REVIEW OF THE NEOTROPICAL GENUS CACOCHARIS WALSINGHAM (LEPIDOPTERA: TORTRICIDAE: OLETHREUTINI), WITH A NEW SYNONYMY AND COMMENTS ON ITS HOST PLANTS AND GEOGRAPHIC DISTRIBUTION

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Abstract.—Cacocharis is a small Neotropical genus comprised of two species: C. albimacula Walsingham, 1872 and C. cymotoma (Meyrick 1917). The synonymy of Olethreutes canofascia Forbes 1930 (new syn.) with C. cymotoma is proposed. The two recognized species are sympatric in the Caribbean on Jamaica, Dominica, and St. Vincent, indicating considerable independent dispersal or inadvertent introduction events. Based on literature and specimen sources, the larval food plants for the genus are Phyllanthus acidus Skeels and P. niuri L. (Euphorbiaceae), which are widely known for their medicinal properties. A possible explanation for the high level of sympatry of the moth species in the Caribbean is that they have been transported throughout the region along with their larval hosts.

Key Words: Tortricidae, Neotropical, Caribbean, Phyllanthus, systematics

I recently discovered an inconsistency in the use of species names in the small Neotropical genus Cacocharis Walsingham. I also noticed that these small moths have broad geographic distributions throughout the Neotropics that are unreported, with considerable sympatry in the Caribbean. Because there are no records of the genus from Florida before about 1946, one of the species may have been introduced there. The purpose of this paper is to propose a new synonymy in the genus, discuss the geographic distributions of the two species, and present food plant records.


Specimens were examined at or borrowed from the following institutions: American Museum of Natural History, New York, New York, U.S.A. (AMNH); The Natural History Museum, London, U.K. (BMNH); Cornell University Insect Collection, Ithaca, New York, U.S.A. (CUIC); Florida State Collection of Arthropods, Gainesville, Florida, U.S.A. (FSCA); Instituto Nacional de Biodiversidad, Santo Domingo de Heredia, Costa Rica (INBio); and the National Museum of Natural History, Washington, D.C., U.S.A. (USNM).
**TAXONOMIC HISTORY**

*Cacocharis* was described by Walsingham (1892), with the type species *C. albimacula* Walsingham 1892, from St. Vincent, West Indies. In his description, Walsingham stated "Having only a single ♀ of this species from St. Vincent I have used a ♂ from Brazil in drawing up the generic description." Apparently Walsingham initially and correctly recognized that the two specimens were congeneric but not conspecific; hence, it is somewhat puzzling that he did not describe the male as a different species. In a subsequent paper, Walsingham (1897) listed Brazil and West Indies as the distribution for *C. albimacula*. Meyrick (1917) described *Argyroploce cymotoma* from British Guiana with the comment "Allied to *albimacula* Wals." It is unclear why he placed his new species in *Argyroploce* rather than in *Cacocharis*, but apparently he did not consider *Cacocharis* to be distinct from *Argyroploce*.

Forbes (1930) described *Olethreutes canofascia* from Puerto Rico, providing comparative illustrations of the male genitalia of *C. albimacula* and *C. canofascia* and an explanation of how the two differ. Forbes opted to treat *Cacocharis* as a subgenus of *Olethreutes*, probably based on Heinrich's (1926) key to North American "Olethreutidae." He also provided a fairly thorough characterization of the "subgenus." Forbes (1930) almost certainly was unaware of Meyrick's (1917) description of *C. cymotoma* because his description of *canofascia* fits it nearly perfectly. Clarke (1958) presented photographs of the lectotype adult and male genitalia of "Olethreutes cymotoma," possibly following Forbes concept of *Cacocharis* as a subgenus. It is uncertain when *cymotoma* was transferred formally to *Cacocharis*, but Kimball (1965) used the combination *Cacocharis cymotoma* for records of this species from Florida, and Powell (1983) followed this usage. Powell et al. (1995) listed *albimacula* and *cymotoma* under *Cacocharis*, but placed *canofascia* in "Olethreutes" (i.e., unplaced species). Brown (2005) treated all three species in *Cacocharis* based primarily on the card file at the BMNH.

In the series of *C. albimacula* in the collection of the BMNH, I found examples of both species. The holotype female of *C. albimacula* from St. Vincent bears a Walsingham label indicating "Type," but one of the male specimens of *C. cymotoma* (from Brazil), almost certainly the male to which Walsingham (1892) refers in his description of the genus, also bears a Walsingham label indicating "Type" and a BMNH label indicating "lectotype," a designation that was never published. Because *C. albimacula* was described from a single female, there is no ambiguity as to the identity of the holotype - it is the female labeled "Type."

**SYSTEMATICS**

*Cacocharis albimacula* Walsingham

(Figs. 2, 4, 6, 7)


Olethreutes albimacula: Forbes 1930: 86 [mispeelling].

Diagnosis.—*Cacocharis albimacula* is easily distinguished from all other Neotropical tortricids by the following pattern which includes a small, immaculate white, semicircular patch near the middle of the forewing costa (Fig. 2), which represents the fusion of costal strigulae pairs 5 and 6 and is centered between the intersection of Sc and R₁ with the costa. In the male genitalia, the valvae of *C. albimacula* (Fig. 4) are only slightly broadened in width from the apex to
the basal concavity, the ventral base of the cucullus forms a 90° angle, and there is a weak, narrow, crescent-shaped flange subbasally from the saccus. In contrast, the valvae of *C. cymotoma* (Fig. 3) are conspicuously broadened from the apex to the basal concavity so that the ventral base of the cucullus forms a downward projecting, triangular-shaped process, and there is no crescent-shaped flange subbasally from the saccus. The female genitalia of *C. albimacula* (Fig. 6) differ from those of *C. cymotoma* (Fig. 7) by the rounded anterior edge of the sterigma, which is distinctly V-shaped in *C. cymotoma*.

Holotype.—♀, West Indies, St. Vincent, H. H. Smith, BMNH slide 11,763, with red BM “Type” label, BMNH.

Distribution and biology.—This species is recorded primarily from the West Indies, including Dominica, Grenada, Jamaica, St. Croix, St. Thomas, and St. Vincent, but there also are four records from Central America (i.e., Costa Rica, Guatemala, and Mexico) (Fig. 7). According to label data, this species was reared from “Phyllanthus sicca” in Jamaica (n = 6); however, I was unable to find this genus-species combination using a variety of botanical references (e.g., GRIN 2007). Pastrana reported C. a/lhimacula from Argentina, Brazil, and Uruguay (Brown 2004), but those records almost certainly refer to C. cymotoma (see below).

Cacocharis cymotoma (Meyrick)  
(Figs. 1, 3, 5, 8)


New synonymy.


Diagnosis.—Although the facies of C. cymotoma are similar to those of C. albimacula, the two species are easily distinguished by the shape of the white patch near the middle of the forewing costa: somewhat chevron-shaped in C. cymotoma (Fig. 1) and semicircular in C. albimacula (Fig. 2). Specimens of C. cymotoma are slightly variable in the development and/or prominence of the white chevron. The male genitalia of C. cymotoma (Fig. 3) differ from those of C. albimacula (Fig. 4) by the pronounced triangular broadening at the ventral edge of the basal portion of the cucullus. In C. albimacula, the valva is only slightly and uniformly broadened from the apex to the basal concavity. The female genitalia of C. cymotoma have a strongly V-shaped anterior edge of the sterigma compared to the rounded edge of C. albimacula. Based on facies and male and female genitalia, there is little doubt that C. canofascia is conspecific with C. cymotoma, and the latter has priority.

Holotype.—♂ (cymotoma), British Guiana, Bartica, “1.13” [Jan 1913], Parish (BMNH). Holotype ♂ (canofascia), Puerto Rico, Rio Piedras, 10 Jul 1916 (AMNH).


Distribution and biology.—Cacocharis cymotoma is distributed from Florida (AMNH, FSCA, USNM) south through much of the Caribbean (Dominica, Dominican Republic, Jamaica, Puerto Rico, St. Vincent) and Central America.
(Costa Rica, Honduras); it also has been recorded throughout much of South America (Brazil, Ecuador, Guyana, Paraguay, Peru, Venezuela) (Fig. 8). Pastrana’s reference to C. albimacula from Argentina, Brazil, and Uruguay (Brown 2004) almost certainly refers to this species. Based on literature (Forbes 1930, Kimball 1965) and specimen label data, the larval food plants are Phyllanthus acidus Skeels and P. niruri L. (Euphorbiaceae). A specimen from Puerto Rico was reported from “tropical almond,” assumed to be Terminalia catappa L. (Combretaceae), but this record is suspect. Forbes (1930) reported that the larva is light olive-green with a light brown head and webs together the leaflets of the food plant.

Remarks.—There is some morphological variation among the specimens included under this species name in regard to two features of the male genitalia. The apex of the triangular process representing the ventral-basal tip of the cucullus varies from strongly pointed to slightly rounded, otherwise the shape of the cucullus is highly uniform. Also, the relative width of the slightly swollen apical region of the uncus is slightly variable. However, the visual appearance of both of these features is influenced by the degree to which the genitalia are flattened in slide-mounted preparations, making me suspect that much of this variation is an artifact of preparation.

**DISCUSSION**

The geographic distribution of Cacocharis (Figs. 7, 8) is somewhat enigmatic and requires dispersal rather than vicariance as an explanation for its present pattern. Owing to the sympatric occurrence of C. albimacula and C. cymotoma on at least three islands in the Caribbean (i.e., Dominica, Jamaica, and St. Vincent), either both species dispersed or were introduced to these islands independently, or one was present historically with the second arriving via dispersal or introduction. The distribution of C. albimacula is Caribbean and Central American whereas C. cymotoma is recorded from North America (Florida), Central America (Costa Rica and Honduras), the Caribbean (Dominica, Dominican Republic, Jamaica, Puerto Rico, and St. Vincent), and South America (Ecuador, Peru, Guyana, Venezuela, and Brazil). The earliest records from Florida are from 1946, with numerous additional records from the 1950s, suggesting that the species may have become established there in the early 1940s. It is not listed in any checklist, catalog, or systematic treatment of the U.S. fauna published prior to 1950 (e.g., Fernald 1903, Heinrich 1926, McDunnough 1939).

The plant genus Phyllanthus includes about 500 temperate and tropical species, many of which are used medicinally throughout the world (Caius 2003, Oudhia 2006). Phyllanthus niruri L. (and its synonym P. fraternus Webster), commonly known as chanca piedra, may be a weed in agricultural situations, but it is a valuable medicinal for herbalists (Oudhia and Tripathi 2002), especially in the Far East. According to Morton (1987), Phyllanthus acidus, Otaheite or Malay gooseberry, is believed to have originated in Madagascar and is adventive in the Caribbean. It was introduced into Jamaica from Timor in 1793 and has been spread casually throughout the Caribbean islands. It has long been naturalized in southern Mexico and the lowlands of Central America, and occasionally is grown in Colombia, Venezuela, Surinam, Peru, and Brazil. Formerly an escapee from cultivation in south Florida, there are now only scattered specimens remaining there as curiosities (Morton 1987).

Owing to the propensity for species of Phyllanthus to be transported throughout the Caribbean (Morton 1987), the
Fig. 7. Geographic distribution of C. albimacula.

opportunity for species of Cacocharis to be moved along with the host seems high. Hence, the present distribution of Cacocharis is most likely the result of anthropomorphic activities.

ACKNOWLEDGMENTS

I thank George Austin (FSCA), E. Richard Hoebeke (CUIC), Randall Schuh (AMNH), José Montero (INBio), and Kevin Tuck (BMNH) for allowing
me to examine specimens in their care. Illustrations were provided by Marie Metz, USDA, Systematic Entomology Laboratory, Washington, D.C. The following provided helpful reviews of the manuscript: Steven Lingafelter and Thomas Henry, USDA, Systematic Entomology Laboratory, National Museum of Natural History, Washington, DC; John Heppner, Florida State Collection of Arthropods, Gainesville, Florida; Joaquin Baixeras, University of
Valencia, Spain; and Lief Aarvik, Zoological Museum University of Oslo, Norway.

LITERATURE CITED


