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Note on North American *Aphelia* Species (Lepidoptera, Tortricidae)

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Fernald (1908, p. 15) erroneously treated Hübner's two genera *Aphelia* and *Amelia* as synonyms, having as type one and the same species, *Pyralis viburniana* Fabricius. This mistake the present author explained recently in his paper on the genera of the Palearctic Tortricidae (Obraztsov, 1954, p. 192), in which he recognized merely the genus *Aphelia* Hübner, 1825, as having the above species as type. The genus *Amelia* Hübner, 1825, with *Phalaena (Tortrix) rhombana* Schiffermiller and Denis as type, he referred as a subjective synonym to the genus *Acleris* Hübner, 1825, with *Eutrachia aspersana* Hübner as type (Obraztsov, 1955, p. 189). In this emended sense the genus *Aphelia* had never before been used in the American literature. In the present paper it is introduced for the first time for the species usually known as *Tortrix alleniana* Fernald and two additional Nearctic species described below as new.

The most typical characters of the genus *Aphelia*, distinguishing it from related genera, are: a free tip of the sacculus of the valva; a sinuate uncus tip; and especially a solid gnathos with its lateral parts well developed and scobinate, and with a large middle process flattened dorsoventrally. In the female genitalia the two cephalolateral projections of the sterigma and a small, round signum with two short, conical tips are characteristic and otherwise unknown in the tribe Archipini.

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These characters show the advisability of separating *Zelothereses* Lederer and *Djakonovia* Obraztsov from the genus *Aphelia*. They were formerly placed by the present author in this genus as subgenera, but must be considered rather as independent genera.

The North American species added to *Aphelia* in the present paper are undoubtedly congeneric with the type species of this genus. Because the external characters of these species are in many cases quite inadequate for their identification, they can be safely separated from one another only on the basis of their genitalia. Because the females of the two new species are as yet unknown, the descriptions are based on males only. The distinguishing characters of all three Nearctic species and Palearctic *Aphelia viburniana* consist chiefly of different shapes of the gnathos, the fultura superior, the distal part of the sacculus of the valva, and, in some measure, of that of the uncus. The remaining parts of the male genitalia are very similar in all known Holarctic species of *Aphelia*.

Aphelia alleniana alleniana (Fernald),
new combination and status

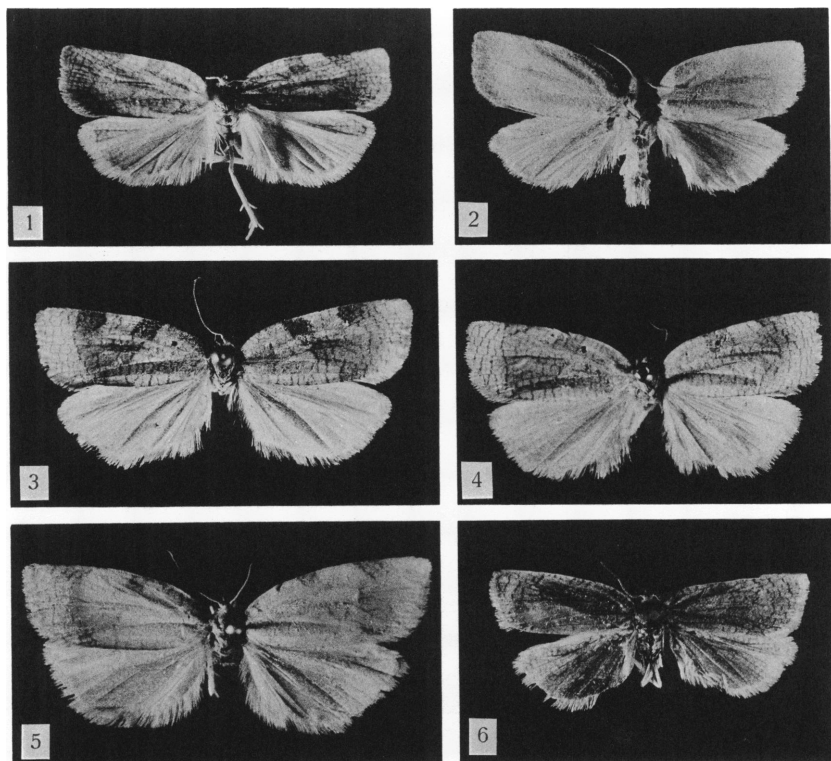
Figures 1, 2, 7, 8

Tortrix alleniana FERNALD, 1882, Trans. Amer. Ent. Soc., vol. 10, p. 68 (type locality: Orono, Maine). GROTE, 1882, New check list of North American moths, p. 58, no. 73. FERNALD, "1903" [1902], Bull. U. S. Natl. Mus., no. 52, p. 482, no. 5394. KEARFOTT, 1905, Canadian Ent., vol. 37, p. 91 (redescription). MEYRICK, 1912, in Wagner, Lepidopterorum catalogus, pt. 10, p. 27; 1913, in Wytzman, Genera insectorum, fasc. 149, p. 29. BARNES AND McDUNNOUGH, 1917, Check list of the Lepidoptera of Boreal America, p. 177, no. 7369. FORBES, "1924" [1923], Mem. Cornell Univ. Agr. Exp. Sta., no. 68, p. 492. McDUNNOUGH, 1939, Mem. Southern California Acad. Sci., vol. 2, p. 57, no. 7415.

Tortrix trentonana McDUNNOUGH, 1923, Canadian Ent., vol. 55, p. 168 (type locality: Trenton, Ontario).

Tortrix allenana LLEWELLYN-JONES, 1935, Proc. Ent. Soc. Brit. Columbia, vol. 31, for 1934, p. 32 (misspelling).

ORIGINAL DESCRIPTION: "*Tortrix alleniana* n. sp.—Head, thorax and fore wings varying in different specimens from reddish to golden-yellow, with irregular cross lines on the fore wings of a darker reddish color. The beginning of an oblique stripe on the middle of the costa and a subapical patch of a dark reddish color, occurs in some specimens. Hind wings dull ochry white, somewhat sordid towards the anal angle. All the fringes above and beneath concolorous with the wings. Under side of hind wings straw-yellow, darker apically. Under side of



FIGS. 1, 2. *Aphelia alleniana alleniana* (Fernald), males. 1. Four miles south of Wilsons Mills, Maine, July 8, 1954, A. B. Klots and F. H. Rindge. 2. Gallo-way Lake, 1 mile from Bevering, Emmet County, Michigan, July 9, 1955, A. B. Klots. Both in the American Museum of Natural History.

FIGS. 3, 4. *Aphelia alleniana rindgeorum*, new subspecies, males. 3. Holo-type. 4. Paratype.

FIG. 5. *Aphelia koebelei*, new species, holotype.

FIG. 6. *Aphelia septentrionalis*, new species, holotype.

fore wings light fuscous, yellowish around the edges. Abdomen above and beneath, and the middle and hind legs concolorous with the hind wings. Fore legs in front, concolorous with the head. Females differ in having narrower fore wings with more pointed apices, and they are of a darker red color, while the hind wings are grayish tipped with yellowish on the apex. Expanse 23–25 mm."

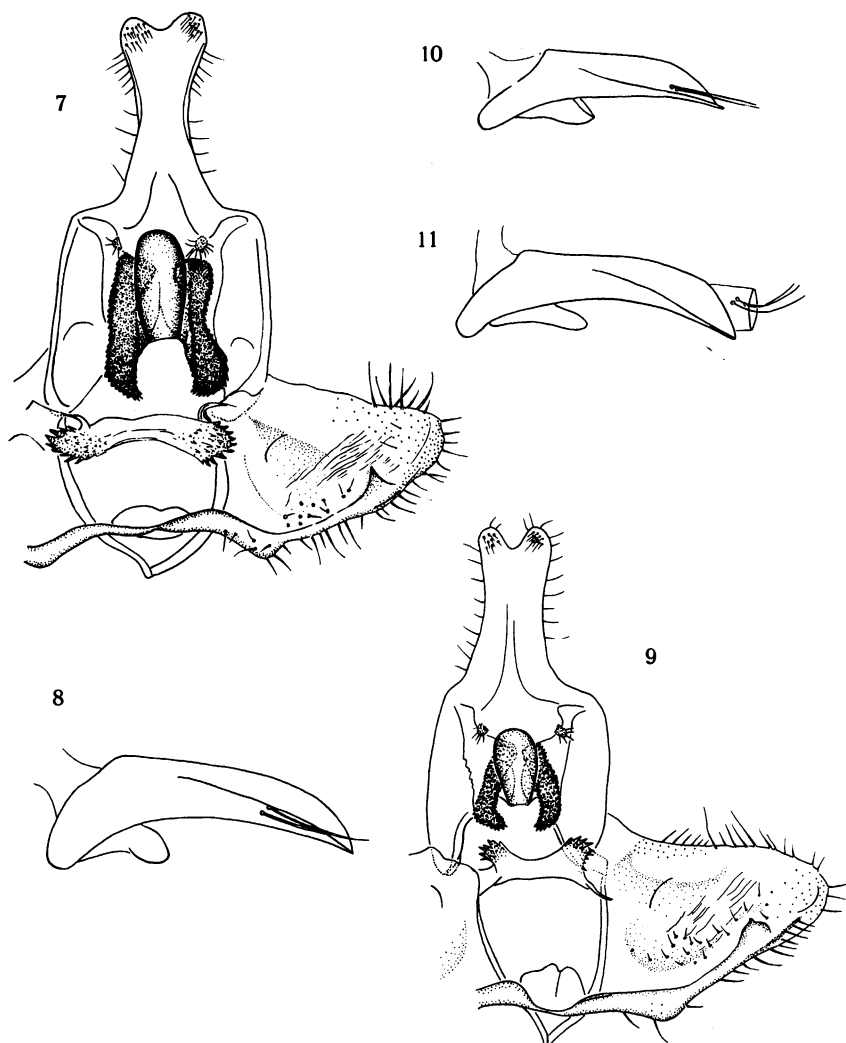
Alleniana was described from three males and three females taken in Orono, Maine, in July. The specimens of Fernald's collection are now in the United States National Museum. A male specimen of *al-*

leniana has been selected as lectotype. Although it does not have any label giving information as to locality, there is no doubt that it belongs to the original series of moths mentioned by Fernald.

The color of the head, thorax, and forewings of *alleniana* is sometimes not reddish to golden yellow, as indicated in the original description, but somewhat olive or grayish. The cross lines and the remaining pattern of the forewings are often also somewhat grayish. Specimens with almost unicolorous forewings are quite common. The moths from different localities reveal some variation, but the material examined by the present author was inadequate for separation of them as geographical forms. Only the specimens from Colorado were found as deserving a separate subspecific name. *Trentonana*, described originally as an independent species, must be treated as a synonym of *alleniana*.

MALE GENITALIA: Uncus broad, slightly narrowed at middle. Lateral arms of gnathos long, distinctly curved, little, if any, dilated distally, scobinate along almost their entire length, with upper inner projections broader and shorter than those of the Palearctic *Aphelia viburniana* (Fabricius). Middle process of gnathos broad, semicylindrical, rounded distad. Fultura superior more or less long, scobinate laterad. Tip of the sacculus of the valvae flat, usually triangular, rarely somewhat rounded. Aedoeagus with a straight, acute tip; base of the caulis not reaching the coecum penis. Two or three long, filiform cornuti.

SPECIMENS EXAMINED: One male, lectotype of *Tortrix alleniana*, no data as to locality (United States National Museum); one female, Vernon, British Columbia, E. P. Venables (genitalia on slide, No. 76; A.M.N.H.); one male, Medicine Hat, Alberta, emerged on June 21 (genitalia on slide, No. 195; A.M.N.H.); one male, Lloydminster, Saskatchewan, July 5, 1942, R. Fitch (genitalia on slide, No. 199; A.M.N.H.); one male, Cartwright, Manitoba, E. F. Heath (genitalia on slide No. 194; A.M.N.H.); one male, Pullman, Washington, June 17, 1933, J. F. Gates Clarke (genitalia on slide, No. 1-Obr. 12/31, 1958; United States National Museum); one male, Spring Creek near Baker, Baker County, Oregon, July 4, 1953, J. H. Baker (genitalia on slide, No. 200; A.M.N.H.); one male, 1 mile west of Beechwood, Iron County, Michigan, July 11, 1955, A. B. Klots (genitalia on slide, No. 197; A.M.N.H.); one male, 4 miles south of Wilsons Mills, Oxford County, Maine, July 8, 1954, A. B. Klots and F. and P. Rindge (genitalia on slide, No. 198; A.M.N.H.). In addition to the above specimens, many others were examined in the collections of the United States National



FIGS. 7, 8. *Aphelia alleniana alleniana* (Fernald). 7. Male genitalia (slide No. 197). 8. Aedeagus (slide No. 195).

FIGS. 9-11. *Aphelia alleniana rindgeorum*, new subspecies. 9. Male genitalia (slide No. 201). 10. Aedeagus (slide No. 201). 11. Aedeagus (slide No. 202).

Museum and the American Museum of Natural History. They come from the states and provinces listed below.

RANGE: British Columbia, Alberta, Saskatchewan, Manitoba, Ontario, Quebec, New Brunswick, Washington, Oregon, Michigan, New York, Maine.

***Aphelia alleniana rindgeorum*, new subspecies**

Figures 3, 4, 9, 10, 11

MALE: Antennae ochreous, more reddish basad and from below, dark annulated. Labial palpi reddish brown, paler at base and on inner surface. Head and thorax brown, the latter somewhat darker. Abdomen pale ochreous, dark banded. Forewings cinnamon-ochreous, with a fine, transverse, partly interrupted reddish brown striation; wing base and terminal area slightly darker brown; from before middle of costa a rather broad, oblique, brown fascia widened and diffuse tornad; it is finely dark-edged along the whole length basad, and only in the precostal part externad; between this fascia and the wing apex a similarly colored costal patch dark-edged basad; fringes concolorous with wing ground; reverse pale grayish ochreous, sometimes paler costad and apicad. Length of the forewing, 12 mm. Hind wings grayish white, usually paler costad and apicad, with darker veins and a fine, obsolescent, gray striation; fringes white, yellowish at apex.

In some specimens the oblique middle fascia and the precostal patch of the forewings are obsolescent or lacking, and the ground color of the forewings varies slightly.

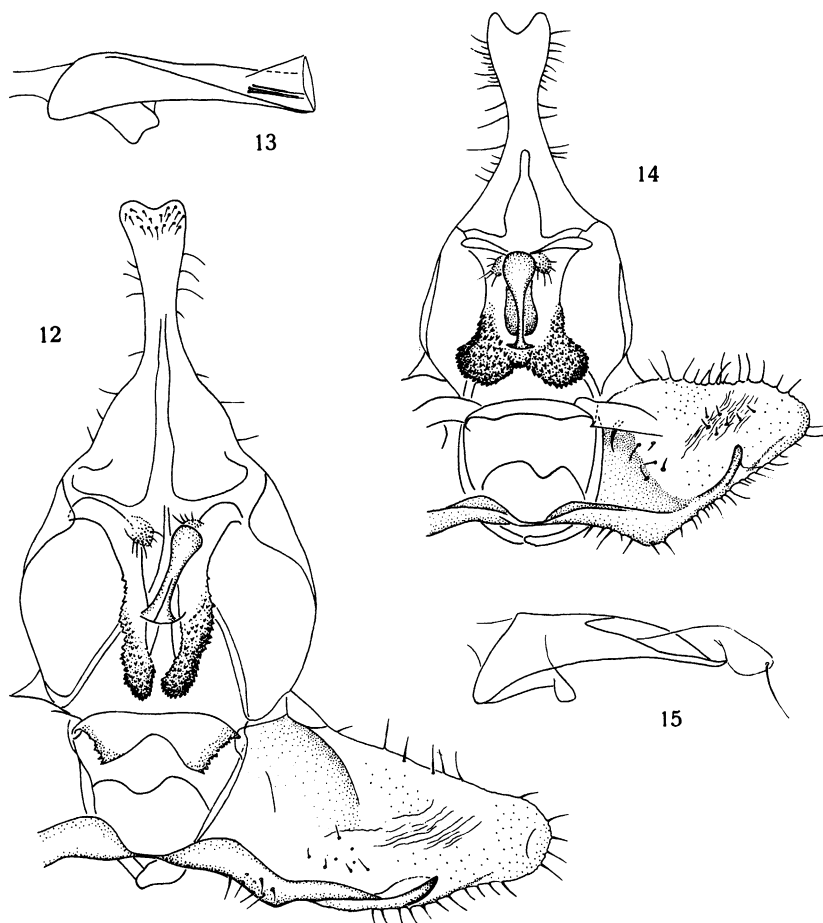
FEMALE: Unknown.

MALE GENITALIA: Uncus slightly broader and shorter than in the nominate subspecies, less incurved at the middle. Lateral arms of gnathos comparatively shorter and narrower. Middle process of gnathos short, ovate. Fultura superior short, deeply incurved dorsad, scobinate laterad. Tip of the sacculus of the valvae flat, rounded, slightly pointed above. Aedoeagus slightly more slender than in the nominate subspecies.

TYPES: Holotype, male, Valley View Lodge, 10 miles south of Steamboat Springs, 7600 feet above sea level, Routt County, Colorado, July 16, 1957, F. and P. Rindge (genitalia on slide, No. 201). Paratype, male, the same locality, July 14, 1957 (without abdomen). Holotype and paratype in the collection of the American Museum of Natural History.

OTHER SPECIMENS: Four males, Muddy Pass, 8772 feet above sea level, Jackson and Grand counties, Colorado, July 13, 1956, F. and P. Rindge, in the American Museum of Natural History (genitalia of one specimen on slide, No. 202).

REMARKS: This new subspecies differs from nominate *Aphelia alleniana alleniana* in having the gnathos much smaller. As the remaining parts of the male genitalia are almost similar in both subspecies, there



FIGS. 12, 13. *Aphelia koebelei*, new species. 12. Male genitalia (slide No. 1-Obr. 12/29, 1958). 13. Aedeagus.

FIGS. 14, 15. *Aphelia septentrionalis*, new species. 14. Male genitalia (slide No. 203). 15. Aedeagus.

is probably no ground for separating *rindgeorum* as an independent species. A brighter color of the forewings and a broader and more complete fascia distinguish *rindgeorum* from subspecies *alleniana*.

Aphelia koebelei, new species

Figures 5, 12, 13

MALE: Antennae ochreous, brown-patched on each joint, unicolorous dark brown from below. Labial palpi grayish ochreous, paler on inner surface. Head and thorax brownish ochreous. Abdomen pale

ochreous, dark-banded. Forewings ochreous, with a fine, obliterate, cinnamon-ochreous transverse striation; from before middle of costa a rather broad, oblique, cinnamon-ochreous fascia reaching slightly over the middle cell, darker at costa and obliterate in and below the middle cell; a flat, triangular precostal patch between this fascia and the wing apex, colored as the costal part of the middle fascia; fringes slightly paler than the wing ground; reverse pale grayish ochreous. Length of the forewing, 14.5 mm. Hind wings grayish white, more white apicad; fringes white.

FEMALE: Unknown.

MALE GENITALIA: Uncus narrow, dilated apicad. Lateral arms of gnathos narrow, rather long, scobinate in lower half, without any upper inner projections. Middle process of gnathos narrow, dilated distad. Fultura superior strongly dilated and scobinate laterad. Tip of the sacculus of the valvae rather thin, pointed, round in section. Aedoeagus with a straight, acute tip; base of the caulis not reaching the coecum penis; this latter less rounded than that of *Aphelia alleniana*. Three rather short, filiform cornuti.

TYPE: Holotype, male, Easton, Washington, Koebel (genitalia on slide, No. 1-Obr. 12/29, 1958). In the collection of the United States National Museum.

REMARKS: This new species closely resembles *Aphelia alleniana* but differs from it in the structure of the male genitalia.

Aphelia septentrionalis, new species

Figures 6, 14, 15

MALE: Antennae black, above with yellowish spots formed by semi-hyaline scales on each joint. Head, labial palpi, and patagia reddish brown. Thorax and abdomen grayish brown. Forewings yellowish gray, with a diffuse, obsolescent, reddish brown, transverse middle fascia and a fine, interrupted transverse striation of the same color; fringes pale yellow; reverse dark gray, with yellow margins. Length of the forewing, 9 mm. Hind wings gray, yellow at apex, with a fine, gray transverse striation; fringes slightly paler than those of the forewings.

FEMALE: Unknown.

MALE GENITALIA: Uncus narrow, strongly dilated apicad, with a deeply sinuate tip. Lateral arms of gnathos broad, distally dilated, scobinate and curved outwardly. Middle process of gnathos on a thin stalk, roundly dilated apicad. Fultura superior narrow, smooth. Tip of the sacculus of the valvae rather thin, obtuse, round in section. Aedoeagus with a thin, acute tip slightly bent upward; base of the caulis

reaching the apex of the coecum penis. One moderate, filiform cornutus.

TYPE: Holotype, male, Kotzebue, Alaska, June 27, 1956, P. R. Ehrlich (genitalia on slide, No. 203). In the collection of the American Museum of Natural History.

OTHER SPECIMENS: Two males, MacKinley Park, Alaska, August 5, 1931, F. W. Morand (genitalia on slide, prepared by A. Busck on October 28, 1931; United States National Museum).

REMARKS: The darkest of the known species of the genus *Aphelia*. Differs from the remaining species of this genus in almost all parts of the male genitalia. The smooth fultura superior of *septentrionalis* is probably the most typical feature of this species.

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