

**CACOTHERAPIA DYAR (PYRALIDAE: GALLERIINAE) AT THE
NATIONAL MUSEUM OF NATURAL HISTORY, WASHINGTON, D.C.:
TYPE IMAGES AND LECTOTYPE DESIGNATIONS**

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Abstract.—Almost all the type specimens of *Cacotherapia* Dyar (Pyralidae: Galleriinae) are located at The National Museum of Natural History, Smithsonian Institution, Washington, DC (USNM). The type specimens and their labels were photographed, and original descriptions were reviewed to investigate the status of primary type specimens. The locality of the type species, *C. nigrocinereella* Hulst, is confirmed to be Utah, and not Texas as in the original description. Lectotypes are designated for *C. angulalis* (Barnes and McDunnough, 1918), *C. flexilinealis* Dyar, 1905, *C. poecilostigma* (Dyar, 1914), *C. ponda* Dyar, 1907, and *C. unipuncta* (Dyar, 1913) to fix and stabilize the scientific name for these species.

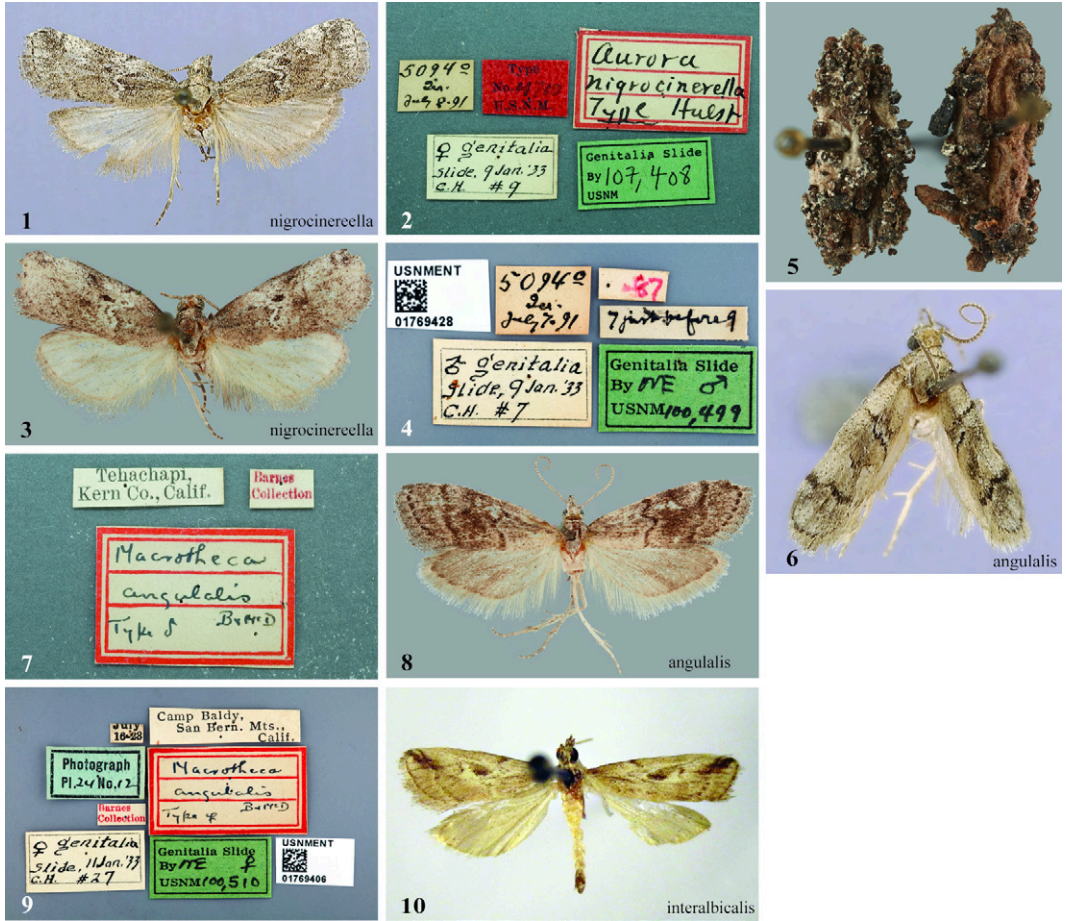
Key Words: Pyraloidea, larvae, Hemiptera, southwestern United States, scavengers

DOI: 10.4289/0013-8797.124.2.346

A few species in *Cacotherapia* Dyar (Pyralidae: Galleriinae) exhibit the unusual habit of feeding on scale insects and mealybugs (Hemiptera) (Dyar 1904, Liebherr 1977). A recent report of a *Cacotherapia* species feeding on the vine mealybug in Mexico (Salas-Monzon et al. 2022) provided an incentive to revisit the taxonomy and identity of its species. *Cacotherapia* is a genus of eleven species, almost all described from the southwestern United States, except for one species each described from Pennsylvania, Florida, Panama, and Mexico. This genus was last treated by Munroe (1995), who replaced the name *Macrotheca* Ragonot,

1891, a junior homonym and therefore unavailable (ICZN Art. 39), with *Cacotherapia*, and newly combined eight species under this genus.

All type specimens are located at the National Museum of Natural History, Smithsonian Institution, Washington, DC, USA (USNM), except for the type specimen of *Macrotheca interalbicalis* (Ragonot, 1891) at the Muséum National d'Histoire Naturelle, Paris, France (MNHP). Five lectotypes are designated to fix and stabilize the names and then labeled as required (ICZN Art. 74.1). Images of the type specimens at the USNM and the MNHP and their labels are provided.



Figs. 1–10. Specimens and labels of species currently classified in *Cacotherapia*. 1, *Aurora nigrocinerella* ♀ holotype, fwl = 10.0 mm. 2, Same, labels. 3, *Cacotherapia nigrocinerella* ♂, fwl = 9.0 mm. 4, Same, labels. 5, Cocoons of *Cacotherapia nigrocinerella* specimens. 6, *Macrotheca angulalis* lectotype, fwl = 8.0 mm. 7, Same, labels. 8, *Macrotheca angulalis* paralectotype, fwl = 8.0 mm. 9, Same, labels. 10, *Macrotheca interalbicalis* holotype, fwl = 6.5 mm. Abbreviations: fwl = forewing length.

Additional material at the USNM is summarized by state, locality, and collector(s). Known host records, records in the literature, and distribution data are also given.

MATERIAL AND METHODS

Literature associated with the original description of the type specimens was located. Subsequent published accounts of species since their description are cited. If the description or a label clearly references a “Type” and there is only one specimen, that specimen is taken to be the

“Holotype” by original designation (in the original description) or monotypy (if there is only one specimen). A lectotype is designated when the description was based on a series of specimens and no holotype was designated by the author of the description. Unique to the USNM are red type labels with a type number; these were either not always applied to type specimens or conversely applied to all specimens in the type series. Specimens in the original type series were located by comparing the original description to

labels on specimens. Under Additional material the locality is listed with the collector in parentheses. Adults and their labels were photographed with a Visionary Digital Imaging System. Images of type specimens were not modified. The USNM scale insect collection at the Beltsville Agriculture Research Center, Beltsville, Maryland was searched for E. A. Schwarz specimens.

RESULTS

Cacotherapia Dyar

Cacotherapia Dyar, 1904: 160. Type species: *Cacotherapia nigrocinereella* Hulst, 1900.

Macrotheca Ragonot, 1891, preoccupied (Munroe 1995). Type species *Cacotherapia interalbicalis* (Ragonot, 1891).

Cacotherapia nigrocinereella

(Hulst, 1900)

(Figs. 1–5)

Aurora nigrocinereella Hulst, 1900: 176.

TL: American Fork, Wasatch Mts., Utah (see Remarks), United States.

Published accounts.—Hulst 1902: 438 (as *Aurora nigrocinereella* Hulst). Dyar 1904: 160; Dyar 1905: 29; Barnes and McDunnough 1912: 37–38, 40; Munroe 1995: 89; Poole 1996: 812; Scholtens and Solis 2015: 71 (as *Cacotherapia nigrocinereella* Hulst). Dyar 1917: 83 (as *Alpheias nigrocinereella* (Hulst)). Barnes and McDunnough 1917: 142; McDunnough 1939: 26; Munroe 1983: 80 (as *Macrotheca nigrocinereella* (Hulst)).

Type specimen data.—One ♀ holotype by original designation. Label data: 5094/July 8.91/USNM Type No. 4710/♀ genitalia slide. 9 Jan '33 C.H. #9/USNM slide # 107408 [USNMENT01432038]. See Remarks below regarding the type locality and date in the original description.

Additional material.—California: El Segundo Dunes, Mojave Desert, Mt. Pines or Pinos, Pala, Manhattan Beach, Rock Creek Tom's Place, N. Shore Mono Lk., Chilao Flats (Leuschner), San Felipe Wash (Dammers), Torrey Pines St. Res., San Diego Tierrasanta (Bloomfield), Old Kern Cyn. Rd. (Richers), San Diego, 9 mi. E. Cedarville (Collector unknown); Utah: 1 ♂ from same series with the same label as holotype including 5094/July 7.91/♂ genitalia slide, 9 Jan. '33, C.H. #7/USNM slide #100499 [USNMENT01769428] (Figs. 3, 4) and 2 cocoons (Fig. 5) from the two reared adults (Figs. 1, 3), length = 11.0 mm long.

Host.—*Leucanium* sp. (Coccidae) (Dyar 1904). This genus name was used for all soft scales (G. Miller, pers. comm.) during the late 1800's. I was unable to find specimens of *Leucanium* sp. collected by E. A. Schwarz at the USNM scale insect collection.

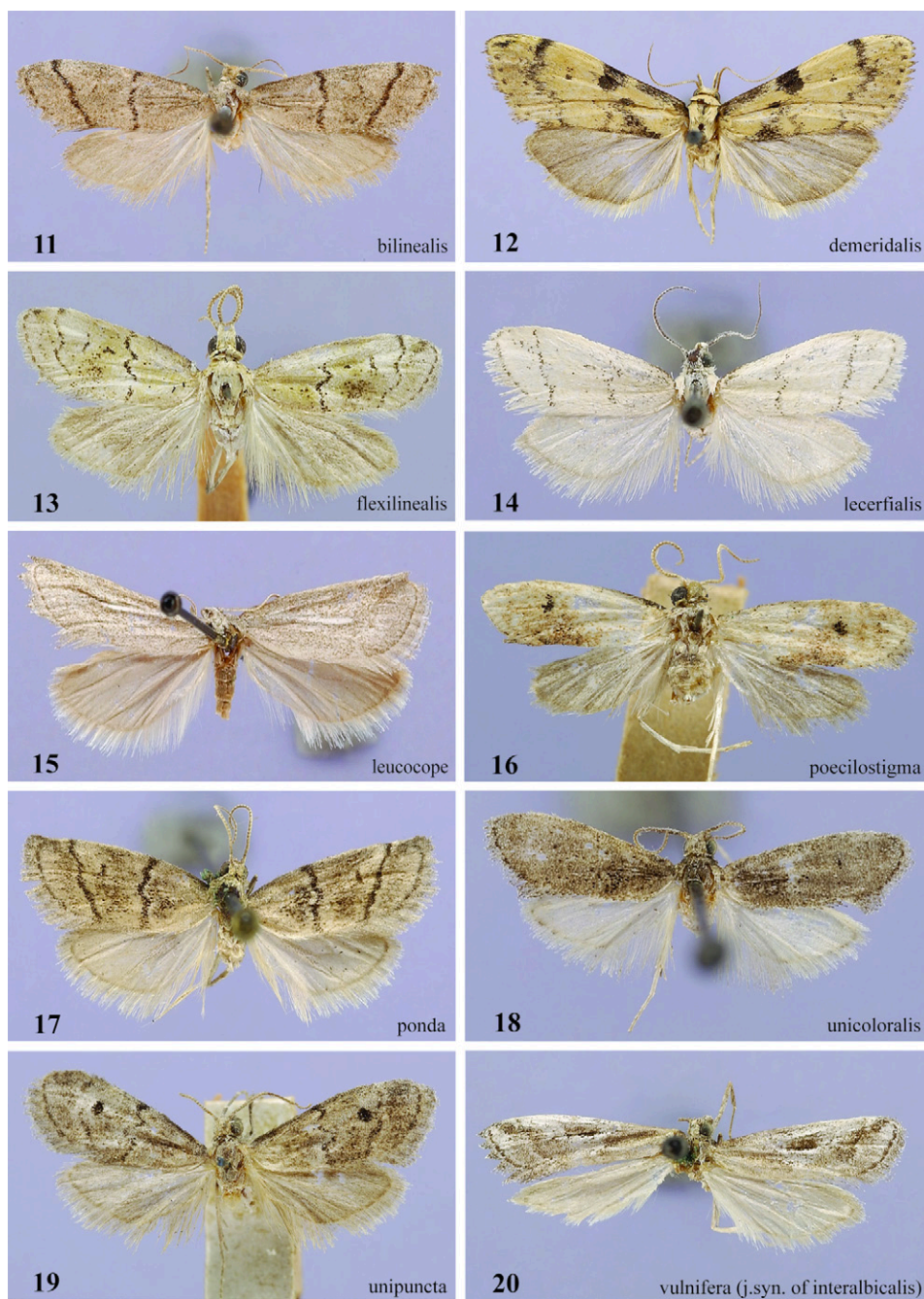
Records.—None.

Distribution.—California, Utah.

Remarks.—There were several issues with the locality and date in the original description by Hulst (1900), which read "Texas; taken July 7". Dyar (1904) designated *C. nigrocinereella* as the type species of *Cacotherapia* and stated:

"The locality "Texas" given by Hulst is erroneous. The specimens were bred from larvae feeding on *Leucanium* sp. on *Bigelovia douglasii*, American Fork, Utah (E. A. Schwarz). Received at Dept. Agriculture June 22, 1891, issued ♂ and ♀ July 7 and 8, 1891 (Dept. Agri., No. 5094). This adds another to the list of carnivorous Lepidoptera."

This was probably data in a ledger or index cards that no longer exist. Images of the reared adults (Figs. 1, 3) and their cocoons collected by E. A. Schwarz are provided. Although Munroe (1995) also listed Texas as the type locality,



Figs. 11–20. Adult type specimens of species currently classified in *Cacotherapia*. 11, *Macrothecha bilinealis*, fwl = 8.0 mm. 12, *Microcausta demeridalis*, fwl = 10.2 mm. 13, *Cacotherapia flexilinealis* lectotype, fwl = 6.0 mm. 14, *Macrothecha lecerfialis*, fwl = 7.0 mm. 15, *Macrothecha leucocope*, fwl = 10.0 mm. 16, *Macrothecha peocilostigma* lectotype, fwl = 5.0 mm. 17, *Cacotherapia ponda* lectotype, fwl = 7.0 mm. 18, *Macrothecha unicoloralis*, fwl = 4.0 mm. 19, *Macrothecha unipuncta* lectotype, fwl = 6.0 mm. 20, *Macrothecha vulnifera*, fwl = 7.0 mm. Abbreviations: fwl = forewing length.

an obituary about Dr. E. A. Schwarz includes a map and a list with all his collecting localities (1873–1928) (Howard et al. 1928). In 1891, Schwarz was in the Wasatch Mts. of Utah and confirms Dyar's correction. The confusion may have been caused by text on the label between the Dept. of Agriculture number and the month, date and year that appears to be "Tex" handwritten in cursive, but based on comparison to cursive writing of the time the first letter is a "J", not a "T." Although it is difficult to discern the next two letters conclusively, they appear to be "Jun" which may have been the month when he collected the specimens. The word "issued" in Dyar's description means "eclosed" and is associated with the month of July on the label. E. A. Schwarz was in the type locality in June based on a beetle species named in his honor that he collected from the same locality in June 1891. Hulst (1900) also states that it was "taken July 7," but the specimen with his and the USNM type labels eclosed on July 8, not July 7. There is no doubt that the two specimens, the holotype ♀ and the other reared ♂ specimen, are the same species (Figs. 1, 2).

Cacotherapia angulalis (Barnes and McDunnough, 1918)
(Figs. 6–9)

Macrotheca angulalis Barnes and McDunnough, 1918: 173. pl. 24, fig. 12. TL: Tehachapi, California, United States.

Published accounts.—McDunnough 1939: 26; Munroe 1983: 80 (as *Macrotheca angulalis* Barnes and McDunnough. Munroe 1995: 89; Poole 1996: 812; Powell and Opler 2009; Scholtens and Solis 2015: 71 (as *Cacotherapia angulalis* Barnes and McDunnough).

Type specimen data.—One ♂ lectotype designated to fix and stabilize the name and have been so labeled as required (ICZN Art. 74). Label data: Tehachapi, Kern Co. California/Barnes Collection/red-bordered label with "Macrotheca angulalis B and McD, Type ♂" handwritten [USNMENT01432032]; 1 ♀ paralectotype, Camp Baldy, S. Bern Mts., California/July 16-28/red-bordered label with "Macrotheca angulalis B and McD, Type ♀" handwritten/♀genitalia slide, 11 Jan '33 ME #27/USNM slide #100510[USNMENT01769406].

Additional material.—Arizona: Baboquivari Mts. (Poling); California: NAS Miramar, Kitchen Creek (Bloomfield).

Host.—Powell and Opler (2009) state that larvae were found under webs feeding on tissue at the base of cones of Monterey cypress, is probably associated with other hosts on the mainland, and may be a scavenger. Salas-Monzon et al. (2022) report *C. angulalis* feeding on *Planococcus ficus* Ben-Dov (Pseudococcidae), the vine mealybug, associated with vineyards in Mexico. The identities of these reared adults need confirmation with dissections and/or COI DNA barcoding.

Records.—Occurs in southern California up to 1800 m, and on Santa Catalina and Santa Cruz Islands (Powell and Opler 2009).

Distribution.—Arizona, California.

Remarks.—Images of both the lectotype and paralectotype are included because the lectotype adult is not spread and difficult to see. The original description does not explicitly label the two co-types, both specimens have a handwritten label with the word "Type", and the label data is clearly described after "Habitat"; there is no red USNM type label on either specimen. Dyar (1917) notes:

“The ♀ is more obscured with smoky with less distinct maculation.”

The type needs to be dissected, and because these specimens are from different localities, it is possible they are not conspecific.

Cacotherapia bilinealis (Barnes and McDunnough, 1918)
(Figs. 11, 21)

Macrotheca bilinealis Barnes and McDunnough, 1918: 173, pl. 24, fig. 11.
TL: Paradise, Arizona, United States.

Published accounts.—McDunnough 1939: 26; Munroe 1983: 80 (as *Macrotheca bilinealis* Barnes and McDunnough). Munroe 1995: 89; Poole 1996: 812; Powell and Opler 2009; Scholtens and Solis 2015: 71 (as *Cacotherapia bilinealis* Barnes and McDunnough).

Type specimen data.—One ♂ holotype by original designation. Label data: a red bordered label with “*Macrotheca bilinealis* B and McD, Type ♂” handwritten/Paradise, Cochise Co., Ariz/ June 1-7/Barnes Collection/Photograph Pl. 24 No. 11/♂genitalia slide, 10 Jan. '33 C.H. #16/USNM genitalia slide #107399 [USNMENT01432070]. One ♂ paratype. Label data: red bordered label with “*Macrotheca bilinealis* B and McD, Paratype ♂” handwritten/Paradise, Cochise Co., Arizona (no date label).

Additional material.—Arizona: Cochise Co. (Davis), Mohave Co. (collector unknown).

Host.—Unknown.

Records.—Occurs in southern California (Powell and Opler 2009).

Distribution.—Arizona, California.

Remarks.—Although the original description does not explicitly state a “type,” the specimen has a handwritten label with the word “Type,” and there is no red USNM type label.

Cacotherapia demeridalis
(Schaus, 1924)
(Figs. 12, 22)

Microcausta demeridalis Schaus, 1924: 73, no figure. TL: Volcan de Santa Maria, Guatemala.

Published accounts.—Munroe 1995: 89 (as *Cacotherapia demeridalis* (Schaus)).

Type specimen data.—One ♀ by original designation. Label data: Volcan Sta Maria, Guatemala/July/Schaus and Barnes collection/“*Microcausta demeridalis* Schaus Type” handwritten/USNM Type No. #25599/♀ Pyralidae, (Brit. Mus. crossed out), Slide No. 1978/5/USNM slide #56364[USNMENT01432006].

Host.—Unknown.

Records.—None.

Distribution.—Guatemala.

Remarks.—None.

Cacotherapia flexilinealis Dyar, 1905
(Figs. 13, 23)

Cacotherapia flexilinealis Dyar, 1905: 30, no figure. TL: Brownsville, Texas, United States.

Published accounts.—Barnes and McDunnough 1917: 142; McDunnough 1939: 26; Munroe 1983: 80 (as *Macrotheca flexilinealis* (Dyar)). Barnes and McDunnough. 1912: 37; Munroe 1995: 89; Poole 1996: 812; Scholtens and Solis 2015: 71 (as *Cacotherapia flexilinealis* (Dyar)).

Type specimen data.—One ♂ lectotype designated to fix and stabilize the name and has been so labeled as required (ICZN Art. 74). Label data: Brownsville, Texas, May 1, 1904/H. S. Barber Collector/USNM Type No. 8198/♂ genitalia slide, 11 Jan. '33 C.H. #22/USNM genitalia slide #107400 [USNMENT01432066]. Six paralectotypes. Label data: USNM Type No. 8198/Brownsville, Tex, 2.V.04,



Figs. 21–31. Adult type specimen labels. 21, *Macrothecha bilinealis*. 22, *Microcausta demeridalis*. 23, *Cacotherapia flexilinealis*. 24, *Macrothecha lecerfialis*. 25, *Macrothecha leucocope*. 26, *Macrothecha peocilostigma*. 27, *Cacotherapia ponda*. 28, *Macrothecha unicoloralis*. 29, *Macrothecha unipuncta*. 30, *Macrothecha vulnifera*. 31, *Macrothecha interbicalis*.

♀ genitalia slide, 11 Jan. '33 C.H. #28/USNM genitalia slide #100514; 1 ♂: Brownsville, Tex/5.VI.04/Los Borregos/H.S. Barber; 4♀♀: Burnet Co., Tex, F.G. Schaupp/March (one specimen), April/a handwritten cotype label.

Additional material.—Texas: Brownsville, San Benito, Southern Texas (Barnes Collection), Brownsville, San Benito, Santa Ana Wildlife Ref., Santa Rosa, Paducah, Conroe, Sinton, Welder Wildlife Refuge (A. and M.E. Blanchard); Sinton, Welder Wildlife Refuge (J.C. and

K. G. Shaffer); Bentsen St. Pk. (OFB); Frio R., Concan, Uvalde Co. (Leuschner).

Host.—Unknown.

Records.—None.

Distribution.—South Texas, as far north as Uvalde County.

Remarks.—The original description clearly states the USNM type number is 8198, but a red label was on all syntypes and no specimen had a handwritten label by Dyar with the word “Type,” although there was a “cotype” label on one of the paralectotypes. Although Dyar

(1905) states that two types are with W. D. Kearfott, all are now at the USNM. The male from Los Borregos collected by H. S. Barber may not be conspecific.

Cacotherapia interalbicalis

(Ragonot, 1891)

(Figs. 10, 31; Figs. 20, 30 of *C. vulnifera*)

Macrotheca interalbicalis Ragonot, 1891
545, pl. 5, figs. 12a, 12. TL: Sonora,
Mexico.

Macrotheca vulnifera Dyar, 1917: 83, no
figure. TL: Yavapai County, Arizona.

Macrotheca vulnifica Dyar: McDunnough,
1939, missp.

Published accounts.—Barnes and
McDunnough 1917: 142; McDunnough
1939: 25; Munroe 1983: 80 (as *Macrotheca
interalbicalis* Ragonot). Barnes and
McDunnough 1912: 37–38, 40; Munroe
1995: 89; Poole 1996: 812; Solis 1996:
523; Scholtens and Solis 2015: 71 (as
Cacotherapia interalbicalis Munroe).

Type specimen data.—One ♂ (but
see remark below) holotype by original
designation. Label data: handwritten
Macrotheca, inter[al]bicalis, Rag. type./
Morrison, Sonora, Mexico.1880./TYPE
on red label/213 handwritten/1901, Coll.
E.-L. Ragonot, Museum Paris.

Macrotheca vulnifera Dyar, junior syn-
onym of *M. interalbicalis* Ragonot. 1♂
holotype by original designation. Label
data: Yavapai County, Arizona/USNM
Type No. 21177/♂ genitalia slide, 9 Jan.
'33 C. H. #1/USNM genitalia slide 107419
[USNMENT01432029] [from original
description additional collection data:
August (W. D. Kearfott)].

Additional material.—Arizona: Redd-
ington, Baboquavari Mtns., Yavapai
County, Santa Catalina Mts. (Barnes
Collection), Arizona, Sells P.O.,
Baboquavari (Poling), Nr. Camp Verde
(Belmont), 2–3 mi. N Portal (Brown),

Ft. Huachuca (Ferguson), Pueblo del
Sol (Wielgus), Cave Creek, Ash Canyon
(Leuschner), Madera Canyon (Nicolay),
Madera Canyon (Franclemont), Ash
Canyon (Leuscher), Mohave Co.
(unknown collector); California: Pinyon
Crest (Leuschner), Keystone Canyon
(J. P. and K.E.S. Donahue); New Mexico:
James Can. (Hall).

Host.—Unknown.

Records.—None.

Distribution.—Arizona, California,
New Mexico.

Remarks.—Ragonot (1891) states that
the type is a male, but the illustration of
the adult head shows porrect labial palpi,
therefore it is probably a female. Dyar
(1917) states:

“This is what Barnes and McDunnough
figure as *M. interalbicalis* Ragonot (Cont.
Nat. Hist. Lep. N.A. I, No. V, Pl.III, figs.
9 and 12, 1912); but I am unable to recon-
cile it with Ragonot’s figure.”

Cacotherapia vulnifera was misspelled
as *C. vulnifica* in McDunnough 1939, not
1917.

Cacotherapia lecerfialis (Barnes and
Benjamin, 1925)
(Figs. 14, 24)

Macrotheca lecerfialis Barnes and
Benjamin, 1925: 64, no figure. TL:
Dixieland, California, United States.

Published accounts.—McDunnough
1939: 26; Munroe 1983: 80 (*Macrotheca
lecerfialis* Barnes and Benjamin). Munroe
1995: 89; Poole 1996: 812; Scholtens and
Solis 2015: 71 (as *Cacotherapia lecerfialis*
Barnes and Benjamin).

Type specimen data.—One ♂ holo-
type by original designation. Label data:
Dixieland, Imperial County, California,
15-30 April, 1922, O.C. Poling, Coll./
red-bordered label with “*Macrotheca
lecerfialis* B. and Benj. ♂ Holotype”

handwritten [USNMENT01432048]. Allotype ♀, 1–15 May, 1922; paratypes 8 ♂♂, 15–30 April, 1922. Allotype and paratypes from the same locality.

Additional material.—California: Folsom (C. V. Riley), Vidal (Westmark), Indian Wells (Martin).

Host.—Unknown.

Records.—None.

Distribution.—California.

Remarks.—None.

Cacotherapia leucocope (Dyar, 1917)
(Figs. 15, 25)

Macrotheca leucocope Dyar, 1917: 83, no figure. TL: Denver, Colorado, United States.

Published accounts.—McDunnough 1939: 26; Munroe 1983: 80 (as *Macrotheca leucocope* Dyar). Munroe 1995: 89; Poole 1996: 812; Scholtens and Solis 2015: 71 (as *Cacotherapia leucocope* Dyar).

Type specimen data.—One ♂ holotype by original designation. Label data: Denver, Colo/Collection Wm Schaus, “*Macrotheca leucocope* Dyar Type” handwritten/USNM Type No. #21176/♂ genitalia slide, 9 Jan. ’33 C.H. #2/USNM slide #107407 [USNMENT01432050].

Additional material.—Colorado: Denver, Colorado (W. Schaus), 4 specimens, with same labels as holotype; 5 mi. N. Buena Vista (Hodges), The Castles, 8 mi. E. Buena Vista (Ferguson), Ponderosa Hills, Parker, Big Thompson Canyon (Leuschner); Arizona: Hockderffer Hill (Hodges), Walnut Canyon (Franclemont), 4 mi. N. Prescott (Martin), Rt. 62 @ Spring Valley Road (Belmont); Nebraska: Valentine NWR (Hodges), Ft. Niobrara (Ferguson); New Mexico: Hot Springs (Fernald), Silver City, Cedar Crest, Sandia Pk. (Leuschner), 2 mi. W. Gran Quivera Nat. Mon. (Davis); Oregon: Baker (Baker); Texas: Sierra Diablo Wildlife Mgmt. Area (A. and E. Blanchard), Mount

Locke (A. and E. Blanchard), Hospital Canyon, Sierra Diablo Wildlife Mgmt. Area (Franclemont), 20 mi NNW Van Horn (Hodges), Sierra Diablo (Ferguson), Alpine (Poling), Davis Mtn. Resort (Marqua); Wyoming: 6 mi NW Newcastle (Hodges), Sect. 24 west of Hwy 287 just north of Colorado (Nordin).

Host.—Unknown.

Records.—None.

Distribution.—Arizona, Colorado, Nebraska, New Mexico, Oregon, Texas, Wyoming.

Remarks.—One specimen “Labeled by Mr. Schaus: “*Macrotheca interalbicans*,” but it does not agree with at all with Ragonot’s figure of *M. interalbicans*.” (Dyar 1917).

Cacotherapia poecilostigma
(Dyar, 1914)
(Figs. 16, 26)

Macrotheca poecilostigma Dyar, 1914: 31, no figure. TL: Trinidad River, Panama.

Published accounts.—Munroe 1995: 89 (as *Cacotherapia poecilostigma* Dyar).

Type specimen data.—One ♂ lectotype designated to fix and stabilize the name and have been so labelled as required (ICZN Art. 74). Label data: Rio Trinidad, Mar 1912, Panama/A. Busck coll./red label with “*Macrotheca poecilostigma* Dyar Type” handwritten/USNM Type No. 16314/♂ genitalia slide, 17 Jan ’33, C.H. #53/USNM slide #107412 [USNMENT01432064]. 1 ♂ paralectotype: La Chorrera/May, 1912/A. Busck coll.

Additional material.—Panama: Barro Colorado Island (Duckworth).

Host.—Unknown.

Records.—None.

Distribution.—Panama.

Remarks.—Two specimens clearly stated in the original description as “cotypes”.

Cacotherapia ponda Dyar, 1907
(Figs. 17, 27)

Cacotherapia ponda Dyar, 1907: 52. TL:
Claremont, California, United States.

Published accounts.—Barnes and McDunnough 1917: 142; McDunnough 1939: 26; Munroe 1983: 80 (as *Macrotheca ponda* (Dyar)). Barnes and McDunnough. 1912: 37–38; Munroe 1995: 89; Poole 1996: 812; Powell and Opler 2009; Scholtens and Solis 2015: 71 (as *Cacotherapia ponda* Dyar).

Type specimen data.—One ♂ lectotype designated to fix and stabilize the name and have been so labelled as required (ICZN Art. 74). Label data: Claremont, Cal., Baker/a white label with “*Cacotherapia ponda* Type Dyar” in Dyar’s handwriting/USNM Type No. 10151/♂ genitalia slide, 10 Jan. ’33 C.H. #14 (slide not found) [USNMENT01432064]. 2 ♂♂ paralectotypes: same locality. Same red USNM type labels.

Additional material.—Arizona: Carr Canyon (Wielgus) Walnut Canyon, Madera Canyon (Franclemont), Paradise (Collector unknown); California: Santa Catalina Island (Meadows), 2 mi. S. Tahoe City (Westerland), Mt. Lowe (collector unknown), Pinyon Crest, Along Kern R., Angelus Oaks, Pala (Leuschner).

Host.—Unknown.

Records.—Occurs in southern California (Powell and Opler, 2009).

Distribution.—Arizona, California.

Remarks.—None.

Cacotherapia unicoloralis (Barnes and
McDunnough, 1913)
(Figs. 18, 28)

Macrotheca unicoloralis Barnes and
McDunnough, 1913: 176, pl. 3, fig.6.
TL: Everglade, Florida, United States.

Published accounts.—Barnes and McDunnough 1917: 142; McDunnough

1939: 26; Kimball 1965: 236; Munroe 1983: 80 (as *Macrotheca unicoloralis* Barnes and McDunnough). Munroe 1995: 89; Poole 1996: 812; Heppner 2007: 294; Scholtens and Solis 2015: 71 (as *Cacotherapia unicoloralis* Barnes and McDunnough).

Type specimen data.—One ♂ holotype by monotypy. Label data: Everglade, Florida/April-15/red bordered label with “*Macrotheca unicoloralis* Type B and McD ♂ Type” handwritten/Barnes Collection/♂ genitalia slide, 9 Jan. ’33, C.H. #4/USNM genitalia slide #107416/Photograph Pl.3 No. 6 [USNMENT01432099].

Additional material examined.—Florida: Archbold Biological Station (Ferguson), University Reserve (Ferguson), Lakeland (Ainslie); South Carolina: Wedge Plantation (Hodges, Ferguson)

Host.—Unknown.

Records.—Florida: Myrtle Grove (WJW), Gainesville (Rogers), Archbold Biological Station (Needham) (Kimball). West, North, Central, Subtropical areas. (Heppner 2007).

Distribution.—Florida, South Carolina.

Remarks.—Some adult specimens are much darker than others. Moths flying March–April, June–July (Heppner 2007).

Cacotherapia unipuncta (Dyar, 1913)
(Figs. 19, 29)

Macrotheca unipuncta Dyar, 1913: 23, no
figure. TL: New Brighton, Pennsylvania,
United States.

Published accounts.—Barnes and McDunnough 1917: 142; Forbes 1923: 535; McDunnough 1939: 26; Kimball 1965: 236; Munroe 1983: 80; Pierce 1995: 434 (missp. *M. unipunctata*) (as *Macrotheca unipuncta* Dyar). Munroe 1995: 89; Poole 1996: 812; Heppner 2007: 294; Scholtens and Solis 2015: 71 (as *Cacotherapia unipuncta* Dyar).

Type specimen data.—One ♂ lectotype designated to fix and stabilize the name and have been so labelled as required (ICZN Art. 74). Label data: New Brighton, PA, VII-25-1905, H. D. Merrick/USNM Type No. 15523/53/♂ genitalia slide. 9 Jan. '33.C.H. #6/USNM genitalia slide #107147/*Macrotheca unipuncta* Dyar HT ♂ (handwritten by E.G. Munroe) [USNMENT01432097]. 3 ♂♂ paralectotypes. Label data: Tryon, North Carolina, W. F. Fiske, 8-13-04, 5-25-04, no collecting date on third paralectotype.

Additional material examined.—Arkansas: Devil's Den St. Pk. (Hodges); Florida: Lake Alfred (Bottimer), Stemper, St. Petersburg (unknown); Georgia: Ochoopee Dunes (Glaser); Illinois: Putnam Co. (Glenn); Maryland: Plummers Island (Busck), 8 km SW Pocomoke City (Hill and Bartgis); North Carolina: Beaufort, Ft. Macon St. Pk., Ft. Bragg Jumping Run Ck., Ft. Bragg Twig Rush Bog, Stella Haywood Landing, Croatan Rd 147, Camp Lejune Corn Landing, Holly Shelter Gamelands, (Sullivan), Niagara (collector unknown); Pennsylvania: New Brighton, not part of the type series (Merrick); South Carolina: Cherry Hill Recreation Area Rt. 107 (Franclemont).

Records.—Michigan: Berrian County (Liebherr 1977); Florida: Escambia Co. (SMH), Myrtle Grove (WJW), Siesta Key (CPK), Punta Gorda (MOG) (Kimball 1956); Pennsylvania (Forbes 1923). They occur in West, North, Central, Subtropical areas of Florida (Heppner 2007).

Host.—*Pseudococcus maritimus* (Ehrhorn), *Planococcus citri* (Risso).

Distribution.—Arkansas, Florida, Georgia, Illinois, Maryland, North Carolina, Pennsylvania, South Carolina.

Remarks.—Munroe was in error to label one specimen as "HT." Most of the collections are of males and very few females (ratio is almost 4 males to 1

female), even in long series from North Carolina collected by B. Sullivan. Moths flying March–April, August–September in Florida (Heppner 2007).

DISCUSSION

Predation, and especially feeding on scale insects (Coccidae) and relatives, occurs in several moth families, but it is considered uncommon in these lepidopteran taxa (Pierce 1995). In the Pyralidae, the Phycitinae has the most known recorded examples with, for example, *Laetilia* Ragonot species reported to feed on scale insects (Coccidae) associated with cacti. Heinrich (1956) reported that the well-known *Laetilia coccidovora* (Comstock) feeds "on any of the larger scales and mealybugs that occur in colonies of sufficient number to provide food. They seem to be fond of the cochineal scale on cactus and on this plant will occasionally vary their diet by feeding upon the flowers." In the Galleriinae, Hemiptera-feeding is confined to the Cacotherapiini. Predators can also be scavengers (Pierce 1995), so Powell and Opler's (2009) observation that *C. angulalis* (See Remarks under this species) may be a scavenger (i.e., omnivorous and feeding opportunistically) could apply to several or all species in this genus.

This paper is written to bring attention to this little-known, but biologically interesting snout moth group that requires a revision with recently collected material for dissection and molecular research. Some species identities still need to be confirmed, for example, Powell and Opler (2009) stated:

"Based on the variation in reared series, this species, *Cacotherapia ponda* (Dyar), also described from southern California, and *C. bilinealis* Barnes and McDunnough from Arizona, may all refer to a single species."

Study of specimens in state, university, and private collections will undoubtedly increase species distributions. Recently collected material at the USNM includes undescribed species from the American southwest, and Neotropical material, though rare, will also undoubtedly uncover new species. Recent material also shows that some of the species have a greenish cast that has disappeared in the older type specimens. Finally, comparison to the related genera in the tribe Cacrotherapiini, *Alpheias* Ragonot, *Alpheioides* Barnes and McDunnough, *Decaturia* Barnes and McDunnough, and *Genopashia* Dyar may elucidate the relationships between them (Barnes and McDunnough 1912).

ACKNOWLEDGMENTS

I thank Jon ‘Buck’ Lewis, retired, Systematic Entomology Laboratory (SEL), for locating and scanning original descriptions, and Gary Miller (SEL) for information about Hemiptera and help in searching the scale insect collection for an E. A. Schwarz record. I kindly thank Joël Minet, Muséum National d’Histoire Naturelle, Paris, France (MNHP), for the images of the Ragonot type and labels under his care. I thank Jason Dombroskie who made suggestions that improved the clarity of the manuscript. Mention of trade names or commercial products in this publication is solely for the purpose of providing specific information and does not imply recommendation or endorsement by USDA. USDA is an equal opportunity provider and employer.

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