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Description of the natural history and immature stages of *Postplatyptilia caribica* Gielis in Puerto Rico (Lepidoptera: Pterophoridae)

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Abstract

Observations of the life history of a plume moth, *Postplatyptilia caribica* Gielis are presented along with an adult diagnosis and descriptions of the final instar larva and pupa. The species was previously known only from two female specimens. Illustrations are provided for the adults and immatures, including both male and female genitalia. Morphological characters of the adults and immatures are discussed and compared with other members of the tribe Platyptiliini. Identification of adults and immatures is especially important because one of the larval hostplants, *Gesneria pauciflora* Urb., is a threatened endemic species of Puerto Rico. The plant family Gesneriaceae is a new addition to the known plant families used by Pterophoridae.

Key words: *Amblyptilia*, Caribbean, chaetotaxy, endemic species, *Gesneria pauciflora*, Gesneriaceae, *Lantanophaga*, larvae, morphology, Pterophoroidea, pupae

Resumen

Se presentan observaciones de la historia de vida de la palomilla *Postplatyptilia caribica* Gielis, junto a un diagnóstico de la fase adulta y una descripción de la última fase instar larval y pupa. La especie era conocida anteriormente a partir de dos ejemplares de hembra únicamente. Se proporcionan ilustraciones para la fase adulta y estadíos inmaduros, incluyendo la genitalia de macho y hembra. Los caracteres morfológicos de los adultos e inmaduros son discutidos y comparados con otros miembros de la tribu Platyptiliini. La identificación de adultos e inmaduros es de suma importancia, ya que la planta hospedera de la larva, *Gesneria pauciflora* Urb., es una especie endémica y amenazada de Puerto Rico. La familia Gesneriaceae es un nuevo registro de plantas hospederas hasta ahora conocidas y utilizadas por Pterophoridae.

Introduction

Pterophoridae, commonly known as plume moths, are recognized by the T-shaped resting posture of adults and the lobed or divided wings of most genera. Worldwide there are over 1,136 species in 89 genera (Gielis, 2003) with more than 200 additional species described in recent reviews (Gielis 2006, 2011). Knowledge of the Puerto Rican fauna is incomplete, with only 21 species recorded (Table 1) thus far. Of these, five were first reported by Möschler (1890), including four new species descriptions. Another five species were recently described (Bigot and Etienne 2009; Gielis 1999, 2006). In addition to literature records, photographs available online (MPG 2014) indicate additional species present. However, most of these need confirmation with genitalia dissection for accurate determination.

Larval host associations are known for 15 of the 21 Pterophoridae from Puerto Rico. Worldwide, about 39% of the known pterophorid host plant species belong to the family Asteraceae and 22% to various families within the order Lamiales, with a total of 70 hostplant families recorded (Matthews and Lott 2005). Within the order Lamiales, the family Gesneriaceae represents a new addition to the known plant families used by Pterophoridae.

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TABLE 1. List of the Pterophoridae of Puerto Rico.

Subfamily **Ochyroticinae** Wasserthal, 1970
Ochyrotica fasciata Walsingham, 1890
Subfamily **Pterophorinae** Zeller, 1841
Tribe **Platyptiliini** Bigot, Gibeaux, Nel & Picard, 1998
Lantanophaga pusillidactylus (Walker, 1864)
Stenoptilodes brevipennis (Zeller, 1874)
Postplatyptilia caribica Gielis, 2006
Lioptilodes albistriolatus (Zeller, 1877)
Michaelophorus hodgesi Gielis, 1999
Michaelophorus margaritae Gielis, 2006
Sphenarches anisodactylus (Walker, 1864)
Tribe **Exelastini** Gielis, 2000
Exelastis montischristi (Walsingham, 1897)
Exelastis pumilio (Zeller, 1873)
Tribe **Oxyptilini** Bigot, Gibeaux, Nel & Picard, 1998
Geina integumentum Gielis, 2006
Megalorhipida leucodactylus (Fabricius, 1794)
Tribe **Oidaematophorini** Bigot, Gibeaux, Nel & Picard, 1998
Hellinsia basalis (Möschler, 1890)
Hellinsia inquinatus (Zeller, 1873)
Hellinsia paleaceus (Zeller, 1873)
Adaina ambrosiae (Murtfeldt, 1880)
= *participatus* Möschler, 1890
Adaina simplicius (Grossbeck, 1917)
Adaina bipunctatus (Möschler, 1890)
Adaina praeustus (Möschler, 1890)
Adaina thomae (Zeller, 1877)
Adaina ipomoeae Bigot & Etienne, 2009

There are six species of *Gesneria* reported for Puerto Rico, five of which are endemic. *Gesneria pauciflora* Urb. was listed as a threatened species in 1995 due to its low distribution range and the potential threat of habitat modification resulting from natural disasters and human disturbances (USFWS 1995). This host species is restricted to the Maricao Commonwealth State Forest where it grows along streambeds on wet serpentine substrate (USFWS 1995). *Gesneria pauciflora* is a decumbent suffruticose plant that produces one to few nectar-producing flowers. Flowering of *G. pauciflora* occurs throughout the year with peak flowering time from August to October (USFWS 1998).

Studies of the pollination ecology and breeding systems of *Gesneria* L. (Gesneriaceae) in Puerto Rico revealed herbivory of *Gesneria citrina* Urb. flowers by plume moth larvae (Martén-Rodríguez and Fenster 2008). Larvae fed on immature stamens contained within the tubular yellow corollas. The plume moth species was unfortunately never identified. However, recent pollination and breeding studies by Pérez and Meléndez-Ackerman (in prep.) involving another Puerto Rican endemic, *Gesneria pauciflora* Urb., allowed for the collection of specimens suitable for identification and morphological description. Female moths oviposit on flower buds of *G. pauciflora* and larvae feed on developing flowers and fruits.

The adult plume moths reared from *G. pauciflora* were identified as *Postplatyptilia caribica* Gielis based on wing maculation and characters of the female genitalia. This species was originally described from two females, the holotype from Dominica and one paratype from Puerto Rico (Gielis 2006). In this paper we provide a diagnosis for identification of the adult moths, descriptions of both male and female genitalia, and descriptions of the final instar larva and pupa. Along with observations on the natural history and distribution of the moths and their larval hostplants, we discuss some of the morphological features of the adults and immatures with respect to potential relationships within the tribe Platyptiliini.

Material and methods

In September 2012, we noticed herbivory in flower buds that showed the following damage characteristics: translucent tracings inside of the corolla at the beginning of herbivory, the accumulation of frass (dark material inside corolla tube) due to consumption of anthers and pistil (but not the external layer cells of the corolla), the rupture of pedicels, and flower buds facing down. To identify the potential vector, damaged flowers (with larvae) were collected, placed in organza mesh bags, and hung on bushes. After one week, pupae were found suspended to the mesh and a week later adult moths had emerged within the bags. Larvae, pupae, and adults were collected, preserved, and mounted for identification.

Genitalia dissections were prepared following standard techniques of tissue maceration in heated 10% KOH and light staining with Chlorazol Black. Dissections were slide mounted in Canada balsam. Slides were photographed with a Zeiss Axiophot transmitted light microscope (40× objective) using Axiocam 3.1 camera software and a KS 400 3.0 digital imaging system. Images were taken at 2 to 3 different focal planes, stacked using Zerene Stacker, version 1.04, and assembled and adjusted for contrast with Photoshop CS5.5.

General setal nomenclature used in descriptions of immatures follows that of Stehr (1987). Specific terminology used in describing immatures is included in Matthews (2006). Voucher study specimens will be deposited in the McGuire Center for Lepidoptera, Florida Museum of Natural History, University of Florida [MGCL] and University of Puerto Rico, Mayaguez [UPRM].

Taxonomic treatment

Postplatyptilia caribica Gielis, 2006

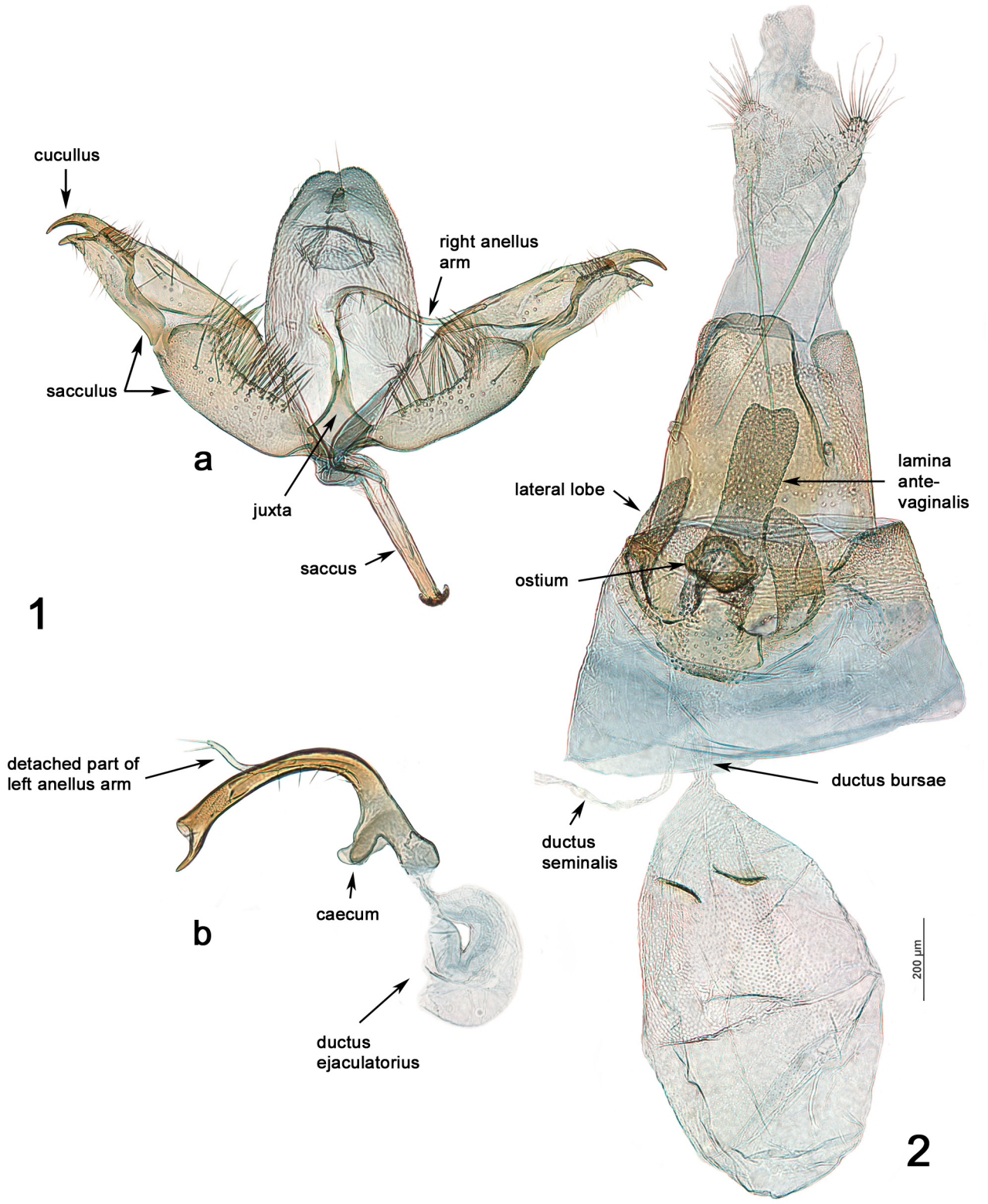
Diagnosis. Wingspan 10–14 mm. A full description is provided by Gielis (2006). This species can be distinguished from the other genera listed in Table 1, except *Lantanophaga* Zimmerman and *Stenoptilodes* Zimmerman, by the presence of both a distinct termen and white subterminal line of the forewing anterior lobe. The metathorax in *P. caribica* is dark brown dorsally and white laterally. It differs from *Lantanophaga* and *Stenoptilodes* in having both the dorsum of the metathorax and first abdominal segment dark brown as opposed to solid cream or white. Characters of the male and female genitalia further distinguish *P. caribica*. In males, the uncus is short and does not protrude beyond the tegumen anterior margin as in *Lantanophaga* and *Stenoptilodes*, the anellus arms are elongated, and the phallus terminates in a distinct spine. In females, *P. caribica* differs from *Stenoptilodes* in having a well-developed lamina ante-vaginalis and from *Lantanophaga pusillidactyla* by the absence of apophyses anteriores and distinct lateral lobes.

Male genitalia (Fig.1). Uncus simple, very short, originating anterad of distal margin of tegumen. Tegumen weakly bilobed. Valvae symmetrical. Cucullus acutely tapered to curved, moderately sclerotized pointed apex just exceeding sacculus. Sacculus bilobed. Basal part rounded, widest distally, bearing fringe of stout setae along mesal margin. Distal part of sacculus with mesal margin sclerotized, with 2 short dentate processes directed toward dorsal margin of valve and terminating in curved dentate process subtending apex of cucullus. Saccus extended as uniformly narrow arm, about half valve length, terminus forked into pair of recurved claw-like structures. Juxta triangular with pair of long narrow anellus arms. Anellus arms about three-fourths valve length and bearing few short setae spaced along length. Phallus strongly curved, with blunt opening and terminating ventrally in thorn-like process. Caecum well-developed. Widened cuticular part of ductus ejaculatorius curved with short narrow connection to base of phallus. Cornuti absent.

Female genitalia (Fig. 2). Papillae anales weakly sclerotized, setose. Apophyses posteriores slender, length 3–4× papillae anales. Apophyses anteriores absent. Ostium centrally placed, comprised of sclerotized labiate ring and concealed by overriding quadrate lamina ante-vaginalis. Lamina ante-vaginalis width about equal to ostium diameter but slightly constricted just posterad of ostium, length exceeding 3× width, extending midway to posterior margin of sternite VIII, terminus weakly bilobate. Ostium and lamina ante-vaginalis flanked by lateral lobes. Lobes with width similar to that of lamina ante-vaginalis; apically rounded, extending caudally to about middle of lamina ante-vaginalis. Antrum poorly defined except for overlying basal part of lamina. Ductus bursae narrow, width less than 0.5× antrum, length about equal to lamina and 0.5× that of corpus bursae. Ductus seminalis filamentous,

inception near middle of ductus bursae. Corpus bursae ovate, with paired elongate signa. Signa transversely aligned with corpus bursae, length similar to ostium diameter, margin finely serrate.

Material examined. Puerto Rico: Maricao: Maricao Federal Reserve, 18°09.337 N, 66°58.918 W, ±4m, 30.ix.2012, ex. *Gesneria pauciflora* growing in riparian habitats on serpentine exposed rocks at 596 masl, leg. Mervin Pérez and José Fumero (1 male, 2 females, 1 adult (without abdomen), 1 larva, 1 pupa).



FIGURES 1–2. Genitalia of *Postplatyptilia caribica*: **1)** Male, **a)** genitalia with phallus removed, slide DM 1674; **b)** phallus, same slide; **2)** female genitalia, slide DM 1676.

FIGURE 3. *Postplatyptilia caribica* life history: **a)** flower of larval hostplant, *Gesneria pauciflora*; **b)** stand of *G. pauciflora*; **c)** live adult, **d)** larva removed from *Gesneria* flower, **e)** pinned adult male, **f)** live pupa.

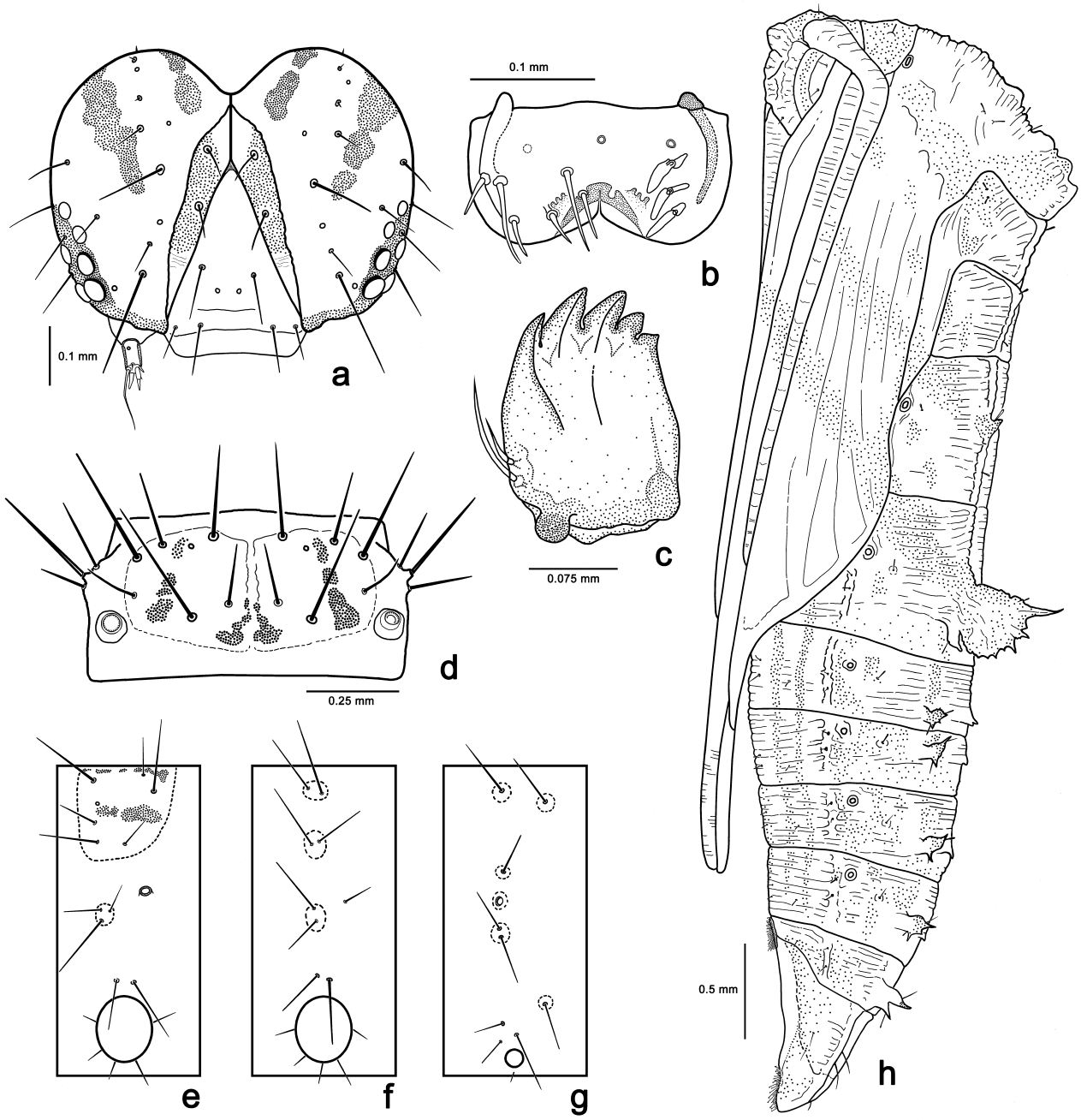


FIGURE 4. Morphology of *Postplatyptilia caribica* larva and pupa: **a)** larval head, frontal view; **b)** labrum, epipharyngeal surface on right; **c)** right mandible; **d)** dorsal view of T1; **e)** chaetotaxic map of segment T1; **f)** segment T2; **g)** segment A3; **h)** pupa, lateral view.

Distribution and phenology. Thus far, this species is only known to occur on Dominica and Puerto Rico. Prior to this study, two specimens were known as reported by Gielis (2006): Holotype: Dominica, Clarke Hall 11.iii.1965 W.W. Wirth, CG 3431 [USNM]; Paratype: Puerto Rico, Centro Vacacional Monte del Estado, nr Maricao, 650 m, 1–9.iii.1971 C.P. Kimball, GC 4878 [CG]. Specimens have been collected in March and September. Since the host blooms throughout the year (USFWS 1998) and larvae feed on flowers, this species is most likely continuous brooded, with population peaks correlating to the peaks in flowering.

Life history and immatures. Final instar larva (Figs. 3d, 4a-g). Length 6.26 mm (n=1). Body reddish tinged with cream middorsal and subdorsal longitudinal stripes. Primary seta clear to brownish tinges, simple with pointed apices, short to minute. Longest setae (D2), less than 0.5 mm. Pinnacula clear, very slightly elevated. Secondary setae absent.

Head: Adfrontal sclerite tapering to anteclypeus, dorsal 0.6× of sclerite darkly sclerotized. Setae AF1and AF2 on dark portion of sclerite. Pore AFa absent. Setae AF1, AF2, and C1 about equal or just less than clypeal width, C2 distinctly shorter than C1. Epicranium with 2 sclerotized, irregular blotchy bands, 1 bordering vertex, the other extending laterad from cervix to middle of epicranium near seta P1. Stemmatal area darkly sclerotized, with moderately sclerotized area extending mediad along antenna base and posterad to cervix. Seta A1 longest, about 1× clypeal width. Seta P1 length similar to F1 and C1. MD and P setae (1-3) and pores in clear area between bands. Labrum dorsally with 6 setae, M2 and L2 longest, about 0.3× labrum width. Labral notch obtusely v-shaped with median secondary fissure and v-shaped sclerotized epipharyngeal shield. Mandible 5-toothed, proximal and distal setae about 0.9× and 0.45× mandible width respectively.

Thorax: Prothoracic shield inconspicuous except for sclerotized spots along midline and between setae D2 and SD2. Spots along midline forming broken longitudinal line ending in a triangular patch posterad. Spot between D2 and SD2 elongate with one or two smaller spots anterad, also forming broken longitudinal line, more conspicuous than that on midline. Setae XD1, XD2, and SD1 aligned along anterior and with a pore between XD1 and XD2. Setae XD1, SD1, and D1 similar in length. Setae D1, XD2, and SD2 shortest. Lateral setae grouped together on slight rise anterad of spiracle, L3 length similar to XD1, L2 and L3 shorter. Spiracle slightly exserted, with darkly sclerotized peritreme and base. Segments T2-T3 with setae D1 and D2 close together, D2 slightly longer and posterolaterad of D1, both directed more or less anterad. Seta SD1 and SD2 likewise grouped together, pinacula slightly elevated but not forming distinct tubercle. Setae L1 and L2 close together, lengths similar. Seta L3 shorter, posterad of L1+ L2. Segments T1-T3 with two SV setae. Legs with 5 minute setae at coxa base. Tarsal segment and claw moderately sclerotized. Distal portion of tibial segment sclerotized laterad.

Abdomen: Segments A1-A8 with setae D1 and D2 separated, D2 slightly laterad of D1, lengths similar, pinacula slightly elevated. Setae SD1 shorter than D setae, directly dorsad of spiracle. Spiracles round, slightly exserted, peritremes dark, base (collar) light to moderately sclerotized on A1-A6, darker on A7-A8, diameter distinctly greater on A8. Setae L1 and L2 close together, with L1 dorsad and L2 longest. Seta L3 posterolaterad of L2+L2, closer to SV setae. Two SV setae present on A1 and A8, 3 on A2-A7. Seta V1 minute, mesad at proleg base on A3-A6. Prolegs elongate, length about 3× width, mesopenellipse with 8 crochets. Segment A9 with D1 and D2 as on A8 but closer together. Both SD1 and SD2 present on A9, close together and lengths similar, longitudinally aligned with spiracle on A8. Lateral setae as on A8, 1 SV and 1 V seta present. Segment A10 with anal plate D-shaped, 2 minute dark spots present at midline and longitudinal row of 2-4 spots between D and SD setae. Setae SD1 and SD2 laterad on plate, closer together than D1 and D2. Three minute setae along posterior margin of plate. Anal proleg moderately sclerotized laterad with about 8 short setae and 12 crochets.

Pupa (Fig. 4h). Length 6 mm (n=1). Angular with prominent dorsal ridge on T2-A3. Ridge on T2 forming scalloped keel on posterior third. Dorsal protuberances well-developed on abdominal segments, forming conspicuous foliate appendage on A3. Antenna, maxilla, legs, thoracic nota and abdominal segments transversely striate. Color beige with dark brown markings including three oblique lateral stripes. Posterior stripe including A3 appendage and extending across middle of forewing. Primary setae minute, clear. Longest seta not exceeding 0.125 mm. Secondary setae absent.

Head: Front projecting ventrad over clypeus. Dorsum of front darkly sclerotized. Both AF setae present, anterior seta mediad on small rise, posterior seta near antenna base. Venter of front, clypeus and pilifers strongly crenulate. Seta C1 minute. Labial palpus smooth. Gena rugose, with longitudinal furrow at middle; genal seta present but very minute. Glazed eye-piece darkly sclerotized, sculptured eye surface similar to that of gena, with 2 setae present. Maxilla base exposed to middle of A2, apex exposed between terminus of T2 legs for about 0.25 mm. Antenna extending to middle of A3, about 0.75× forewing length; posterior half of scape, pedicel, and basal five flagellomeres also darkly sclerotized.

Thorax: Pronotum darkly sclerotized as on head except for beige spot in place of D1 seta; seta SD1 present at lateral apex of sclerite; setae D1 and D2 absent in specimen examined; remaining setae not found in specimen examined; dorsal midline (suture) not sclerotized; foreleg extending to A3 posterior margin, right and left leg joined posteriad of exposed maxilla base; longitudinal ridge present on anterior half. Mesonotum with subdorsal ridge, ridge closer to midline anterad and posterad; area dorsad of ridge dark to moderately sclerotized; ridge forming distinct keel at posterior third, anterior half of keel sclerotized across ridge and laterad on mesonotum; seta D1 anterad of ridge, D2 on ridge; seta D1 just posteriad of small bump on ridge near middle; area laterad of ridge on anterior 0.67× of mesonotum cream colored and transversely striate; setae SD1 and SD2 close together within

light lateral area; SD2 transversely aligned with D1; subdorsal setae slightly longer than D setae; forewing extending to anterior margin of A5, with dark markings as noted above, and with stripe from A3 crossing at anal angle; midleg extending to middle of A7. Spiracle on T2 slightly elevated, surrounded by light area but with peritreme moderately sclerotized. Metanotum with subdorsal ridge aligned with T2 keel; seta D1 anterad on ridge; anterolateral angle with brown sclerotized area (of oblique stripe) extending to posterolateral angle and with lighter area near middle; setae SD1 and SD2 within dark area at anterolateral angle; hindwing extending to 0.33× of A2; hindleg beneath T2 leg, tip just exceeding T2 leg tip in ventral aspect.

Abdomen: Segments A1-A3 with dorsal ridge as noted above. Segment A1 with D setae on ridge, D1 near anterior margin, D2 0.67× from anterior margin; area surrounding setal bases not noticeably sclerotized; seta SD1 present at anterolateral angle; some moderately sclerotized light brown areas laterad near hindwing (part of oblique stripe). Segment A2 with D setae on ridge at about 0.45× (D1) and 0.80× (D2) from anterior margin; seta D1 anterad on darkly sclerotized dentate tubercle; seta D2 arising from ridge; anterolateral area with brown sclerotized triangular patch (of oblique stripe); spiracle near apex of hindwing slightly elevated but not distinctly sclerotized; seta SD1 dorsad of spiracle; distinct small dark brown spot posteriad of spiracle (separate from oblique stripe); posterolateral angle with brown area included on third oblique stripe; light brown diffuse band dorsad and slightly posteriad of D1 tubercle, extending as an arc across dorsum. Segment A3 with dorsal ridge anterad of appendage light; area dorsad of ridge moderately sclerotized with small dentate middorsal tubercle subtended by brown middorsal stripe; seta D1 positioned along anterior margin of A3 appendage; D2 on smaller lobe arising from posterior margin of appendage; appendage dark to moderately sclerotized except for D2 lobe, sclerotized area extending to anterolateral angle of A3; appendage also subtended by brown stripe; anterior (D1 part) with 3-5 distinct spikes, anterior spike attenuate; spiracle and dark spot posteriad of spiracle as on A2; setae L1 and L2 present on small elongate rise laterad of dark spot; part of a subventral brown stripe present at posterior margin (part concealed by wing, continued on A4). Segments A4-A7 with middorsal dentate tubercle transversely aligned with D1+D2 tubercles; middorsal tubercles only lightly sclerotized; diffuse brown middorsal stripe on A4, incomplete and faded on A5 and A6; setae D1 and D2 on combined darkly sclerotized tubercles, each with one anterior and one posterior directed point or tooth and one smaller central point; setae D1 and D2 subtending anterior and posterior points respectively and likewise directed anterad and posterad; an irregular brown longitudinal stripe anterad and posterad of tubercles and coalescing with brown lateral markings; seta SD1 dorsad of spiracles, within brown areas except on A4 where it is preceded anterad by small light brown spot; area surrounding spiracles light but spiracular peritremes darkly sclerotized; spiracles slightly elevated; setae L1 and L2 on elongate lightly sclerotized ridge; 1 or 2 minute dark spots also present on ridge; 2 thin brown subventral longitudinal lines present with seta L3 on light area between lines; 2 SV setae present; midventral area diffuse light brown. Segment A8 with D1+D2 tubercles basally fused, light except for dark brown tubercle apices; setae D1 and D2 basad of sclerotized part of tubercles; without middorsal tubercle; middorsal area and lateral part of A8 mostly brown; seta SD1 present; spiracular scar obscure; seta L1 and L2 on light lateral ridge; seta L3 near posterior margin of segment. Segment A9 light brown dorsally with strong (light-colored) ridge; darker laterad and ventrad; seta D1 about 0.6× from anterior segment margin, on ridge and with sclerotized pinaculum; with 2 lateral setae. Dorsum of A10 with one D seta on ridge; venter with anterior and posterior hamuli present, hooked, lengths variable.

Discussion

Identification of *P. caribica* was established by comparison with the original description and illustrations provided by Gielis (2006). This original description, as in many Neotropical species, is based on few specimens, in this case two females from different and distant islands in the Caribbean, Dominica and Puerto Rico. As more material becomes available, potential morphological and genomic differences in disjunct populations and potential host races should be examined. Our reared specimens are consistent with the written description and holotype image in Gielis (2006). However, we note some differences in the line drawing of Gielis versus the image presented from one of our dissections. Principal among these is the origin of the ductus bursae which appears to wrap around the ostium ring in Gielis' illustration whereas it is obscured in our preparations. This is due in part to the lamina ante-vaginalis which covers the ostium. Likewise the lamina ante-vaginalis is obscured by scaling depicted in Gielis'

illustration whereas our descaled preparation shows the bilobed terminus of this structure. Of particular interest are the lateral lobes which flank the ostium/lamina ante-vaginalis complex. The shape and relative length of these lobes, compared with that of the lamina ante-vaginalis and the sclerotized, heavily scaled posterior margin of segment VII, appear to be diagnostic at the species level.

Such lateral lobes can be found in several *Postplatyptilia* species as illustrated by Gielis (2006) including *P. antillae* Gielis, *P. nebuloarbustum* Gielis, and *P. flinti* Gielis. Likewise, similar lobes appear in *Lantanophaga minima* (B. Landry and Gielis). Other similarities between species of *Postplatyptilia* and *Lantanophaga* include the extended saccus of males in *P. carchi* Gielis, *P. flinti*, *Lantanophaga minima*, and *L. pusillidactyla*. In the latter species the apex of the saccus is recurved and forked as in *P. caribica*.

The genus *Postplatyptilia* is entirely Neotropical in distribution and includes 38 species (Gielis 2003, 2006). Including *P. caribica*, larval hostplant associations are known for only four of these species. Along with *Gesneria,* host genera include *Lantana* [Verbenaceae] (Gielis 1993) and *Hyptis* [Lamiaceae] (Landry 1993). Immature stages have not been previously described for *Postplatyptilia* and are unknown with the exception of preserved specimens of *P. huigraica* Landry and Gielis from the Galapagos Islands, Ecuador.

The larva of *P. caribica*, unlike *P. huigraica* lacks secondary setae. The absence of secondary setae in *P. caribica* may be associated with internal feeding within flowers, as seen in larvae of *Lantanophaga pusillidactyla* (Walker). Characters present in both species include a dark sclerotized spot on T1 dorsal of seta SD2 and a darkly pigmented stemmatal area of the head. The latter character also occurs in a few other genera of the tribe Platyptiliini such as *Anstenoptilia* and *Amblyptilia* (Matthews 2006). Larval characters of *P. caribica* which are diagnostic at or above the tribal level include the adfrontal sclerite extending to the anteclypeus, the absence of pore AFa, 5-toothed mandible with both setae present, secondary median fissure of the labrum, and 6 labral setae present.

The pupa of *P. caribica*, as in various genera of Platyptiliini and Oxyptilini, has an enlarged A3 dorsal appendage and well-developed keel of the mesothorax. Like pupae of *Amblyptilia pica* (Walsingham) and *Anstenoptilia marmarodactyla* (Dyar), it also has distinct oblique stripes extending across the wing from the base of the A2 and A3 dorsal processes, suggesting potential relationships of these genera within the Platyptiliini.

Larvae of *P. caribica* feed concealed within the pre-anthesis corollas of the host, consuming the immature anthers. A similar situation occurs in *Stenoptilodes taprobanes* when feeding on *Penstemon* flowers (Matthews 2006). Flower feeding in general is a common habit of Pterophoridae, with about 53% feeding on reproductive structures (Matthews and Lott 2005). Along with possible protective benefits of the corolla (e.g., dehydration, parasitoids), immature anthers and pollen are a rich source of nutrients, especially amino acids and fatty acids (Stanley and Linskens 1974).

Preliminary data suggest that the rate of flower herbivory in *G. pauciflora* is moderate (less than 30%) (Pérez and Meléndez-Ackerman, in prep.). Further studies will investigate the role of this native herbivore in the reproductive success of *G. pauciflora* by monitoring the flowering and fruiting phenology of the plant and how these relate to long-term reproductive success and the dynamics of the herbivore population.

Recent field expeditions have uncovered new patches of *G. pauciflora* within the Maricao Reserve, and most of these patches show signs of herbivory by *P. caribica.* Thus, this herbivore seems to occur throughout the distribution range of *G. pauciflora*. A next step in our studies is to identify whether or not *P. caribica* is the same plume-moth species attacking *G. citrina* or if herbivory of the other *Gesneria* on the island is by different species of Pterophoridae and/or other species of Lepidoptera. Ongoing studies in Puerto Rico with *G. pauciflora* will help us understand more about the natural history of *Postplatyptilia caribica* and the factors that lead to its restricted distribution.

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