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NEW FRESH-WATER CRABS (PSEUDOTHELPHUSA)
FROM COLOMBIA.*

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The material described forms part of the collection obtained by the Walker Expedition which was sent by the University of Michigan to Santa Marta, Colombia, in 1913. The Crustacea as a whole will be reported on by Dr. A. S. Pearse. As, however, Doctor Pearse lacks a reference collection of Potamonidae with which to compare the species of *Pseudothelphusa*, he has turned over to me the specimens of that genus for description. The new forms will be figured in Doctor Pearse's report.

The species here described all possess a type of maxilliped which exists only in Colombia, Ecuador, Peru, and Bolivia; the merus is subtriangular, its outer margin being straight or a little concave, not broadly rounded as in species from Mexico, Central America, the West Indies, and some parts of South America, including Colombia.

***Pseudothelphusa pearsei* sp. nov.**

Holotype.—Adult male, Cat. No. 45,872, Museum of Zoology, University of Michigan, Ann Arbor, Michigan. Collected at the Cincinnati Coffee Plantation, Santa Marta Mountains, Colombia, 4500 feet elevation, under log, by Dr. A. S. Pearse, July 2, 1913. Orig. No. 7.

Measurements.—Holotype male, length of carapace on the median line 19.6 mm., width of carapace 33.2 mm., width between outer angles of orbits 20 mm., width of front above, between the eyes, 10 mm., length of larger propodus below 26 mm., greatest height of palm (near middle) 9.6 mm., greatest thickness of palm 7.1 mm., length of dactylus of cheliped 13.2 mm.

* Published by permission of Dr. A. G. Ruthven, Director of the Museum of Zoology, University of Michigan.

Description.—Carapace slightly convex, surface paved with flattened granules among which are good-sized punctæ visible to the naked eye; cervical suture sinuous and at its middle part deep; H-depression well marked. Lateral margins roughened by small, blunt, irregular teeth; two larger teeth are placed, one at the cervical suture, and the other, obtusangled, a little behind the orbit. Front with a broad median V-sinus above which separates two slightly sinuous and oblique lobes as seen from above; from in front the lobes slope downward toward the middle; the edge overhangs the surface of the front and is tuberculated, the tubercles flat and not in a single row; the lower edge of the front is deeply sinuous, three-lobed; surface of front deepest at outer ends, although the middle lobe reaches a little lower down than the outer lobes. Orbits in front view oblique, margins sub-rhomboidal.

The orifice of the efferent branchial channel is almost closed, as the antero-lateral angle of the buccal cavity is produced in a spine which meets or nearly meets the lateral lobe of the epistome.

Merus of outer maxilliped subtriangular, its outer margin concave or nearly straight until near the distal end where it forms an angle or lobe just behind the summit of the segment. Ischium widest a little behind the distal end, the outer margin being sinuous. Exognath slender, about $\frac{2}{3}$ as long as ischium of endognath.

Chelipeds noticeably unequal, roughened, the granules of the merus fine and arranged more or less in transverse rugæ; inner margin armed with triangular teeth increasing in size toward the distal end of the segment; surface of carpus, propodus and dactylus similar to that of carapace but rougher; carpal tooth short, blunt; palm with lower edge swollen, upper edge nearly straight; fingers meeting when closed, and armed with broad, low teeth.

Abdomen of male with sides convex from the third segment to the extremity; appendages of first segment armed distally with three lobes, one stout at the external angle, two slender and overlapping at the middle.

Relationships.—This species in its shape is near *P. colombiana* Rathbun,* but differs in several important particulars: The shape of the merus of the maxilliped is altogether different, in *P. pearsei* the outer margin is straight, forming an angle with the anterior margin, while in *P. colombiana* the outer margin is convex and curves into the anterior margin. *P. pearsei* has two enlarged teeth on the antero-lateral margin, while *P. colombiana* has in their places only slight interruptions in the margin. The upper edge of the front is more horizontal, and the lower edge less sinuous in *P. colombiana* than in *P. pearsei*.

In my key to the species of the genus *Pseudothelphusa*,† the species *pearsei* would come directly after *colombiana*, on p. 275.

Record of specimens.—Cincinnati Coffee Plantation, Santa Marta Mountains, 4500 feet, under stone in brook, A. S. Pearse, July 2, 1913,

* Proc. U. S. Nat. Mus., vol. 16, 1893, p. 653, pl. 74, fig. 10, pl. 75, fig. 1.

† Nouv. Arch. Mus. Hist. Nat., Paris, ser. 4, vol. 7, 1905, pp. 273-276.

2 ♀, Orig. No. 5, Cat. Nos. 45,726, 45,876.* Cincinnati Coffee Plantation, 4500 feet, under log, A. S. Pearse, July 2, 1913, 1 ♂ holotype, Orig. No. 7, Cat. No. 45,872. Cincinnati Coffee Plantation, 4500 feet, under logs, F. M. Gaige, July 2, 1913, 5 ♂ 5 ♀ 5 juv., Orig. No. 8, Cat. Nos. 45,863, 45,879. Southeast of Cincinnati Coffee Plantation, 4800 feet, in forest, A. S. Pearse, July 2, 1913, 1 ♀, Orig. No. 15, Cat. No. 45,869. Cincinnati Coffee Plantation, under stones in damp creek bed, A. S. Pearse, July 3, 1913, 13 ♂ 8 ♀ 7 juv., Orig. No. 18, Cat. No. 45,721. Cincinnati Coffee Plantation, 4000 feet, under stones in creek bed, but not in water, A. S. Pearse, July 3, 1913, 2 ♂ 1 ♀ 6 juv., Orig. No. 19, Cat. Nos. 45,721, 45,865. Cincinnati Coffee Plantation, 3800 feet, in bottom of stream, A. S. Pearse, July 3, 1913, 1 ♀ juv., Orig. No. 22, Cat. No. 45,875. Cincinnati Coffee Plantation, 4800 feet, walking over ground during rain, F. M. Gaige, July 3, 1913, 1 ♂ 3 ♀, Orig. No. 25, Cat. No. 45,720. Cincinnati Coffee Plantation, 3800 feet, in burrow under rock beside stream, A. S. Pearse, July 4, 1913, 2 ♂ 3 ♀, Orig. No. 27, Cat. No. 45,719. Cincinnati Coffee Plantation, over 4000 feet, walking in a creek, A. S. Pearse, July 4, 1913, 1 ♀ with many young, Orig. No. 34, Cat. No. 45,724. South of Cincinnati Coffee Plantation, in forest, under stones in dry creek bed, A. S. Pearse, July 5, 1913, 2 ♂ 2 juv., Orig. No. 40, Cat. No. 45,861. Cincinnati Coffee Plantation, 4200 feet, in cavity in stump, A. S. Pearse, July 5, 1913, 2 ♀, Orig. No. 44, Cat. No. 45,859. Cincinnati Coffee Plantation, 3500 feet, under stone, A. G. Ruthven, July 5, 1913, 1 ♀, Orig. No. 47, Cat. No. 45,870. Santa Marta Mountains, 4600 feet, under logs in forest, A. G. Ruthven, July 7, 1913, 1 ♂, Orig. No. 55, Cat. No. 45,717. Cincinnati Coffee Plantation, 5000 feet, in rill in cornfield, A. S. Pearse, July 8, 1913, 1 ♂, Orig. No. 56, Cat. No. 45,862. South of Cincinnati Coffee Plantation, in gully in forest, A. S. Pearse, July 9, 1913, 1 ♀, ovig., Orig. No. 66, Cat. No. 45,718. Cincinnati Coffee Plantation, 4500 feet, Clara Flye, July 10, 1913, 1 ♂, Orig. No. 76, Cat. No. 45,871. Cincinnati Coffee Plantation, 4000 feet, Clara Flye, July 11, 1913, 1 ♀, Orig. No. 78, Cat. No. 45,723. Cornfield at south end of Cincinnati Coffee Plantation, 4500 feet, F. M. Gaige, July 12, 1913, 1 ♀, Orig. No. 81, Cat. No. 45,722. Below Cincinnati Coffee Plantation, 4000 feet, in creek under stone, A. S. Pearse, July 16, 1913, 1 ♂ juv., Orig. No. 102, Cat. No. 45,878. San Lorenzo Mountain, 4700 feet, under stones in dry creek bed in forest, A. S. Pearse, July 17, 1913, 2 ♂, Orig. No. 114, Cat. No. 45,715. Near Cincinnati Coffee Plantation, 4200 feet, A. G. Ruthven, July 17, 1913, 1 juv., Orig. No. 115, Cat. No. 45,868. Cincinnati Coffee Plantation, 4500 feet, Clara Flye, July 21, 1913, 1 ♀, Orig. No. 147, Cat. No. 45,725. Cincinnati Coffee Plantation, 4200 feet, in creek, Clara Flye, July 24, 1913, 2 ♀ 2 juv., Orig. No. 175, Cat. Nos. 45,860, 45,866. Cincinnati Coffee Plantation, 4200 feet, in creek, Clara Flye, July 26, 1913, 1 juv., Orig. No. 183, Cat. No. 45,728.

Remarks.—The type was chosen for its good preservation. There are larger specimens in the collection. The largest male (45,720) measures

* The catalogue numbers are those of the Museum of Zoology, University of Michigan.

25.2 by 44.2 mm., the largest hard-shell female (45,722) is 31.3 by 57.2 mm.; a thin-shell female (45,873) is about 1 mm. larger.

A female (45,724) is accompanied by over 50 young in the first free-swimming stage; some of them are still attached to the abdomen; they have the general form of the adult; the upper margin of the front is just beginning to develop; the exognath is longer than in larger specimens but does not reach end of ischium; the efferent branchial orifice is open, the jugal spine not yet developed.

One female (45,721) has the left cheliped represented by a very short stump; the right cheliped is of normal size but the fingers are strongly bent, the immovable finger outward and the dactylus inward so that their planes form an angle of about 55°.

***Pseudothelphusa angulata* sp. nov.**

Holotype.—Adult male, Cat. No. 45,880, Museum of Zoology, University of Michigan, Ann Arbor, Michigan. Collected above Minca, Santa Marta Mountains, Colombia, 2900 feet elevation, under stones bordering a rill, July 10, 1913.

Measurements.—Holotype male, length of carapace on the median line 40 mm., width of carapace 65 mm., width between outer angles of orbits 32 mm., width of front above, between the eyes, 15.3 mm., length of larger propodus below 52.7 mm., height of palm at distal end 19.9 mm., greatest thickness of palm 14.6 mm.; length of dactylus of cheliped (approx.) 27.2 mm.

Description.—This species in its shape and ornamentation resembles the preceding, but is somewhat larger. The front is narrower and the orbits higher. The orifice of the efferent branchial channel is wide open behind. The merus of the outer maxilliped is similar in shape to that of *pearsei*, having a concave outer margin, but that margin forms at its union with the anterior margin a very prominent angle or lobe, to which the specific name refers. Exognath very short, about $\frac{1}{4}$ as long as ischiognath. Chelipeds rougher than in *pearsei*, carpal tooth acute.

Shape of male abdomen subtriangular after the third segment. Appendage of first segment with a large outer lobe near the end; tip subtruncate, with a short projecting point.

Relationships.—Near *P. monticola* Zimmer* but distinguished as follows: In *monticola* the outer margin of the merognath is not concave and the antero-external angle not so well marked or so advanced; the penultimate segment of the abdomen is shorter; the lobe on the outer edge of the first abdominal segment is more evenly rounded, not subtriangular as in *angulata*.

***Pseudothelphusa clausa* sp. nov.**

Holotype.—Adult male, Cat. No. 45,864; Museum of Zoology, University of Michigan, Ann Arbor, Michigan. Collected in brooklet,

* Mém. Soc. neuchâteloise Sci. nat., vol. 5, 1912, p. 3, pl. 1, figs. 3 and 4, text-figs. 6-10.

Cincinnati Coffee Plantation, Santa Marta Mountains, Colombia, 4500 feet elevation, by M. A. Carriker, July 10, 1913, Orig. No. 75.

Measurements.—Holotype male, length of carapace on the median line 15.3 mm., width of carapace 26.6 mm., width between outer angles of orbits 15.5 mm., width of front above, between the eyes, 8.3 mm., length of larger propodus below 25.2 mm., greatest height of palm (near middle) 10.3 mm., greatest thickness of palm 7.3 mm., length of dactylus of cheliped, 13 mm. Largest female, length 18, width 32 mm.

Description.—A small species. Carapace smooth to the eye, very finely granulate and furrowed, punctae visible without a lens; cervical suture straight and deep for the greater part of its length, but almost imperceptible toward the middle of the carapace and toward the margin. Lateral margins almost entire; a broad emargination just behind the orbit, and a number of inconspicuous teeth behind the cervical suture. Front without definite upper limit, the dorsal surface of the carapace rounding gradually downward to the sinuous or quadrilobate lower margin. Orbits nearly transverse, upper and lower margins subparallel.

Orifice of efferent branchial channel completely rimmed but in a different way from *P. pearsei*. In *clausa* the outer end of the epistome is produced laterally in a long spine, which meets an oblong prominence of the jugal area.

Merus of outer maxilliped with outer margin very oblique, and nearly straight, with only a very shallow sinus behind the articulation with the carpus; ischium a little narrowed at distal end; exognath between $\frac{2}{3}$ and $\frac{3}{4}$ as long as ischium.

Chelipeds very unequal; merus very rough above, irregularly toothed within; tooth of carpus short, subacute; fingers gaping; a tooth at the extreme proximal end of the immovable finger gives a peculiar appearance to the large chela.

The sides of the male abdomen are as a whole somewhat convex after the third segment although the margins of the segments are separately concave. The appendages of the first segment viewed from the inside are slightly constricted behind the extremity, which is oblique and arcuate and produced at either end; an upward-pointing tooth projects from the distal surface.

Relationships.—In my key (*op. cit.*) this species would fall under *a*, *b*, *c'*.

Variations.—The front is not always distinctly four-lobed, as the median emargination is at times so slight as to be almost imperceptible.

Record of specimens.—Cincinnati Coffee Plantation, Santa Marta Mountains, Colombia, 4500 feet, under logs, F. M. Gaige, July 2, 1913, 1 ♂ 1 ♀ 1 juv., Orig. No. 8, Cat. No. 45,879. In forest south of Cincinnati Coffee Plantation, 4200 feet, A. S. Pearse, July 2, 1913, 1 ♀ 6 juv. (first free stage), Orig. No. 14, Cat. No. 45,874. Cincinnati Coffee Plantation, 4100 feet, under stones near creek, A. S. Pearse, July 3, 1913, 1 ♂ 6 juv., Orig. No. 19, Cat. No. 45,877. Cincinnati Coffee Plantation, 4800 feet, walking over ground during rain, F. M. Gaige, July 3, 1913, 1 ♂

juv., Orig. No. 25, Cat. No. 45,720. In forest south of Cincinnati Coffee Plantation, under stones in dry creek bed, A. S. Pearse, July 5, 1913, 1 ♂ 2 ♀, Orig. No. 40, Cat. No. 45,861. South of Cincinnati Coffee Plantation, 4000 feet, under stones, F. M. Gaige, July 5, 1913, 2 ♀, Orig. No. 46, Cat. No. 45,867. Santa Marta Mountains, 4600 feet, under logs in forest, A. G. Ruthven, July 7, 1913, 2 ♀, Orig. No. 55, Cat. No. 45,717. Cincinnati Coffee Plantation, 4500 feet, from brooklet, M. A. Carriker, July 10, 1913, 1 ♂ holotype, Orig. No. 75, Cat. No. 45,864. Cincinnati Coffee Plantation, 4200 feet, in creek, Clara Flye, July 26, 1913, 1 ♀, Orig. No. 183, Cat. No. 45,728.

***Pseudothelphusa ruthveni* sp. nov.**

Holotype.—Adult female, Cat. No. 45,716, Museum of Zoology, University of Michigan, Ann Arbor, Michigan. Collected at south end of Cincinnati Coffee Plantation, Santa Marta Mountains, Colombia, 2500 feet elevation, by Dr. A. G. Ruthven, July 4, 1913, Orig. No. 33.

Measurements.—Holotype female, length of carapace on the median line 19.8 mm., width of carapace 35 mm., width between outer angles of orbits 21 mm., width of front above, between the eyes, 9.7 mm., length of larger propodus below 26 mm., greatest height of palm (near middle) 9 mm., greatest thickness of palm 6.4 mm., length of dactylus of cheliped 14.6 mm.

Description.—The dorsal aspect is much like that of *P. clausa*. The size is greater, the punctæ are proportionally larger, lateral teeth more prominent and surface near them rougher; cervical suture more sinuous, epigastric lobes higher. Front trilobate, middle lobe lower down than lateral lobes. Orifice of efferent branchial channel closed and similar to that of *P. pearsei*, the jugal angle being prolonged in a spine which meets the lateral tooth of the epistome. Outer margin of merus of maxilliped nearly straight up to the articulation with the carpus; sides of ischium subparallel; exognath reaching very nearly to end of ischium.

Fingers longer and slenderer in proportion to palm than in *clausa*; larger prehensile teeth narrower and more separated than in *clausa*, most noticeable in the smaller chela.