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SOD WEBWORM MOTHS (PYRALIDAE: CRAMBINAE) IN SOUTH DAKOTA

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ABSTRACT. Twenty-seven species of the subfamily Crambinae known as sod webworm moths were collected from South Dakota. A key to species has been included as well as their distribution patterns in South Dakota.

This study began after damage to rangeland in several South Dakota counties in the years 1974 and 1975. Damage was reported from Corson, Dewey, Harding, Haakon, Meade, Perkins, Stanley and Ziebach counties. An effort was made to determine the species of Crambinae present in South Dakota and their distribution. Included are a key for species identification and a list of species with their flight periods and collection sites.

MATERIALS AND METHODS

Black light traps using the General Electric Fluorescent F₁₅ T8 B1 15 watt bulb were set up in Brookings, Jackson, Lawrence, Minnehaha, Pennington and Spink counties. In Minnehaha County collecting was carried out with a General Electric 200 watt soft-glow bulb. Daytime collecting was used in several localities. Material in the South Dakota State University Collection was also utilized. For each species a map is included showing collection localities by county. On the maps the following symbols are used: ● = collected by sweepnet. ○ = collected by light trap.

Key to South Dakota Crambinae

- 1a. R₅ stalked 2
1b. R₅ arising directly from discal cell 22

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2a. Male antennae simple, serrate, lamellate	3
2b. Male antennae pectinate	19
3a. Forewing with discal area silvery white	4
3b. Discal area not silvery white	12
4a. Forewing silvery white, no stripe	5
4b. Forewing with silvery white stripe or stripes	6
5a. Dark scaling in median area, complete row of terminal black spots	<i>Microcrambus elegans</i> Clemens
5b. Dark scaling absent, immaculate silvery white	<i>Crambus perlellus innotatellus</i> (Walker)
6a. Forewing with single silvery stripe	7
6b. Forewing with one silvery stripe in the discal cell, one silvery stripe along costa	11
7a. A white patch beyond discal silvery stripe	8
7b. Without white patch	9
8a. Stripe extends beyond costal inception of subterminal line; forewing apex falcate	<i>Crambus pascuellus floridus</i> Zeller
8b. Stripe not reaching costal inception of subterminal line; apex square	<i>Crambus alboclavellus</i> Zeller
9a. Wing base with stripe and brown area above discal stripe nearly equal in width	<i>Crambus praefectellus</i> Zincken
9b. Wing base with costal brown area reduced to a narrow line	10
10a. Gnathos narrow at base, broadening distally, appearing spoon shaped; subterminal area of wing as dark as median area, usually with four black dashes	<i>Crambus ainslieellus</i> Klots
10b. Gnathos narrow throughout; subterminal area paler than median area, usually with five black dashes	<i>Crambus leachellus</i> Zincken
11a. Terminal line preceded by black dots	<i>Crambus agitatellus</i> Clemens
11b. Terminal line preceded by black dashes	<i>Crambus laqueatellus</i> Clemens
12a. Fringe metallic gold	13
12b. Fringe not metallic gold	16
13a. Terminal line replaced on lower half of wing by dots	<i>Chrysoteuchia topiaria</i> (Zeller)
13b. Terminal row of dots complete	14
14a. White scaling along cubitus	<i>Crambus coloradellus</i> Fernald
14b. White scaling along cubitus absent	15
15a. Front conical	<i>Agriphila vulgivagella</i> (Clemens)
15b. Front flattened	<i>Agriphila ruricolella</i> (Zeller)
16a. Lower half of forewing along inner margin darker than discal area	17

- 16b. Lower half of inner margin of forewing not darker than discal area *Pediasia luteolella* (Clemens)

Three forms are recorded from South Dakota and are separated as follows:

- Forewing light yellow-brown *P. l. luteolella* (Clemens)
 Forewing dark brown *P. l. caliginosella* (Clemens)
 Forewing gray *P. l. zeella* (Fernald)
- 17a. Fringe cut by white opposite veins *Pediasia trisecta* (Walker)
 17b. Fringe ground color, not cut by white opposite veins 18
 18a. Three terminal black dots; inner margin sprinkled with black scales *Pediasia dorsipunctella* (Kearfott)
 18b. Seven terminal black dots *Pediasia mutabilis* (Clemens)
 19a. Male antennae bipectinate *Thaumatopsis pexellus* (Zeller)
 19b. Male antennae unipectinate 20
 20a. A black stripe from base to apex of forewing
 *Thaumatopsis fernaldellus* Kearfott
 20b. Black stripe absent 21
 21a. Cubitus white scaled, wing brown
 *Thaumatopsis pectinifer* Zeller
 21b. Cubitus not set off by white scaling; wing light brown to white *Thaumatopsis repandus* Grote
 22a. Ocelli absent 23
 22b. Ocelli present 24
 23a. Palpi more than three times as long as head; hindwings white
 *Thoepetis forbesellus* (Fernald)
 23b. Palpi less than twice as long as head; hindwings brownish gray *Occidentalia comptulatalis* (Hulst)
 24a. Wings crossed by two yellow stripes
 *Euchromius californicalis* (Packard)
 24b. Wings without two yellow stripes 25
 25a. Forewings with vein 3A present; silvery white with brown lines *Platytes vobisne* Dyar
 25b. Forewings with 3A absent 26
 26a. Vein R₂ arising from discal cell; color silvery white
 *Argyria nivalis* (Drury)
 26b. Vein R₂ stalked with R₃₊₄; color brown with light colored veins *Eoreuma crawfordi* Klots

Subfamily Crambinae

Crambus praefectellus praefectellus Zincken (Figs. 1C-2, 4a & b)

Records. 99 specimens from Brookings, Lawrence, Minnehaha counties.

Flight period. Bivoltine with peaks in June and August, extreme dates 2 May to 18 September.

Remarks. Klots (pers. comm.) calls this subspecies an eastern and Rocky Mountain form. He stated that the Rocky Mt. race is larger and brighter. He called attention to the wide brown costal border from base of the forewing.

Crambus leachellus Zincken
(Figs. 1A-6, 4g & h)

Records. 56 specimens from Brookings, Minnehaha, Spink counties.

Flight period. Peaked late in September, extreme dates 31 August to October.

Remarks. Klots (pers. comm.) stated that this species is almost continent-wide; often very common to abundant. He states it is of some economic importance in lawns. More or less continually on wing over a long period of time. Klots considers the color and pattern usually indistinguishable from *C. ainslieellus* but genitalia very distinctive. We have found the gnathos to be a distinguishing character in separating *C. leachellus* from *C. ainslieellus* in South Dakota material.

Crambus ainslieellus Klots
(Figs. 2A, 4c & d)

Records. 135 specimens from Brookings, Custer, Dewey, Haakon, Harding, Jackson, Lawrence, Meade, Minnehaha, Spink, Ziebach counties.

Flight period. Most records in mid-September, extreme dates 30 August to 24 September.

Remarks. Klots (pers. comm.) considers *C. ainslieellus* like *C. leachellus* to be almost continent-wide in distribution. He states that *C. ainslieellus* is rare or uncommon. However, we have found it to be the more common species in the western section of South Dakota.

Crambus laqueatellus Clemens
(Figs. 1A-5, 4i & j)

Records. 3 specimens from Brookings, Minnehaha counties. Dates of capture were 31 June and 3 August.

Remarks. Klots (pers. comm.) regards *C. laqueatellus* as fundamentally an eastern species. He states that it is often the first *Crambus* to fly in late spring. *C. laqueatellus* was only found in the eastern portion of South Dakota and only 3 specimens were collected. It is normally associated with lawn grasses and wet meadows.

Crambus perlellus innotatellus Walker
(Figs. 2B, 7c)

Records. 20 specimens from Brookings, Jackson, Lawrence, Meade, Minnehaha, Pennington, Shannon counties.

Flight period. Most records in early August, extreme dates 19 July to 11 September.

Crambus agitatellus Clemens
(Figs. 1A-2, 5f)

Records. 2 specimens from Minnehaha County dated 16, 21 June.

Remarks. Klots (pers. comm.) said *C. agitatellus* is the conventional name now used in literature, but this will be corrected when he publishes his work dealing with the Crambinae.

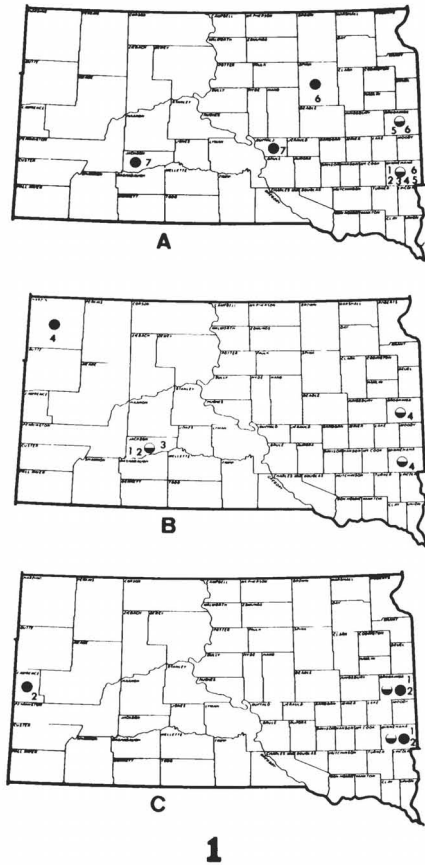


FIG. 1. Distribution data for: A) 1—*Crambus alboclavellus*, 2—*Crambus agitatellus*, 3—*Crambus pascuellus floridus*, 4—*Microcrambus elegans*, 5—*Crambus laqueatellus*, 6—*Crambus leachellus*, 7—*Crambus coloradellus*. B) 1—*Thaumatoopsis pectinifer*, 2—*Thaumatoopsis repandus*, 3—*Occidentalia comptulatalis*, 4—*Thopetuis forbesellus*. C) 1—*Argyria nivalis*, 2—*Crambus praeffectellus*.

Crambus alboclavellus Zeller
(Figs. 1A-1, 4e & f)

Records. A single specimen collected from Minnehaha County dated 15 July.

Remarks. Klots (pers. comm.) regards this species as often abundant in East, rarer westward. He said *C. alboclavellus* Zeller is the conventional name for this species; however, it is incorrect. He regards *C. alboclavellus* as difficult to distinguish from *C. agitatellus*, but genitalia are distinctive. We have only studied 3 specimens of *C. alboclavellus* and *C. agitatellus*; therefore our use of the presence or absence of a white patch beyond the single stripe on the forewing may not be a reliable character; genitalia were distinctive for the South Dakota material.

Crambus pascuellus floridus Zeller
(Figs. 1A-3, 5a)

Records. 4 specimens from Minnehaha County.

Flight period. Specimens collected on 2 July and 7 August.

Remarks. Klots (pers. comm.) said this species exists in the northern $\frac{2}{3}$ of continent. He states that the nominate subspecies is Palearctic and that *C. pascuellus floridus* is definitely a northern species, but found in the mountains of southern areas.

Microcrambus elegans (Clemens)
(Figs. 1A-4, 7g)

Records. 48 specimens from Minnehaha County.

Flight period. Most records in mid-July, extreme dates 28 June to 10 September.

Crambus coloradellus Fernald
(Fig. 1A-7)

Records. 2 specimens from Buffalo and Jackson counties dated 7 August.

Remarks. Klots (pers. comm.) stated that *coloradellus* is not congeneric with other members of the genus *Crambus* and that he is in the process of erecting a new combination for this species. However, for the purpose of this paper it will be treated as a member of the genus *Crambus*.

Chrysoteuchia topiaria (Zeller)
(Figs. 2C, 4k & l)

Records. 329 specimens were collected from Brookings, Jackson, Lawrence, Minnehaha, Pennington counties.

Flight period. Most records for South Dakota are in mid-July, extreme dates 2 May to 25 August.

Remarks. Klots (pers. comm.) states that this species has, until recently, been regarded as a North American race of the European "*Crambus*" *hortuellus* (Huebner) and is still so treated in the literature. It has been recorded as a pest on cranberry; however, it occurs widely where there is no cranberry, often it is abundant in grasslands. According to Klots there may be two "sibling" species, or "food plant" species. The species is northern but exists continent-wide.

Agriphila vulgivagella (Clemens)
(Figs. 2D, 5g & h)

Records. 121 specimens from Brookings, Dewey, Codington, Harding, Jackson, Lawrence, Meade, Minnehaha, Spink counties.

Flight period. Peak in early September, extreme dates 19 July to 18 September.

Remarks. In the literature this species is recorded as *Crambus vulgivagellus* the well known pest called "Vagabond Crambus." It is most often confused with *A. ruricorella* here in South Dakota.

Agriphila ruricorella (Zeller)
(Figs. 2E, 5e)

Records. 188 specimens from Clay, Dewey, Hamlin, Harding, Jackson, Lawrence, Meade, Minnehaha, Pennington, Shannon, Spink counties.

Flight periods. Most records in August, extreme dates 11 July to 23 September.

Remarks. *A. ruricorella* is a smaller form than *A. vulgivagella* and often has some

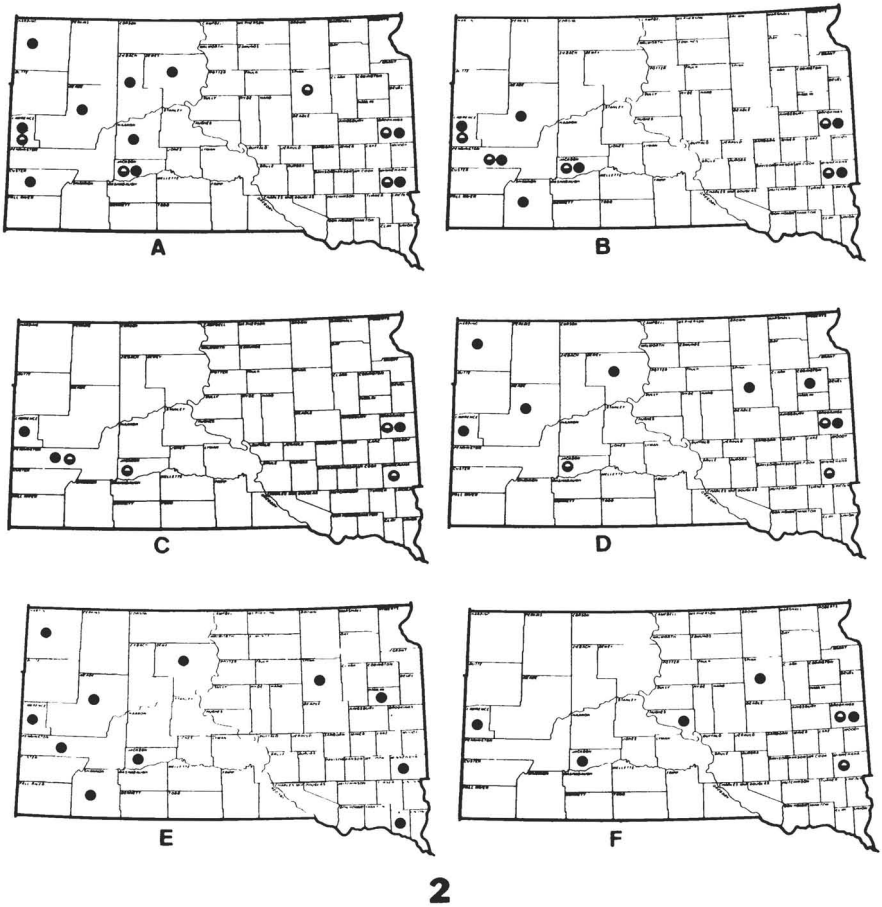


FIG. 2. Distribution data for: A—*Crambus ainslieellus*, B—*Crambus perllellus innotatellus*, C—*Chrysoteuchia topiaria*, D—*Agriphila vulgivagella*, E—*Agriphila ruricorella*, F—*Pediasia luteolella*.

transverse markings on the forewings. The most distinguishing character of *A. ruricorella* is the flattened front. In *A. vulgivagella* the front is produced and conical.

Pediasia luteolella (Clemens)

(Figs. 2F, 5b, c, d, i)

Records. 47 specimens from Brookings, Hughes, Jackson, Lawrence, Minnehaha, Spink counties.

Flight period. Most records in July, extreme dates 11 June to 31 August.

Remarks. Klots (pers. comm.) states regarding two specimens sent to him "The specimens are not typical, but in this mess they are seldom so." He referred to the specimens as a continent-wide species complex, or superspecies, that includes *P. l. zeella* Fernald

and *P. l. caliginosella* (Clemens). Color ranges from almost unmarked yellow to dark sooty brown, sometimes with contrasting marks, sometimes almost unmarked. Klots regards some of this group to be of economic importance. Some will damage sprouting corn. He expects to be putting this group in a new genus. In this paper we have treated *zeella* (Fig. 5c), and *caliginosella* (Fig. 5b), as subspecies and devised a key utilizing color to separate *P. l. luteolella*, *P. l. caliginosella* and *P. l. zeella*; this has worked well for our South Dakota material but may not hold up regarding other regions.

Pediasia trisecta (Walker)

(Figs. 3A, 7e & f)

Records. 3597 specimens from Brookings, Buffalo, Clay, Dewey, Codington, Fall River, Harding, Hyde, Jackson, Jones, Lawrence, Meade, Minnehaha, Pennington, Spink, Stanley, Todd counties.

Flight period. Bivoltine possibly trivoltine with peaks in July and September, extreme dates 7 May to 13 October.

Remarks. This species, until recently, has been known in the literature as *Crambus trisectus*. This is a very common webworm associated with lawns throughout South Dakota. It is very abundant during peak periods and can cause economic damage to grass lawns. According to Klots (pers. comm.) this species has white veins; often has reduced or short white streaks at the margin or in fringe area. A couple of very close species with sexual dimorphism exist. Also there is much variation between the 2-3 generations. This species is a continuous flyer. Klots warns that specimens with no traces of the white streaks should be carefully examined. They may be *Pediasia laciniella* (Grote).

Pediasia dorsipunctella (Kearfott)

(Figs. 3B, 6e & f)

Records. 191 specimens from Brookings, Jackson, Lawrence, Pennington, Spink counties.

Flight period. Most records in mid-August, extreme dates 19 July to 18 September.

Remarks. This species is smaller than *P. trisecta*, there are no white streaks in fringe of forewing. The male genitalia will separate *P. dorsipunctella* from *P. trisecta* in that the gnathos lack the terminal hook. To separate females the terminal fringe of forewing cut with white streaks is the important distinguishing character.

Pediasia mutabilis (Clemens)

(Figs. 3C, 6g & h)

Records. 58 specimens from Brookings, Brown, Duel, Lawrence, Minnehaha, Spink counties.

Flight period. Bivoltine with peaks by early July and early September, extreme dates 10 June to 18 September.

Remarks. This species is known as *Crambus mutabilis* Clemens in the literature. Klots (pers. comm.) intends to put this species in a different genus. This species belongs to the genus *Pediasia* and is so treated in this paper. Bleszynski (1959) cites this species as *Pediasia mutabilis*.

Thaumatopsis pexellus (Zeller)

(Figs. 3D, 6a & b)

Records. 1628 specimens from Brookings, Clay, Codington, Dewey, Harding, Jackson, Lawrence, Minnehaha, Spink counties.

Flight period. Most recorded in early to mid-September, extreme dates 16 July to 1 October.

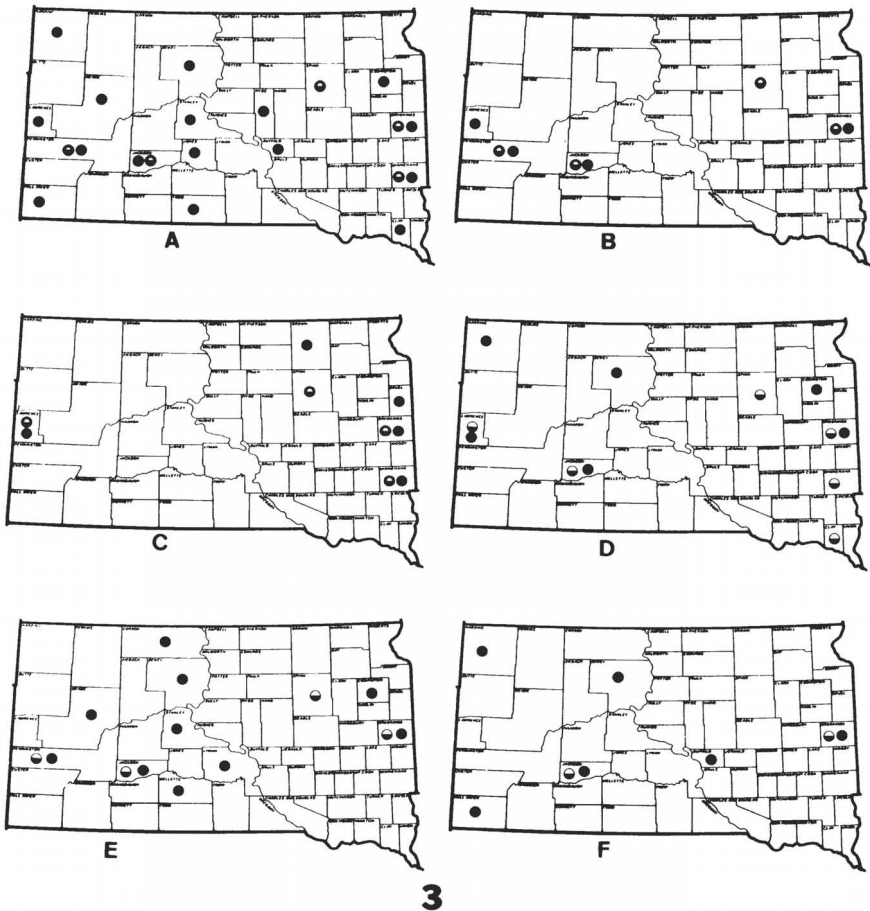


FIG. 3. Distribution data for: A—*Pediasia trisecta*, B—*Pediasia dorsipunctella*, C—*Pediasia mutabilis*, D—*Thaumatoopsis pexellus*, E—*Thaumatoopsis fernaldellus*, F—*Euschromius californicalis*.

Remarks. Klots (pers. comm.) regards *T. pexellus* as very baffling in its local and individual variations. Males are needed for positive identification. The bipectinate antennae of the male separates it from all other South Dakota species. Females have filiform antennae and are indistinguishable from *T. fernaldellus* unless collected with males because of individual variations.

Thaumatoopsis fernaldellus Kearfott
(Figs. 3E, 6c & d, 7h & i)

Records. 967 specimens from Brookings, Codington, Corson, Dewey, Jackson, Lyman, Meade, Mellette, Pennington, Spink, Stanley counties.

Flight period. Bivoltine with peaks in early June and early August, extreme dates 28 May to 20 September.

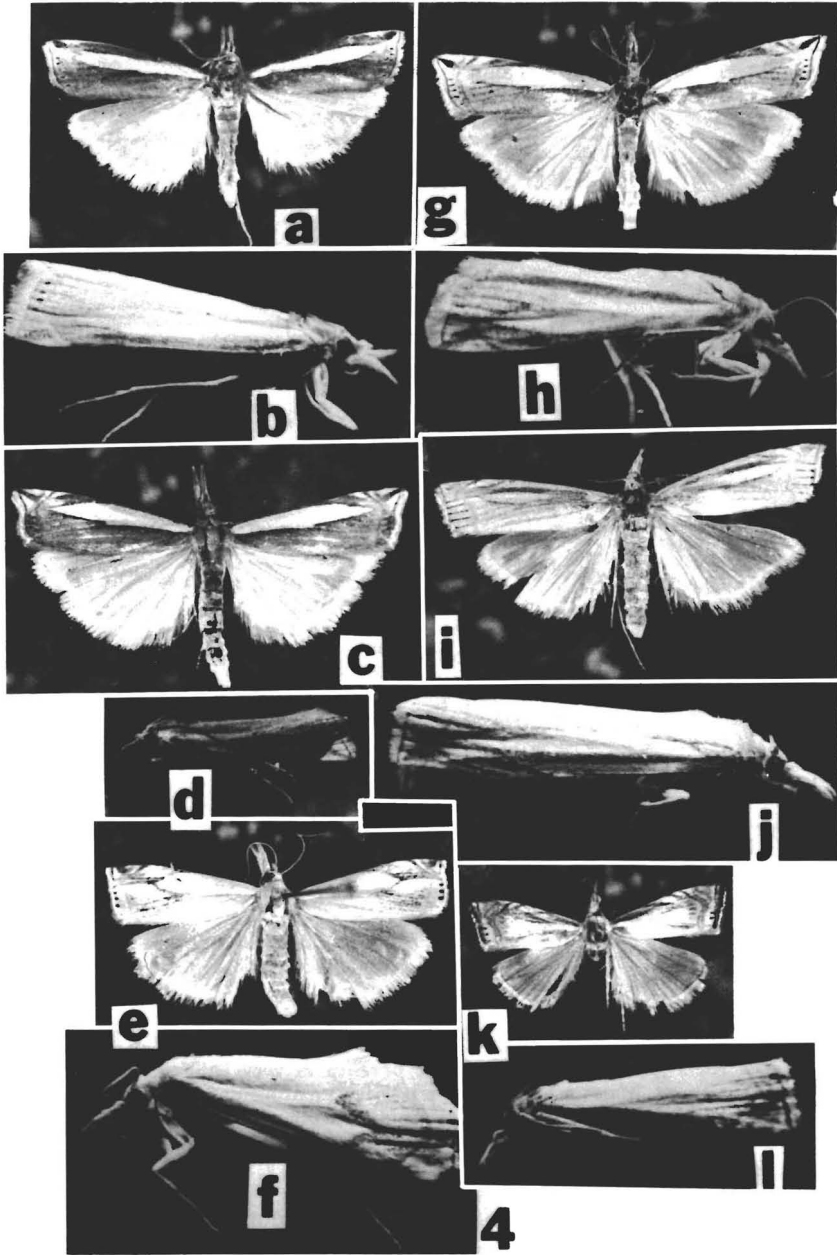


FIG. 4. a & b—*Crambus praefectellus*, c & d—*Crambus ainslieellus*, e & f—*Crambus alboclavellus*, g & h—*Crambus leachellus*, i & j—*Crambus laqueatellus*, k & l—*Chrysoteuchia topiaria*.

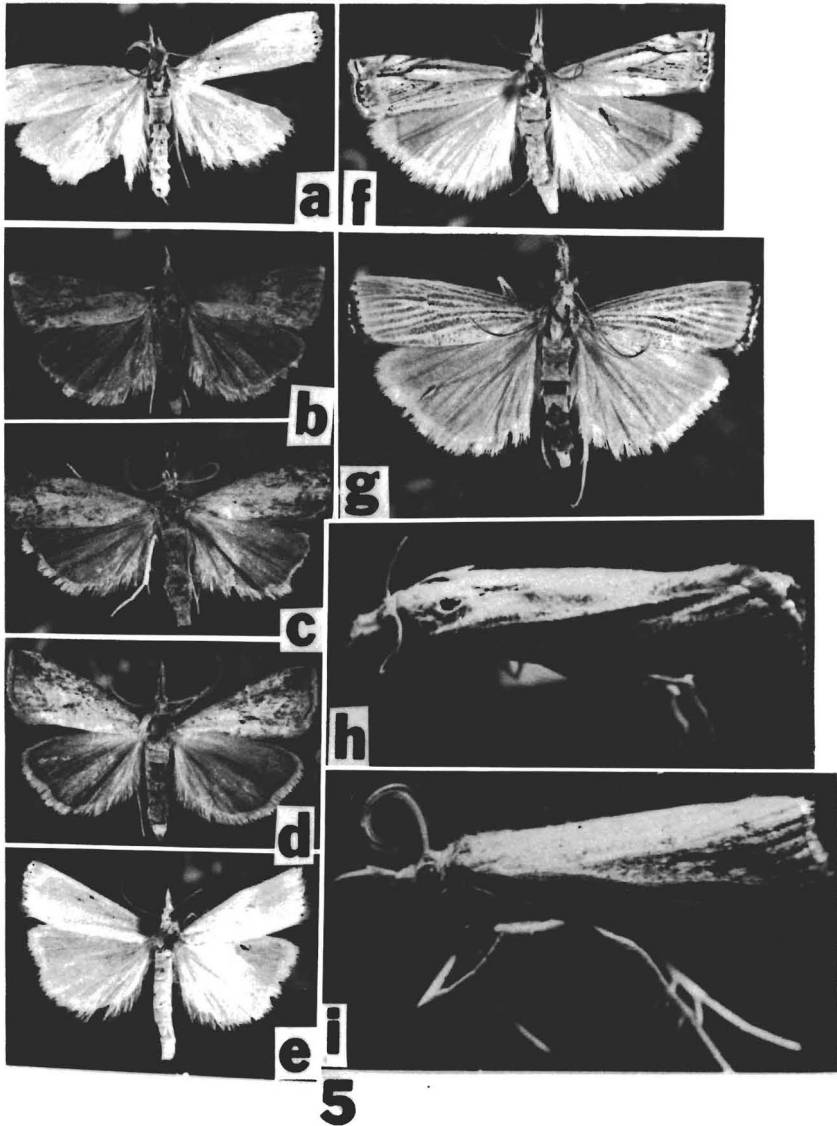


FIG. 5. a—*Crambus pascuella floridus*, b—*Pediasia luteolella* form *caliginosella*, c—*P. l.* form *zeella*, d—*P. l. luteolella*, e—*Agriphila ruricolella*, f—*Crambus agitatus*, g & h—*Agriphila vulgivagella*, i—*Pediasia luteolella*.

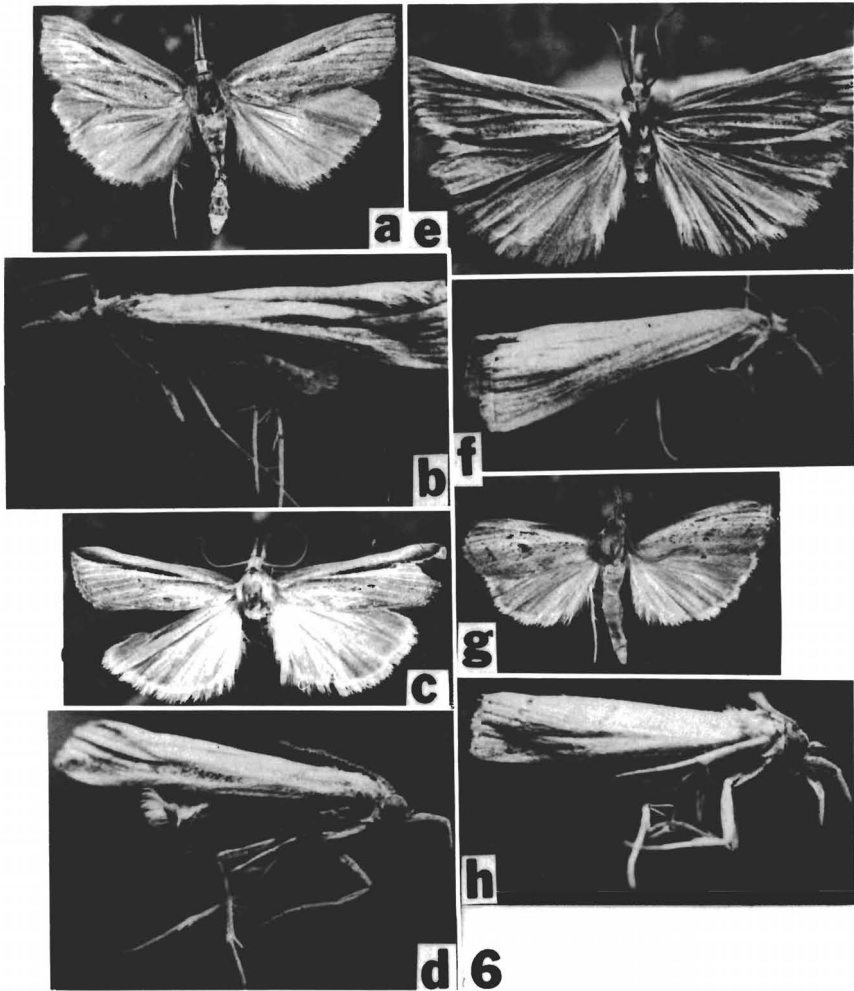


FIG. 6. a & b—*Thaumatopsis pexellus*, c & d—*Thaumatopsis fernaldellus*, e & f—*Pediasia dorsipunctella*, g & h—*Pediasia mutabilis*.

Remarks. The identification of all but 63 specimens recorded in this work could be questioned; however, all material was compared with the 63 specimens identified by Dr. Klots as *T. fernaldellus*. The character used in the key (dark stripe from base to apex of forewing) is often rubbed off or is hard to see on "worn" or light trap collected specimens. Work needs to be done on the genitalia within this genus.

Thaumatopsis pectinifer Zeller
(Fig. 1B-1)

Records. 2 specimens from Jackson County dated 25 August.

Remarks. The presence of the white scaled cubitus vein is the reason for these 2 specimens being identified as *T. pectinifer*.

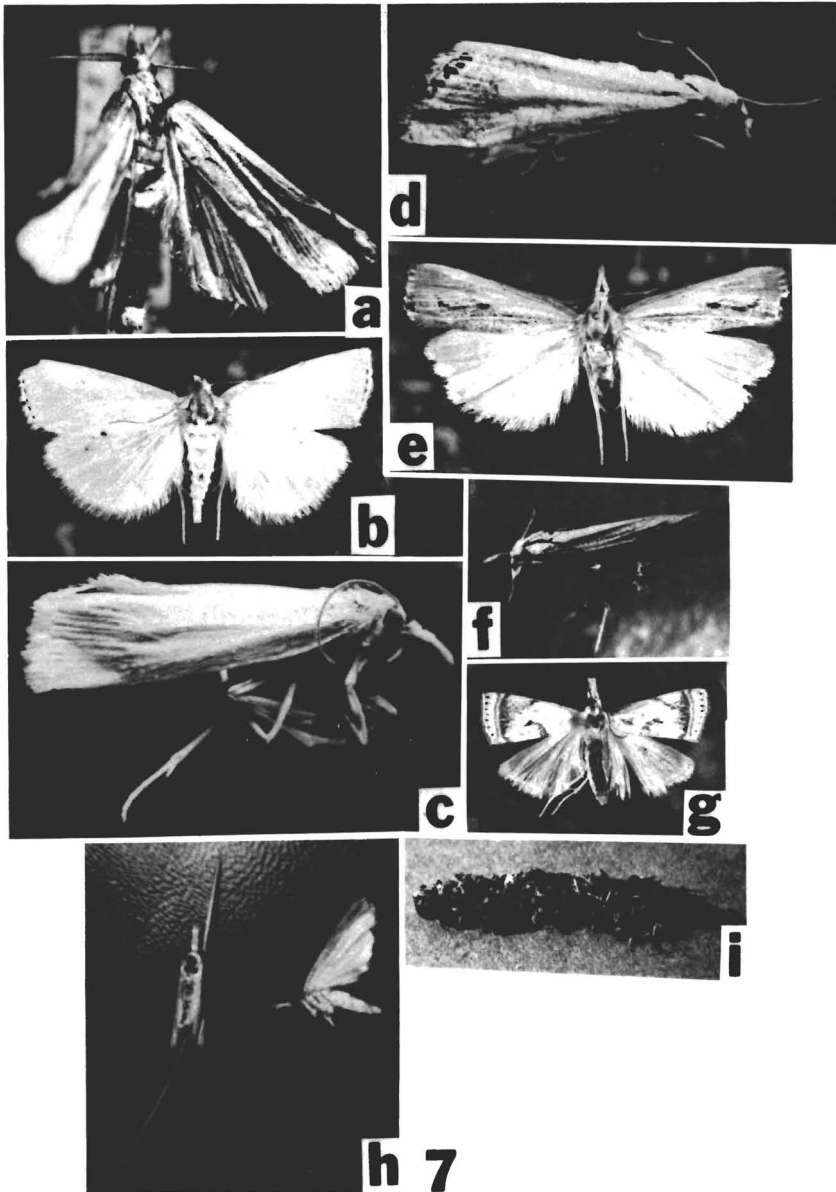


FIG. 7. a—*Thamatopsis repandus*, b—*Argyria nivalis*, c—*Crambus perlellus innotatellus*, d—*Euchromius californicalis*, e & f—*Pediasia trisecta*, g—*Microcrambus elegans*, h & i—*Thaumatopsis fernaldellus* male, female, larval case.

Thaumatopsis repandus Grote
(Figs. 1B-2, 7a)

Records. 7 specimens from Jackson County.

Flight period. Most recorded as being collected in late August, extreme dates 7 August to 8 September.

Remarks. Klots (pers. comm.) says the *T. repandus* material from South Dakota is a very good record. This western species represents an intrusive element in the population. This species is somewhat dimorphic in that the males have long or short pectinations of the antennae. Klots states the distribution for *T. repandus* as Rocky Mountain states westward.

Thoepetis forbesellus (Fernald)
(Fig. 1B-4)

Records. 6 specimens from Brookings, Harding, Minnehaha counties dated 12 July and 13 August.

Occidentalia comptulatalis (Hulst)
(Fig. 1B-3)

Records. 2 specimens from Jackson County dated 28 July.

Euchromius californicalis (Packard)
(Figs. 3F, 7d)

Records. 602 specimens from Brookings, Buffalo, Dewey, Fall River, Harding, Jackson counties.

Flight period. Peaks in mid-July, extreme dates 15 May to 2 October.

Remarks. This is the only species of this genus we have collected from South Dakota; however, the females of this species and *Euchromius ocellus* are difficult to separate. All males studied belong to *E. californicalis*. The genitalia are the distinguishing structure between these two species. *E. ocellus* has been recorded from North Dakota and can be found in South Dakota.

Platytes vobisne Dyar

Remarks. This species has been cited by Forbes in the literature as occurring in South Dakota.

Argyria nivalis (Drury)
(Figs. 1C-1, 7b)

Records. 41 specimens from Brookings, Minnehaha counties.

Flight period. Peaks in early July, extreme dates 18 June to 31 July.

Eoreuma crawfordi Klots

Remarks. Klots (pers. comm.) stated "One specimen, which I have returned, is very unusual and to be cherished. It is almost certainly *E. crawfordi* which I named in 1970 from Ames, Iowa, and Manitoba, Canada. But the abdomen is missing, so the determination is not certain (it must, then be a new species if not *crawfordi*)." No additional material of this species has been collected to date.

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