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Description of three new species of *Galethalea* Butler, 1876 (Lepidoptera: Erebidae), with comments on the genus

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Abstract

Galethalea portoricensis **sp. nov.** (Holotype male deposited in SMNS: Puerto Rico, 20.iii.1974, W. Plathsr. leg.), *G. wolfei* **sp. nov.** (Holotype male deposited in LACM: Colombia, 1.iv.1995, K. Wolfe et al. leg.), and *G. machadoi* **sp. nov.** (Holotype male deposited in SMNS: Ecuador, 23.x.2000, G. Brehm leg.) are described, all known only from males. *G. machadoi* **sp. nov.** and *G. wolfei* **sp. nov.** seem to be closely related to *G. davidi* Dognin, 1889 **resur. stat.**, while *G. portoricensis* **sp. nov.** seems closer to the type species, *G. pica* (Walker, 1854). The three new species, plus *G. davidi,* are illustrated in habitus and genitalia, and comments on the genus *Galethalea* are provided, along with a key to the species currently placed in this genus.

Key words: *Eucereon*, *Nelphe*, Neotropical, revalidated status, taxonomy

Introduction

Butler (1876) erected *Galethalea* to include three species: *G. pica* (Walker, 1854), *G. tigrata* (Herrich-Schäffer, [1855]), and *G. confinis* (Herrich-Schäffer, [1855]). These species had been previously placed in *Nelphe* Herrich-Schäffer, [1858] (Herrich-Schäffer, [1850–1858]).

Kirby (1892) synonymized *Galethalea* with *Nelphe*, and Hampson (1898) considered them both synonyms of *Eucereon* Hübner, [1818]. Subsequent authors (Zerny 1912; Draudt 1915) followed this action. Travassos (1952) resurrected *Galethalea* including in it only its type species. This author defined the genus by the following characters: heavily sclerotized, though rudimentary, valvae; paired projections between the tegumen and the uncus; a tubercle at each anal papilla, and subdivided bursa in the female. However, because of the resurrection of the genus with only one species, it remained unclear whether these characters were generic or specific.

During visits to the Staatliches Museum für Naturkunde Stuttgart (SMNS), Museum Natural d'Histoire Naturelle (MNHN), Los Angeles County Museum of Natural History (LACM), and to the National Museum of Natural History (NMNH), three new species were discovered, and are here described in *Galethalea.*

Material and methods

Specimens were dissected following methods detailed in the literature (Winter 2000), with some modifications. The genitalia were either prepared in slides (specimens from the BMNH) or kept in vials with glycerine. They were photographed at the stereomicroscope with an attached camera. Terminology follows Klots (1970), except for the following abbreviations: abdominal tergites and sternites are referred to as T1 for the first tergite and S2 for the second sternite, and so on; forewings and hindwings are abbreviated as FW and HW, respectively; resurrected status is abbreviated to resur. stat.

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Results and discussion

Delimitation of *Galethalea*

There is an obvious proximity between *Galethalea* and *Nelphe*, evidenced by external characters such as FW and abdominal patterns. The most obvious character uniting the two genera are the two elaborated projections between the tegumen and the uncus. However, this character is also found in some species of *Heliura* Butler, 1876 (*e.g.*, *H. zonata* Druce, 1905), and *Eucereon,* including its type species, *E. archias* (Stoll, 1790). It is unclear, though, whether they are homologous in all of these species, because the projections seem to arise either from the tegumen, the intersegmental membrane 9–10, or the base of the uncus, depending on the species. Similar projections, probably analogous, are found in many species of the *Euchaetes* group, as shown in DaCosta *et al.* (2006).

Galethalea pica seems to be a highly derived species, with many autapomorphic genitalic traits. Its FW pattern, though, is quite distinctive, and is shared by the three new species here described, and by *G. davidi* **resur. stat.** Other species also have a very similar habitus, but because they could not be studied in detail at the moment, they are left in their current taxonomic position until further studies can be made. These are: *Eucereon ockendeni* Druce, 1906, *E. coenobitum* (Möschler, 1886), *E. exile* Strand, 1912, *E. tigrisoma* Rothschild, 1912, *E. consorta* Schaus, 1910, *E. picoides* Rothschild, 1912, *E. cyneburge* Schaus, 1924, and *Nelphe tigrata* (Herrich-Schäffer, [1855]). Future studies on the systematics of *Galethalea, Eucereon,* and *Nelphe* are required to ascertain the limits of each of these genera.

Galethalea pica is not redescribed here, for it has been treated in detail in Travassos (1952).

Key to the species of *Galethalea*

1. All antennal flagellomeres black. Metascutellum black. FW predominantly black. HW partially hyaline, devoid of scales; hyaline area bearing minute setae or no setae at all. S2–6 white 2

1'. Antennae predominantly black, subproximal flagellomeres white dorsally. Metascutellum black laterally and yellow or white dorsally. FW predominantly white. Hyaline aspect of HW given by white, almost transparent, scales. Truly hyaline area absent. S2–6 white ventrally and black laterally 4

2 (1). Medial white spot at the subdistal portion of discal cell of FW "T"-shaped (shown as letter "a" in Fig. 1). Proximal portion of cell CuA2-1A of FW with a white spot (shown as letter "b" in Fig. 1). Hyaline area of HW completely devoid of scales or setae, occupying part of the discal cell and of cells M2-M3, M3-CuA1, CuA1-CuA2, CuA2-1A, and 1A-2A 3

2'. Medial white spot at the subdistal portion of discal cell of FW "I"-shaped. Proximal portion of cell CuA2-1A of FW black. Hyaline area of HW restricted to the proximal portion of cell CuA2-1A. . . . . *G. machadoi* **sp. nov.**

3 (2). Frontoclypeus black ventrally and white dorsally. Scape predominantly white. Internal margin of FW always with a small subproximal white spot. Post-discal white spots in cells Sc-Rs to CuA1-CuA2 connected, uninterruptedly . . . . . *G. davidi*

3'. Frontoclypeus black, except for very few white scales near the vertex, laterally. Scape predominantly black. Internal margin of FW black, or with a small white spot. Post-discal white spots in cells Sc-Rs to CuA1-CuA2 unconnected, interrupted by black scales in vein M2. . . . . *G. wolfei* **sp. nov.**

4 (1'). Labial palpi black and white. Subdistal antennal flagellomeres conspicuously white dorsally. Patagia predominantly white. T8 predominantly white . . . . . *G. portoricensis* **sp. nov.**

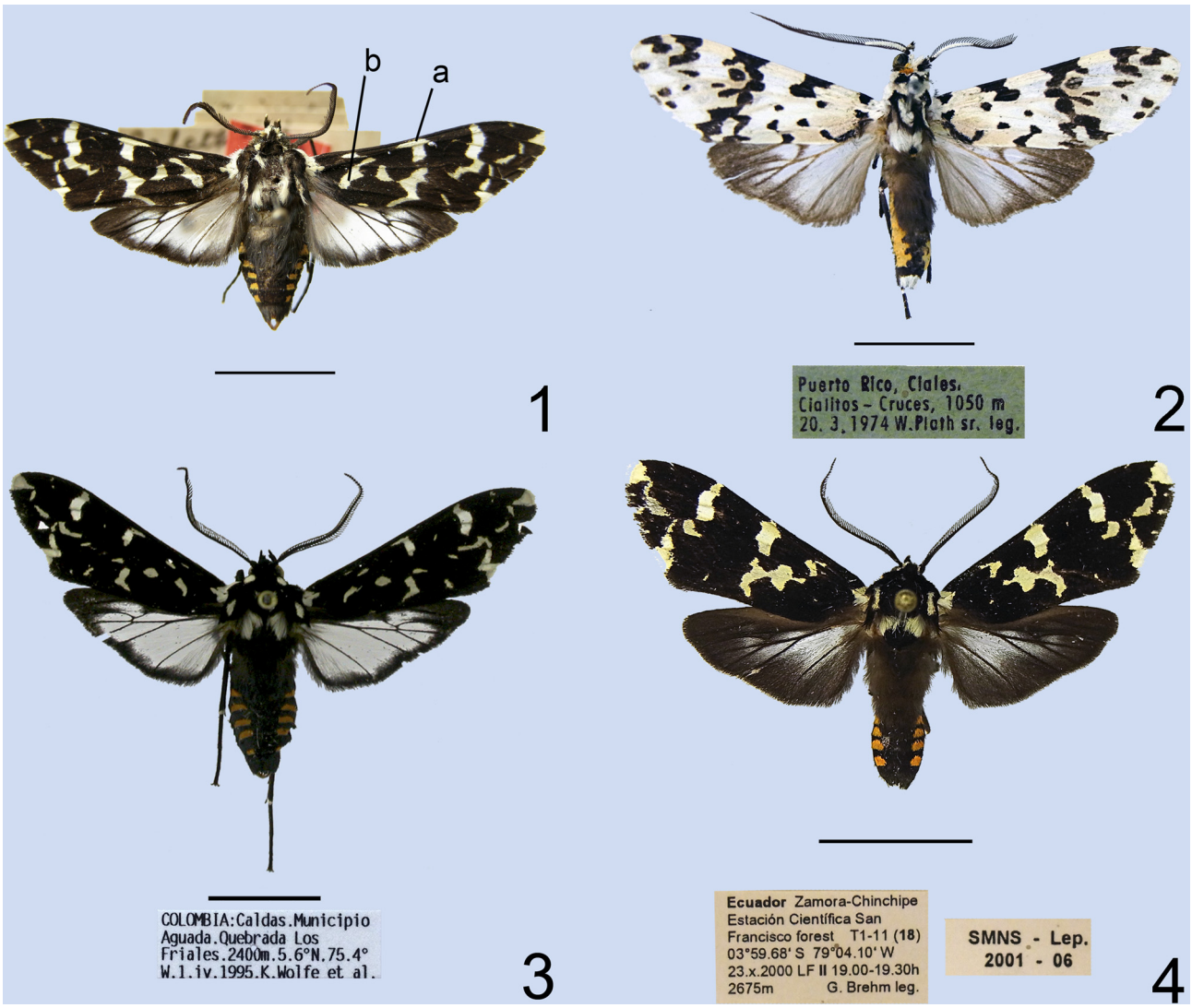
4'. Labial palpi black. Subdistal antennal flagellomeres with very few white scales dorsally, or entirely black. Patagia predominantly black. T8 entirely black . . . . . *G. pica*

Galethalea davidi Dognin, 1889, resur. stat.

(Figures 1, 8–11)

Galethalea davidi Dognin, 1889: 14. Syntype male: ECUADOR, Loja, August (NMNH) [photograph examined].
Nelphe davidi (Dognin, 1889); Kirby, 1892: 172; Kirby, 1892: 904.
Eucereon davidi (Dognin, 1889); Hampson, 1898: 490.
Eucereum davidi (Dognin, 1889); Zerny, 1912: 139; Draudt, 1915: 179, pl. 25, row e.
Eucereum davidi clarius Draudt, 1915: 179.

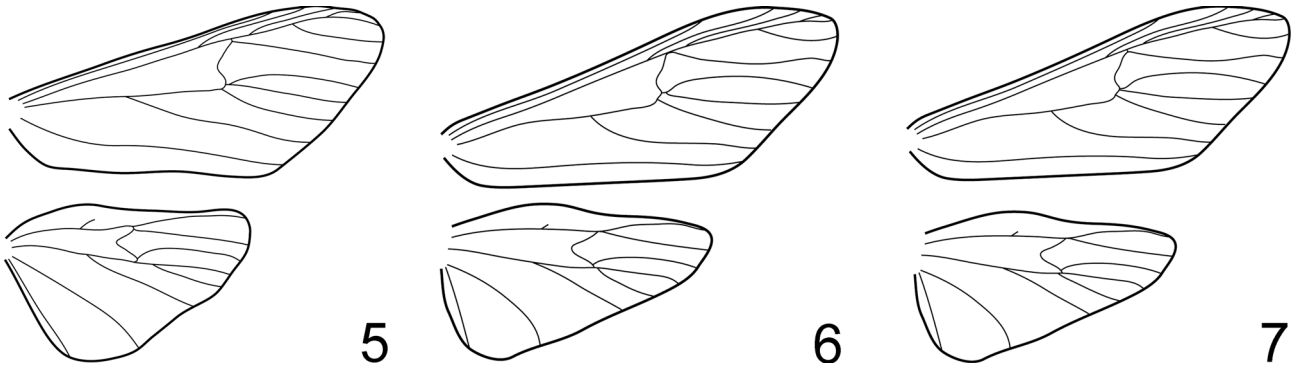
Diagnosis ♂**.** Antennae black, except for the lateral surfaces of the scape, white. Frontoclypeus black ventrally and white dorsally. Mesoscutellum with three white markings. Metascutellum black. FW predominantly black, with various white spots. HW partially hyaline. T8 black.



FIGURES 1–4. Habitus of *Galethalea* species, dorsal views. 1. syntype of *Galethalea davidi*; 2. holotype of *G. portoricensis* **sp. nov.**; 3. holotype of *G. wolfei* **sp. nov.**; 4. holotype of *G. machadoi* **sp. nov.** Scale bars = 10 mm.

Redescription ♂. Head. Proboscis light brown. Palpi three segmented, reaching vertex. First and second segments black. Third segment approximately three times longer than wide, black, except for the dorsal apical surface, white. Antennae black, except for the scape, with few white scales anteriorly and posteriorly. Pectination starting in the second flagellomere. Frontoclypeus as wide as long, black ventrally and white dorsally; ventral half smooth-scaled, dorsal half rough-scaled. Vertex mainly black, white scales laterally. Occiput and ocular ring black. Cervical scales orange. **Thorax**. Mesothorax predominantly black, with three white areas, one anterior and two posterior, parallel. Metascutellum black. Patagia black, except for the external margin, white. Tegulae predominantly black, white scales at the anterior margin and near the external margin of the posterior portion. Epimera and episterna with long black scales. Ventral scales on the first pre-episternum black, like the surrounding scales. Anterior surface of the forecoxae predominantly black proximally, distal margin white. Lateral surface black. Forefemora black with a white proximal end, and two white mid-ventral spots. Foretibiae black with two white spots at the distal end. Foretarsi black. Midcoxae white anteriorly and laterally. Midfemora as forefemora, but with the white ventral spots more conspicuous. Midtibiae predominantly black, with a white dorsal subproximal area, and white distal end; spurs white. Midtarsi black, except for the distal end of the first segment, white. Hindcoxae as midcoxae. Hindfemora as the others, but with the distal end white. Hindtibiae black with white distal end and white spurs. Hindtarsi predominantly black, first segment white at both ends, and second segment white at the posterior end. *FW*. Entirely scaled. Axillary scales white. Dorsal surface predominantly

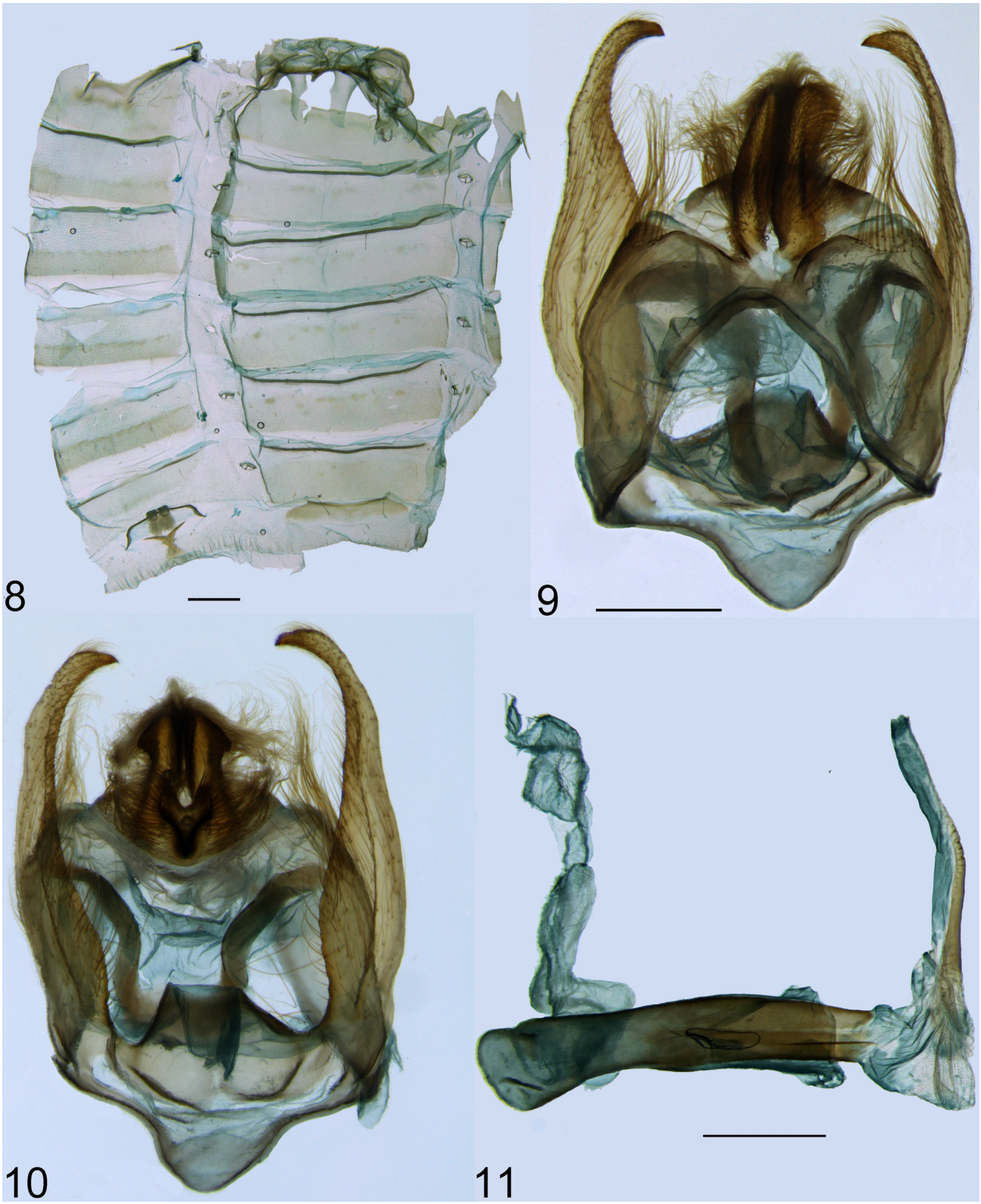
covered by black scales. Pattern of the dorsal surface of the forewings consisting of various white spots. Fringe of the external margin with black scales, except for the area corresponding to cells CuA1-CuA2 to CuA2-CuP and for the apex, with white scales. Pattern of the ventral surface simpler than that of the dorsal surface, composed of black scales and the following white areas: the distal portion of the discal cell, subproximal portion of cells R5-M1 and M1-M2, apex, subdistal portion of cell M3-CuA1, and distal margin of cell CuA1-CuA2. Venation as in Fig. 7: R1 branching before the transversal vein, and R2 after it. M1 branching either beside the transversal vein, or together with it, with a short branch connecting both to the R stalk. M2 and M3 branching very near each other, without a common stalk. *HW*. Margins and veins with black scales, part of the central portion completely hyaline. Discal cell predominantly scaled, distal portion of the posterior half hyaline. Subproximal portion of cell M1-M2 partially hyaline, as well the proximal portions of cells M2-M3 and M3-CuA1. Cells CuA2-CuP and CuP-1A entirely hyaline, except for the external margin. Cell 1A-2A covered only by long brown scales. Venation as in Fig. 7: Sc rudimentary, but distinguishable. M3 and CuA1 not stalked. **Abdomen.** T1–2 black. T3–7 predominantly black, with two latero-posterior orange spots. T8 black. Hair-like scales present on T1–4. S2–7 whitish ventrally and black laterally. S8 black. Coremata present on ventral intersegmental membrane 7–8, but reduced in size. Anterior margin of T8 with two small sacular projections. **Male genitalia.** Ejaculatory duct almost as long as the aedoeagus, inserted dorsally. Coecum rounded. Aedoeagus straight, approximately the same width throughout. Vesica as long as the aedoeagus when fully everted, mostly membranous, with a longitudinal sclerotization on the inner dorsal surface. Saccus developed, slightly asymmetrical; posterior margin somewhat pointed. Tegumen composed of two parallel plates connected by the posterior margin, which bears long setae laterally. Two dorsal projections arising from the intersegmental membrane 9–10, with apex somewhat pointed, hiding the uncus in dorsal view. Dorsal surface of the projections densely setose, ventral surface glabrous. Base of the uncus much wider than its lobe, with setae dorsally and laterally. Lobe of the uncus not compressed laterally or dorsally, with dorsal setae, longer than the dorsal projections of the tegumen in lateral view; apex pointed. Valvae subequal, exceeding the dorsal projections of the tegumen, with a single lobe. Most part of the inner and ventral surface of the valvae covered by setae, external side covered by shorter setae at the distal end of the valvae; apex sharp. Transtilla and juxta heavily sclerotized, the former bearing setae laterally, and the latter connected with the valvae.



FIGURES 5–7. Wing venation of *Galethalea* species. 5. *G. portoricensis* **sp. nov.**, wing venation; 6–7. *G. wolfei* **sp nov.**, types of wing venation.

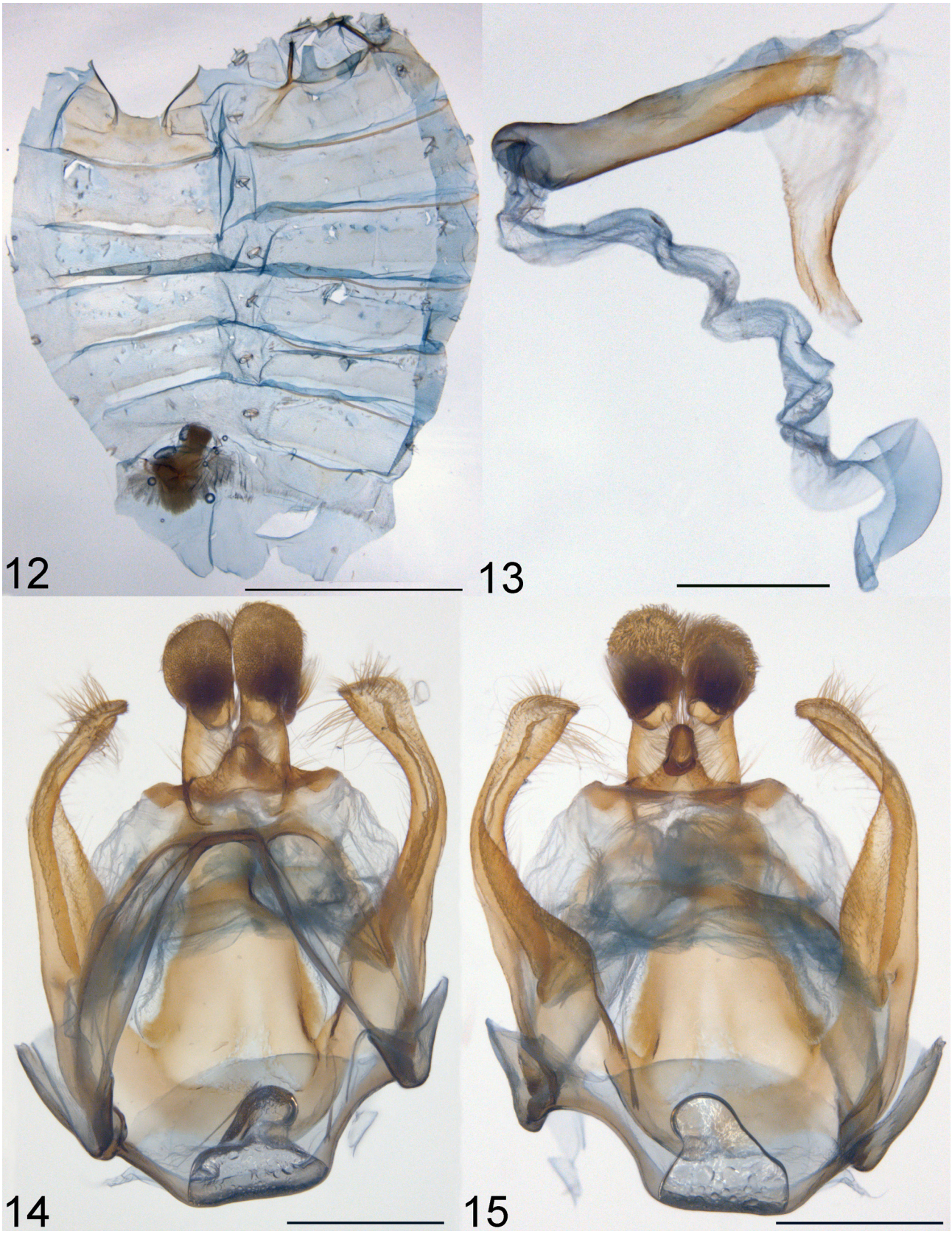
Material examined (12 ♂). BOLIVIA, Rio Songo, 750 m, Coll. Fassl (BMNH), 1 male; Chaco, Garl[epp] (BMNH), 1 male; **ECUADOR**, Napo Prov., km 23, via Santa Barbara-La Bonita, elev. 2400 m, 7–9 April 1986, Stuart McKamey (MZSP), 1 male; **PERU**, Oconeque, Carabaya, SE Peru, 7000 ft., G. Ockenden, J. Joicey bequest Brit. Mus. 1934-120 (BMNH), 3 males; idem, dry s., vii.1904, G. Ockenden, Rothschild bequest B. M. 1939-1 (BMNH), 5 males; Agualani, Carabaya, 9000 ft., viii.[19]05, dry s., G. Ockendeni, Rothschild bequest B. M. 1939-1 (BMNH), 1 male; Huancabamba, Cerro de Pasco, 6–10000 ft., Böttger, Rothschild bequest B. M. 1939-1 (BMNH), 1 male.

Remarks. *Galethalea davidi* was described from an undetermined number of specimens, which is why the type specimen kindly photographed by Donald Harvey is here treated as a syntype. In his description, Dognin (1889) mentioned a similarity between this species and *Nelphe confinis*, especially because of the abdomen. In fact, this is true of all species currently placed in *Nelphe*, and many of the species placed in *Eucereon*, some of which were discussed in the introduction of this paper.



FIGURES 8–11. Abdominal pelt and genitalia of *Galethalea davidi* (male from Napo, Ecuador). 8. abdominal pelt; 9. genital capsule, dorsal view; 10. same, ventral view; 11. aedoeagus, lateral view. Scale bars = 1 mm.

It is unclear whether the poorly developed coremata are characteristic of the species, or if this is due to a developmental restraint caused by the low pyrrolizidine alkaloid content of the foodplant available to the larva, similarly to what Davenport & Conner (2003) described for another arctiid.



FIGURES 12–15. Abdominal pelt and genitalia of *G. portoricensis* **sp. nov.** (male from Puerto Rico). 12. abdomen; 13. aedoeagus, lateral view; 14. genital capsule, dorsal view; 15. same, ventral view. Scale bars = 1mm, except for the abdomen, = 5 mm.

***Galethalea portoricensis* sp. nov.**
(Figures 2, 5, 12–15)

Holotype male, PUERTO RICO, Ciales, Cialitos – Cruces, 1050 m, 20.iii.1974 (W. Plathsr. leg.); Dissection number 3416 (L. Pinheiro) kept in vial (SMNS). **Two paratypes.** PUERTO RICO, Ciales, 3200 ft., 7 km south, 2.ii–12.iii.[19]73, EL light (Plath sr.) (SMNS), 1 male; Naguabo, Sierra de Luquillo, Pico del Oeste, 12.viii.1985, B. Laianne & Casseu leg.(MNHN), 1 male.

Diagnosis ♂. Antennae predominantly brown, with white scales on the subproximal flagellomeres and at the tip. Frontoclypeus black ventrally and white dorsally. Mesoscutellum predominantly white. Metascutellum brown with sparse orange scales. FW predominantly white, with various brown spots. HW entirely scaled. Posterior margin of T8 white.

Description ♂. Head. Proboscis light brown. Palpi three segmented, reaching vertex. First segment black with white distal margin. Second segment black proximally and white distally. Third segment twice longer than wide, black, except for the apical surface, white. Scape predominantly white, posterior surface black. Pedicel white. Most flagellomeres black, subproximal flagellomere white dorsally. Pectination starting in the first flagellomere. Frontoclypeus almost as wide as long. Ventral portion whitish medially and black laterally; dorsal portion white. Vertex white with few black scales medially. Occiput and ocular ring black. Cervical scales orange. **Thorax**. Mesothorax predominantly white, black dorsally in two longitudinal markings. Metascutellum black with few orange scales. Patagia predominantly white, with dark brown scales anteriorly on external lateral side and dorsally near posterior end. Tegulae predominantly white, posterior and external margins black. Epimera and episterna with long black scales. Anterior surface of forecoxae predominantly brown, white at proximal and distal ends. Forefemora white proximally and black distally. Foretibia predominantly white, with two black markings, one proximal, and the other one subdistal. Foretarsi predominantly brown, two proximal segments with white proximal and distal margins; third segment white at the proximal margin. Midcoxae white ventrally and laterally. Midfemora predominantly white, with two black markings, one at the proximal margin, the other one mid-ventral. Midtibia black medially and white at the proximal and distal ends; spurs white. Midtarsi as foretarsi. Hindcoxae and hindfemora as the respective segments of midlegs. Hindtibia black with white distal margin and spurs, and white ventral surface of the proximal margin. Hindtarsi predominantly black, first three segments white at both extremities, and fourth segment white at the distal margin. *FW.* Entirely scaled. Axillary scales white. Dorsal surface predominantly covered by white scales, with a complex pattern on the dorsal surface, consisting of various black spots. Fringe of the external margin with white scales, except for the area corresponding to the junction of the internal and external margins, and for the cell R5-M1, with black scales. Pattern of the ventral surface similar to that of the dorsal surface, but with the distal black markings coalesced. Venation as in Fig. 5: R1 branching before the transversal vein, and R2 after it. M1 branching together with the transversal vein, with a short branch connecting both to the R stalk. M2 and M3 branching from the transversal vein without a common stalk. *HW.* Margins and veins with black scales, central portion white. Discal cell entirely white. Proximal portions of cells M1-M2 to CuA2-CuP with white scales, these cells largely black. Cell CuP-1A with brown scales near external margin, and white scales at the rest of its surface, interspersed with long, more sparse brown scales. Cell 1A-2A densely covered by long brown scales, with white small scales in between. Venation as in Fig. 5: vein Sc present, veins M3 and CuA1 with a short common stalk. **Abdomen.** T1–2 brown; T3–7 predominantly brown with two latero-posterior orange/yellow spots; T8 brown with white scales posteriorly. Hair-like scales on T1–4. S2–7, S8 brown. Anterior margin of T8 with two small sacular projections. Coremata present on ventral intersegmental membrane 7–8. **Male genitalia.** Ejaculatory duct longer than aedoeagus, inserted dorsally. Coecun rounded. Aedoeagus approximately the same width throughout. Vesica shorter than aedoeagus when fully everted, mostly membranous. Subterminal region of vesica slightly sclerotized. Saccus little developed, asymmetrical. Tegumen composed of two oblique plates connected by the posterior margin. Intersegmental membrane between tegumen and uncus with two dorsal projections, heavily sclerotized, with rounded apex densely covered by setae. Base of the uncus sclerotized, much wider than its lobe, short and turned ventrally. Both the base and lobe of the uncus with setae. Valvae exceeding uncus, with a single lobe, with the apex more or less rounded and setae concentrated mainly near the apex. Transtilla slightly sclerotized. Juxta almost as sclerotized as the valvae, longer than wide.

Etymology. The name is a reference to the only known locality where this species occur.

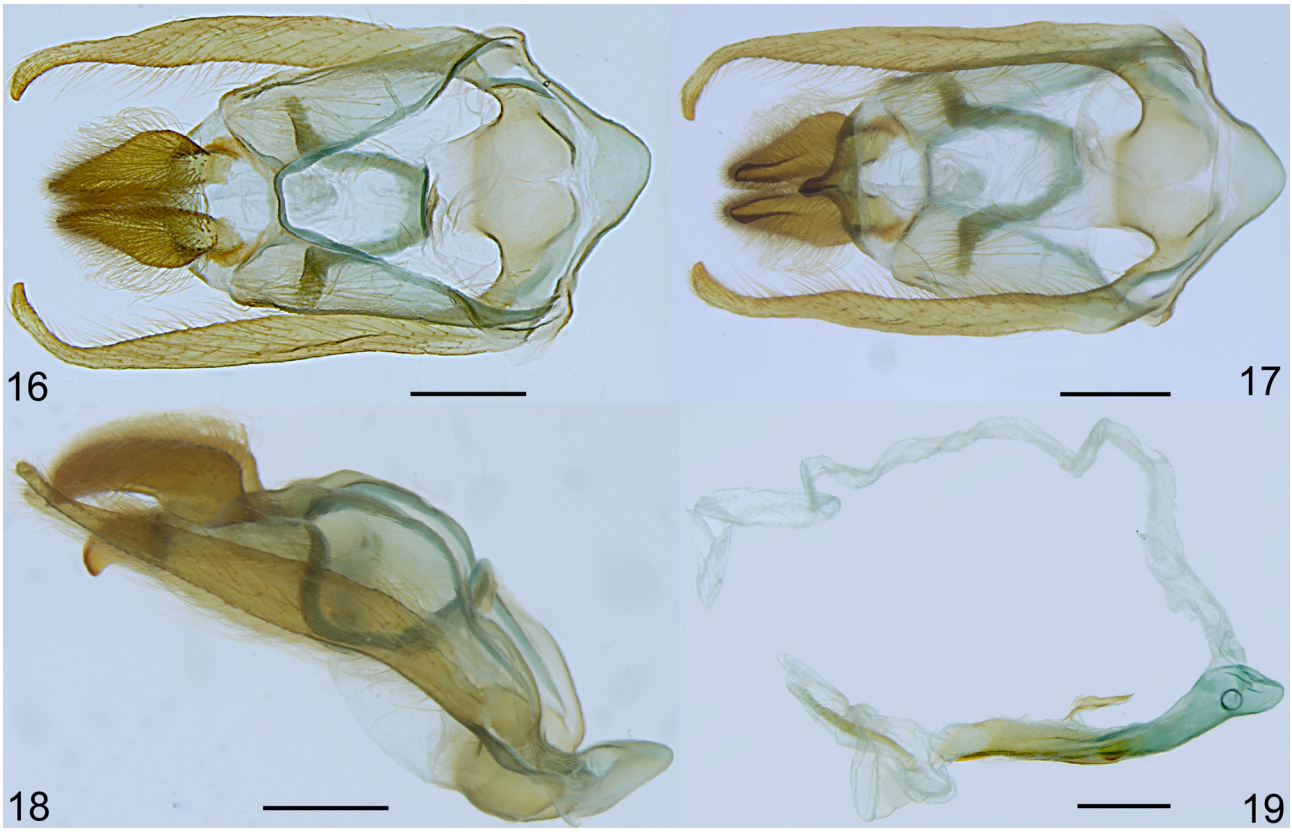
Remarks. *Galethalea portoricensis* **sp. nov.** shares with *G. pica* the predominance of white scales on the FW,

as opposed to the predominance of black scales on the other species placed in the genus. Both species also share the white proximal end of the antennae, black in all other *Galethalea* species. The white posterior margin of the T8 is unique to *G. portoricensis* **sp. nov.**

***Galethalea wolfei* sp. nov.**
(Figures 3, 6–7, 16–19)

Holotype male, COLOMBIA, Caldas, Municipio Aguada. Quebrada Los Friales, 2400m, 5.6°N, 75.4°W, 1.iv.1995, K. Wolfe *et al.* (LACM). **Six paratypes.** COLOMBIA, Caldas, Municipio Aguada. Quebrada Los Friales, 2400 m, 5.6°N, 75.4°W, 1.iv.1995, K. Wolfe *et al.*(LACM), 2 males; Bogotá, Pueblo Guasca, F. Johnson donor (NMNH), 1 male; San Antonio, W Colombia, xii.[19]07, 580 ft., M. G. Palmer (BMNH); 3 males.

Diagnosis ♂. Antennae black, except for the anterior and inner surface of the scape, white. Frontoclypeus almost entirely black. Mesoscutellum with four white markings. Metascutellum black. FW predominantly black, with various white spots. HW partially hyaline. T8 black.



FIGURES 16–19. Genitalia of *G. wolfei* **sp. nov.** (male from Caldas, Colombia). 16. genital capsule, dorsal view; 17. same, ventral view; 18. same, lateral view; 19. aedoeagus, lateral view. Scale bars = 1mm.

Description ♂. **Head.** Proboscis light brown. Palpi three segmented, exceeding vertex. First segment black with few white scales at the external side, near the tip. Second segment entirely black. Third segment twice longer than wide, black, except for the dorsal apical surface, white. Antennae black, except for the scape, with few white scales anteriorly and at the inner surface. Pectination starting in the second flagellomere. Frontoclypeus almost as wide as long, black. Vertex black with few white scales laterally and at its anterior margin. Occiput and ocular ring black. Cervical scales orange. **Thorax**. Mesothorax predominantly black, with four white spots, the anterior pair smaller than the posterior pair. Metascutellum black. Patagia black, with white spot near the external margin. Tegulae predominantly black, white scales at the anterior margin and near the posterior margin. Epimera and episterna with long black scales. Ventral scales on the first pre-episternum white, surrounded by black scales

laterally. Ventral surface of the forecoxae black proximally and white distally. Lateral surface black. Forefemora black with a white mid-ventral spot. Foretibiae and tarsi black. Midcoxae white anteriorly and laterally. Midfemora black, except for the proximal end and a small mid-ventral spot, white. Midtibiae black with a white dorsal area proximally and very few white scales at the distal margin, laterally. Midtarsi black. Hindlegs as midlegs, except for the tibiae, black with the whole circumference of the distal margin white. *FW*. Entirely scaled. Axillary scales white. Dorsal surface predominantly covered by black scales. Pattern of the dorsal surface of the forewings consisting of various white spots. Fringe of the external margin with black scales, except for the area corresponding to cell CuA2-CuP and for the apex, with white scales. Pattern of the ventral surface simpler than that of the dorsal surface, composed of black scales and the following white areas: the distal portion of the discal cell, subproximal portion of cells R5-M1 and M1-M2, apex, subdistal portion of cell M3-CuA1, and distal margin of cell CuA1-CuA2. Venation as in Figs 6–7: R1 branching before the transversal vein, and R2 after it. M1 branching either beside the transversal vein, or together with it, with a short branch connecting both to the R stalk. M2 and M3 branching either from the transversal vein with a short common stalk, or very near each other, without a common stalk. *HW*. Margins and veins with black scales, part of the central portion completely hyaline. Discal cell predominantly scaled, distal portion of the posterior half hyaline. Subproximal portion of cell M1-M2 partially hyaline, as well the proximal portions of cells M2-M3 and M3-CuA1. Cells CuA2-CuP and CuP-1A entirely hyaline, except for the external margin. Cell 1A-2A covered only by long brown scales. Venation as in Figs 6–7: Sc rudimentary, but distinguishable. M3 and CuA1 either with a very short stalk, or not stalked. **Abdomen.** T1–2 black. Post-spiracular hoods black, except for the anterior margin, grey laterally, and the posterior margin, with few white scales laterally. T3–6 black with orange spots laterally at the posterior margin. T7–8 black. Hair-like scales present on T1–5. S2–6 black laterally and white ventrally and at the posterior margin. S7 as the previous sternites, but with the posterior margin black. S8 black. Coremata present on ventral intersegmental membrane 7–8, but reduced in size. Anterior margin of T8 with two small sacular projections. **Male genitalia.** Ejaculatory duct longer than aedoeagus. Coecum rounded. Aedoeagus slightly curved upwards, with approximately the same width across its length. Vesica shorter than aedoeagus when fully everted, mostly membranous, with a longitudinal sclerotization on the inner surface. Saccus developed, symmetrical; posterior margin somewhat pointed. Tegumen composed of two parallel plates connected by the posterior margin. Two dorsal, heavily sclerotized and densely setose projections arising from the intersegmental membrane 9–10, with apex somewhat pointed, hiding the uncus in dorsal view. Base of the uncus much wider than its lobe, with setae dorsally and laterally. Lobe of the uncus with dorsal setae, laterally compressed, and reaching the same length of the dorsal projections of the tegument; apex somewhat pointed. Valvae subequal, exceeding the dorsal projections of the tegumen, with a single lobe, very long and covered by setae ventrally at its whole length, and laterally at the tip; apex sharp. Transtilla and juxta heavily sclerotized, the former bearing setae, and the latter connected with the valvae.

Etymology. This species is dedicated to Mr. Kirby Wolfe, American amateur lepidopterist and collector of part of the type series.

Remarks. The black scales in *Galethalea wolfei* have a violet blue iridescence more intense than in any other examined species of *Galethalea*. However, because the iridescence can be lost due to photodecomposition or greasing, the lack of iridescence in other species may be due to an artifact.

Sotavalta (1964) has already documented polymorphism in wing venation for Nearctic and Palearctic Arctiina, which led him to point out the problems of the use of such characters in taxonomy. His findings seem to apply to Neotropical Ctenuchina as well.

Galethalea machadoi sp. nov.

(Figures. 4, 20–23)

Holotype male, ECUADOR, Zamora-Chinchipe, Rio San Francisco, Estación Científica San Francisco T1-11(18), 3°58'S, 79°04'W, 2675 m, 23.x.2000, LF II 19:00–19:30 (G. Brehm); SMNS - Lep 2001-06. Dissection number 3417 (L. Pinheiro), kept in vial (SMNS). **Five paratypes.** ECUADOR: Zamora-Chinchipe, Rio San Francisco, Estación Científica San Francisco, SW1(7), 3°58'S, 79°04'W, 1920 m, 3.xi.2002, LF I 18:45–19:15 (N. Hilt & C. Schulze) (SMNS), 1 male; same, SW2(9), 1900 m, 13.iv.2002, LF VI 21:15–21:45 (N. Hilt & D. Fetting) (SMNS), 1 male; same, SG1(8), 1912 m, 23.x.2003, LF I 18:45–19:15 (N. Hilt & C. Ramenda) (SMNS), 1 male; same,

SW2(9), 1900 m, 13.iv.2002, LF II 19:15–19:45 (N. Hilt & D. Fetting) (SMNS), 1 male; same, GL1(11), 1863 m, 3.ix.2003, LF VI 21:15–21:45 (N. Hilt & C. Ramenda) (SMNS), 1 male.

FIGURES 20–23. Abdominal pelt and genitalia of *G. machadoi* **sp. nov.** (male from Zamora, Ecuador). 20. abdomen; 21. aedoeagus, lateral view; 22. genital capsule, dorsal view; 23. same, ventral view. Scale bars = 1 mm, except for the abdomen, = 5 mm.

Diagnosis ♂**.** Antennae black, except for the anterior and inner surface of the scape, white. Frontoclypeus almost entirely black. Mesoscutellum with one white area. Metascutellum black. FW predominantly black, with various white spots. HW with a very small hyaline area. T8 black.

Description ♂. Head. Proboscis light brown. Palpi three segmented, reaching vertex. First two segments black. Third segment twice as long as wide, black, except for the apical surface, white. Antennae black, except for the scape and pedicel, with few white scales anteriorly. Pectination starting in the second flagellomere. Frontoclypeus almost as wide as long, black. Vertex black with few white scales at its anterior margin. Occiput and ocular ring black. Cervical scales orange. **Thorax**. Mesothorax predominantly black, with a white medial area. Metascutellum black. Patagia black, with a white spot near the external margin. Tegulae predominantly black, with white scales at the anterior margin and medially. Epimera and episterna with long black scales. Ventral surface of the forecoxae black proximally and white distally. Lateral surface black. Forefemora black with a white mid-ventral spot and white proximal margin. Foretibiae and tarsi black with white distal ends. Midcoxae white anteriorly and laterally. Midfemora black, except for the proximal and distal margins, and for a small mid-ventral spot, white. Midtibiae black with white proximal and distal margins, spurs either black or white. Midtarsi black with white distal ends, sometimes with the second segment also white at the distal end. Hindlegs as midlegs. *FW.* Entirely scaled. Axillary scales white. Dorsal surface predominantly covered by black scales. Pattern of the dorsal surface of the forewings consisting of various white spots. Fringe of the external margin with black scales, except for the area corresponding to cell CuA2-CuP and for the apex, with white scales. Pattern of the ventral surface simpler than that of the dorsal surface, composed of black scales and fewer white areas than the dorsal surface. Venation as in *G. wolfei* **sp. nov.** *HW.* Margins and veins with black scales, part of the central portion hyaline, with the hyaline portion bearing very small setae. Discal cell predominantly hyaline, a small area at the distal portion of the posterior half with sparsely distributed scales. Proximal portions of cells M2-M3, M3-CuA1, and CuA2-CuP also with sparsely distributed scales. Proximal half of cell CuP-1A hyaline. Cell 1A-2A densely scaled, except for the region adjacent to vein 1A, sparsely scaled. Venation also as in *G. wolfei* **sp. nov. Abdomen.** T1–2 and T8 black. T3–7 predominantly black, with two latero-posterior orange spots. Hair-like scales on T1–4. S2–7 whitish ventrally and black laterally; S8 black. Coremata present on ventral intersegmental membrane 7–8. Anterior margin of T8 with two small sacular projections. **Male genitalia.** Ejaculatory duct longer than aedoeagus, inserted dorsally. Coecum rounded. Aedoeagus straight, approximately the same width throughout. Vesica slightly shorter than aedoeagus when fully everted, mostly membranous. Posterior region of vesica with a small sclerotized area and tiny cornuti. Saccus developed, slightly asymmetrical; posterior margin somewhat pointed. Tegumen composed of two oblique plates connected by the posterior margin. Two dorsal, glabrous, heavily sclerotized projections arising near the base of the uncus, with pointed apex and situated between the lobe of the uncus in ventral view. Base of the uncus sclerotized, with few setae, much wider than its lobe, which is short and turned ventrally. Valvae bilobed, asymmetrical, the right valve exceeding uncus, and the left valve reaching it. In both valvae, ventral lobe more sclerotized and longer than the dorsal lobe. Inner surface of each valve with a filiform projection. Ventral surface of both valvae densely covered by setae, dorsal suface with much less setae. Transtilla approximately as sclerotized as the juxta.

Etymology. This species is dedicated to Dr. Angelo B. M. Machado on the occasion of his 80th birthday.

Remarks. *Galethalea machadoi* **sp. nov.** is similar to *G. davidi* Dognin, 1889, which also has Ecuador as its type locality. The main external differences between *G. machadoi* **sp. nov.** and *G. davidi* are the proximal brown markings in the forewings, more extensive in *G. machadoi* **sp. nov.** than in *G. davidi*, and the hindwings, more brown in the former around the edges of the wings. The genitalia of both species are quite distinct, the most remarkable differences being the densely setose dorsal projections in *G. davidi* and the asymmetrical valvae in *G. machadoi* **sp. nov.**

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