

PROCEEDINGS

OF THE

NEW ENGLAND ZOOLOGICAL CLUB

TWO NEW BLIND PRAWNS FROM CUBA WITH A
SYNOPSIS OF THE SUBTERRANEAN CARIDEAOF AMERICA¹

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STUDY of three specimens of a blind prawn collected from a well in eastern Cuba by Col. Jose Garcia Castañeda and forwarded to the Museum of Comparative Zoölogy by Dr. Luis Howell Rivero of the Museo Poey, Havana, has led to the discovery that not only these specimens, but also part of a lot collected earlier in Havana Province by Dr. Thomas Barbour and recorded as *Palaemonetes calcis* by Miss M. J. Rathbun, are referable to two distinct and previously undescribed species.

The number of subterranean prawns thus far discovered is relatively small, amounting to twenty-one species and subspecies, arranged in ten genera and representative of only three caridean families, the Atyidae, Hippolytidae and Palaemonidae. The American species are treated in greater detail below, but it might be noted here that, of

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the twelve species (including the two described herein) now known from the Western Hemisphere, six are confined to the island of Cuba, alone. The remaining six are fairly well scattered; one is found in Kentucky, one in Texas, two in Yucatan and two in the Guianas and Brazil. Of the extra-American forms, all but one—the palaemonid, *Macrobrachium cavernicolum* (Kemp, 1924), from a cave in Assam, India—are confined to the general area bordering the central and eastern portions of the Mediterranean, from southern France and Italy eastward as far as the Caucasus and southward into Cirenaica. In this general region are found the Atyids, *Troglocaris schmidti* Dormitzer, 1853, (with three subspecies) and *Troglocaridella hercegovinensis* Babić, 1922, and three species of the unique palaemonid genus *Typhlocaris*—*T. galilea* Calman, 1909, *T. lethaea* Parisi, 1920, and *T. salentina* Caroli, 1924.

Palaemonetes inermis sp. nov.

Plate VI

Palaemonetes calcis Rathbun, 1912, p. 451 (part), pl. 1, fig. 4.

Holotype.—Female, M.C.Z., no. 12,275, from pool in a cave situated on the calzada from Madruga to Aguacate, about one kilometer from the junction with the calzada from Madruga to Matanzas, Havana Province, Cuba; collected by Thomas Barbour, February or March, 1912.

Paratypes.—One male and four females from the same locality.

Description.—Carapace strongly inflated, particularly laterally, being much broader proportionately than in other members of the genus. Anterior margin entirely unarmed, without antennal or branchiostegal spines, although there may be a subacute angle below the orbit. From below this angle, a straight, oblique furrow runs backward and downward for about half the length of the carapace. Behind and above the posterior end of this furrow is a much

fainter, nearly semicircular one bounding the branchial region dorsally. Rostrum broad in lateral view, with subparallel margins in its basal half, and tapering rapidly to a point distally. In all but one of the specimens it is completely unarmed, and that specimen is possibly abnormal, as it has a single spine on the dorsal edge just behind the tip, so that the latter appears somewhat bifid. The posterior orbital margin runs to the tip of the rostrum on either side as a lateral keel. Abdomen smoothly rounded dorsally; sixth somite about three fourths as high as long and about one third again as long as fifth somite. Telson longer than sixth somite, usually armed with two pairs of dorsal spinules placed close together a short distance from the tip, and two pairs of terminal spines, between which are eight to thirteen plumose setae.

Eyes totally unpigmented, tapering to a blunt point in lateral view; in dorsal view they are subquadrate with a minute tubercle at the outer distal angle. Inner antennular flagellum slightly longer than body of prawn; outer flagellum fused for five segments, the free portion of the short inner branch composed of about seventeen segments, the outer branch more than two and one half times the length of the animal. Antennal scale with the outer margin convex and the distal end evenly rounded, the outer spine scarcely protruding beyond the regular outline of the scale; antennal flagellum subequal in length to the outer branch of the antennular flagellum. The third maxillipeds do not extend as far as the end of the antennal scales. Carpus of first pereiopods distinctly longer than merus and about twice as long as chela. Second pereiopods not greatly longer than the first pair; carpus subequal to the merus in length and slightly shorter than the chela; palm of chela very short, little more than a third as long as the strongly curved fingers. The second pereiopods are proportionately so much shorter and less robust than in most other species of the genus that they appear to be regenerating, but they are of constant form in all of the specimens examined. Last three pereiopods increasing in length from the third to the fifth and ending in slender, evenly tapered dactyls.

Measurements.—The holotype has a carapace length to base of rostrum of 6.0 mm. The abdomen is so firmly flexed in all of the specimens that it is impossible to obtain the total length of the animal.

There is no doubt that these specimens, which Miss Rathbun confused with *Palaemonetes calcis*, belong to a separate species. They may be distinguished at a glance from that species by the short, chunky body and very differently

formed rostrum. Other important differences include the absence of an antennal spine in *P. inermis*, the armature of the telson, the shape of the antennal scale, the much shorter and very differently formed second pereiopods, the longer and more evenly tapered dactyls of the ambulatory legs and the very different mouth parts. In *P. inermis* the dorsal spines of the telson are placed very close together and there are from eight to thirteen terminal setae, as compared with only five in *P. calcis*. As will be seen from the accompanying figures, the mouth parts are so different that the species might conceivably belong to a separate subgenus. Miss Rathbun unfortunately described and figured the mandible of this species in her description of *P. calcis*; in *P. inermis* the incisor process is armed with but two teeth, whereas it bears three in *P. calcis*.

Dr. Barbour informs me that he believes there were two pools or streams in the cave from which both of these species were taken, one near the entrance and the other much farther back in the cave. If these two bodies of water should belong to separate tributary systems, it would readily explain the occurrence of these two species in the same cave.

Palaemonetes gibarensis sp. nov.

Plate VII

Holotype.—Male, M.C.Z., no. 12,277, from a well, 29 yards deep, entering an underground stream; Aguada del Montañes, en el Jobal, Barrio de Cupeysillo, Termino de Gibara, Oriente Province, Cuba; collected by Col. Jose Garcia Castañeda.

Paratypes.—Two females from the same locality.

Description.—Carapace armed with a small antennal spine below the orbit, but without a branchiostegal spine. There is the usual faint, arched suprabranchial furrow and an oblique furrow running backward and downward from a point on the anterior margin below the antennal spine. Rostrum reaching nearly as far as the end

of the antennular peduncle, with subparallel margins proximally and tapering to a point distally, armed with two or three teeth above, one of which is behind the level of the hind margin of the orbit, and unarmed below; it is strengthened by a lateral keel on each side running from the posterior orbital margin to the tip. Abdomen smoothly rounded. The sixth somite is somewhat longer than high and at least one half again as long as the fifth. Telson nearly one half again as long as the sixth somite, armed with two pairs of dorsal spinules and two or three pairs of terminal spines, between which are six plumose setae; the anterior pair of dorsal spinules is placed about halfway from the base to the tip of the telson, and the posterior pair midway between the first pair and the tip.

Eyes entirely without pigment, rounded distally and provided with a minute tubercle, just discernible in dorsal view at the outer distal angle. Inner antennular flagellum about as long as the carapace and half of the abdomen; outer flagellum fused for four segments, the free portion of the inner ramus made up of about fifteen segments, the outer branch about one and two thirds times the length of the prawn. Antennal scale convex externally and evenly rounded distally; the outer spine protrudes but little beyond the outline of the scale. Antennal flagellum more than twice as long as the body of the animal. Third maxillipeds extend as far as the end of the antennal scale. Carpus of first pereiopods slightly longer than the merus and nearly half again as long as the chela. Second pereiopods long, extending beyond the antennal scale by the length of the chela and most of the carpus; carpus slightly longer than merus, but not more than two thirds as long as the chela; palm slightly more than half as long as the slightly curved fingers. Last three pairs of legs increasing in length from third to fifth; the dactyls are subparallel basally, then taper rather abruptly to a sharp point, thus forming an obtuse angle at about the mid-point of the outer margin as in *P. calcis*.

Measurements.—Total length of holotype about 25 mm.; length of carapace to base of rostrum 6.8 mm. The female paratypes have carapace lengths of 4.4 and 8.6 mm.

Aside from the form of the rostrum, which appears to be constantly quite distinct in the two species, *P. gibarensis* is very similar to *P. calcis* from Havana Province.

Dr. Howell Rivero writes that he kept the present specimens alive for a time and found that they were live-feeders, taking mosquito larvae quite voraciously but discarding bread crumbs after sampling them.

KEY TO THE AMERICAN SPECIES OF SUBTERRANEAN CARIDEA

1. First two pairs of pereiopods similar; carpus entire and excavated distally for the reception of the proximal end of the chela; fingers bearing a brush of long hairs (Atyidae).....2

Carpus of first two pairs of pereiopods not excavated distally; fingers without a conspicuous terminal brush of hairs.....4

2. Rostrum extending beyond end of antennular peduncle and armed with numerous small, movable spines; carapace armed with supraocular, antennal and pterygostomian spines.....
.....*Palaemonias ganteri*

Rostrum short, not extending as far as end of antennular peduncle, and unarmed; carapace completely unarmed.....3

3. Rostrum reaching nearly as far as distal end of second segment of antennular peduncle; fifth pereiopod with rudimentary exopod; epipods biflagellate.....*Typhlatya pearsei*

Rostrum not reaching as far as end of first segment of antennular peduncle; well developed exopods on all five pairs of pereiopods; epipods simple and strap-like....*Typhlatya garciai*

4. Carpus of second pereiopods multiarticulate (Hippolytidae). Rostrum armed with 4 to 6 spines above and 2 to 4 below; eyes pigmented; carpus of second pereiopods made up of 26 to 32 segments and merus with 12 to 17.....*Barbouria poeyi*

Carpus of second pereiopods entire, not subdivided. (Palaeomonidae).....5

5. Rostrum more or less blade-like, compressed laterally; branches of outer flagellum of antennules fused for a few segments at base.....6

Rostrum very short, flattened dorso-ventrally and unarmed; outer antennular flagellum completely divided.....11

6. Mandibles provided with a palp; rostrum armed with teeth on both margins..... *Palaemon morleyi*
- Mandibles without palp; rostrum unarmed below..... 7
7. Rostrum totally unarmed; no sharp spines on anterior margin of carapace..... *Palaemonetes inermis*
- One or more teeth on dorsal margin of carapace or rostrum; at least an antennal spine on anterior margin of carapace below orbit..... 8
8. A single dorsal tooth on carapace behind base of rostrum; lower margin of rostrum concave..... *Palaemonetes calcis*
- Two or more teeth on dorsal margin of rostrum; lower margin of rostrum straight or convex..... 9
9. Rostrum slightly upturned, tapering gradually to a point, which reaches to or slightly beyond end of antennal scale; armed with 6 to 8 dorsal teeth..... *Palaemonetes eigenmanni*
- Rostrum extending about as far as end of second segment of antennular peduncle, subparallel proximally and tapering rather abruptly to a point distally..... 10
10. Rostrum armed with 10 to 13 dorsal teeth..... *Palaemonetes antrorum*
- Rostrum armed with 2 to 3 dorsal teeth... *Palaemonetes gibarensis*
11. Merus of second pereiopods with two inconspicuous ventral lobes distally; carpus without a spine on inner side; fingers hardly longer than palm..... *Euryrhynchus wrzesiowskii*
- Merus of second pereiopods with two acute spiniform teeth at distal end of lower surface; carpus with a sharp tooth on inner side near distal end; fingers distinctly longer than palm..... *Euryrhynchus burchelli*

THE SUBTERRANEAN CARIDEA OF AMERICA

ATYIDAE

Palaemonias ganteri Hay

Palaemonias ganteri Hay, 1901, p. 180; 1902, p. 226, text figs. a-k; Kemp, 1912, p. 114; Bouvier, 1925, p. 74, text figs. 120-127; Fage, 1931a, pp. 646-649; 1931b, p. 362, text figs. 1-21.

Type locality.—Roaring River, Mammoth Cave, Kentucky.

Additional locality.—Styx River, Mammoth Cave, Kentucky.

Typhlatya pearsei Creaser

Typhlatya pearsei Creaser, 1936, p. 128, text figs. 31-41.

Type locality.—Balam Canche Cave, 4.8 kilometers east, 0.8 kilometer south, Chichen Itza, Yucatan.

Additional locality.—Santa Elena Cave, 4.8 kilometers south of Talcha, Yucatan.

Typhlatya gaciai Chace

Typhlatya gaciai Chace, 1942, p. 99, pl. 29.

Type locality.—"Potrero del Molino" Cave, "Las Cuatrocienas Rosas," Banes, Oriente Province, Cuba.

HIPPOLYTIDAE

Barbouria poeyi Rathbun

Barbouria poeyi Rathbun, 1912, p. 455, pls. 2-5.

Type locality.—Cave near seashore, between Morro Castle and Cojimar, Cuba.

Dr. Howell Rivero informs me that the roof of the cave in which *Barbouria* was found has been further broken in and the pool converted into a swimming pool. This may have resulted in the complete extinction of this unique species unless it is to be found in another locality.

PALAEMONIDAE

Palaemon morleyi Creaser

Palaemon morleyi Creaser, 1936, p. 126, text figs. 25-30.

Type locality.—San Isidro Cave, Salar Colony, Merida, Yucatan.

Additional localities.—Balam Canche Cave 4.8 kilometers east, 0.8 kilometer south, Chichen Itza, Yucatan. Amil Cave on Tixcacal Hacienda, 14 kilometers southeast, 2 kilometers east of Merida, Yucatan. (?) San Bulha Cave, Motul, Yucatan.

Palaemonetes inermis

See page 26.

Palaemonetes calcis Rathbun

Palaemonetes calcis Rathbun, 1912, p. 451, pl. 1; Kemp, 1925, p. 317.

Type locality.—Pool in a cave situated on the calzada from Madruga to Aguacate, about one kilometer from the junction with the calzada from Madruga to Matanzas, Havana Province, Cuba.

Palaemonetes eigenmanni Hay

Palaemonetes eigenmanni Hay, 1903, p. 431, text fig. 2; Pike, 1906, pp. 267-276; Rathbun, 1912, p. 453; Kemp, 1925, p. 317.

Type locality.—Cavern at Ashton, Pinar del Rio Province, Cuba.

Additional localities.—Caves of Modesta, San Isidro and Jaiguan, near Cañas, Pinar del Rio Province, Cuba. Cave near Güira de Melena, Havana Province, Cuba.

All of the above localities are in the same general region to the east and west of Alquizar in the southwestern corner of Havana Province. In the Museum of Comparative Zoölogy is a lot of eight males and five females, undoubtedly belonging to this species, which was collected by Dr. Thomas Barbour in 1913 from a cave near Alacranes, Matanzas Province, so *P. eigenmanni* apparently has a more extensive range than any other subterranean species of the genus.

Palaemonetes antrorum Benedict

Palaemonetes antrorum Benedict, 1896, p. 615; Ulrich, 1902, p. 93, pl. 17; Neher, 1902, pp. 96-101, 6 text figs.; Kemp, 1925, p. 317.

Type locality.—An artesian well at San Marcos, Texas.

Palaemonetes gibarensis

See page 28.

Euryrhynchus wrzesniowskii Miers

Euryrhynchus wrzesniowskii Miers, 1877, p. 662, pl. 67, figs. 2-2b; Calman, 1907, p. 297, text fig. 1; Gordon, 1935a, p. 135; 1935b, p. 327, text figs. 13-21.

Type locality.—Cayenne (from a well).

Additional localities.—Manicole Swamp, Upper Cuyuni, British Guiana. Forest pool near Penal Settlement, Mazaruni, British Guiana.

Euryrhynchus burchelli Calman

Euryrhynchus Burchelli Calman, 1907, p. 297, text figs. 2-8.

Type locality.—Pará, Brazil (from a well).

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EXPLANATION OF PLATES

Plate V

Palaemonetes calcis. A. Carapace of female holotype. B. Frontal region of holotype from above. C. Telson of holotype. D. Mandible of female paratype. E. First maxilla of same specimen. F. Second maxilla of same. G. First maxilliped of same. H. Second maxilliped of same.

Plate VI

Palaemonetes inermis. A. Female holotype. B. Frontal region of holotype from above. C. Telson of female paratype. D. Tip of same more highly magnified. E. Mandible of female paratype. F. First maxilla of same specimen. G. Second maxilla of same. H. First maxilliped of same. I. Second maxilliped of same.

Plate VII

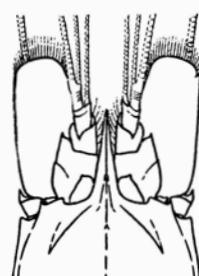
Palaemonetes gibarensis. A. Male holotype. B. Frontal region of holotype from above. C. Telson of holotype. D. Tip of same more highly magnified. E. Mandible of female paratype. F. First maxilla of same specimen. G. Second maxilla of same. H. First maxilliped of same. I. Second maxilliped of same.



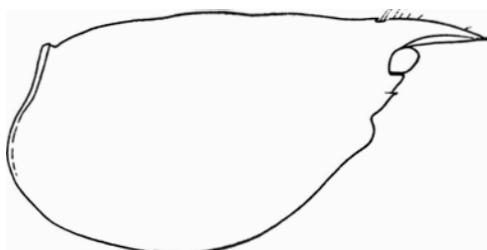
D



E



B



A



C



