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Two new species of grasshoppers, *Dellia karstica* spec. nov. and *Dellia maroona* spec. nov. (Orthoptera: Acrididae) from the Cockpit Country, Jamaica

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Abstract

The acridid grasshopper genus *Dellia* Stål is redescribed and compared to other genera of Copiocerinae. Two new species of *Dellia* (*Dellia karstica* spec. nov. and *Dellia maroona* spec. nov.) from the Cockpit Country, Jamaica, are described and illustrated. General morphology and coloration indicate that *D. karstica* is closely related to the previously described *D. gemmicula* Rehn & Hebard from the Jamaican Blue Mountains.

Keywords

Acridids, Jamaica, Greater Antilles, Caribbean.

Introduction

The West Indian grasshopper genus *Dellia* Stål 1878 was first reported from Jamaica by Rehn & Hebard (1938), when they described *Dellia gemmicula* from Pleasant Hill in the Blue Mountains. Previous to that *Dellia* was known only from Cuba with two nominal species: *Dellia insulana* Stål 1878 and *D. multicolor* Carl 1916. The latter species has subsequently been synonymized with the former by Amédégnato *et al.* (1995). Also three Costa Rican species were described in *Dellia* in the early 1900's, but were subsequently transferred to three different genera of Proctolabinae: *Drymophilacris* Descamps 1976, *Lithoscirtus* Bruner 1908 and *Paratela* Descamps & Rowell 1978. More recently, three additional species of *Dellia* have been described from Hispaniola by Perez *et al.* (1995) and Perez-Gelabert & Otte (1999). There is also an unconfirmed report of "*Dellia* sp." from the eastern mountains of Puerto Rico (Medina-Gaud & Martorell 1973) and a new but still undescribed species was recorded from the island of San Salvador, Bahamas, by Perez-Gelabert (2000). Thus distribution records indicate that *Dellia* is restricted to the Greater Antilles and the Bahamas where it appears to have undergone considerable speciation. The extent of diversity within the genus is only now beginning to be discovered and additional collections are needed for a comprehensive characterization of the genus. Seven species of *Dellia* are now described from the West Indies, although about twice that number are already known from Cuba and will be the subject of a future paper.

The two new species of *Dellia* described here are quite distinct from each other, *D. karstica* being similar in morphology (furculae, supra-anal plate and cerci) and coloration

pattern to *D. gemmicula* Rehn & Hebard from eastern Jamaica. *D. maroona* and *D. karstica* were found in two areas of the Jamaican Cockpit Country. An intensive search for several days resulted in the capture of only two adults of each species and a few juveniles. As has been observed for *Dellia* populations in Hispaniola, it is likely that their densities increase by the end of the summer. A small group of juveniles collected on the highest hills of the Cockpit Country, probably represent another still undescribed species.

Material and Methods

For identification, specimens were compared with the single adult available (the holotype) of *D. gemmicula*, with the three described *Dellia* species from Hispaniola, and with black and white photographs of the *Dellia insulana* and *Dellia multicolor* types (from Cuba) provided by C. S. Carbonell. Measurements were taken with an ocular micrometer having resolution to 0.01 mm. Specimens are deposited at the Academy of Natural Sciences, Philadelphia (ANSP).

Dellia Stål 1878

Redescription of genus.— General external morphology relatively homogeneous, the interspecific differences being more marked in the male external genitalia, the female ovipositor and coloration patterns. Preliminarily, *Dellia* is classified within the Copiocerinae (Amédégnato *et al.* 1995) and the group Eucopiocerae, that also includes the Central American and Mexican genera *Apoxitettix*, *Chapulacris*, *Clematodes*, *Eucopiocera*, and *Halffterina*. It can be distinguished from these taxa by the following combination of characters.

Size small (14–23 mm both sexes), body slender, brilliantly colored, sometimes both sexes equally colored, most often females less brightly colored. Antennae filiform, longer than combined length of head and pronotum. Head vertex little developed (markedly elongate in *Eucopiocera*, *Chapulacris* and *Halffterina*), somewhat rounded, and slightly depressed between eyes. Eyes slightly protruding, separated by a narrow interocular distance, sometimes brilliantly colored in life. Pronotum saddle-shaped and short, bearing three transverse sulci plus a fourth sulcus submarginal to

head. Dorsal surface of pronotum, especially metanotum, coarsely punctate. Median and lateral carinae absent, sometimes a medial line visible on disk. Posterior pronotal lobes rounded, anterior pronotal margin broadly convex and posterior pronotal margin often with a slight medial notch. Head and pronotum display brightest body colors (most commonly yellow, cream, green, and red), in several broad bands that extend laterally to the epimera. Tegminal vestiges variably developed, lobate, sometimes elongated as far as hind femoral heads. Epimera 1 and 2 often with contrasting coloration (bearing a red spot in several species). Prosternal process small, sub-conical. Tympanum often absent (as in *D. dominicensis* and *D. karstica*), other times covered by tegminae. Abdomen smooth, less brightly colored than anterior portion of body and hind legs. Abdominal segments with well-marked median carinae. Furculae usually present in males (absent in *D. roseomaculata*), digitiform or pointed, sometimes relatively large. Male cerci simple, cylindrical tapering distally, slightly curved inwards, varying in thickness between species. Male supra-anal plate broad, sub-quadrangular or sub-triangular, with small protruding ridges near lateral margins, and posterior margin with a broadly produced tip. First and second pair of legs bright green, sometimes with red tinged femora. Hind femora not markedly robust, smooth and commonly bright green with knees black, elongated beyond end of abdomen in males. Hind tibiae pubescent, blue-green with short black spines (4-7 externally, 6-9 internally). Hind tarsi long, the second slightly shorter than other two. Epiphallus bridge-like, with thick lateral plates; lophi and ancorae large, the latter with inwardly pointed tips.

Dellia karstica spec. nov.
(Figs 1A, 2A-D)

Holotype.— **Male:** JAMAICA, Trelawny Parish, 4.1 road-km S intersection Springvale, Cockpit Country, disturbed forest, 18°21.06' N 77°44.24' W, 370 m, 16.v.2000, D. E. Perez-Gelabert, (ANSP).

Etymology.— Species epithet “karstica” in reference to the karstic geology of the Jamaican Cockpit Country.

Diagnosis.— Distinguished from all other species in the genus by its overall bright green and black coloration on the legs and abdomen combined with a blue head and a blue and red pronotum in both sexes. Apparently closely related to *D. gemmicula*, sharing features of coloration and morphology. *D. karstica* has blue, red, black and white on the pronotum, vestigial tegminae very small, furculae lying horizontally and supra-anal plate slightly widening distally. *D. gemmicula* has red, green, brown and black on pronotum, vestigial tegminae larger (about twice as long), furculae pointed upwards at 45° angle, and supra-anal plate nearly uniform in width.

Description of male holotype.—

Coloration: integument smooth and shiny as typical in *Dellia*. Generally bright green and black except for the pronotum and head which combine reddish and blue. An-

tennae with first two segments light green the rest light reddish. Fastigium of vertex green, genae and rest of face blue, clypeus tinged reddish. Pronotum distinctly marked with red in between sulci, sulci black. Red and black area in turn bound by hues of blue and black, then contrasted by white at pronotal margins. Vestigial tegminae whitish in life. Abdomen bright green, marked on dorsum by broad black band that extends from pronotum to epiproct. Epimera darker green. Anterior legs with orange femora, middle and posterior legs all bright green. Hind knees black, hind tibiae blue with 6-7 black-tipped spines externally and internally, hind tarsi reddish. Supra-anal plate green anteriorly becoming black on posterior half. Cerci light brown proximally, their distal apex black.

Morphology: size small and smaller than *D. maroona* (Fig. 1A). Head: antennae filiform, of 23 cylindrical articles, about 2X as long as pronotum and head length. Eyes oval and somewhat protruding. Vertex slightly depressed between eyes with projecting fastigium. Frontal carinae nearly parallel, above and below median ocellus (Fig. 2A). Pronotum: slightly longer than wide, of uniform width and traversed by four deep and wide sulci. Pronotal margins smoothly rounded, slightly convex anteriorly, posterior margin slightly emarginate. Lateral pronotal lobes not clearly defined. Wings: vestigial tegmina minute and lobate, nearly the length of a small antennal segment. Legs: not particularly robust. Hind tibiae with 5 external and 7 internal black-tipped spines. Furculae well-developed and lying horizontally. External genitalia: supra-anal plate broad, sub-rectangular, widening distally with posterior margin widely tipped (Fig. 2B). Generally smooth, with particular corrugations on its surface. Cerci simple, elongated and tapering, not surpassing end of abdomen (Fig. 2C).

Allotype.— **Female:** Slightly larger and more robust than male. In life colored in the same manner and intensity. Vestigial tegminae lobate, slightly larger than in male. Supra-anal plate short, blunt-ended triangular. Valves of ovipositor small, weakly dentate (Fig. 2D).

Collecting data of allotype.— ♀: Same as holotype, (ANSP). The pair were collected together on a shrub at the edge of a trail.

Measurements (mm).— Holotype ♂: body length 14.33; interocular distance 0.37; head length 1.78; pronotum length 3.67; hind femur length 10.44; hind tibia length 8.33.

Allotype ♀: body length 17.78; interocular distance 0.42; head length 2.00; pronotum length 4.00; hind femur length 11.89; hind tibia length 10.00.

Habitat.— This species was found in secondary vegetation at the edge of a montane forest consisting of a mixture of dense vegetation and large trees. This area seemed wetter than the habitat of *D. maroona*.

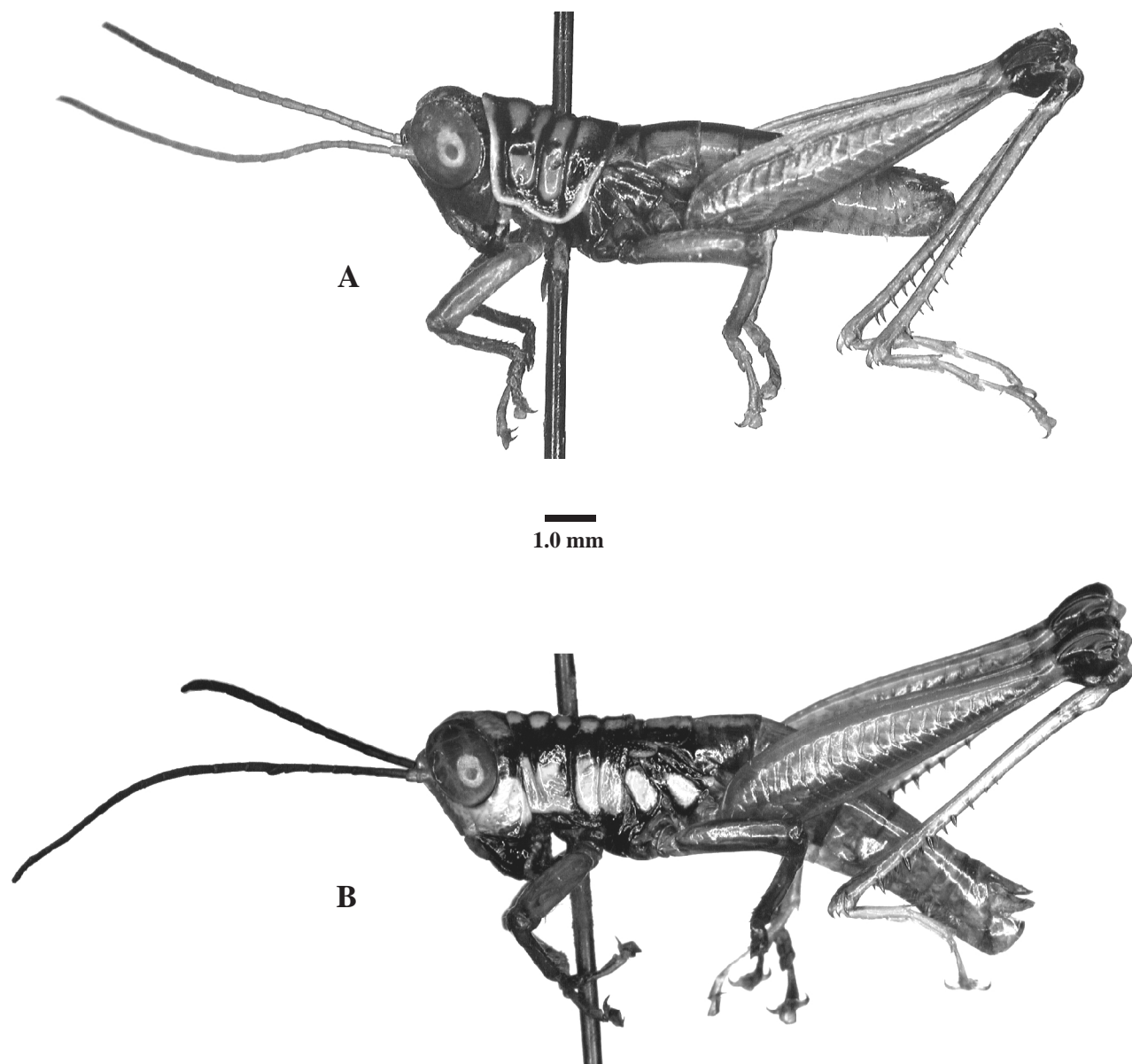


Fig. 1A. Habitus of *Dellia karstica*, ♂ holotype; B. Habitus of *Dellia maroona*, ♂ holotype.

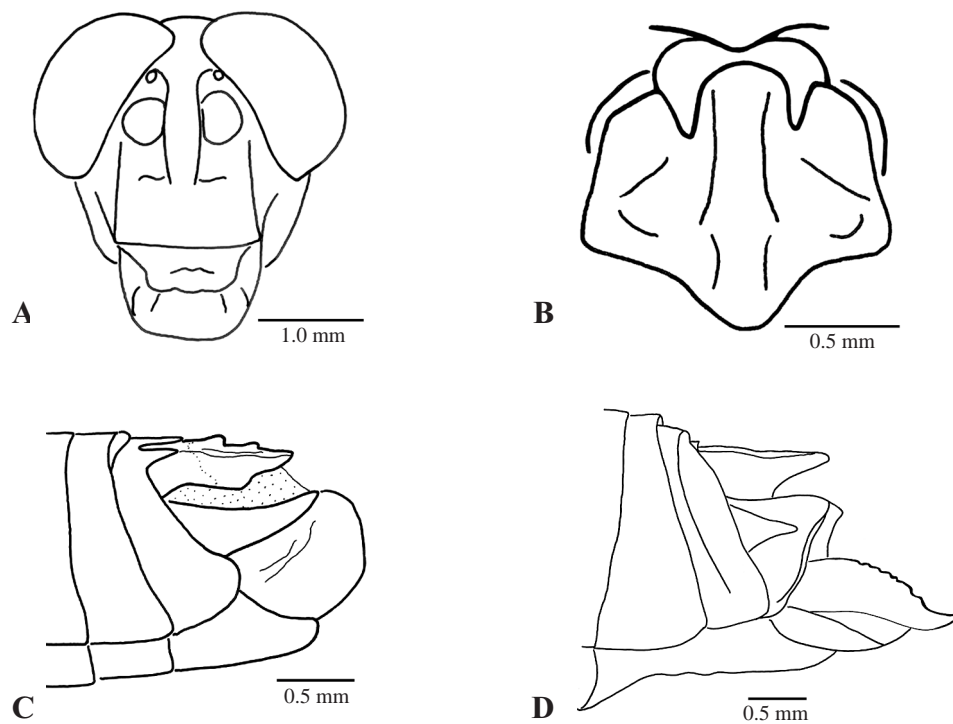


Fig. 2. A-D. *Dellia karstica*: A. Face of male; B. Dorsal view of male epiproct; C. Side view of male abdominal end; D. Side view of female abdominal end and ovipositor.

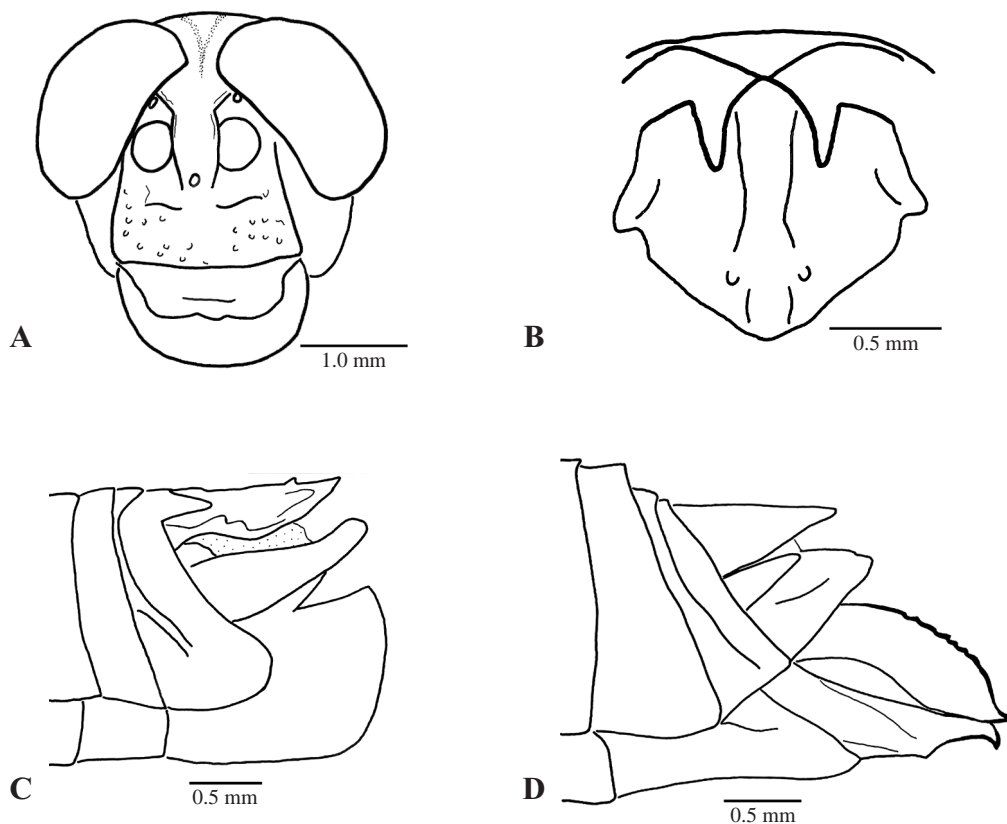


Fig. 3. A-D. *Dellia maroona*: A. Face of male; B. Dorsal view of male epiproct; C. Side view of male abdominal end; D. Side view of female abdominal end and ovipositor.

Dellia maroona spec. nov.
(Figs 1B, 3A-D)

Holotype.— **Male:** JAMAICA, Trelawny Parish, 400 m N of intersection at Burnt Hill, Cockpit Country, 18°19.05' N 77°33.43' W, 600 m, 17.v.2000, D. E. Perez-Gelabert, (ANSP).

Etymology.— Species epithet “maroona” in dedication to the Jamaican maroons, rebel slaves that used the Cockpit Country as a safe haven.

Diagnosis.— Differentiated from other *Dellia* species by its combination of broad cream and black bands on pronotum and anterior abdominal portion, while all legs and posterior half of abdomen are bright green.

Description of male holotype.—

Coloration: generally cream and black on head and pronotum; legs and abdomen bright green. Face cream, clypeus, labrum and mandible increasingly dark. Head vertex with black triangular area bounded by cream at both sides, not extending beyond eyes to fastigium of vertex. Broad black postocular band, continuing over pronotum and first three abdominal segments. Broad cream band below eyes, extending backward over sides of pronotum and epimera, delimited below by narrow dark area that marks the lower pronotal margin. Disk dorsally with two narrow cream-yellowish bands separated by a median black band. Vestigial tegmina with a fine black medial streak surrounded by brown. Abdomen black and brown only in anterior third, black dorsal band disappearing distally after fourth segment. Legs green and light brown. Hind femora bright green with knees black, hind tibiae blue with black-tipped spines and tarsi reddish. End of abdomen, cerci and epiproct bright green in life.

Morphology: size small, though larger than *D. karstica* (Fig. 1B). Integument smooth and shiny as characteristic for genus. Head: antennae filiform with 21 cylindrical articles, the initial six significantly shorter than the rest. Eyes protruding, interocular distance narrow, about as wide as the antennal scape is long. Fastigium of vertex projecting only slightly beyond eyes. Face coarsely pitted (Fig. 3A). Frontal ridge with weakly marked carinae. Pronotum: longer than wide, traversed by four deep and wide sulci. Metazona finely pitted. Anterior pronotal margin smoothly concave, posteriorly emarginate with a slight medial notch. Wings: vestigial tegmina lobate and minute. Abdomen: furculae well-developed, somewhat triangular and pointed. Legs: hind tibiae with 4-5 external and 6 internal black spines. External genitalia: epiproct wide, sub-rectangular, smoothly flattened, and with relatively few corrugations on its surface (Fig. 3B). Cerci long and thick, weakly incurved, not surpassing end of abdomen, with their inner apical margin expanded by a small blunt projection (Fig. 3C).

Allotype.— **Female:** larger and more robust than male. Face and pronotal dorsum light brown, as most of abdominal surface. Legs light green, hind femora with knees black and hind tibiae bluish becoming black on lower half. Epiproct

an elongated triangle. Ovipositor larger than in *D. karstica*, with upper valve curved down and weakly dentate (Fig. 3D).

Other material examined.— Allotype ♀: JAMAICA, Trelawny Parish, 2 road-km SE Kingloss, Cockpit Country, 18°23.48' N 77°33.23' W, 325 m, 21.v.2000, D. E. Perez-Gelabert, (ANSP). **Paratypes:** Two juvenile ♂♂, Trelawny Parish, 9 road-km NW of bridge in Troy, Cockpit Country, 18°16.75' N 77°40.08' W, 530 m, 21.v.2000, D. E. Perez-Gelabert, (ANSP). One juvenile ♂, Trelawny Parish, between Campbells and Kinloss, Cockpit Country, 18°23.48' N 77°33.23' W, 330 m, 21.v.2000, D. E. Perez-Gelabert, (ANSP).

Measurements (mm).— Holotype ♂: body length 18.33; interocular distance 0.37; head length 2.33; pronotum length 3.67; hind femur length 12.11; hind tibia length 10.33. Allotype ♀: body length 26.11; interocular distance 0.53; head length 2.89; pronotum length 4.67; hind femur length 14.44; hind tibia length 12.78.

Habitat.— Specimens were collected on shrubs at the sides of the mountain road after very persistent search. Incursions into the steep sides of the hills proved difficult and did not result in the capture of any specimens.

Dellia sp.

A small group of juveniles collected on shrubs at the side of an isolated mountain path probably represent another species of *Dellia*. This is suggested by their different coloration patterns, most distinctively, a broad yellowish band on the lower pronotal side.

Material examined.— Six juvenile ♂♂, Trelawny Parish, 10.2 road-km NW from bridge in Troy, Cockpit Country, 18°17.00' N 77°40.46' W, 553 m, 21.v.2000, D. E. Perez-Gelabert, (ANSP).

Key to the Jamaican Dellia (♂)

1. Lower side of pronotum banded cream and yellow.
Remnants of tegmina colored cream and black
..... *D. maroona* spec. nov.
- Pronotum reddish. Remnants of tegmina colored white or very light brown 2
2. Remnants of tegmina very small, furculae lying horizontally, tarsi reddish..... *D. karstica* spec. nov.
- Remnants of tegmina relatively large, furculae elevated at 45° angle, tarsi whitish
..... *D. gemmicula* Rehn & Hebard

Table 1. Reported species of *Dellia* Stål.**Cuba**

Dellia insulana Stål 1878: 83.

Hispaniola (Dominican Republic)

Dellia dominicensis Perez et al. 1995: 158

Dellia monticola Perez-Gelabert & Otte 1999: 6

Dellia roseomaculata Perez-Gelabert & Otte 1999: 5

Jamaica

Dellia gemmicula Rehn & Hebard 1938: 225

Dellia karstica spec. nov.

Dellia maroona spec. nov.

Dellia sp. This paper. Known only from juveniles.

Puerto Rico

Dellia sp. In: Medina-Gaud & Martorell 1973: 253.

Bahamas (San Salvador Is.)

Dellia sp. In: Perez-Gelabert 2000: 338.

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