

NOMENCLATORIAL CHANGES IN EUCOSMINI (TORTRICIDAE)

RICHARD L. BROWN

Department of Entomology, Cornell University, Ithaca, N.Y. 14853

ABSTRACT. The genera *Kundrya*, *Norma*, and *Erinaea* are synonymized with *Rhopobota*. Female genitalia of *R. unipunctana*, *R. dietziana*, and *R. finitimana* are illustrated. *Griselda stagnana* and *G. myrtillana* are transferred to *Rhopobota*. *Epiblema separationis*, formerly a subspecies of *E. praesumptiosa*, is recognized as a species. Female genitalia of both species are illustrated. *Notocelia trimaculana*, *N. illotana*, *N. culminana*, and *N. purpurissatana* are distinguished from *Epiblema*.

Problems of identification, classification, and evolutionary relationships of the Olethreutinae have persisted in spite of the economic importance of many species in this subfamily. Heinrich's revision (1923) of the Eucosmini was based principally upon characteristics of wing venation and male genitalia. In recent years Bentinck and Diakonoff (1968), Diakonoff (1973), and Obratzsov (1958-1968), have recognized the value of the female genitalia in differentiating species as well as defining the genera. This paper presents modifications in the classification of selected Eucosmini genera and species as a result of the examination of the female genitalia and other characters.

Changes in *Rhopobota*

Rhopobota Lederer, 1859, Wien. Ent. Monat., 3: 366.

Type species: *Tortrix naevana* Huebner [1814-1817], by monotypy. Although Lederer considered *R. naevana* a senior synonym of *Tortrix unipunctana* Haworth [1811], *R. naevana* is now recognized as a junior subjective synonym of *R. unipunctana*.

Norma Heinrich, 1923, U.S. Natl. Mus. Bull. 123: 191. [New Synonymy.]

Type species: *Epinotia dietziana* Kearfott, 1907, by monotypy.

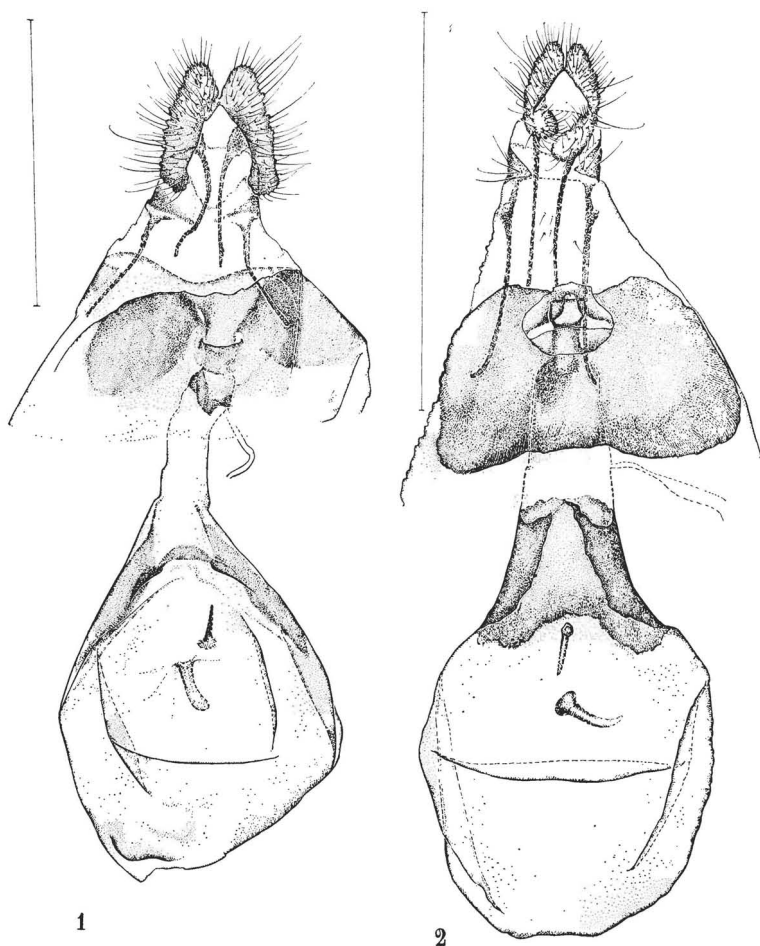
Kundrya Heinrich, 1923, U.S. Natl. Mus. Bull. 123: 192. [New Synonymy.]

Type species: *Kundrya finitimana* Heinrich, 1923, by monotypy.

Erinaea Meyrick, 1907, Journ. Bombay Nat. Hist. Soc., 18: 141. [New Synonymy.]

Type species: *Erinaea chlorantha* Meyrick, 1907, by monotypy; a junior subjective synonym of *Teras verditer* Hampson, 1891 (Diakonoff, 1950).

The genera *Norma* and *Kundrya* were considered by Heinrich to be close to *Rhopobota*. Heinrich distinguished *Kundrya* by a character of the forewing venation, R_4 and R_5 united. These two veins were described as stalked in *Rhopobota* and approximate in *Norma*. *Rhopobota* was separated from the first two on the basis of the porrect socii which are



FIGS. 1-2. Female genitalia including seventh abdominal segment: (1, left) *Rhopobota unipunctana* (Bellingham, Washington; USNM 17763); (2, right) *Rhopobota dietziana* (Ethel, Arkansas; R. L. Brown prep. 683). Scale line = 1 mm.

apically fused. Meyrick (1907) described *Erinaea* based upon a species from Ceylon, and did not indicate a relationship with *Rhopobota*.

Unique characters of the female genitalia of all the type species and a reassessment of previous distinctions provide the basis for synonymizing *Erinaea*, *Norma*, and *Kundrya* with *Rhopobota*. The most distinctive character is the sclerotization of the sides and base of the corpus bursae and distal area of the ductus bursae. A separate sclerotized band around the ductus bursae is located near the colliculum at the inception of the

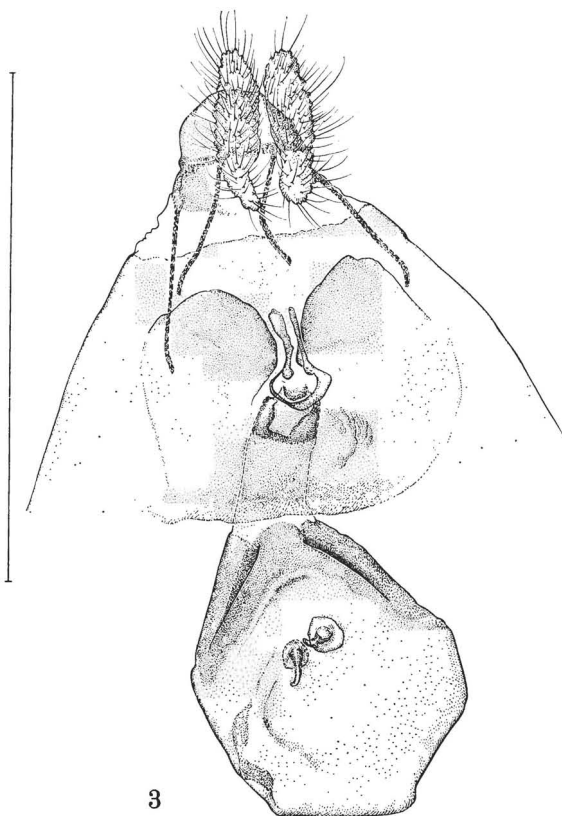


FIG. 3. Female genitalia including seventh abdominal segment of *Rhopobota finitimana* (Falls Church, Virginia; USNM 17762). Scale line = 1 mm.

ductus seminalis. The colliculum is sclerotized ventrally and extends beyond the lamella antevaginalis. Both the lamella antevaginalis and lamella postvaginalis are well developed and may be fused with or separate from the seventh sternite (Figs. 1, 2, 3; Clarke, 1958, pl. 169). These characteristics are also shared by the Asian species, *R. eclipticodes* (Meyrick) and *R. microrrhyncha* (Meyrick), as figured by Clarke (1958, pl. 170) and the Palearctic species, *R. ustomaculana* (Curtis), figured by Bentinck and Diakonoff (1968, fig. 189b, c).

The eighth tergite which surrounds the papillae anales possesses scales as well as simple setae in the three North American species, *dietziana*, *finitimana*, and *unipunctana*. Scales may be present or absent on the eighth tergite among the species of the related genera, *Epinotia*, *Ancylis*, and *Chimoptesis*.

The male genitalia of *finitimana*, *dietziana*, and *unipunctana* are similar in having a bifurcate uncus with widely separated arms that are fingerlike and weakly sclerotized. The socii are long, porrect, and densely setose, separate in *finitimana* and *dietziana* and fused apically in *unipunctana*. The gnathos of *Rhopobota* is reduced and weakly sclerotized medially. The aedeagus is short in *finitimana*, longer in *dietziana* and *unipunctana*. The male of *chlorantha* has not been examined.

The condition of veins R_4 and R_5 in the forewing represents a transition from approximate in *dietziana* ($n = 17$) to stalked in *unipunctana* ($n = 37$) and united in *finitimana* ($n = 7$). The length of the stalk varies among the specimens of *unipunctana* examined. These veins are stalked in the type of *chlorantha*, as illustrated by Clarke (1958).

All three North American species of *Rhopobota* feed on *Ilex* (Aquifoliaceae). *R. unipunctana* also feeds on *Vaccinium* (Ericaceae) and is a pest of cranberry, *Vaccinium macrocarpon* Aiton (Heinrich, 1923). The larvae of *unipunctana* and *dietziana* were described by MacKay (1959) and were considered to be closely related.

Analysis of photographs and drawings of the genitalia (Bentinck and Diakonoff, 1968; Pierce and Metcalfe, 1922) provides evidence for synonymizing *Griselda stagnana* (Denis and Schiffermueller) and *G. myrtillana* (Westwood) with *Rhopobota*. Obraztsov (1945) included these two species in *Griselda* Heinrich, based on the presence of a costal fold in the forewing of the male. Powell (1964) provisionally retained these two in *Griselda* but indicated that they might not be congeneric with the type species, *G. radicans* (Walsingham), the sole North American species. The male and female genitalia of *G. radicans* are similar to those of *Epinotia hopkinsonana* (Kearfott) and *E. subviridis* Heinrich, all conifer feeders.

The presence of the costal fold in *stagnana* and *myrtillana* does not justify their separation from the other *Rhopobota* species which lack one. Secondary sexual characteristics, such as the costal fold of the male, are seldom of generic value, as is emphasized by Diakonoff (1973) in his study of the South Asiatic Olethreutini. My investigations of *Epinotia* also show the costal fold may be present or absent in closely related species.

Rhopobota stagnana ([Denis and Schiffermueller]). [New Combination.]

Tortrix stagnana [Denis and Schiffermueller], 1775, Ankündigung eines Systematischen Werkes von den Schmetterlingen der Wienergegend, p. 131.

Tortrix fractifasciana Haworth, [1811], Lepidoptera Britannica, 3: 466.

Rhopobota fractifasciana, Pierce and Metcalfe, 1922, Genitalia British Tortricidae, p. 75, pl. 26.

Griselda fractifasciana, Obraztsov, 1945, Zeitschr. Wiener Entomol. Ges., 30: 33–34.

The female of *R. stagnana* has a corpus bursae with sclerotized sides.

The sterigma is similar in shape to that of *R. dietziana*, both lamella postvaginalis and antevaginalis are well developed. A sclerotized band around the ductus bursae is located near the colliculum. Scales are present on the eighth tergite, as shown in the specimen figured by Bentinck and Diakonoff (1968).

R. stagnana occurs in England and central Europe (Meyrick, 1895), and feeds on the flowers and seeds of *Scabiosa columbaria* L. (Dipsaceae) in England (Ford, 1949).

Rhopobota myrtillana (Westwood). [New Combination.]

Sericoris myrtillana Westwood, In Humphreys and Westwood, 1845, British Moths, 2: 146, pl. 89, fig. 15.

Grapholitha vacciniana Zeller, 1846, Isis von Oken, p. 248.

Rhopobota vacciniana, Pierce and Metcalfe, 1922, Genitalia British Tortricidae, p. 75, pl. 26.

Griselda vacciniana, Obratzsov, 1945, Zeitschr. Wiener Entomol. Ges. 30: 34.

Griselda myrtillana, Bradley, 1959, Entomol. Gazette, 10: 72, pl. 11.

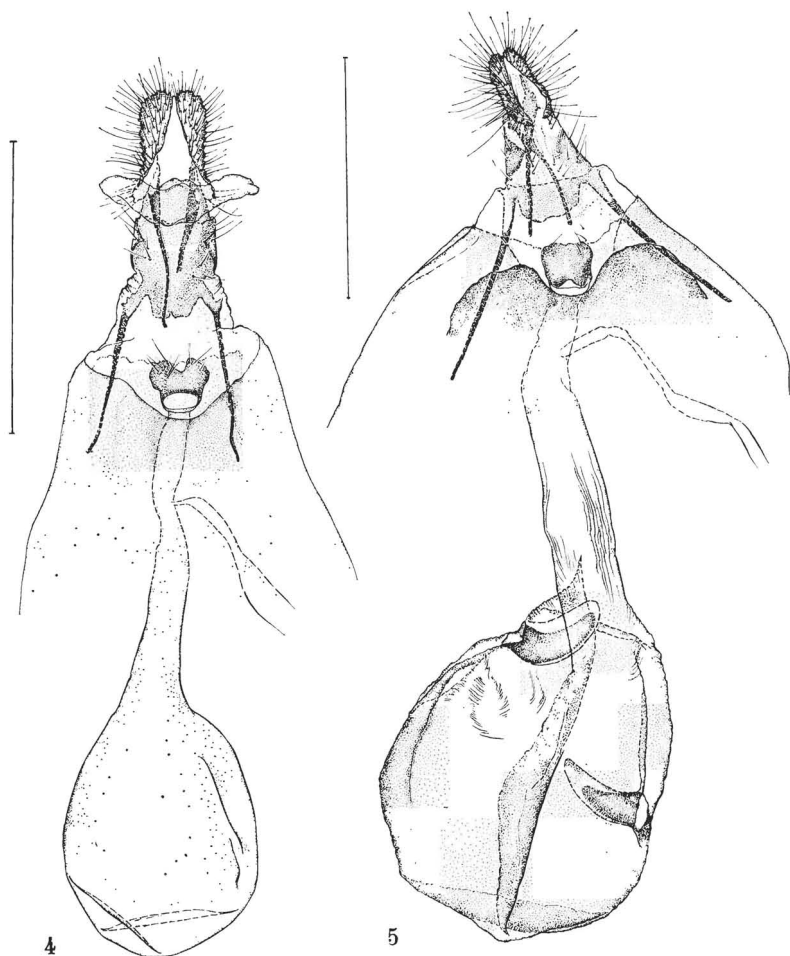
The female has a similar, although weaker, sclerotization of the corpus bursae than that described above. The sclerotized band around the ductus bursae is located near the colliculum. Both the lamella antevaginalis and postvaginalis appear well developed and separate from the seventh sternite. Scales on the eighth tergite probably are present, but are not evident in the figures. The male has a rudimentary clasper on the valva, similar to *R. unipunctana* and *ustomaculana*.

R. myrtillana occurs through north and central Europe and the British Isles. The larvae feed on *Vaccinium myrtillana* L. (Ericaceae) (Meyrick, 1895).

Changes in *Epiblema* Huebner

Epiblema separationis was described by Heinrich (1923) as a subspecies of *praesumptiosa* Heinrich but is raised to the species level in this paper. Heinrich characterized *separationis* by its smaller size, the absence of brown spots on the inner margin of the forewing ocellus and vein 1A, and the more rounded cucullus. *E. separationis* has a forewing expanse of 9–11 mm ($n = 10$); *praesumptiosa* has a forewing expanse of 14–17 mm ($n = 11$). However, the maculation of the forewing varies with the brown spots present or absent in each.

The most conspicuous differences are found in the female genitalia and seventh abdominal segment (Figs. 4, 5). *E. separationis* lacks signa on the corpus bursae, whereas *praesumptiosa* has two well developed signa. The papillae anales of *separationis* are widened apically but those of *praesumptiosa* are nearly uniformly wide. The lamella postvaginalis is more setose and emarginate posteriorly in *separationis*. The sclerotiza-



FIGS. 4-5. Female genitalia including seventh abdominal segment: (4, left) *Epibelema separationis* (San Benito, Texas; USNM 17735); (5, right) *Epibelema praesumptiosa* (Brownsville, Texas; USNM 17708). Scale line = 1 mm.

tion of sternite VII is relatively narrower and longer in *separationis* than in *praesumptiosa*. Both species lack sclerotization of the ductus bursae; however, the ductus bursae of *praesumptiosa* is distinct in being striate. Both species possess setae but lack scales on tergite VIII.

E. separationis possesses a tri-lobed eversible pouch ventrally, anterior to the papillae anales. This pouch can be everted by forcing alcohol with a syringe into the anterior opening of the seventh segment after it has been separated from the rest of the abdomen. The pouch appears to be glandular under high magnification.

The male genitalia of *separationis* differ from those of *praesumptiosa* in having shorter setae on the corona of the rounded cucullus, a smaller rudimentary clasper, and a truncate uncus. Male genitalia of both species have been figured by Heinrich (1923).

E. separationis appears to be closely related to *discretivana* (Heinrich). Both species lack signa and sclerotization of the ductus. *E. praesumptiosa* is thought to be most closely related to *numerosana* (Zeller), *grossbecki* Heinrich, *abruptana* (Walsingham), *deflexana* Heinrich, and *exacerbatricana* Heinrich. This species group shares the derived characteristic of long coronal setae on the cucullus. Sclerotization of the ductus is also lacking in this group. MacKay (1959) included *insidiosana* Heinrich in this group. However, *insidiosana* has short coronal setae on the cucullus and a sclerotized band around the ductus bursae.

The distribution of *separationis* within the United States is limited to southern Texas and Florida. The larvae, described by MacKay (1959), have been reared from galls of *Borrchia frutescens* (L.) (Compositae) in both localities. *E. praesumptiosa* is limited to southern Texas; the host plant has not been identified.

Four *Notocelia* species, *trimaculana* (Haworth), *illotana* (Walsingham), *culminana* (Walsingham), and *purpurissatana* (Heinrich), were included in *Epiblema* by Heinrich (1923). *N. suffusana*, a junior subjective synonym of *trimaculana*, was reassigned to *Notocelia* from *Epiblema* by Bentinck and Diakonoff (1968). MacKay (1959) described the external feeding larvae of *culminana* and *trimaculana* and considered them to be a separate genus but retained them in *Epiblema*.

Notocelia is distinguished from *Epiblema* by the presence of two non-deciduous cornuti at the apex of the aedeagus and a well-developed lamella antevaginalis of the female. The antevaginal plate is reflexed outward producing a projecting ostium. The ductus bursae of the female is lightly sclerotized from the ostium to the heavily sclerotized band at the inception of the ductus seminalis.

ACKNOWLEDGMENTS

I wish to acknowledge with my appreciation the following individuals and institutions who have provided specimens used in this study: D. R. Davis, U.S. National Museum of Natural History, Smithsonian Institution; J. G. Franclemont, Cornell University; Museum of Comparative Zoology, Harvard University; W. W. Moss, Academy of Natural Sciences of Philadelphia; E. Munroe, Canadian National Collection; F. H. Rindge, American Museum of Natural History. Drs. Franclemont, William Miller, and Jerry Powell have read parts of the manuscript and made suggestions for its improvement. I thank Amy Louise Trabka for the draw-

ings. This study was supported in part by National Science Foundation Grant DEB 77-15808 and a Grant-in-Aid of Research from the Society of Sigma Xi.

LITERATURE CITED

- BENTINCK, G. A. G. AND A. DIAKONOFF. 1968. De Nederlandse Bladrollers (Tortricidae). Mono. Ned. Entomol. Vereen., No. 3. 201 p., 33 pl.
- CLARKE, J. F. G. 1958. Catalogue of the type specimens of Microlepidoptera in the British Museum (Natural History) described by Edward Meyrick. Vol. 3. British Museum (Natural History), London. 600 p.
- DIAKONOFF, A. 1950. The type specimens of certain oriental Eucosmidae and Carposinidae. Bull. Brit. Mus. (Nat. Hist.) Ent. Vol. 1(4): 275-300, 8 pl.
- . 1973. The South Asiatic Olethreutini (Lepidoptera, Tortricidae). Zööl. Mono. Rijksmus. Nat. Hist., No. 1. i-xii, 700 p.
- FORD, L. T. 1949. A guide to the smaller British Lepidoptera. So. London Ent. and Nat. Hist. Soc., London. 230 p.
- MACKEY, M. R. 1959. Larvae of the North American Olethreutidae (Lepidoptera). Can. Ent. 91, Suppl. 10. 338 p.
- MEYRICK, E. 1895. A handbook of British Lepidoptera. MacMillan and Co., London. i-vi, 843 p.

Journal of the Lepidopterists' Society
33(1), 1979, 28

EDITORIAL POLICY STATEMENT TO CONTRIBUTORS

Contributors are urged to pay particularly close attention to the directions for preparing manuscripts for publication in the *Journal*. These directions are clearly spelled out on the inside back cover of each issue. Before preparing the final copies to be submitted, each author should decide whether or not this contribution should be in the form of an *article* or a *general note*. Topics of articles should be of major importance to the field of Lepidopterology. Please note that the format for these two types of contributions differs. Beginning with 1 Jan. 1979, all articles should be submitted in triplicate (an original, and two reviewer's copies). Abstracts also are required for articles, but not for general notes.

Authors are urged not to submit color illustrations for publication, unless 1) they are of exceedingly high quality, and 2) the author is prepared to pay for the cost of these illustrations himself (the cost is approximately \$550 per plate). High quality color slides are preferred to color prints. Because of the tremendous workload involving the editorial committee presently, the editor reserves the right to return those manuscripts not conforming to the specific requirements of the *Journal* directly to their authors, without review.

AUSTIN P. PLATT, *Department of Biological Sciences, University of Maryland Baltimore County, 5401 Wilkens Avenue, Catonsville, Maryland 21228.*