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Insects of Aspen Catkins in the Canadian Prairies

by H.R. Wong and J.C.E. Melvin



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IN THE CANADIAN PRAIRIES

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ABSTRACT

A total of 45 species of insects and 2 species of spiders representing 20 families and 7 orders were collected from aspen catkins in the Canadian Prairies. Most insects were obtained from female catkins. Twenty-one of the species found on aspen catkins were present on willow catkins. Limited collections on poplar cultivars disclosed only two insect species. Biological observations were made on the three most common species: Epinotia nisella Clerk, Anathix puta (Grote and Robinson) and Dorytomus spp. The parasites recovered from the larvae of E. nisella are listed.

RESUME

Les auteurs récoltèrent sur des chatons de Tremble (Populus tremuloides) dans les Prairies canadiennes 45 espèces d'insectes et 2 espèces d'araignées, représentant 20 familles et 7 ordres. La plupart furent récoltés sur les chatons femelles. Vingt et une des espèces étaient aussi présentes sur les chatons de Saules. Des récoltes peu nombreuses sur des cultivars de Peupliers permirent de rapporter seulement deux espèces d'insectes. Des observations biologiques furent effectuées sur les trois espèces les plus communes: Epinotia nisella Clerk, Anathix puta (Grote et Robinson) et un Dorytomus. Les auteurs énumèrent les parasites trouvés sur les larves d'E. nisella.

INTRODUCTION

Aspens are attacked by a wide variety of insects. The important defoliators, borers and sucking insects in North America have been recorded by Davidson and Prentice (1968) and Batzer (1972). Other insects reported as damaging to aspen in Canada and not noted by the above authors were the leaf miner, *Stigmalla (Nepticula) turbidella* H.S. by Cochaux (1969) and a scale, *Aspidiotus (Hemiberlesia) popularum* Marlatt by Wilkinson (1964). Some insects and mites causing galls and abnormal growths on this host have been noted by Wong *et al.* (1970). A key to common lepidopterous larvae feeding on aspen is presented by Lindquist and Miller (1969).

This report deals with insects associated with male and female catkins of aspen, and their occurrence on some hybrid poplars and willows in the Canadian Prairies. Brief life histories are presented for the three most common species on aspen.

METHODS

Weekly collections of catkins were made from early April to late July by N. R. Brandt and B. B. McLeod around Winnipeg, Manitoba in 1968 and 1969, by J. C. E. Melvin and H. R. Wong around Edmonton, Alberta in 1971 and 1972, and by the Forest Insect and Disease Technicians throughout Manitoba and Saskatchewan in 1969. The transfer of the personnel of the Winnipeg laboratory to Edmonton in 1970 precluded any collections in that year.

A total of 413 collections containing over 12,000 catkins was made. These comprised 246 collections from aspen, 157 from willow and

20 from hybrid poplars. The female (Fig. 1) and male (Fig. 2) catkins from each sample were placed in separate containers with soil in the laboratory at 70°F and 55% relative humidity. The life histories of three common species are noted and all adults reared were sent to specialists for determination.

BIOLOGICAL OBSERVATIONS

A total of 45 species of insects and 2 species of spiders representing 20 families, 7 orders and 2 classes were obtained from male and female catkins of aspen (Table 1). Most of these were from female catkins. Six species were obtained from male catkins. The small sample of catkins from four hybrid poplars in Saskatchewan in early May yielded a dark-winged fungus gnat, *Bradysia* sp. on Dunlop, Northwest, Saskatchewan and Wheeler cultivars, and a weevil, *Dorytomus* spp. on only the first two cultivars and trembling aspen. The latest guidelines were used to identify these cultivars (Roller *et al*, 1972).

Davidson and Prentice (1968) indicated that at least 300 insect species feed on aspen. Many also feed on willow (McGugan, 1958; Prentice 1962, 1963, 1965). Collections from willow catkins disclosed 52 species of insects as compared to 45 species on aspen catkins with 21 of these species found on both hosts (Table 2).

The most abundant species collected on aspen catkins were *Epinotia nisella* Clerk, *Anathix puta* (Grote and Robinson) and *Dorytomus* spp. Although *Anthocoris* spp. were frequently collected, they are predators of small insects and insect eggs and do not feed on the catkins.

EPINOTIA NISELLA CLERK

This species with variable markings is distributed from Newfoundland to British Columbia (Prentice 1965) and was recorded on catkins of poplar, alder, birch, and other hosts, by Forbes (1923). The adults (Figs. 3, 4) described by Forbes (1923) and Heinrich (1923) were observed from mid-June to early July in the study period. Eggs are laid singly on new buds of poplar and willow. They pass the winter in this stage and emerge in the spring. The larvae feed within the buds and then on the capsules (Figure 7) of various catkins (Figure 8) before consuming the developing leaves. Larvae become full grown (Figure 5) generally in June and drop to the ground to pupate (Figure 6). The late-instar larvae of *E. nisella* have been described and illustrated by MacKay (1959).

The following parasites have been recovered from larvae of *E. nisella*:

Hymenoptera

Braconidae

Apanteles n. sp.
Ascogaster sp.
Brachistes sp.
Clinocentrus n. sp.
Braconid sp.

Chalcididae

Chalcid sp.

Encyrtidae

Copidosoma poss. n. sp.

Ichneumonidae

Bathyplectes sp.
Carria dreisbachi montana Townes and Townes
Diadegma sp. 1
Diadegma sp. 2
Diadegma sp.
Scambus atrocoxalis (Ashm.)
Scambus nr. *atrocoxalis* (Ashm.)
Tersilochinae sp.

Pteromalidae

Habrobracon gelechiae (Ashm.)
Sphegigaster sp.
Trichomalus poss. n. sp. A
Trichomalus poss. n. sp. B

Diptera

Tachinidae

Psaliptoeryx macdunnoughi Brooks

ANATHIX PUTA (GROTE AND ROBINSON)

In describing the adults of *Anathix puta* (Grote and Robinson), Forbes (1954) noted that it was distributed from Quebec to British Columbia in Canada. The adults (Figure 9) emerge from mid-June to August. Smirnoff (1969) indicated that the fecundity of the female varies from 60 to 80 eggs, which are deposited at the axil of a bud. The winter is passed in the egg stage. Hatching takes place in the spring with the opening of the male flowers of aspen (Smirnoff 1969). The larvae (Figure 10) described by Crumb (1956) feed within the bud or capsules of the catkins, and on pollen and developing leaves. Pupation occurs in earthen cells (Figure 11, 12) in June and July. No parasites were recovered from larvae of *A. puta* at the present time, but Smirnoff (1967) reported that some larvae were affected by the protozoan disease, *Nosema* sp.

DORYTOMUS SPP.

Weevils of this genus have been revised by O'Brien (1970). The three species reared from catkins of aspen were: *laticollis* Leconte, *luridus* Mannerheim and *marginatus* Casey. The life histories of the above species are apparently similar. Adults (Figure 13) emerge from May to July. The female deposits one or more eggs in an oviposition scar generally near the base of a catkin bud, after which the scar is sealed with a black tar-like substance. The overwintering eggs hatch in early April when the bud scales of the catkins start to burst. The larvae (Figure 15) bore into and consume the interior of the bud, stalk and main stem of the catkins. Since no pupae were

observed in the catkins, pupation (Figure 14), which lasts about one month, apparently occurs in the ground. No parasites of *Dorytomus* spp. were recovered in this study.

ACKNOWLEDGEMENTS

We greatly appreciate the assistance of N. B. Brandt and B. B. McLeod, who initiated the study; the Forest Research Technicians for collection of catkins in Manitoba and Saskatchewan; and P. S. Debnam for the photographs. Thanks are extended to Dr. Bruce Heming, Dept. of Entomology, University of Alberta, Edmonton, and officers of the Biosystematics Research Institute, Ottawa for identifying the insects in this study.

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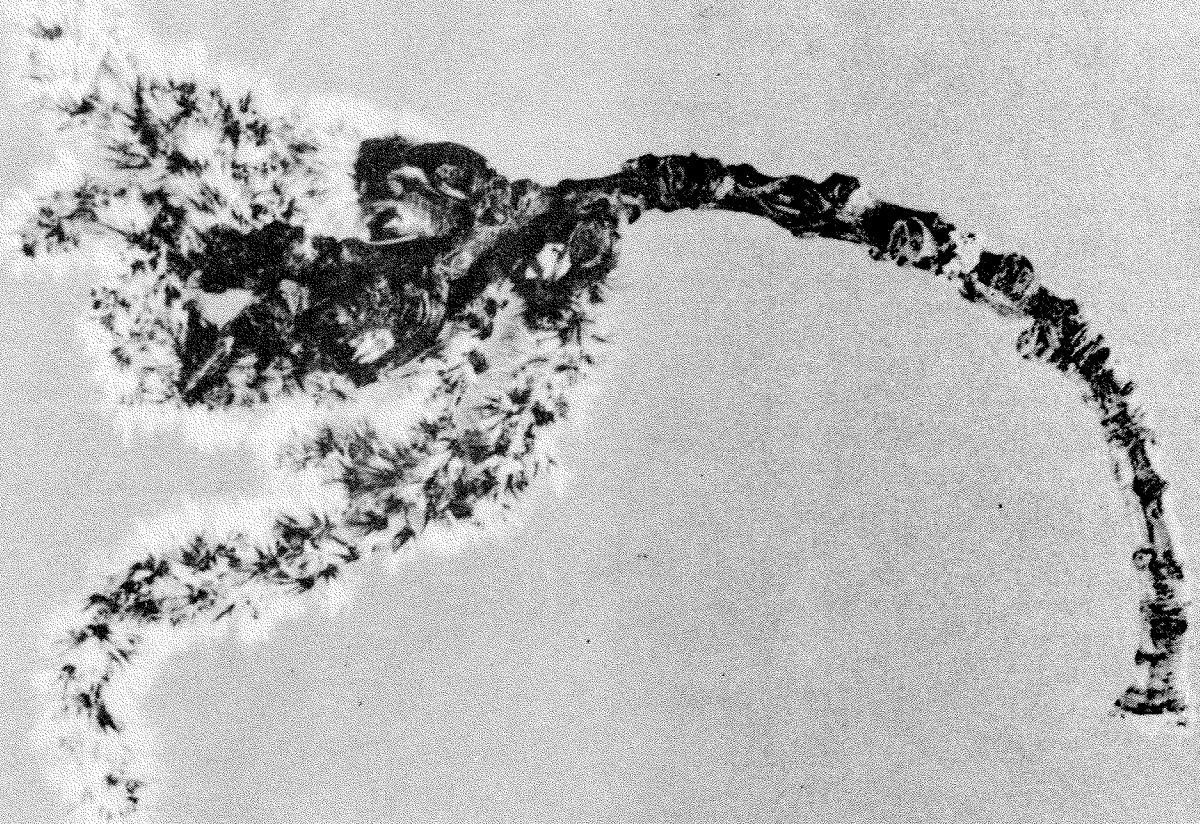
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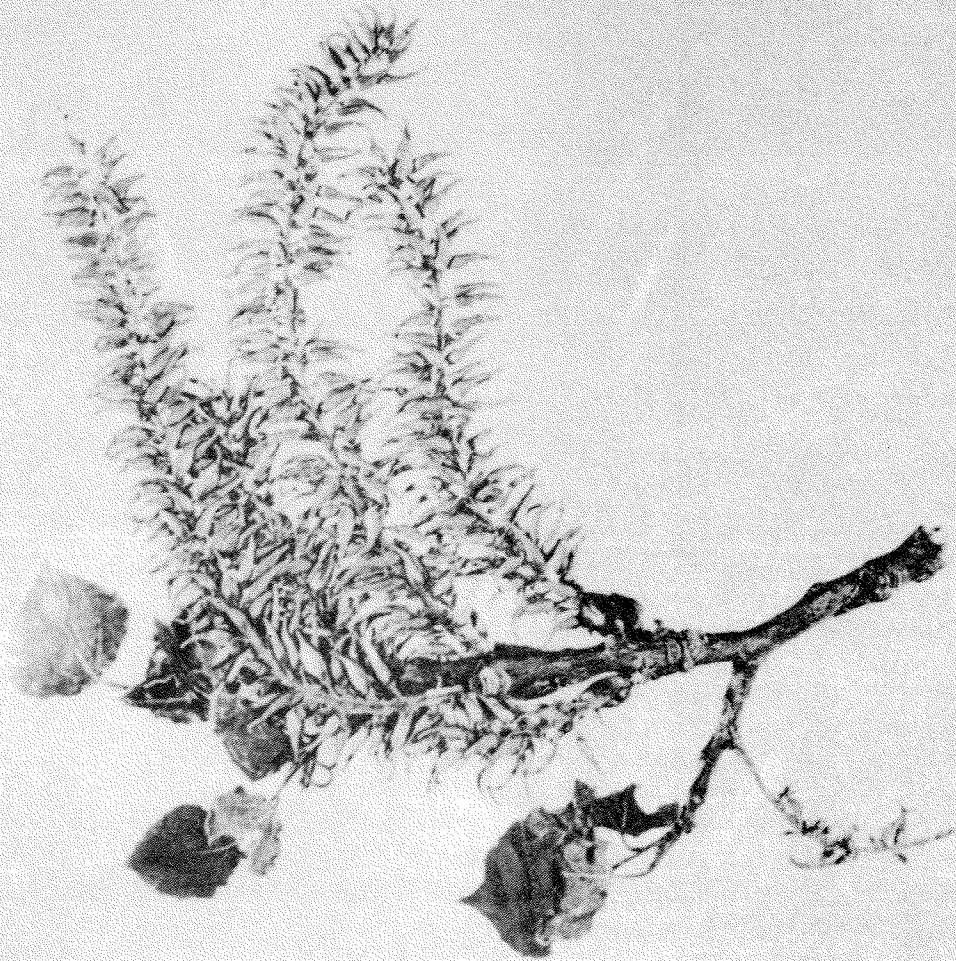
CATKINS OF TREMBLING ASPEN

Fig. 1, female

Fig. 2, male



2



1

EPINOTIA NISELLA CLERK

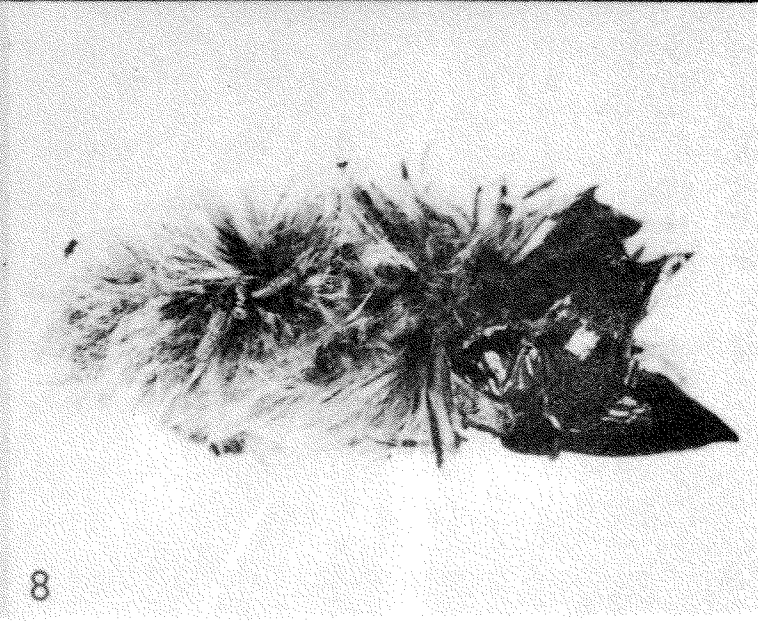
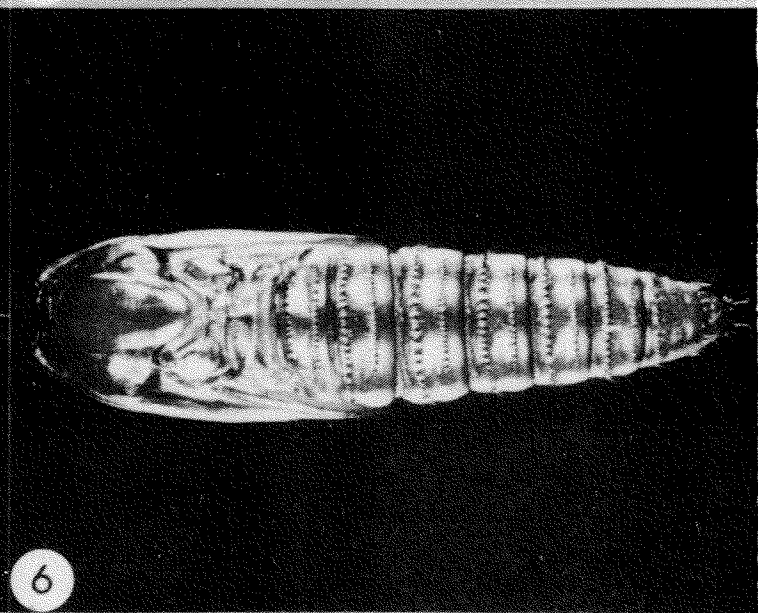
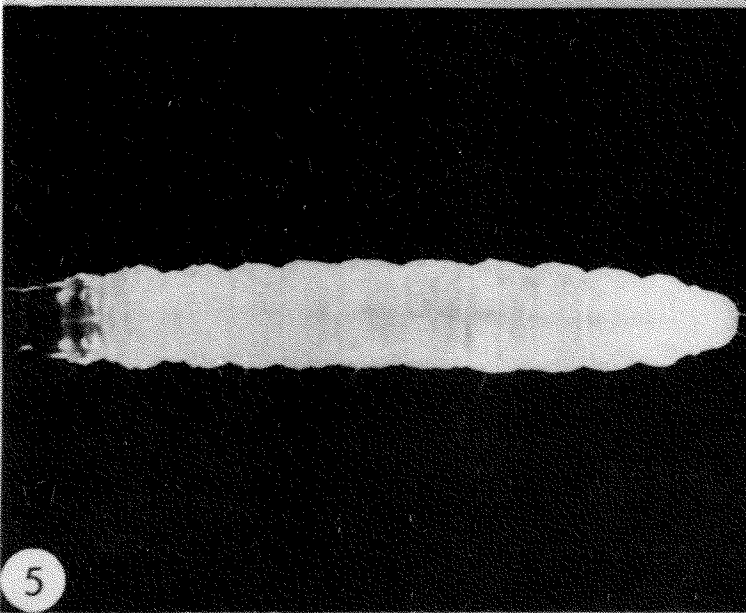
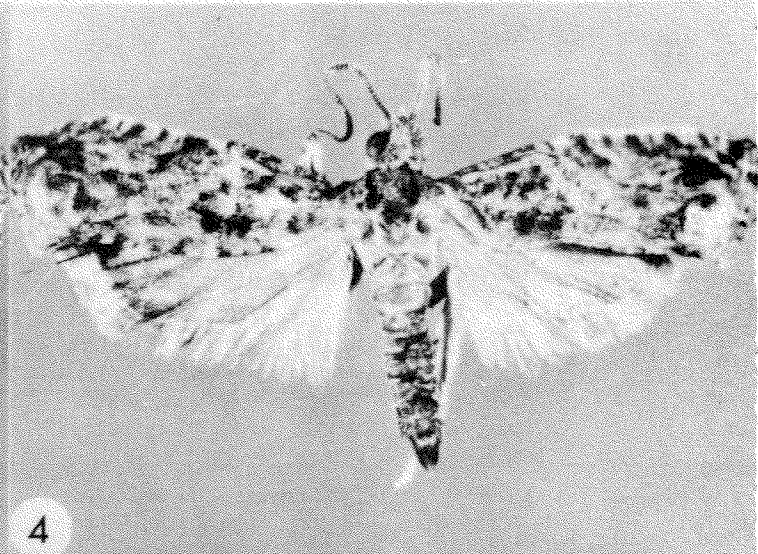
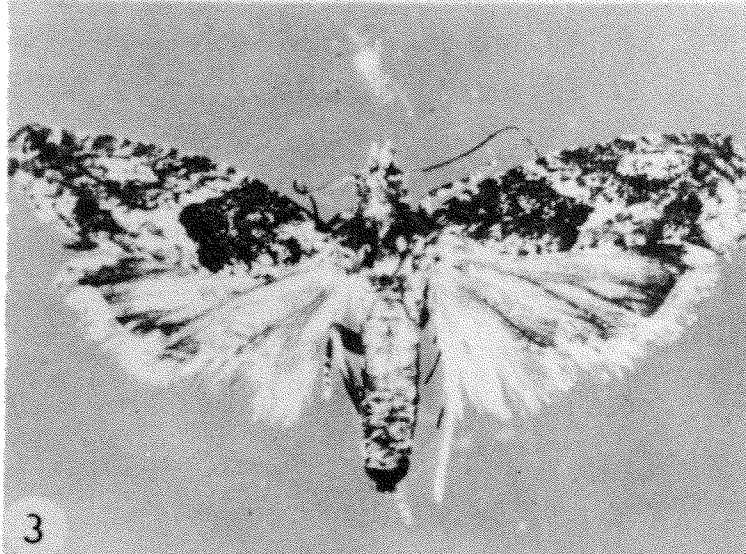
Figs. 3, 4, adults

Fig. 5, mature larva

Fig. 6, pupa

Fig. 7, capsules damaged by larvae

Fig. 8, young larva feeding in catkin



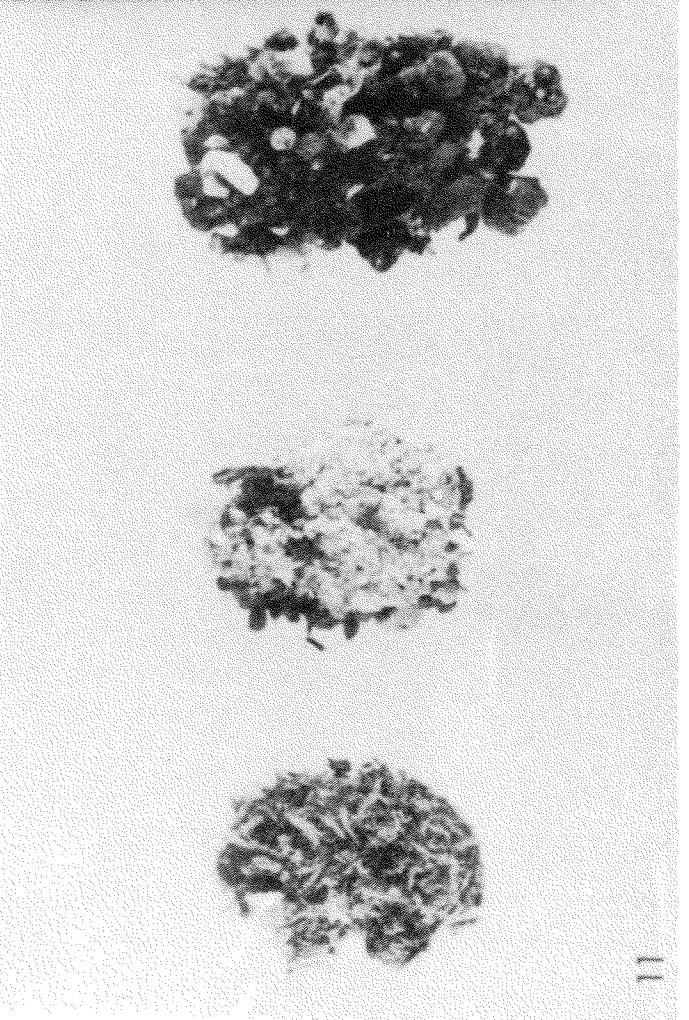
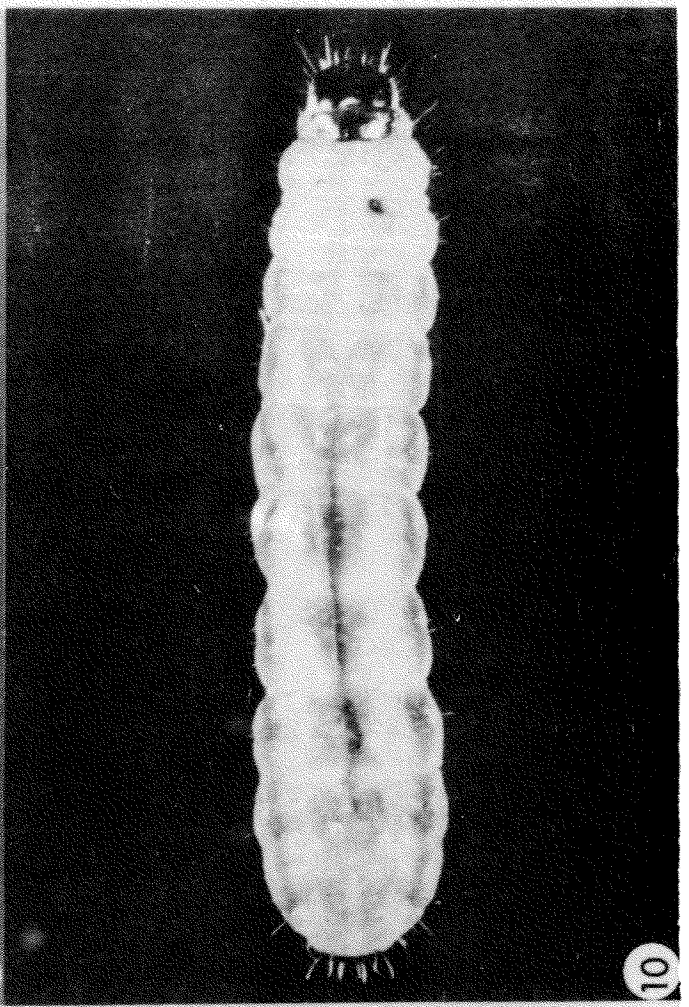
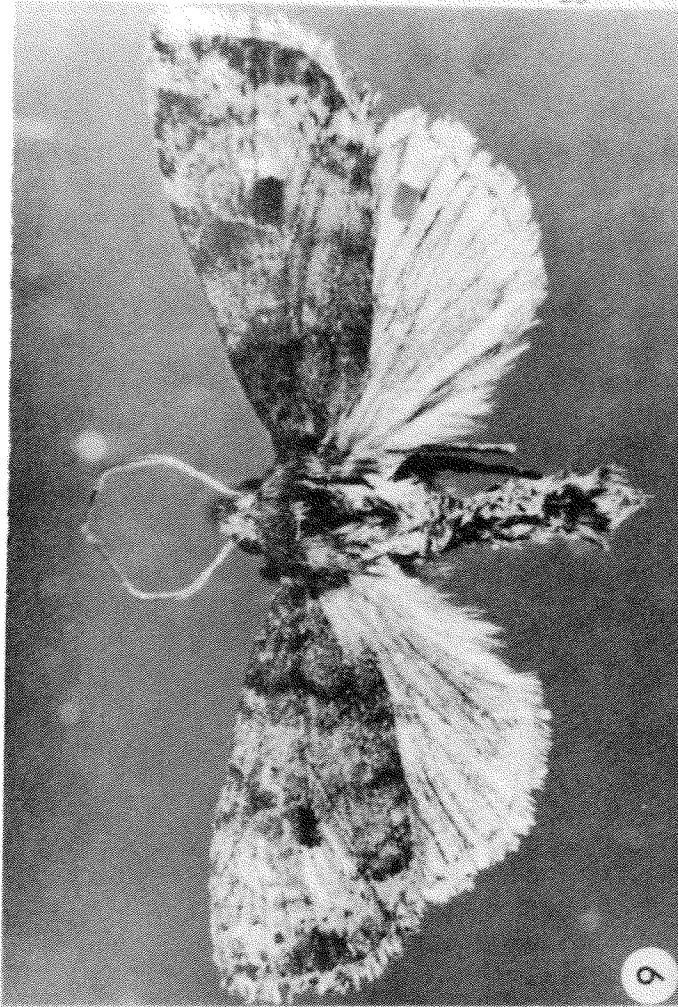
ANATHIX PUTA (G. & R.)

Fig. 9, adult

Fig. 10, mature larva

Fig. 11, pupa in earthen cell

Fig. 12, pupa



DORYTOMUS SP.

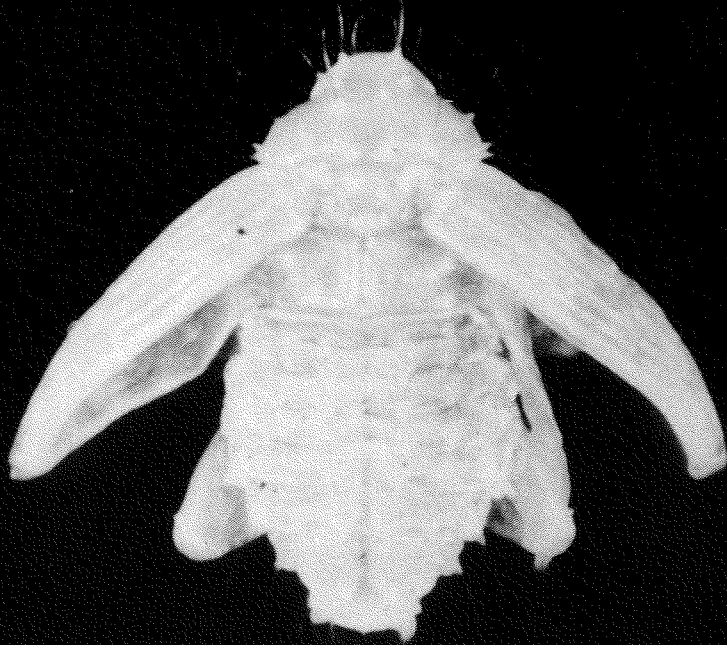
Fig. 13, adult

Fig. 14, pupa

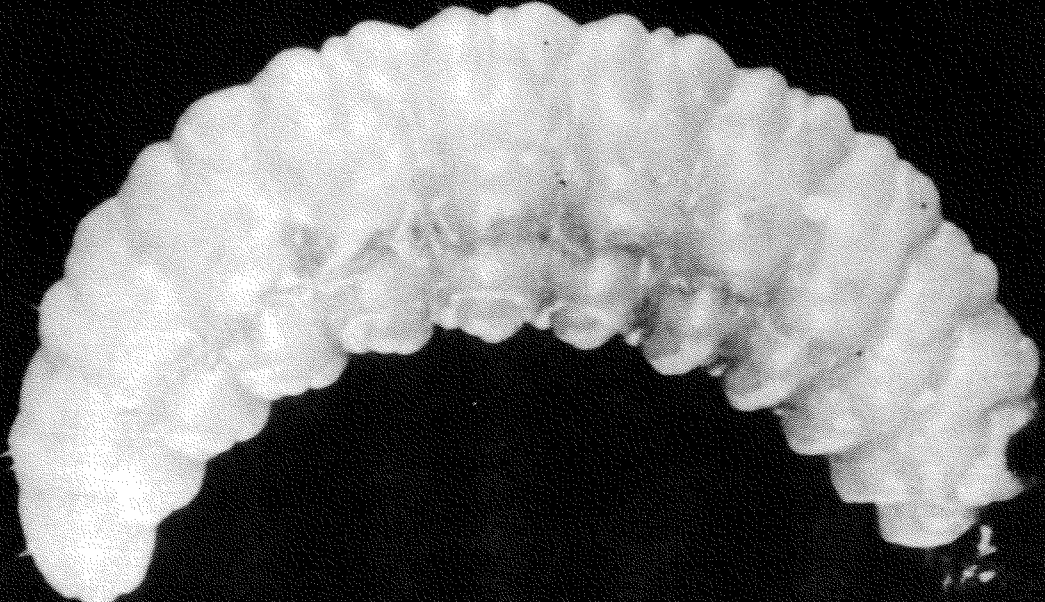
Fig. 15, mature larva



13



14



15

TABLE 1

INSECTS ASSOCIATED WITH MALE AND FEMALE CATKINS OF ASPEN

Order Family Species	Stage					Seasonal Occurrence of Larvae		Catkins			Total Number of Insects
	E	L	N	P	A	First Collection	Last Collection	♀	♂	?	
ARACHNIDA											
Araneida											
Dictynidae											
<i>Dictyna annulipes</i> (Blackwell)					X	22-6		X			2
<i>Dictyna</i> sp.					X	22-6		X			1
INSECTA											
Thysanoptera											
Oeolothripidae											
<i>Oeolothrips</i> prob. <i>fasciatus</i> L.					X	12-5		X			1
Thripidae											
<i>Frankiniella fusca</i> (Fitch)					X	23-5		X			1
<i>Frankiniella tritici</i> (Fitch)					X	12-5			X		3
<i>Taeniothrips</i> sp.		X		X	X	23-5		X			10
<i>Taeniothrips vulgatissimus</i> (Haliday)					X	23-5		X			1
Hemiptera											
Anthocoridae											
<i>Anthocoris musculus</i> (Say)			X		X	6-5	25-7	X			68
<i>Anthocoris pulverulentus</i> (Uhler)					X	29-5	2-7	X			5
<i>Anthocoris</i> poss. <i>musculus</i> (Say)	X		X			15-5	7-6	X			2

TABLE 1

(Continued)

Order Family Species	Stage					Seasonal Occurrence of Larvae		Catkins			Total Number of Insects
	E	L	N	P	A	First Collection	Last Collection	♀	♂	?	
Lygaeidae <i>Kleidocerys resedae</i> (Panzer)					X	28-4			X		1
Miridae Mirid sp.			X			24-5	7-6			X	2
Homoptera											
Aphididae <i>Chaitophorus</i> n. sp.			X			12-5	12-6		X		33
Cicadellidae <i>Idiocerus</i> sp.			X			12-5	20-5		X		7
Coleoptera											
Chrysomelidae											
<i>Chalcoides</i> sp.					X	1-6			X		1
<i>Crepidoderma aereola</i> (Lec.)					X	30-4			X		1
<i>Pachybrachys</i> sp.					X	30-4			X		1
Curculionidae											
<i>Dorytomus laticollis</i> Le Conte		X			X	16-4	10-6		X		46
<i>Dorytomus luridus</i> (Mann.)		X			X	25-4			X		1
<i>Dorytomus marginatus</i> Casey		X			X	25-4	30-5		X		14
<i>Dorytomus</i> sp.		X			X	20-4	10-6		X		30
poss. <i>Dorytomus marginatus</i> Casey		X			X	24-4	30-5		X		76
<i>Magdalis</i> sp.					X	8-8			X		1
Curculionid sp.	X	X		X		9-4	13-5		X	X	85

TABLE 1

(Continued)

Order Family Species	Stage					Seasonal Occurrence of Larvae		Catkins			Total Number of Insects
	E	L	N	P	A	First	Last	♀	♂	?	
						Collection	Collection				
Elateridae											
<i>Ctenicera propola propola</i> Lec.					X	4-6				X	1
Helodidae											
<i>Cyphon variabilis</i> (Thunb.)					X	30-4			X		5
Lathridiidae											
<i>Lathridius minutus</i> (L.)					X	24-6				X	1
<i>Melanophthalma</i> sp.		X				29-4	25-6			X	7
Lepidoptera											
Coleophoridae											
<i>Coleophora</i> sp.		X				23-5	19-6		X		2
Gelechiidae											
<i>Gelechia lynceela</i> Zell.		X				16-4	24-6		X		24
Geometridae											
<i>Itame loricaria julia</i> Hlst.		X				11-5			X		1
Geometrid sp.		X				15-5	23-6		X	X	6
Noctuidae											
<i>Anathix puta</i> G. & R.		X		X		16-4	15-5		X	X	284
poss. <i>Anathix puta</i> G. & R.		X				28-4	21-5		X		17
<i>Orthosia hibisci</i> Gn.		X				23-4			X		1
<i>Xylomyges dolosa</i> Grt.		X				23-6			X		2
Noctuid sp.		X				28-4	12-5		X	X	17

TABLE 1

(Continued)

Order Family Species	Stage					Seasonal Occurrence of Larvae		Catkins			Total Number of Insects	
	E	L	N	P	A	First	Last	♀	♂	?		
						Collection	Collection					
Tortricidae												
<i>Badebecia urticana</i> Hbn.		X				11-5			X			1
<i>Epinotia nisella</i> Clerck.	X	X		X		19-4	4-7		X	X		871
<i>Pandemis canadana</i> Kft.		X				9-6			X			1
<i>Pseudexentera oregonana</i> Wlshm.		X				29-4			X			1
<i>Sciaphila duplex</i> Wlshm.		X				12-5	26-6		X			9
Tortricid sp.		X				15-5	20-5		X			2
Diptera												
Syrphidae												
<i>Syrphus bigelowi</i> Curran		X				28-5			X			5
Sciaridae												
<i>Bradysia</i> sp.		X				14-4	23-6		X	X		173

Abbreviations: A = adult; E = egg; L = larva; N = nymph; P = pupa

TABLE 2

INSECTS ASSOCIATED WITH ASPEN AND WILLOW CATKINS

Order Family Species	Trembling Aspen Catkins			Willow Catkins		
	♀	♂	?	♀	♂	?
ARACHNIDA						
Araneida						
Araneidae						
						1
						1
Dictynidae						
			2			
			2			
Theridiidae						
						2
Thomisidae						
						1
						1
INSECTA						
Thysanoptera						
Oeolothripidae						
			1			
Thripidae						
			1			
				3		5

TABLE 2

(Continued)

Order Family Species	Trembling Aspen Catkins			Willow Catkins		
	♀	♂	?	♀	♂	?
<i>Taeniothrips vulgatissimus</i> (Haliday)	1			1		
<i>Taeniothrips</i> sp.	10					
Hemiptera						
Anthocoridae						
<i>Anthocoris musculus</i> (Say)	68			52		
<i>Anthocoris pulverulentus</i> (Uhler)	5			3		
<i>Anthocoris</i> poss. <i>musculus</i> (Say)	2			7		
<i>Anthocoris</i> sp.				7		
Lygaeidae						
<i>Kleidocerys resedae</i> (Panzer)	1					
Miridae						
Mirid sp.	1					
Pentatomidae						
<i>Banasa dimidiata</i> Say				2		
Homoptera						
Aphididae						
<i>Chaitophorus</i> n. sp.	33			10		
Cicadellidae						
<i>Idiocerus</i> sp.	7					
Psyllidae						
<i>Psylla</i> nr. <i>magnicauda</i> Crawford				21		
<i>Psylla</i> sp.				32		

TABLE 2

(Continued)

Order Family Species	Trembling Aspen Catkins			Willow Catkins		
	♀	♂	?	♀	♂	?
Coleoptera						
Chrysomelidae						
<i>Chalcoides</i> sp.	1					
<i>Crepidoderma aereola</i> (LeC.)	1					
<i>Orsodacne atra</i> Ahr.				1		
<i>Pachybrachys</i> sp.	1					
Cryptophagidae						
<i>Atomaria</i> sp.				12		
Curculionidae						
<i>Acalyptus carpini</i> (Hbst)				25		
<i>Anthonomus</i> sp.				1		
<i>Dorytomus laticollis</i> Le Conte	46					
<i>Dorytomus luridus</i> (Mann.)	1			10		
<i>Dorytomus marginatus</i> Casey	14				1	
<i>Dorytomus</i> sp.	30				1	
poss. <i>Dorytomus marginatus</i> Casey	76					
<i>Elleschus ephippiatus</i> (Say)				1		
<i>Magdalis</i> sp.	1					
<i>Rhynchaenus niger</i> Horn				1		
Curculionid sp.	48	37		1		
Elatерidae						
<i>Ctenicera propola propola</i> Lec.	1					
Helodidae						
<i>Cyphon variabilis</i> (Thunb.)	5			2		

TABLE 2

(Continued)

Order Family Species	Trembling Aspen Catkins			Willow Catkins		
	♀	♂	?	♀	♂	?
Lathridiidae						
<i>Lathridius minutus</i> (L.)	1					
<i>Melanophthalma</i> sp.	7			8		
Lepidoptera						
Coleophoridae						
<i>Coleophora innotabilis</i> Braun				1		
<i>Coleophora</i> sp.	2					
Gelechiidae						
<i>Gelechia lynceella</i> Zell	24			3	2	
Geometridae						
<i>Itame loricaria julia</i> Hist.	1					
Geometrid sp.	4	2				
Noctuidae						
<i>Anathix puta</i> G. & R.	267	17		18		
poss. <i>Anathix puta</i> G. & R.	17			1		
<i>Orthosia hibisci</i> Gn.	1			1		
<i>Xylomyges dolosa</i> Grt.	2					
Noctuid sp.	17			1	1	
Oecophoridae						
<i>Agonopterix geledella</i> Busck.				1		
Tortricidae						
<i>Acleris maccana</i> Fr.					2	
<i>Badebecia urticana</i> Hbn.	1					
<i>Epinotia nisella</i> Clerck	849	22		173		

TABLE 2

(Continued)

Order Family Species	Trembling Aspen Catkins			Willow Catkins		
	♀	♂	?	♀	♂	?
<i>Olethreutes cepitana</i> Hbn.				1		
<i>Pandemis canadana</i> Kft.	1			6		
<i>Pseudexentera oregonana</i> Wlsh. m.	1					
<i>Sciaphila duplex</i> Wlsh. m.	9					
Tortricid sp.	2				2	
Yponomeutidae						
<i>Argyresthia pygmeella</i> Hbn.				2		
Hymenoptera						
Andrenidae						
<i>Andrena carlini</i> Ckll.				7		
<i>Andrena mariae</i> Robt.				1		
<i>Andrena n.</i> sp.				1		
Formicidae						
<i>Formica obscuripes</i> Forel				5		
Halictidae						
<i>Lasioglossum</i> sp.				1		
Diptera						
Anthomyiidae						
<i>Hylemya muscaria</i> (Fab.)				5		

TABLE 2

(Continued)

Order Family Species	Trembling Aspen Catkins			Willow Catkins		
	♀	♂	?	♀	♂	?
Muscidae						
<i>Coenosia</i> sp.				1		
<i>Muscina stabulans</i> (Fallen)				8		
Sciaridae						
<i>Bradysia</i> sp.	173			15		18
Syrphidae						
<i>Carposcalis</i> sp.				2		
<i>Melangyna</i> sp.				2		
<i>Syrphus bigelowi</i> Curran	5					

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