

PROCEEDINGS
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A NEW SPECIES OF FRESHWATER SHRIMP
(GENUS *ATYA*) FROM THE PACIFIC DRAINAGES
OF PANAMÁ

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This new species of *Atya* was collected during a survey of the decapod crustacean fauna of Panamá (Abele, 1972) and is described here as a contribution towards a knowledge of that fauna.

The abbreviation *cl* refers to carapace length measured from the orbital margin to the posterior margin of the carapace; *tl* to total length measured from the apex of the rostrum to the distal margin of the telson; UPRC to the University of Panamá Reference Collection, Panamá City, Republic of Panamá; USNM to the National Museum of Natural History, Washington, D.C.

Atya dressleri new species

Figures 1-2

Material: Panamá, Pacific drainage, Veraguas Province, Río Santa María drainage, small stream N of Santa Fe, fast flowing, riffles present, 600 m elevation, 9 February 1962, H. L. Loftin, E. W. Tyson, 6 specimens, USNM.—Panamá, Pacific drainage, Veraguas Province, Río Santa María drainage, headwaters of Río San Juan about 15 km above Calobre, fast flowing, riffles present, 566 m elevation, 20 February 1973, L. G. Abele, M. H. Robinson, LGA 73-16, 1 male holotype, 2 female paratypes, USNM, 1 male paratype UPRC.—Panamá, Pacific drainage, Panamá Province, Río Pacora drainage, Río Cabra above Cerro Azul, fast flowing, riffles present, 650 m elevation, 1968, 2 males (molts of aquarium specimens), R. Dressler, USNM.

Measurements: Male holotype *cl* 20.2 mm, *tl* 52.4 mm; male paratype *cl* 9.5 mm, *tl* 31.4 mm; female paratypes *cl* 18.5, 20.2 mm, *tl* 59.4, 60.2 mm.

Diagnosis: Rostrum triangular in dorsal view, no lateral teeth; third pereopod with small, depressed tubercles; podobranch present on second maxilliped.

Description: The rostrum (Fig. 1A) is acute, triangular in dorsal view, laterally compressed with a distinct dorsal carina. It just reaches to the distal margin of the basal antennular segment. The lateral margins lack lobes or extensions, being almost straight from the orbits to the apex. There are 1-2 small dorsal notches, which may be absent, just posterior to the apex and 1-2 distinct ventral teeth (Fig. 1B). The antennal spine arises at the lower margin of the orbit and a bluntly acute pterygostomial spine is present. There are no other spines on the carapace, which lacks pubescence.

The first three pleura are broadly rounded; the fourth is slightly angled and the fifth and sixth are distinctly angled but blunt (Fig. 2). There is a subtriangular lobe with a dorsal notch above the sixth pleuron. There are no spines on the ventral margins of any pleura in either sex. The fourth abdominal segment is about 1.25 times the length of the fifth, 1.1 times the sixth and 1.06 times the length of the telson. The sixth segment is about 1.15 times the length of the fifth segment and only slightly shorter than the telson. The length of the telson is slightly less than twice the width (Fig. 1E). It is armed dorsally with two rows of 10-12 spines (one row on each side of the midline). The rows begin about four-sevenths of the distance from the posterior margin with each row diverging distally and ending with 1 or 2 small spines at the lateral angles adjacent to a longer medial spine on the distal margin of the telson. There is a distinct depression between the rows of spines which terminates in a large spine just proximal to the distal margin of the telson. There are long, strong setae on the distal margin of the telson. The anal tubercle (Fig. 1D) is long and acute.

The eyes (Fig. 1B) are well-developed and pigmented.

The basal antennular segment (Fig. 1C) is armed with a well-developed stylocerite which does not extend to the distal margin. The distal margin is armed with 7-9 dark colored spines which decrease in size laterally. The second segment is about twice as long as wide and has a row of 7-10 small spines on the mid-dorsal surface. The distal margin is armed with 5-6 spines. The ultimate segment is armed with 5-8 small spines at the insertion of the lateral flagellum. The ultimate segment is about 0.56 times the length of the second; the second is slightly shorter than the total length of the basal segment but is about 1.77 times the visible portion of the basal segment.

The basicerite has a blunt lobe dorsally and a small lateral spine which does not extend to the tip of the stylocerite. The lamella of the scaphocerite extends beyond the antennular peduncle; a lateral tooth arises about two-thirds of the distance from the base. The carpocerite is shorter than the antennular peduncle and is armed with about 12 small spines at the distal margin. The antenna is slightly longer than the body.

The branchial formula is:

	Maxillipeds			Pereiopods				
	1	2	3	1	2	3	4	5
pleurobranch	—	—	—	1	1	1	1	1
arthrobranch	—	—	2	1	—	—	—	—
podobranh	—	1	—	—	—	—	—	—
epipod	1	1	1	1	1	1	1	—
exopod	1	1	1	—	—	—	—	—

The third maxilliped extends to the distal end of the carpoperite or slightly beyond it; it does not extend to the distal end of the antennular peduncle. The exopod extends to the distal margin of the penultimate segment. The antepenultimate segment is about 1.3 times the length of the penultimate which is about 1.2 times the length of the ultimate segment. There are rows of setae on the penultimate and ultimate segments, the latter having large serrate, spoon-shaped setae distally.

The first two pereiopods are typical of the genus and similar. The third pereiopod (Fig. 1F) is unarmed and is only slightly longer than the fourth and fifth; the propodus extends beyond the antennular peduncle. There is a row of pubescence from the proximal lateral part of the merus to the distal part of the propodus. Depressed squamose tubercles are present on the lateral surfaces of the propodus, carpus and distal three-fourths of the merus. The merus is slightly more than 5 times as long as wide; it is about 3 times the length of the carpus, more than twice the length of the propodus and about 7 times the length of the dactylus. The dactylus (Fig. 1G) has a circular depression laterally with setae present; the ventral margin is armed with about 7 strong spines and the distal portion is narrow and acute. The tip of the dactylus of the fourth pereiopod extends to the distal margin of the antennular peduncle. The fourth pereiopod has many fewer tubercles than the third and is armed with 4 spines: 1 on the distal lateral surface and 2 long movable ones on the inner surface of the merus; the distal one is very long being about one-sixth the length of the merus; the fourth spine is on the proximal part of the carpus. The carpus is slightly less than half the length of the merus and shorter than the propodus. The dactylus is similar to that of the third pereiopod. The fifth pereiopod extends just to the basicerite; it is armed on the inner surface of the merus with 3 evenly spaced spines and 1 spine on the distal outer surface of the merus; the propodus is armed with rows of small dark-colored spines on the inner surface. The merus is longer than the carpus but both are shorter than the propodus. The dactylus is similar in form to the others. In terms of the relative lengths of segments the merus becomes shorter from the third to the fifth pereiopod while the propodus becomes longer.

The endopod of the first male pleopod (Fig. 11) is subrectangular in

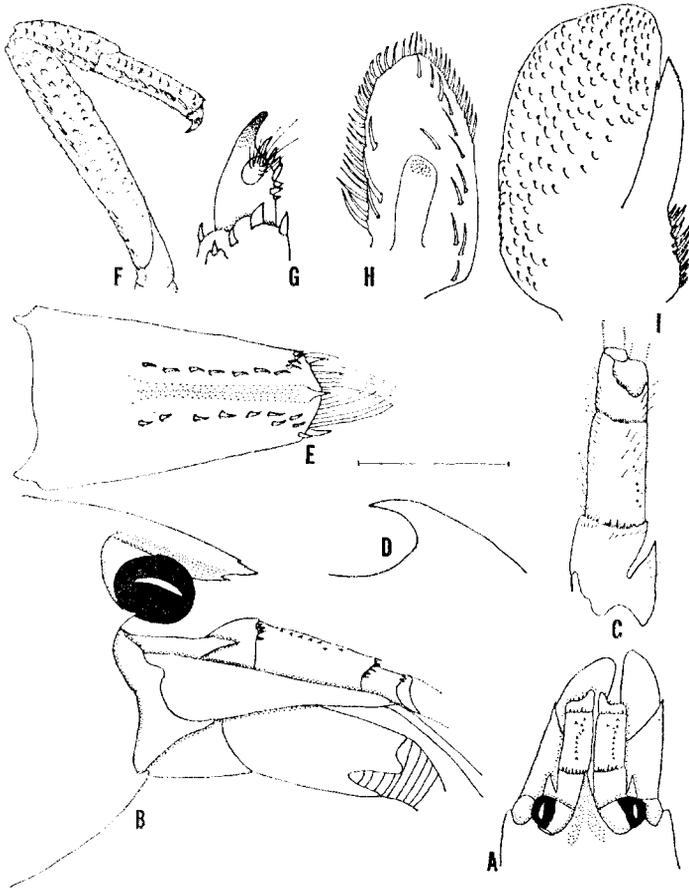


FIG. 1. *Atya dressleri* new species. A, Dorsal view of anterior region of carapace. B, Lateral view of anterior portion of carapace. C, Antennal peduncle. D, Preanal carina. E, Telson. F, Third pereopod. G, Dactylus of F. H, Appendix masculina of male. I, Endopod of first male pleopod. D, H, I, Holotype male, others paratype female. Scale = 15 mm for A, F; 7 mm for B, C, E; 4 mm for D, G, H, I.

shape, it is covered on one side with very small backwardly directed spines; the other side is unarmed. It is about subequal in length to the exopod. The appendix masculina (Fig. 1H) is slightly more than twice as long as wide; it has strong curved setae present on the margins and a few scattered setae anterior to the appendix interna. The uropods

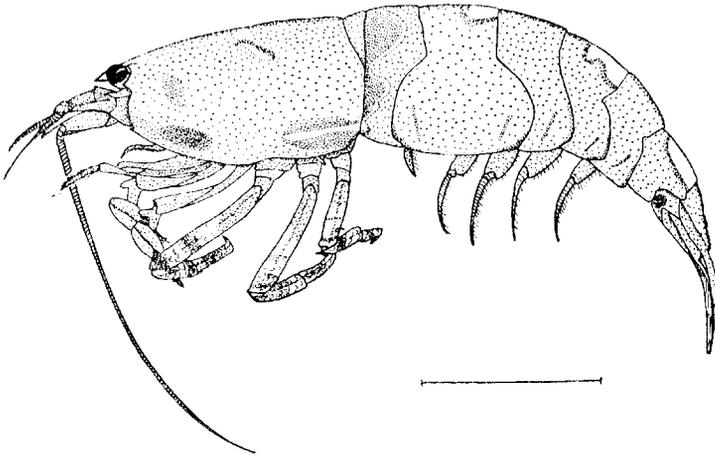


FIG. 2. *Atya dressleri* new species. Lateral view of male showing one of the more common color patterns. Scale = 15 mm.

both extend well beyond the telson; the diacresis of the exopod is armed with about 18 to 21 spinules.

Color: The color pattern of a live male is shown in Figure 2. The ground color is light brown with both yellow and black specks present. The carapace is light brown with a dark brown oblong area on the anterior lateral surface just above an elongated black spot. Posterior to and above these is a short yellow rectangular area with a black posterior border. On the lower posterior part of the carapace is a long yellow stripe distinctly bordered by black. The first abdominal segment has a sinuous black area covering the anterior part of the segment; the black is bordered by a distinct narrow yellow band. The second abdominal segment has the anterior and posterior pleural angles bordered in black with an oblique black stripe medial to each. There is a distinct yellow area bordered by a black band on the dorsal posterior part of the segment. The third segment has the pleural angle black with an oblique stripe anterior to it. There is an hourglass shaped yellow area bordered in black on the posterior dorsal surface of the fourth segment; the pleural angle is black with an oblique black stripe anterior to it. The pleural angle of the fifth segment is black with an oblique black stripe anterior to it. The sixth segment has almost the entire dorsal surface yellow with a black border. There is a distinct black spot at the base of the uropods.

The antennular peduncle has yellow markings on the dorsal surface of the antepenultimate and penultimate segments. The flagella are brown.

The third through the fifth pereopods have 7 yellow bands: 1 at the coxa-ischium, 1 about the middle and 1 towards the end of the merus, 1 at the merus carpus joint, 1 distally on the carpus and 1 each at the proximal and distal ends of the propodus.

The remainder of the shrimp is an even brown color.

The color pattern varied among individuals with some individuals being an even brown, others having the dorsal markings fused into a dorsal stripe and others having variations on the color pattern described. There was no obvious sexual dimorphism although small specimens were usually an even light brown without any pattern.

Etymology: This species is named for Robert L. Dressler who introduced me to the natural history of Panamá.

Type locality: Panamá, Veraguas Province, approximately 15 km above the town of Calobre, 566 meters elevation, Pacific drainage, Río San Juan emptying out of Laguna Yeguada eventually entering the Río Santa María drainage system. The stream was from 0.2 to 4 m wide with the depth to 1 m; riffles were present in narrow sections and there was overhanging vegetation.

Habitat: *Atya dressleri* occurs in small fast running freshwater streams from about 560 to 650 m elevation. All of the specimens were collected from vegetation or overhanging roots in areas where the current was swift.

Distribution: The species has been taken at three localities in Panamá; the type locality, above Santa Fe in the same drainage and on Cerro Jefe in the Pacora drainage, Panamá Province.

Remarks: *Atya dressleri* is most closely related to *A. lanipes* Holthuis, 1963 which occurs on St. Thomas, Virgin Islands and on Puerto Rico. The two species can be immediately distinguished in that *A. dressleri* has squamose tubercles on the third pereopods while *A. lanipes* lacks tubercles. Other features which appear to separate the two species are the following: the merus and carpus of the third pereopod are unarmed in *A. dressleri* while the merus is armed with 3 and the carpus with 1 spine in *A. lanipes*; the telson is less than twice as long as wide in *A. dressleri* while it is more than twice as long as wide in *A. lanipes*; the dorsal surface of the telson is armed with 10–12 spines in *A. dressleri* while it is armed with 6–7 spines in *A. lanipes*; a podobranch is present on the second maxilliped in *A. dressleri* while it is lacking in *A. lanipes*.

Atya dressleri can be distinguished from all other American species of *Atya* in that the carapace is unarmed in the hepatic and postorbital regions and the rostrum lacks lateral lobes.

The species is fairly long lived. Robert Dressler has kept adult individuals alive in an aquarium for more than 5 years.

Discussion: Six species of the genus *Atya* occur in Panamá. *Atya scabra* (Leach, 1815) and *A. innocous* (Herbst, 1792) occur in Atlantic drainage streams while *A. dressleri* new species, *A. tenella* Smith (1871), *A. rivalis* Smith (1871) and *A. crassa* Smith (1871) occur in Pacific drainage streams. Doflein (1900) reported *A. crassa* from the Atlantic

coast of Panamá but this seems to be the only record. No other locality data were given so it was not possible to recollect the area. *Atya crassa* was collected in the Pacific drainage of Río Bayano and from no other areas in Panamá, and *A. dressleri* is known from only a few localities, but all other species are widely distributed in Panamá. Some question has been raised concerning the specific distinction of the Pacific *A. tenella* from the Atlantic *A. innocous* and of the Pacific *A. rivalis* from the Atlantic *A. scabra* (see Bouvier, 1925; Chace and Hobbs, 1969). Holthuis (1966) considered *A. scabra* and *A. rivalis* to be distinct and pointed out some differences between them. While a review of the genus is not the objective of the present report, it seems worthwhile to point out that *A. tenella* and *A. rivalis* appear to be valid species. In addition, a comparison of the figures and description of *A. ortmannoides* Villalobos (1956) with *A. tenella* reveals that they are very similar. A detailed comparison between these species is necessary to resolve their status.

In *A. innocous* the ventral borders of the third through the fifth pleura are armed with short strong denticles (Chace and Hobbs, 1969:65, fig. 10c), while in *A. tenella* they are unarmed. In *A. scabra* the ventral borders of the second through the fifth pleura are armed with short strong denticles (Chace and Hobbs, 1969:65, fig. 10f), while in *A. rivalis* only the third through fifth pleura are armed; the second pleuron is unarmed. These differences were found to be constant on more than 25 specimens of each of the 4 species. There appeared to be other differences in the spination and form of the antennal peduncles, in the shape of the preanal carinae and in the robustness of the legs but these were not examined in detail.

LITERATURE CITED

- ABELLE, L. G. 1972. Comparative habitat diversity and faunal relationships between the Pacific and Caribbean Panamanian decapod Crustacea: A preliminary report with some remarks on the crustacean fauna of Panamá. pp. 125-138. In M. L. Jones (ed.). The Panamic biota: some observations prior to a sea level canal. Bull. Biol. Soc. Washington, No. 2, 1972.
- BOUVIER, E. L. 1925. Recherches sur la morphologie, les variations, la distribution géographique des Crevettes de la famille des Atyides. Encycl. Entom. Ser A, 4:1-370, figs. 1-716.
- CHACE, F. A., JR. AND H. H. HOBBS, JR. 1969. The freshwater and terrestrial decapod crustaceans of the West Indies with special reference to Dominica. Bull. U.S. Nat. Mus. 292:v, 1-258, figs. 1-76.
- DOFLEIN, F. 1900. Weitere Mitteilungen über dekapode Crustaceen der k. bayerischen Staatssammlungen. Sitzung. Math.-Phys. Classe Kgl. Bayer. Akad. Wissen. Munchen 1900, 1:125-145.
- HERBST, J. F. W. 1791-1796. Versuch einer Naturgeschichte der

- Krabben und Krebse nebst einer systematischen Beschreibung ihrer verschiedenen Arten, 2:i-viii, 1-226, pls. 22-46.
- HOLTHUIS, L. B. 1963. Two new species of fresh-water shrimp (Crustacea Decapoda) from the West Indies. Proc. Kon. Nederlandsche Akad. Wetensch. 66:61-69, 3 figs.
- . 1966. The freshwater shrimps of the Island of Annobon, West Africa. In *The R/V Pillsbury deep-sea biological expedition to the Gulf of Guinea, 1964-65. II.* Stud. Trop. Oceanogr., No. 4(1):224-239, figs. 1-5.
- LEACH, W. E. 1815. A tabular view of the external characters of four classes of animals which Linné arranged under Insecta; with the distribution of the genera composing three of these classes into orders, etc. and descriptions of several new genera and species. Trans. Linn. Soc. London 11:306-400.
- SMITH, S. I. 1871. List of the Crustacea collected by J. A. McNeil in Central America. Rep. Peabody Acad. Sci. 1869:87-98.
- VILLALOBOS, A. F. 1956. Contribucion al conocimiento de las *Atyidae* de Mexico I. Una nueva especie de *Atya* de la vertiente del Pacifico del estado de Michoacán. An. Inst. Biol., Univ. México 26(2[for 1955]):459-475, figs. 1-6.