

Research Article

A new species of *Polypoetes* Druce, 1885 (Lepidoptera: Notodontidae) from Colombia, with confirmation of a new host plant for the Diophtinae

Una especie nueva del género *Polypoetes* Druce, 1885 (Lepidoptera: Notodontidae) de Colombia, con la confirmación de una nueva planta hospedante para Diophtinae

Liliana Prada-Lara^{1*} , Andrea C. Jiménez-Bolívar²  & Ryan A. St Laurent³ 

¹Research associate. Gimnasio Campestre, Bogotá, Colombia. ✉ *lprada@campestre.edu.co. ²Grupo de Investigación Biodiversidad del Caribe Colombiano, Universidad del Atlántico, Barranquilla, Colombia. E-mail: andreaibolivar@gmail.com. ³Department of Entomology, Smithsonian Institution, National Museum of Natural History, Washington, D.C., U.S.A. /McGuire Center for Lepidoptera and Biodiversity, Florida Museum of Natural History, Gainesville, FL 32611, USA. E-mail: ryanstlaurent93@gmail.com

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Abstract. A new species of the genus *Polypoetes* Druce, 1885, *Polypoetes milleri* **spec. nov.** from Colombia is described. We provide diagnostic characters for the species, photographs of the adults and genital structures of both sexes. Additionally, we confirm a new host plant for the subfamily Diophtinae, *Quararibea cordata* (Malvaceae), commonly known as “zapote”.

Key words: Moths; Neotropical; taxonomy; zapote.

Resumen. Se describe una nueva especie del género *Polypoetes* Druce, 1885, *Polypoetes milleri* **spec. nov.** de Colombia. Se proveen caracteres diagnósticos, fotografías de los adultos, así como de la genitalia del macho y la hembra. Adicionalmente, se confirma una nueva planta hospedante para la subfamilia Diophtinae, *Quararibea cordata* (Malvaceae), conocida como “zapote”.

Palabras clave: Neotropical; polillas; taxonomía; zapote.

Introduction

Diophtinae Walker, 1862 is a subfamily within the Notodontidae Stephens, 1829, a family commonly known as prominent moths due to the “prominent” tubercles or projections present in both larval and adult stages. The distribution of Diophtinae ranges from the west coast of the United States to northern Argentina, with the bulk of the diversity (~90%) in the Neotropical region (Miller 2009). The members of this group exhibit diurnal flying activity with bright and colorful wing patterns, remarkable features among notodontids. To date, the subfamily has been classified into two tribes: Josiini and Diophtini, which constitute a total of 43 genera and approximately 466 species (Miller 2009; Miller & Thiaucourt 2011; Schintlmeister 2013; Aguila 2013).

Within the Diophtini, the genus *Polypoetes* Druce, 1885 exhibits the widest range of morphological variation in the subfamily and the highest number of described species.

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According to Miller (2009; see diagnosis) *Polypoetes* species can be recognized by the following combination of characters: male antennae bipectinate (less commonly with extremely short rami), the metathoracic tympanum is shallow, forewings brown to blackish brown, usually with an ovoid hyaline or semi-hyaline fascia, discal cell longer than one half of the forewing length, and veins frequently lined with orange or yellow scales. However, species identification relies heavily on male and female genitalia and dissections are usually required for specific determination.

To date, 63 *Polypoetes* species have been described, occurring from southern Mexico to southeastern Brazil and Argentina at altitudes ranging from 700 to 4200 m a.s.l. Most taxa live in cloud forests, rarely occur in lowland forests, and no single specimen has been recorded in the Amazon Basin. Regarding the biology of the group, the host plant list for *Polypoetes* spans a broad taxonomic spectrum, including Malvaceae, Celtidaceae, Ericaceae, Sapindaceae, and Euphorbiaceae (Miller 2009).

The genus, like the majority of Notodontidae genera, exhibits several taxonomic issues. As addressed by Miller (2009), since the 1900's the collection frequency of *Polypoetes* moths has been very low and sporadic, resulting in biological collections with scarce and old material. Additionally, most species are only known from one or two specimens, or even just a single sex. As a direct consequence, *Polypoetes* diversity is most likely to be underestimated with many species currently undescribed.

In the present study, we aim to contribute to the knowledge of *Polypoetes* moths with the description of a new species from the Colombian Andean region and the confirmation of a new host plant for the Dioptinae subfamily that had been reported with some uncertainty in previous work (Miller 2009).

Material and Methods

The specimens examined in this study were found deposited in the Notodontidae section of the “Colección Taxonómica Nacional de Insectos Luis María Murillo” (CTNI), an agro-entomological collection located in Mosquera, Cundinamarca, Colombia. To generate the diagnosis and the description all taxonomy and morphological terminology were based on Miller (2009). For dissecting genitalia, standard techniques within Notodontidae were used (Miller 1987); the preparations were preserved in glycerol-filled microvials and pinned to the adult specimens. Images of adults were taken with a Fujifilm Finepix S8300 camera and genital structures were photographed using a stereomicroscope (ZEISS Stereo Discovery V20). Plates were arranged using Adobe Photoshop Creative Cloud 2021. In total, 15 specimens were designated in the type series and deposited in the following biological collections: USNM (Smithsonian National Museum of Natural History, Washington, United States of America), CTNI (Colección Taxonómica Nacional de Insectos “Luis María Murillo”, Cundinamarca, Colombia), and MPUJ (Museo Javeriano de Historia Natural, Bogotá, Colombia), as detailed in the description.

Results

Taxonomy

Family Notodontidae Stephens, 1829

Subfamily Dioptinae Walker, 1862

Genus *Polypoetes* Druce, 1885

Polypoetes milleri Prada, Jiménez-Bolívar & St Laurent **spec. nov.**
(Figs. 1-3)

Type material. Holotype: 1 male. **COLOMBIA: Cundinamarca:** Cachipay. 21.xi.1973, leg. L. Núñez. "Hoja de zapote" CTNI 2656a / Previously identified as *Polypoetes aff. cethegus* by E. L. Todd in 1974. **HOLOTYPE** male *Polypoetes milleri* Prada, Jiménez-Bolívar & St Laurent 2023 [red label] / (CTNI). **Paratypes:** 14 total; 2 males, 12 females. Same locality, date, and collector data as holotype (CTNI 2656b-j) (MPUJ_ENT 0071540-0071539) (USNM JSM-1568 / JSM-1569). Paratypes with the following yellow label: Paratype *Polypoetes milleri* Prada, Jiménez-Bolívar & St Laurent 2023.

Additional material examined: 4 total; 2 males, 1 female, 1 sex undetermined. Same data as holotype (CTNI 2656).

Diagnosis. The habitus of this species is unremarkable. It can be confused with *P. villia* Druce, 1897 or *P. eriphus* Druce, 1885, genitalia must be examined to separate these species. *Polypoetes milleri* can be distinguished by the horn-like *uncus*, the naked, twisted and antler-like shape *socii*, the "M" shape of the *tegumen*, the *aedeagus* which is straight rather than bent, tergite 8 naked with two lateral apodemes with an elaborate pocket-like structure, the lateral margins of the 8th segment of the female terminalia with mesal horn-like projections, and the *signum* ovoid and dentate.

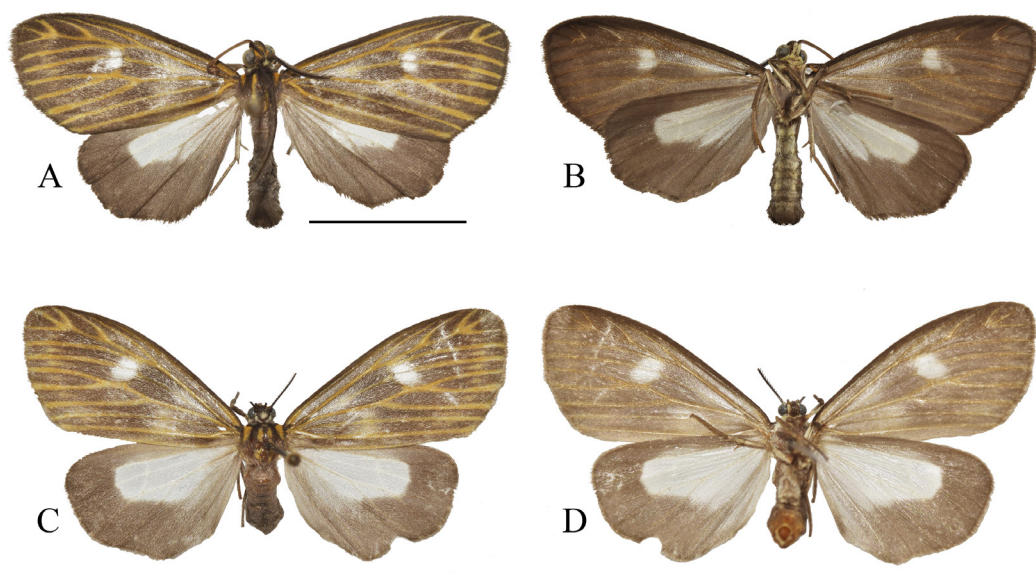


Figure 1. Habitus of *Polypoetes milleri* **spec. nov.** Holotype male. **A.** Dorsal. **B.** Ventral. Paratype female. **C.** Dorsal. **D.** Ventral. Scale: 1 cm. / Holotipo macho. **A.** Dorsal. **B.** Ventral. Paratipo hembra. **C.** Dorsal. **D.** Ventral. Escala: 1 cm.

Description. Male. Head: Small (Fig. 1). Labial palpus greatly elongate, folded elbowlike over frons apex extending posteriorly to the clypeus. Clypeus yellow, white-cream epicranium surrounded by gray scales. Labial palpus segment 1 faded white-cream colored dorsally. Labial palpus segments 2 and 3 with long dark brown scales with inner short white-cream color scales. Eyes very large, comprising more than two-thirds area of the head. Antenna

bipectinate, rami relatively long, base of the antenna covered with appressed glossy dark brown scales. **Thorax:** Dorsally clothed in dark brown scales with two central yellow bands, ventrally clothed with dark brown scales. **Legs:** Covered in dark brown scales. Epiphysis well-developed. **Forewing:** Length (base to apex): 15 mm, wingspan: 30 mm. Single frenulum. Dorsal ground color dark gray-brown, veins yellowish to light orange. The postbasal area with diffused scales. An irregular white ovoid spot is present in postdiscal area. Ventrally dark gray-brown, veins slightly yellowish to light orange. Presence of the same white ovoid spot as in dorsum. **Hindwing:** Dorsal ground color dark gray-brown with a basal white discal patch that extends beyond cell. Ventrally same as dorsal. **Abdomen:** Covered in glossy dark gray-brown scales. Ventrally with white-cream scales. **Terminalia:** (Fig. 2). Tergite 8 naked with two lateral apodemes, posterolateral angles expanded to form an elaborate pocket-like structure. Sternite 8 squared naked with sclerotized apex. Horn-like *uncus* with antler-like, naked, twisted, and sclerotized *socii*. Base of *tegumen* sclerotized forming an "M". *Valva* mostly membranous enclosing hair-like androconia. *Aedeagus* relatively long and narrow, with a small, membranous pointed hook-shaped process at the apex. *Cornuti* not found in the examined genitalia. **Female.** Differs from male in the following characteristics: **Head:** Antenna bipectinate, rami extremely short. **Forewing:** Length (base to apex): 20 mm; wingspan: 34 mm. *Frenulum* composed a tuft of bristles. **Terminalia:** Tergite 8 sclerotized (Fig. 3), long, and wide, with two sclerotized lobes, posterior margin convex with a small mesal excavation, lateral margins of 8th segment with mesal horn-like projections. Posterior margin of sternite 8 with a deep, U-shaped mesal excavation. *Anal papilla* short, covered and fused with the sternite 8 and tergite 8. *Ostium* forming an expanded funnel-shaped structure leading to the short and membranous *ductus bursae*. *Corpus bursae* membranous and short, almost round. *Signum* ovoid and dentate, located laterally on the left side from a lateroventral view. Dorsal part of *corpus bursae* has an internal pocket with rugose surface. Apophyses anteriores are straight, long, and thin, and the apophyses posteriores not clearly visible, they are straight but shorter and thinner than the anteriores.

Etymology. The name *milleri* is a latinized noun in genitive singular. This new species is named in honor of the late Dr. James S. Miller (affectionately called "Jim" by most of his friends and colleagues), who dedicated a great part of his life to country music and the study of Lepidoptera. Jim was an outstanding lepidopterist, always willing to collaborate and share knowledge. Jim was also the first to recognize this taxon as undescribed in his 2009 monograph on the Diophtinae.

Distribution. *Polypoetes milleri* **spec. nov.** is only known from the type locality in Cachipay, a small town in Cundinamarca, Colombia.

Biology. Caterpillars were found feeding on *Quararibea cordata* (Malvaceae), commonly known as "zapote". This hostplant is a new record for the Diophtinae.

Discussion

The 50-year history surrounding *Polypoetes milleri* **spec. nov.** is interesting and essential for understanding the species description. In 1973, approximately 18 caterpillars of *P. milleri* were found by L. Nuñez feeding on *Quararibea cordata* (Malvaceae) in Cachipay, Cundinamarca. One year later, with reared caterpillars and pinned adults, specimens were sent to the United States for their identification. The moths were given to entomologist Edward Lawrence Todd, who specialized in the taxonomy and systematics of Noctuidae. He identified the specimens as "*Polypoetes* aff. *cethegus*" (now a synonym of *P. eriphus* Druce, 1885) and returned the material to the CTNI (back then named Instituto Colombiano Agropecuario ICA) and left two adult specimens at the USNM.

Then decades later, Jim Miller started working on his generic revision of the Dioprinae (Miller 2009) and came across these two specimens in the USNM. He dismissed the identification proposed by E. L. Todd and left it as an undescribed species belonging to the *P. villia* species complex. Finally, 13 years later, Prada (2022) went to the CTNI collection to revise the material belonging to the family Notodontidae. For the first author, these specimens were very similar to *P. eriphus* (the same identification given by Todd in 1974), however, its distribution made it doubtful since *P. eriphus* is known from Mexico, Guatemala, and Nicaragua. So, when Miller was consulted for identification assistance, he immediately recognized the locality and morphotype as the undescribed taxon mentioned in the 2009 monograph (Miller pers. comm. 2021).

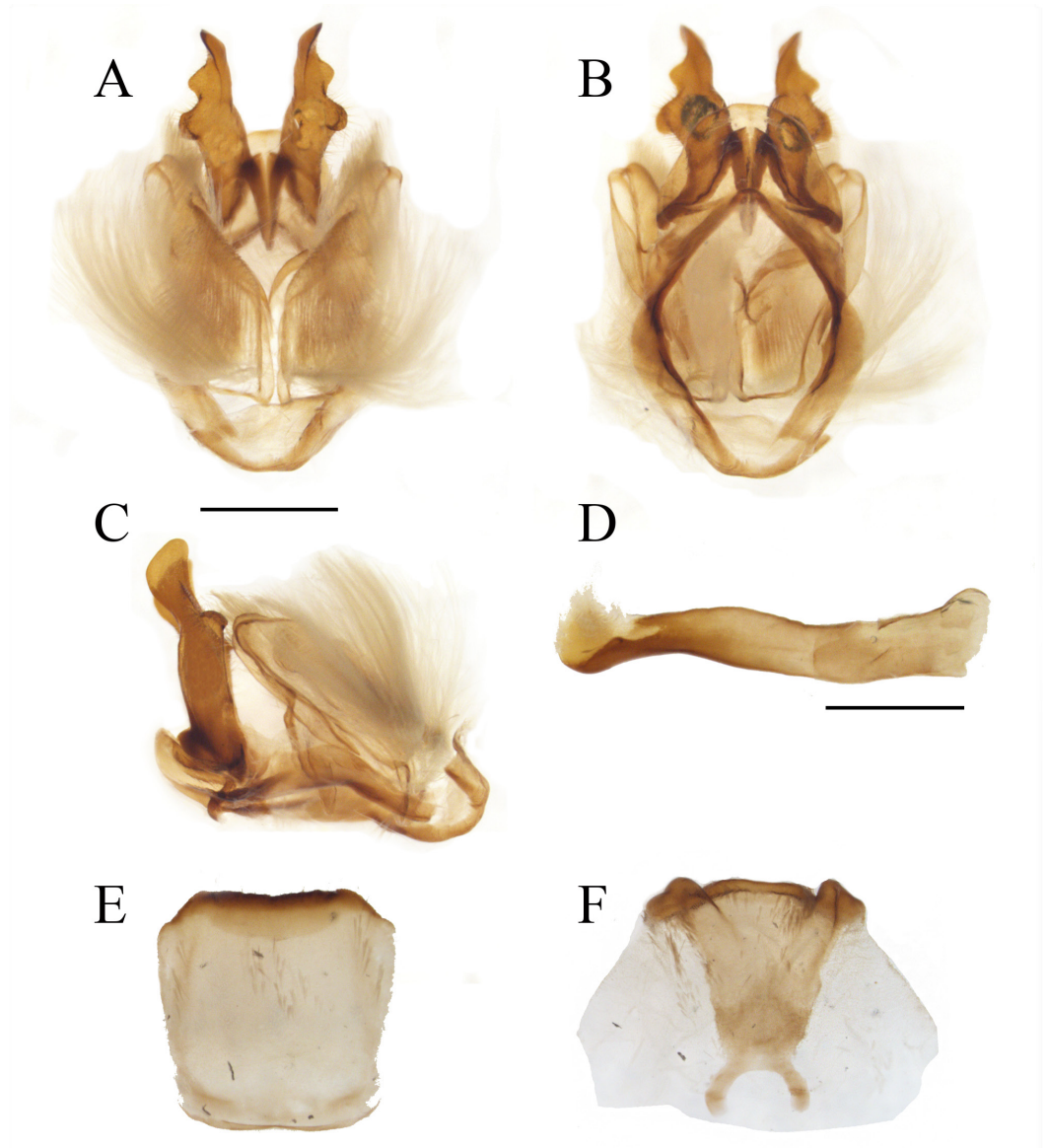


Figure 2. Male genitalia of *Polypoetes milleri* spec. nov. **A.** Ventral. **B.** Dorsal. **C.** Lateral. **D.** Aedeagus. **E.** Sternite 8. **F.** Tergite 8. Scale: 1 mm. / **A.** Ventral. **B.** Dorsal. **C.** Lateral. **D.** Aedeago. **E.** Esternito 8. **F.** Terguito 8. Escala: 1 mm.

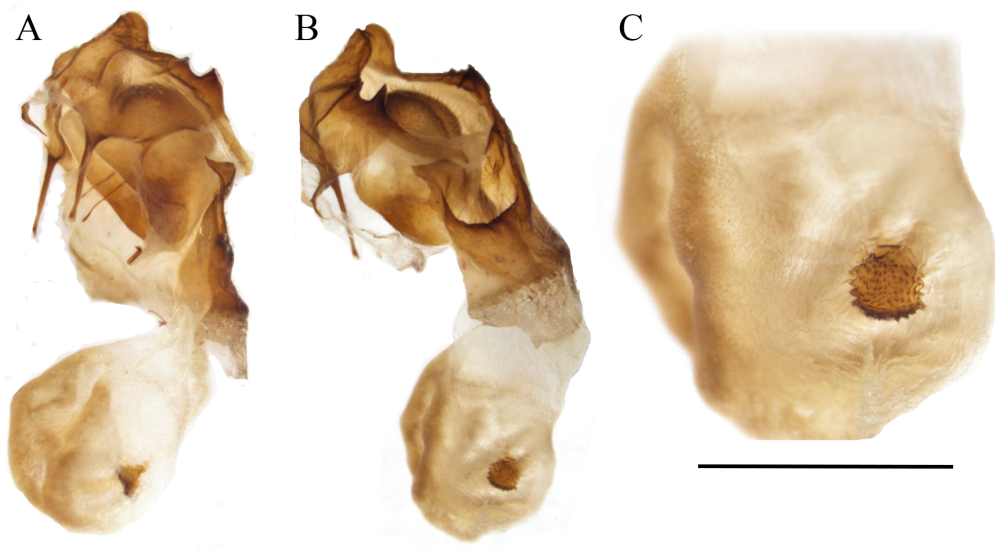


Figure 3. Female genitalia of *Polypoetes milleri* **spec. nov.** **A.** Dorsolateral. **B.** Ventrolateral. **C.** *Corpus bursae* detail showing *signum*. Scale: 1 mm. / **A.** Dorsolateral. **B.** Ventrolateral. **C.** Detalle del *corpus bursae* mostrando el *signum*. Escala: 1 mm.

Polypoetes milleri **spec. nov.** belongs to the *P. villia* species complex. The latter is common in collections, but dissections are needed for a correct identification, since three cryptic species co-occur in Costa Rica and Panama, and three or more undescribed species occur in South America, with *P. milleri* being one of these (Miller 2009).

The genus *Polypoetes* is very diverse and complex, many species remain undescribed. We have been able to recognize potential new taxa from photos posted on different nature servers (such as iNaturalist.org), however without collected material, descriptions are impossible. Like *P. milleri*, many moths have a long history and await to be found, known, and studied.

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