

Type—Catalogue No. 12573, U. S. National Museum.

Cotypes in the collections of the U. S. National Museum and of the author.

This species averages larger than *C. philadelphica*; it is a little more robust and the markings are heavier. The head and pronotum are shining blue-green, while in *philadelphica* they are distinctly alutaceous and the color is a duller brassy green. In *philadelphica* the inner lunule of the humerus is nearly always complete, gently arcuate and more slender; it encloses two widely separated slender spots and all the markings are more delicate.

C. amelia, in the imago and larva states, occurs exclusively upon the alder (*Alnus rugosa*); *C. philadelphica* lives only upon *Cornus* (*Cornus stolonifera* Michx., Massachusetts, G. Dimmock; *C. amomum* Mill., vicinity of Washington, D. C., Knab). In the vicinity of Washington these two species may often be found in close proximity upon their respective food-plants, a natural result of the habits of these two plants.

The writer is well aware of the extensive literature which deals with the species of the group to which the foregoing belong. However, until our knowledge is more complete, any attempt to handle this literature critically would only add to the existing confusion. Certain it is that the numerous mis-identifications, not only of the beetles but of the food-plants as well, have made the subject a most complicated one.

NOTES ON MICROLEPIDOPTERA, WITH DESCRIPTIONS OF NEW NORTH AMERICAN SPECIES.

By AUGUST BUSCK.

Aristotelia placidella Zeller.

Gelechia placidella Zeller; Verh. Zoo.-Bot. Gesellsch. Wein, xxiv, p. 441; pl. 12, fig. 11, 1875.

Aristotelia natalella Busck; Proc. U. S. Nat. Mus., xxvii, p. 756, 1904.

Gelechia placidella Zeller, from Vancouver Island, has hitherto been overlooked and is mentioned neither in my Gelechiid revision nor in Dyar's List of North American Lepidoptera.

The type in Lord Walsingham's collection, which I have now examined, proves the above synonymy.

Sophronia roseicrinella, new species.

Second joint of labial palpi rosy white, exteriorly mottled transversely with fuscous; the well-developed brush dusky; terminal joint

white, strongly mottled with black and with black tip. Face white. Head and thorax mottled with fuscous. Fore wings with the rosy-white ground color strongly overlaid with brown and fuscous scales, especially on dorsal half and towards apex. On the middle of costa begins an outwardly strongly oblique, ill-defined, brown shade; at apical third is a narrow, strongly outwardly angulated, spear-formed fascia of unmottled rosy white, edged towards the base of the wing with dark scales; the apical third of the wing outside the fascia is neatly mottled with black on white ground and just before the sharp-pointed apex is a small black round dot. Hind wings whitish fuscous. Abdomen with the first joints velvety yellow above. Legs ochreous; tarsi blackish with narrow ochreous annulations.

Alar expanse: 15 mm.

Habitat—Kerrville, Texas. F. C. Pratt, collector.

Type—U. S. National Museum No. 12262.

This is the second species of the genus recorded from America; it is very distinct from and quite as pretty as *Sophronia primella* Busck, also described from Texas.

Anacampsis crescentifasciella Chambers.

Dyar, List North American Lepidoptera, No. 5703, 1903.

This species, which in collections has hitherto been represented by the unique type in the U. S. National Museum and some of Chambers's original specimens in the Cambridge Museum, was lately received from Mr. W. D. Pierce, who bred four specimens from *Krameria secundiflora* at Dallas and Victoria, Texas.

Gelechia lipatiella, new species.

Labial palpi, tongue, face, and head ochreous white. Antennae blackish brown with narrow white annulations. Thorax blackish brown. Fore wings blackish brown with white markings; basal and dorsal parts lighter brown with a strong coppery sheen; at basal fourth is an outwardly oblique, white costal streak, which reaches beyond the fold, but not to the dorsal edge; at apical third of costa is an inwardly oblique white fascia of the same angle as, but in opposite direction from the first costal streak. Between these two white streaks is a nearly round, but not sharply defined, white spot just within the costal margin; on the extreme apex before the cilia are a few white scales. Abdomen blackish brown with white tip. Legs blackish brown with white annulations.

Alar expanse: 12 to 13 mm.

Habitat—Platte Canyon, Colorado, E. J. Oslar, collector.

Type—U. S. National Museum No. 12279.

A typical *Gelechia* of the black, white-marked group, intermediate between *arizonella* Busck and *bimaculella* Chambers, differing from the former in the dark thorax and from both in the smaller size and in details of the white ornamentation. The lighter brown and coppery color of the basal and dorsal parts of the wing is also an easy distinction.

***Gelechia bforella*, new species.**

Labial palpi light ochreous, mottled with dark brown; brush on second joint rather short, furrowed. Antennæ light brown with black annulations. Face whitish ochreous. Head and thorax light ochreous brown. Fore wings with light ochreous scales, each tipped with dark brown, and with a purplish sheen; on the middle of the wing is a large oval transverse deep black spot, narrowly edged with ochreous; on the end of the cell is a similar but smaller and more circular black spot, also edged with light ochreous scales; base of costa is blackish and at apical third is a small ochreous costal spot.

Alar expanse: 6 mm.

The striking ornamentation of this species reminds one very much of *Telphusa glandiferella* Zeller.

Habitat—Cotulla, Texas, at light; J. C. Crawford, collector.

Type—U. S. National Museum No. 12263.

***Dichomeris hirculella*, new species.**

Tuft on second joint of labial palpi long, pointed, blackish exteriorly, ochreous fuscous on the inner side; terminal joint ochreous. Face and head iridescent, light fuscous. Thorax and fore-wings ochreous fuscous, mottled with black scales and with larger irregular, blackish spots, of which two or three are found on the cell, one or two at the end of the cell, and five or six on apical fourth; around apical edge is an indistinct series of blackish dots, more or less confluent; cilia ochreous. Hind-wings opaque, light fuscous. Legs blackish fuscous; tarsal joints with narrow, ochreous annulations.

Alar expanse: 11 to 12 mm.

Habitat—East River, Connecticut; Chas. R. Ely, collector.

Type—U. S. National Museum No. 12264.

A small, obscure, narrow-winged species, nearest in form and color to *Dichomeris ligulella* Hübner, but smaller and without the transparent hind wings found in that species.

The name *Dichomeris* Hübner will take the place of *Ypsolophus* Fabricius. The contention of Mr. Durrant that Fabricius's idea of his genus *Ypsolophus* was equivalent to the genus *Cerostoma* of authors, while amply proven by him is further verified by the examination of Fabricius's type in the

Royal Museum in Copenhagen, which I had opportunity to study last year; there are found in their original order only six species under the genus *Ypsolophus* and all of these belong to *Cerostoma*.

***Dichomeris delotella*, new species.**

Second joint of labial palpi with the well-developed, pointed tuft blackish brown exteriorly, ochreous fuscous on the inner side and with the apical edge whitish; terminal joint ochreous fuscous with black tip. Antennæ light ochreous with narrow black annulations. Head and thorax ochreous brown, sprinkled with fuscous. Fore-wings light ochreous brown, sprinkled with dark brown and black scales. There is a prominent, large, blackish-brown, triangular, dorsal dash at basal fourth, reaching obliquely outwards more than half way across the wing; on the costal edge is a series of small blackish-brown dots, separated by light ochreous spaces; on the end of the cell is a small, indistinct, blackish-brown spot, edged by a few white scales; apical fourth of the wing is heavily overlaid with blackish brown, rather sharply limited from the lighter basal part of the wing; the extreme edge around apex is light ochreous with ill-defined blackish-brown marginal dashes. Hind-wings ochreous fuscous. Cilia a shade lighter. Abdomen dark fuscous. Legs blackish fuscous, with the tips of the tarsal joints and the tuft on posterior tibiae ochreous.

Alar expanse: 14 to 15 mm.

Habitat—Baboquivari Mountains, Santa Rita Mountains, and Hot Springs, Arizona (E. A. Schwarz), May--June.

Type—U. S. National Museum No. 12265.

Most nearly related to *Dichomeris eupatoriella* Chambers, from which the pattern easily distinguishes it.

***Dichomeris georgiella* Walker.**

Depressaria georgiella Walker, Cat. Lep. Het. Br. Mus., xxxv, p. 1827, 1866.

Trichotaphe georgiella Walsingham, Proc. Zool. Soc. London, p. 312, 1891; Busck, Proc. U. S. N. M. xxiv, p. 731, 1902; Busck, l. c., xxv, p. 916, 1903; Dyar, List N. Am. Lep., No. 5672, 1903.

Ypsolophus roseocostellus Walsingham, Trans. Am. Ent. Soc. Phil., x, p. 185, 1882; Busck, Proc. U. S. N. M., xxv, p. 916, 1903; Dyar, List N. Am. Lep., No. 5689, 1903.

As stated in my "Revision of the North American Gelechiidæ," 1903, Walker's *georgiella* was unknown to me at that time and was left in the genus *Trichotaphe*, where it had been placed by Lord Walsingham, though it was obvious from Walker's description of the labial palpi that it could not be a typical *Trichotaphe*.

I have since on two occasions examined Walker's type in the British Museum and found it to belong to the present genus and to be identical with *Dichomeris roseocostella* Walsingham.

While writing on this genus I might mention that I now regard the *malifoliella* of Fitch as but another synonym of *ligulella* Hübner and the hitherto unidentified *querciella* Chambers as a synonym of *ventrella* Fitch.

Dichomeris deflecta, new species.

Second joint of labial palpi white, sprinkled with light ochreous scales; terminal joint nearly pure white with the extreme tip black; the terminal joint in the type (female) before me is rather peculiarly deflected and appears as a continuation of the tuft on second joint, but I judge this is merely an accidental position assumed when the insect was killed. Tongue long, curled, scaled at base. Maxillary palpi distinct, short, simple, pointed. Antennæ light fuscous. Head and thorax white, sprinkled with light ochreous scales. Fore-wings elongate, pointed, termen slightly sinuate below the somewhat produced apex; the white ground color is heavily overlaid with light ochreous, fuscous, and blackish scales, the central part of the wing only being nearly unmottled; there is a large round, blackish, first discal spot and a small black dot at the end of the cell; the flexus is marked by a few black scales and the veins are indicated by longitudinal blackish-fuscous lines, which terminate in a series of apical spots along the edge of the wing. Hind-wings ochreous fuscous. Legs white; the anterior pairs strongly mottled with fuscous, the posterior scarcely so.

Alar expanse, 23 mm.

Habitat—Redington, Arizona.

Type—U. S. National Museum No. 12278.

A large light species, not mistakable for any other described American species of the genus, but reminding one in a general way of the much larger *Dorata lineata* Walsingham.

ETHMIIDÆ, new family.

In my "Revision of the American Oecophoridæ" (Proc. U.S. Nat. Mus., xxxv, p. 205, 1908) was suggested the necessity of recognizing *Ethmia* Hübner and allies as a family distinct from the Oecophoridæ, with which they have hitherto been classed. The family name was even proposed in the manuscript, but due to my absence in England at the time, it was left out in the final proof by a mistake, which is now corrected.

The main structural character by which this family may be distinguished from the Oecophoridæ is the proximity of vein 5 in the hind wings to vein 6 instead of to vein 4, as in Oecophoridæ, it being radial, not cubital; but the general habitus is

very different from that of the hitherto supposed allies and the genus *Ethmia* has no near relationship with *Depressaria*, which has been regarded as a derivative from it.

The genera *Azinis* Walker, *Tamarrha* Walker, and some other exotic genera belonging to this family differ from *Ethmia* only in secondary sexual characters of the males and must be included in that genus.

ELACHISTIDÆ, Authors.

The supposed family Elachistidæ as defined in Meyrick's Handbook of British Lepidoptera and in Dyar's List of North American Lepidoptera is found to comprise several groups, which have really no close relationship, and a complete rearrangement must be made.

The genus *Cynodia* Herrich-Schaeffer,* of which *Mendesia* Joannis† and *Triboloneura* Walsingham‡ are in the writer's judgment synonyms reveals a highly developed type with nine veins in the hind wing, one more than is normally found. After vain efforts to explain the additional vein, termed by Abbé Joannis "7 bis" in some other way (as an acquired modern character, a secondary sexual splitting of vein 7), I am at last forced to accept it as a persisting primitive character, as my friend, Mr. J. Hartley Durrant, first suggested to me last summer.

Genera with this additional vein cannot have been derived from any modern genera with only 8 veins, but must be remains of a quite separate branch from early micropterygid ancestors, and such genera must hence logically be regarded as a separate superfamily, parallel with and systematically of equal value to all of the other modern microlepidoptera.

The name CYCNODIOIDEA may appropriately be utilized for this group, which may be of larger extent than at present realized, because the higher forms have attained very much the same characters and general habitus as the higher TINEOIDEA. The genera *Elachista* of authors (*Aphclosetia* Stephens, Walsingham); *Stephensia* Stainton; *Perittia* Stainton; *Scirptopda* Wocke; *Polymetis* Walsingham, and *Aphigalia* Dyar are direct derivations from *Cynodia* and must consequently be included in this superfamily, though they have lost or at least partly lost the vein "7 bis"; some of these genera appear to be syn-

*Syst. Bearb. Schmett. Europe, v, p. 211, pl. XIII, fig. 13, 1885.

†Bull. Soc. Ent. France, LXXI, p. 230, 1902.

‡Ent. Mo. Mag., XIX, p. 54, 1908.

onyms. The exact relationship of the genera *Tinagma* Zeller, *Douglasia* Stainton, *Coelopoeta* Walsingham, and their allies is not apparent at present, but I expect they will eventually be proven to belong to the CYCNODIOIDEA.

I am under much obligation to Lord Walsingham and Mr. Durrant for type material of their genera in this group and to Abbé J. de Joannis, who has liberally sent me type material of his genus *Mendesia*.

The genus *Mompha* Hübner (Meyrick) (*Laverna* Curtis) forms the basis of another natural family, which according to Durrant* should be called Lavernidæ.

This comprises the bulk of the genera hitherto placed in the Elachistidæ, such as *Cosmopteryx* Hübner, *Stathmopoda* Stainton, *Anybia* Stainton, *Pancalia* Curtis, *Chrysoclista* Stainton, *Perimede* Chambers, *Ithome* Chambers, *Walshia* Clemens, *Stilbosis* Clemens, *Cyphopora* Herrich-Schaeffer, *Stagmotophora* Herrich-Schaeffer, *Blastodacna* Wocke (= *Leucophryne* Chambers), *Theisoa* Chambers, *Synalagma* Busck, *Erineda* Busck, and several others.

This family, which is related to the Gelechiidæ, Oecophoridæ, and Blastobasidæ and which is rather higher in the sequence than any of them, nearest to Gelechiidæ, is restricted to genera with long recurved, pointed palpi, with veins 7 and 8 in the fore wings stalked (or coincident) and with vein 7 to costa. A revision of the North American moths of this family is now under way.

A third group is formed by the genera *Scythris* Hübner (= *Arotrura* Walsingham = *Colinita* Busck), *Bryophaga* Ragonot, and *Apostibes* Walsingham. This group I include temporarily in the Plutellidæ, though it may eventually be recognized as a separate definable family; I do this with much hesitation, because my learned friend Mr. Edward Meyrick, in a recent letter, has expressed it as his opinion that the group is allied to and derived from the Oecophoridæ; but though the posterior tibiæ strongly suggest this family, I am unable to see how the pterogostic characters could have been derived from oecophorid stock. The real point of difference is probably our different interpretation of the veins in the fore wing; Mr. Meyrick regards vein 8 absent and vein 7 to costa, while the writer believes it one of the dorsal veins which is absent and consequently vein 7 to termen.

The genus *Coleophora* and its few true allies form a fourth group, which I believe we all agree is closely allied to and

*Ent. Mo. Mag., XLV, p. 51, 1909.

derived from the Plutellidæ, but which will eventually be recognized as a separate family. Whether the genus *Batrachedra* Stainton is as closely related to this group as is generally accepted may be open to some doubt; *Coleophora* can at least not be a derivative from *Batrachedra*, as suggested in Meyrick's Handbook, because *Batrachedra* has the more specialized venation of the two genera.

The writer wishes to acknowledge the large share of the credit which is due to Messrs. Edw. Meyrick and J. Hartley Durrant for any value there may be in the above suggestions; I have discussed the subject very thoroughly, in person and in letters, with both of them.

On the other hand, the writer must alone bear the responsibility for any errors in the conclusions. A large amount of work had to be done; even the purely mechanical part was no small item. Thus more than 250 slides of carefully denuded wings of species in these groups have been made, which constitute a valuable permanent basis for verification and further study of the subject.

Genus THEISOA Chambers.

Can. Ent., vi, p. 75, 1874.

Type—*Theisoa bifasciella* Chambers (= *Oecophora constrictella* Zeller).

New synonym: *Cacelice* Busck, Journ. N. Y. Ent. Soc., x, p. 93, 1902.

Type—*Cacelice permolestella* Busck.

A critical study of the genera hitherto classed under the family name Elachistidæ proves the above synonymy; the writer has given a delineation of the characteristic venation (l. c., pl. XII, fig. 2). The two species at present included, *Theisoa constrictella* Zeller and *T. permolestella* Busck, are specifically quite distinct.

Genus ERINEDA, new.

93

Type—*Erineda elyella* Busck.

Labial palpi long, smooth, curved; second joint slightly thickened with appressed scales; terminal joint slender, pointed, shorter than second joint. Antennæ two-thirds, without pecten on basal joint, with long thin ciliation on the rest of the joints as in the genus *Stathmopoda*. Head with long hairlike scales, smoothly brushed down over the face and partly over the eyes; these scales are easily mistaken for pecten on the antennæ by superficial examination. Tongue short, spiraled. Maxillary palpi absent. Fore wings narrow, pointed, smooth, with 11 veins; vein 6 absent; vein 11 distant from base, approximate to 10; veins 7 and 8 stalked; 9 out of their stalk; 2 from before the end of the cell;

3, 4, and 5 equidistant from the end of the cell. Hind wings $\frac{1}{2}$, narrow, lanceolate, with 8 veins, all free, though so closely approximated on account of the narrowness of the wing that veins 6 and 7 might as properly be said to be connate or stalked from a common origin; cell open between 5 and 6. Hind tibiae smooth, with tufts of spines above the spurs. The hind legs are probably carried erect during rest and walking.

The genus is allied to *Stathmopoda* H.-Sch. (*pedella*, Linn.), which it closely resembles in general habitus as well as in the form of palpi and antennae; the fore wings, however, are much less attenuated than in *Stathmopoda* and the venation easily distinguishes it.

***Erineda elyella*, new species.**

Labial palpi and basal joint of antennae golden yellow; rest of antennae yellowish fuscous with narrow black annulations and with long (6) fine ciliation. Face, head, and thorax golden yellow. Fore wings shining bronzy fuscous, with a dorsal longitudinal streak of golden yellow from base to tornus. Hind wings light bronzy fuscous. Abdomen yellow. Forelegs dark fuscous; other legs yellow with fuscous joints.

Alar expanse, 11 mm.

Habitat—East River, Connecticut; Chas. R. Ely, collector.

Type—U. S. National Museum No. 12266.

An interesting addition to our known fauna, which I take pleasure in naming in honor of the collector.

***Psacaphora passerella*, new species.**

Labial palpi long, recurved, rather thick, clothed with smoothly appressed scales, white with an ill-defined brown annulation at the end of the second joint. Face, head, and thorax silvery white. Antennae brown. Basal half of the fore wings white, slightly overlaid with ochereous; extreme base of costa black; a small black costal streak at basal third and a small black dot near base on the middle of the wing; exterior half of the wing strongly overlaid with golden brown, edged towards the white basal half by a tuft of black raised scales near dorsal edge; another similar tuft is found near the dorsal edge at apical third; between these tufts is a short black costal streak and in the apical part of the wing is a small, longitudinal, central, black streak, on both sides of which the ground color shows through as a small costal and dorsal silvery spot. A transverse black line crosses the tip of the apical cilia. Basal two-thirds of the hind wings deep black, apical third fuscous. Legs white; tarsi annulated with black.

Alar expanse, 7 mm.

Habitat—East River, Connecticut; Chas. R. Ely, collector.

Type—U. S. National Museum No. 12267.

Venation as in the type of the genus; fore wings 12 veins; 7 and 8 stalked; 7 to costa; rest separate. Hind wings with 8 veins; 5 and 6 stalked; rest separate. Basal joint of antennæ with pecten.

To this genus belong the European *schrunkella* Hübner, *terminella* Westwood, and *raschiella* Zeller. The American *Mompha engelella* Busck also falls in this genus, as indicated in the original description.

***Psacaphora purpuriella*, new species.**

Labial palpi, head, and thorax dark shining purple; antennæ purple. Basal half of forewings uniformly dark shining purple. Apical half bright brick-red with a large purple spot in the middle and with a small white costal dash at apical fifth; cilia and extreme apex and tornus purplish black; the dark parts on the apical half of the wing have in some lights a strong metallic golden reflection. Hind wings purplish black. Abdomen and legs uniformly purplish black, with strong metallic reflection.

Alar expanse, 12 mm.

Habitat—Florissant, Colorado, "at flowers of *Argentina anserina* Linn.;" T. D. A. Cockerell, collector.

Type—U. S. National Museum No. 12268.

A brilliant insect, typical of the genus, with vein 3 and 4 in hind wing connate, as it is often found in specimens of the type of the genus.

***Perimede particornella*, new species.**

Labial palpi bronzy fuscous. Face light bronzy fuscous. Antennæ dark bronzy, with apical third white. Head and thorax dark bronzy brown. Fore wings shining dark bronzy brown with three small dull black dots of slightly raised scales, one on the middle of the fold, one on the middle of the wing, and one at the end of the cell. Hind wings shining whitish fuscous; cilia ochereous fuscous. Abdomen ochereous fuscous; female with short, stout flattened horny ovipositor. Legs uniformly dark fuscous; tuft on hind tibia somewhat lighter.

Alar expanse, 12 mm.

Habitat—Washington, D. C., and Plummer's Island, Maryland; Busck, collector.

Type—U. S. National Museum No. 12269.

Typical of the genus; easily recognized by the shining fore wings and the white-tipped antennæ.

***Heliodines metallicella*, new species.**

Palpi and head dark steel gray with strong bluish metallic reflections. Thorax dark metallic blue. Fore wings deep orange-red; base of the

wing and patagium light steel-gray; before the middle of the wing is a straight perpendicular light steel-gray fascia, bordered on both sides with black scales; apical third of the wing light steel-gray, edged basally with a narrow line of black scales; the apical metallic gray color reaches along the dorsal edge to the middle of the wing. First abdominal segments bluish black; rest of abdomen deep orange-red; extreme tip black. Legs bluish black.

Alar expanse, 8.5 mm

Habitat—Williams, Arizona; H. S. Barber, collector.

Type—U. S. National Museum No. 12270.

A remarkably fine species, typical of the genus in oral and pterogostic characters, but at once distinguished from all described American species of the genus by its complete transverse fascia.

Scythris eburnea Walsingham.

Arotrura eburnea Walsingham, Insect Life, 1, p. 116, fig. 22, 1888.

Arotura eburnea Dyar, List N. Am. Lep., No. 6173, 1903.

Holcocera arizonella Kearfott, Can. Ent., xxxix, p. 8, 1907.

Colinita arizonella Busck, Journ. N. Y. Ent. Soc., xv, p. 140, 1907.

Lord Walsingham and Mr. Durrant have already published* the generic synonymy indicated above, as worked out during my stay at Merton Hall last year. By fixing *chenopodiella* Hübner as type of *Scythris*, *Arotrura* Walsingham and *Colinita* Busck became synonyms of that genus. The specific identity of *Arotrura eburnea* and *Holcocera arizonella* Kearfott did not occur to me in 1907, but is at once established by the examination of the types.

Allononyma vicarialis Zeller.

Simaethis vicarialis Zeller, Verh. Zoo.-Bot. Gesell. Wien, xxv, p. 322, 1875.

Hemerophila vicarialis Busck, Journ. N. Y. Ent. Soc., viii, p. 243, 1900; Dyar, List N. Am. Lep., No. 5530, 1903.

Orchemia diana var. *betuliperda* Dyar, Proc. U. S. N. M., xxv, p. 403, 1902; List N. Am. Lep., No. 5537 a, 1903.

Allononyma diana var. *betuliperda* Busck, Proc. U. S. N. M., xxvii, p. 746, 1904.

Examination of Zeller's type in Lord Walsingham's collection proves the above synonymy.

*Ent. Mo. Mag. XLII, p. 46 and 52, 1909.

LOTISMA, new genus.

Type—*Sciaphila trigonana* Walsingham (Dyar's List N. Am. Lep., No. 5413).

Tongue very long, spiraled. Labial palpi long, rather straight, up-turned, reaching vertex; second joint very long, roughly thickened with loose scales towards apex; third joint short, thick, smooth with apex obtuse. Face and head with smoothly appressed scales. Fore wings about three times as long as broad; costa nearly straight, but slightly deflexed at the pointed apex; termen straight and oblique; dorsum straight; 12 veins, all separate; internal vein from between 10 and 11 to between 8 and 9; 7 to below apex; 3, 4, and 5 from the end of the cell; 2 from apical fifth of the cell; 1b furcate at base; 1c distinct. Hind wings wider than the fore wings, with straight costa and rounded tornus; 8 veins; 3 and 4 short-stalked; 6 and 7 parallel; 5 radial, nearest 6. Posterior tibiae smooth.

The genus much resembles *Hemerophila*, but has more thickened palpi and differs in the position of the internal vein in the fore wing and of vein 5 in the hind wing.

The type species, described as a tortricid by Lord Walsingham, was redescribed by the writer as *Hemerophila kincaidella* (Proc. U. S. Nat. Mus., xxvii, p. 746, 1904).

Olethreutes albiciliana Fernald.

Miss Cora H. Clarke, of Boston, who for many years has made interesting contributions to life histories of insects and to whom the writer is under obligation for several valuable biological notes, notably the life history of the new genus and species *Ectoedemia populella*,* sent me last fall stalks of the common "touch-me-not" (*Impatiens*) containing larvæ of a tortricid, which this spring proved to be the above pretty species.

Miss Clark observed the larva during summer, and in September collected them in abundance at Magnolia, Mass.

The larva lives in the hollow stalk and in the succulent pith in the swelled joints; it overwinters as larva and towards spring gnaws a small circular hole in the stalk near a joint, leaving only the extreme epidermis intact as a semitransparent port hole; just inside this it spins a few threads of silk and pupates with its head toward the window, through which eventually the imago issues. In the insectary the first moth issued the latter part of April.

The writer has observed larvæ with similar habits in *Impa-*

*Busck, Proc. Ent. Soc., Wash., viii, p. 97-99, 1907.

tiens on Plummer's Island, Maryland, but has not yet had opportunity to breed the moths.

Hemimene plummeriana, Busck.

Proc. Biol. Soc. Wash., XIX, p. 181, 1906.

This interesting little species has been bred at the type locality (Plummer's Island, Maryland), by Mr. E. A. Schwarz from the flowers of pawpaw (*Asimina triloba*). The larvæ are short, thickset, purplish or greenish white, with light-brown head and brown divided cervical shield. The adults issued May 16.

This is an unusual food plant for the genus *Hemimene* (*Dichrorampha*), which has been supposed to be confined to the Compositæ.

CAMERARIA Chapman.

The Entomologist, XXXV, p. 141, 1902.

Type—*Lithocolletis guttifinitella* Clemens.

Miss Annette Braun's "Revision of the American species of *Lithocolletis*"* is a very valuable addition to the literature on American microlepidoptera, and the author deserves great credit for her careful work, and especially for the excellent plates, which are a great help in the identification of the many closely allied species of this group. The generic arrangement, however, shows some lack of logic and cannot be maintained.

The genus *Lithocolletis*, as understood in Dyar's List of North American Lepidoptera and by the earlier American workers on the group, consists, as repeatedly pointed out by Clemens and Chambers, of two main divisions—the cylindrical-larva group and the flat-larva group. These two branches have developed parallel from gracilariid stock, probably not from the same but from nearly allied origin. There can clearly not have been any crossings between these two branches of development since the first separation; neither could one have been developed from the other.

That the imaginal characters are structurally identical could be expected; they started alike and have had the same conditions to meet; but each group has retained its typical larval development, its typical feeding habits, its peculiar cocoons, and its typical coloration. In any of the stages it can at a glance be decided to which of the two groups a given species belongs.

In the one of these main branches of the phylogenic tree a

*Trans. Am. Ent. Soc., XXXIV, p. 269-357, pls. xx-xxiv, 1908.

few species have not reached as far as the majority in the development towards the *Lithocolletis* ideal; they have retained a small unessential vein from the ancestral type, which the main body of species have lost; and a single species is slightly in advance over the main body by having lost an extra vein. Thus we have:

LITHOCOLLETIS (Authors).

Porphyrosela Braun

Phyllonorycter Hübner

Cameraria Chapman

Cremastobombycia Braun

Cylindrical larva

Flat larva

Allied Gracilariid stock

It may be that these subdivisions of the cylindrical-larva group are worthy of subgeneric rank; I consider the differences too trivial for generic use. It would be logical to include all the species of both groups in one genus; this at least would be a natural group; but to erect subgenera for two of the subdivisions of the one main branch and then include the other main branch in the third subdivision is obviously unscientific.

The best way is to recognize the two easily defined main divisions of the group as good genera, for which the names *Phyllonorycter* Hübner* (type, *rajella* Linné) and *Cameraria* Chapman† (type, *guttifinitella* Clemens) must be used.

I have treated this comparatively unimportant case in some detail, because it elucidates similar cases of much more far-reaching consequences, in which I think the present classification of the microlepidoptera weak, or rather, unnatural.

We have been doing our classification too much horizontally, so to say—any twig on the entire phylogenic tree which has reached a certain type of imaginal structure has been placed in such or such a genus or family without sufficient regard for its origin. This does not produce a natural system.

In the above diagrammatic phylogenic tree it is of course the easiest to say that everything which has reached a certain level *A* is to be considered a systematic entity and that what

*Hübner, Tentamen, 1806.

†The Entomologist, xxxv, p. 141, 1902.

reaches to the level *B* is another family or subfamily, as the characters may warrant, irrespective of whether it originated from main branch *I*, *II*, or *III*.

But such a system would be purely mechanical and not according to nature's own divisions. And while we with our limited powers of observation are forced to adopt to some extent some mechanical arrangement in order to get any classification at all, it is manifestly obligatory, when we can trace the phylogeny and realize the true natural lines, that we utilize such knowledge and not continue our temporary mechanical system, merely because it is easier.

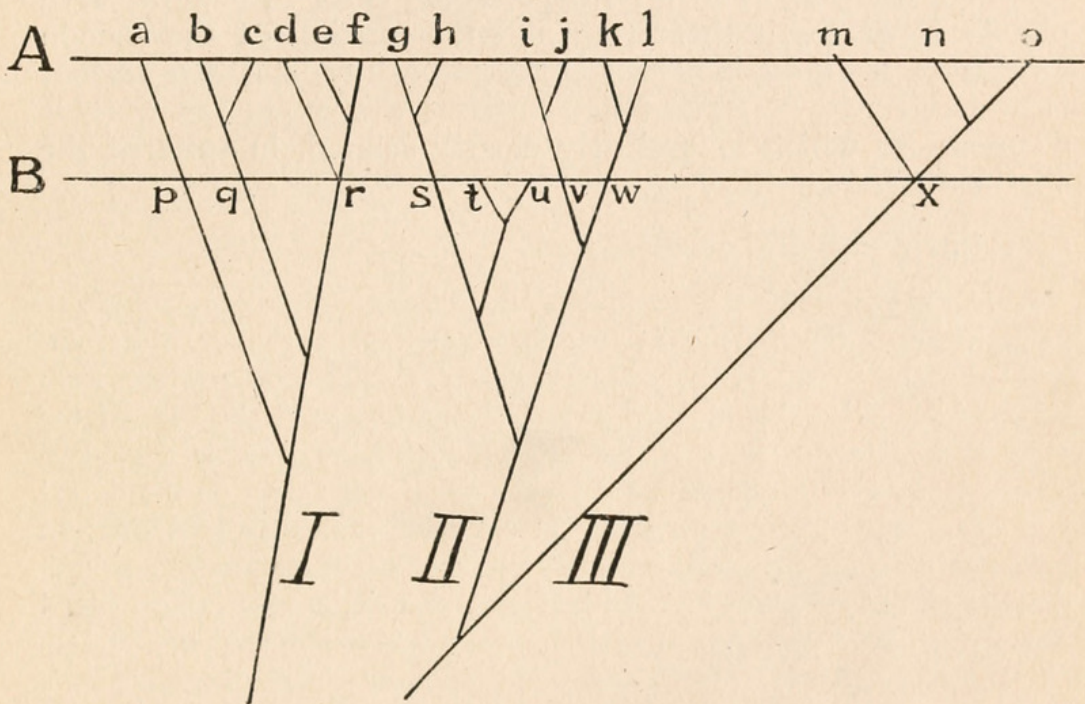


FIG. 5.—Diagrammatic phylogenetic tree.

Thus in the above illustration it is clearly correct to place the species (or genera) *a*, *b*, *c*, *d*, *e*, and *f* in the same family or genus *A* as their common characters may warrant, but in this family must not be placed *g*, *h*, *i*, to *o*.

Likewise it may be proper to include *s*, *t*, *u*, *v*, *w*, and even *x*, in one systematic entity (*B*) of whatever rank the characters may warrant, but *p*, *q*, and *r* will have to be considered separately, although they may have developed similar characters.

And while *e*, *f*, and *g* may look enough alike to tempt putting them all in one group, *e* and *f* are first cousins and therefore justly placed together, but *f* and *g* have their common ancestors far back in ancient history and have attained similar characters on entirely independent lines.

There are several such cases in our present classification. Miss Braun's treatment of the *Lithocolletis* group is a case in point, but a very striking example is the superfamily CYCNO-DIOIDEA, mentioned above (p. 92), which has been classed as a part of the family Elachistidæ. The discovery of the 9-veined genera throws an entirely new light over the group and proves that it has really nothing whatever to do with the forms with which it has hitherto been associated and to which it is embarrassingly alike in structure.

Lithocolletis ostensackenella Fitch (*ornatella* Chambers). Miss Braun has included this in the cylindrical-larva group, to which the pattern of the imago would refer it, but the larva plainly separates it therefrom and the making of the cocoon outside of the mine is heterogenous to both groups. The species is probably best referred temporarily to the genus *Leucanthiza* Clemens, to which it is clearly closely related, in spite of the slight difference in venation.

Gracilaria elotella, new species.

Labial palpi white, second joint dark fuscous exteriorly; maxillary palpi white on the inner side, fuscous exteriorly. Antennæ white, annulated with brown. Face, head, and thorax shining silvery white. Fore wing white with golden-brown and black markings; at the base of the wing is a brown costal spot; on the middle of the wing is a golden-brown transverse fascia, broader on the costal edge than on the dorsal and edged posteriorly by a sharp black, somewhat angulated line; at apical third is an outwardly strongly oblique fascia attenuated towards dorsum and edged posteriorly with black and a similar fascia also edged with black, but hardly so oblique is situated between this and the tip of the wing. Across the cilia and the extreme tip of the wing is a transverse streak of mixed brown and black. Fore and middle legs with swollen black femora and white tarsi. Hind legs white, shaded externally with brown; tibiæ smooth.

Alar expanse: 6 to 7 mm.

Habitat—East River, Connecticut; Chas. R. Ely, collector.

Type—U. S. National Museum, No. 12271.

Nearest to *Gracilaria fulgidella* Clemens, from which it differs by the white basal half of the fore wings, broken only by the costal basal spot.

Tisheria albostraminea Walsingham.

Proc. U. S. Nat. Mus., xxxiii, p. 224, 1907.

This species, which was described from a unique specimen (U. S. N. M. type No. 10356) collected by Mr. Beutenmüller

in New York, has long been known to me in nature and the recording of its food plant will materially aid in its future recognition.

The larva makes a small, very pale straw-colored upper mine in leaves of oak around Washington. The mine is normally placed at the edge of the leaf and frequently causes the edge to bend over in a small fold.

The species has several generations in this vicinity; the first mines collected in early April, 1900, produced moth the same month and others were bred in July and August.

Dyotopasta yumaella Kearfott.

Plutella yumaella Kearfott, Can. Ent., xxxix, p. 6, 1907.

Dyotopasta yumaella Busck, Journ. N. Y. Ent. Soc., xv, p. 140, 1907;
Proc. U. S. N. M., xxxiii, p. 227, 1907.

Pseudoxylesthia angustella Walsingham, Proc. U. S. N. M., xxxiii, p. 226, 1907.

The above names apply to the same species. The unique female specimen on which Lord Walsingham founded his genus *Pseudoxylesthia* had lost its head and had through a mistake of the preparator been supplied with a head of quite a different insect, as we discovered on closer examination at Merton Hall last summer. This accounts for the discrepancies between the generic descriptions.

Tinagma obscurofasciella Chambers.

Douglasia obscurofasciella Chambers, Journ. Cinn. Soc. Nat. Hist., III, p. 291, 1880; Dyar, List North Amer. Lepidoptera, No. 6172, 1903.

Tinagma crenulellum Engel, Entom. News, xviii, p. 279, 1907.

The writer must take the blame for the fact that Mr. H. Engel redescribed this species and thus created a synonym. *Douglasia obscurofasciella* was at the time not recognized, but there can be no doubt that the two names apply to the same species, which is congeneric with and specifically very close to *Tinagma perdicellum* Zeller, of Europe. Chambers gave a very good drawing of the unique venation of this genus.



Busck, August. 1909. "Notes on Microlepidoptera with descriptions of new North American species." *Proceedings of the Entomological Society of Washington* 11, 87–103.

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