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CONTENTS

	Page
Notes on Some Lepidoptera from Eastern Texas - - - - - L. J. BOTTIMER	797
Water and Water Solutions of Organic Compounds as Dips for the Soil of Potted Plants Infested with the Japanese Beetle - - - - - WALTER E. FLEMING	821
Nutritive Value of Protein in Beef Extract, Ox Blood, Ox Palates, Calf Lungs, Hog Snouts, and Cracklings - - - - - RALPH HOAGLAND and GEORGE G. SNIDER	829
The Growth of <i>Ophiobolus graminis</i> Sacc. in Relation to Hydrogen-Ion Concentration - ROBERT W. WEBB and HURLEY FELLOWS	845
Experimental Disturbances in the Milk Secretion of the Cow - - - - - F. A. DAVIDSON	873
The Effect of Feeding Cellulose on the Pulse Rate of Steers - - - - - HARRY W. TITUS	887

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JOURNAL OF AGRICULTURAL RESEARCH

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NOTES ON SOME LEPIDOPTERA FROM EASTERN TEXAS¹

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INTRODUCTION

In the latter part of 1922, and again in 1923, the writer was detailed to collect and rear Lepidoptera from eastern Texas, especially those of the Malvaceae. The project was carried out in connection with work on the eradication of the pink bollworm (*Pectinophora gossypiella* Saunders), under the supervision of the late W. D. Hunter, in charge. The main objects of the work were twofold; to discover, if possible, host plants of the pink bollworm other than cotton, and to enlarge the list of Lepidoptera likely to be mistaken for this comparatively new cotton pest.

Most of the collections were made in Liberty and Chambers Counties, in parts of which infestations of the pink bollworm had been found in 1917, 1919, and 1920. In 1918 and 1919 a similar study of the lepidopterous insects of malvaceous and related plants was made and the results published.³ The pink bollworm was not found on any of the plants examined.

Of the 40 species of Lepidoptera listed in the present paper, four are described as new, and two, already described, are here recorded for the first time from the United States. One variety is also described as new, and one new genus has been erected by Busck. In the course of the work a large number of observations were made on rather well-known species. The present paper, however, has been confined practically altogether to new species and to previously unrecorded data regarding the habits and distribution of other forms.

FAMILY HESPERIIDAE

PYRGUS SYRICHTUS (FABRICIUS)

Papilio syrictus Fabricius, 1775, Syst. Ent., p. 534.

Hesperia syrictus Dyar, 1902, List N. Amer. Lepidop., no. 652.

Pyrgus syrictus Barnes and McDunnough, 1917, Check List Lepidop. Bor. Amer., no. 493, 1917.

Larvae of this species were collected on leaves of the following malvaceous plants during 1923: *Sida rhombifolius* Linnaeus, at

¹ Received for publication May 12, 1926; issued November, 1926.

² The writer is indebted to Schaus, Busck, and Heinrich for determining the Lepidoptera and for other assistance; to Rohwer, Gahan, and Cushman for naming the Hymenoptera; and to Aldrich for identifying the dipterous parasites. He is also indebted to Bessey, of East Lansing, Mich., and Standley, of the National Herbarium, for determining the host plants. The drawings were made by H. B. Bradford, under the supervision of August Busck.

³ HEINRICH, C. SOME LEPIDOPTERA LIKELY TO BE CONFUSED WITH THE PINK BOLLWORM. Jour. Agr. Research 20: 807-836, illus. 1921.

Liberty, Tex., July 7; *Malvastrum americanum* (Linnaeus) Torrey, at Victoria, Tex., August 2 and August 25; and on the same host plants at Lake Charlotte, Tex., November 16. An adult emerged July 24, 1923, from a specimen taken at Liberty.

FAMILY SATURNIIDAE

AUTOMERIS IO (FABRICIUS)

Bombyx io Fabricius, 1775, Syst. Ent., p. 560.

Automeris io Dyar, 1902, List N. Amer. Lepidop. no. 753; Barnes and McDunnough, 1917, Check List Lepidop. Bor. Amer., no. 780.

A colony of about 25 half-grown larvae of this moth was found defoliating a cotton plant at Liberty August 31, 1923. The larvae collected became mature during the last week of the month following and pupated within tough, oval-shaped, brownish cocoons. From these specimens several adults were reared during the latter half of April, 1924.

A single immature larva was also taken on cotton at Smith Point, Tex., October 4, 1923. Several days later two young larvae were collected on leaves of *Hibiscus lasiocarpus* Cavanilles at Liberty. A nearly full-grown larva was found feeding upon the leaflets of *Amorpha fruticosa* Linnaeus at Lake Charlotte, October 23, 1923.

FAMILY NOCTUIDAE

SUBFAMILY AGROTINAE

HELIOTHIS OBSOLETA (FABRICIUS)

Bombyx obsoleta Fabricius, 1793, Ent. Syst., 3 (1): 456.

Chloridea obsoleta Hampson, 1903, Cat. Lepidop. Phal. Brit. Mus. 4: 45, 657.

Heliothis obsoleta Barnes and McDunnough, 1917, Check List Lepidop. Bor. Amer., no. 1090.

Larvae of this species, which is known as the "cotton bollworm," were collected in maturing bolls of *Hibiscus lasiocarpus* Cavanilles and *H. militaris* Cavanilles at Lake Charlotte from August 18 to September 8, 1922, and in the bolls and open flowers of *H. lasiocarpus* at Liberty during September of the same year. Pupation took place within oval-shaped cells in the soil, the average pupation period of the five adults reared being 11 days. The adults emerged from September 11 to October 13, 1923.

Larvae were also found feeding upon leaves and bolls of okra (*Hibiscus esculentus* Linnaeus) at Smith Point October 3, 1923. One adult emerged October 30, 1923, and two emerged April 8 and April 17, 1924.

HELIOTHIS VIRESCENS (FABRICIUS)

Noctua virescens Fabricius, 1781, Spec. Ins. 2: 216.

Chloridea virescens Dyar, 1902, List N. Amer. Lepidop., no. 2296.

Heliothis virescens Barnes and McDunnough, 1917, Check List Lepidop. Bor. Amer., no. 1091.

Larvae were collected on leaves and bolls of okra (*Hibiscus esculentus* Linnaeus) at Smith Point October 3, 1923. The larvae pupated the same month, and from these specimens three adults were reared during the first part of the following April.

SUBFAMILY ERASTRIINAE

XANTHOPTERA NIGROFIMBRIA GUENÉE

Xanthoptera nigrofimbria Guenée, 1852, Spec. Gén. 6: 241.

One larva was found in a ripening capsule of *Ipomoea speciosa* Walter at Smith Point, September 1, 1922. Pupation took place about September 3 within a thin cocoon fastened to the stem of the plant and covered with small pieces of leaf. The moth emerged September 15, 1922.

HELIOCONTIA MARGANA (FABRICIUS)

Paralis margana Fabricius, 1794, Ent. Syst., 3 (2): 257.

Spragueia sordida Dyar, 1902, List N. Amer. Lepidop., no. 2710.

Heliocontia margana Hampson, 1910, Cat. Lepidop. Phal. Brit. Mus. 10: 666-667; Barnes and McDunnough, 1917, Check List Lepidop. Bor. Amer., no. 2924.

Larvae of this species were collected on the leaves and buds of *Malvastrum americanum* (Linnaeus) Torrey at Victoria August 21, 1923. From this material a male emerged September 3 of the same year.

SUBFAMILY ACONTIINAE

BAGISARA RECTIFASCIA (GROTE)

Schinia rectifascia Grote, 1874, Boston Soc. Nat. Hist. Proc. 16: 242.

Aethmia rectifascia Dyar, 1902, List N. Amer. Lepidop., no. 2267.

Bagisara rectifascia Hampson, 1910, Cat. Lepidop. Phal. Brit. Mus. 9: 156; Barnes and McDunnough, 1917, Check List Lepidop. Bor. Amer., no. 2730; Heinrich, 1921, Jour. Agr. Research 20: 834.

Larvae were collected on leaves of *Hibiscus lasiocarpus* (?) at Smith Point August 10, 1922. One specimen pupated August 13 in a loosely folded leaf, and the adult emerged 11 days later. An adult was reared November 7, 1923, from larvae collected on leaves of *Malvaviscus drummondii* Torrey and Gray at the same locality October 3, 1923.

The larvae were found in large numbers on *Malvaviscus* at Lake Charlotte during October, 1923. When full grown the larva enters the soil and constructs a flattened circular cell which is lined with silk, and in which it rests until it pupates the following spring. No adults were obtained from these larvae.

The full-grown larva is 30 to 35 mm. long, 2 to 2½ mm. wide, and nearly cylindrical. The body above is light green, with seven narrow, wavy stripes of darker green, one dorsal, two subdorsal on each side, and one lateral; paler beneath. Head pale greenish white with four transverse broken rows of grayish spots; thoracic shield and anal plate of body color; thoracic legs pale; abdominal legs pale, rather elongate, one pair each on fifth and sixth abdominal segments; (absent on third and fourth abdominal segments); crochets about 20 in number, arranged in a semicircle on inner side; anal legs pale, well developed; anal fork lacking; body setae elongate and slender. The dorsal surface of the full-grown larva is often tinged with a pale wine color.

Heinrich has advised the writer that this species should be placed in the Acontiinae rather than in the Acronyctinae because of characters of the larva and the adult, the latter having vein 5 of the hind wing well developed.

Larvae collected at Lake Charlotte were found to be parasitized by *Meteorus laphygmae* Viereck (Hymenoptera). Two of these emerged about December 1, 1923, from oval-shaped cocoons spun by the parasitic larvae after the latter had left the body of the host.

SUBFAMILY PHYTOMETRINAE

PHYTOMETRA OO (CRAMER)

[*Phalaena*] oo Cramer, 1782, Pap. Exot. 4: 45, pl. 311, fig. E (nec. F).
Phytometra oo Hampson, 1913, Cat. Lepidop. Phal. Brit. Mus. 13: 522.

A single adult was reared about December 1, 1923, from a larva found in a fold of an okra leaf at Smith Point November 1, 1923. The larva was a very pale green, except for a large blackish area on the middle of the dorsal surface. The dark area was present on the pupa and is retained on the pupal case.

SUBFAMILY EREBINAE

ANOMIS EROSA HÜBNER

Anomis erosa Hübner, 1818, Zutr. Samml. Exot. Schmett., p. 19, fig. 287, 288; Barnes and McDunnough, 1917, Check List Lepidop. Bor. Amer., no. 3407.

Larvae and pupae were collected in large numbers on okra at Smith Point during October, 1923. The larvae feed upon the leaves and pupate in a long roll or fold in the leaf. Emergence dates ranged from October 8 to about December 1, 1923.

From this material four adults of the hymenopterous parasite *Itopectis conquisitor* (Say) were reared during December, 1923, each parasite developing singly within the body of its host and emerging during the pupal stage of the latter.

One larva of *Anomis erosa* was taken on *Malvaviscus drummondii* Torrey and Gray at Lake Charlotte October 23, 1923. The specimen pupated one week later in a loosely tied leaf, and about December 1 of the same year a dipteran, *Zenillia blanda* Osten Sacken, emerged from the pupa.

A series of adults of the hymenopteron *Syntomosphyrum esurus* Riley emerged from a pupa of *Anomis erosa* during the first part of December, 1923. A single emergence hole in the dorsal surface of the abdomen of the host was made. This parasite was also reared in large numbers during the winter of 1923-24 from pupae of *Alabama argillacea* (Hübner), taken on cotton in various parts of Liberty and Chambers Counties.

ANOMIS EXACTA HÜBNER

Anomis exacta Hübner, 1810, Samml. Exot. Schmett., v. 2, pl. 411; Barnes and McDunnough, 1917, Check List Lepidop. Bor. Amer., no. 3410.

One larva was collected on *Malvaviscus* at Lake Charlotte October 12, 1923. The specimen pupated October 17 in a loosely tied leaf of the host plant, and the adult emerged November 8, 1923.

FAMILY GEOMETRIDAE

SYNCHLORA DENTICULARIA (WALKER)

Nemoria (?) *denticularia* Walker, 1861, List Lepidop. Brit. Mus. 22: 536.

Synchlora excurvaria Hulst, 1895, Ent. News 6: 71.

Synchlora denticulata Dyar, 1902, List N. Amer. Lepidop., no. 3580.

Synchlora denticularia Barnes and McDunnough, 1917, Check List Lepidop. Bor. Amer., no. 3801.

Four adults were reared June 30, to July 16, 1923, from pupae collected on the flower heads of *Rudbeckia maxima* Nuttall at Liberty June 27 and July 7, 1923. One larva was taken on the flower head of *Helianthus* sp. at Smith Point October 2, and a second on *Malvastrum americanum* (Linnaeus) Torrey at Lake Charlotte November 16, 1923. An adult was reared October 20, 1923, from the first specimen. The larvae are surface feeders, and carry about with them seeds and particles of the host plant attached to the spiny tubercles on the dorsal surface of the abdominal segments. Pupation takes place within a very frail web covered with small pieces of the host plant.

FAMILY PYRALIDAE

SUBFAMILY PYRAUSTINAE

LOXOSTEGE HELVIALIS (WALKER)

Spilodes helvialis Walker, 1859, List Lepidop. Brit. Mus. 18: 772.

Loxostege helvialis Dyar, 1902, List N. Amer. Lepidop., no. 4351; Barnes and McDunnough, 1917, Check List Lepidop. Bor. Amer., no. 5022.

Several larvae of this species were found feeding within loosely rolled leaves of *Amaranthus spinosus* Linnaeus, at Liberty July 2 to 4, 1923. On July 4 one larva was also taken in a rolled leaf of *Sida rhombifolia* Linnaeus, in close proximity to some of the *Amaranthus* plants. Feeding of the larva on *Sida* was not noted.

The feeding larva is pale green, and when full grown is about 18 mm. in length. Just before pupation its dorsal surface becomes either a solid deep pink or is marked with broad stripes of dark pink. Moths emerged July 11 and July 16, 1923, from the tough, dark brown cocoons, to the outside of which leaves of the host plant had been fastened. From a whitish cocoon spun by one of the larvae a dipteran emerged July 18, but it was in poor condition and could not be determined.

PYRAUSTA PHOENICEALIS (HÜBNER)

Haematia phoenicealis Hübner, 1818, Zutr. Exot. Schmett., fig. 115, 116.

Pyrausta phoenicealis Dyar, 1902, List N. Amer. Lepidop., no. 4448; Barnes and McDunnough, 1917, Check List Lepidop. Bor. Amer., no. 5145.

Larvae of this species were collected in frail silken tubes in the flower heads of a mint, *Mesosphaerum rugosum* (Linnaeus) Pollard, at Liberty, during September and at Smith Point on October 2, 1923. The full-grown larva is about 15 mm. long, pale green, with pale pinkish-purple stripes, and with conspicuous, black, elongate-oval chitinizations at the base of the body setae. Adults were reared September 30, 1923, and from February to April, 1924. The species overwinters as full-grown larvae.

NOCTUELIA RUFOFASCIALIS (STEPHENS)

Ennychia rufofascialis Stephens, 1834, Illus. Brit. Ent. Haust. 4: 33.

Noctuelia rufofascialis Barnes and McDunnough, 1918, Contrib. Nat. Hist. Lepidop. N. Amer. 4: 167; Heinrich, 1921, Jour. Agr. Research 20: 829-830.

Heinrich has recently received larvae of this species collected at Eagle Pass, Tex., by C. E. Bellis in cotton shipped from Rosita, Tex. This is a new host record. The insect has not been taken in the eastern part of Texas.

SUBFAMILY THYRIDINAE

MESKEA DYSPTERARIA GROTE

Meskea dyspteraria Grote, 1877, Canad. Ent. 9: 115; Dyar, 1902, List N. Amer. Lepidop, no. 4139; Barnes and McDunnough, 1917, Check List Lepidop. Bor. Amer., no. 4897; Heinrich, 1921, Jour. Agr. Research 20: 828-829.

Galls in the stems of *Malvaviscus drummondii* Torrey and Gray containing larvae of this species were collected at Lake Charlotte September 21 and October 27, 1922, and October 23 and November 16, 1923. The galls were found mainly on small, stunted plants which made up one large colony. Other near-by colonies of the same plant, but of normal growth, were not at all infested. A few galls were found on *Malvaviscus* at Liberty, during September, 1923. They were usually formed singly on the upper half of the main stem, but occasional plants bore galls on the branches. In one case a very elongate enlargement on a branch of the host contained three larvae of *Meskea dyspteraria*, each in a separate cavity in the stem.

The conspicuous galls are of a light russet color, elongate-oval in shape, and usually quite regular in outline. They range in length from 20 to 50 mm., and in diameter at the middle or largest part of the gall from 6 to 13 mm., the average being about 40 mm. long and 11 mm. wide. In the upper part of the gall is a small round hole scarcely 1 mm. in diameter, through which frass in the form of short cylindrical pellets was discharged at regular intervals for a short period after the specimens were collected. Immediately after each operation the larva spun a web over the hole on the inside of the burrow. The burrow is lined with a thin web and is kept quite clean.

The winter is passed in the larval stage. When ready to pupate the larva cuts a round hole at the lower extremity of the cavity through the woody part of the gall to the outer surface, leaving the thin bark or epidermis unbroken. Pupation then takes place within the cavity, the caudal end of the pupa being fastened to the upper part of the burrow and the cephalic end pointing toward the newly constructed hole at the base of the cavity, through which the adult escapes upon emergence. The pupal case remains entirely concealed within the gall. Pupation took place during the latter part of March and the first part of April. From larvae collected September 21 and October 27, 1922, adults were reared April 17 to April 30, 1923, and from specimens collected October 23 and November 16, 1923, moths emerged April 13 to April 29, 1924.

Upon emergence the sluggish adults climbed to the upper part of the stems of the host plant in the rearing cages and rested in a very characteristic pose. In this pose the fore wings are more or less

folded along the anterior margin of the hind wings, which are spread, and in this position both pairs of wings are moved around toward the ventral surface of the insect until they form an acute angle with each other, but remain nearly at right angles to the thorax. Both sexes rest with the abdomen curved slightly upward.

Three specimens of the hymenopterous parasite *Calliephialtes grapholithae* (Cresson) were reared from larvae of *Meskea dyspteraria* Grote, each parasite developing singly within the body of its host and emerging through a small hole in one end of the gall. One specimen emerged on February 18 and two on March 12, 1924, from larvae collected at Lake Charlotte during November, 1923.

SUBFAMILY PHYCITINAE

HOMOEOSOMA ELECTELLUM (HULST)

Anerastia electella Hulst, 1887, Entomologica Americana 3: 137-138.

Homoeosoma electellum Hulst in Dyar, 1902, List N. Amer. Lepidop., no. 4865; Heinrich, 1921, Jour. Agr. Research 20: 832.

Two adults were reared September 11 and October 5, 1922, from larvae found feeding in the flower heads of *Helianthus* sp. at Smith Point August 9 and September 14. From larvae collected in the flower heads of *Rudbeckia maxima* Nuttall and *Helianthus* sp. at Liberty in June and July, 1923, adults were reared June 27 to July 16 of the same year. Pupation took place in the irregular webbed channels made by the larvae.

From a parasitized larva taken in a flower head of *Rudbeckia maxima* a specimen of *Spilochalcis delira* (Cresson) was reared July 5, 1923.

EUZOPHERA SEMIFUNERALIS (WALKER)

Nephoteryx semifuneralis Walker, 1863, List Lepidop. Brit. Mus. 27: 57.

Euzophera semifuneralis Hulst, 1890, Trans. Amer. Ent. Soc., 17: 175; Dyar, 1902, List N. Amer. Lepidop., no 4832; Barnes and McDunnough, 1917, Check List Lepidop. Bor. Amer., no. 5720.

Four adults were reared March 18 to April 14, 1924, from larvae collected in stalks of corn at Snyder, Scurry County, December 19, 1923. The larvae construct rather heavy webs in the irregular burrows in the pith of the host for pupation.

EPHESTIA CAUTELLA (WALKER)

Pempelia cautella Walker, 1863, List Lepidop. Brit. Mus. 27: 73.

Ephestia cautella Rebel, 1901, Cat. Lep. Eur. 2, no 271; Barnes and McDunnough, 1917, Check List Lepidop. Bor. Amer., no. 5801.

Adults of this species were reared from larvae found feeding upon the pulp of ripened bolls of *Malvaviscus drummondii* Torrey and Gray collected at Lake Charlotte during August, 1922. The larvae pupated within folds in small pieces of cloth in the rearing cages. Emergence dates ranged from October 7 to October 17, 1922, the pupation period averaging 10 days.

FAMILY COSMOPTERYGIDAE

CHAETOCAMPA BUSCK,⁴ NEW GENUS

(Fig. 1, A to F; fig. 2, D; fig. 3, A, B, C)

Type.—*Chaetocampa crotonella* Bottimer, hereinafter described.

Chaetocampa, n. g.

Labial palpi curved upward, sickle shaped, smooth, reaching vertex, terminal joint nearly as long as second and pointed. Antennae with strong pecten on basal joint. Face and head smooth. Fore wings narrow lanceolate; 12 veins; 6 and 7 long-stalked, inclosing apex; 8 out of their stalk; 5 out of base of stalk; rest separate; 1b not furcate at base; 1c present, strong. Hind wings half as wide as fore wings; lanceolate; 8 veins; 6 and 7 very long-stalked or united; rest separate; 5 nearest 6 and 7. A series of long spinelike scales along costal edge. Posterior tibiae strongly tufted above. Male genitalia with rounded broad uncus; gnathos divided into two free knobbed arms; socii absent; tegumen slender, elongate; harpes greatly reduced, small, semicircular; vinculum narrow, with long anteriorly projecting process; annellus strongly developed, with chitinous processes; aedeagus long, slender, and nearly straight. Larva with secondary setae.

The genus is for the present placed in the family Cosmopterygidae, where it would go on its oral and pterogostic characters, but the larvae and the genitalia prove that this family is heterogeneous and must be divided. The present genus does not go with *Cosmopteryx* and its allies, but represents a distinct family, characterized by the quite different genitalia and by the hairy larvae. (Fig. 3, C.)

Belonging to this family and closely allied to the present genus is the Transcaucasian genus *Parametriotes* Kusnezov (type, *P. theae* Kusnezov),⁵ and some of the species at present wrongly referred to the genus *Batrachedra* Stainton.

The definition of the family is advisedly postponed until the entire group can be properly worked up.

CHAETOCAMPA CROTONELLA, NEW SPECIES

Chaetocampa crotonella, n. sp.

Antenna above whitish ochreous; beneath black, pubescent, and with whitish ochreous scales at apex of each joint, giving under surface a serrate appearance. Labial palpus whitish ochreous; second joint with a few dark fuscous scales on upper and outer sides, especially near apex; terminal joint with a few dark fuscous scales in middle on outer side. Face, head, and thorax whitish ochreous. Fore wing whitish ochreous, overspread with dark fuscous scales, more strongly above and beyond cell; a distinct black dot at end of cell; from there an indistinct longitudinal dark streak to apex, and a more or less distinct marginal series of black dots; cilia light ochreous fuscous. Hind wing dark silvery fuscous; cilia light ochreous. Under surface of both fore and hind wings dark silvery fuscous. Abdomen whitish ochreous. Legs whitish ochreous, shaded with light fuscous exteriorly.

Male genitalia of paratype from Smith Point figured (fig. 1, D, E).

Alar expanse.—9 to 13½ mm.

Type.—Cat. No. 27333, United States National Museum.

Type locality.—Liberty, Tex.

Food plant.—*Croton engelmannii* Ferguson.

Described from male type (May 27, 1924) and three male and four female paratypes reared April 9 to June 16, 1924, from larvae collected in seeds October 19, 1923; one male and two female paratypes

⁴ Description of the new genus furnished by August Busck.

⁵ KUSNEZOV, N. J. DESCRIPTION OF PARAMETRIOTES THEAE, GEN. N., SP. N. (LEPIDOPTERA, TINEIDAE), A NEW ENEMY OF THE TEA BUSH IN TRANSCAUCASIA. Russ. Ent. Obozr. (Rev. Russe Ent.) 15: 627-652, illus. 1916. [In Russian. English summary, p. 642-649.]

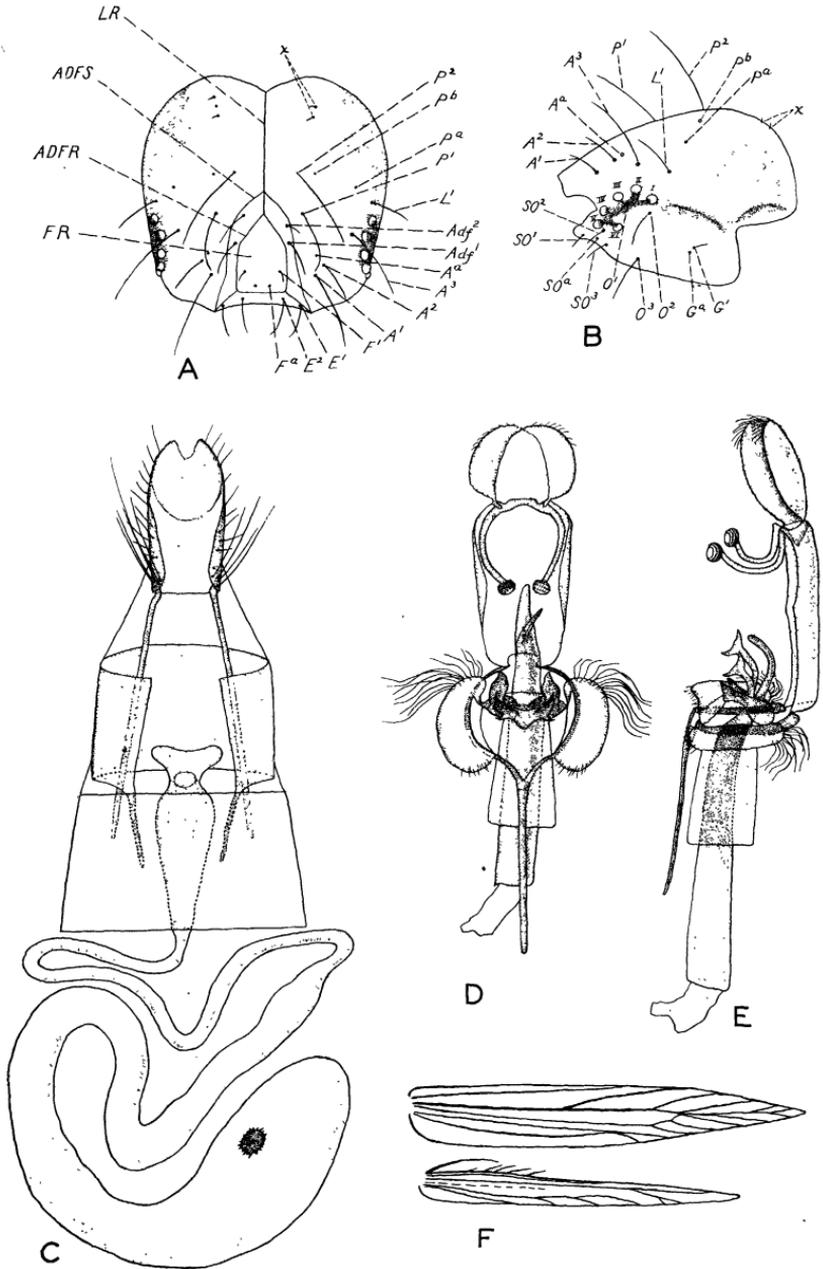


FIG. 1.—*Chaetocampa crotonella*: A, head of larva, front view; B, head of larva, side view; C, female genitalia; D, male genitalia, front view; E, male genitalia, side view; F, wing venation

A¹, A², A³, A^a, anterior setae and puncture of epicranium; Adf¹, Adf², adfrontal setae and puncture of epicranium; ADFR, adfrontal ridge of frons; ADFS, adfrontal suture; E¹, E², epistomal setae; F¹, F^a, frontal seta and puncture; FR, frons; G¹, G^a, genal seta and puncture of epicranium; L¹, lateral seta and puncture of epicranium; LR, longitudinal ridge of frons; O¹, O², O³, ocellar setae and puncture of epicranium; P¹, P², P^a, P^b, posterior setae and punctures of epicranium; SO¹, SO², SO³, SO^a, subocellar setae and puncture of epicranium; X, ultraposterior setae and punctures of epicranium.

reared July 28, 1923, from larvae collected in leaf galls July 6, 1923, all from the type locality; and one male paratype reared August 31, 1922, from a leaf gall found at Smith Point, Tex.

Chaetocampa crotonella is quite common in parts of Liberty and Chambers Counties. Larvae were collected in galls in the petioles of leaves of the host plant from June 28 to August 10. The galls are usually formed next to the leaf blade and are somewhat irregularly conical in shape, tapering away from the base of the leaf blade. The enlargements average from 3 to 4 mm. in diameter at the widest point and range from 5 to 15 mm. in length.

Later in the season the larvae are to be found only in the immature three-seeded capsules of the same plant. Larvae were noted in the seeds as early as July 11, and were collected as late as November 13 in late-maturing plants. In the capsule the larva feeds upon the contents of the seeds, going from one to another through very clean-cut holes.

The larva possesses secondary body setae. The younger stages are white. When full grown the larva is 8 to 10 mm. long and purple-black, the color becoming paler toward the anterior end; thoracic segments each with a middle lateral spot of the darker color. Head pale purplish white, with lateral margins purple-black; thoracic shield purplish white with darker spots, posterior margin broadly purple-black; thoracic legs pale; abdominal legs normal, crochets (fig. 2, D) about 15 in number, arranged in a circle broken outwardly; anal plate of body color; anal fork absent.

Pupation of the larva found in the galls takes place within the enlarged petioles of the leaf, the pupal case remaining in the gall after the emergence of the moth. When full grown the seed-feeding larva leaves the capsule of the host and seeks a suitable place in which to pupate, but does not enter the soil. Those in the rearing cages pupated in pieces of cork, the cases remaining in the silk-lined cavities upon emergence of the adults. The species overwinters as pupae.

The pupa (fig. 3, A, B) is 5 to $6\frac{1}{2}$ mm. long and 1 to $1\frac{1}{4}$ mm. wide; nearly cylindrical, slightly dorsally concave; color yellowish brown; surface granular, dorsal surface of abdominal segments finely transversely corrugated. Front, vertex, prothorax, and anterior half of mesothorax thickly covered with very short, stout spines, and with a few larger scattered spines; a large curved spine at lower margin of eye, several on first joints of antennae, one on outer hind angle of vertex, several on posterior half of mesothorax, and one near outer margin of metathorax. Maxillae and prothoracic legs about half as long as wing cases; antennae, metathoracic legs, and wing cases reaching beyond fifth abdominal segment; serrations of antennae plainly visible; antennae meeting at fourth abdominal segment and diverging posteriorly, exposing the tips of metathoracic legs. Abdomen with movable joints between segments 5 and 6, and 6 and 7, the sutures between these segments being wide and deep; caudal end bluntly pointed; segments 9 and 10 fused ventrally; anal prolegs with crochets present.

Larvae found in the galls produced moths July 13 to August 31 of the same year. A few adults were reared during the later part of September from larvae taken in seeds, but most of the seed-feeders did not produce moths until the following year, the emergence dates

ranging from April 5 to June 17. The adult rests with all its legs touching the surface, with the head slightly elevated, and with the antennae above the wings along the side of the body.

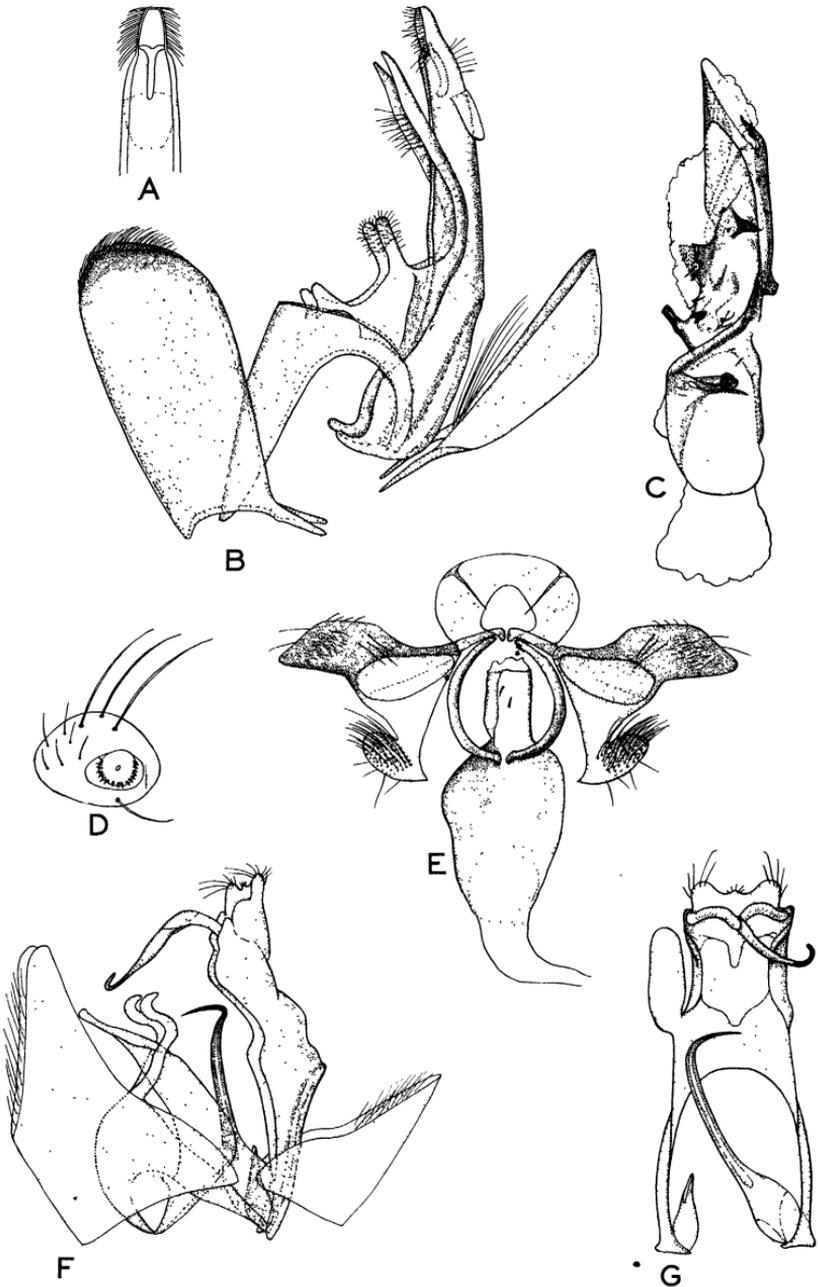


FIG. 2.—*Gelechia monotaeniella*: A, male genitalia, uncus; B, male genitalia, aedeagus removed; C, male genitalia, aedeagus. *Chaetocampa crotonella*: D, abdominal proleg of larva. *Isophrictis simitiella*: E, male genitalia. *Recurvaria eryngiella*: F, male genitalia, side view; G, male genitalia, front view

Two specimens of *Bassus gibbosus* Say (Hymenoptera) were reared January 14, 1924, from Croton seed capsules collected at Liberty and are probably parasitic upon the lepidopteron.

FAMILY GELECHIIDAE

ISOPHRICTIS SIMILIELLA (CHAMBERS)

(Fig. 2, E; fig. 3, D, E, F)

Gelechia similiella Chambers, 1872, *Canad. Ent.* 4: 193.*Paltodora similiella* Busck, 1903, *U. S. Natl. Mus. Proc.* 25: 779-780.*Isophrictis similiella* Meyrick, 1917, *Ent. Mo. Mag.* 53: 113; Heinrich (in part), 1921, *Jour. Agr. Research* 20: 813-814.

In Heinrich's paper two species of *Isophrictis* are confused under the name *similiella*—the true *similiella* (Chambers) and *rudbeckiella*, a species here described as new, the genitalia figured in Plate 95, A, of his paper belonging to the new species.⁶ Both species have the harpe of the male genitalia divided, but in the new species it is nearly twice as long as in *similiella*.

Five adults were reared from September 26 to October 21, 1922, from larvae collected in the flower heads of a tall wild sunflower (*Helianthus* sp.) at Smith Point in September. The larvae were found in large numbers in the dried flower heads of a similar sunflower at Sweetwater and San Angelo, in northern Texas, during December. Specimens collected at the latter locality December 14, 1923, remained over winter as larvae. In the rearing cage pupation took place from May to June, the adults emerging from May 7 to July 1, 1924.

The larvae range from 5 to 10 mm. in length and have three or four crochets on the anal and abdominal legs. The pupa (fig. 3, D, E, F) is 5 to 6½ mm. long, 1¼ to 1½ mm. wide; cephalic end pubescent; wing cases reaching nearly to eighth abdominal segment; tips of metathoracic legs exposed beyond tips of wing cases; maxillae extending well beyond caudal end, which is armed with numerous elongate hooked spines and a dorsally projecting cremaster.

From the San Angelo material the following Hymenoptera were reared during April, 1924: *Microbracon mellitor* (Say), one specimen; *M. nuperus* (Cresson), one specimen; *Microbracon* n. sp., one specimen; *Zaglyptonotus schwarzi* Crawford, three specimens; *Callimome* sp., three specimens; and four specimens of a pteroma id. Six adults of *Cremastus facilis* (Cresson) were also obtained, the emergence dates ranging from April 27 to July 14, 1924.

ISOPHRICTIS SIMILIELLA DENOTATA, NEW VARIETY

(Fig. 3, G, H)

***Isophrictis similiella denotata*, n. v.**

Differs from the true *similiella* in its darker color, and in having the fore wings covered with white-tipped black scales without the distinct golden longitudinal streaks. These are replaced by scattered reddish brown scales, which at the apex form a V-shaped mark as in the typical specimens.

The genitalia are the same as in *similiella*.*Alar expanse*.—9 to 16 mm.*Type*.—Cat. No. 27334, United States National Museum.*Type locality*.—Liberty, Tex.*Food plant*.—*Helianthus mollis* Lamarck.

Described from male type and 4 male and 11 female paratypes reared September 17 to October 24, 1923, from larvae collected during the first part of the same month.

⁶ HEINRICH, C. SOME LEPIDOPTERA LIKELY TO BE CONFUSED WITH THE PINK BOLLWORM. *Jour. Agr. Research* 20: 807-836, pl. 95, A. 1921.

The habits of the larva are similar to those of the larva *Isophrictis similiella*. The larva differs from that of the true *similiella* in having one crochet, rarely two, on the anal and abdominal legs. The pupa

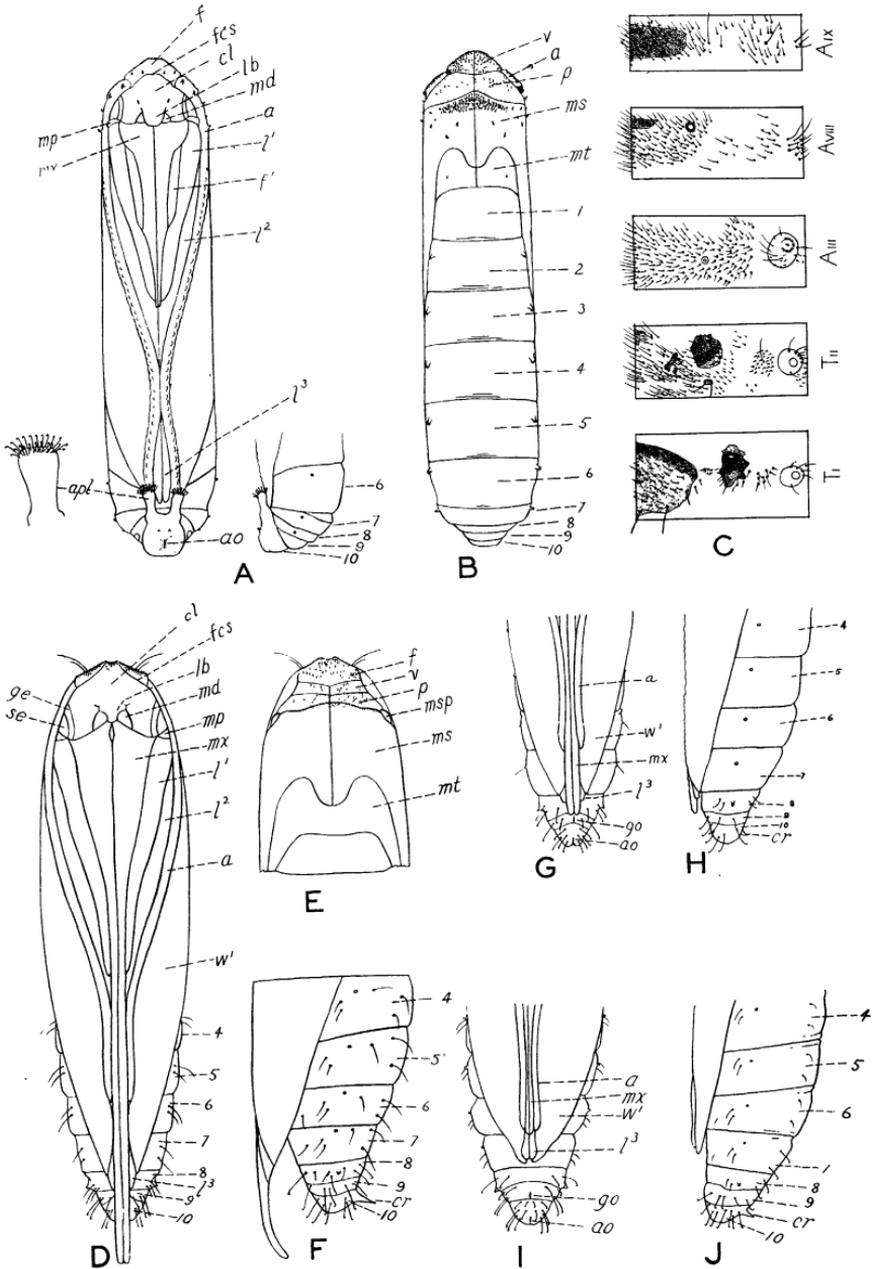


FIG. 3.—*Chaetocampa crotonella*: A, pupa, front and side views; B, pupa, back view; C, setal map of larva. *Isophrictis similiella*: D, pupa, front view; E, pupa, back view; F, pupa, side view. *Isophrictis similiella denotata*: G, posterior tip of pupa, front view; H, posterior tip of pupa, side view. *Isophrictis rubbeckiella*: I, posterior tip of pupa, front view; J, posterior tip of pupa, side view. a, antenna; ao, anal opening; apl, anal proleg; cl, clypeus; cr, cremaster; f, front; f', femora of prothoracic leg; fcs, fronto-clypeal suture; ge, glazed eye; go, genital opening; l', prothoracic leg; l², mesothoracic leg; l³, metathoracic leg; lb, labrum; md, mandible; mp, maxillary palpus; ms, mesonotum; msp, mesothoracic spiracle; mt, metanotum; mx, maxilla; p, pronotum; se, sculptured eyepiece; v, vertex; w¹, mesothoracic wing

(fig. 3, G, H) differs in the length of the maxillae, which extend only slightly beyond the tips of the wing cases and metathoracic legs; in none do they reach the tip of the abdomen.

Twelve specimens of *Tachinophyto* sp. (Diptera) were reared September 18 to October 24, 1923, as parasites of the larvae of this species.

During the latter half of September, 1923, the following Hymenoptera were reared from the Liberty material: *Apanteles dakotae* Muesebeck, four specimens; *Callimome* sp., one specimen; and *Cremastus* sp., one specimen.

ISOPHRICTIS RUDBECKIELLA, NEW SPECIES

(Fig. 3, I, J)

Isophrictis rudbeckiella, n. sp.

Antenna with basal joints whitish, overlaid with fuscous scaling; apically becoming golden ochreous, strongly annulated with black, the ochreous scales spreading, giving a serrated appearance, especially on apical half; finely pubescent beneath. Palpus white; second joint with outer upper edge fuscous, and with outer side and inner apical third of well-developed brush fuscous; terminal joint with outer side fuscous, extreme tip black. Face white. Head and thorax covered with white-tipped dark scales. Fore wing covered with white-tipped dark scales, the darker color fuscous at base, becoming black at apex of wing; marked with narrow longitudinal streaks of white-tipped golden scales, one below costa, one along fold, and a third midway between the two, rather distinct on basal half, the streaks beyond middle becoming shorter, more numerous, and confused, forming a rather distinct V-shaped area of golden scales pointing toward the apex just before a strong edging of white-tipped black scales; cilia light fuscous, at apex darker, and crossed by two nearly black lines. Hind wing dark silvery fuscous; cilia light fuscous. Both fore and hind wings dark fuscous beneath. Abdomen dark silvery fuscous, with silvery lateral streak. Legs silvery white, heavily overlaid with fuscous exteriorly.

Alar expanse.— $11\frac{1}{2}$ to 16 mm.

Type.—Cat. No. 27335, United States National Museum.

Type locality.—Liberty, Tex.

Food plant.—*Rudbeckia maxima* Nuttall. Also reared from *R. hirta* Linnaeus.

Described from male type and four male and six female paratypes reared June 10 to June 28, 1924, from larvae collected in flower heads of *Rudbeckia maxima* at Liberty September, 1923, and one male paratype reared from *Rudbeckia* sp. (Heinrich, May 26, 1918) at Alvin, Brazoria County.

This species is distinguished from *similiella* Chambers only by means of the male genitalia, slight but constant larval and pupal characters, and host plants. The male genitalia of *rudbeckiella* are figured by Heinrich⁷ under the name *Isophrictis similiella* Chambers.

The larva feeds throughout the flower head of its host and pupates within the burrow or in the upper part of the stem. From that of *similiella* the larva differs in having one or two crochets on the anal legs and none on the abdominal legs. The pupa (fig. 3, I, J) differs in having the maxillae considerably shorter than the wing cases, which are equal in length to the metathoracic legs and extend slightly beyond the seventh abdominal segment.

Two generations were noted. Larvae and pupae collected in *Rudbeckia maxima* on July 17, 1922, produced adults from July 26 to August 12, 1922, and larvae taken in the same host in September,

⁷ HEINRICH, C. SOME LEPIDOPTERA LIKELY TO BE CONFUSED WITH THE PINK BOLLWORM. Jour. Agr. Research 20: 807-836, pl. 95, A. 1921.

1923, produced moths the following June. A large series of the second generation was reared during June, 1924, from flower heads of *Rudbeckia hirta* L. nnaeus taken at Liberty in November of the previous year. The winter is passed in the larval stage.

The larvae were found to be parasitized by several Hymenoptera. From those in *Rudbeckia maxima* three specimens of *Aerophilus* n. sp. were reared April 3, April 8, and June 11, 1924, and one specimen of *Cremastus* sp. emerged March 26 of the same year. Sixteen specimens of *Aerophilus* n. sp. (March 31 to June 19), one specimen of *Microbracon* n. sp. (May 13), and two specimens of *Cremastus minor* Cushman (April 30) were obtained during 1924 from the larvae in *R. hirta*.

The species recorded by Braun⁸ as *Isophrictis similiella* Chambers is presumably referable to the present species.

ARISTOTELIA CORALLINA WALSINGHAM

Aristotelia corallina Walsingham, 1909, Biol. Centr.-Amer., Lep.-Het. 4: 23.

Larvae of this species were collected on leaves of *Vachellia farnesiana* (Linnaeus) Wight and Arnot at Lake Charlotte, in September and October, 1923. From this material a series of 12 adults emerged October 4 to October 13, 1923, and January 11 to January 12 of the following year. This is the first record of this Mexican species occurring in the United States.

The larvae construct silken tubes, to which are fastened leaflets of the host plant. The full-grown larva is 8 to 10 mm. long. Body with second and third thoracic segments broadly banded dorsally, with purplish black, pale lavender beneath, intersegmental areas white; first abdominal segment with anterior half white, posterior half purplish black; second to fourth abdominal segments with posterior dorsal third purplish black, anterior dorsal third same color but marked with broad wavy white bands, middle dorsal third pale lavender with similar white markings; bands of first to fourth abdominal segments becoming paler beneath; fifth to tenth abdominal segments beneath pale brownish, more or less mottled with white, dorsally purplish black except for narrow dorsal whitish stripe from anterior margin of sixth abdominal segment to caudal end; a similar broad whitish lateral stripe extending from just before middle of fifth abdominal segment to caudal end; the three whitish bands mottled with pale lavender, becoming pale brown on last segment. Thoracic legs black; abdominal legs slightly elongate, crochets numerous, arranged in a complete circle; anal plate with lateral margins broadly brownish black, middle stripe whitish; anal fork well developed, two-pronged, black.

The pupa is 4 to 4½ mm. long, about 1 mm. wide; dark reddish brown; entirely pubescent; antennae, metathoracic legs, and wing cases reaching nearly to posterior margin of fifth abdominal segment; caudal end with numerous long, hooked spines, and cremaster.

⁸ BRAUN, A. F. NOTES ON MICROLEPIDOPTERA WITH DESCRIPTIONS OF NEW SPECIES. Ent. News 32:8. 1921.

LATHONTOGENUS PALPIGERA WALSINGHAM

- Gelechia palpigera* Walsingham, 1891, Ent. Soc. Lond. Trans., p. 94, pl. 4, fig. 31.
Lathontogenus adustipennis Walsingham, 1897, Zool. Soc. Lond. Proc. 1: 88.
Paraspistes ioloncha Meyrick, 1905, Jour. Bombay Nat. Hist. Soc. 16: 600; 1911, Linn. Soc. Lond., Trans. (2), 14: 274.
Lipatia crotalariella Busck, 1910, Trinidad Dept. Agr. Bul. 9: 243, 244.
Paraspistes palpigera Busck, 1914, U. S. Natl. Mus. Proc. 47: 10, 11.
Lathontogenus palpigera Walsingham, 1915, Biol. Centr.-Amer., Lep.-Het. 4: 409.

A single adult was reared March 9, 1923, from pods of *Vachellia farnesiana* (Linnaeus) Wight and Arnot collected at Kingsville during January, 1923. The species is known from the Tropics, and has not heretofore been recorded from the United States.

RECURVARIA ERYNGIELLA, NEW SPECIES

(Fig. 2, F, G)

***Recurvaria eryngiella*, n. sp.**

Antenna golden ochreous, basal joint white with small black spot above. Labial palpus white with dark fuscous scales on outer side at base; terminal joint with two broad black annulations, one near base and the other near tip. Face and head white. Thorax white with base of patagium and posterior dot black. Forewing white, strongly overlaid on outer two-thirds with golden ochreous scales, especially below the black costal markings; costal edge with small black streak at base, narrowly black to the middle, from which a short, outwardly oblique, black streak runs toward a few black scales on end of cell; at apical third a similar smaller, outwardly oblique, black streak; a few scattered black scales at apex; a black spot below middle of fold, and a smaller black dot near end of dorsum; cilia golden white, with scattered black dots near apex. Hind wing light silvery fuscous; cilia white. Abdomen and a strong hair pencil at base of hind wing golden ochreous. Legs golden ochreous, with broad black bars and annulations, the darker markings less pronounced on the hind legs.

Male genitalia of type figured (fig. 2, F, G).

Alar expanse.—7 to 10 mm.

Type.—Cat. No. 27336, United States National Museum.

Type locality.—Stowell, Chambers County, Tex.

Food plant.—*Eryngium aquaticum* Linnaeus.

Described from male type and 17 male and 34 female paratypes reared July 11 to July 16, 1923, from larvae and pupae collected July 3, 1923.

This species is near *variella* Chambers and *apicitripunctella* Clemens. From the former it differs in having the labial palpi and the legs marked with black. From the latter it is distinct in having the face, head, and thorax white, and in lacking the annulations on the antennae.

As many as 10 larvae were removed from a single flower head in which feeding had taken place. Pupation occurs within the silk-lined channels made by the larvae, the pupal cases remaining in the cavities after emergence of the adults. The full-grown larva is 7 to 8 mm. long; body color white, each segment with a broad, deep pink band on posterior half of dorsal surface, the white of the anterior half of thoracic segments 2 and 3 and abdominal segments 1 to 4 quite distinct, but that of the other abdominal segments becoming narrower and less distinct posteriorly; under surface similarly banded but paler. Head pale yellowish brown; thoracic shield slightly lighter in color, usually with a darker lateral border on each side; chitinizations at base of body setae small, round, yellowish in color; thoracic legs yellowish; crochets of abdominal legs numerous, arranged in a circle broken inwardly; anal plate yellowish brown; anal fork well developed, eight-pronged.

The pupa is about 4 mm. in length and 1 mm. in width; cephalic end bluntly rounded, abdomen gradually tapering posteriorly, caudal end rather pointed, armed with numerous elongate hooked spines, but without cremaster; maxillae more than half the length of wing cases; wing cases, antennae, and metathoracic legs nearly reaching sixth abdominal segment; antennae with tips separated, exposing ends of metathoracic legs.

RECURVARIA ROBINIELLA (FITCH)

Anacamptis robiniella Fitch, 1859, Rept. Nox. Benef. Ins. N. Y. 5: 834-835.
Recurvaria robiniella Busek, 1903, U. S. Natl. Mus. Proc. 25: 812, 813.

Twelve adults were reared March 17 to April 4, 1924, from larvae collected on *Amorpha fruticosa* Linnaeus at Lake Charlotte October 23, 1923. Feeding and pupation of the larva took place between two leaflets, which were webbed together along the edge so that the upper surfaces were on the inside. The species overwinters as pupae.

POLYHYMNO ACACIELLA BUSCK

Polyhymno acaciella Busek, 1900, Jour. N. Y. Ent. Soc. 8: 235-236, pl. 9, fig. 1; Busek, 1903, U. S. Natl. Mus. Proc. 25: 839; Barnes and McDunnough, 1917, Check List Lepidop. Bor. Amer., no. 6179.

One adult was reared October 2, 1923, from leaves of *Vachellia farnesiana* Wight and Arnot collected in September, 1923, at Lake Charlotte.

GELECHIA MONOTAENIELLA, NEW SPECIES

(Fig. 2, A, B, C)

Gelechia monotaeniella, n. sp.

Antenna purplish black, with indistinct white annulations. Labial palpus with second joint whitish, dusted with black scales exteriorly; brush rather short, furrowed, gradually diminishing toward apex of second joint; terminal joint black, with few scattered white scales. Face, head, and thorax heavily overlaid with purplish-black scales. Fore wing dark fuscous, with few scattered black and brown scales; at apical fourth a transverse, irregular, incomplete, whitish fascia, before which are an ill-defined black costal spot and a similar dorsal spot; cilia light fuscous, with edging of black scales at apex. Hind wing silvery fuscous, dark toward apex; cilia light fuscous. Abdomen with basal segments above velvety yellowish, others above fuscous; under surface very dark fuscous. Legs dark fuscous, with tips of tarsi white.

Male genitalia of types figured (fig. 2, A, B, C).

Alar expanse.—12 to 16 mm.

Type.—Cat. No. 27337, United States National Museum.

Type locality.—North shore of Lake Charlotte, Chambers County, Tex.

Food plant.—*Vachellia farnesiana* (Linnaeus) Wight and Arnot.

Described from male type (Nov. 12, 1923) and 2 male and 16 female paratypes reared October 13 to November 12, 1923, and January 29 to March 24, 1924, from larvae collected from September to November, 1923.

This species is very near *serotinella* Busck, from which it is distinguished by the conspicuous whitish fascia on the fore wing, by lacking the narrow, chocolate brown, longitudinal streak below the costal edge of the fore wing (which is prominent in *serotinella*), and by its smaller size.

The larva is a leaf feeder, constructing a white silken tube along the midrib of a leaf or along a small branch and fastening to it leaflets of the host. The full-grown larva is 13 to 15 mm. long. Body pale

greenish white; upper surface with six broad, very irregular, wine-colored stripes, two dorsal, a subdorsal, and a lateral, the subdorsals being slightly widest; ventral surface with three similar but much paler stripes, a narrow ventral and a broad, poorly defined marking on each side just above prolegs. Head pale yellow, posterior half reddish brown, with irregular, elongate, triangular markings of the same color projecting anteriorly; posterior margin narrowly black. Thoracic shield pale yellow, usually indistinctly bordered with black on posterior margin. Thoracic legs and anal plate yellow; abdominal legs normal, with alternating long and short crochets arranged in a complete circle; anal fork absent.

Pupation took place within thin, white, oval cocoons, to the outside of which were fastened particles of frass and leaflets of the host. A few of the specimens passed the winter as pupae, but most of them did not pupate until the first part of February. The colored stripes of the wintering larvae are barely visible.

The pupa is smooth, rather stout, 5 to 6 mm. long, and $1\frac{3}{4}$ to 2 mm. wide at the metathorax or widest part; cephalic end bluntly rounded; abdomen gradually tapering to caudal end, which is also bluntly rounded; maxillae very broad at base, two-thirds as long as wing cases; antennae meeting beyond maxillae but abruptly converging before end of wing cases, exposing ends of metathoracic legs; antennae, metathoracic legs, and wing cases reaching nearly to sixth abdominal segment; ventral posterior margin of seventh abdominal segment scalloped, and fringed with very short hairs; caudal end without cremaster.

A dipteran, *Zenillia blanda* Osten Sacken, emerged March 22, 1924, from a pupa of *Gelechia monotaeniella*. The parasite had pupated within the pupa of its host. A second parasitized pupa was noted, but the dipteran was not reared.

Two specimens of the hymenopteron *Brachymeria hammari* (Crawford) emerged October 8 and October 9, 1923, from two pupae of *Gelechia monotaeniella*. They were undoubtedly secondary parasites of the gelechiid, the primary host in this case being *Zenillia blanda*.

FAMILY BLASTOBASIDAE

ZENODOCHIUM CITRICOLELLA (CHAMBERS)

Blastobasis citricolella Chambers, 1880, U. S. Com. Agr. Rept. 1879: 206-207.
Zenodochium citricolella Dietz, 1910, Amer. Ent. Soc. Trans. 36: 11-12.

Several larvae and pupae of this species were taken in mature capsules of jimson weed (*Datura tatula* Linnaeus) at Smith Point, August 11, 1922. The larvae were webbing together and feeding upon the seeds. The pupae were in thin but strong webs, to the outside of which were fastened particles of frass and seeds. From this material five adults were obtained, the emergence dates ranging from August 17 to September 11, 1922.

HOLCOCERA CONFAMULELLA HEINRICH

Holococera confamulella Heinrich, 1921, Jour. Agr. Research 20: 818-819.

Eight adults were reared during April, 1923, from fruits of *Crataegus* sp. collected at Smith Point October 18 and November 1, 1922.

FAMILY OLETHREUTIDAE

SUBFAMILY LASPEYRESIINAE

LASPEYRESIA PACKARDI (ZELLER)

Grapholitha packardi Zeller, 1875, Verh. Zool.-Bot. Ges. Wien 25: 300.

Steganoptycha pyricolana Murtfeldt, 1891, U. S. Dept. Agr. Bul. 23: 52.

Epinotia pyricolana Fernald, in Dyar, 1902, List N. Amer. Lepidop., no. 5234.

Enarmonia packardi Fernald, in Dyar, 1902, List N. Amer. Lepidop., no. 5282.

Enarmonia pyricolana Garman, 1918, Md. Agr. Expt. Sta. Bul. 223: 105-106, 108-109.

Laspeyresia packardi Barnes and McDunnough, 1917, Check List Lepidop. Bor. Amer., no. 7238.

A single male specimen was obtained April, 1923, from fruits of *Crataegus* collected at Smith Point during October of the preceding year. The above synonymy was furnished by Carl Heinrich.

SUBFAMILY EUCOSMINAE

EUCOSMA GIGANTEANA MINORATA HEINRICH

Eucosma giganteana minorata Heinrich, 1924, Jour. Wash. Acad. Sci. 14: 388.

In each of two flower heads of *Silphium gracile* A. Gray was found a dirty pinkish larva which might easily be mistaken for the pink bollworm. The part of the flower head above the cavity eaten out by the larva had darkened in color, indicating the presence of the insect. The specimens were collected near Liberty, July 17, 1922. Pupation of the one specimen reared took place July 19 in the cavity made during the growth of the larva and within a thin cocoon covered with small pieces of the dead portion of the flower head. The adult emerged July 29, 1922.

A second adult emerged July 5, 1923, from a pupa taken in a typically injured flower head of *Silphium gracile* at Stowell, Chambers County, July 3 of the same year. From material collected in mature and immature flower heads of the same plant at Liberty, July 7, 1923, a third moth was reared nine days later.

These adults furnished the type material for the variety *minorata* Heinrich.

EPIBLEMA TRIPARTITANA (ZELLER)

Paedisca tripartitana Zeller, 1875, Verh. Zool.-Bot. Ges. Wien 25: 308.

Eucosma tripartitana Fernald, in Dyar, 1902, List N. Amer. Lepidop., no. 5141; Barnes and McDunnough, 1917, Check List Lepidop. Bor. Amer., no. 7025.

Epiblema tripartitana Heinrich, 1923, U. S. Natl. Mus. Bul. 123: 146.

This is the olethreutid referred to in Heinrich's paper.⁹ The host plant of this species is *Rudbeckia maxima* Nuttall, commonly called "niggerhead" in eastern Texas. The larvae are quite common in parts of Liberty, Chambers, and Harris Counties. The larva spends the first part of its life in a burrow in the central part of the flower head of the host plant, the cavity extending downward about an inch into the stem. The presence of the larva may often be detected by a slight enlargement of the stem immediately below the flower head.

⁹ HEINRICH, C. SOME LEPIDOPTERA LIKELY TO BE CONFUSED WITH THE PINK BOLLWORM. Jour. Agr. Research 20: 813, illus. 1921.

The taking of a single specimen at light (Liberty, July 23, 1924) and the presence of a very few pupal cases in the flower heads of the hosts during July indicate a possibility of there being two generations. If such is the case, the following notes pertain to the second generation.

When apparently full grown the larva leaves its host through a small hole near the bottom of the cavity in the upper part of the stem and enters the same plant about a half inch above one of the lower leaves, from 6 to 12 inches above the surface of the soil. The leaf is webbed to the stem at the point of entrance of the larva. The conspicuous white chewings which have fallen to the ground at the base of the plant indicate that the larva has recently entered the stem. Upon entering the lower part of the plant the larva constructs a burrow which extends from a point 2 or 3 inches above the entrance hole to the base, where the cavity is slightly enlarged. The entrance hole is then plugged securely.

A few of the larvae had made the change described above before June 23, and by July 15 about half of them had reentered the plant at the base. Larvae were found in the flower heads of the host as late as October 10.

This insect passes the winter in the larval stage at the base of the host plant. At some time during the winter the larva cuts the stem off from the inside at the upper part of its cavity and plugs the upper inch or so with chewings. Just before pupation a hole is chewed nearly through the stem in the uppermost part of the remaining cavity for the emergence of the moth. Pupation takes place in the burrow. A number of pupae were observed to move quite rapidly down the burrow by means of a spiral movement of the abdomen.

The first pupa was taken at Liberty February 23, 1924, and from it the adult emerged March 15, 1924. From plants collected at the above locality on February 23 and 27, 1924, adults emerged March 15 to April 29 of the same year.

The larvae were parasitized by two species of Diptera: *Siphophyto floridensis* Townsend, four specimens of which were reared June 28 to July 3, 1923, and *Tachinophyto* sp., two specimens of which were reared June 29 and July 3, 1923.

The larvae were also parasitized by *Macrocentrus* sp. (Hymenoptera), the brownish cocoons of which were taken in large numbers in the flower heads of the host plant during June and July. Adults were reared June 29 to July 10. From a parasitized larva in the lower part of the stem of the host one specimen of *Bassus* sp. was reared March 29, 1924. The hymenopteron had spun its cocoon within the burrow made by the host.

EPIBLEMA DISCRETIVANA (HEINRICH)

Eucosma discretivana Heinrich, 1921, Jour. Agr. Research 20: 823-824.

Epiblema discretivana Heinrich, 1923, U. S. Natl. Mus. Bul. 123: 138, 147-148.

Larvae of this species were taken in stem galls of "wild myrtle" in August, 1924, with the assistance of A. C. Johnson, who collected and reared the type material of the species. The larvae were collected at Sheldon, Harris County, the type locality. The host plant has been determined as *Baccharis halimifolia* Linnaeus, of the family Carduaceae.

CROCIDOSEMA PLEBEIANA ZELLER

Crocidosema plebeiana Zeller, 1847, Isis von Oken 10: 721-722; Heinrich, 1921, Jour. Agr. Research 20: 822-823.

Larvae of this species were collected in several Malvaceae in addition to those mentioned by Heinrich.¹⁰ From capsules of *Sida* sp. collected at Liberty July 31, 1922, several adults emerged during the first part of the following month. At Lake Charlotte on November 6 larvae were found in large numbers in the seed pods of *Sida spinosa* Linnaeus, *S. rhombifolia* Linnaeus, *Malvastrum americanum* (Linnaeus) Torrey, and *Anoda cristata* (Linnaeus) Schecht. Adults were reared during November, 1923, from larvae collected in mature capsules of *Reidlea corchorifolia* (Linnaeus) De Candolle at Smith Point November 1, 1923. This host plant belongs to the Buettneriaceae, and closely resembles some of the malvaceous plants.

The larvae were found singly in the seed capsules, except in the case of okra, in which several specimens were taken in one pod. In *Sida* and other host plants having small seed pods the larvae were often taken in a tie of the terminal leaves and immature capsules. The larvae pupated where feeding had taken place or within a roll or fold at the edge of a leaf. There are evidently two or more generations a year. Emergence dates ranged from the middle of August to the first part of December.

EPINOTIA PERPLEXANA (FERNALD)

Epiblema perplexana Fernald, 1901, Jour. N. Y. Ent. Soc. 9: 51.

Eucosma perplexana Fernald, in Dyar, 1902, List N. Amer. Lepidop., no. 5130; Barnes and McDunnough, 1917, Check List Lepidop. Bor. Amer., no. 6983.

Epinotia perplexana Heinrich, 1923, U. S. Natl. Mus. Bul. 123: 202-203.

Six adults of this species emerged October 16 to October 30, 1923, from mature pods of a wild cowpea, *Vigna repens* (Linnaeus) Kuntze, collected on the north shore of Galveston Bay at Smith Point October 3, 1923. The larvae fed upon the seeds and pupated within the pods.

SUBFAMILY OLETHREUTINAE

OLETHREUTES MALACHITANA (ZELLER)

Grapholitha malachitana Zeller, 1875, Verh. Zool.-Bot. Ges. Wien 25: 292-293.

Olethreutes malachitana Dyar, 1902, List N. Amer. Lepidop., no. 5044.

A large series of moths was reared during October, 1922, from larvae collected in folded leaves of young persimmon trees (*Diospyros virginiana* Linnaeus), at Lake Charlotte September 22, 1922. One specimen of a parasitic dipteran, *Lixophaga variabilis* Coquillett, was reared September 26 from this material.

¹⁰ HEINRICH, C. SOME LEPIDOPTERA LIKELY TO BE CONFUSED WITH THE PINK BOLLWORM. Jour. Agr. Research 20: 822, illus. 1921.

FAMILY TORTRICIDAE

PLATYNOTA FLAVEDANA CLEMENS

Platynota flavedana Clemens, 1860, Acad. Nat. Sci. Phila. Proc. [12]: 348; Dyar 1902, List N. Amer. Lepidop., no. 5382.

Three adults were obtained during the first season. One moth emerged August 12 from a pupa collected August 7 in loosely tied leaves of an undetermined plant at Liberty. Larvae were found webbing together and feeding upon the yellow ray flowers of *Helianthus* sp. at Smith Point September 14. One of these pupated in the loosely webbed ray flowers September 17, and the adult emerged September 26. A larva of *P. flavedana* was taken with larvae of *P. rostrana* (Walker) and *Sparganothis sulfureana* (Clemens) on *Eupatorium compositifolium* Walter at Smith Point September 14. This specimen pupated September 19, and the adult emerged September 26.

PLATYNOTA LABIOSANA ZELLER

Platynota labiosana Zeller, 1875, Verh. Zool.-Bot. Ges. Wien 25: 237-238; Dyar, 1902, List N. Amer. Lepidop., no. 5385.

Sparganothis labiosana Barnes and McDunnough, 1917, Check List Lepidop. Bor. Amer., no. 7326.

Six adults of this species were reared October 15 to November 5, 1923, from larvae collected in ties in the leaves of *Eupatorium compositifolium* Walter and of okra (*Hibiscus esculentus* Linnaeus) at Smith Point October 3, 1923.

PLATYNOTA ROSTRANA (WALKER)

Teras rostrana Walker, 1863, List Lepidop. Brit. Mus. 28: 290.

Platynota rostrana Dyar, 1902, List N. Amer. Lepidop., no. 5383; Heinrich, 1921, Jour. Agr. Research 20: 821.

The following records were made during 1922: One larva of *Platynota rostrana* was taken in a mature boll of *Hibiscus* sp. at Smith Point August 10, and on August 11 another specimen was taken in a mature seed capsule of *Datura tatula* Linnaeus at the same locality. The latter specimen was associated with the larvae of *Zenedochium citricolella* (Chambers). A full-grown larva was found in a seed of a mature boll of cotton which had been injured by the boll weevil, at Liberty September 8 (G. C. Albrecht, collector). Two moths were reared from larvae taken on *Eupatorium compositifolium* Walter at Smith Point September 14. The work of the larvae was very similar to that of a larva of *Sparganothis sulfureana* (Clemens) which was taken on the same plant. One larva was found feeding upon an injured orange at Lake Charlotte September 20 (E. Sherman, collector). Another specimen was taken in a withered flower of *Malvaviscus drummondii* Torrey and Gray at Smith Point October 19. Three larvae were found on leaves of *Hibiscus lasiocarpus* Cavanilles, two at Liberty September 12, and the third at Lake Charlotte October 27. One larva from each locality was in a rolled leaf the stem of which had been partially eaten through, apparently by the larva of *Gelechia hibiscella* Busck. Pupation dates of the above larvae ranged from August 11 to October 24, and emergence dates of the adults from August 19 to November 5, 1922.

Four adults were obtained during the second season. One moth was reared October 4 from a larva taken in a tie in the terminal leaves of *Amorpha fruticosa* Linnaeus at Lake Charlotte September 24. At the same locality and on the same date several larvae were collected in webbed leaflets of huisache, *Vachellia farnesiana* (Linnaeus) Wight and Arnot. From this material two adults were reared October 29 and November 6. The fourth adult emerged October 15 from a larva taken October 2 in a mature capsule of *Ipomoea speciosa* Walter at Smith Point.

FAMILY PHALONIIDAE

PHALONIA CEPHALANTHANA HEINRICH

Phalonia cephalanthana Heinrich, 1921, Jour. Agr. Research 20: 825-826.

Two adults were reared October 9 and October 11, 1922, from mature flower heads of *Cephalanthus occidentalis* Linnaeus collected in September, 1922, at Lake Charlotte. From material collected one year later at the same locality two moths emerged September 28 and September 29, 1923. Although the adults are from the type locality of the species, they are a lighter brown than the typical specimens.

Larvae of this species were found in the seed heads of the host plant at Uvalde during February, 1923, and at San Angelo in December of the same year, showing a general distribution over the State.

From the Lake Charlotte material the following Hymenoptera were reared: Three specimens of *Eupelmus momphae* Gahan (no date), and one specimen each of *Macrocentrus* sp. (Sept. 29, 1923) and *Apanteles* sp. (Oct. 23, 1923).

