

## **FARRODES (EPHEMEROPTERA: LEPTOPHLEBIIDAE) IN THE ANTILLES: NEW SPECIES FROM PUERTO RICO AND REVIEW OF THE GENUS<sup>1</sup>**

C. R. Lugo-Ortiz, W. P. McCafferty<sup>2</sup>

**ABSTRACT:** *Farrodes taino*, n. sp. (Ephemeroptera: Leptophlebiidae) is described from larvae collected from the central mountainous region of Puerto Rico. The species is compared to *F. grenadae* and *F. hyalinus*, the other Antillean species known from larvae. *Farrodes taino* can be distinguished from these species by the presence of six oblong pale markings on the vertex, the crown-like pattern of the pronotum, the complex abdominal color pattern, and the presence of blackish apical markings on each femur. A key is provided to differentiate the three species.

Peters (1971) erected the genus *Farrodes* (Ephemeroptera: Leptophlebiidae) to include *F. bimaculatus* Peters and Alayo, *F. grenadae* Peters, and *F. hyalinus* Peters. These species are known from Cuba, Grenada, and Jamaica, respectively. *Farrodes grenadae* and *F. hyalinus* are known from the larval and adult stages, whereas *F. bimaculatus* is known from the adult stage only (Peters 1971). Larvae pertaining to the genus can be distinguished by the presence of long, slender gills on abdominal segments 1-7; the distinct denticulation of the tarsal claws, with the apical denticle being much larger than others; the presence of five denticles on the anteromedian emargination of the labrum; and the presence of a V-shaped ridge near the ventral, inner anterolateral margin of the maxillae. Adults of *Farrodes* can be distinguished by the presence of a symmetrically forked MP vein in the forewings; the vein  $1Cu_1$  not attaching to veins  $CuA$  or  $CuP$ ; dissimilar tarsal claws (one hooked, the other pad-like); and the styliiger plate of the male adult being deeply cleft apically and extending posteriorly dorsal to the forceps.

Savage (1987) indicated that *Farrodes* is closely related to the South American genera *Homothraulius* Demoulin and *Simothraulopsis* Demoulin, but did not provide detailed phylogenetic data to establish these relationships. Peters (1988) indicated that *Farrodes* evolved in South America and later moved northward, but failed to provide phylogenetic data for his conclusion. In any case, on the basis of the scant information available, the genus appears to have originated in South America (see also McCafferty *et al.* 1992) when the continent became isolated during the Eocene (54-38 mya) and extended northward after North and South America reunited during the Pliocene (5-2 mya). Its radiation in the Antilles is most likely the consequence of continuous dispersal and isolation among the islands during and after the Eocene.

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<sup>2</sup> Department of Entomology, Purdue University, West Lafayette, IN 47907.

As part of a continuing effort to document the Ephemeroptera fauna of the Neotropics (Lugo-Ortiz and McCafferty 1993, 1994a, 1994b; McCafferty and Lugo-Ortiz 1992, 1994), we here describe a distinct, new species of *Farrodes* based on larval material collected from the central mountainous region of Puerto Rico. We compare this species to *F. grenadae* and *F. hyalinus*, the other members of the genus known also from the larval stage, and provide a key for their differentiation. The material upon which this study is based is housed in the Purdue Entomological Research Collection (PERC), West Lafayette, Indiana.

### *Farrodes taino* Lugo-Ortiz and McCafferty, NEW SPECIES

**Larva** (Fig. 1). Body length: 4.0-5.8 mm; caudal filaments: 8.0-10.5 mm. Head: Coloration yellow brown, suffused with black markings. Area surrounding antennae and beneath compound eyes suffused with black. Area between ocelli with black band. Area surrounding compound eyes pale yellow-brown. Vertex with six pale brown oblong marks. Antennae pale yellow-brown to pale yellow, 2.0-2.5x length of head capsule. Thorax: Color yellow-brown to medium brown. Pronotum marginally suffused with black spots, with medial V-shaped black mark, and with seven to eight short, simple setae anterolaterally. Mesonotum yellow-brown medially, suffused with black laterally, especially anterolaterally. Metanotum yellow-brown. Sterna pale yellow-brown to yellow-brown. Pleura suffused with black. Legs pale yellow-brown; anterior faces of coxae and trochanters with row of five to six small, simple setae; femora with many long, simple setae dorsally and short, simple setae ventrally, with setae of intermediate length on anterior and posterior faces, and small black markings distally on anterior face; tibiae with row of very fine, long, simple setae dorsally and robust, simple setae of medium length ventrally, and with branched setae on anterior face; tarsi with row of fine, simple setae dorsally and seven to ten short, robust, simple setae ventrally; tarsal claws with 14-17 denticles, becoming progressively larger distally (distal denticle largest). Abdomen: Color yellow-brown with black markings; terga 1-10 with blackish band posteriorly, almost 1/3 length of each tergum; terga 4-6 often with submedian pale triangle; remaining terga variable in color pattern, sometimes with two anterior submedian black spots. Sterna pale yellow brown to yellow-brown, often with sublateral black to brown dash. Caudal filaments yellow-brown; terminal filament longer than cerci.

**Adult.** Unknown.

**Material.** Holotype: Female larva, PUERTO RICO, Maricao, Salto Curet, Sector Orama, VI-2-1992, C. R. Lugo-Ortiz, deposited at PERC. Paratypes: 21 female and five male larvae, same data and deposition as holotype.

**Etymology.** This species is named after the Taino indians who originally inhabited Puerto Rico.

**Remarks.** *Farrodes taino* was taken in the central mountainous region of Puerto Rico. It was collected from stream riffle areas at water temperatures of 21°-24°C.

The new species differs from *F. hyalinus* and *F. grenadae* by the presence of six distinct oblong markings on the vertex, the crown-like color pattern of the pronotum, the presence of small black markings on the anterior face of each femur, and the complex color pattern of the abdomen (Fig. 1).

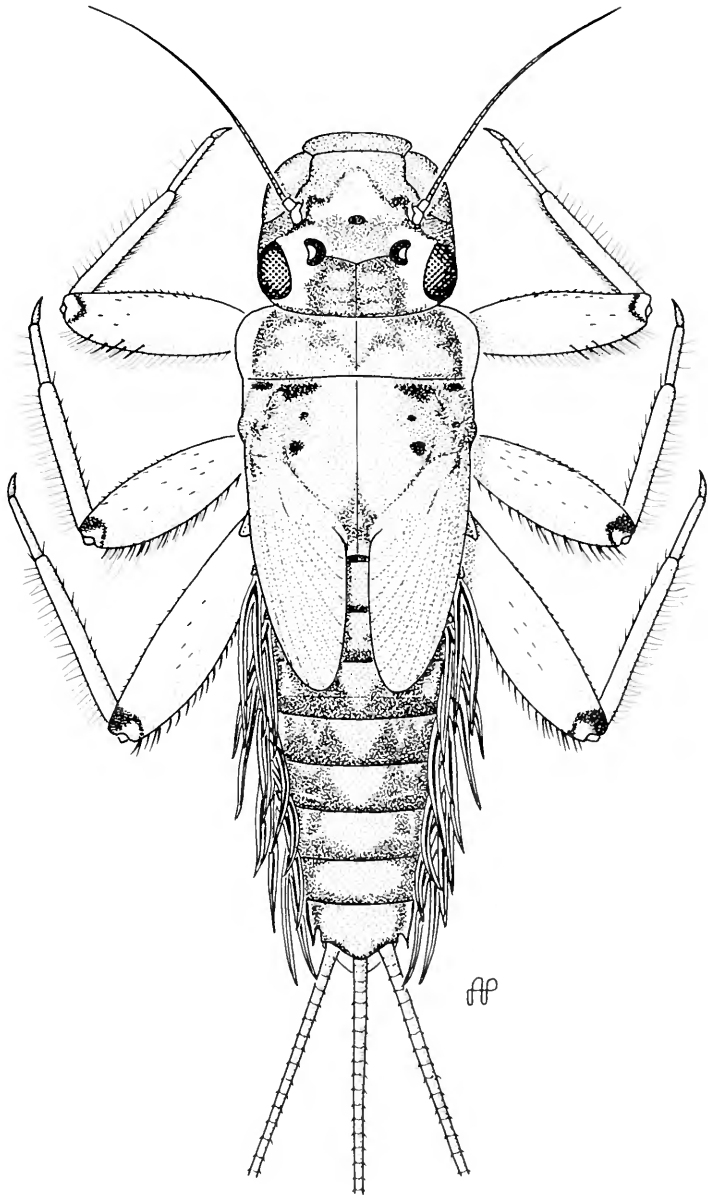


Fig. 1. *Farrodes taino*, new species, female larva, dorsal view.

KEY TO THE KNOWN LARVAE OF *FARRODES* FROM THE ANTILLES

1. Abdominal terga 1-8 uniformly brown; fore- and midfemora entirely pale;  
 Grenada . . . . . *grenadae*  
 – Abdominal terga 1-8 patterned; fore- and midfemora with apical markings . . . . . 2  
 2(1) Abdominal tergum 5 with narrow pale medial marking, tergum 6 with subtriangular  
 medial pale marking, terga 7-8 with narrow anterior and posterior brown margins, tergum  
 9 pale with two submedial brown markings, tergum 10 pale [Figure 211: Peters (1971)];  
 fore- and midfemora with brown apical markings; Jamaica . . . . . *hyalinus*  
 – Abdominal terga as in Figure 1; fore-, mid-, and hindfemora with dark apical markings;  
 Puerto Rico . . . . . *taino*

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