 3.9$.



1



2



3

Pseudothelphusa cstevisi new species, male holotype. 1, dorsal view; 2, ventral view; 3, detail of the front. 1, 2, $\times 1$; 3, $\times 2.6$.