



<http://dx.doi.org/10.11646/zootaxa.3794.4.5>

<http://zoobank.org/urn:lsid:zoobank.org:pub:DE6AB76C-5FB2-46FD-AEDA-E1C35C33BB42>

***Anacamptis rhoifruetella* (Clemens): clarification of its identity and larval biology, and differentiation from a similar species, *Anacamptis consonella* (Zeller), revised status (Lepidoptera: Gelechiidae)**

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Abstract

Anacamptis rhoifruetella (Clemens) (Lepidoptera: Gelechiidae) was described from individuals reared from larvae collected in fruit racemes of staghorn sumac, *Rhus typhina* (Anacardiaceae). Rearing efforts in central Illinois, however, have established that *A. rhoifruetella* actually feeds on leaves of *Viburnum prunifolium* (Caprifoliaceae). Furthermore, a second *Anacamptis* species also feeds on leaves of *V. prunifolium*. The second species is very similar to *A. rhoifruetella* in external appearance of the adult and in larval feeding mode but is readily differentiated on basis of larval appearance, phenology, and genital morphology of both genders. Examination of type specimens of *Gelechia consonella* Zeller, *G. quadrimaculella* Chambers, and *G. ochreocostella* Chambers, all of which were previously designated as junior synonyms of *A. rhoifruetella*, revealed that the valid name of the second species is ***Anacamptis consonella* (Zeller, 1873), revised status**; *G. ochreocostella* and *G. quadrimaculella* are assigned as junior synonyms of *A. consonella*. We provide descriptions and illustrations of characters that reliably differentiate *A. rhoifruetella* from *A. consonella*. We conclude that Clemens' record of *A. rhoifruetella* feeding on fruits of sumac is erroneous, and we offer an explanation of how the error probably occurred.

Key words: Microlepidoptera, taxonomy, larval host plants, Anacardiaceae, *Rhus*, Caprifoliaceae, *Viburnum*, *innocueella*, *populella*, forest insects

Introduction

The genus *Anacamptis* Curtis (Lepidoptera: Gelechiidae) is developed to varying degrees in the world's faunal regions, apparently reaching its greatest diversity in the Neotropics, where over 150 species are attributed to the genus (Lee 2009). In North America north of Mexico, *Anacamptis* comprises 23 described species (Lee et al. 2009). North American species for which life histories are known are reported to feed as larvae on Anacardiaceae, Asteraceae, Betulaceae, Caprifoliaceae, Combretaceae, Euphorbiaceae, Fabaceae, Fagaceae, Rosaceae, Salicaceae, and Sapindaceae, and most species are recorded as being monophagous or oligophagous within a single plant genus (Robinson et al. 2009).

Clemens (1861) described *Gelechia rhoifruetella* from moths that were reared from larvae collected among overwintered fruits of staghorn sumac, *Rhus typhina* Linnaeus (Anacardiaceae) in April and early May, in Pennsylvania, USA. Subsequently, Zeller (1873) described *Gelechia consonella*, and Chambers described *G. quadrimaculella* (1874) and *G. ochreocostella* (1878a). The latter three species were described from type specimens that were collected as adults (*G. consonella* from Missouri, the remaining two species from Texas), and all were later evaluated as junior synonyms of *A. rhoifruetella* (Walsingham 1882; Dyar 1902; Busck 1903). Chambers (1875) also inadvertently described a different species of gelechiid from Colorado as *G. quadrimaculella*, which became a junior homonym of the moth described by that name in 1874. Upon becoming aware of the problem, Chambers (1878b) emended the name of the Colorado moth to *pravinominella*. It is a member of the genus *Filatima* Busck and therefore does not figure into the present paper.

Material examined. Missouri: lectotype of *Gelechia consonella*, BMNH specimen BMNH(E)#1055486; abdomen missing, otherwise in good condition; labels: (1) “*Gelechia (Tachyptilia) consonella* Z. Missouri: Rly. 69”; (2) “TYPE”; (3) “Lectotypus m# *Gelechia consonella* Z. Select.: K. Sattler, 1961” (4) “241” (5) “*Gel. populellae proxima*’ Z. Missouri Riley lit. 10/69” (6) “Zeller Coll. Walsingham Collection. 1910–247.” (7) “LECTO-TYPE” (8) “Abdomen missing”; Texas: lectotype of *Gelechia quadrimaculella*, designated by R. W. Hodges (Miller and Hodges 1990: 65): MCZ type #MCZT_1436; abdomen missing, otherwise in good condition; label information given by Miller and Hodges (1990: 65). Type specimen of *Gelechia ochreocostella* (MCZ type #MCZT_1455); specimen intact and in good condition; labels: (1) “Type 1455”; (2) “Tex.”; (3) [illegible ink run]; (4) “101”; (5) “*ochreocostell*[truncated] Chb”; (6) “*Anacamptis consonella* (Zeller) Det. T. Harrison, 2014”; genitalia in glycerin in vial on separate pin beside specimen in tray; labels: (1) “Genitalia of type MCZT_1455 *Gelechia ochreocostella* Chambers Dissected T. Harrison, 2013”; (2) “*Anacamptis consonella* (Zeller) Det. T. Harrison, 2014”; Illinois, reared on *Viburnum prunifolium*: Charleston Lake View Park: (1) 22-V-1991, em. 30-V-1991; (2) 13-V-1991, em. 30-V/1-VI-1991; (2) 23-V-1992, em. 10/11-VI-1992; 7 miles south of Charleston: (1) 20-V-1992, em. 14-VI-1992; Piatt County, Robert Allerton Park: (7) 7-VI-1997, em. 15/21-VI-1997.

Discussion

The pronounced trend in *Anacamptis* toward stringent specialization in larval host plant preference, and the observed larval biologies of *A. rhoifruetella* and *A. consonella* (including refusal of sumac fruits by *A. rhoifruetella* in feeding trials) compel us to doubt and attempt to explain Clemens’ record of *A. rhoifruetella* larvae feeding on sumac. *Rhus typhina* is a common plant that occurs in every state east of the Mississippi River except Florida (USDA, NRCS 2009). A common tortricid moth, *Paralobesia rhoifruetana* (Kearfott), feeds on the fruits of *R. typhina* during the summer months, and its feeding activity leaves frass and silk among the host tissue. The sumac fruit cluster and its *P. rhoifruetana*-generated debris persist through winter and into the following spring, at which time of year (“April or early May”) Clemens (1861) reported collecting larvae of *A. rhoifruetella* from the fruits of *R. typhina*. Clemens stated that the presence of larvae “is indicated by strings of ‘frass’ clinging to the exterior” [of the fruit spike]. We suggest that this most likely was frass that was deposited by *P. rhoifruetana* during the preceding year, rather than by *A. rhoifruetella*. Clemens also states that the larvae of *A. rhoifruetella* “feed on the crimson hairs and exterior envelope of the drupes, without however eating the drupes themselves.” It is not clear whether this statement was based only on examination of damage on the fruits, or on actual observation of apparent feeding activity by *A. rhoifruetella* larvae. If the former, then it seems likely that the damage was that of *P. rhoifruetana*; if the latter, then the behavior might have been related to prepupation, rather than being actual feeding activity. Based on our knowledge of the biology of *A. rhoifruetella*, therefore, it appears evident that the larvae collected by Clemens had migrated to the fruit cluster of a nearby sumac solely for the purpose of using it as a pupation site, after they had finished feeding on leaves of the true host plant, viburnum.

Considering the similarities between *A. rhoifruetella* and *A. consonella* in host plant preference, larval mode of feeding, and external appearance of adults, it is perhaps tempting to hypothesize that the two are sister species within *Anacamptis*. The resolution of this question, however, must await a phylogenetic analysis of the genus.

Acknowledgments

For the loan or imaging of type specimens of *Anacamptis* species treated in this paper, we thank Jason Weintraub, ANSP, Dr. Philip Perkins, MCZ, and Kevin Tuck, BMNH. We are grateful to Ilona Loser for images of the larva and larval feeding damage of *Anacamptis consonella*. We thank two reviewers for their helpful comments on the manuscript, and we thank the Tyler Foundation for financial support of this work.

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