

Description of *Sphecosoma pattiannae*, new species, with comments on its novel male androconia (Lepidoptera: Arctiidae: Arctiinae: Euchromiini)

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Abstract

A new species of the mimetic tiger moth genus *Sphecosoma*, *S. pattiannae* Simmons **sp. nov.**, is described and illustrated. The presumed sister species, *S. tarsalis* (Walker), is redescribed with illustrations of the male and female genitalia. These two species bear a novel androconial structure, which is a dorsal pouch at the base of the genitalia; this structure is described and illustrated. Phylogenetic placement of *S. tarsalis* and *S. pattiannae* within *Sphecosoma* Butler is discussed, with male and female genital comparisons to *S. cognatum* (Walker).

Key words: Lepidoptera, Arctiidae, Euchromiini, *Sphecosoma*, new species, androconia, mimicry

Introduction

Tiger moths in Euchromiini are striking mimics of Hymenoptera, including polybiine wasps (Figs. 1, 2). They also possess a wide array of male androconia (Weller et al. 2000), including coremata, single-pocket subabdominal pouches, and double-pocket subabdominal pouches. This paper describes a new euchromiine species, *Sphecosoma pattiannae* Simmons, and illustrates a previously undescribed male scent structure: a dorsal, intersegmental pocket at the base of the genital capsule that contains deciduous scales. This structure is described in the species descriptions.

Hampson (1898) established *Pompilopsis* as a monotypic genus, with the type species *Glaucopis tarsalis* Walker (1854). Simmons and Weller (2004) relegated *Pompilopsis* to a junior subjective synonym of the neotropical genus *Sphecosoma* based on six synapomorphies; as a result 42 species currently are placed in *Sphecosoma*. During that study, it was discovered that the name *S. tarsalis* has been applied to two species, one of which is unde-

scribed. Males and females of *S. tarsalis* and males of the new species, *S. pattiannae*, are illustrated.

Materials and Methods

Standard genital and whole-body dissections were done as described by Winter (2000). Specimens were softened in warm 10% KOH for 5–15 minutes and then cleaned (scales and viscera removed) in several rinses of 40% ethanol. Abdominal sclerites and genitalia were stained with chlorazole black E (Sigma, St. Louis, MO) dissolved in deionized distilled water (saturated). Specimens were viewed in 40% ethanol. Wings were bleached, neutralized in weak acetic acid, rinsed, and stained overnight in Eosin Y (1% in distilled water; Fisher Scientific, Pittsburgh, PA). Permanent slide mounts (Euparal, BioQuip®, Rancho Dominguez, CA) were made of abdominal pelts and genitalia.

Terminology for abdominal and genital morphology follows Klots (1970) and Forbes (1939). Type specimens of *Glaucopis tarsalis* Walker (BMNH) and *Glaucopis semihyalina* Walker (BMNH) were examined and photographed. The type specimen of *S. pattiannae* Simmons is deposited in CMNH. Collections consulted include: BMNH, The Natural History Museum, London; CMNH, the Carnegie Museum of Natural History, Pittsburgh; FLMNH/AME, the Allyn Museum of Lepidoptera, Gainesville; MNHP, Muséum National d'Histoire Naturelle, Laboratoire d'Entomologie, Paris; and NMNH, National Museum of Natural History, Smithsonian Institution, Washington, D.C.

Sphecosoma pattiannae Simmons, NEW SPECIES (Figs. 2, 3, 4, 8, 9)

Diagnosis (Fig. 2). *Sphecosoma pattiannae* possesses a black body and hyaline wings; it lacks brown pigment on the hindwing, and the pigment is greatly reduced on the forewing membrane (Figs. 1, 2). *Sphecosoma pattiannae* is most similar to *S. tarsalis*, but is conspicuously smaller (forewing length 12–13 mm versus 18 mm, respectively).

Description.

Head: Black. Vertex, black. Palpi black with white stripes. Antenna bipectinate, black with some white scales at pedicel. Ocelli present with sclerotized rim. Proboscis longer than thorax.

Thorax: Prothorax and patagia black. Tegula and mesothorax black. Scutum black. Legs black, scattered with few white scales, remainder black. Metaepisternite without defined striated band.



FIGURE 1. *S. tarsalis*, habitus.



FIGURE 2. *S. pattiannae*, habitus.

Wings (Fig. 3): Hyaline, with brown pigmentation on forewing membrane. Forewing costal region and discal cross vein bright royal blue. Forewing length 12–13 mm in male (n = 3).

Abdomen: Tympanal hood black, dorsal on second segment. Third abdominal segment narrowed. Remainder of abdomen black.

Abdominal androconia: Dorsal scent pocket present between seventh and eighth abdominal segments (Fig. 4).

Genitalia. Male (Figs. 8, 9): Tegumen rounded, bearing bifid projections on either side of uncus. Uncus central, setose. Saccus rounded. Valvae unilobed, curved apically. Juxta shield-like, with central sclerotization. **Aedoeagus:** Phallus margin smooth with not projections. Distal portion of phallus rounded. Vesica membranous.

Female: Unknown.

Early Stages: Unknown.

Types: Holotype: **BRAZIL:** Pará (CMNH, 1M). Paratypes: **BRAZIL:** Hyutanhan, Rio Purus (CMNH, 1M); Mato Grosso, Chapada near Cuiabá (CMNH, 1M).

Additional material: BRAZIL: Pará (BMNH, 1M); Santa Catharina (MNHP, 1M).

Etymology: *S. pattiannae* is named in honor of Patricia Ann Weller (maiden name Guigliano) (1938–2002) known to her friends and family as Patty Ann. This species is named in memory of her life and contributions as a mother, grandmother, and friend.

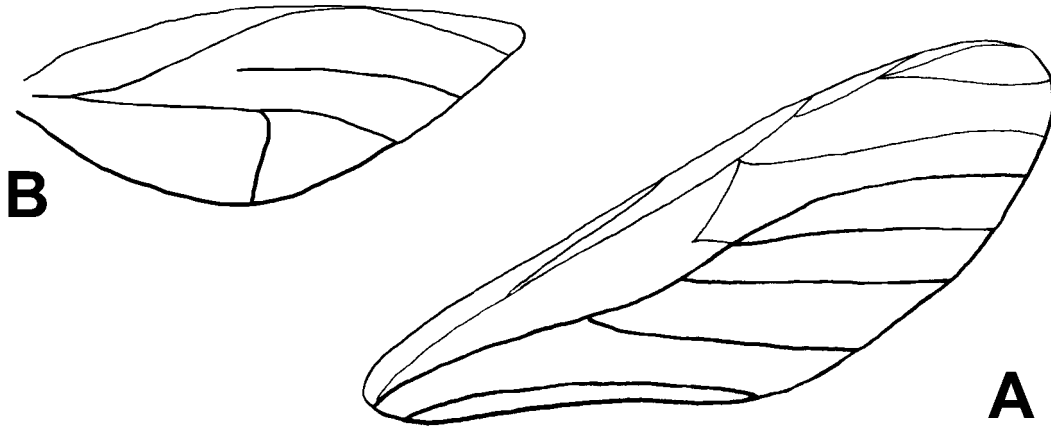


FIGURE 3. Wing venation of *S. tarsalis* and *S. pattiannae*.

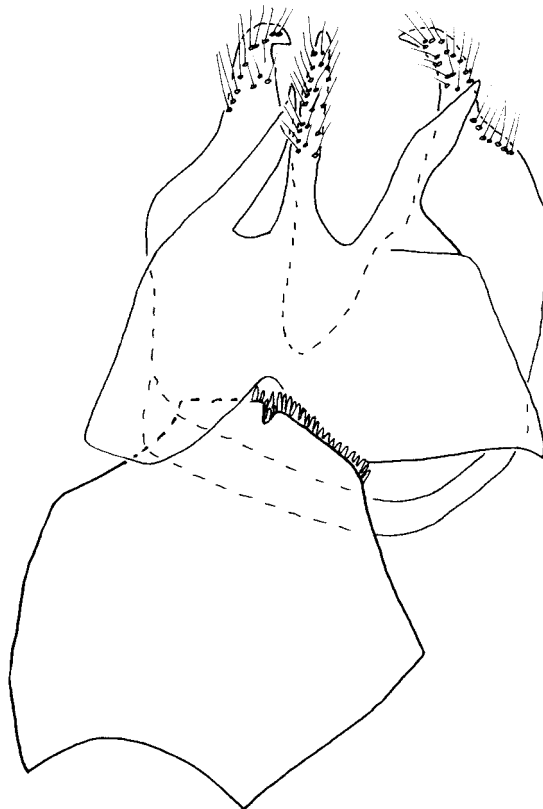


FIGURE 4. Dorsal view of *S. tarsalis*/*S. pattiannae* male abdomen (arrow = location of scent pocket).

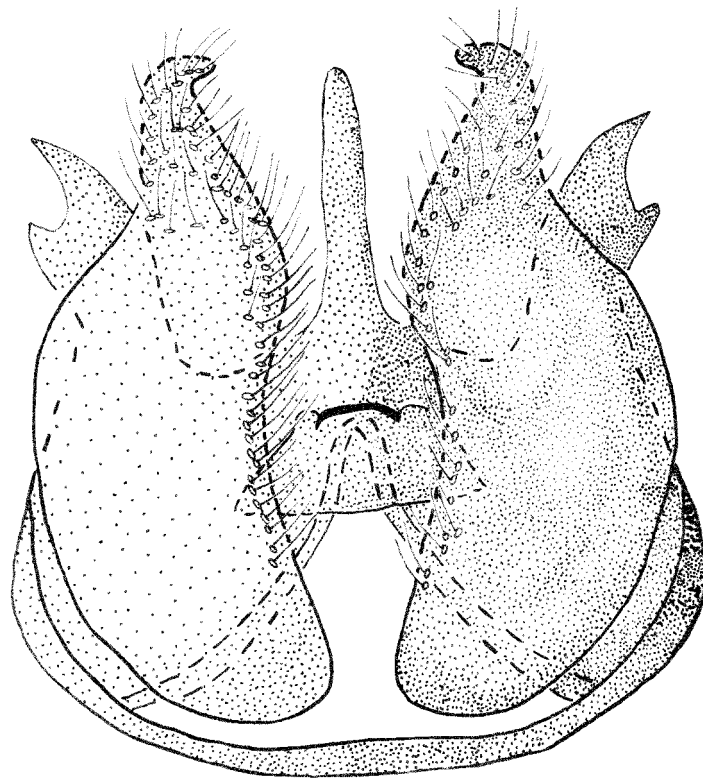


FIGURE 5. *S. pattiannae*, male genital capsule, ventral view.

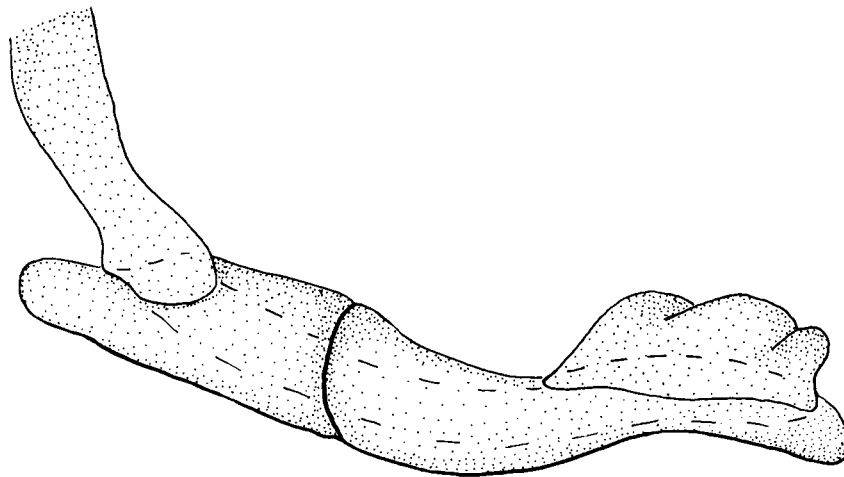


FIGURE 6. *S. pattiannae*, aedoeagus, lateral view.

Sphecosoma tarsalis (Walker) (Figs. 1, 3–7)

Glaucopis tarsalis Walker, 1854: 196.

Glaucopis semihyalina Walker, 1854: 197.

Pseudosphex vespiformis Herrich-Schäffer, 1850–1869 [1855]: pl. 74, fig. 425.

Pompilopsis tarsalis (Walker): Hampson, 1898: xii, 161.

Sphecosoma tarsalis (Walker): Simmons & Weller 2004: 69.

Diagnosis. In *S. tarsalis*, brown wing membrane pigmentation is present on large portions of the fore- and hindwing, with bright royal blue highlights on the costal and distal portion of the discal cell of the forewing, and apically in the hindwing. *Sphecosoma pattiannae* possesses the same highlights on the forewing, but lacks them on the hindwing.

Redescription.

Head: Black with some metallic green sheen. Vertex black, rimmed with electric blue. Palpi black dorsally and white ventrally. Antenna bipenctinate, black with metallic green flagellum. Ocelli present with sclerotized rim. Eyes rimmed with white. Proboscis longer than thorax.

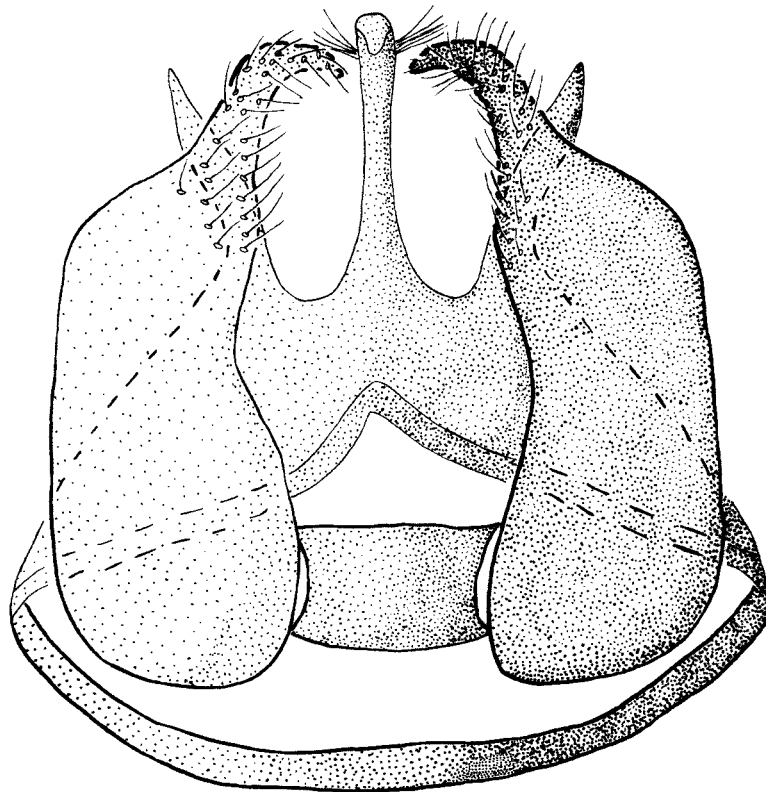


FIGURE 7. *S. tarsalis*, male genital capsule, ventral view.

Thorax: Prothorax black; patagia black with long white setae. Tegula black. Mesothorax black with metallic green sheen. Scutum black. Legs black, with some scattered white scaling. Metaepisternite without defined striated band.

Wings (Fig. 3): Hyaline, with brown membrane pigmentation. Forewing costal region, discal cross vein, and portion of hindwing royal blue. Forewing length 18 mm in both male and female (n = 3).

Abdomen: Tympanal hood black with metallic green, dorsal on second segment. Third abdominal segment narrowed, edged in white. Remainder of abdomen black with metallic green sheen.

Abdominal androconia: Dorsal scent pocket present between the seventh and eighth abdominal segments, at base of genital capsule (Fig. 4). Androconium not eversible. Scales within pouch deciduous.

Genitalia. Male (Figs. 5, 6): Tegumen rounded, bearing fingerlike projections on either side of uncus. Uncus central, setose. Saccus rounded. Valvae unilobed, slightly curved apically. Juxta shieldlike. **Aedoeagus:** Phallus margin with two spikelike projections. Distal portion of phallus rounded. Vesica membranous, cornuti absent. **Female (Fig. 7):** Papillae anales (PA) lightly sclerotized, laterally flattened; anterior apophyses (AA) reduced and thickened; 8th tergum and sternum unmodified; antevagellar plate (AV) unmodified; ostium bursae central; ductus bursae membranous; corpus bursae membranous, signa absent; ductus seminalis arising from accessory bursae; accessory bursa small, arising from ductus bursae.

Early stages: Unknown.

Types: BRAZIL: Pará, 50–45 (BMNH, 1M, holotype of *Pompilopsis tarsalis*); Pará, 51–147 (BMNH, 1F, holotype of *Pompilopsis semihyalina*).

Additional material examined: BOLIVIA: Buenavista, 750m (BMNH, 2M); Prov. del Sara, Dep. Sta. Cruz (BMNH, 1M). **BRAZIL:** Goiás (BMNH, 3M); Humayta, Rio Madeira (BMNH, 1M); Luis Paulo (NMNH, 1F); **Mato Grosso:** Cuiabá (BMNH, 1M); Nivac (BMNH, 1M); **Pará:** (BMNH, 2M); Obidos (BMNH, 2M; NMNH, 1F); Santa Catharina (BMNH, 1M); São Paulo, Rio Preto (BMNH, 1M); Teapa (BMNH, 1M); Tonantins (BMNH, 1M); No locality data: (BMNH, 1M). **GUYANA:** Georgetown (FSMC, 1F); No locality data (BMNH, 1M). **FRENCH GUIANA:** St. Laurent (BMNH, 1M; NMNH, 1F); No locality data (BMNH, 1M). **GUATEMALA:** Cuyuga (NMNH, 1M); Teleman, Vera Paz (BMNH, 1M). **SURINAM:** No locality data: (BMNH, 1M). **NO COUNRTY DATA:** (NMNH, 1M); (MNHP, 1F).

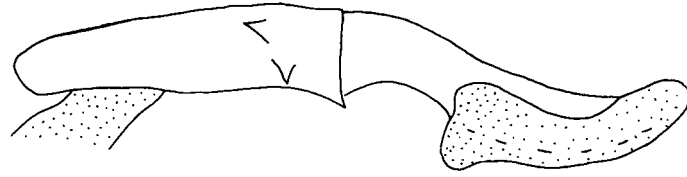


FIGURE 8. *S. tarsalis*, aedeagus, lateral view.

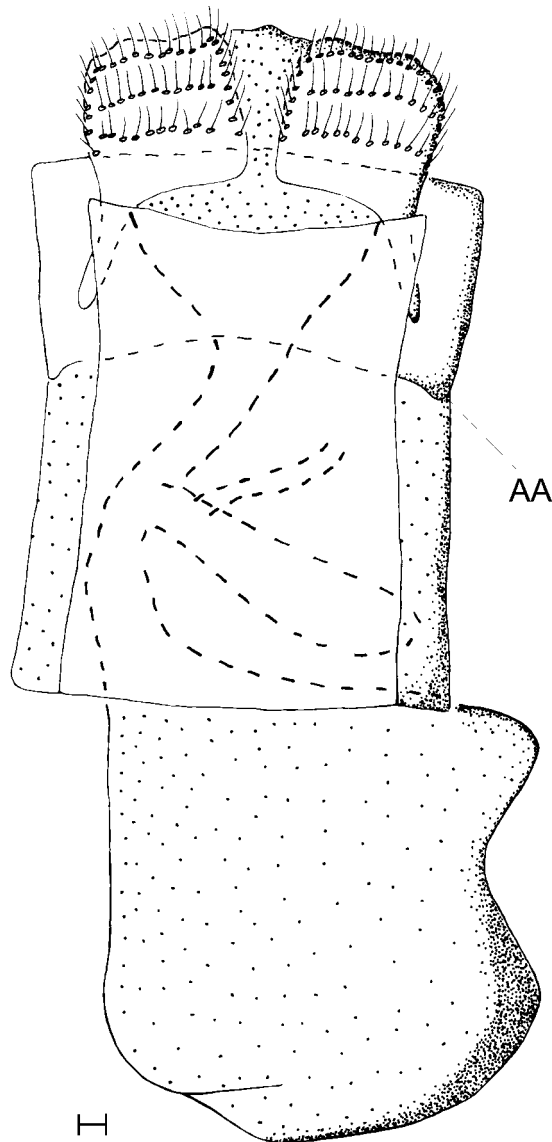


FIGURE 9. *S. tarsalis*, female genitalia, ventral view.

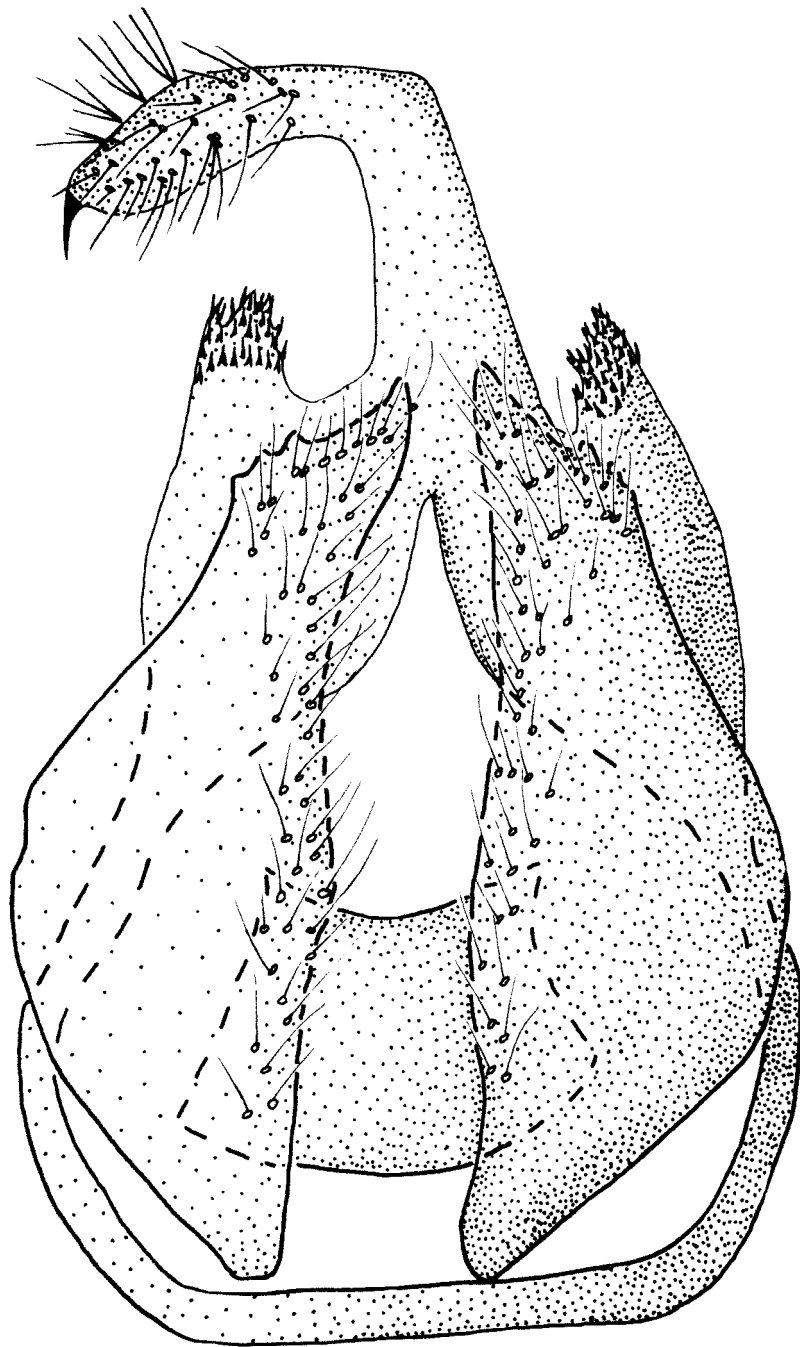


FIGURE 10. *S. cognatum*, male genital capsule, ventral view.

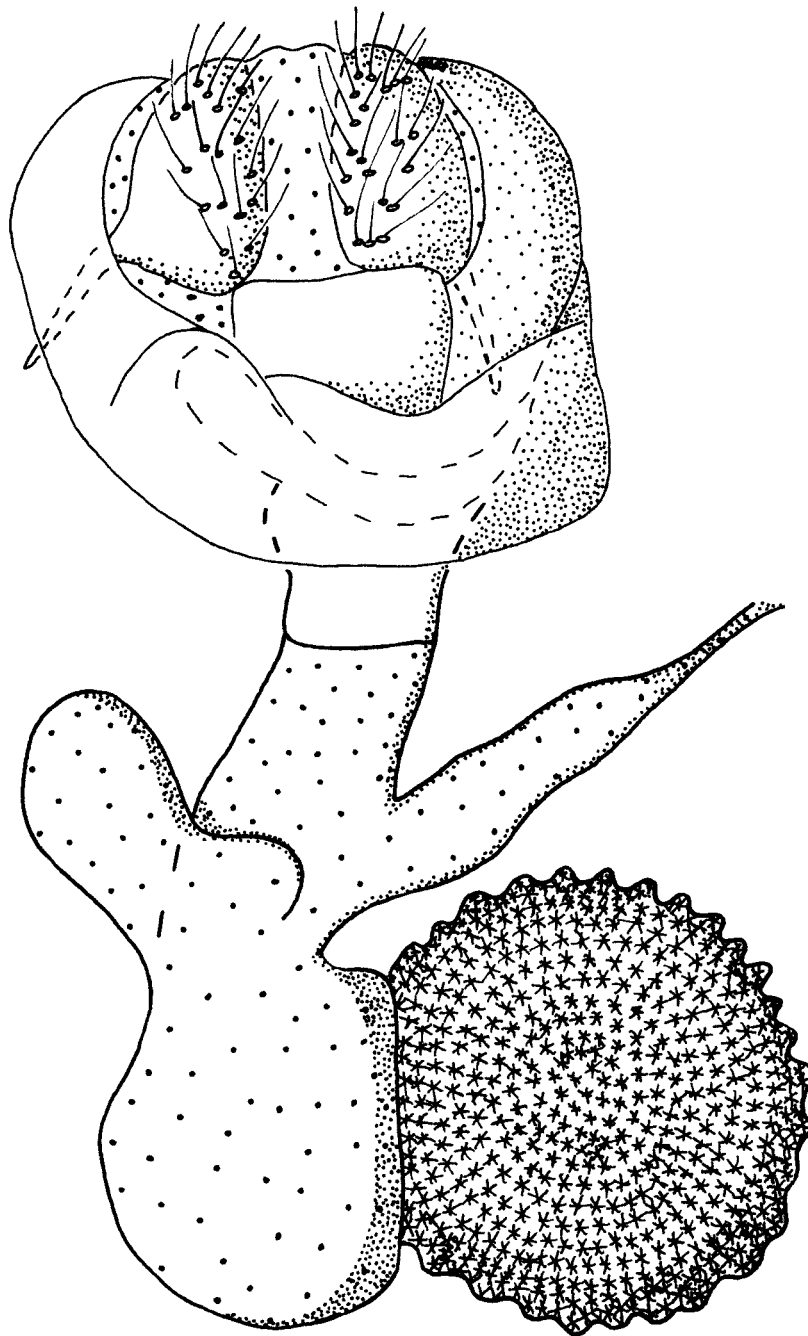


FIGURE 11. *S. cognatum*, female genitalia (cb = corpus bursae), ventral view.

Phylogenetic placement. Simmons & Weller (2004) place *Pompilopsis* Hampson as a junior subjective synonym of *Sphecosoma* Butler because it possesses the six synapomorphies of the latter genus; however, it differs from both *Sphecosoma* and the *Sphecosoma* genus group in a number of features. The petiolate waist of *S. tarsalis* and *S. pattiannae* is formed by a narrowed third abdominal segment as in the unrelated genus *Trichura* Hübner (Ctenuchini) (Weller et al. 2000). Within *Sphecosoma*, the petiolate waist typically is formed by a modified second abdominal segment (Weller et al. 2000). *Sphecosoma tarsalis* and *S. pattiannae* have unlobed valves like some *Sphecosoma*, but the valves differ in shape from those of the latter. The valves of *S. cognatum* are blunt apically, the valves of *S. tarsalis* and *S. pattiannae* taper and curve (Figs. 5, 8, 10). Male *S. cognatum* have a ventral, subabdominal pouch between segments 2–4, as described in Weller et al. (2000); however, *S. tarsalis* and *S. pattiannae* possess a dorsal pouch of scent scales at the base of the genitalia. Female *S. tarsalis* have unornamented bursae, while other *Sphecosoma* have numerous small signa covering a portion or the entire corpus bursae (Figs. 7 & 11). Thus, the taxonomic placement of these two species should be considered tentative; they are in need of further study in the context of larger taxon sampling.

Acknowledgements

I am grateful to Susan and Eric Weller for kindness, friendship and advice. I thank Julian Donahue for his generous assistance with the taxonomy of Ctenuchini. I also thank the following curators for access to their museum material: D. Carter (BMNH), D. Goodger (BMNH), J. & L. Miller (FLMNH/AME), J. Minet (MNHP), M. Pogue (NMNH), and J. Rawlins (CMNH). I thank Jacqueline Miller (FSMC), Eric Grissell (USDA/ARS/PSI/SEL), Julian Donahue (Los Angeles, CA), and William Miller (University of Minnesota) for comments that improved the quality of the manuscript. Financial support was provided by a Dissertation Improvement Grant NSF/DEB-9706192.

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