

ATYA ABELEI, A NEW ATYID SHRIMP (CRUSTACEA, DECAPODA, ATYIDAE) FROM THE PACIFIC SLOPE OF PANAMA

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Abstract.—*Atya abelei* is described from a single male collected from the Pacific drainage of Panama. It is easily distinguished from its sympatric congeners by having acute rostral prominences, no comb setae on pereopods 1 and 2, and three transverse white bands on the dorsum.

The genus *Atya* Leach, 1815, has recently been reviewed by Hobbs and Hart (1982). These authors include the American and West African representatives of the genus which currently includes 11 species.

Six of the 11 species have been reported from Panama in Central America (Abele 1975; Hobbs and Hart 1982): *Atya scabra* (Leach, 1815); *A. innocous* (Herbst, 1764) [a senior synonym of *Atya tenella*]; *A. margaritacea* (A. Milne Edwards, 1864) [a senior synonym of *Atya rivalis*]; *A. dressleri* Abele, 1975; and *A. crassa* Smith, 1871. As a result of investigations of the biology of Panamanian atyids (Felgenhauer and Abele, in press) an apparently new species of *Atya* was found in the Pacific drainage. The specimen had been maintained in an aquarium for one and one-half years and we were alerted to the possibility that it was unique by its color pattern, method of feeding, and size. Below we describe the specimen and provide notes on its feeding behavior and color.

Atya abelei, new species

Figs. 1-4

Material.—Holotype, ♂ USNM 195335, 8.1 mm cl, 49 mm tl. Type locality: Panama, El Valle, Coclé Province, unnamed tributary of Rio Anton, 600 m elevation, 17 Oct 1980; coll. B. E. Felgenhauer, N. H. Williams.

Description.—Rostrum (Fig. 3A-B) short with distinct dorsal carina extending to sharply acute tip; latter projecting just beyond basal antennal segment. Lateral prominences acute. Dorsal and ventral carinae lacking teeth. Ventral carina armed with several rows of long plumose setae. Carapace (Fig. 3A-B) smooth, lacking pubescence. Antennal spine and sharply acute pterygostomial spine present. Distinct doublure lacking pubescence. First 4 abdominal pleura (Figs. 1, 3G) broadly rounded posteroventrally; ventral margins of third and fourth pleura armed with several long simple setae. Fifth and sixth pleura slightly angled and blunt, with prominent strong setae present on ventral margin of fifth. Telson (Fig. 3D) armed on each side of midline with row of 7 strong spines; each row beginning about $\frac{1}{3}$ distance from anterior margin of telson and terminating in single additional spine at each posterolateral margin. Posterior margin with 2 strong spines located above one another just anterior to posterior margin, and 12 long plumose setae. Eyes well developed and pigmented. Preanal carina (Fig. 3F, H) long, terminating in bifid tooth. Antennule (Fig. 3A-B) bearing single row of 5 or 6

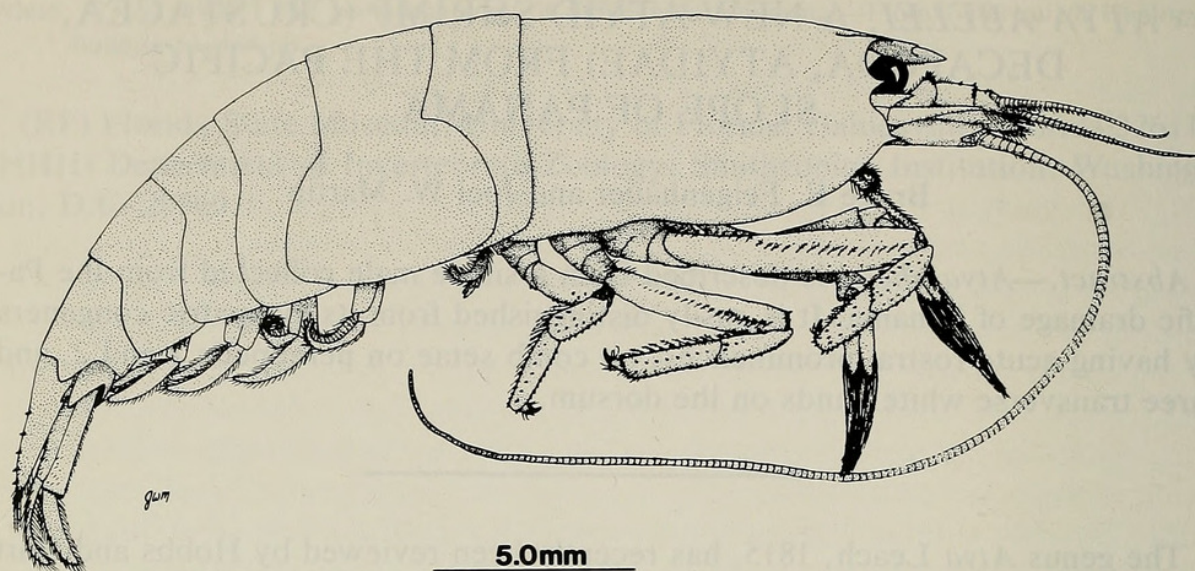


Fig. 1. *Atya abelei*, male holotype, lateral view.

dark spines on distal margin of basal segment; this segment with longitudinal rows of simple setae on dorsal surface. Second segment about twice length of proximal segment and bearing single medial dark spine dorsally; distal margin armed with 7 or 8 such spines. Dorsum of third segment with 6 or 10 dark spines on distal margin. Antennae extending about $\frac{2}{3}$ length of body. Scaphocerite reaching just beyond antennular peduncle. Third maxilliped pediform, extending slightly beyond antennular peduncle. Fused propodus-dactylus with several rows of strong serrate setae. First 2 pereopods typical for genus and similar. Propodus and dactylus armed with long setae modified for filtering. No serrate or comb setae present. Third pereopod (Fig. 3C) swollen and armed with single row of

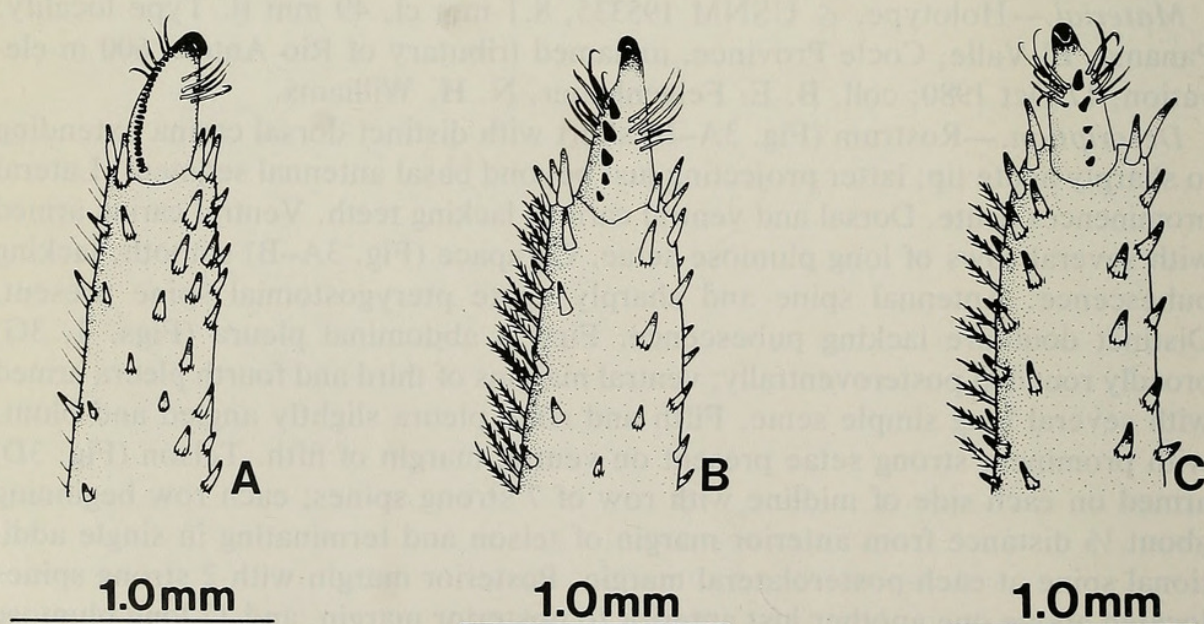


Fig. 2. *Atya abelei*, male holotype, dactylus and distal parts of propodus of pereopods 3 through 5. A, pereopod 5; B, pereopod 4; C, pereopod 3.

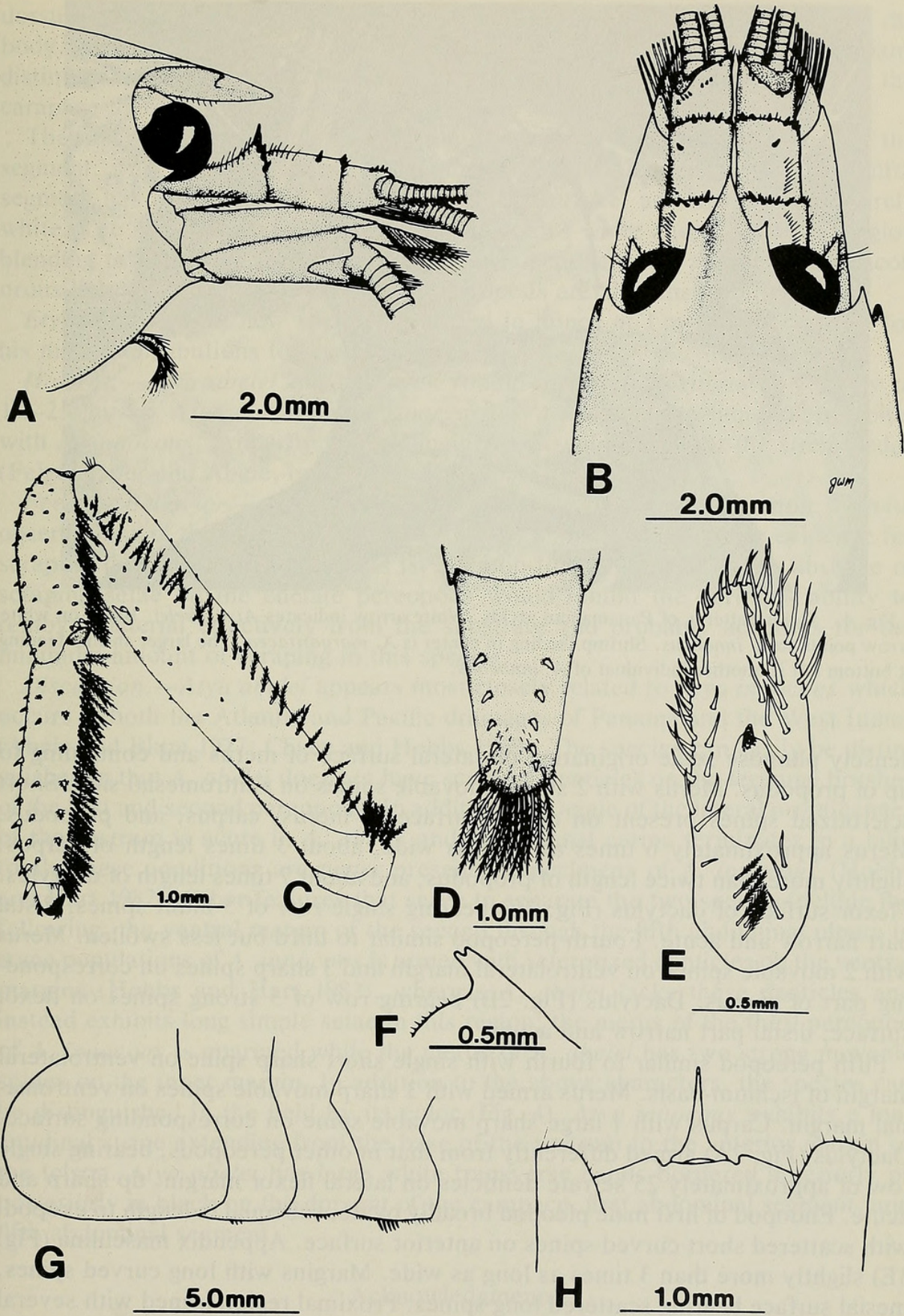


Fig. 3. *Atya abelei*, male holotype. A, anterior region, lateral view; B, anterior region, dorsal view; C, pereopod 3; D, telson, dorsal view; E, appendices masculina and interna; F, preanal carina, lateral view; G, Second through fifth abdominal pleura; H, Sternum of sixth abdominal segment and preanal carina.



Fig. 4. Color patterns of Panamanian atyids. White arrow indicates *Atya abelei*. Black on white arrow points to *A. innocous*. Shrimp feeding in center is *A. margaritacea*. The larger shrimp feeding at bottom left is another individual of *A. innocous*.

densely plumose setae originating on lateral surface of merus and continuing to tip of propodus. Merus with 2 strong movable spines on ventromesial side. Short sclerotized spines present on dorsal surface of merus, carpus, and propodus. Merus approximately 6 times as long as wide, about 3 times length of carpus, slightly more than twice length of propodus, and about 7 times length of dactylus. Flexor surface of dactylus (Fig. 2C) bearing single row of 5 blunt spines; distal part narrow and acute. Fourth pereopod similar to third but less swollen. Merus with 2 movable spines on ventrolateral margin and 3 sharp spines on corresponding part of carpus. Dactylus (Fig. 2B) bearing row of 5 strong spines on flexor surface; distal part narrow and acute.

Fifth pereopod similar to fourth with single short sharp spine on ventrolateral margin of ischium-basis. Merus armed with 3 sharp movable spines on ventromesial margin. Carpus with 1 large sharp movable spine on corresponding surface. Dactylus (Fig. 2A) armed differently from that in other pereopods, bearing single row of approximately 25 serrate denticles on lateral flexor margin; tip sharp and acute. Endopod of first male pleopod broadly ovate, subequal in length to exopod, with scattered short curved spines on anterior surface. Appendix masculina (Fig. 3E) slightly more than 3 times as long as wide. Margins with long curved spines, mesial surface bearing scattered long spines. Proximal region armed with several long plumose setae.

Color.—The color pattern described below is from the single live male kept in an aquarium at Florida State University. The ground color of the ventral half of the body is light grey and the upper half rust brown. The intensity of the brown

dorsum increases anteriorly. Light yellow specks are present on all parts of the body. The light brown carapace is marked with a prominent transverse band distinctly bordered posteriorly by black. On the upper posterior surface of the carapace there is a black band that decreases in width ventrally.

The first abdominal segment has a white transverse band covering much of the segment. The third and fourth abdominal segments are light brown. The fifth segment has a small white band on its dorsal surface, and the sixth is entirely white. The proximal region of the uropods is also white and in the distal region blending to yellowish brown. The antennular peduncle and antenna are concolorous light brown. The pereopods and pleopods are all translucent brown.

Etymology.—This new species is named in honor of Lawrence G. Abele for his many contributions to crustacean biology.

Habitat.—*Atya abelei* inhabits rock rubble in water flowing at a velocity of 1.5–2.0 m/sec. *Atya abelei* and *A. margaritacea* occur in the same microhabitat with *A. innocous*, primarily found clinging to vascular plants at the stream edge (Felgenhauer and Abele, in review).

Feeding Behavior.—*Atya abelei* feeds primarily by passive filtration. Careful observations of this shrimp in aquaria for over a year revealed little evidence for scraping the substrate for food as is common for many atyids. The absence of scraping setae on the chelate pereopods would inhibit the shrimp's ability to remove material effectively from the substrate and probably accounts for the minimum amount of scraping in this species.

Discussion.—*Atya abelei* appears most closely related to *Atya innocous* which occurs in both the Atlantic and Pacific drainages of Panama and the West Indies (Abele and Blum 1977; Chace and Hobbs 1969). The species can easily be distinguished in that *A. abelei* does not have scraping denticles on the terminal brushes of the first and second pereopods. In addition, the angle of the lateral prominences of the rostrum is acute in *A. abelei* and the preanal carina terminates in a bifid tooth; these conditions are never present in specimens of *A. innocous* (Hobbs and Hart 1982). Other features that serve to separate the two species include the following: the ventral margin of the second through the fifth abdominal pleura in some populations of *A. innocous* is armed with sclerotized denticles on the ventral margins (Hobbs and Hart 1982), whereas *A. abelei* lacks these denticles and instead exhibits long simple setae in this region; the merus of the third pereopod of *A. innocous* is unarmed while the merus of *A. abelei* has two strong movable spines on the inner margin. In addition to the above characters, the species can be distinguished in the field by its color (Fig. 4). *Atya innocous* exhibits a longitudinal stripe extending from the base of the rostrum to the anterior margin of the telson. *Atya abelei* has large white transverse bands bordered anteriorly or posteriorly in black on the dorsum of the carapace, first abdominal segment, and fifth abdominal segment.

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Literature Cited

- Abele, L. G. 1975. A new species of freshwater shrimp (genus *Atya*) from the Pacific drainages of Panama.—*Proceedings of the Biological Society of Washington* 88:51–58.
- , and N. Blum. 1977. Ecological aspects of the freshwater decapod crustaceans of the Perlas Archipelago, Panama.—*Biotropica* 9:239–252.
- 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.—*Bulletin of the United States National Museum* 292:1–258.
- Felgenhauer, B. E., and L. G. Abele. (In press). Aspects of mating in the tropical freshwater shrimp *Atya innocous* (Herbst).—*Biotropica*.
- , and ———. Ultrastructure and ecological morphology of the feeding and associated appendages of the tropical freshwater shrimp *Atya innocous* (Herbst). (In review).
- Hobbs, H. H., Jr., and C. W. Hart, Jr. 1982. The shrimp genus *Atya* (Decapoda: Atyidae). *Smithsonian Contributions to Zoology* 364: iii + 143 pp.

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Felgenhauer, Bruce E. and Martin, J W. 1983. "Atya abelei, a new atyid shrimp (Crustacea, Decapoda, Atyidae) from the Pacific slope of Panama ," *Proceedings of the Biological Society of Washington* 96, 333–338.

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