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The Hadeninae (Lepidoptera: Noctuidae) of Great Smoky Mountains National Park, USA

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Abstract

Fifty-two species of Hadeninae are recorded from Great Smoky Mountains National Park, Tennessee and North Carolina, USA. Of the six hadenine tribes, five are present in the Park. They include 13 species of Orthosiini, one species of Tholerini, ten species of Hadenini, nine species of Leucaniini, and 19 species of Eriopygini. A total of 160 localities were collected across the Park. The three most diverse localities in the Park were Purchase Knob with 44 species, Big Cove Road with 32 species, and Foothills Parkway with 24 species. The most widespread species in the Park was *Pseudorthodes vecors* from 59 localities. The most abundant species was *Polia detracta* with 210 specimens. Images of adults, description/diagnosis, flight period, collected localities, abundance, elevational range, general distribution, and larval hosts are presented for each species.

Key words: faunistics, All Taxa Biodiversity Inventory, North Carolina, Tennessee, moths

Introduction

This is the third paper in a series documenting the Noctuidae of Great Smoky Mountains National Park (GSMNP), in Tennessee and North Carolina, as part of the All Taxa Biodiversity Inventory (ATBI) project (Pogue 2005, 2006). Introductory remarks are found in Pogue (2005).

The Hadeninae are trifid noctuids, which are defined by having vein Cu in the hindwing with three branches, M3, CuA1, and CuA2. The best character to use to identify the Hadeninae is the presence of surface hairs projecting between the facets on the eye.

Fibiger and Lafontaine (2005) divided the Hadeninae into six tribes, five of which occur in GSMNP, *i.e.*, Orthosiini, Tholerini, Hadenini, Leucaniini, and Eriopygini. Adults of Leucaniini can be defined by the heavily sclerotized, laterally compressed, and blade-like ovipositor lobes of the female genitalia. Many species of the Leucaniini can be recognized by fine longitudinal streaking of the forewing, but this pattern also occurs in other grass-feeding species of noctuids (Fibiger and Lafontaine 2005). All other tribes are defined by larval characters, which were not studied in this project.

A total of 52 species of Hadeninae were collected during this study in GSMNP. The Orthosiini are represented by 13 species. Many species in the Orthosiini overwinter as fully developed adults in the pupa and emerge early in the spring; most records were from mid-March to May. Larvae feed on woody plants (Fibiger and Lafontaine 2005). The Tholerini is a small tribe of three Holoarctic genera of which only one species, *Nephelodes minians* (Guenée), occurs in GSMNP. The Hadenini are represented by ten species in GSMNP. The Leucaniini are represented by nine species in GSMNP. The larvae are predominantly grass-feeders and several, including *Mythimna unipuncta* (Haworth), are agricultural pests. The largest tribe in GSMNP is the Eriopygini with 19 species. This tribe is defined by several larval characters including an undivided hypopharynx, without the transverse groove separating the basal and distal lobes as in other Hadeninae; the mandible lacks an inner tooth which is rarely lost in other hadenine; the spinneret is long and narrow (2–3 X as long as wide); and the fringe at the apex of the spinnert is confined to a small area at the end of the narrow dorsal groove. There are no diagnostic tribal characters for the adults, but some characters associate some genera within the tribe (Fibiger and Lafontaine 2005).

Material and methods

Materials and methods follow Pogue (2005). Adult and larval common names are from Covell (1984, 1999). Scientific and common names of plants were obtained from The Plants Database (USDA, NRCS 2008). Each species is sequentially numbered. All collecting localities are listed in Table 1 and shown on Map 1.

Some larvae were reared on chokecherry (*Prunus virginiana* L., Rosaceae), orchardgrass (*Dactylis glomerata* L., Poaceae), and dandelion (*Taraxacum* spp., Asteraceae). These plant species are not natural hosts, but were used by John G. Franclemont to rear larvae from eggs obtained from captive female moths. Because many Noctuidae are polyphagous feeders he was successful in rearing many species on these plants. Godfrey (1972) lists these records as hosts, mentions the rearing techniques of Franclemont in the Materials and Methods section of this publication, and does not mention that the larvae were not found on these hosts in the wild. I have indicated in the following accounts of larval hosts that these hosts are not natural.

Species accounts

The following is a checklist of the Hadeninae of Great Smoky Mountains National Park. The higher-level classification follows Fibiger and Lafontaine (2005). The species in the checklist are listed in alphabetical order by genus and species within each tribe. The author and year of publication follow the species name. Original spellings of the species epithet are used, and are not changed to be in agreement with the gender of the genus name (Poole 1989). Dates that include brackets e.g., [1857] 1856, indicate that the publication was

stated to have been published in 1856, but external information indicates that it was actually published in 1857. The arrangement in the text follows the checklist.

Tribe Orthosiini Guenée, 1837
Achatia distincta (Hübner, 1813)
Crocigrapha normani (Grote, 1874)
Egira alternans (Walker, [1857] 1856)
Himella fidelis Grote, 1874
Morrisonia confusa (Hübner, [1831] 1825)
Morrisonia evicta (Grote, 1873)
Morrisonia latex (Guenée, 1852)
Morrisonia triangular Sullivan & Adams, 2009
Orthosia alurina (Smith, 1902)
Orthosia garmani (Grote, 1879)
Orthosia hibisci (Guenée, 1852)
Orthosia revicta (Morrison, 1876)
Orthosia rubescens (Walker, 1865)

Tribe Tholerini Beck, 1996
Nephelodes minians (Guenée, 1856)

Tribe Hadenini Guenée, 1837
Dargida diffusa (Walker, 1852)
Hadena ectypa (Morrison, 1875)
Melanchra adjuncta (Guenée, 1852)
Melanchra assimilis (Morrison, 1874)
Polia detracta (Walker, 1857)
Polia imbrifera (Guenée, 1852)
Polia nimbosa (Guenée, 1852)
Sideridis congermana (Morrison, 1874)
Spiramater lutra (Guenée, 1852)
Trichordestra legitima (Grote, 1864)

Tribe Leucaniini Guenée, 1837
Leucania adjuta (Grote, 1874)
Leucania inermis (Forbes, 1936)
Leucania linda Franclemont, 1952
Leucania multilinea Walker, 1856
Leucania phragmatidicola Guenée, 1852
Leucania pseudargyria Guenée, 1852
Leucania scirpicola Guenée, 1852
Leucania ursula (Forbes, 1936)
Mythimna unipuncta (Haworth, 1809)

Tribe Eriopygini Fibiger & Lafontaine, 2005
Homorthodes furfurata (Grote, 1875)
Homorthodes lindseyi (Benjamin, 1922)
Lacinipolia anguina (Grote, 1881)
Lacinipolia explicata McDunnough, 1937
Lacinipolia implicata McDunnough, 1937

Lacinipolia laudabilis (Guenée, 1852)
Lacinipolia lorea (Guenée, 1852)
Lacinipolia meditata (Grote, 1873)
Lacinipolia olivacea (Morrison, 1874)
Lacinipolia renigera (Stephens, 1829)
Lacinipolia teligera (Morrison, 1875)
Orthodes majuscula (Herrich-Schäffer, 1868)
Orthodes cynica Guenée, 1852
Orthodes goodelli (Grote, 1875)
Protorthodes oviduca (Guenée, 1852)
Pseudorthodes vecors (Guenée, 1852)
Tricholita signata (Walker, 1860)
Ulolonche culea (Guenée, 1852)
Ulolonche modesta (Morrison, 1874)

TABLE 1. Collecting localities of GSMNP Hadeninae.

Map No.	State	County	Locality	UTM N	UTM E	Latitude	Longitude	Elev. ft / m
1	NC	Haywood	Flat Creek Trail on Balsam Mountain Rd.	3936384	302922	35.5533 N	83.1742 W	4890 / 1490
2	NC	Haywood	Balsam Mountain Rd., 6.1 mi N of Jct. with Blue Ridge Parkway on Hemphill Bald Trail	3937708	304176	35.5637 N	83.1608 W	5125 / 1562
2	NC	Haywood	Balsam Mountain Rd., 6.1 mi N of Jct. with Blue Ridge Parkway on Rough Fork Trail	3937696	304142	35.5654 N	83.1611 W	5140 / 1567
2	NC	Haywood	Balsam Mountain Rd., Polls Gap, Hemphill Bald Trail	3937790	302929	35.5660 N	83.1745 W	5400 / 1646
3	NC	Haywood	Balsam Mountain Campground	3937914	302953	35.5653 N	83.1743 W	5320 / 1622
3	NC	Haywood	Balsam Mountain picnic area on Flat Creek Trail	3938314	302279	35.5706 N	83.1818 W	5265 / 1605
4	NC	Haywood	Balsam Mountain Rd., 5.2 mi N of Jct. with Blue Ridge Parkway on Flat Creek Trail	3936675	303688	35.5537 N	83.1658 W	2120 / 646
5	NC	Haywood	Purchase Knob at lower creek	3938381	311511	35.5730 N	83.0800 W	4000 / 1219
5	NC	Haywood	Purchase house, 1 mi SE off Purchase Road	3938997	312581	35.5787 N	83.0681 W	4630 / 1411
5	NC	Haywood	Purchase Knob, 1.1 rd mi from house	3939249	312477	35.5792 N	83.0696 W	4924 / 1501
5	NC	Haywood	Purchase Knob in trees on road	3939138	312434	35.5800 N	83.0700 W	4570 / 1393
5	NC	Haywood	Purchase Knob, 0.5 mi N of gate	3939295	312401	35.5814 N	83.0704 W	4640 / 1414
5	NC	Haywood	Purchase Knob cabin	3939314	312176	35.5815 N	83.0729 W	4360 / 1329
5	NC	Haywood	Purchase Knob Ferguson cabin	3939198	312279	35.5805 N	83.0717 W	4600 / 1402
5	NC	Haywood	Purchase Knob, on road in meadow	3939582	312443	35.5840 N	83.0700 W	4520 / 1378
5	NC	Haywood	Purchase Knob E of house, field	3939986	312217	35.5858 N	83.0726 W	4914 / 1498
5	NC	Haywood	Purchase Knob NW of house	3939810	312176	35.5860 N	83.0730 W	4800 / 1463
5	NC	Haywood	Purchase Knob house	3939833	312122	35.5862 N	83.0736 W	4924 / 1501
5	NC	Haywood	Purchase Knob NE of house	3939847	312149	35.5863 N	83.0733 W	4924 / 1501
5	NC	Haywood	Purchase Knob N of house, forest	3939947	311970	35.5872 N	83.0753 W	4998 / 1523
5	NC	Haywood	Purchase Knob N of house, forest	3939980	312016	35.5875 N	83.0748 W	4950 / 1509
5	NC	Haywood	Purchase Knob E of house, forest	3939962	312841	35.5875 N	83.0657 W	4838 / 1475

to be continued.

TABLE 1. (continued)

Map No.	State	County	Locality	UTM N	UTM E	Latitude	Longitude	Elev. ft / m
5	NC	Haywood	Purchase Knob 100 yds. up road to house	3940112	312293	35.5870 N	83.0720 W	4852 / 1479
5	NC	Haywood	Purchase Knob in woods at base of knob	3939877	312749	35.5867 N	83.0667 W	4800 / 1463
6	NC	Haywood	Cove Creek Rd. jct. with paved section. 0.5 rd. mile from park edge	3945565	314692	35.6383 N	83.0466 W	3578 / 1091
6	NC	Haywood	Cove Creek Rd.	3945535	314380	35.6380 N	83.0500 W	3760 / 1146
7	NC	Haywood	Cataloochee, just off paved road to Cosby	3945240	311307	35.6348 N	83.0839 W	2600 / 792
7	NC	Haywood	Cataloochee, uphill from pull off at Sal Patch Gap	3945726	313389	35.6395 N	83.0610 W	3480 / 1061
7	NC	Haywood	Cataloochee, pull off at Sal Patch Gap	3945700	313351	35.6393 N	83.0614 W	3440 / 1049
7	NC	Haywood	Cataloochee service rd. off Cataloochee Road	3945811	313758	35.6404 N	83.0569 W	3540 / 1079
8	NC	Haywood	Piney Mountain	3946085	314573	35.6430 N	83.0480 W	3880 / 1183
9	NC	Haywood	trail to Hannah Hogden Cemetery	3946370	314012	35.6455 N	83.0543 W	3605 / 1099
10	NC	Haywood	Cataloochee, NW of Palmer Chapel	3944491	308804	35.6275 N	83.1113 W	2650 / 808
11	NC	Haywood	Cataloochee	3945813	311668	35.6400 N	83.0800 W	2600 / 792
12	NC	Haywood	Mt. Sterling Trail	3952634	309278	35.7010 N	83.1080 W	4400 / 1341
12	NC	Haywood	0.72 mi from Mt. Sterling trailhead	3952488	309173	35.6997 N	83.1091 W	4440 / 1353
12	NC	Haywood	1.54 mi from Mt. Sterling trailhead	3952847	308602	35.7028 n	83.1155 w	5140 / 1567
13	NC	Swain	Tricorner Knob	3952207	295808	35.6945 N	83.2567 W	5960 / 1817
14	NC	Swain	Blue Ridge Parkway, Thomas Divide overlook	3932763	295967	35.5193 N	83.2500 W	3560 / 1085
15	NC	Swain	Big Cove Road, site c	3931177	291121	35.5040 N	83.3030 W	2080 / 634
16	NC	Swain	Big Cove Road, site p	3932160	291779	35.5130 N	83.2960 W	2040 / 622
16	NC	Swain	Big Cove Road, site w	3931834	291499	35.5100 N	83.2990 W	2030 / 619
16	NC	Swain	Ravensford	3931836	291408	35.5100 N	83.3000 W	2020 / 616
17	NC	Swain	Oconaluftee Staff Housing					
18	NC	Swain	Big Cove Road, site b	3932935	291888	35.5200 N	83.2950 W	2120 / 646
19	NC	Swain	200 yds. up Tow String Road in meadow	3935122	291848	35.5397 N	83.2960 W	2120 / 646
20	NC	Swain	Smokemont	3937410	290359	35.5600 N	83.3130 W	2250 / 686
21	NC	Swain	Collins Creek Picnic area	3938292	288264	35.5675 N	83.3363 W	2400 / 732
22	NC	Swain	8.3 mi NW of GSMNP entrance on 441, Kephart Prong Trail	3940466	286398	35.5867 N	83.3575 W	2825 / 861
23	NC	Swain	Kephart Prong Trail	3940504	286261	35.5870 N	83.3590 W	2760 / 841
24	NC	Swain	13.5 mi NE of entrance to GSMNP on Thomas Divide Trail	3940265	282711	35.5841 N	83.3981 W	4634 / 1412
25	NC	Swain	Beetree Ridge	3939471	283062	35.5770 N	83.3940 W	4860 / 1481
26	NC	Swain	Indian Gap on Clingman's Dome Road	3943235	278540	35.6099 N	83.4449 W	5286 / 1612
27	NC	Swain	15.2 mi NE of entrance to GSMNP on Deep Creek Trail	3941998	280456	35.5992 N	83.4234 W	4815 / 1468
28	NC	Swain	5 rd. mi N of Clingman's Dome	3942376	277871	35.6020 N	83.4520 W	5460/ 1664

to be continued.

TABLE 1. (continued)

Map No.	State	County	Locality	UTM N	UTM E	Latitude	Longitude	Elev. ft / m
29	NC	Swain	3.3 mi NW of Clingman's Dome parking lot on Fork Ridge Trail	3940997	276224	35.5892 N	83.4697 W	5780 / 1762
30	NC	Swain	1.2 mi NE of Clingman's Dome parking lot on Noland Divide Trail	3938635	275151	35.5677 N	83.4810 W	6000 / 1829
30	NC	Swain	5.6 mi SW of Jct. 441 & Clingman's Dome Rd. on Noland Divide Trail	3938658	275115	35.5679 N	83.4814 W	5950 / 1814
31	NC	Swain	Upper Noland Divide Trailhead, ca. Clingman's Dome	3938560	275059	35.5670 N	83.4820 W	5920 / 1804
32	NC	Swain	1 rd mi N of Clingman's Dome	3938526	274937	35.5667 N	83.4833 W	5960 / 1817
33	NC	Swain	Mt. Buckley	3938060	272869	35.5620 N	83.5060 W	6560 / 1999
34	NC	Swain	Noland Creek	3934305	276494	35.5290 N	83.4650 W	3540 / 1079
35	NC	Swain	Deep Creek Ranger Station	3926502	278706	35.4592 N	83.4385 W	2120 / 646
36	NC	Swain	Lakeview Dr., 1st turnout, Quietway Trail	3926410	274071	35.4573 N	83.4895 W	2200 / 671
37	NC	Swain	0.4 km up trail from lake at Forney Creek	3927775	267749	35.4682 N	83.5595 W	2100 / 640
37	NC	Swain	0.7 km up creek from mouth of Goldmine Creek	3926331	268498	35.4553 N	83.5508 W	2140 / 652
38	NC	Swain	0.5 km from mouth of Chambers Creek, 300 ft. up hillside on NW side	3924950	263269	35.4417 N	83.6080 W	1990 / 607
39	NC	Swain	Welch Ridge, 300 ft. above Lake Fontana	3926205	251764	35.4502 N	83.7350 W	1720 / 524
40	NC	Swain	0.2 km W of mouth of Hazel Creek	3928576	253041	35.4718 N	83.7217 W	1900 / 579
41	NC	Swain	Hazel Creek, Proctor Cemetery	3928884	252456	35.4745 N	83.7283 W	1800 / 549
42	NC	Swain	Hazel Creek, Bradshaw Cemetery	3929336	252196	35.4785 N	83.7312 W	2040 / 622
43	NC	Swain	0.7 km S of Payne Cemetery	3927198	244115	35.4572 N	83.8195 W	2000 / 610
44	NC	Swain	Twentymile Ranger Station, 0.1 mi NE	3928653	239142	35.4690 N	83.8747 W	1508 / 460
44	NC	Swain	Twentymile Ranger Station, 0.2 mi NE	3928719	239253	35.4696 N	83.8735 W	1520 / 463
45	TN	Cocke	Cosby 3.6 mi E of Jct. on Hwy. 32	3963333	303178	35.7962 N	83.1780 W	1520 / 463
46	TN	Cocke	Foothills Parkway N at 1st overlook	3964618	297900	35.8067 N	83.2367 W	1680 / 512
46	TN	Cocke	Foothills Parkway 1st parking lot nr. N Cosby	3964806	297756	35.8070 N	83.2380 W	1801 / 549
46	TN	Cocke	Foothills Parkway, 2nd overlook East	3964679	298127	35.8073 N	83.2342 W	1800 / 549
46	TN	Cocke	Foothills Parkway, 2nd pullout	3964670	298513	35.8100 N	83.2300 W	1800 / 549
46	TN	Cocke	Foothills Parkway, 1.3 mi N of 321	3964955	298142	35.8086 N	83.2382 W	1801/ 549
46	TN	Cocke	Foothills Parkway south overlook	3964861	298421	35.8090 N	83.2310 W	1860 / 567
46	TN	Cocke	Foothills Parkway, N of 3rd pullout	3965559	299313	35.8137 N	83.2211 W	2198 / 670
46	TN	Cocke	Foothills Parkway	3965602	299974	35.8160 N	83.2140 W	2400 / 732
46	TN	Cocke	Foothills Parkway	3966059	299442	35.8200 N	83.2200 W	2020 / 616
46	TN	Cocke	Foothills Parkway, 3rd overlook from Cosby	3966572	300420	35.8248 N	83.2093 W	1880 / 573
46	TN	Cocke	Foothills Parkway N, 4.5 mi from Hwy. 321	3966593	300358	35.8250 N	83.2100 W	1920 / 585
46	TN	Cocke	Foothills Parkway at I-40	3967869	302828	35.8370 N	83.1830 W	1330 / 405
47	TN	Cocke	0.25 mi inside entrance to Cosby	3962756	298273	35.7900 N	83.2321 W	1350 / 411

to be continued.

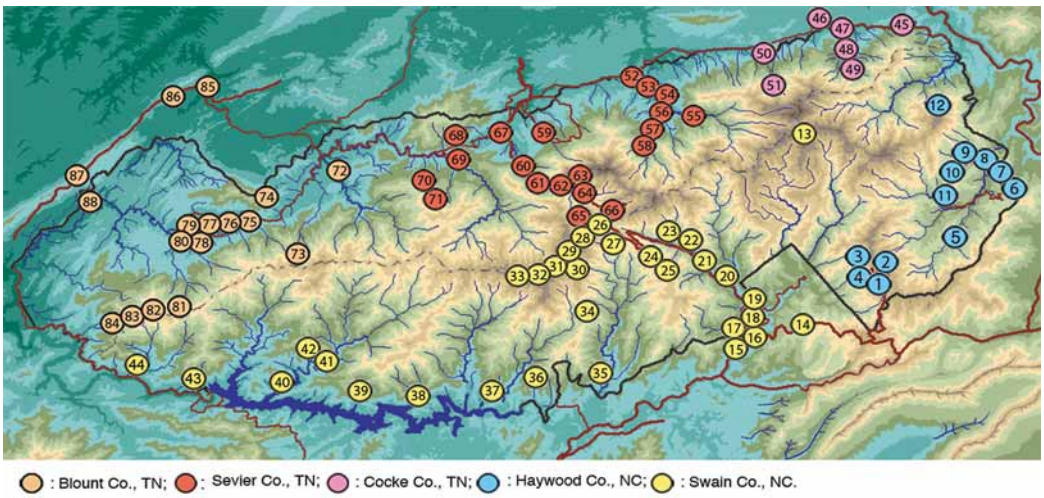
TABLE 1. (continued)

Map No.	State	County	Locality	UTM N	UTM E	Latitude	Longitude	Elev. ft / m
47	TN	Cocke	0.6 mi from state route 32 on road to Cosby campground	3961139	299992	35.7758 N	83.2127 W	1765 / 538
48	TN	Cocke	1.2 mi from state route 32 on road to Cosby campground	3960271	299942	35.7680 N	83.2130 W	1910 / 582
49	TN	Cocke	Cosby campground area	3958252	301075	35.7500 N	83.2000 W	2600 / 792
49	TN	Cocke	Cosby campground	3958603	300305	35.7530 N	83.2086 W	2340 / 713
49	TN	Cocke	Cosby Campground, vicinity of Trailhead	3958363	300480	35.7533 N	83.2067 W	2315 / 4706
49	TN	Cocke	Cosby picnic area	3959052	300163	35.7570 N	83.2103 W	2200 / 671
49	TN	Cocke	Cosby ATBI house	3961354	299896	35.7777 N	83.2138 W	1760 / 536
49	TN	Cocke	Cosby Creek, Cosby house	3960480	299919	35.7698 N	83.2133 W	
49	TN	Cocke	Cosby vic. ATBI house	3961350	299893	35.7777 N	83.2134 W	1750 / 533
49	TN	Cocke	Cosby Ranger Station	3961387	299879	35.7780 N	83.2140 W	1750 / 533
50	TN	Cocke	Maddron Bald Trail	3960340	295061	35.7676 N	83.2670 W	1900 / 579
51	TN	Cocke	Albright Grove Trailhead	3956976	293816	35.7370 N	83.2799 W	2000 / 610
52	TN	Sevier	Greenbrier Ranger Station	3956495	282355	35.7302 N	83.4064 W	1700 / 518
53	TN	Sevier	Greenbrier, 2.6 mi from state route 321	3954571	284324	35.7133 N	83.3841 W	1620 / 494
54	TN	Sevier	Greenbrier area, Old Settlers Trail	3954109	284587	35.7092 N	83.3811 W	1675 / 511
55	TN	Sevier	Greenbrier area, end of Ramsey Cascade Rd.	3953270	286667	35.7021 N	83.3579 W	2050 / 625
56	TN	Sevier	Greenbrier covered picnic area, 3.5 mi S of Rt. 321	3953511	284065	35.7037 N	83.3867 W	1760 / 536
56	TN	Sevier	Greenbrier picnic shelter	3954537	284335	35.7130 N	83.3840 W	1760 / 536
57	TN	Sevier	Return on Greenbrier loop road, 3.85 mi S of Rt. 321	3952889	284087	35.6981 N	83.3863 W	1760 / 536
58	TN	Sevier	4 mi S Rt. 321 end of Greenbrier Loop Rd.	3952717	283865	35.6965 N	83.3887 W	2060 / 628
59	TN	Sevier	Ogle Place	3951447	274659	35.6830 N	83.4900 W	4810 / 1466
60	TN	Sevier	Hwy. 441 at upper hairpin	3944937	281111	35.6240 N	83.4170 W	4528 / 1380
61	TN	Sevier	6 mi S of Sugarlands Visitor Center	3946660	274293	35.6398 N	83.4927 W	3320 / 1012
62	TN	Sevier	Cove Forest pullout	3946644	275081	35.6398 N	83.4840 W	3100 / 945
62	TN	Sevier	Chimneys Campground, 1 mi above	3946793	275512	35.6395 N	83.4793 W	3200 / 975
63	TN	Sevier	Alum Cave pulloff	3945567	278045	35.6290 N	83.4510 W	3885 / 1184
64	TN	Sevier	7 mi S of Sugarlands Visitor Center	3946354	276778	35.6376 N	83.4652 W	3640 / 1109
65	TN	Sevier	Road Prong Trail, 1.3 mi W of Jct. 441 & Clingman's Dome Rd. or 5.7 mi NE of Clingman's Dome Parking Lot	3943217	278342	35.6097 N	83.4472 W	5260 / 1603
65	TN	Sevier	Road Prong Trail at road	3943414	278472	35.6100 N	83.4460 W	5259 / 1603
66	TN	Sevier	Newfound Gap	3943512	280351	35.6110 N	83.4250 W	5026 / 1532
67	TN	Sevier	Park Headquarters	3952000	270417	35.6870 N	83.5370 W	1480 / 451
67	TN	Sevier	Sugarlands Visitor Center	3951889	270414	35.6860 N	83.5370 W	1478 / 451
68	TN	Sevier	Laurel Falls Trail	3950695	265687	35.6720 N	83.5890 W	2300 / 701
69	TN	Sevier	Elkmont	3948440	266428	35.6540 N	83.5800 W	2200 / 671
69	TN	Sevier	Elkmont Jake's Creek	3947971	266239	35.6497 N	83.5820 W	2398 / 731
70	TN	Sevier	Campsite 20 on Meigs Mountain Trail, nr. creek	3947793	263946	35.6476 N	83.6072 W	2570 / 783

to be continued.

TABLE 1. (continued)

Map No.	State	County	Locality	UTM N	UTM E	Latitude	Longitude	Elev. ft / m
70	TN	Sevier	E of Campsite 20	3947812	264146	35.6478 N	83.6050 W	2550 / 777
70	TN	Sevier	W of Campsite 20	3947885	263903	35.6484 N	83.6077 W	2520 / 768
71	TN	Sevier	Campsite 27, Jake's Creek Trail	3945031	264335	35.6228 N	83.6021 W	3550 / 1082
71	TN	Sevier	Jake's Creek Trail, near campsite 27	3945045	264277	35.6229 N	83.6033 W	3590 / 1094
71	TN	Sevier	Jake's Creek Trail, below campsite 27	3945057	264218	35.6230 N	83.6034 W	3595 /1096
71	TN	Sevier	Jake's Creek Trail	3945069	264155	35.6231 N	83.6041 W	3640 / 1109
71	TN	Sevier	Jake's Creek Trail, above campsite 27	3945002	264199	35.6225 N	83.6036 W	3600 / 1097
72	TN	Blount	Tremont Environmental Center	3947301	256311	35.6413 N	83.6913 W	1390 / 424
72	TN	Blount	Tremont	3947157	256307	35.6400 N	83.6913 W	1390 / 424
73	TN	Blount	Cold Spring Gap	3934731	242757	35.5229 N	83.8368 W	4240 / 1292
74	TN	Blount	Campsite 6 along Scott Mountain Trail	3945124	249410	35.6201 N	83.7667 N	3324 / 1013
74	TN	Blount	Campsite 6, at creek, Scott Mountain Trail	3945161	249493	35.6205 N	83.7658 W	3225 / 983
74	TN	Blount	Campsite 6, head of spring, Scott Mountain Trail	3945205	249480	35.6208 N	83.7660 N	3292 / 1003
75	TN	Blount	Cades Cove near Ranger Station	3943351	248453	35.6037 N	83.7768 W	1900 / 579
75	TN	Blount	Cades Cove campground	3943371	248704	35.6040 N	83.7740 W	1940 / 591
75	TN	Blount	Cades Cove Ranger Station	3943213	248428	35.6025 N	83.7770 W	1880 / 573
76	TN	Blount	Cades Cove Abrams Creek	3943688	248532	35.6050 N	83.7760 W	1841 /561
76	TN	Blount	Vicinity of Cades Cove	3943572	248311	35.6057 N	83.7784 W	1880 / 573
77	TN	Blount	Cades Cove Primitive Baptist Church	3943252	245073	35.6020 N	83.8140 W	1800 / 549
78	TN	Blount	Cades Cove Loop Abrams Creek	3942637	242517	35.5940 N	83.8420 W	1706 / 520
79	TN	Blount	Cades Cove ATBI house, 2000 m SW	3943081	243315	35.6000 N	83.8333 W	1740 / 530
80	TN	Blount	Cades Cove, Forge Creek Rd.	3941343	242733	35.5842 N	83.8392 W	1790 / 546
81	TN	Blount	Spence Field	3938824	252505	35.5640 N	83.7307 W	4887 / 1490
82	TN	Blount	Gregory Bald, 0.1 mi W	3934272	239987	35.5198 N	83.8672 W	4929 / 1502
82	TN	Blount	Greogory Bad, 0.2 mi SW of Campsite 13 on Wolf Ridge Trail	3934314	239289	35.5200 N	83.8749 W	4677 / 1426
82	TN	Blount	Gregory Bald Trail, E of Campsite 13	3934327	239598	35.5202 N	83.8715 W	4680 / 1426
82	TN	Blount	Gregory Bald	3934368	240099	35.5207 N	83.8660 W	4949 / 1508
82	TN	Blount	Gregory Bald Trail, N of Campsite 13	3934428	239574	35.5211 N	83.8718 W	4690 / 1430
83	TN	Blount	Wolf Ridge Trail, 0.2 mi NE of Parson's Bald	3934120	238721	35.5181 N	83.8811 W	4700 / 1433
84	TN	Blount	Parson's Bald	3934328	238826	35.5200 N	83.8800 W	4732 / 1442
85	TN	Blount	Foothills Parkway West at Little River	3956218	244705	35.7187 N	83.8222 W	1000 / 305
86	TN	Blount	Foothills Parkway West, 2.5 mi W Hwy. 321	3955257	241949	35.7093 N	83.8523 W	1600 / 488
86	TN	Blount	Foothills Parkway West, 2.1 mi W Hwy. 321	3955297	242007	35.7097 N	83.8517 W	1570 / 479
87	TN	Blount	Foothills Parkway West	3946720	232843	35.6300 N	83.9500 W	2400 / 732
88	TN	Blount	Abrams Falls parking area	3944564	234410	35.6110 N	83.9320 W	1160 / 354



MAP 1. Collecting localities of Hadeninae. Numbers refer to localities in Table 1.

Tribe Orthosiini Guenée, 1837

1. *Achatia distincta* (Hübner) Distinct Quaker
(Fig. 1, Map 2)

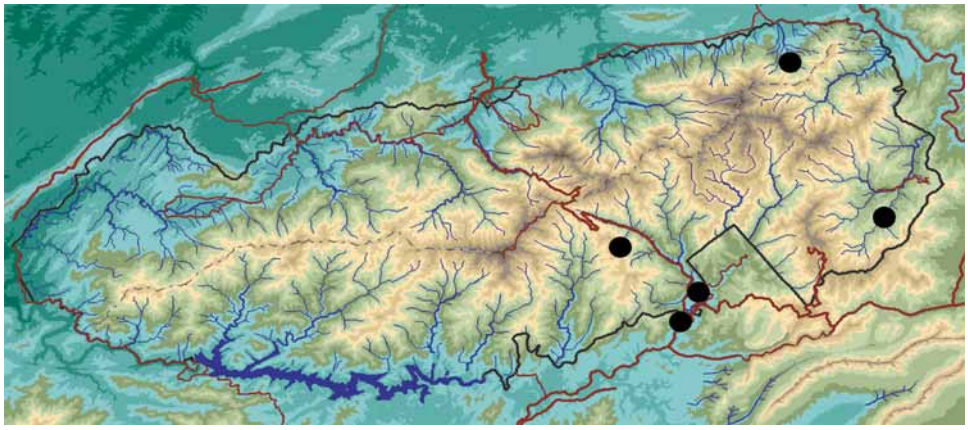
Identification: Forewing length 13–17 mm. A distinct, black transverse bar runs across the frons at the dorsal eye margin. The general coloration of the forewing is gray with a white basal area speckled with pale gray and black scales. The orbicular and reniform spots are large, filled with white and gray scales, and thinly outlined with black. Between the basal area and orbicular spot is a dark gray angulate patch that is thinly outlined and divided into four sections by black scales. Hindwing is pale gray with a dark gray marginal border.

Flight period: Late April to June.

Collected localities: North Carolina: Haywood Co., Purchase Knob, Purchase Knob house, Purchase Knob NW of house; Swain Co., Beetree Ridge, Big Cove Road site b, Big Cove Road site c. Tennessee: Blount Co., Tremont; Cocke Co., Cosby Creek Cosby House. (22 specimens)

Elevation range: 2080–4924 ft. (634–1501 m)

General distribution: A widespread eastern species from Manitoba, Canada; and in the U.S. from New Hampshire south to Florida, throughout the Midwest from Ohio and Kentucky west to North Dakota and south to Texas and west to Colorado.



MAP 2. Collecting localities of *Achatia distincta.*

Larval hosts: Larvae feed on forest trees including linden (*Tilia* sp., Tiliaceae), walnut (*Juglans* sp., Juglandaceae) (Crumb 1956), European white birch (*Betula pendula* Roth, Betulaceae), butternut (*Juglans cinerea* L., Juglandaceae), white ash (*Fraxinus americana* L., Oleaceae), white oak (*Quercus alba* L., Fagaceae), bur oak (*Q. macrocarpa* Michx., Fagaceae) (Prentice 1962), and maple (*Acer* sp., Aceraceae) (Kimball 1965). The larva is illustrated in Wagner (2005).

2. *Crocigrapha normani* (Grote) Norman's Quaker
(Figs. 2–3, Map 3)

Identification: Forewing length 14–18 mm. Ground color of forewing is rusty red brown that can become lighter near outer margin in some specimens. The antemedial line is almost straight, white and edged with darker ground color; postmedial line does not reach costa, curves around reniform spot then is slightly angled to posterior margin. Both of these lines can be variable in color from white to dark rusty red brown and variable in intensity from distinct to faint. Hindwing is white with the veins and marginal band gray. The amount of gray on the hindwings is variable.

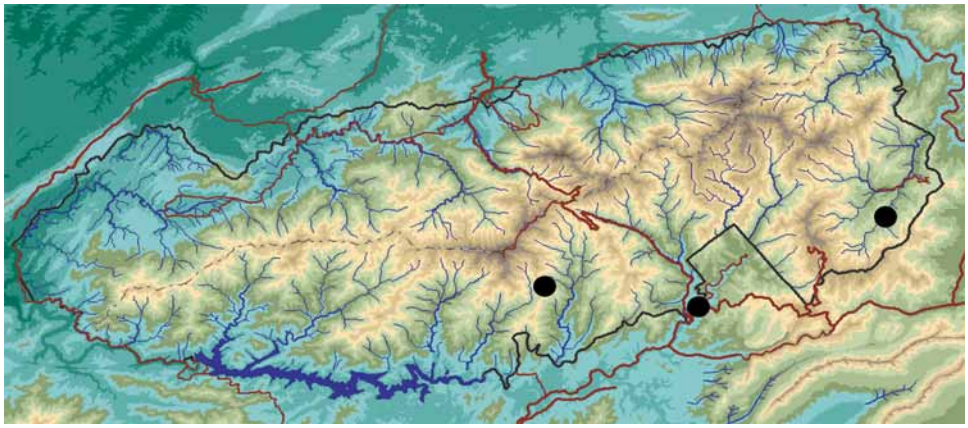
Flight period: April to May.

Collected localities: North Carolina: Haywood Co., Purchase Knob, Purchase Knob at house, Purchase Knob NW of house; Swain Co., Big Cove Road site p; Noland Creek. (7 specimens)

Elevation range: 2040–4924 ft. (622–1501 m)

General distribution: Mainly a northern species distributed from Nova Scotia and Quebec in Canada. In the U.S. it ranges from Maine south to North Carolina and west to North Dakota and south to Texas.

Larval hosts: This is a polyphagous species feeding on a wide variety of forest trees and shrubs, including giant blue cohosh (*Caulophyllum giganteum* (Faw.) Laconte & Blackwell, Berberidaceae), beaked hazelnut (*Corylus cornuti* Marsh., Betulaceae) (Gibson 1903); apple (*Malus* sp., Rosaceae), cherry (*Prunus* sp., Rosaceae) (Patch 1908, Forbes 1954). The following hosts are arranged in order of preference based on the number of specimens collected from each host: European white birch (*Betula pendula* Roth, Betulaceae), sugar maple (*Acer saccharum* Marsh., Aceraceae), red maple (*Acer rubrum* L., Aceraceae), American elm (*Ulmus americana* L., Ulmaceae), willow (*Salix* sp., Salicaceae), white ash (*Fraxinus americana* L., Oleaceae), white oak (*Quercus alba* L., Fagaceae), ironwood (*Eusideroxylon* sp. Teijsm. & Binnend., Lauraceae), yellow birch (*Betula alleghaniensis* Britton, Betulaceae), quaking aspen (*Populus tremuloides* Michx., Salicaceae), pin cherry (*Prunus pennsylvanica* L., Rosaceae), American hornbeam (*Carpinus caroliniana* Walter, Betulaceae), green ash (*Fraxinus pennsylvanica* Marsh., Oleaceae), bur oak (*Quercus macrocarpa* Michx., Fagaceae), mountain ash (*Sorbus* sp., Rosaceae), gooseberry (*Ribes* sp., Grossulariaceae), bigtooth aspen (*Populus grandidentata* Michx., Salicaceae), black walnut (*Juglans nigra* L., Juglandaceae), balsam fir (*Abies balsamea* (L.) Mill., Pinaceae), and butternut (*Juglans cinerea* L., Juglandaceae) (Prentice 1962). The larva is illustrated in Wagner (2005).



MAP 3. Collecting localities of *Crocigrapha normani*.

3. *Egira alternans* (Walker) Alternate Woodling
(Figs. 4–5, Map 4)

Identification: Forewing length 15–18 mm. General forewing coloration is gray. The white antemedial line is slightly sinuate and bordered distally by a thin black line. Orbicular spot is white with gray center, extending below discal cell, and is bordered on either side by thin black lines. Reniform spot is pale gray with ferruginous center and bordered by a thin black line proximally; on fresh specimens there are a few black scales around spot distally. A black bar extends between the antemedial and postmedial lines below the reniform spot in some specimens. Hindwing is white and variably suffused with gray scales, a small gray discal spot is present, and a thin dark gray line along outer margin of wing.

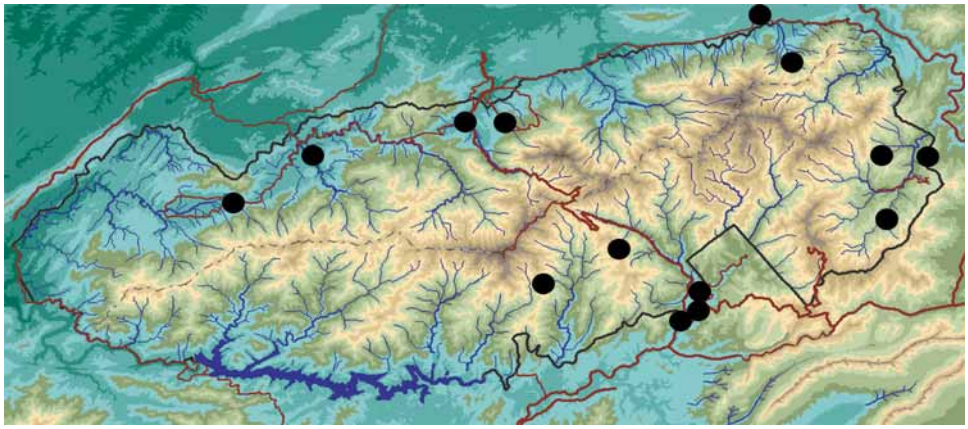
Flight period: April to June.

Collected localities: North Carolina: Haywood Co., Cataloochee just off paved road to Cosby, Cataloochee NW of Palmer Chapel, Purchase Knob, Purchase Knob NW of house; Swain Co., Beetree Ridge, Big Cove Road site b, Big Cove Road site c, Big Cove Road site p, Noland Creek. Tennessee: Blount Co., Cades Cove, Cades Cove Ranger Station, Cades Cove Campground, Tremont GSMI; Cocke Co., Cosby campground area, Cosby Ranger Station, Cosby Creek Cosby House, Foothills Parkway; Sevier Co., Greenbrier Road just above Ranger Station, Ogle Place, Park Headquarters. (59 specimens)

Elevation range: 1360–4924 ft. (415–1501 m)

General distribution: This is an eastern species ranging from Maine to Florida and west to Texas.

Larval hosts: Another forest species feeding on a variety of woody shrubs and trees. Hosts include blueberry (*Vaccinium* sp., Ericaceae), cherry (*Prunus* sp., Rosaceae), honeysuckle (*Lonicera* sp., Caprifoliaceae), horse chestnut (*Aesculus hippocastanum* L., Hippocastanaceae), rhododendron (*Rhododendron* sp., Ericaceae), silver bells (*Halesia carolina* L., Styracaceae), sourwood (*Oxydendrum arboreum* (L.) DC., Ericaceae), walnut (*Juglans* sp., Juglandaceae), and willow (*Salix* sp., Salicaceae) (Wagner 2005). The larva is illustrated in Wagner (2005).



MAP 4. Collecting localities of *Egira alternans.*

4. *Himella fidelis* Grote Faithful Quaker
(Figs. 6–8, Map 5)

Identification: Forewing length 13–16 mm. Forewing is reddish-brown with a few specimens being gray. Antemedial and postmedial lines faint, cream-colored and bordered on both sides by darker scales. Orbicular and reniform spots ground color and outlined with a thin line of cream-colored scales. A small black spot at base of wing; a small black spot contiguous with the antemedial line below the orbicular spot and a small black spot contiguous with the postmedial line below the reniform spot can be present or absent. Hindwing pale gray to gray becoming darker toward outer margin.

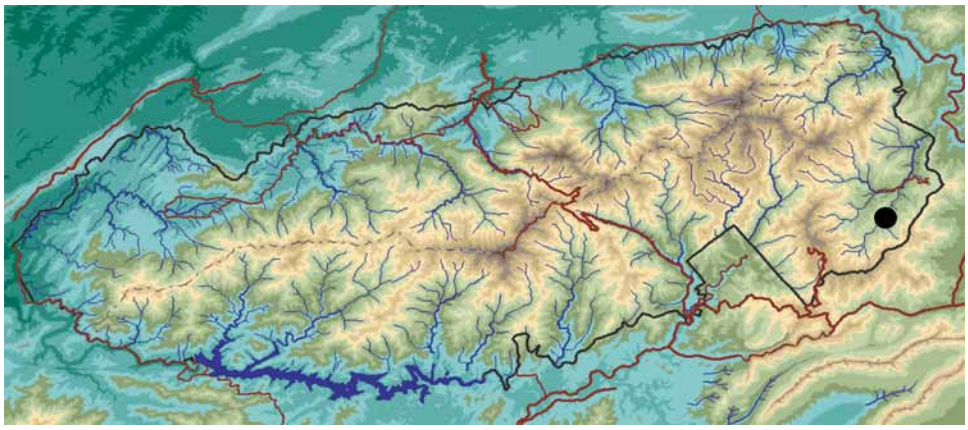
Flight period: Mid-April.

Collected localities: North Carolina: Haywood Co., Purchase Knob, Purchase Knob NW of house. (3 specimens)

Elevation range: 4911–4924 ft. (1497–1501 m)

General distribution: An eastern species ranging from Maine to Florida and west to Michigan, Illinois, and Texas.

Larval hosts: A polyphagous species of many trees and woody shrubs. Host plants include apple (*Malus* sp., Rosaceae), cherry (*Prunus* sp., Rosaceae), blackberry (*Rubus* sp., Rosaceae), blueberry (*Vaccinium* sp., Ericaceae), elm (*Ulmus* sp., Ulmaceae), hickory (*Carya* sp., Juglandaceae), hophornbeam (*Ostrya* sp., Betulaceae), oak (*Quercus* sp., Fagaceae), viburnum (*Viburnum* sp., Caprifoliaceae), witchhazel (*Hamamelis* sp., Hamamelidaceae) (Wagner 2005).



MAP 5. Collecting localities of *Himella fidelis.*

5. *Morrisonia confusa* (Hübner) Confused Woodgrain
(Fig. 9, Map 6)

Identification: Forewing length (14–19 mm). Forewing ground color dark brown to reddish brown but with many other shades of brown giving the wing a streaked appearance. A thin black line extends from base of wing to antemedial line. Orbicular and reniform spots with ground color centers, cream-colored border, and thin black outer border that is never complete. Subterminal line black, zigzag with faint white spots at apices of zigzag line, a solid white border of scales from vein CuA2 to posterior border. Hindwing with varying amounts of gray scales, veins highlighted gray, small gray discal spot present, with wing becoming darker toward outer margin.

Flight period: Late April to early June.

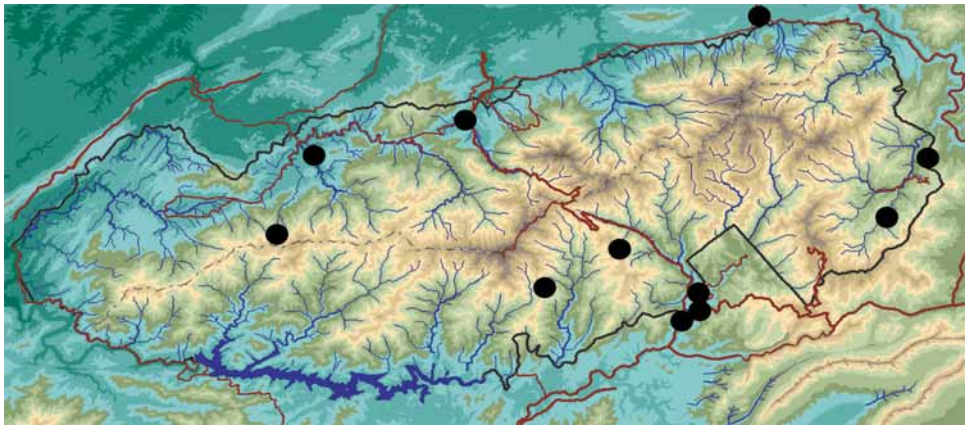
Collected localities: North Carolina: Haywood Co., Cataloochee just off paved road to Cosby, Purchase Knob, Purchase Knob at house, Purchase Knob at lower creek, Purchase Knob NW of house; Swain Co., Beetree Ridge, Big Cove Road site b, Big Cove Road site c, Big Cove Road site p, Noland Creek. Tennessee: Blount Co., Cold Spring Gap, Tremont GSMI; Cocke Co., Foothills Parkway south overlook; Sevier Co., Park Headquarters, Sugarlands Visitor Center bathrooms. (27 specimens)

Elevation range: 1390–4924 ft. (424–1501 m)

General distribution: An eastern species distributed in Nova Scotia, Canada, and in the U.S. from Maine to Florida and west to Michigan, Missouri and Texas.

Larval hosts: A polyphagous species on both deciduous and coniferous trees and forbs. The following hosts are arranged in order of preference based on the number of specimens collected from each host: red maple (*Acer rubrum* L., Aceraceae), American basswood (*Tilia americana* L., Tiliaceae), European white birch (*Betula pendula* Roth, Betulaceae), American elm (*Ulmus americana* L., Ulmaceae), cherry (*Prunus* sp., Rosaceae), balsam poplar (*Populus balsamifera* L., Salicaceae), ironwood (*Eusideroxylon* sp. Teijsm. & Binnend., Lauraceae), horse chestnut (*Aesculus hippocastanum* L., Hippocastanaceae), and red oak (*Quercus*

rubra L., Fagaceae) (Prentice 1962). Other host plants include: ash (*Fraxinus* sp., Oleaceae), blueberry (*Vaccinium* sp., Ericaceae), rhododendron (*Rhododendron* sp., Ericaceae), American sycamore (*Platanus occidentalis* L. Platanaceae), walnut (*Juglans* sp., Juglandaceae), willow (*Salix* sp., Salicaceae) (Wagner 2005). The larva is illustrated in Wagner (2005).



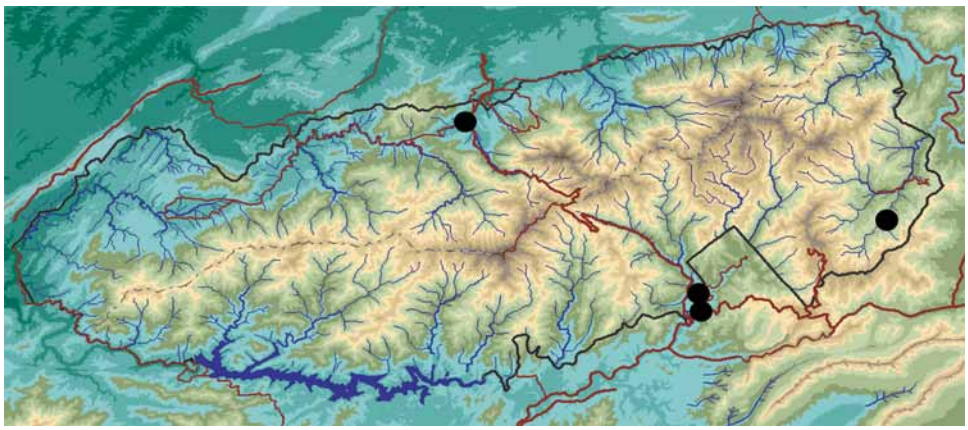
MAP 6. Collecting localities of *Morrisonia confusa.*

6. *Morrisonia evicta* (Grote) Bicolored Woodgrain
(Figs. 10–13, Map 7)

Identification: Forewing length 14–18 mm. The overall coloration of the forewing is gray with reddish-brown overtones. The lower half of the forewing can be completely black (Fig. 10) to a variable amount of black (Figs. 11–12) to lacking any black (Fig. 13). The orbicular and reniform spots are contiguous with reddish-brown to black centers and partially outlined with white. Veins are variably highlighted with black. Base of hindwing dirty white, rest of wing suffused with gray becoming darkest along outer margin.

Flight period: Late April.

Collected localities: North Carolina: Haywood Co., Purchase Knob at house, Purchase Knob NW of house; Swain Co., Big Cove Road site b, Big Cove Road site p. Tennessee: Sevier Co., Park Headquarters. (8 specimens)



MAP 7. Collecting localities of *Morrisonia evicta.*

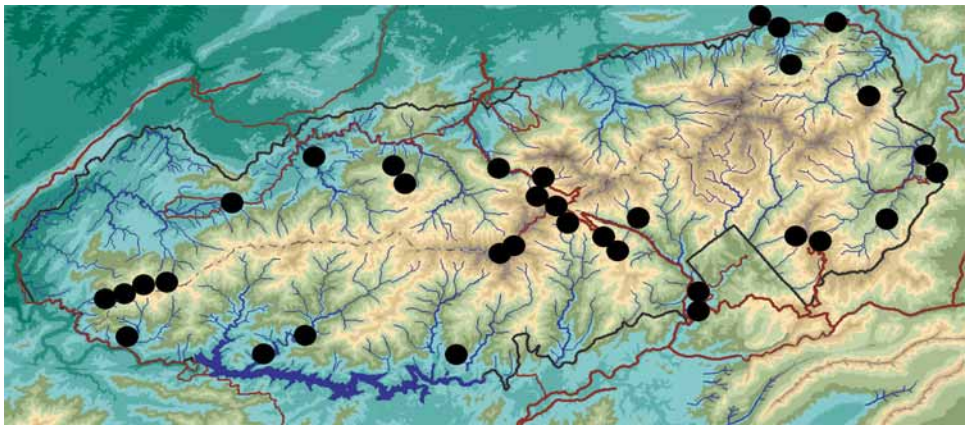
Elevation range: 2040–2120 ft. (622–646 m)

General distribution: A widespread eastern and midwestern species distributed from Nova Scotia and Manitoba in Canada, and in the U.S. from Maine south to Florida, throughout the Midwest from Michigan west to Missouri, South Dakota, and Colorado.

Larval hosts: Godfrey (1972) borrowed larvae from the Canadian National Collection that were reared on wild cherry (*Prunus* sp, Rosaceae). The record for chokecherry (*Prunus virginiana* L.) is not a natural host plant, but eggs were obtained from the female moth and the larvae were able to complete development on this plant.

7. *Morrisonia latex* (Guenée) Fluid Arches
(Figs. 14–15, Map 8)

Identification: Forewing length 17–22 mm. A distinct, black transverse bar runs across the frons at the dorsal eye margin. The forewing has a distinct black, somewhat triangular spot on costa between the basal and antemedial lines. Orbicular spot is white and faintly outlined in black; reniform spot is outlined in black and is multicolored with white, black, and gray scales, but its most distinguishing character is the patch of ferruginous scales on its proximal border. An angulate black dash is present between the orbicular and reniform spots and runs from the costa to bottom of discal cell. In the terminal area of the wing there is a short black dash between veins R4 and R5, the longest black dash between veins R5 and M1, and another short dash at the tornus. Hindwing is gray with a faint discal spot and a thin terminal line consisting of contiguous crescent-shape spots.



MAP 8. Collecting localities of *Morrisonia latex*.

Flight period: Late April to early August.

Collected localities: North Carolina: Haywood Co., Balsam Mountain picnic area on Flat Creek Trail, Cataloochee pull off at Sal Patch Gap, Cataloochee service road off Cataloochee Road, Cove Creek Road, Cove Creek Road junction with paved section 0.5 rd mi. from park edge, Mt. Sterling trail 0.72 mi from Trailhead, Purchase Knob, Purchase Knob at house, Purchase Knob at lower creek, Purchase Knob Ferguson cabin, Purchase Knob on road in meadow, Purchase Knob N of house, Purchase Knob NE of house, Purchase Knob NW of house, Rough Fork Trail at Polls Gap on Balsam Mountain Road 6.1 mi N of Blue Ridge Parkway; Swain Co., Beetree Ridge, Big Cove Road site b, Big Cove Road site p, 1 road mi N of Clingman's Dome, 13.5 mi NE of GSMNP entrance on Rt. 441 Thomas Divide Trail, 15.2 mi NE of GSMNP entrance on Rt. 441 Deep Creek Trail, 8.3 mi NW of GSMNP entrance on Rt. 441 Kephart Prong Trail, Clingman's Dome Road Indian Gap, Upper Noland Divide Trailhead ca. Clingman's Dome, 0.1 mi NE of Twentymile Ranger Station, 0.2 mi NE of Twentymile Ranger Station, 0.2 km W mouth Hazel Creek, 0.7 km up creek from mouth of Goldmine Creek. Tennessee: Blount Co., Cades Cove Ranger Station, 0.2 mi SW of Campsite 13 on Wolf Ridge Trail, Gregory Bald, E of Campsite 13 on Gregory Bald Trail, N of Campsite 13 on Gregory Bald Trail, 0.2 mi NE of Parsons Bald on Wolf Ridge Trail, Parsons Bald, Spence Field, Tremont; Cocke Co., 3.6 rd mi E of junction on Rt. 32 Cosby, Cosby ATBI house, vicinity of Cosby Campground trailhead, 0.25 mi inside entrance to Cosby Campground, Foothills Parkway south overlook, Foothills Parkway 4.5 mi from Rt. 321;

Sevier Co., Campsite 27 on Jake's Creek Trail, near Campsite 27 on Jake's Creek Trail, below Campsite 27 on Jake's Creek Trail, Campsite 20 on Meigs Mountain Trail nr. creek, 1.3 mi W of junction 441 and Clingman's Dome Road on Road Prong Trail, 6 mi S of Sugarlands Visitor Center, ca. 7 mi S of Sugarlands Visitor Center. (124 specimens)

Elevation range: 1350–5960 ft. (411–1817 m)

General distribution: An eastern North American species distributed from Nova Scotia to Ontario in Canada, and in the U.S. from Maine south to North Carolina and west to Michigan, Kentucky, and Tennessee.

Larval hosts: This is another polyphagous forest species feeding on many trees and woody shrubs. The following hosts are arranged in order of preference based on the number of specimens collected from each host: European white birch (*Betula pendula* Roth, Betulaceae), American elm (*Ulmus americana* L., Ulmaceae), red maple (*Acer rubrum* L., Aceraceae), ironwood (*Eusideroxylon* sp. Teijsm. & Binnend., Lauraceae), yellow birch (*Betula alleghaniensis* Britton, Betulaceae), sugar maple (*Acer saccharum* Marsh., Aceraceae), white oak (*Quercus alba* L., Fagaceae), black cherry (*Prunus serotina* Ehrh., Rosaceae), and beech (*Fagus* sp., Fagaceae) (Prentice 1962). Other hosts include American hornbeam (*Carpinus caroliniana* Walter, Betulaceae), basswood (*Tilia americana* L., Tiliaceae), hophornbeam (*Ostrya* sp., Betulaceae), hazel (*Corylopsis* sp., Hamamelidaceae), poison ivy (*Toxicodendron radicans* (L.) Kuntze, Anacardiaceae), willow (*Salix* sp., Salicaceae), and witchhazel (*Hamamelis* sp., Hamamelidaceae) (Wagner 2005); river birch (*Betula nigra* L., Fagaceae) (Crumb 1956). The larva is illustrated in Wagner (2005).

8. *Morrisonia triangula* Sullivan & Adams Triangle-barred Morrisonia
(Figs. 16–17, Map 9)

Identification: Forewing length 16–19 mm. A distinct, black transverse bar runs across the frons at the dorsal eye margin. The forewing ground color is pale brownish gray. Distinct markings include the black costal triangle, black basal dash, and black anal dash, both just above the posterior margin of the forewing. The orbicular and reniform spots are barely outlined with black and rufous scales. Hindwing is gray with a slightly darker margin and pale rufous fringe.

This species was recently described (Sullivan and Adams 2009) and is a new species recorded for the Park.

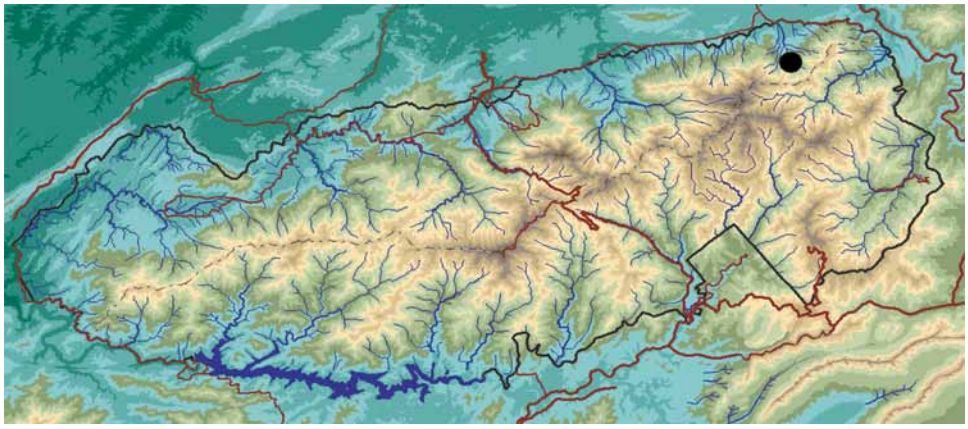
Flight period. Mid-May.

Collected localities: Tennessee: Cocke Co., Cosby Ranger Station. (1 specimen)

Elevation range: 1750 ft. (533 m)

General distribution: A southeastern species distributed from the eastern shore of Maryland, south to Florida, and west to Tennessee, Alabama, Mississippi, Louisiana, Arkansas, and Texas.

Larval hosts: Unknown.



MAP 9. Collecting localities of *Morrisonia triangula*.

9. *Orthosia alurina* (Smith) Gray Quaker
(Figs. 18–19, Map 10)

Identification: Forewing length 15–18 mm. Male has bipectinate antennae, filiform in female. Ground color of forewing reddish-brown with antemedial, medial, postmedial, and subterminal lines a darker ground color and inconspicuous; in some specimens there can be a few black scales in these lines. Orbicular and reniform spots faint and outlined with cream-colored scales. Hindwing dirty white suffused with dark gray scales. A small discal spot is present, terminal line thin, and some specimens have a faint postmedial line.

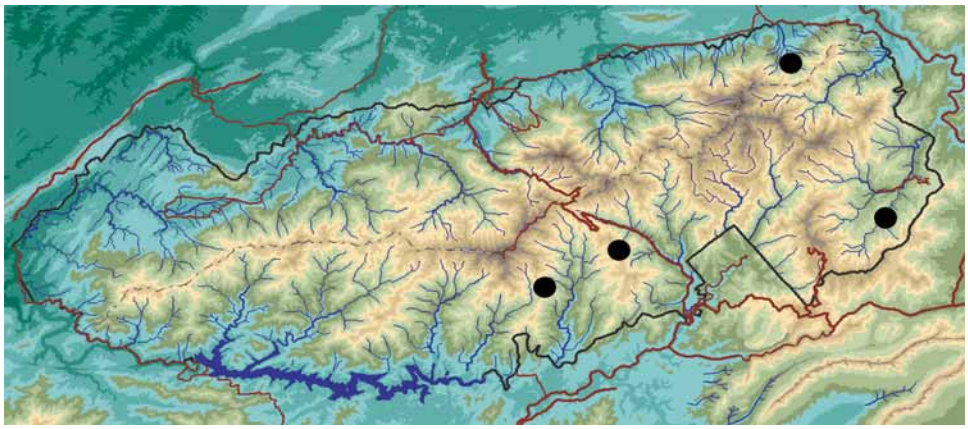
Flight period: March to April.

Collected localities: North Carolina: Haywood Co., Purchase Knob; Swain Co., Beetree Ridge; Noland Creek. Tennessee: Cocke Co., Cosby Ranger Station. (5 specimens)

Elevation range: 1750–4924 ft. (533–1501 m)

General distribution: This is an eastern species distributed from New York south to Florida and west to Kansas and Texas.

Larval hosts: Eggs were obtained from females and the larvae were reared on chokecherry (*Prunus virginiana* L., Rosaceae) and black cherry (*Prunus serotina* Ehrh., Rosaceae) (Godfrey 1972). The larva is described in Wagner (2005).



MAP 10. Collecting localities of *Orthosia alurina.*

10. *Orthosia garmani* (Grote) Garman's Quaker
(Figs. 20–21, Map 11)

Identification: Forewing length 15–19 mm. Male has serrate antennae, filiform in female. Forewing ground color is dark reddish brown. Antemedial and postmedial lines are faint and cream-colored. Orbicular and reniform spots are faint and cream-colored to light reddish brown with black borders distally and proximally on the orbicular spot and only proximally on the reniform spot. Subterminal line is black and consists of a subapical black spot that is usually connected to a series of four contiguous black spots by a thin line of black scales. Hindwing is dirty white suffused with reddish-brown scales, a faint discal spot is present, and terminal line is absent.

Flight period: March.

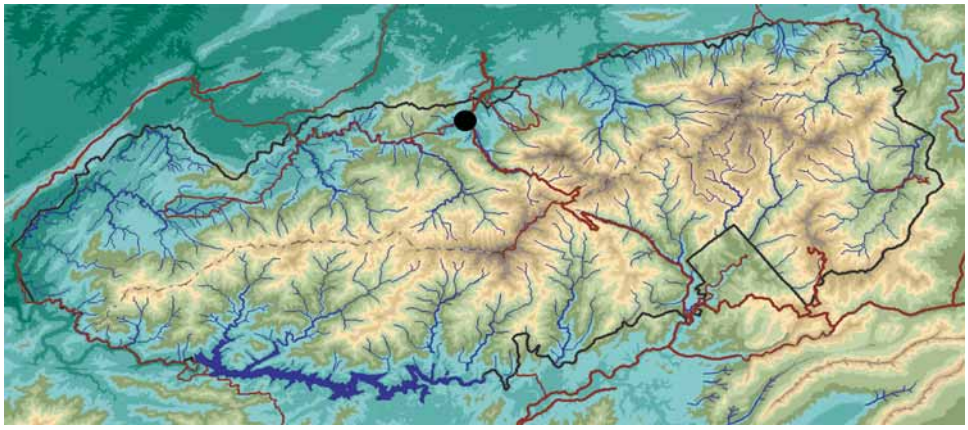
Collected localities: Tennessee: Sevier Co., Park Headquarters. (2 specimens)

Elevation range: 1480 ft. (451 m)

General distribution: An eastern and midwestern species distributed from New York south to Tennessee and west to North Dakota, Kansas, and Texas.

Larval hosts: Larvae obtained from eggs have been reared from chokecherry (*Prunus virginiana* L., Rosaceae), cherry (*Prunus* spp.), black walnut (*Juglans nigra* L., Juglandaceae), sugar maple (*Acer saccharum* Marsh., Aceraceae) (Godfrey 1972). McFarland (1967) also reared this species from eggs on elm

(*Ulmus* sp., Ulmaceae) and dogwood (*Cornus* sp., Cornaceae) and mentions that it is probably a general feeder on woody plants.



MAP 11. Collecting localities of *Orthosia garmani.*

11. *Orthosia hibisci* (Guenée) Speckled Green Fruitworm Moth (adult), Speckled Green Fruitworm (larva)
(Figs. 22–23, Map 12)

Identification: Forewing length 15–19 mm. Male has serrate antenna, filiform in female. Forewing ground color is grayish brown to pale reddish brown. Antemedial line varies from being absent to dark reddish brown with black scales, but in most specimens the line is faint. Postmedial line can be absent to consisting of a series of black spots on veins from costa to posterior margin with dark reddish brown between the costal spots. A thin cream-colored subterminal line shaded proximally with dark reddish brown is present. Orbicular spot is gray and reniform spot is gray dorsally and dark gray ventrally; both spots are outlined with cream-colored scales. Hindwing is pale gray with a faint discal spot.

Flight period: March to May.

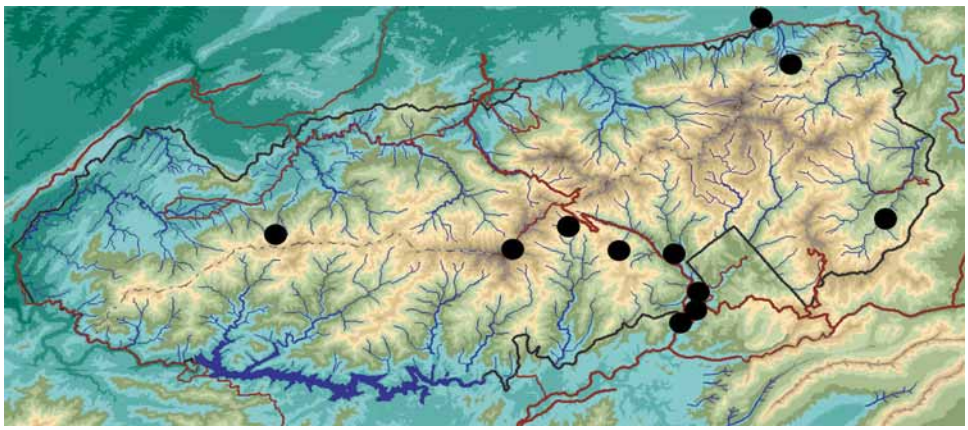
Collected localities: North Carolina: Haywood Co., Purchase Knob; Swain Co., Beetree Ridge, Upper Noland Divide Trailhead ca. Clingman's Dome, Big Cove Road site c, Big Cove Road site p, Big Cove Road site b, Noland Creek, Smokemont. Tennessee: Blount Co., Cold Spring Gap; Cocke Co., Cosby Ranger Station, Foothills Parkway south overlook. (16 specimens)

Elevation range: 1750–4924 ft. (533–1501m)

General distribution: This is a widespread species distributed across Canada from Nova Scotia to British Columbia and in the U.S. from New Hampshire south to South Carolina, throughout the Midwest to the southwest, and west coast.

Larval hosts: A common and highly polyphagous species, including both deciduous and coniferous trees and woody shrubs. In the prairie regions of Canada, the preferred host is quaking aspen and in Ontario it is white birch (Prentice 1962). The following hosts are arranged in order of preference based on the number of specimens collected from each host: quaking aspen (*Populus tremuloides* Michx., Salicaceae), willow, (*Salix* sp., Salicaceae), European white birch (*Betula pendula* Roth, Betulaceae), balsam poplar (*Populus balsamifera* L., Salicaceae), white spruce (*Picea glauca* (Moench) Voss, Pinaceae), speckled alder (*Alnus incana* (L.) Moench, Betulaceae), boxelder (*Acer negundo* L., Aceraceae), American elm (*Ulmus americana* L., Ulmaceae), chokecherry (*Prunus virginiana* L., Rosaceae), basswood (*Tilia americana* L., Tiliaceae), green ash (*Fraxinus pennsylvanica* Marsh., Oleaceae), red alder (*Albus rubra* Bong., Betulaceae), white ash (*Fraxinus americana* L., Oleaceae), bigtooth aspen (*Populus grandidentata* Michx., Salicaceae), bur oak (*Quercus. macrocarpa* Michx., Fagaceae), Douglas-fir (*Pseudotsuga menziesii* (Mirb.) Franco, Pinaceae), jack pine (*Pinus banksiana* Lamb., Pinaceae), hickory (*Carya* sp., Juglandaceae), balsam fir (*Abies balsamea* (L.) Mill., Pinaceae), hazel (*Corylopsis* sp., Hamamelidaceae), Oregon white oak (*Quercus garryana* Douglas

ex Hook., Fagaceae), red oak (*Quercus rubra* L., Fagaceae), mountain ash (*Sorbus* sp., Rosaceae), tamarack (*Larix laricina* (Du Roi) K. Koch, Pinaceae), western hemlock (*Tsuga heterophylla* (Raf.) Sarg., Pinaceae), ironwood (*Eusideroxylon* sp. Teijsm. & Binnend., Lauraceae), black spruce (*Picea mariana* (Mill.) Britton, Sterns, & Poggenb., Pinaceae), western red cedar (*Thuja plicata* Donn ex D. Don, Cupressaceae), pin cherry (*Prunus pennsylvanica* L., Rosaceae), beech (*Fagus* sp., Fagaceae), hemlock (*Tsuga* sp., Pinaceae), locust (*Gleditsia* sp., Fabaceae), arborvitae (*Thuja occidentalis* L., Cupressaceae), apple (*Malus* sp., Rosaceae), alternateleaf dogwood (*Cornus alternifolia* L. f., Cornaceae), cranberry (*Vaccinium macrocarpon* Aiton, Ericaceae), black cottonwood (*Populus balsamifera* L. ssp. *trichocarpa* (Torr. & A. Gray ex Hook.) Brayshaw, Salicaceae), and redosier dogwood (*Cornus sericea* L., Cornaceae) (Prentice 1962). Other hosts include autumn olive (*Elaeagnus umbellata* Thunb., Elaeagnaceae) and gooseberry (*Ribes* sp., Grossulariaceae) (Wagner 2005). The larva is illustrated in Wagner (2005).



MAP 12. Collecting localities of *Orthosia hibisci.*

12. *Orthosia revicta* (Morrison) Subdued Quaker
(Figs. 24–25, Map 13)

Identification: Forewing length 15–18 mm. The forewing ground color is variable from dark reddish brown to pale gray. Antemedial line is variable from absent on dark colored specimens to a series of contiguous crescent-shaped spots. Postmedial line is a series of small black spots on wing veins that can be variable in number and intensity. Subterminal line is cream colored proximally and ferruginous distally or can be a series of black spots. Orbicular spot is ground color and bordered with cream colored and ferruginous scales. Reniform spot is darker than orbicular spot and similarly ringed. A remnant of the claviform spot, a thin curved ferruginous and cream-colored line, below orbicular spot. Hindwing is dirty white suffused with gray and ferruginous scales with a faint discal spot in most specimens.

Flight period: Late March to early May.

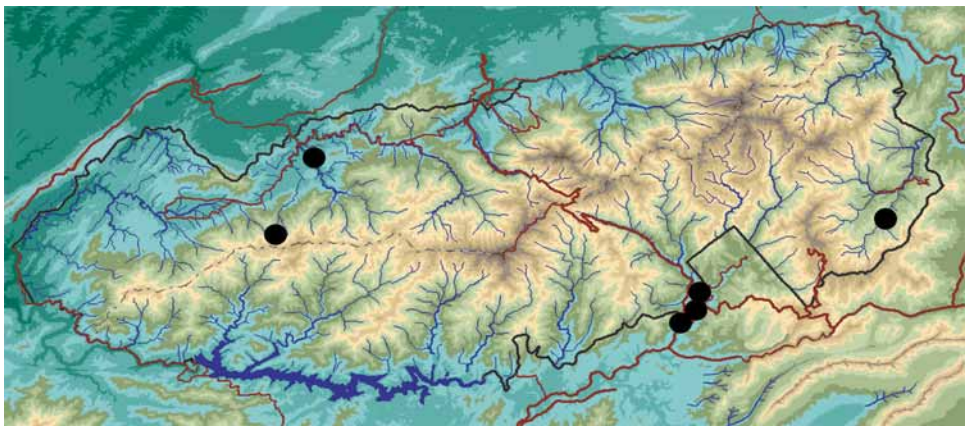
Collected localities: North Carolina: Haywood Co., Purchase Knob; Swain Co., Big Cove Road site b, Big Cove Road site c, Big Cove Road site p. Tennessee: Blount Co., Cold Spring Gap, Tremont GSMI. (15 specimens)

Elevation range: 1390–4924 ft. (424–1501m)

General distribution: This is a widespread species occurring across Canada from New Brunswick and Nova Scotia to British Columbia, except for Quebec, and in the U.S. from Maine to North Carolina and Tennessee west to Colorado and Utah and north to Washington, Oregon, and Alaska.

Larval hosts: A polyphagous species on forest trees. The following hosts are arranged in order of preference based on the number of specimens collected from each host: willow (*Salix* sp., Salicaceae), quaking aspen (*Populus tremuloides* Michx., Salicaceae), sugar maple (*Acer saccharum* Marsh., Aceraceae), white ash (*Fraxinus americana* L., Oleaceae), basswood (*Tilia americana* L., Tiliaceae), European white

birch (*Betula pendula* Roth, Betulaceae), yellow birch (*Betula alleghaniensis* Britton, Betulaceae), beech (*Fagus* sp., Fagaceae), red maple (*Acer rubrum* L., Aceraceae), bigtooth aspen (*Populus grandidentata* Michx., Salicaceae), American elm (*Ulmus americana* L., Ulmaceae), black walnut (*Juglans nigra* L., Juglandaceae), hickory (*Carya* sp., Juglandaceae), pin cherry (*Prunus pennsylvanica* L., Rosaceae), white oak (*Quercus alba* L., Fagaceae), red oak (*Quercus rubra* L., Fagaceae), bur oak (*Quercus. macrocarpa* Michx., Fagaceae) (Prentice 1962). Other hosts include rose spirea (*Spiraea douglasii* Hook., Rosaceeae) and apple (*Malus* sp., Rosaceae) (Crumb 1956). The larva is illustrated in Wagner (2005).

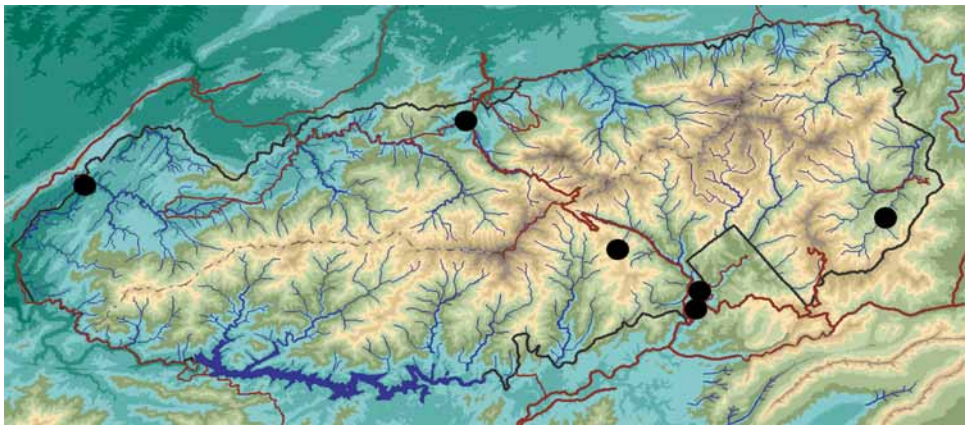


MAP 13. Collecting localities of *Orthosia revicta.*

13. *Orthosia rubescens* (Walker) Ruby Quaker
(Figs. 26–28, Map 14)

Identification: Forewing length 15–18 mm. Male with bipectinate antenna with long pectinations, female antenna is filiform. Forewing color is variable from reddish brown to dark reddish brown. The antemedial and postmedial lines are virtually absent. Usually lighter colored specimens may have a few black dots that make up these lines. The orbicular and reniform spots are usually prominent, especially on darker specimens. The orbicular spot is cream colored with some reddish-brown scales in center and the reniform is reddish brown with gray scales in the ventral half and is ringed with cream colored scales. Hindwing is variable from dirty white suffused with gray scales to gray and the fringe is dirty white to cream colored.

Flight period: Mid-March to April.



MAP 14. Collecting localities of *Orthosia rubescens.*

Collected localities: North Carolina: Haywood Co., Purchase Knob; Swain Co., Beetree Ridge, Big Cove Road site b, Big Cove Road site p. Tennessee: Blount Co., Abrams Falls parking area; Sevier Co., Park Headquarters. (12 specimens)

Elevation range: 1160–4924 ft. (354–1501m)

General distribution: An eastern species that is distributed from Nova Scotia to Ontario in Canada, and from Maine south to Great Smoky Mountains National Park and west to Wisconsin and Missouri.

Larval hosts: A general feeder on both deciduous and coniferous trees and woody shrubs including beech (*Fagus* sp., Fagaceae), birch (*Betula* sp., Betulaceae), blueberry (*Vaccinium* sp., Ericaceae), cherry (*Prunus* sp., Rosaceae), chestnut (*Castanea* sp., Fagaceae), elderberry (*Sambucus* sp., Caprifoliaceae), gooseberry (*Ribes* sp., Grossulariaceae), greenbrier (*Smilax* sp., Smilacaceae), hemlock (*Tsuga* sp., Pinaceae), holly (*Ilex* sp., Aquifoliaceae), hophornbeam (*Ostrya* sp., Betulaceae), maple (*Acer* sp., Aceraceae), oak (*Quercus* sp., Fagaceae), and viburnum (*Viburnum* sp., Caprifoliaceae); sometimes found on forbs and other low-growing plants (Wagner 2005). The larva is illustrated in Wagner (2005).

Tribe Tholerini Beck, 1996

14. *Nephelodes minians* (Guenée) Bronzed Cutworm Moth (adult), Bronzed Cutworm (larva)
(Fig. 29, Map 15)

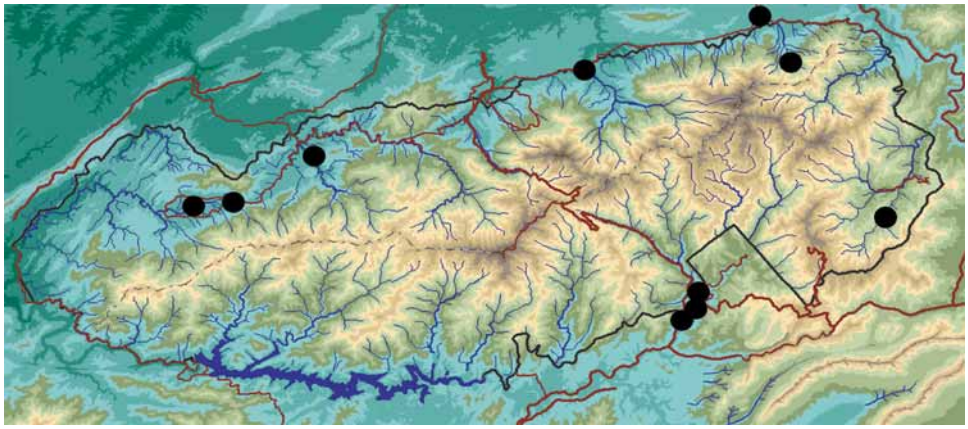
Identification: Forewing length 15–23 mm. Male antenna with short bipectinations, female antenna filiform. The forewing color varies from reddish brown to dark reddish brown. The antemedial line is a series of slight crescent-shaped lines between the veins that are darker than ground color or can be obscured in darker specimens. A large, median, dark reddish-brown irregular spot surrounds the orbicular and reniform spots, extends from costa to posterior margin with the postmedial line forming the distal margin. Hindwing is dirty white suffused with gray to dark gray and a pinkish fringe.

Flight period: September to mid October.

Collected localities: North Carolina: Haywood Co., Purchase Knob, Purchase Knob NW of house; Swain Co., Big Cove Road site b, Big Cove Road site c, Big Cove Road site p, Big Cove Road site w. Tennessee: Blount Co., Cades Cove near Ranger Station, Cades Cove Primitive Baptist Church, Cades Cove Campground, Tremont Environmental Center; Cocke Co., Cosby ATBI House, Cosby Campground area, Foothills Parkway 2nd overlook east; Sevier Co., Greenbrier near Ranger Station. (52 specimens)

Elevation range: 1360–4924 ft. (415–1501m)

General distribution: A widespread species occurring across Canada from Newfoundland to British Columbia and in the U.S. from Maine south to North Carolina, Tennessee, Louisiana, and Texas west to the west coast.



MAP 15. Collecting localities of *Nephelodes minians*.

Larval hosts: The bronzed cutworm is an occasional pest of lawns, golf roughs, and pastures (Potter 1998). Hosts include corn (*Zea mays* L., Poaceae), grass (*Poa* spp., Poaceae), cereal crops, bluegrass (*Poa* spp., Poaceae), timothy (*Phleum pratense* L., Poaceae), clover (*Trifolium* sp., Fabaceae), and has been reported feeding on the buds and leaves of fruit trees (Crumb 1926, Tietz 1972, Potter 1998). French (1878) reported the bronzed cutworm feeding on corn, grass, and prostrate knotweed (*Polygonum aviculare* L. Polygonaceae) in captivity. The larva is illustrated in Wagner (2005).

Tribe Hadenini Guenée, 1837

15. *Dargida diffusa* (Walker) Wheat Head Armyworm Moth (adult), Wheat Head Armyworm (larva) (Figs. 30–31, Map 16)

The former name of this species was *Faronta diffusa.* A recent revision has synonymized the genus *Faronta* with *Dargida* (Rodríguez and Angulo 2005).

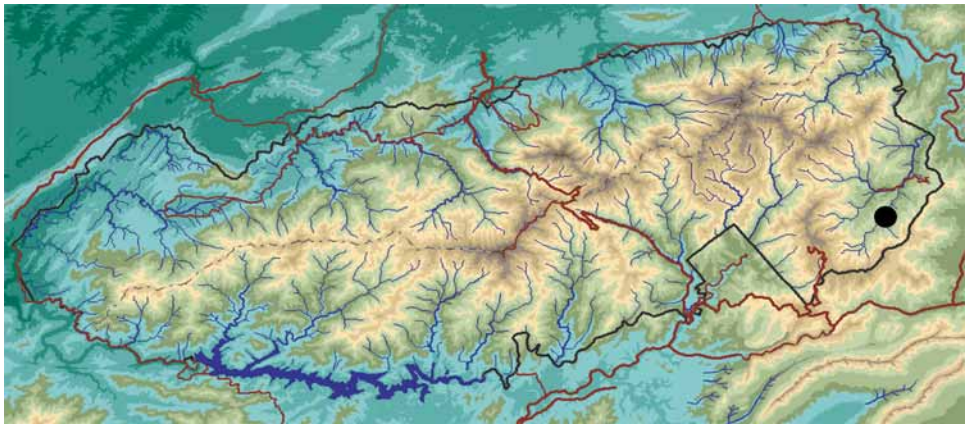
Identification: Forewing length 13–16 mm. This is an easily recognized species with the cream-colored forewing and horizontal stripes. The space between the costa and R vein from base to apex is a mixture of white and pale gray scales. A grayish-brown triangular patch at end of discal cell extends from vein M3 to M1 to outer margin. Vein Cu is highlighted white with two black dashes, one at base and one at the fork of Cu and Cu1 just below vein Cu. Reniform spot is a small black dot. Hindwing is white with veins highlighted with gray and becomes more heavily suffused with gray toward outer margin. Some specimens can have almost a completely gray hindwing.

Flight period: Mid-June.

Collected localities: North Carolina: Haywood Co., Purchase Knob. (1 specimen)

Elevation range: 4924 ft. (1501m)

General distribution: This is a widespread species occurring from Nova Scotia to Saskatchewan in Canada and from Maine to North Carolina and across the Midwest and Southwest to California and Oregon.



MAP 16. Collecting localities of *Dargida diffusa.*

Larval hosts: This is the Wheat Head Armyworm and is a pest of wheat and other grains, including sorghum and corn. This is a polyphagous species preferring species in the grass family (Poaceae). Other hosts include: slender wheatgrass (*Elymus trachycaulus* (Link) Gould ex Shinners ssp. *subsecundus* (Link) A. Löve & D. Löve, Poaceae), big bluestem (*Andropogon gerardi* Vitman, Poaceae), common oat (*Avena sativa* L., Poaceae), bluejoint (*Calamagrostis canadensis* (Michx.) P. Beauv., Poaceae), orchardgrass (*Dactylis glomerata* L., Poaceae), barnyardgrass (*Echinochloa crus-galli* (L.), Poaceae), Canada wildrye (*Elymus canadensis* L., Poaceae), foxtail barley (*Hordeum jubatum* L., Poaceae), common barley (*Hordeum vulgare* L., Poaceae), rice (*Oryza sativa* L., Poaceae), timothy (*Phleum pratense* L., Poaceae), cereal rye (*Secale cereale* L., Poaceae), yellow foxtail (*Setaria pumila* (Poir.) Roem. & Schlult. ssp. *pumila*, Poaceae), green

bristlegrass (*Setaria viridis* (L.) P. Beauv., Poaceae), indiangrass (*Sorghastrum nutans* (L.) Nash, Poaceae), sorghum (*Sorghum bicolor* (L.) Moench, Poaceae), common wheat (*Triticum aestivum* L., Poaceae), splet (*Triticum spelta* L., Poaceae), corn (*Zea mays* L., Poaceae), bindweed (*Convolvulus* sp., Convolvulaceae), clover (*Trifolium* sp., Fabaceae), and black bindweed (*Polygonum convolvulus* L., Polygonaceae) (Tietz 1972).

16. *Hadena ectypa* (Morrison) The Starry Campion Moth
(Fig. 32, Map 17)

Identification: Forewing length 12–15 mm. Overall appearance is that of a dark gray moth with patterns of gray, brown, and black. The most distinguishing characters are the large black, triangular shaped claviform spot just below the orbicular spot and the fine, white subterminal line running from the apex to the posterior margin. Along the costa just prior to the subterminal line are three white dashes. The orbicular spot is angled toward the head and the reniform spot is more or less vertical and both are ground color, with fine black borders distally and proximally. Hindwing is dark gray to dark brown with a white fringe.

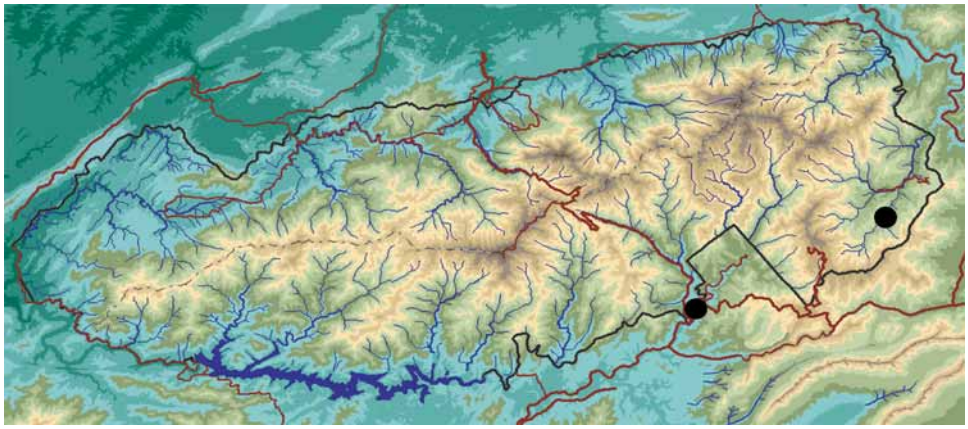
Flight period: End of May and end of July.

Collected localities: North Carolina: Haywood Co., Purchase Knob E of house, Purchase Knob at lower creek; Swain Co., Big Cove Road site p. (5 specimens)

Elevation range: 2040 and 4000–4838 ft. (622 and 1219–1475 m)

General distribution: An uncommon species from New York south to Great Smoky Mountains National Park and west to Illinois and Kansas.

Larval hosts: The larvae are seed predators and seem to be restricted to only two closely related host plants, widowsfrill (*Silene stellata* (L.) W.T. Aiton, Caryophyllaceae) and fire pink (*Silene virginica* L.) (Kephart *et al.* 2005).



MAP 17. Collecting localities of *Hadena ectypa.*

17. *Melanchra adjuncta* (Morrison) Hitched Arches
(Fig. 33, Map 18)

Identification: Forewing length 15–19 mm. This is a black moth with white markings. The white markings include the basal line, orbicular spot, prominent reniform spot, and a zig-zag subterminal line. There are two small white spots on the costa above both the orbicular and reniform spots and three short dashes along costa between reniform and apex. Hindwing is white, but heavily suffused with black giving a dark gray appearance. The veins are highlighted with black and a faint postmedial line is present in most specimens. There is a series of shallow crescent-shaped lines between the veins along the outer margin.

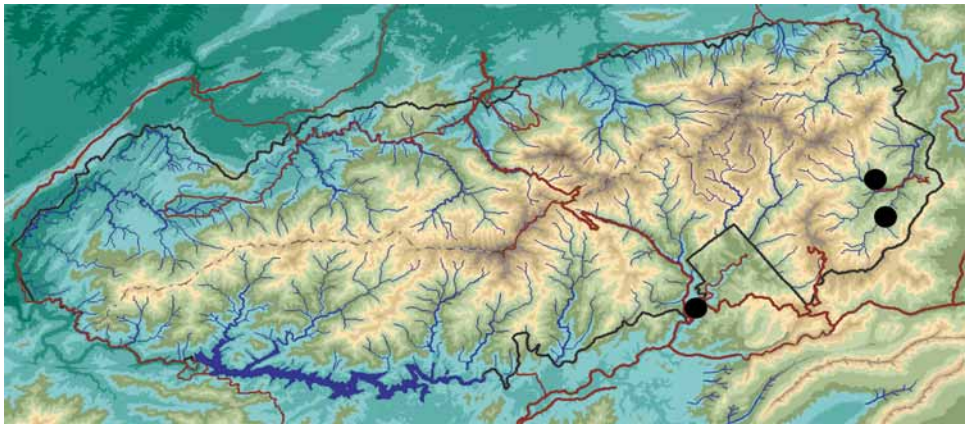
Flight period: May to June and August, apparently double brooded in the Park.

Collected localities: North Carolina: Haywood Co., Cataloochee, Purchase Knob, Purchase Knob at house, Purchase Knob NW of house; Swain Co., Big Cove Road site p. (11 specimens)

Elevation range: 2040–2600 and 4800–4924 ft. (622–792 and 1463–1501m)

General distribution: A common widespread species from Newfoundland across Canada to British Columbia and in the U.S. from Maine south to North Carolina and Arkansas and west to Utah, Idaho, Oregon, and Washington.

Larval hosts: This species has a wide range of hosts that include western brackenfern (*Pteridium aquilinum* (L.) Kuhn var. *latiusculum* (Desv.) Underw. ex A. Heller, Dennstaeditiaceae), garden asparagus (*Asparagus officinalis* L., Liliaceae), white snakeroot (*Ageratina altissima* (L.) King & H. Rob., Asteraceae), Canada goldenrod (*Solidago altissima* L., Asteraceae), Virginia strawberry (*Fragaria virginiana* Duschesne, Rosaceae), bitter cherry (*Prunus emarginata* (Douglas ex Hook.) D. Dietr., Rosaceae), phlox (*Phlox* sp., Polemoniaceae), and oldfashioned weigela (*Weigela florida* (Bunge) A. DC., Caprifoliaceae) (Tietz 1972). Covell (1984) added clover (*Trifolium* spp., Fabaceae), dandelion (*Taraxacum* spp., Asteraceae), and elm (*Ulmus* sp., Ulmaceae). In Ohio additional host plants include plantain (*Plantago* spp., Plantaginaceae) and willow (*Salix* sp., Salicaceae) (Anonymous 2008).



MAP 18. Collecting localities of *Melanchra adjuncta.*

18. *Melanchra assimilis* (Morrison) Black Arches
(Fig. 34, Map 19)

Identification: Forewing length 15–17 mm. This is a dark gray moth with black markings and a white angular spot at the juncture of the outer and posterior margins of the forewings. The black markings include an orbicular spot, claviform spot, an incomplete antemedial line extending from the claviform to posterior margin, forming a short scalloped line, a reniform spot, and a very fine curved, scalloped postmedial line. The subterminal line consists of three obscure white dots bordered by a few black scales in apical half of forewing, a variable amount of white scales (sometimes mostly absent) leading to the angular white spot at the tornus. Hindwing is white with a gray discal spot and a wide gray marginal band that can vary in intensity.

Flight period: Mid-August in the Park.

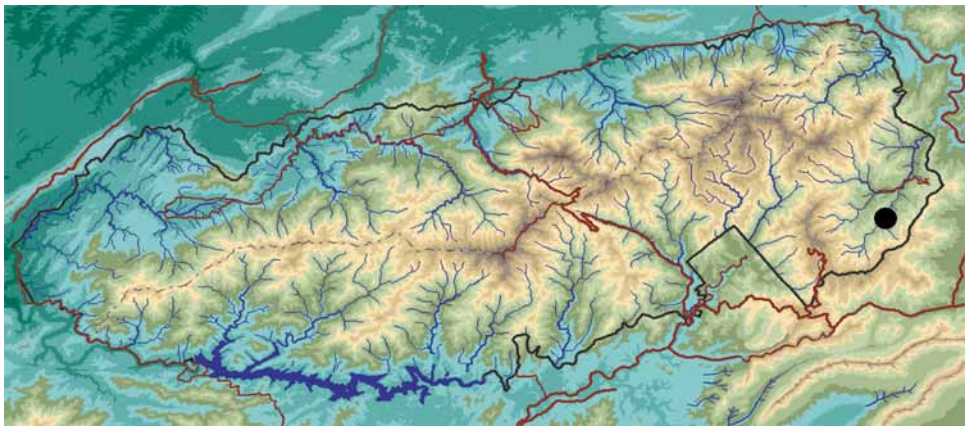
Collected localities: North Carolina: Haywood Co., Purchase Knob at house. (1 specimen)

Elevation range: 4924 ft. (1501m)

General distribution: This is a boreal species that is distributed across Canada from Nova Scotia to British Columbia and in the United States from Maine south to western Maryland and in Great Smoky Mountains National Park in Hayward Co., North Carolina. It is also distributed in the upper Midwest from northern Ohio west to North Dakota.

Larval hosts: This species is a fairly polyphagous, mainly feeding on low forest plants and occasionally invading forest trees as a solitary defoliatior (Prentice 1962). Hosts include goldenrod (*Solidago* sp.,

Asteraceae) (Goodell 1881); brake fern (*Pteris* sp., Pteridaceae) (Dyar 1904); bracken and other low plants (Forbes 1954); willow (*Salix* sp., Salicaceae) (Crumb 1956); buffalo berry (*Shepherdia* sp., Elaeagnaceae), alder (*Alnus* sp., Betulaceae), European white birch (*Betula pendula* Roth, Betulaceae), white ash (*Fraxinus americana* L., Oleaceae) (Prentice 1962); and cinnamon fern (*Osmunda cinnamomea* L., Osmundaceae), gray birch (*Betula populifolia* Marsh., Betulaceae), birch (*Betula* sp., Betulaceae) (Godfrey 1972). The larva is illustrated in Wagner (2005).



MAP 19. Collecting localities of *Melanchra assimillis.*

19. *Polia detracta* (Walker) Disparaged Arches
(Figs. 35–37, Map 20)

Identification: Forewing length 13–17 mm. The male antenna is bipectinate and is filiform in the female. The overall appearance of this species is that of a dark gray moth with a prominent, black, triangular claviform spot in the forewing. This species closely resembles *Hadena ectypa*, but lacks the fine, white subterminal line found in *H. ectypa*. There is a small black spot at base of forewing below Cu vein. The orbicular and reniform spots are prominent, lighter than the ground color, and bordered with black. Hindwing is dark gray.

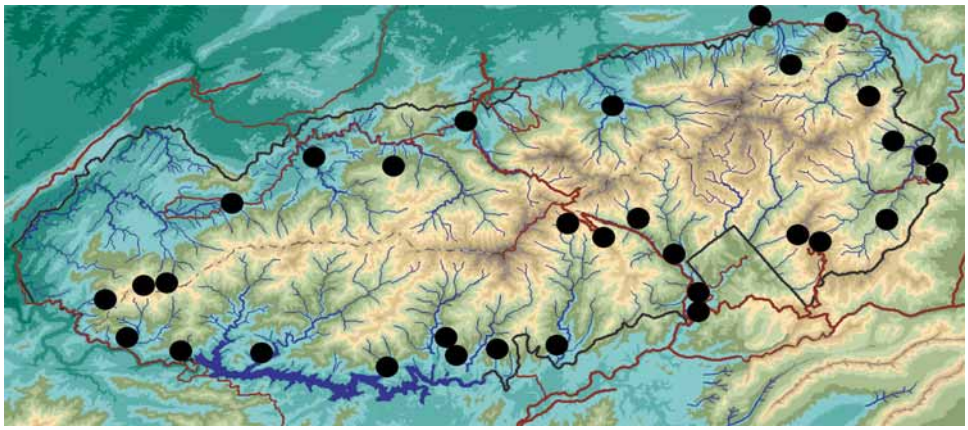
Flight period: Mid-May to mid-August.

Collected localities: North Carolina: Haywood Co., Balsam Mtn. Picnic area on Flat Creek Trail, Cataloochee pull off at Sal Patch Gap, Cataloochee uphill from pull off across road, Cove Creek Rd., Cove Creek Rd. just west of paved section 0.5 rd. mi from park edge, trail to Hannah Hogden Cemetery, Mt. Sterling trail 0.72 mi from Trailhead, Purchase Knob, Purchase Knob 1.1 rd. mi from house, Purchase Knob north of house, Purchase Knob NW of house, Purchase Knob at house, Purchase Knob at lower creek, Rough Fork Trail Polls Gap on Balsam Mtn. Rd. 6.1 mi N of Blue Ridge Parkway; Swain Co., Big Cove Rd. site b, Big Cove Rd. site p, Big Cove Rd. site w, 13.5 mi NE of GSMNP entrance on Rt. 441 Thomas Divide trail, 15.2 mi NE of GSMNP entrance on Rt. 441 Deep Creek Trail, 8.3 mi NW of GSMNP entrance on Rt. 441 Kephart Prong trail, Lakeview Dr. at 1st turnaround Quietway Trail, 0.2 km W mouth of Hazel Creek, 0.5 km from mouth of Chanbers Creek 300 ft up hillside on NW side, 0.7 km up creek from mouth of Goldmine Creek, 300 ft. above lake on Welch Ridge, 0.7 km S Payne Cemetery, Smokemont, 0.1 mi NE of Twentymile Ranger Station, 0.2 mi NE of Twentymile Ranger Station. Tennessee: Blount Co., Cades Cove Ranger Station, 0.2 mi SW of Campsite 13 on Wolf Ridge trail, Parsons Bald, Spence Field, Tremont; Cocke Co., Cosby 3.6 mi E of Jct. on Rt. 32, Cosby ATBI house, Foothills Parkway, Foothills Parkway at I-40, Foothills Parkway south overlook, Foothills Parkway 2nd pullout, Foothills Parkway East, Foothills Parkway East 1.3 mi N of 321; Sevier Co., E of Campsite 20, W of Campsite 20, Campsite 20 near creek, Greenbrier covered picnic area 3.5 mi S Rt. 321, Sugarlands Visitor Center. (210 specimens)

Elevation range: 1330–5265 ft. (405–1605 m)

General distribution: A widespread and common species from New Brunswick and Nova Scotia across Canada to British Columbia. In the U.S. it occurs from Maine south to Florida and west to Montana and Utah.

Larval hosts: Host plants predominantly include trees and woody shrubs, such as pale serviceberry (*Amelanchier pallida* Greene, Rosaceae), gray birch (*Betula populifolia* Marsh., Betulaceae), hickories (*Carya* spp., Juglandaceae), oaks (*Quercus* spp., Fagaceae), white oak (*Quercus alba* L., Fagaceae), common dandelion (*Taraxacum officinale* F.H. Wigg., Asteraceae), lowbush blueberry (*Vaccinium angustifolium* Aiton, Ericaceae), and velvetleaf huckleberry (*Vaccinium myrtilloides* Michx., Ericaceae) (Tietz 1972). Covell (1984) added clover.

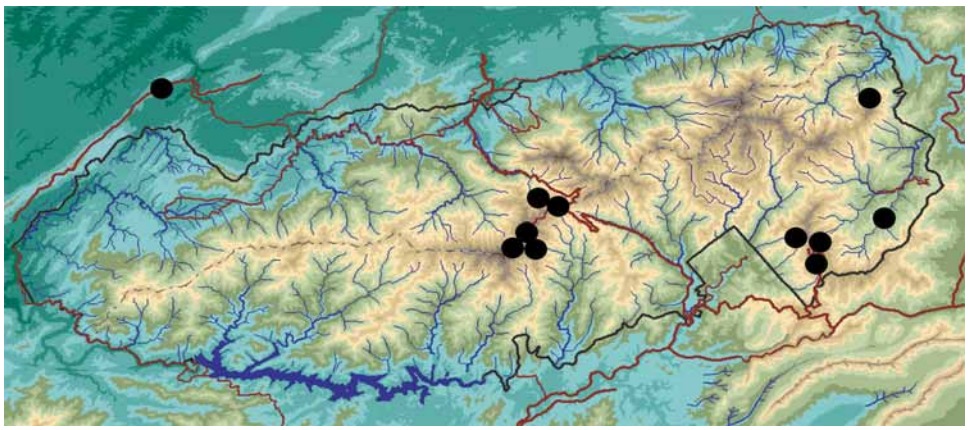


MAP 20. Collecting localities of *Polia detracta.*

20. *Polia imbrifera* (Guenée) Cloudy Arches
(Fig. 38, Map 21)

Identification: Forewing length 21–26 mm. Frons has a black horizontal stripe below antennae. The male antenna is serrate and is filiform in the female. This is a large dark gray species with prominent white orbicular and reniform spots that are suffused with gray and bordered by black scales. Claviform spot is gray with a black border. Proximal to the subterminal line are various sized black triangulate spots with the largest an oblong spot just above the tornus. Hindwing is dark gray with a faint postmedial line.

Flight period: June to early August and one record from mid-October, apparently double brooded in the Park.



MAP 21. Collecting localities of *Polia imbrifera.*

Collected localities: North Carolina: Haywood Co., Balsam Mtn. picnic area on Flat Creek trail, Flat Creek trail on Balsam Mtn. road, Mt. Sterling Trail, Hemphill Bald trail at Polls Gap on Balsam Mtn. road, Purchase Knob, 1 mi SE of Purchase house off Purchase Road in forest, Purchase Knob 1.1 rd. mi from house, Purchase Knob at house, Purchase Knob Ferguson cabin, Purchase Knob E of house in field, Purchase Knob

NW of house in forest, Purchase Knob on road in meadow, Rough Fork trail at Polls Gap on Balsam Mtn. road 6.1 mi N of Blue Ridge Parkway; Swain Co., Noland Divide trail 1.2 mi NE on Clingman's Dome parking lot, 3.3 mi NE of Clingman's Dome parking lot on Fork Ridge trail, Indian Gap on Clingman's Dome road, 5.6 mi SW of Jct. 441 and Clingman's Dome Rd. on Noland Divide trail, Upper Noland Divide Trail ca. Clingman's Dome. Tennessee: Blount Co., 2.5 mi from Rt. 321 on Foothills Parkway West; Sevier Co., 1.3 mi W of Jct. 441 and Clingman's Divide road on Road Prong trail. (82 specimens)

Elevation range: This is typically a high elevation species ranging from 4630–6000 ft. (1411–1829 m), but there is one record from 1600 ft. (411 m) along the Foothills Parkway.

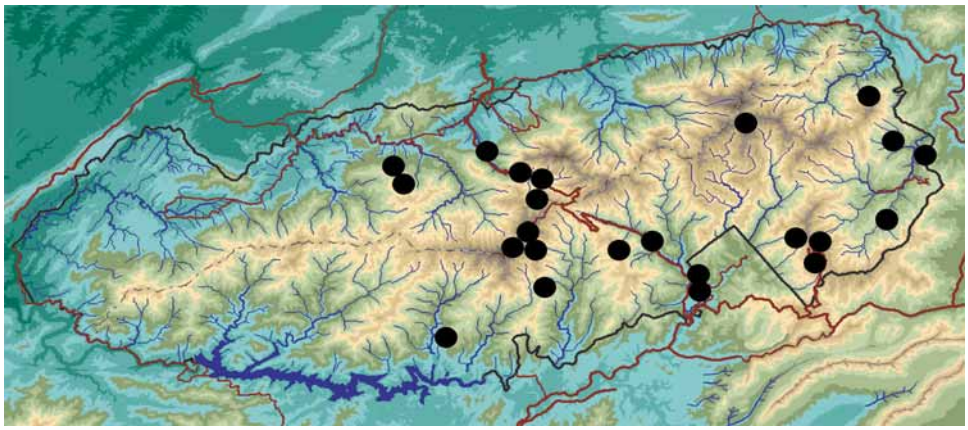
General distribution: Distributed across Canada from Newfoundland and Nova Scotia to British Columbia. In the U.S. this species ranges from Maine south to North Carolina and Tennessee and west to Montana, Colorado, and New Mexico.

Larval hosts: This species is somewhat polyphagous on woody shrubs and trees. Hosts include chokecherry (*Prunus virginiana* L., Rosaceae), willow (*Salix* sp., Salicaceae), sweet birch (*Betula lenta* L., Betulaceae), gray birch (*Betula populifolia* Marsh., Betulaceae), and speckled alder (*Alnus incana* (L.) Moench ssp. *rugose* (Du Roi) R.T. Clausen, Betulaceae) (Godfrey 1972).

21. *Polia nimbosa* (Guenée) Stormy Arches
(Figs. 39–40, Map 22)

Identification: Forewing length 21–26 mm. Frons with a horizontal black bar between the eyes and just below the antennae. Male and female antennae are filiform. A dorsal tuft of scales is present in the middle of the mesothorax. Forewing ground color is white with black markings giving an overall light gray appearance. Orbicular and reniform spots are distinct and outlined in black. There is a series of small black spots along costa from basal line to just below apex. Terminal line consists of a series of black crescent-shaped spots between the wing veins. Hindwing is dark gray with a faint postmedial line.

Flight period: Late June through August.



MAP 22. Collecting localities of *Polia nimbosa.*

Collected localities: North Carolina: Haywood Co., Balsam Mtn. picnic area on Flat Creek trail, Balsam Mtn. road on Flat Creek trail, Rough Fork trail at Polls Gap on Balsam Mtn. road 6.1 mi N of Blue Ridge Parkway, Cataloochee pull of at Sal Patch Gap, Cataloochee service road off Cataloochee road, Balsam Mtn. road at Polls Gap on Hemphill Bald trail, trail to Hannah Hogden Cemetery, Mt. Sterling trail, Mt. Sterling trail 0.72 mi from Trailhead, Mt. Sterling trail, Mt. Sterling trail 1.54 mi from Trailhead, Purchase Knob, Purchase Knob at house, Purchase Knob E of house in field, Purchase Knob E of house in forest, Purchase Knob N of house in forest, Purchase Knob NE of house in field, Purchase Knob NW of house in forest, Purchase Knob 0.5 mi N of gate; Swain Co., 200 yds. up Tow String road in meadow, Beetree Ridge, Big Cove Rd. site b, 1.2 mi NE of Clingman's Dome parking lot on Noland Divide trail, 3.3 mi NE of Clingman's

Dome parking lot on Fork Ridge trail, boglet 0.5 mi NW of Collins Creek picnic area, 5.6 mi SW of Jct. 441 and Clingman's Dome road on Noland Divide trail, Noland Creek, Noland Divide trailhead, Tricorner Knob, Upper Noland Divide trail ca. Clingman's Dome, Forney Creek 0.4 km up trail from lake. Tennessee Co., Sevier Co., W of Campsite 20, Cove Forest pullout on Rt. 441, 1 mi above Chimneys Campground, Hwy. 441 at upper hairpin, Campsite 27 on Jake's Creek trail, below Campsite 27 on Jake's Creek trail, near Campsite 27 on Jake's Creek trail, above Campsite 27 on Jake's Creek trail, Jake's Creek Trail, 1.3 mi W of Jct. 441 and Clingman's Dome road on Road Prong Trail, Road Prong Trail at road, ca. 7 mi S of Sugarlands Visitor Center. (162 specimens)

Elevation range: 2120–6000 ft. (646–1829 m)

General distribution: This is a widely distributed species from Manitoba, Alberta, and British Columbia in Canada, and from New Hampshire to North Carolina and Tennessee in the eastern U.S. west to Wisconsin, Montana, Colorado, Idaho, Oregon, and Washington.

Larval hosts: Feeds on woody shrubs and trees, including alder (*Alnus* spp., Betulaceae), red alder (*Alnus rubra* Bong., Betulaceae), huckleberry (*Gaylussacia* sp., Ericaceae), vine maple (*Acer circinatum* Pursh, Aceraceae), and gooseberry (*Ribes* sp., Grossulariaceae) (Godfrey 1972).

22. *Sideridis congermana* (Morrison)
(Fig. 41, Map 23)

Identification: Forewing length 13–17 mm. This species has a dark reddish-brown forewing with gray highlighted veins and white markings. It is similar is coloration to *O. rubescens*, but is easily distinguish by the male filiform antenna in *S. congemana*, whereas the male antenna of *O. rubescens* is bipectinate. The forewing has a white to pale rufous basal line from the costa to anal vein, antemedial line pale rufous and scalloped, orbicular spot small and white, reniform spot white speckled with gray internally, postmedial line with contiguous crescent-shaped lines between veins with a small white spot on each vein, and subterminal line consists of a series of white and pale rufous irregular shaped lines and spots that vary in intensity. Fringe has alternating gray and rufous and pale rufous spots giving a checked appearance. Hindwing is white with gray highlighted veins, faint discal spot, and a broad gray marginal band that suffuses into base of wing.

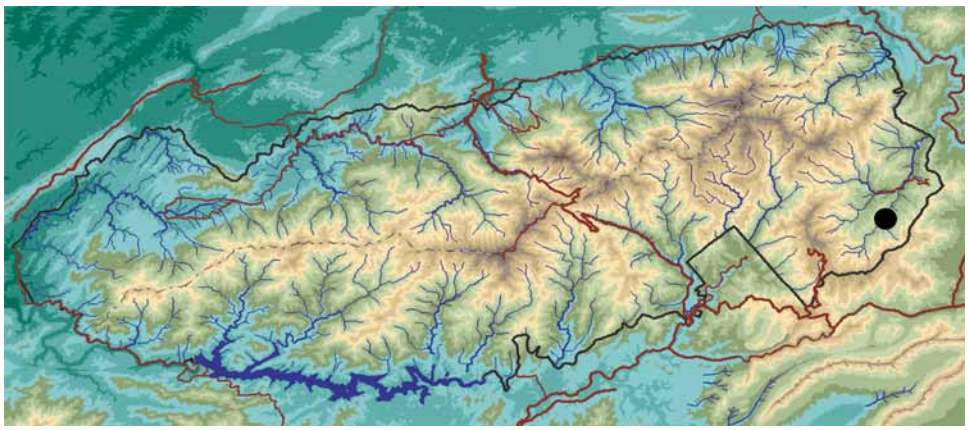
Flight period: Mid-August in the Park.

Collected localities: North Carolina: Haywood Co., Purchase Knob at house. (1 specimen)

Elevation range: 4924 ft. (1501m)

General distribution: An eastern species ranging from Nova Scotia, Canada, and in the United States from Maine south to North Carolina. Although it is widespread it is infrequently collected at black light.

Larval hosts: Unknown.



MAP 23. Collecting localities of *Sideridis congermana.*

23. *Spiramater lutra* (Guenée) Otter Spirameter
(Figs. 42–43, Map 24)

Identification: Forewing length 16–20 mm. Male and female antennae are filiform. Forewing ground color is dark gray with a large ferruginous patch between basal and antemedial lines below the Cu vein. There are a variable amount of ferruginous scales between the veins proximal to the white subterminal line. Orbicular and reniform spots are white with dark gray centers and outlined in black with the reniform being more distinct than the orbicular spot. Claviform spot is ground color outlined in black directly below the orbicular spot. There is a variably distinct patch of white and ferruginous scales along the posterior margin, below and slightly distal to the reniform spot. Hindwing is dirty white heavily suffused with gray and darker toward outer margin. A faint discal spot is present. Abdomen with a series of dorsal scale tufts.

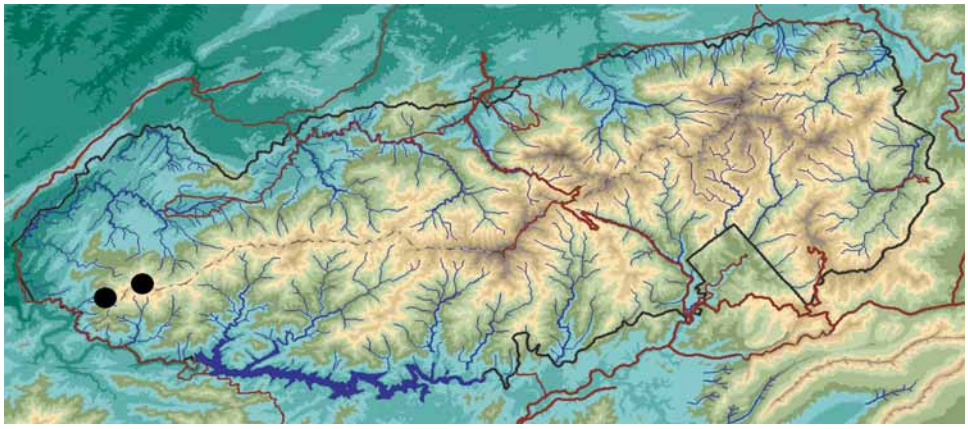
Flight period: Late May to early June.

Collected localities: Tennessee: Blount Co., 0.1 mi W of Gregory Bald; Parsons Bald. (3 specimens)

Elevation range: 4732–4929 ft. (1442–1502m)

General distribution: Across Canada from Newfoundland and Nova Scotia to British Columbia. In the eastern U.S. from Maine south to Great Smoky Mountains National Park and in the Midwest from Michigan, Indiana, North Dakota, and South Dakota, west to Montana, Colorado, Idaho, Washington, Oregon, and California.

Larval hosts: A polyphagous species especially on forest trees, including both coniferous and deciduous, and shrubs. The following hosts are arranged in order of preference based on the number of specimens collected from each host: Douglas fir (*Pseudotsuga menziesii* (Mirb.) Franco, Pinaceae), red alder (*Alnus rubra* Bong., Betulaceae), buffaloberry (*Shepherdia* sp., Elaeagnaceae), willow (*Salix* sp., Salicaceae), western hemlock (*Tsuga heterophylla* (Raf.) Sarg., Pinaceae), western red cedar (*Thuja plicata* Donn ex D. Don, Cupressaceae), water birch (*Betula occidentalis* Hook., Betulaceae), arbutus (*Epigaea* sp., Ericaceae), maple (*Acer* sp., Aceraceae), tamarack (*Larix laricina* (Du Roi) K. Koch, Pinaceae), European white birch (*Betula pendula* Roth, Betulaceae), speckled alder (*Alnus incana* (L.) Moench, Betulaceae), Oregon white oak (*Quercus garryana* Douglas ex Hook., Fagaceae), grand fir (*Abies grandis* (Douglas ex D. Don) Lindl., Pinaceae), Sitka spruce (*Picea sitchensis* (Bong.) Carrière, Pinaceae), white spruce (*Picea glauca* (Moench) Voss, Pinaceae), lodgepole pine (*Pinus contorta* Douglas ex Louden, Pinaceae), chokecherry (*Prunus virginiana* L., Rosaceae), hazel (*Corylopsis* sp., Hamamelidaceae), quaking aspen (*Populus tremuloides* Michx., Salicaceae), Pacific silver fir (*Abies amabilis* (Douglas ex Louden) Douglas ex Forbes, Pinaceae), dwarf birch (*Betula nana* L., Betulaceae), bigleaf maple (*Acer macrophyllum* Pursh, Aceraceae), white poplar (*Populus alba* L., Salicaceae), and gooseberry (*Ribes* sp., Grossulariaceae) (Prentice 1962). Other hosts include vine maple (*Acer circinatum* Pursh, Aceraceae), rose spirea (*Spiraea douglasii* Hook., Rosaceae), corn (*Zea mays* L., Poaceae), and plantain (*Plantago* sp. L., Plantaginaceae) (Crumb 1956); gray dogwood (*Cornus racemosa* Lam., Cornaceae) (Godfrey 1972).



MAP 24. Collecting localities of *Spiramater lutra*.

24. *Trichordestra legitima* (Grote) Striped Garden Caterpillar Moth (adult), Striped Garden Caterpillar (larva)
(Fig. 44, Map 25)

Identification: Forewing length 15–17 mm. Male and female antennae are filiform. Forewing ground color is pale gray suffused with ferruginous between costa and Cu vein. Orbicular spot is white outlined in black. Reniform spot is gray in ventral half, ferruginous dorsally, surrounded by white, and partially outlined in black. A diagnostic character is the black, triangular claviform spot that can be either solid or with a ferruginous center. Hindwing is dirty white, suffused with gray scales, especially along darker margin; discal spot present.

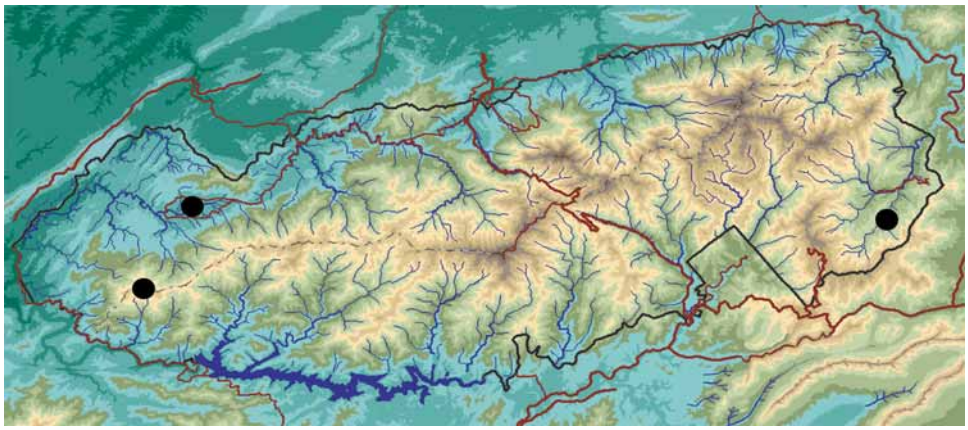
Flight period: August to September.

Collected localities: North Carolina: Haywood Co., Purchase Knob NE of house in field, Purchase Knob NW of house in forest, Purchase Knob on road in meadow. Tennessee: Blount Co., Cades Cove Primitive Baptist Church, Gregory Bald, (8 specimens)

Elevation range: 1800 and 4925–4929 ft. (1501m)

General distribution: Across Canada from Newfoundland and Nova Scotia to British Columbia. In the eastern U.S., this species ranges from Maine to Florida, throughout the Midwest from Ohio to Kansas and Nebraska, south to Texas, and Utah.

Larval hosts: Larva seems to be general feeders on a variety of grasses and vegetables. The normal host plants are probably the slender grasses, including ring muhly (*Muhlenbergia torreyi* (Kunth) Hitchc. ex Bush) and winter bentgrass (*Agrostis hyemalis* (Walter) Britton, Sterns & Poggenb.) (Poaceae) (Crumb 1929). Other hosts include asparagus (*Asparagus* sp., Liliaceae), swamp milkweed (*Asclepias incarnata* L., Asclepiadaceae), blackberry (*Rubus* sp., Rosaceae), cabbage, collards (*Brassica oleracea* L., Brassicaceae), clover (*Trifolium* sp., Fabaceae), garden pea (*Pisum sativum* L., Fabaceae), rape, rutabaga, turnip (*Brassica napus* L., Brassicaceae), prairie willow (*Salix humilis* Marsh., Salicaceae), goldenrod (*Solidago* sp., Asteraceae), hairy crabgrass (*Digitaria sanguinalis* (L.) Scop., Poaceae), tobacco (*Nicotiana* sp. Solanaceae), and violet (*Viola* sp., Violaceae) (Crumb 1929). The larva is illustrated in Wagner (2005).



MAP 25. Collecting localities of *Trichordestra legitima.*

Tribe Leucaniini Guenée, 1837

25. *Leucania adjuta* (Grote) Adjutant Wainscot
(Figs. 45–46, Map 26)

Identification: Forewing length 14–16 mm. General overall forewing coloration is tan with darker brown shading along Cu vein, then angles slightly toward apex. There are two tiny black dots associated with vein

Cu, one is at middle of discal cell below vein Cu and one at end of discal cell above vein Cu. Postmedial line consists of two tiny black dots, one on vein M2 and one on vein CuA2. Terminal line consists of a series of minute black dots. Hindwing is white variously and sometimes heavily suffused with gray. The outer margin is darker than the rest of the hindwing.

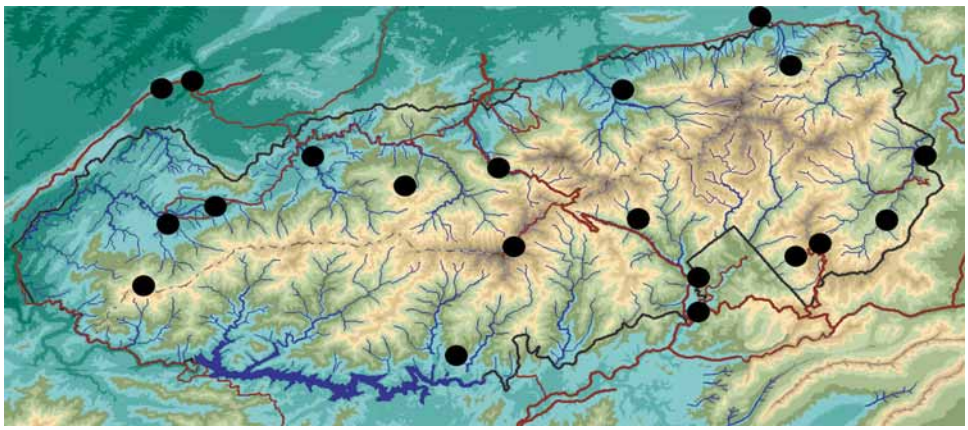
Flight period: Late April to mid-October, two to three broods annually.

Collected localities: North Carolina: Haywood Co., Balsam Mountain Road 5.2 mi N of junction with Blue Ridge Parkway on Flat Creek Trail, Balsam Mountain Road 6.1 mi N of junction with Blue Ridge Parkway on Hemphill Bald Trail, Balsam Mountain Road, Polls Gap, Hemphill Bald Trail, Cataloochee just off paved road to Cosby, 1 mi SE of Purchase house off Purchase Road in forest, Purchase Knob Eof house in field, Purchase Knob NE of house in field, Purchase Knob; Swain Co., 0.7 km up creek from mouth of Goldmine Creek; 200 yards up Tow String Road in meadow, Big Cove Road site p, Noland Divide Trailhead, 8.3 mi NW of Park entrance on 441 Kephart Prong Trail. Tennessee: Blount Co., vic. Cades Cove, Cades Cove Forge Creek Road, Foothills Parkway west at Little River, Gregory Bald Trail Eof campsite 13, Tremont; Cocke Co., Cosby campground area, Foothills Parkway 2.1 mi W Hwy. 321, Foothills Parkway first overlook, Foothills Parkway second overlook east, Foothills Parkway 4.5 mi from Rt. 321 third overlook; Sevier Co., Greenbrier area Old Settlers Trail off Ramsey Cascade Road, Jake's Creek Trail near campsite 27, 6 mi S of Sugarlands Visitor Center on Hwy. 441. (51 specimens)

Elevation range: 1000–5930 ft. (305–1807 m)

General distribution: Ranges from New York south to Florida, west across the southeastern U.S. to Oklahoma and Texas, with one record from southern Ohio.

Larval hosts: As with all species of *Leucania, L. adjuta* is a grass feeder. Larvae obtained from eggs were reared on orchardgrass (*Dactylis glomerata* L., Poaceae) (Godfrey 1972).



MAP 26. Collecting localities of *Leucania adjuta*.

26. *Leucania inermis* (Forbes) Unarmed Wainscot
(Figs. 47–49, Map 27)

Identification: Forewing length 14–19 mm. Overall ground color of forewing is light brown with no obvious striping as in *L. adjuta*. Antemedial line is present, but faint and consists of indistinct black spots, which can be connected with thin lines, especially near posterior margin. Postmedial line consists of a double row of black spots with the distal row consisting of more spots than the proximal row. In some specimens the spots from the proximal row are connected with short lines to the spots in the distal row forming a zig-zag pattern. A black spot is present at end of the discal cell. The orbicular and reniform spots are faint, consisting of just a slightly lighter area in the discal cell; spots sometimes indistinct. Terminal line is a series of minute black spots. Hindwing is gray, lighter basally with no distinct darker margin.

Leucania inermis, L. pseudargyria, and *L. ursula* have a similar forewing pattern. Males of *L. inermis* can be easily separated from the other two species by the absence of long, thick scales on the foretibia. These long,

bushy scales are present on the male foretibia in *L. pseudargyria*, and *L. ursula*. The orbicular and reniform spots are very faint to almost absent in *L. inermis* with the reniform having a minute, central dark dot. Postmedial line consists of a series of 6–8 tiny black dots from costa to posterior margin. Terminal line consists of a series of minute black dots. Hindwing is white with veins highlighted gray and with an indistinct gray marginal band.

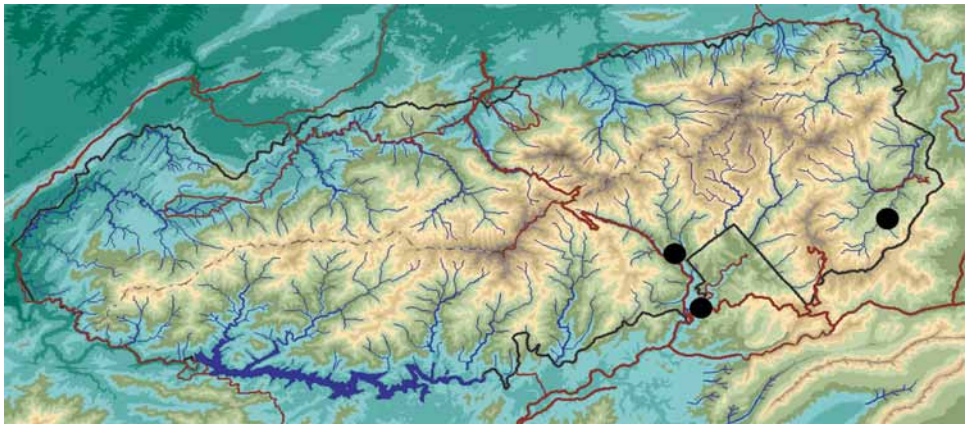
Flight period: Late April to mid-October, two broods annually (Covell 1984).

Collected localities: North Carolina: Haywood Co., Purchase Knob at lower creek; Swain Co., Smokemont, Big Cove Road site p. (3 specimens)

Elevation range: 2040–4000 ft. (622–1219 m)

General distribution: An eastern species that ranges from Nova Scotia in Canada south to South Carolina.

Larval hosts: This is a general grass feeder and larvae obtained from eggs were reared on orchardgrass (*Dactylis glomerata* L., Poaceae) (Godfrey 1972).



MAP 27. Collecting localities of *Leucania inermis.*

27. *Leucania linda* Franclemont Linda's Wainscot
(Figs. 50–51, Map 28)

Identification: Forewing length 14–17 mm. Overall appearance of the forewing is tan to light brown with a faint, pale gray shading along Cu vein to end of discal cell. Cu vein is highlighted white. There is a tiny black spot consisting of only a few scales at the end of the discal cell just dorsal to Cu vein. This tiny spot can be absent in worn specimens. Postmedial line consists of a series of 6–8 tiny black spots from costa to posterior margin. Terminal line consists of a series of minute black dots that can be absent in worn specimens. Hindwing is white with veins highlighted gray and varying amounts of gray shading along posterior margin. *Leucania linda* is similar to *L. adjuta*, but the postmedial line in *L. linda* has 6–8 tiny black dots and in *L. adjuta* there are only two dots. The hindwing is whiter in *L. linda* and grayer in *L. adjuta*.

Flight period: Mid-May to mid-October, two broods annually.

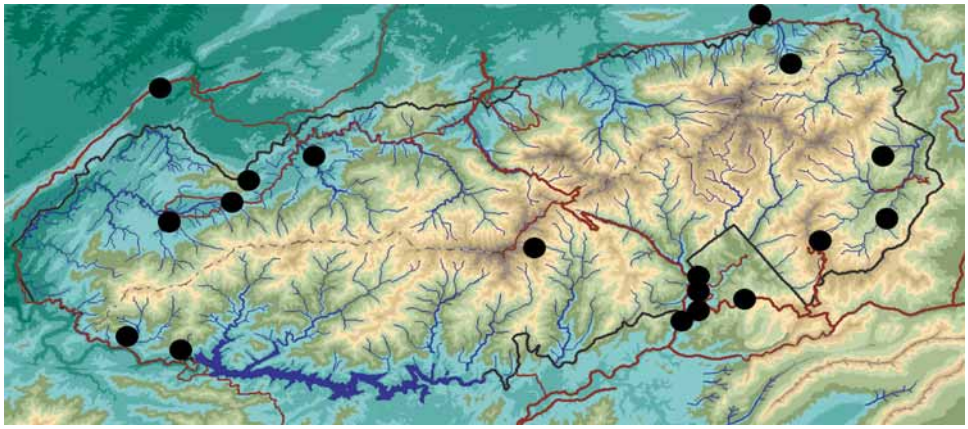
Collected localities: North Carolina: Haywood Co., Balsam Mountain Road 6.1 mi N of junction with Blue Ridge Parkway on Hemphill Bald Trail, Cataloochee, Cataloochee NW of Palmer Chapel, Purchase Knob at house, Purchase Knob north of house in forest, Purchase Knob Eof house in field, Purchase Knob NE of house in field, Purchase Knob in trees on road; Swain Co., 200 yards up Tow String Road in meadow, Blue Ridge Parkway Thomas Divide overlook, 5.6 mi southwest of junction 441 and Clingmans Dome Road Noland Divide Trail, Mt. Buckley, 0.2 mi NE Twentymile Ranger Station, Big Cove Road site b, Big Cove Road site c, Big Cove Road site p, Big Cove Road site w, Ravensford, 0.7 km S Payne Cemetary. Tennessee: Blount Co., Cades Cove Ranger Station, Cades Cove Primitive Baptist Church, Cades Cove at Forge Creek Road, Scott Mountain Trail campsite 6, Tremont; Cocke Co., Cosby Campground, Cosby Ranger Station,

Foothills Parkway, Foothills Parkway 2.1 mi west Hwy. 321, Foothills Parkway 3rd overlook from Cosby; Sevier Co., Park Headquarters. (47 specimens)

Elevation range: 1390–6560 ft. (424–1999 m)

General distribution: From Massachusetts south to South Carolina and west to Kansas, Oklahoma, and Texas.

Larval hosts: Unknown, but probably grasses.

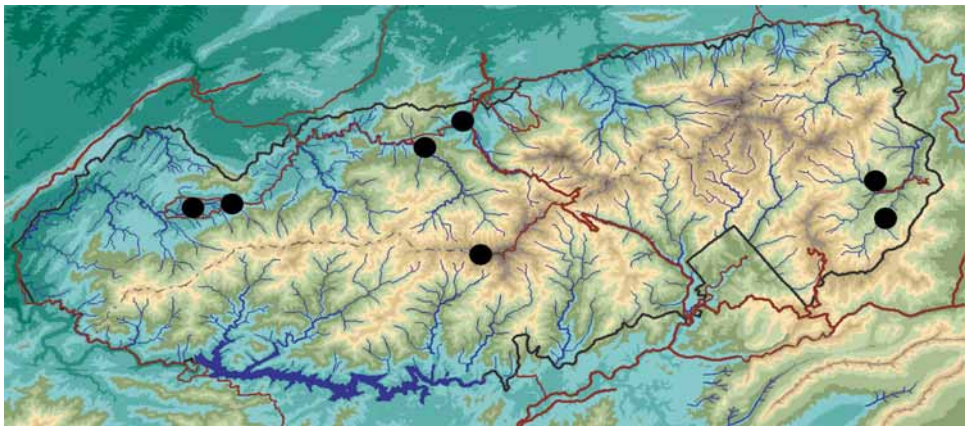


MAP 28. Collecting localities of *Leucania linda.*

28. *Leucania multilinea* Walker Many-lined Wainscot
(Fig. 52, Map 29)

Identification: Forewing length 15–17 mm. Overall appearance of the forewing is tan with a dark brown shading along Cu vein to end of discal cell then continuing above vein M2 to outer margin. There are two tiny black dots associated with vein Cu, one is at middle of discal cell below vein Cu (can be reduced to absent) and one at end of discal cell above vein Cu. Postmedial line consists of 2–3 tiny black dots one on vein M2 and one on vein CuA2. Terminal line consists of a series of minute black dots. Hindwing is white with a few black dots between veins along posterior margin.

This species resembles *L. adjuta* but the forewing horizontal dark stripe is much darker in *L. multilinea*. The hindwing is white with only tiny black dots along the posterior margin in *L. multilinea* and in *L. adjuta* the hindwing is gray with a distinct marginal band of darker gray.



MAP 29. Collecting localities of *Leucania multilinea.*

Flight period: May to October, double brooded.

Collected localities: North Carolina: Haywood Co., Cataloochee, Purchase Knob, Purchase Knob NW of house; Swain Co., Mt. Buckley. Tennessee: Blount Co., Cades Cove campground, Cades Cove Primitive Baptist Church; Sevier Co., Elkmont, Park Headquarters. (17 specimens)

Elevation range: 1480–6560 ft. (451–1999 m)

General distribution: Across Canada from Nova Scotia to Alberta. In the eastern U.S. this species ranges from New York south to Florida and west to Montana.

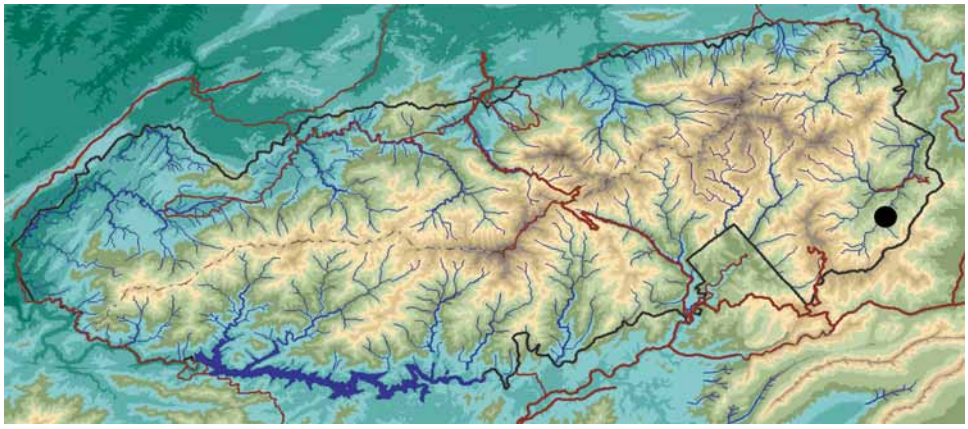
Larval hosts: Another grass feeder, feeding on sugarcane (*Saccharum officinarum* L., Poaceae) and sorghum (*Sorghum bicolor* (L.) Moench, Poaceae) (Vickery 1915). Other hosts include brome (*Bromus* sp., Poaceae), quackgrass (*Elymus repens* (L.) Gould, Poaceae), and larvae obtained from eggs were reared on orchardgrass (*Dactylis glomerata* L., Poaceae) (Godfrey 1972).

29. *Leucania phragmatidicola* Guenée Phragmites Wainscot
(Figs. 53–54, Map 30)

Identification: Forewing length 14–18 mm. Overall appearance of the forewing is tan with a dark brown shading along Cu vein to end of discal cell then continuing above vein M2 to outer margin. There is a tiny black dot at end of discal cell above vein Cu. Postmedial line consists of a series of 4–7 tiny black dots from costa to posterior margin. In some specimens these dots can consist of only a few scales or be absent. Terminal line consists of a series of minute black dots. Hindwing is white with pale gray shading from apex to no further than middle of posterior margin.

This species closely resembles *L. multilinea* but the forewing horizontal stripe is less defined and not as wide. The postmedial line consists of more tiny black dots in *L. phragmatidicola* than in *L. multilinea*. The hindwing is white in both *L. phragmatidicola* and *L. multilinea*, but in *L. multilinea* there are small black dots between the veins along the posterior margin and in *L. phragmatidicola* the dots are absent with very faint gray shading, especially at the apex. In some specimens this shading can be virtually absent.

Flight period: June to September, two broods annually.



MAP 30. Collecting localities of *Leucania phragmatidicola.*

Collected localities: North Carolina: Haywood Co., Purchase Knob, Purchase Knob at house, Purchase Knob NW of house, Purchase Knob on road in meadow. (12 specimens)

Elevation range: 4800–4924 ft. (1463–1501 m)

General distribution: This is a widespread eastern species found from Newfoundland to Manitoba in Canada. In the U.S., it ranges from Maine to South Carolina, throughout the Midwest to Montana, Colorado, and New Mexico.

Larval hosts: Similar to that of *L. multilinea*, including bluegrass (*Poa* sp., Poaceae), Virginia wild rye (*Elymus virginicus* L., Poaceae), quackgrass (*Elymus repens* (L.) Gould, Poaceae), and larvae obtained from

eggs were reared from brome (*Bromus* sp., Poaceae) and orchardgrass (*Dactylis glomerata* L., Poaceae) (Godfrey 1972).

30. *Leucania pseudargyria* Guenée False Wainscot
(Fig. 55, Map 31)

Identification: Forewing length 18–21 mm. Foretibia in male covered with thick long scales giving a bushy appearance. Overall ground color of forewing is light brown with a slight ferruginous cast and no obvious striping. Antemedial line is present, but faint and consists of a slightly curved vertical line within the discal cell and a second line between the Cu and A veins. Postmedial line consists of a double row of black spots with the distal row consisting of more spots than the proximal row. In some specimens the spots from the proximal row are connected with short lines to the spots in the distal row forming a zig-zag pattern. The orbicular and reniform spots are cream colored and the reniform can have a small ground color spot in its ventral half. Terminal line is a series of minute black spots, which can be absent in some specimens. Hindwing is gray, lighter basally with no distinct darker margin.

Leucania pseudargyria is similar to *L. ursula* with the male foretibia having thick, long scales giving it a bushy appearance. *Leucania pseudargyria* is larger with a forewing length of 18–21 mm versus 13–17 mm in *L. ursula*. The forewing ground color in *L. pseudargyria* is light brown with a distinct ferruginous cast and in *L. ursula* the ground color is gray with a brownish cast.

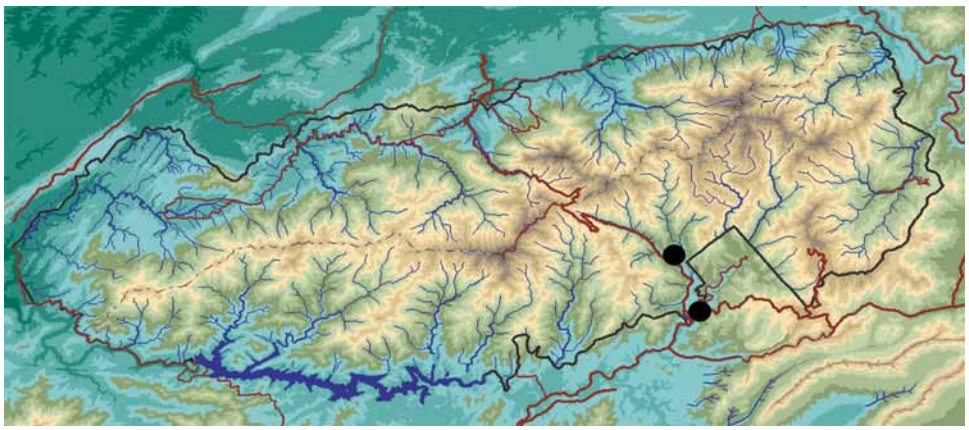
Flight period: Late June to early July.

Collected localities: North Carolina: Swain Co., Big Cove Road site p, Smokemont. (2 specimens)

Elevation range: 2040–2250 ft. (622–686 m)

General distribution: In Canada distributed from Nova Scotia to Ontario and in the U.S. ranges from Maine to North Carolina and west to Wisconsin and Illinois.

Larval hosts: Feeds on a variety of grasses including redtop (*Agrostis gigantea* Roth, Poaceae), timothy (*Phleum* sp., Poaceae), Virginia wild rye (*Elymus virginicus* L., Poaceae), common wheat (*Triticum aestivum* L., Poaceae), and larvae obtained from eggs were reared on orchardgrass (*Dactylis glomerata* L., Poaceae) and brome (*Bromus* sp., Poaceae) (Godfrey 1972).



MAP 31. Collecting localities of *Leucania pseudargyria.*

31. *Leucania scirpicola* Guenée Scirpus Wainscot
(Figs. 56–57, Map 32)

Identification: Forewing length 15–18 mm. Overall appearance of the forewing is light brown with a gray shading along Cu vein to end of discal cell. There is a small black dot at approximately the middle of the discal cell below vein Cu that can be reduced to a few scales in some specimens. At the end of the discal cell

there is a small white spot that can have a few black scales dorsally. Postmedial line consists of a series of more than two and up to seven small black spots. Terminal line consists of a series of minute black dots. Hindwing is white with veins highlighted gray and with a faint gray shading along posterior margin.

Resembles *L. phragmatidicola* by having a darker brown suffusion in the forewing than *L. linda* or *L. multilinea*. The white dot at the end of the discal cell is distinct in *L. scirpicola*, and barely visible in *L. phragmatidicola.* Vein Cu in the forewing is gray in *L. scirpicola* and white in *L. phragmatidicola.*

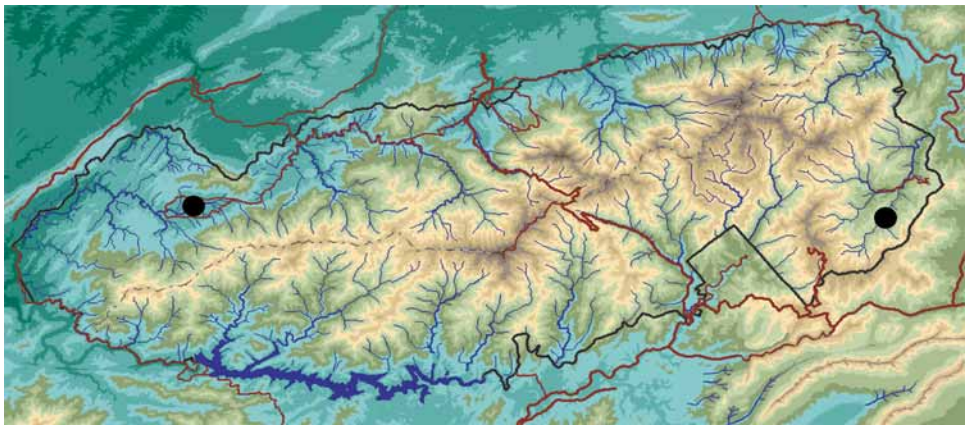
Flight period: Late June to early July.

Collected localities: North Carolina: Hayward Co., Purchase Knob at house. Tennessee: Blount Co., Cades Cove, Primitive Baptist Church. (3 specimens)

Elevation range: 4800 ft. (1463 m)

General distribution: This is a southern species ranging from eastern New Jersey south to Florida and west to Texas.

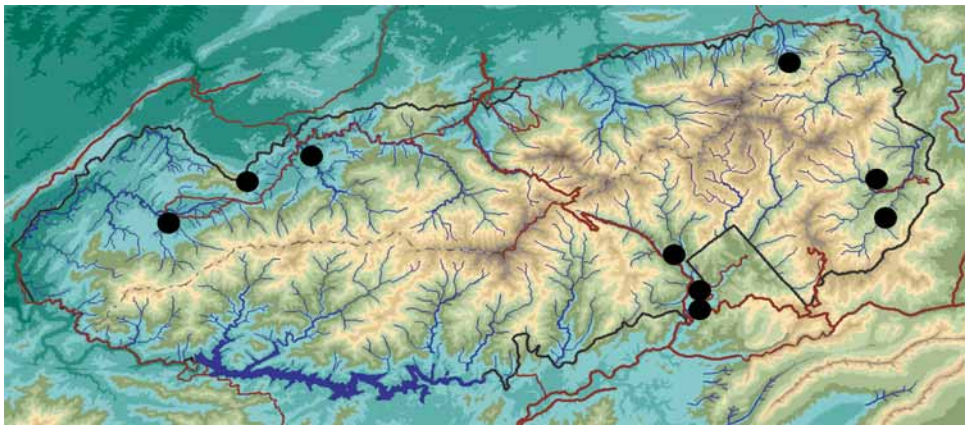
Larval hosts: Larvae obtained from eggs were reared on orchardgrass (*Dactylis glomerata* L., Poaceae) (Godfrey 1972), but probably feeds on other grasses.



MAP 32. Collecting localities of *Leucania scirpicola.*

32. *Leucania ursula* (Forbes) Ursula Wainscot
(Fig. 58, Map 33)

Identification: Forewing length 13–17 mm. *Leucania ursula* has the same bushy male foretibial scaling as in *L. pseudargyria*. The forewing and hindwing coloration and pattern is the same as in *L. pseudargyria,* except there is a more of a ferruginous cast to the forewing ground color in *L. pseudargyria,* and in *L. ursula* the forewing is more grayish brown.



MAP 33. Collecting localities of *Leucania ursula.*

Leucania ursula can be separated from *L. pseudargyria* by its smaller size. *Leucania inermis* lacks the bushy male foretibia present in *L. pseudargyria* and *L. ursula.*

Flight period: May and August, two broods annually.

Collected localities: North Carolina: Haywood Co., Cataloochee, Purchase Knob at lower creek, Purchase Knob at house, Purchase Knob 1.1 rd. mi from house; Swain Co., Big Cove Road site b, Big Cove Road site p, Ravensford, Smokemont. Tennessee: Blount Co., along Scott Mountain Trail campsite 6, Tremont, Cades Cove at Forge Creek Road, Cades Cove Loop at Abrams Creek, Cades Cove at Abrams Creek; Cocke Co., Cosby Ranger Station. (20 specimens)

Elevation range: 1390–4000 ft. (424–1219 m)

General distribution: This is an eastern species from Ontario in Canada and in the U.S. from Massachusetts south to Florida and west to Iowa and Missouri.

Larval hosts: Forbes (1954) listed honeysuckle (*Lonicera* sp., Caprifoliaceae). Larvae obtained from eggs were reared on crabgrass (*Digitaria* sp., Poaceae) (Godfrey 1972).

33. *Mythimna unipuncta* (Haworth) Armyworm Moth (adult), Armyworm (larva)

(Figs. 59–60, Map 34)

The former name of this species was *Pseudaletia unipuncta* but is now placed in the genus *Mythimna* (Fibiger and Lafontaine 2005).

Identification: Forewing length 17–21 mm. Forewing ground color is brown with a ferruginous cast and can vary in intensity, some specimens being lighter or darker than others. Black scales are randomly sprinkled throughout forewing. There is a distinct tiny white dot at the end of the discal cell and the Cu vein is highlighted either white or black and contrasts with the ground color. Orbicular and reniform spots are faint being just slightly lighter than ground color and reniform can have some darker scales in center. Postmedial line is a series of small black dots that curve from costa to posterior margin. A fuzzy black dash angles from apex to postmedial line at vein M2. Hindwing is dark gray with a faint discal spot and white fringe.

This species is easily identified by the ferruginous-brown forewing, tiny white spot at end of discal cell, and an angled fuzzy black band from the apex to the postmedial line.

Flight period: Late April to early November, 2–3 broods annually.

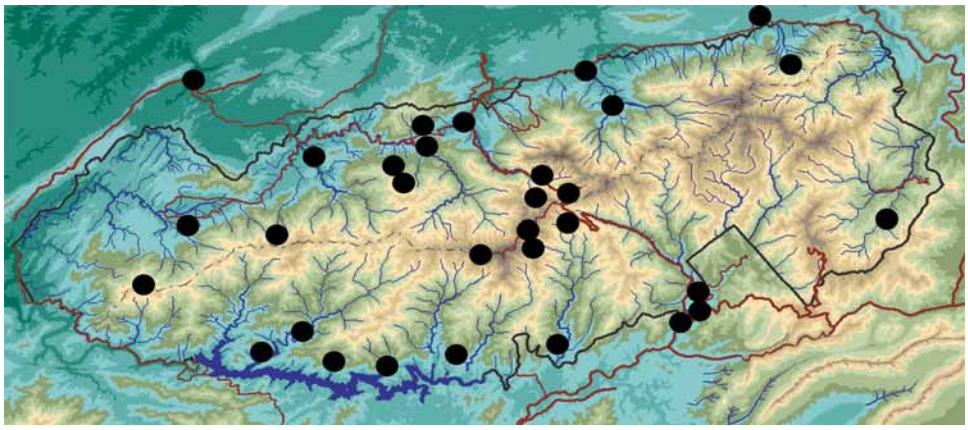
Collected localities: North Carolina: Haywood Co., Purchase Knob, Purchase Knob at house, Purchase Knob N of house, Purchase Knob NE of house, Purchase Knob NW of house; Swain Co., Big Cove Road site b, Big Cove Road site c, Big Cove Road site p, Big Cove Road site w, Clingman's Dome parking lot 1.2 mi NE Noland Divide Trail, 3.3 mi NE of Clingman's Dome parking lot on Fork Ridge Trail, Deep Creek Ranger Station, 15.2 mi NE of GSMNP entrance on 441 on Deep Creek Trail, 0.2 km W of mouth of Hazel Creek, 0.5 km from mouth of Chamber's Creek 300 ft. up hillside on NW side, 0.7 km up creek from mouth of Goldmine Creek, Mt. Buckley, 300 ft. above lake on Welch Ridge. Tennessee: Blount Co., Cades Cove Abrams Creek, Cades Cove Primitive Baptist Church, Cold Spring Gap, Foothills Parkway W at Little River, Gregory Bald, Gregory Bald Trail E of campsite 13, Tremont Environmental Center; Cocke Co., vic. Cosby ATBI house, Cosby Campground area, Cosby Campground vic. trailhead, Cosby Ranger Station, Foothills Parkway East, Foothills Parkway 2nd overlook East, Foothills Parkway East 1st overlook at 1st turnout; Sevier Co., 5.7 mi NE of Clingman's Dome parking lot on Road Prong Trail, Greenbrier Ranger Station, Laurel Falls Trail, W of Campsite 20, Elkmont, Elkmont Jake's Creek, 3.5 mi S of Rt. 321 Greenbrier covered picnic area, Jake's Creek Trail nr. Campsite 27, Newfound Gap, Park Headquarters, 7 mi S Sugarland Visitor Center. (120 specimens)

Elevation range: 1000–6560 ft. (305–1999 m)

General distribution: This is a common widespread species, occurring across Canada and the U.S. from coast to coast.

Larval hosts: A polyphagous species that prefers grasses and cereal crops, but like most polyphagous agricultural pests will eat many other hosts if preferred host is not available (Crumb 1927). Hosts include barley (*Hordeum* sp., Poaceae), Bermudagrass (*Cynodon dactylon* (L.) Pers., Poaceae), bluegrass (*Poa* sp.,

Poaceae), corn (*Zea mays* L., Poaceae), common oat (*Avena sativa* L., Poaceae), common wheat (*Triticum aestivum* L., Poaceae), larvae obtained from eggs were reared on orchardgrass (*Dactylis glomerata* L., Poaceae), redtop (*Agrostis gigantea* Roth, Poaceae), rye (*Secale* sp., Poaceae), sorghum (*Sorghum bicolor* (L.) Moench, Poaceae), sugarcane (*Saccharum officinarum* L., Poaceae), timothy (*Phleum* sp., Poaceae), turnip (*Brassica napus* L., Brassicaceae), alfalfa (*Medicago sativa* L., Fabaceae), clover (*Trifolium* sp., Fabaceae), flax (*Linum* sp., Linaceae), and strawberry (*Fragaria* sp., Rosaceae) (Godfrey 1972). The larva is illustrated in Wagner (2005).



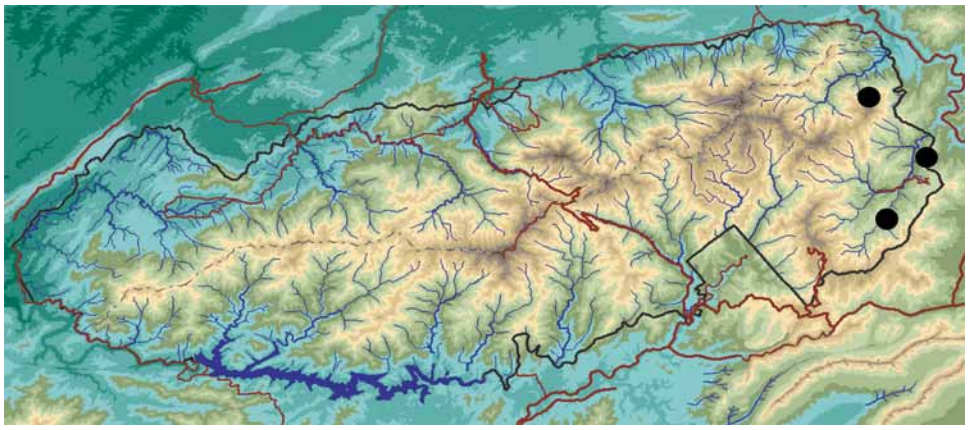
MAP 34. Collecting localities of *Mythimna unipuncta*.

Tribe Eriopygini Fibiger & Lafontaine, 2005

34. *Homorthodes furfurata* (Grote) Scurfy Quaker
(Figs. 61–63, Map 35)

Identification: Forewing length 10–12 mm. This is a variable species with the forewing ground color from dark brown to ferruginous brown. Costa has a series of short, cream-colored dashes from middle to apex. A prominent black spot is at end of discal cell. Postmedial line is a series of small black spots from below the R vein to posterior border. The Cu and A veins are subtly highlighted by black and white scales. Veins of hindwing are highlighted gray with the ground color varying from white with indistinct gray marginal band to almost completely gray.

This species can easily be differentiated from *H. lindseyi* by having a dark brown to ferruginous brown forewing with a black spot at the end of the discal cell. In *H. lindseyi* the forewing is bright ferruginous and there are two small white spots at the end of the discal cell.



MAP 35. Collecting localities of *Homorthodes furfurata.*

Flight period: Early June to mid-October, double brooded.

Collected localities: North Carolina: Haywood Co., Purchase Knob at house, Purchase Knob NW of house, Purchase Knob, Purchase Knob at lower creek, Cataloochee, uphill from pull off across road, Mt. Sterling trail 0.72 mi from Mt. Sterlig trailhead. (13 specimens)

Elevation range: 3480–4924 ft. (1061–1501 m)

General distribution: Widespread across North America from coast to coast.

Larval hosts: The only information available about the larval hosts is that larvae were

offered living and dead leaves of maple (*Acer* sp., Aceraceae), oak (*Quercus* sp., Fagaceae), cherry (*Prunus* sp., Rosaceae), and Indian plum (*Oemleria cerasiformis* (Torr. & A. Gray ex Hook & Arn.) Landon, Rosaceae), but only accepted common dandelion (*Taraxacum officinale* F.H. Wigg., Asteraceae). Only two larvae reached maturity but did not survive to become adults (Neil 1983). The preferred host of this species can still be considered unknown.

35. *Homorthodes lindseyi* (Benjamin) Southern Scurfy Quaker

(Figs. 64–65, Map 36)

Identification: Forewing length 10–13 mm. The forewing ground is ferruginous with a varying amount of black scales suffused throughout wing resulting in some specimens being darker than others. Forewing veins are highlighted with black and white scales. Orbicular and reniform spots are pale ferruginous and are not outlined. At the base of the reniform and end of discal cell are two small white spots that can vary in intensity. Postmedial line is pale ferruginous, sinuate, bordered by scattered black scales proximally, and can be obscure to absent in darker specimens. Subterminal line pale ferruginous and separates the usually darker forewing from the paler terminal area. Hindwing is white suffused with gray especially along the posterior margin to completely gray.

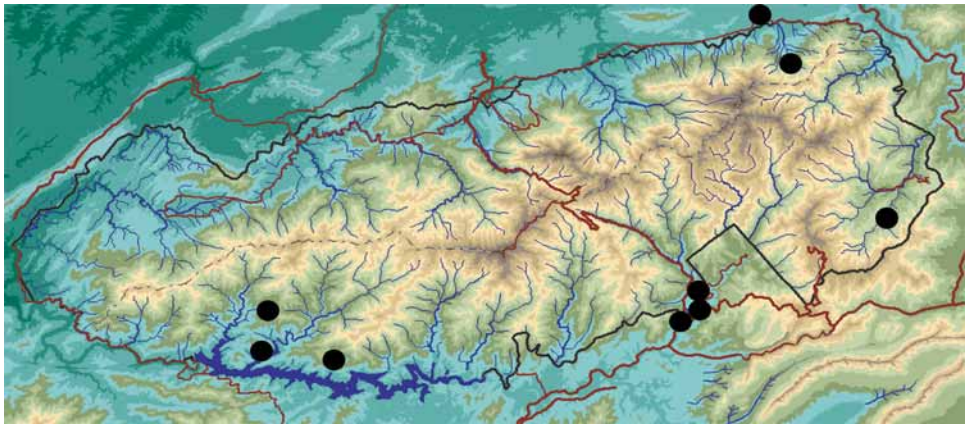
Flight period: Late April to May and August to early September, indicating two broods annually.

Collected localities: North Carolina: Haywood Co., Purchase Knob at house; Swain Co., Big Cove Road site b, Big Cove Road site c, Big Cove Road site p, 300 ft. above lake on Welch Ridge, Hazel Creek Bradshaw Cemetary. Tennessee: Cocke Co., Cosby Ranger Station, Foothills Parkway south overlook, Foothills Parkway 1.3 mi N of 321, Foothills Parkway N of 3rd pullout. (19 specimens)

Elevation range: 1720–2198 and 4800 ft. (524–670 and 1463 m)

General distribution: Distributed from Massachusetts south to Georgia and west to Missouri and Kansas.

Larval hosts: Little is known about the breadth of this species hosts. Recorded hosts include cherry (*Prunus* sp., Rosaceae), black cherry (*Prunus serotina* Ehrh., Rosaceae), and dead oak leaves (Godfrey 1972).



MAP 36. Collecting localities of *Homorthodes lindseyi*

36. *Lacinipolia anguina* (Grote) Snaky Arches
(Figs. 66–67, Map 37)

Identification: Forewing length 11–16 mm. Prothorax with a medial, black, horizontal line. Overall forewing ground color is gray. This is a heavily patterned species with a black basal dash and black crenulate basal line. Orbicular spot is white with basal tan shading and distal and proximal black margins. Reniform spot is white with proximal tan shading and distal and proximal black margins. There is a distinct black dash just above the tornus that has a variably shaped white spot, usually in the form of an arrowhead that is contiguous with the black dash. This white arrowhead is the terminus of the subterminal line. Hindwing is white with a variable amount of gray scales along posterior margin. Hindwing veins can be highlighted with gray.

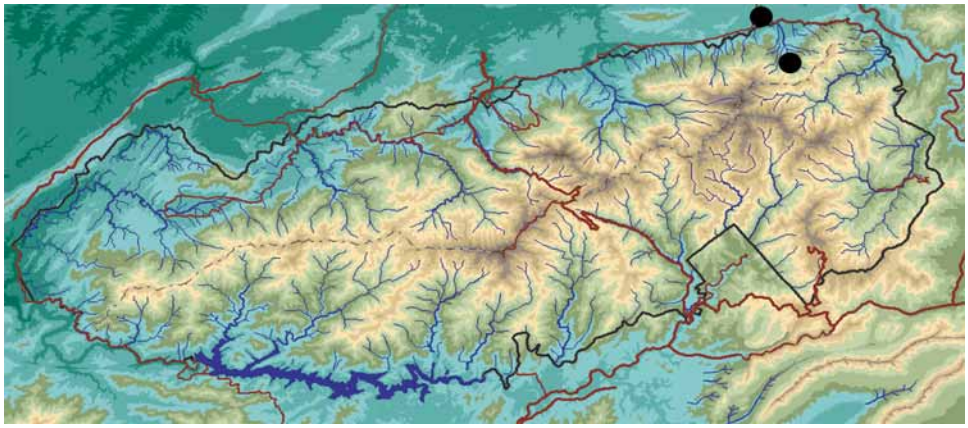
Flight period: Mid-May.

Collected localities: Tennessee: Cocke Co., Cosby Ranger Station, Foothills Parkway. (5 specimens)

Elevation range: 1750–2400 ft. (533–732 m)

General distribution: Across Canada from Newfoundland and Nova Scotia to British Columbia. In the U.S. from Maine south to Tennessee and throughout the Midwest to Idaho, Wyoming, and Colorado.

Larval hosts: Unknown.



MAP 37. Collecting localities of *Lacinipolia anguina.*

37. *Lacinipolia explicata* McDunnough Explicit Arches
(Figs. 68–69, Map 38)

Identification: Forewing length 11.5–14 mm. Frons white with two black dashes just below antenna and touching eyes but are not contiguous across frons. Patagium white proximally and black distally. Forewing from base to antemedial line is variable in coloration from mostly ferruginous brown (some specimens) to mostly black (majority of specimens) and with the area from costa to R vein mostly white and grayish-green with some black dashes along costa. Claviform spot is black and elongate below Cu vein. The median area between the antemedial and postmedial lines is always darker than the basal area. The median area is black with white and grayish green dashes along costa. Within the median area are the orbicular and reniform spots. Orbicular spot is grayish green with a black to ferruginous brown center and faintly outlined with black. Reniform spot is mostly ferruginous brown with some grayish green dorsally and faintly outlined with black. The distal portion of the forewing is a mixture of white and grayish green with a few black scales. An elongate black bar is present just dorsal to the tornus (posterior apex of forewing). Hindwing is white with gray highlighted veins and is suffused with a variable amount of gray, which is darkest along posterior margin.

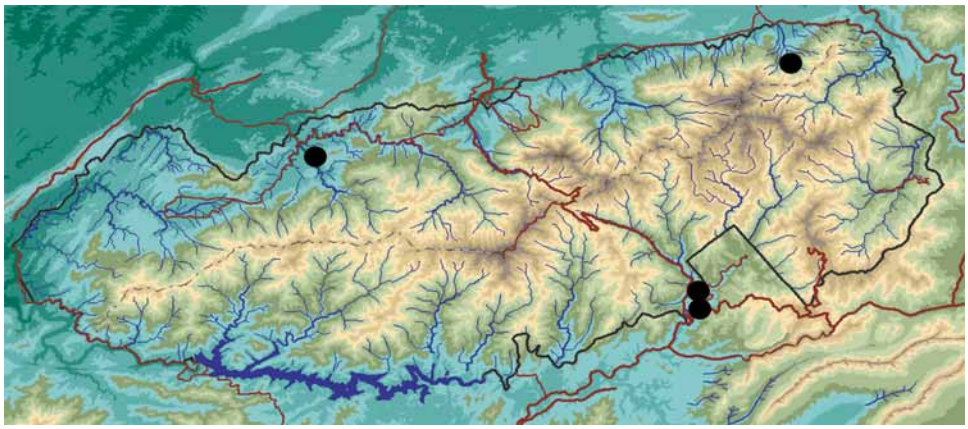
Flight period: May and September, two broods annually.

Collected localities: North Carolina: Swain Co., Big Cove Road site b, Big Cove Road site w. Tennessee: Blount Co., Tremont; Cocke Co., Cosby Ranger Station. (5 specimens)

Elevation range: 1390–2120 ft. (424–646 m)

General distribution: This is mainly a southeastern species from Maryland to Florida and west to Texas, Missouri, and Kansas.

Larval hosts: This species has been reared on clover (*Trifolium* sp., Fabaceae) and dandelion (*Taraxacum* spp., Asteraceae) (Godfrey 1972), but nothing is known about its natural hosts.

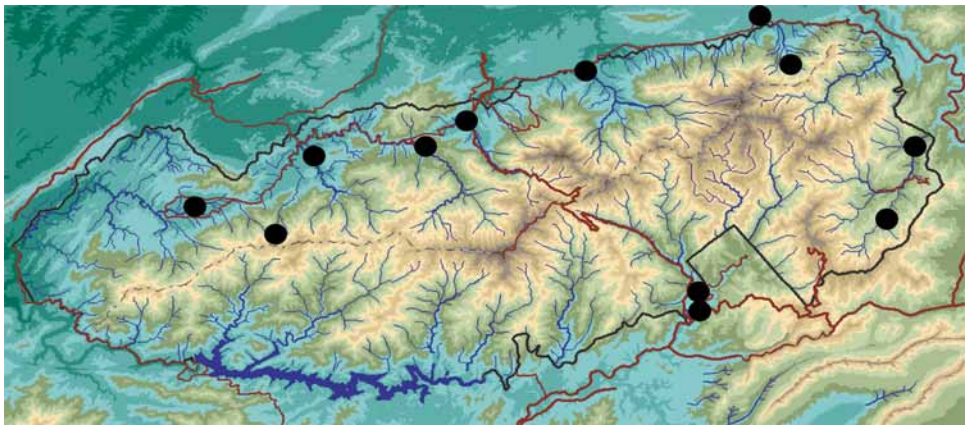


MAP 38. Collecting localities of *Lacinipolia explicata.*

38. *Lacinipolia implicata* McDunnough Implicit Arches
(Figs. 70–72, Map 39)

Identification: Forewing length 12–14 mm. Frons white with two black dashes just below antenna and touching eyes but are not contiguous across frons. Patagium is mostly grayish green with a thin distal black border. Forewing from base to antemedial line is grayish green mixed with a few white scales and some small black spots along costa. Claviform spot is obscure usually only a few black scales below Cu vein. The median area between the antemedial and postmedial lines is black with ferruginous brown between the orbicular and reniform spots in some specimens. Orbicular and reniform spots are grayish green outlined in black. The distal portion of the wing is grayish green. In some specimens the subterminal line is present and is represented by a series of white oval to triangular spots. Hindwing is gray with a postmedial line.

Lacinipolia implicata resembles *L. explicata* but can be separated by the grayish-green basal area and the grayish-green orbicular and reniform spots which are more contrasting within the median area in *L. implicata* than the darker basal area and the more ferruginous brown orbicular and reniform spots in *L. explicata*. The hindwing is usually darker in *L. implicata* with a distinct postmedial line. In *L. explicata* the hindwing is whiter and the postmedial line is usually absent.



MAP 39. Collecting localities of *Lacinipolia implicata.*

Flight period: September to mid-October with 2 broods across range.

Collected localities: North Carolina: Haywood Co., Piney Mt., Purchase Knob, Purchase Knob NW of house in forest, Purchase Knob cabin; Swain Co., Big Cove Road site b, Big Cove Road site p, Big Cove Road site w. Tennessee: Blount Co., Cades Cove Primitive Baptist Church, Cold Spring Gap, Tremont; Cocke Co., Cosby Ranger Station, Foothills Parkway south overlook, Foothills Parkway second overlook, Foothills Parkway; Sevier Co., Greenbrier near Ranger Station, Elkmont, Park Headquarters. (38 specimens)

Elevation range: 1360–4924 ft. (415–1501 m)

General distribution: Distributed from Massachusetts south to South Carolina and west to Texas.

Larval hosts: Larvae obtained from eggs were reared on common dandelion (*Taraxacum officinale* F.H. Wigg., Asteraceae), lettuce (*Latuca* sp., Asteraceae), and cultivated endive (*Cichorium endivia* L., Asteraceae) (Godfrey 1972).

39. *Lacinipolia laudabilis* (Guenée) Laudable Arches

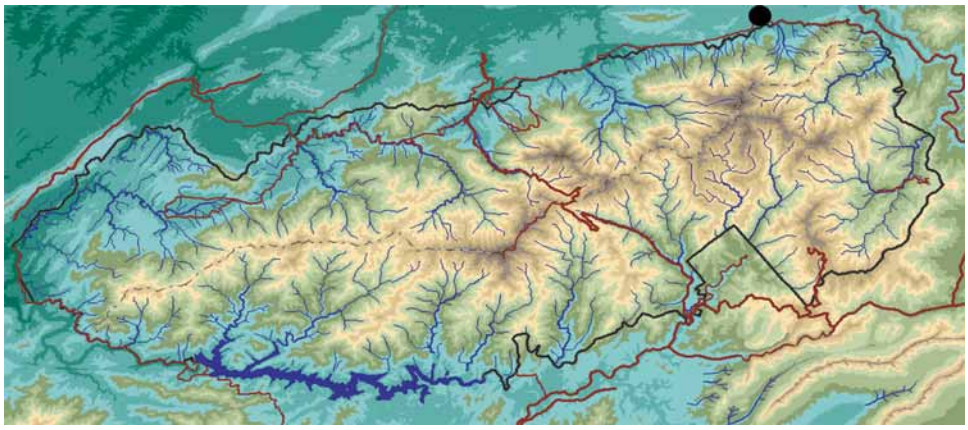
(Figs. 73–74, Map 40)

Identification: Forewing length 11–13 mm. Frons white with two black spots just below antenna and touching eyes but are not contiguous across frons. Patagium is mostly grayish green with a thin distal black border. Forewing ground color is grayish green. Basal line a short curved, white line from costa to Cu vein bordered by black spots with another short curved white line from Cu vein to anal vein bordered by irregular black scale patches. Antemedial line is white and slightly sinuate. Orbicular spot is round, grayish greed and bordered by black scales. Reniform spot has a grayish green center outlined with a white border. Postmedial line is crennulate and white. Median area between antemedial line and postmedial line is black and extends ventrally to approximately midway between Cu and anal veins. Subterminal line is sinuate, white and irregularly bordered with a various amount of black scales being more numerous at costa and above tornus. Fringe is white with black spots giving it a checked appearance. Hindwing is mostly white bordered by a narrow margin of gray scales. The amount of gray scales is variable and some specimens can have a mostly gray hindwing.

Lacinipolia laudabils resembles *L. implicata* but can be separated by the median black area extending further past the reniform spot and never extending to the posterior margin of the forewing in *L. laudabilis*, whereas in *L. implicata* the black median area only borders the reniform spot distally and extends to the posterior margin of the forewing. The hindwing is much whiter in *L. laudabilis* than the more gray hindwing in *L. implicata.*

Flight period: Mid-May in Park.

Collected localities: Tennessee: Cocke Co., Foothills Parkway, 1.3 mi N of 321. (1 specimen)



MAP 40. Collecting localities of *Lacinipolia laudabilis.*

Elevation range: 1800ft. (549 m)

General distribution: This is a southern species with single specimens from Maine and Ohio in the USNM collection. Distributed from Maryland south to Florida and west to eastern Texas from the Dallas-Fort Worth area south to Brownsville.

Larval hosts: Little is known about the specific host host plants of this species. Dyar (1903) stated they are a general feeder and Crumb (1956) listed mustard (*Brassica* sp., Brassicaceae) and low plants in a yard and also stated they are probably general feeders on herbs. Larvae obtained from eggs were reared on common dandelion (*Taraxacum officinale* F.H. Wigg., Asteraceae) (Godfrey 1972).

40. *Lacinipolia lorea* (Guenée) Bridled Arches
(Fig. 75, Map 41)

Identification: Forewing length 12–15 mm. Forewing ground color is yellowish brown with a darker median area and lighter subterminal and terminal areas. Antemedial line is obscure, but most distinct as two contiguous curved lines, one between Cu and A veins and the second between A vein and posterior margin. Median area dark yellowish brown with the orbicular and reniform spots a lighter yellowish brown thinly outlined with brown. Postmedial line brown, slightly angled toward posterior margin from veins R4 to M2 then abruptly angled proximally to posterior margin. Subterminal and terminal areas indistinguishable, yellowish brown with veins and terminal line brown. Hindwing is gray with yellowish brown fringe.

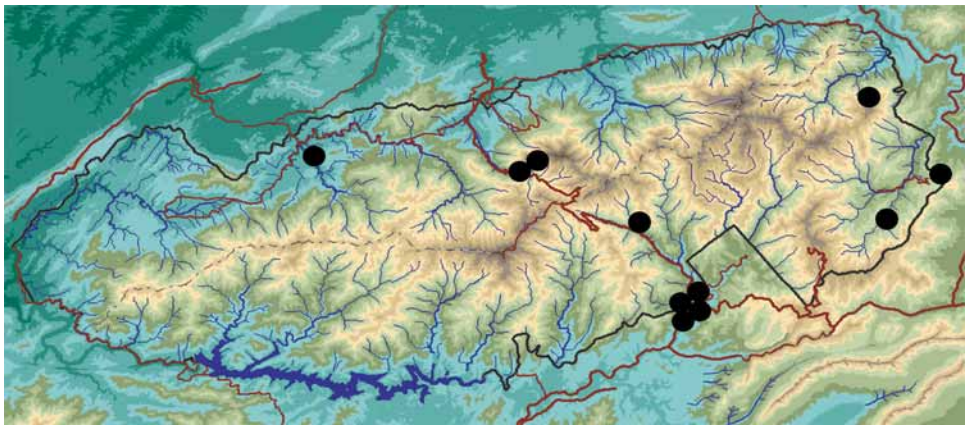
Flight period: Late May to June and August, two broods annually.

Collected localities: North Carolina: Haywood Co., Cove Creek Road, Mt. Sterling Trail, Purchase Knob, Purchase Knob at house, Purchase Knob NW of house in forest, Purchase Knob on road in meadow; Swain Co., Big Cove Road site b, Big Cove Road site c, Big Cove Road site p, 8.3 mi NW of GSMNP entrance on Hwy. 441 Kephart Prong Trail, Oconaluftee Staff Apartments. Tennessee: Blount Co., Tremont; Sevier Co., Alum Cave pulloff, above Chimneys Campground. (32 specimens)

Elevation range: 1360–4924 ft. (415–1501 m)

General distribution: Widely distributed across Canada from Newfoundland and Nova Scotia to British Columbia. In the U.S. it ranges from Maine south to North Carolina and Tennessee and west throughout the Midwest to Washington and Oregon.

Larval hosts: A somewhat polyphagous species with a variety of hosts including gray birch (*Betula populifolia* Marsh., Betulaceae), blueberry (*Vaccinium* sp., Ericaceae), alfalfa (*Medicago sativa* L., Fabaceae), clover (*Trifolium* sp., Fabaceae), spotted geranium (*Geranium maculatum* L., Geraniaceae), sweet fern (*Comptonia peregrina* (L.) J.M. Coult., Myricaceae), strawberry (*Fragaria* sp., Rosaceae), and white meadowsweet (*Spiraea alba* Du Roi var. *latifolia* (Aiton) Dippel, Rosaceae) (Godfrey 1972). Larvae obtained from eggs were reared on common dandelion (*Taraxacum officinale* F.H. Wigg., Asteraceae) (Godfrey 1972).



MAP 41. Collecting localities of *Lacinipolia lorea.*

41. *Lacinipolia meditata* (Grote) The Thinker
(Fig. 76, Map 42)

Identification: Forewing length 12–15 mm. Forewing ground color is brown to dark chocolate brown with varying amounts of ferruginous shading throughout wing. Markings are not well defined, especially in darker specimens. In lighter specimens, the antemedial line is brown with some scales tipped with white. Orbicular and reniform spots are lighter than surrounding area with white tipped scales around margin and outlined with brown. In the terminal area of forewing scales can be tipped with white. Hindwing is gray to dark brown with a ferruginous cast.

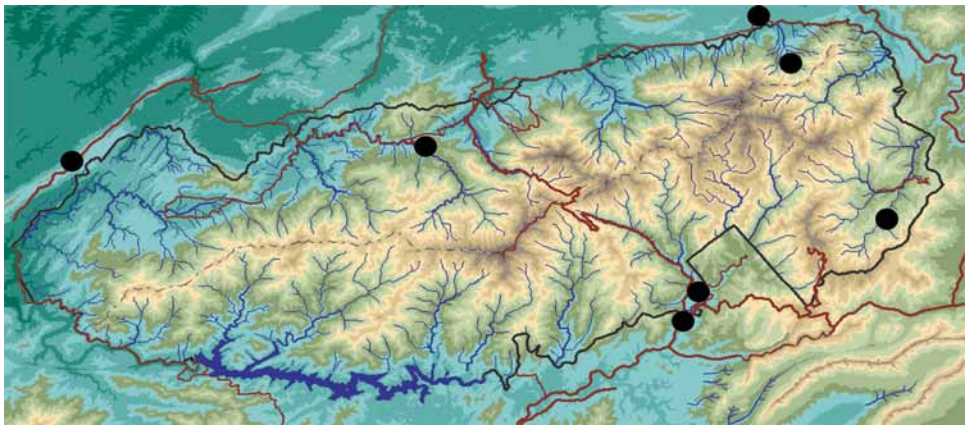
Flight period: August to mid-October.

Collected localities: North Carolina: Haywood Co., Purchase Knob, Purchase Knob at house, Purchase Knob in woods at base of knob, Purchase Knob NW of house in forest; Swain Co., Big Cove Road site b, Big Cove Road site c. Tennessee: Cocke Co., Cosby ATBI house, Foothills Parkway second overlook, Foothills Parkway; Sevier Co., Elkmont. (23 specimens)

Elevation range: 1760–2400 and 4800–4924 ft. (536–768 and 1463–1501 m)

General distribution: Across Canada from Newfoundland to Alberta. In the U.S. it ranges from Maine south to South Carolina, throughout the Midwest from South Dakota to Texas, and west to Montana.

Larval hosts: This is a polyphagous species feeding mainly on herbaceous plants including goldenrod (*Solidago* sp., Asteraceae), white heath aster (*Symphyotrichum ericoides* (L.) G.L. Nesom var. *ericoides*, Asteraceae), clover (*Trifolium* sp., Fabaceae), bluegrass (*Poa* sp., Poaceae), broomsedge bluestem (*Andropogon virginicus* L., Poaceae), apple (*Malus* sp., Rosaceae), tobacco (*Nicotiana* sp., Solanaceae), and grape (*Vitus* sp., Vitaceae) (Godfrey 1972). Larvae obtained from eggs were reared on common dandelion (*Taraxacum officinale* F.H. Wigg., Asteraceae) (Godfrey 1972).



MAP 42. Collecting localities of *Lacinipolia meditata*.

42. *Lacinipolia olivacea* (Morrison) Olive Arches
(Figs. 77–79, Map 43)

Identification: Forewing length 11–12 mm. Overall forewing color is black and white. The basal area is black and white mixed with tawny to olive green scales. Antemedial line is obscure, black, and tends to blend into the median area. Median area is black with scattered areas of tawny to olive green scales. Orbicular spot is gray margined with a few white scales and bordered proximally and distally with black. Reniform spot is white with tawny to greenish gray center and bordered with black. Distal area is white with a few scattered black scales and irregular areas of tawny to olive green scales. Hindwing is gray being lighter basally with a faint discal spot in some specimens.

There is some variation in the forewing coloration with the white basal and distal areas being dark gray. In specimens with a dark gray distal area the subterminal line is white and somewhat sinuate.

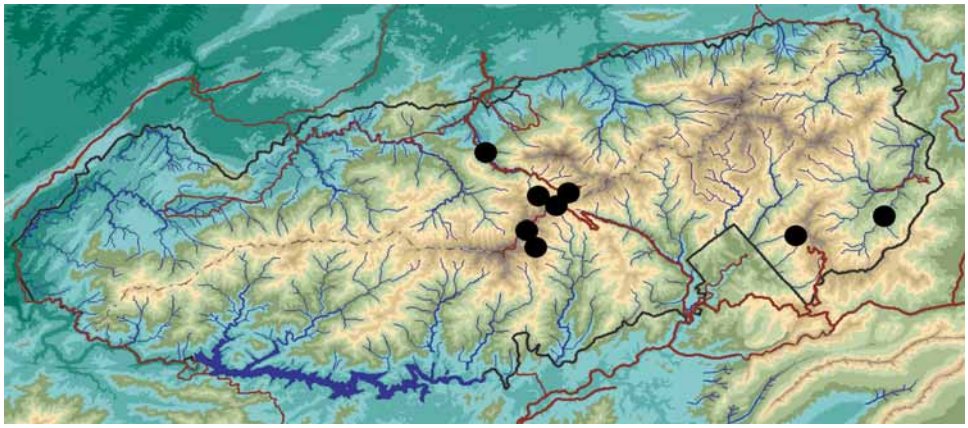
Flight period: Mid-July to early September.

Collected localities: North Carolina: Haywood Co., Balsam Mountain campground, Purchase Knob, Purchase Knob 1.1 rd. mi from house, Purchase Knob 100 yds. up road to house, Purchase Knob at house, Purchase Knob cabin, Purchase Knob E of house in forest, Purchase Knob in woods at base of knob, Purchase Knob N of house in forest, Purchase Knob NE of house in field, Purchase Knob NW of house in forest, Purchase Knob on road in meadow; Swain Co., 1.2 mi NE Clingmans Dome parking lot Noland Divide Trail, 3.3 mi NE Clingmans Dome parking lot Fork Ridge Trail, Indian Gap off Clingmans Dome Road, lower Clingman's Dome Road, Noland Divide Trail on Clingman's Dome Road. Tennessee: Sevier Co., Hwy. 441 at upper hairpin, 1.3 mi W of junction Hwy. 441 and Clingmans Dome Road Road Prong Trail, Road Prong Trail at road, Newfound Gap. (81 specimens)

Elevation range: 4360–6000 ft. (1329–1829 m)

General distribution: Across Canada from Prince Edward Island, Newfoundland, and Nova Scotia to British Columbia. In the U.S. it ranges from Maine to North Carolina, throughout the upper Midwest from Missouri to North Dakota, west to Idaho, Nevada, and Washington, and southwest to New Mexico and Arizona. Southern distributions are at higher elevations than more northerly areas.

Larval hosts: Not much is known about the specific range of host plants. Larvae have been reared from clover, grass, and various herbs (Crumb 1956). Larvae obtained from eggs were reared on common dandelion (*Taraxacum officinale* F.H. Wigg., Asteraceae) and rabbitbrush (*Chrysothamnus* sp., Asteraceae) (Godfrey 1972).



MAP 43. Collecting localities of *Lacinipolia olivacea.*

43. *Lacinipolia renigera* (Stephens) Bristly Cutworm Moth (adult), Bristly Cutworm (larva)
(Figs. 80–81, Map 44)

Identification: Forewing length 10–13 mm. Overall forewing coloration is brown. Basal area has a median, horizontal stripe of olive green that extends onto middle of antemedial line. A large, black claviform spot is contiguous with the olive green segment of the antemedial line. Orbicular spot is ground color bordered by black proximally and distally. Reniform spot is conspicuous, olive green with a white ventral margin, and bordered with black. Postmedial line is thin and black angled from the top of the discal cell toward the outer margin then abruptly angles proximally to posterior margin. There is a conspicuous olive green patch of scales adjacent to the postmedial line just above posterior margin of forewing. Subterminal area can have a varying degree of dark pinkish scales throughout in some specimens. Hindwing is white suffused with gray toward margin. Some specimens can have an almost completely gray hindwing.

Flight period: May to October, multiple brooded.

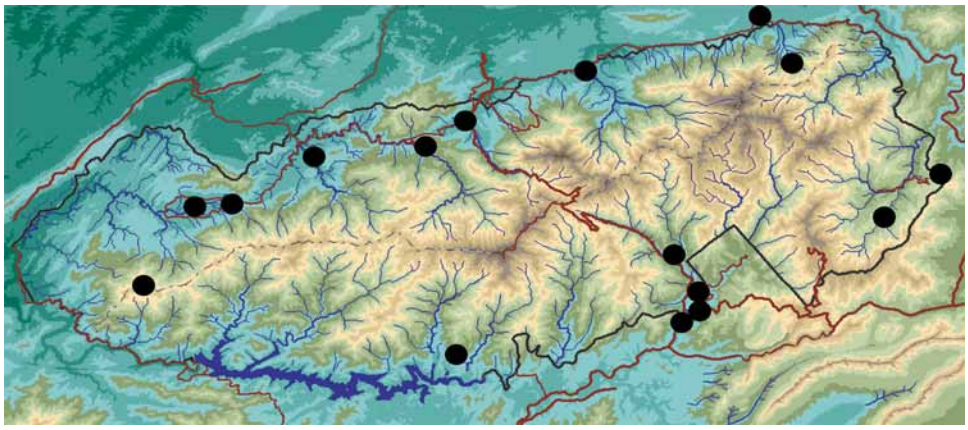
Collected localities: North Carolina: Haywood Co., Cataloochee NW of Palmer Chapel, Purchase Knob, Purchase Knob at house, Purchase Knob cabin, Purchase Knob Eof house in field, Purchase Knob in woods at base of knob, Purchase Knob north of house in forest, Purchase Knob NE of house in field, Purchase Knob

NW of house in forest; Swain Co., Big Cove Road site b, Big Cove Road site c, Big Cove Road site p, Big Cove Road site w; 0.7 km up creek from mouth of Goldmine Creek, Smokemont. Tennessee: Blount Co., Cades Cove Primitive Baptist Church, Cades Cove Ranger Station, Gregory Bald, Tremont; Cocke Co., Cosby ATBI house, Cosby campground area, Cosby Ranger Station, Foothills Parkway, Foothills Parkway second overlook, Foothills Parkway East; Sevier Co., Greenbrier Ranger Station, Elkmont, Park Headquarters. (103 specimens)

Elevation range: 1360–4998 ft. (415–15253 m)

General distribution: A widespread species across North America from New Brunswick, Newfoundland, and Nova Scotia across Canada to Alberta. In the U.S. it ranges from Maine south to South Carolina and west to Washington and California.

Larval hosts: This is a polyphagous species feeding on many wild and cultivated plants. Hosts include chichory (*Cichorium intybus* L., Asteraceae), lettuce (*Latuca* sp., Asteraceae), white heath aster (*Symphyotrichum ericoides* (L.) G.L. Nesom var. *ericoides*, Asteraceae), comfrey (*Symphytum* sp., Boraginaceae), cabbage (*Brassica oleracea* L., Brassicaceae), turnip (*Brassica napus* L., Brassicaceae), mouse-ear chickweed (*Cerastium* sp., Caryophyllaceae), alfalfa (*Medicago sativa* L., Fabaceae), clover (*Trifolium* sp., Fabaceae), common plantain (*Plantago major* L., Plantaginaceae), narrowleaf plantain (*Plantago lanceolate* L., Plantaginaceae), corn (*Zea mays* L., Poaceae), grasses (*Poa* spp., Poaceae), curly dock (*Rumex crispus* L., Polygonaceae), apple (*Malus* sp., Rosaceae), cottonwood leaves (*Populus* sp., Salicaceae), and tobacco (*Nicotiana* sp., Solanaceae) (Godfrey 1972). Larvae obtained from eggs were reared on common dandelion (*Taraxacum officinale* F.H. Wigg., Asteraceae) (Godfrey 1972).



MAP 44. Collecting localities of *Lacinipolia renigera.*

44. *Lacinipolia teligera* (Morrison)
(Fig. 82, Map 45)

Identification: Forewing length 12–15 mm. Prothorax has a black medial line. Forewing ground color is gray with a black dash from base, below Cu vein. Orbicular and reniform spots are ground color outlined in white and bordered with black. There is an oblique black line from under orbicular spot to postmedial line. Subterminal line is inconspicuous except for a white spot margined with a few black scales at tornus. Hindwing is white with a few gray scales along margin and tips of veins gray to the being heavily suffused with gray scales from outer margin to middle of wing.

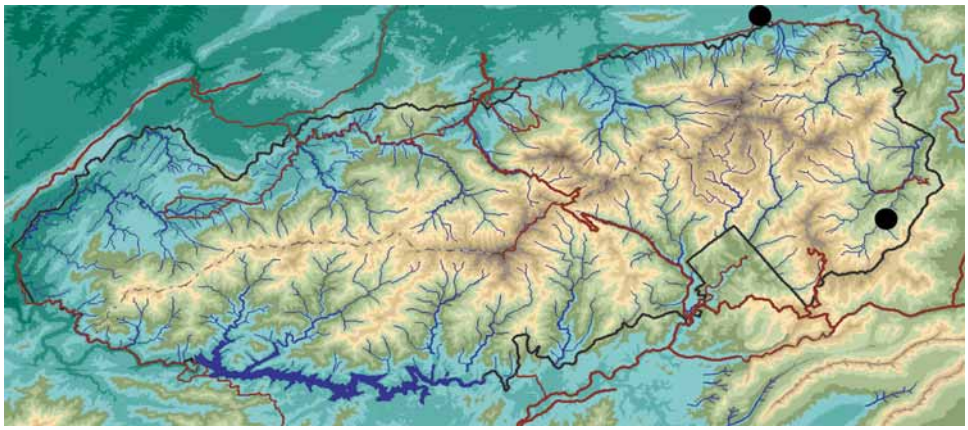
Flight period: September.

Collected localities: North Carolina: Haywood Co., Purchase Knob 1.1 rd. mi from house, Purchase Knob at house. Tennessee: Cocke Co., Foothills Parkway second overlook, Foothills Parkway East. (8 specimens)

Elevation range: 1800–4924 ft. (549–1501 m)

General distribution: Distributed from Massachusetts south to Tennessee and in the Midwest from Michigan, Kansas, and Texas.

Larval hosts: Unknown.



MAP 45. Collecting localities of *Lacinipolia teligera.*

45. *Orthodes majuscula* (Herrich-Schäffer) Rustic Quaker
(Figs. 83–84, Map 46)

This species used to go under the name *Orthodes crenulata* (Butler), but was recently found to be a synonym of *Orthodes majuscula* described from Cuba (Becker 2002). This is a widespread species occurring from North America south to Mexico, Central America, and Brazil.

Identification: Forewing length 13–16 mm. Prothorax with a black spot of hair-like scales between the patagia. Forewing ground color dark gray to brown. Antemedial line is light brown, oblique from costa to posterior margin. Orbicular and reniforms spots are ground color and outlined in light brown. Postmedial line light brown angled toward outer margin from costa to M1 vein then angled proximally to posterior margin. Terminal line a series of triangular spots outlined with light brown between the wing veins. On dark specimens the triangular spots disappear and only the light brown line remains in a zig-zag pattern. Hindwing is brown to dark gray.

This species is easily recognized by the ground color orbicular and reinform spots that are outlined with light brown and the black spot between the patagia directly behind the head.

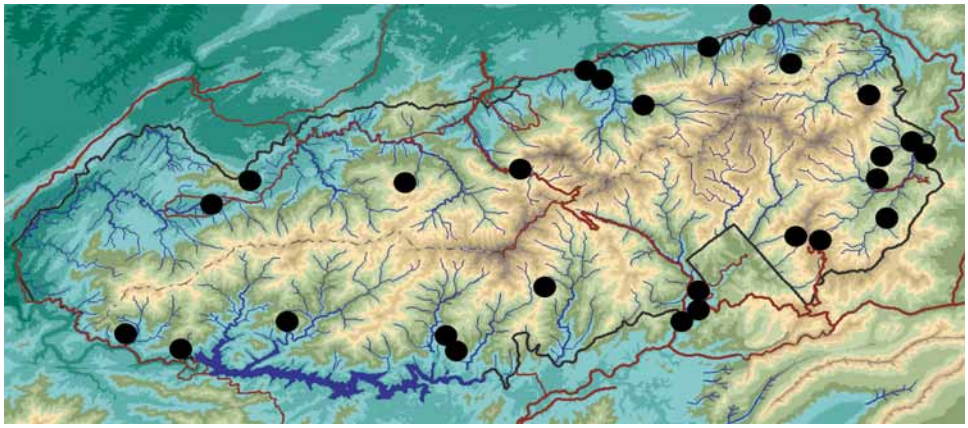
Flight period: May to October, multiple brooded.

Collected localities: North Carolina: Haywood Co., Balsam Mountain picnic area on Flat Creek Trail, Balsam Mountain Road 6.1 mi north of junction Blue Ridge Parkway on Hemphill Bald Trail, Cataloochee, Cataloochee NW of Palmer Chapel, Cataloochee service road off Cataloochee Road, Mt. Sterling Trail, Piney Mt., Purchase Knob, Purchase Knob at house, Purchase Knob at lower creek, Purchase Knob NW of house; Swain Co., Big Cove Road site b, Big Cove Road site p, Big Cove Road site w, Forney Creek 0.4 km up trail from lake, Hazel Creek Proctor Cemetery, 0.7 km up creek from mouth of Goldmine Creek, Noland Creek, 0.7 km S. of Payne Cemetery, Tennessee: Blount Co., Cades Cove Abrams Creek, vic. Cades Cove, Campsite 6 Scott Mtn. Trail; Cocke Co., Cosby picnic area off Gabes Mountain trail, Foothills Parkway, Foothills Parkway 3rd overlook from Cosby, Foothills Parkway East, Foothills Parkway East 1.3 mi N of 321, Maddron Bald Trail; Sevier Co., Greenbrier Ranger Station, Campsite 27 Jake's Creek Trail, Jake's Creek Trail below campsite 27, Chimney Tops Trail, Cove Forest pullout on Rt. 441, Greenbrier 2.6 mi from state route 321, Greenbrier area end of Ramsey Cascade Road uphill from parking lot. (43 specimens)

Elevation range: 1620–5265 ft. (494–1605 m)

General distribution: Widespread across North America from New Brunswick and Nova Scotia to Alberta in Canada. In the U.S. it is distributed from Maine south to Florida and throughout the Midwest to Colorado, Utah, and Arizona.

Larval hosts: A wide variety of hosts including white heath aster (*Symphyotrichum ericoides* (L.) G.L. Nesom var. *ericoides*, Asteraceae), jewelweed (*Impatiens capensis* Meerb., Balsaminaceae), common plantain (*Plantago major* L., Plantaginaceae), tobacco (*Nicotiana* sp., Solanaceae), and willow (*Salix* sp., Salicaceae) (Godfrey 1972). Larvae obtained from eggs were reared on common dandelion (*Taraxacum officinale* F.H. Wigg., Asteraceae) (Godfrey 1972).



MAP 46. Collecting localities of *Orthodes majuscula*.

46. *Orthodes cynica* Guenée Cynical Quaker
(Figs. 83–85, Map 46)

Identification: Forewing length 13–15 mm. Forewing ground color varies from dark gray to dark ferruginous. Antemedial line is black and slightly scalloped. Orbicular and reniform spots are ground color outlined in white. Postmedial line is black and angled from costa to reniform spot then curves around reniform to posterior margin. A series of distal triangular spots is associated with the postmedial line from reniform to posterior margin. Subterminal line is usually present, is white to pale ferruginous, and separates the darker subterminal area from the lighter terminal area. Hindwing is gray with pale ferruginous to white fringe.

Darker specimens have ferruginous antemedial, postmedial, and subterminal lines with no spots associated with the subterminal line. Easily distinguished from *O. majuscula* by the lack of a black spot between the patagia and the orbicular and reniform spots outlined in white.

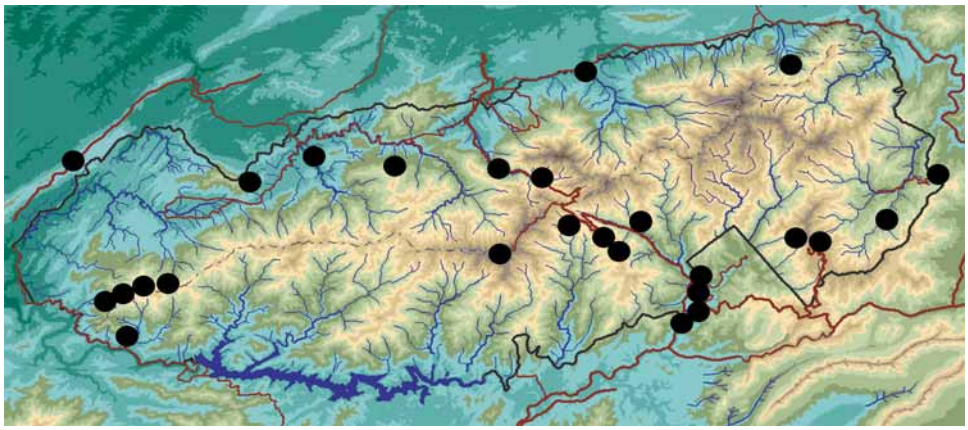
Flight period: Late April to June and August, multiple brooded.

Collected localities: North Carolina: Haywood Co., Balsam Mountain picnic area on Flat Creek Trail, Cove Creek Road, Purchase Knob, Purchase Knob 1.1 rd. mi from house, Purchase Knob at house, Purchase Knob at lower creek, Purchase Knob NW of house, Purchase Knob on road in meadow, Balsam Mountain Road 6.1 mi north of Blue Ridge Parkway Polls Gap Rough Fork Trail; Swain Co., Beetree Ridge, Big Cove Road site b, Big Cove Road site c, Big Cove Road site p, Big Cove Road site w, 1 road mi north Clingmans Dome, 13.5 mi NE GSMNP entrance on Hwy. 441 Thomas Divide Trail, 15.2 mi NE GSMNP entrance on Hwy. 441 Deep Creek Trail, 8.3 mi NW GSMNP entrance on Hwy. 441 Kephart Prong Trail, Oconaluftee Staff Apartments, 0.1 mi NE Twentymile Ranger Station, 0.2 mi NE Twentymile Ranger Station. Tennessee: Blount Co., 0.2 mi SW of Campsite 13 on Wolf Ridge Trail, 0.1 mi west Gregory Bald, Gregory Bald Trail E of Campsite 13, Gregory Bald Trail north of Campsite 13, 0.2 mi NE of Parsons Bald on Wolf Ridge Trail, Parsons Bald, Spence Field, Campsite 6 head of spring Scott Mountain Trail, Tremont; Cocke Co., Cosby 3.6 mi E junction Hwy. 32, Cosby ATBI house, Cosby Campground area, Cosby Campground, Cosby Campground vic. Trailhead, Cosby Ranger Station, Foothills Parkway East, Foothills Parkway 1st parking lot nr. N Cosby; Sevier Co., Greenbrier Ranger Station, E of Campsite 20, Campsite 20, 6 mi south Sugarlands Visitor Center, 7 mi south Sugarland Visitor Center. (187 specimens)

Elevation range: 1360–5960 ft. (415–1817 m)

General distribution: Ranges across Canada from Nova Scotia to Saskatchewan. In the U.S. it is distributed from Maine to North Carolina and west to North Dakota, Colorado, and Texas.

Larval hosts: This is one of the most common species in the Park, but the natural host is unknown. Larvae obtained from eggs were reared on common dandelion (*Taraxacum officinale* F.H. Wigg., Asteraceae) (Godfrey 1972).

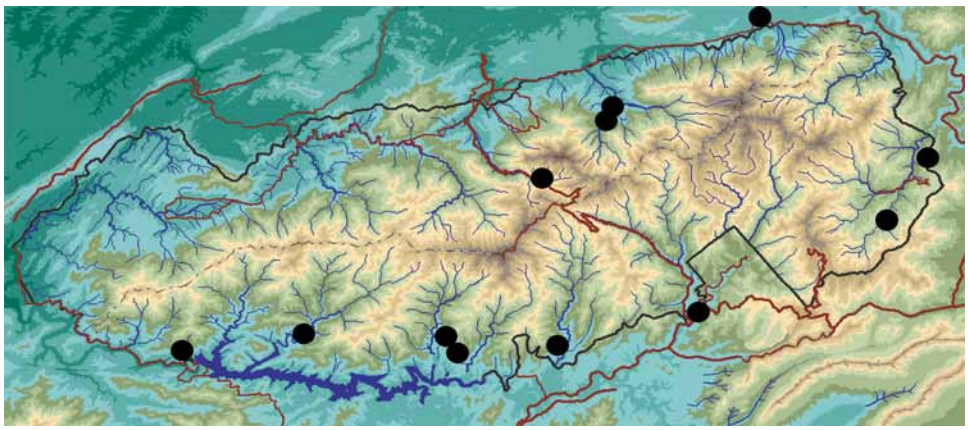


MAP 47. Collecting localities of *Orthodes cynica.*

47. *Orthodes goodelli* (Grote) Goodell's Arches
(Figs. 88–90, Map 48)

Identification: Forewing length 13–17 mm. Forewing ground color is dark gray to ferruginous gray. Antemedial line is a wide white, slightly scalloped line from costa to posterior margin, but can be obscure or absent in some specimens. Orbicular spot ground color outlined with a few white scales and heavily bordered by black proximally and distally. Claviform spot is triangular and black and distinct on most specimens. Reniform spot is white with the center containing a few ground-color scales and bordered by black proximally and distally. Hindwing is gray with lighter fringe.

This species has a distinct white reniform spot and black claviform spot, which both *O. majuscula* and *O. cynica* lack.



MAP 48. Collecting localities of *Orthodes goodelli.*

Flight period: Late May to August.

Collected localities: North Carolina: Haywood Co., Cataloochee pull off at Sal Patch Gap, Cataloochee service road off Cataloochee Road, Purchase Knob 1.1 rd. mi from house, Purchase Knob cabin, Purchase Knob NW of house, Purchase Knob E of house in field, Purchase Knob, Big Cove Road site p, Deep Creek

Ranger Station, Forney Creek 0.4 km up trail from lake, 0.2 km W mouth Hazel Creek, 0.7 km up creek from mouth of Goldmine Creek, 0.7 km S Payne Cemetery, Ravensford. Tennessee: Cocke Co., Foothills Parkway 2.1 mi west Hwy. 321, Foothills Parkway East, Foothills Parkway first overlook; Sevier Co., Greenbrier picnic shelter, return on Greenbrier Loop Road 3.85 mi south Rt. 321, 7 mi south Sugarlands Visitor Center. (22 specimens)

Elevation range: 1570–4924 ft. (479–1501 m)

General distribution: Distributed across Canada from New Brunswick and Nova Scotia west to Saskatchewan. In the U.S. it ranges from Maine south to Florida and west to Illinois, and again in Montana, Colorado, and New Mexico.

Larval hosts: Unknown.

48. *Protorthodes oviduca* (Guenée) Ruddy Quaker
(Figs. 91–93, Map 49)

Identification: Forewing length 11–14 mm. Male antenna is bipectinate and filiform in the female. Forewing ground color is ferruginous to ferruginous brown. Basal line white and curved from costa to A vein. Antemedial line is white and extends from costa around orbicular spot to posterior margin. Orbicular spot ground color to darker than ground color and margined by white. Reniform spot is ferruginous with gray scales to completely gray margined by white. Postmedial line is white and extends from costa around reniform spot to posterior margin. Subterminal line is white and extends from apex to tornus. Veins are highlighted black from postmedial line to outer margin. Terminal line is a series of minute, black triangular spots between veins. Hindwing is gray with a faint discal spot.

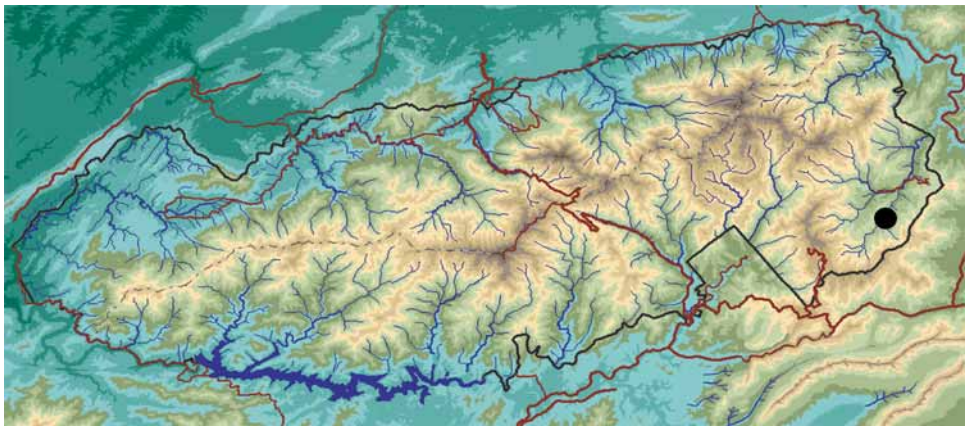
Flight period: Early May.

Collected localities: North Carolina: Haywood Co., Purchase Knob, Purchase Knob NW of house in forest. (2 specimens)

Elevation range: 4911–4924 ft. (1497–1501 m)

General distribution: This is a widespread species from Nova Scotia to British Columbia in Canada. In the U.S. from Maine south to Florida, in the southeast from Tennessee, Alabama, and Mississippi; across the Midwest from Ohio to North and South Dakota and Iowa; in the west from Montana south to Arizona and west to California. In Ohio and Michigan this species is associated with sandy soils.

Larval hosts: Larvae seem to feed on low plants including common dandelion (*Taraxacum officinale* F.H. Wigg., Asteraceae), clover (*Trifolium* sp., Fabaceae), common plantain (*Plantago major* L., Plantaginaceae), mullein (*Verbascum* sp., Scrophulariaceae) (Godfrey 1972). Natural native hosts are unknown.



MAP 49. Collecting localities of *Protorthodes oviduca.*

49. *Pseudorthodes vecors* (Guenée) Small Brown Quaker
(Figs. 94–97, Map 50)

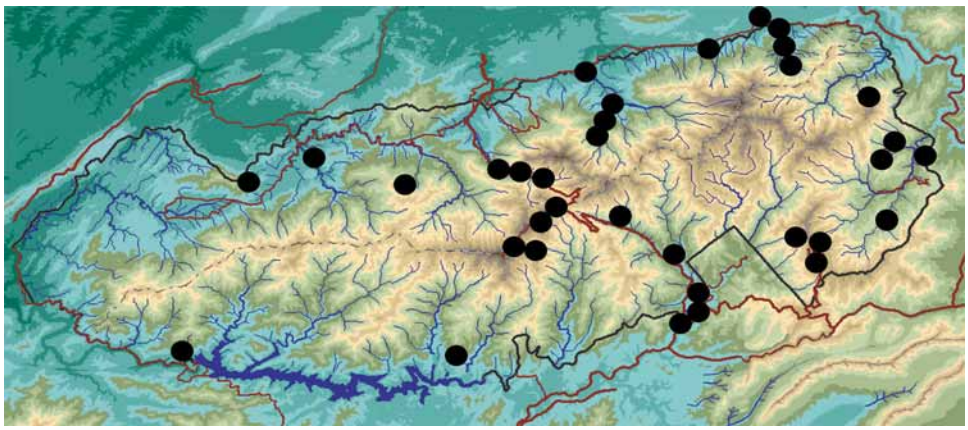
Identification: Forewing length 12–16 mm. Forewing ground color ferruginous to brown. Antemedial line is slightly scalloped and black, in some specimens the scalloped line can be double with a light ground color between. Orbicular spot is absent, but in a few specimens it is represented by a small white spot. Reniform spot is a small, white rectangle bordered by a few black scales distally. Some specimens can have a pale ferruginous reniform spot. Postmedial line is black, faint, and curves around reniform spot to posterior margin. Subterminal line is a series of black spots that can be connected with black lines on some specimens. Hindwing is gray with light colored fringe.

Flight period: May to early September, 2 broods.

Collected localities: North Carolina: Haywood Co., Balsam Mountain picnic area on Flat Creek Trail, Balsam Mountain Road Flat Creek Trail, Balsam Mountain Road Polls Gap Hemphill Bald Trail, Balsam Mountain Road 6.1 mi north of Blue Ridge Parkway Polls Gap Rough Fork Trail, Cataloochee pull off at Sal Patch Gap, Cataloochee service road off Cataloochee road, Cataloochee just off paved road to Cosby, Cataloochee NW of Palmer Chapel, trail to Hannah Hogden Cemetery, Mt. Sterling trail 0.72 mi from Trailhead, Purchase Knob, Purchase Knob road in meadow, Purchase Knob E of house in forest, Purchase Knob NW of house, Purchase Knob at house, Purchase Knob on road in meadow, Purchase Knob at lower creek, Purchase Knob Ferguson cabin, Purchase Knob 1.1 rd. mi from house, Purchase Knob in woods at base of knob, Purchase Knob 0.5 mi N of gate. Swain Co., Beetree Ridge, Big Cove Road site b, Big Cove Road site c, Big Cove Road site p, Big Cove Road site w, 5 road mi north Clingmans Dome, Indian Gap Clingmans Dome Road, 5.6 mi southwest of junction Hwy. 441 and Clingmans Dome Road Noland Divide Trail, 0.7 km up creek from mouth of Goldmine Creek, 0.7 km S Payne Cemetery, Kephart Prong Trail, Ravensford, Smokemont, Upper Noland Divide Trail below Clingmans Dome. Tennessee: Blount Co., Campsite 6 head of spring Scott Mountain Trail, Tremont; Cocke Co., 0.6 mi from state route 32 on road to Cosby campground, 1.2 mi from state route 32 on road to Cosby campground, Cosby ATBI house, Cosby Campground, Cosby picnic area off Gabes Mountain Trail, Foothills Parkway, Foothills Parkway East, Foothills Parkway 3rd overlook from Cosby, Foothills Parkway 2.5 mi from Rt. 321, Maddron Bald Trail; Sevier Co., above Chimney's Campground, Jake's Creek Trail Campsite 27, Jake's Creek Trail near Campsite 27, Jake's Creek Trail above Campsite 27, Jake's Creek Trail, Cove Forest pullout Hwy. 441, end of Greenbrier Loop Road 4 mi south Rt. 321, Greenbrier Ranger Station, Greenbrier picnic shelter, return on Greenbrier Loop Road 3.85 mi south Rt. 321, 6 mi south Sugarlands Visitor Center, 7 mi south Sugarlands Visitor Center. (179 specimens)

Elevation range: 1360–5950ft. (415–1814 m)

General distribution: Distributed from Nova Scotia and Ontario in Canada. In the U.S. it ranges from Maine south to North Carolina and Tennessee and west to Wisconsin.



MAP 50. Collecting localities of *Pseudorthodes vecors*.

Larval hosts: Feeds on herbaceous plants, such as daisy (*Chrysanthemum* sp., Asteraceae), white heath aster (*Symphyotrichum ericoides* (L.) G.L. Nesom var. *ericoides*, Asteraceae), jewelweed (*Impatiens capensis* Meerb., Balsaminaceae), and common plantain (*Plantago major* L., Plantaginaceae) (Godfrey 1972). Larvae obtained from eggs were reared on common dandelion (*Taraxacum officinale* F.H. Wigg., Asteraceae) (Godfrey 1972).

50. *Tricholita signata* (Walker) Signate Quaker
(Figs. 98–99, Map 51)

Identification: Forewing length 12–18 mm. Male antenna is bipectinate and filiform in the female. Forewing ground color ferruginous to ferruginous brown. Antemedial line faint, black, and slightly scalloped between veins. Orbicular spot is obscure being slightly lighter than ground color and margined with scales that are slightly darker than ground color. Reniform spot is variable from absent to white with a variable amount of ferruginous scales inundating the center of the spot. Postmedial line is black and is slightly sinuate to slightly scalloped between veins. Subterminal line is black to dark ferruginous and more sinuate and wider than postmedial line. Subterminal line separates the usually darker subterminal area from the lighter terminal area. In some specimens the subterminal and terminal areas are concolorous. Hindwing is gray.

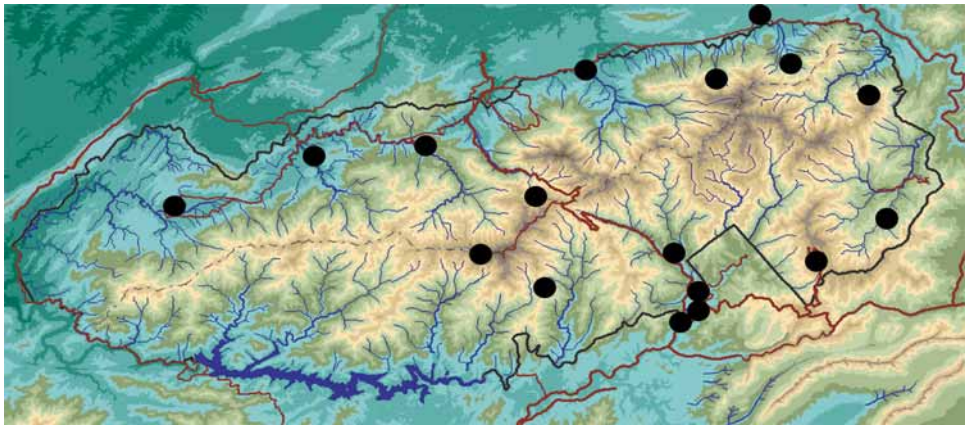
Flight period: June to mid-October.

Collected localities: North Carolina: Haywood Co., Balsam Mountain Road Flat Creek Trail, Mt. Sterling Trail, Mt. Sterling Trail 1.54 mi from trailhead, Purchase Knob at house, Purchase Knob E of house in field, Purchase Knob E of house in forest, Purchase Knob, Purchase Knob north of house in forest, Purchase Knob NE of house in field, Purchase Knob cabin; Swain Co., Big Cove Road site b, Big Cove Road site c, Big Cove Road site p, Big Cove Road site w, Mt. Buckley, Noland Creek, Smokemont. Tennessee: Blount Co., Cades Cove ATBI house 2,000 m SW, Tremont; Cocke Co., Albright Grove trailhead, Cosby ATBI house, Cosby Campground, Cosby Ranger Station, Foothills Parkway second pullout; Sevier Co., Greenbrier Ranger Station, 1.3 mi west of junction Hwy. 441 and Clingmans Dome Road on Road Prong Trail. (96 specimens)

Elevation range: 1300–6560 ft. (396–1999 m)

General distribution: From Nova Scotia to Ontario in Canada. In the U.S. it ranges from Maine to Florida, in the Midwest from Ohio, Michigan and Arkansas to North Dakota and Kansas, and west to Colorado and New Mexico.

Larval hosts: Larvae obtained from eggs were reared on common dandelion (*Taraxacum officinale* F.H. Wigg., Asteraceae), goldenrod (*Solidago* sp., Asteraceae), and common plantain (*Plantago major* L., Plantaginaceae) (Godfrey 1972). Little is known about this species natural hosts.



MAP 51. Collecting localities of *Tricholita signata.*

51. *Ulolonche culea* (Guenée) Sheathed Quaker
(Figs. 100–102, Map 52)

Identification: Forewing length 12–16 mm. Forewing ground color is light brown to brown. Antemedial line is cream colored and angulate from costa to posterior margin. Orbicular spot is faint and can be either cream-colored or dark brown margined by cream-color. Reniform spot is dark brown margined by cream color. Postmedial line is cream colored, slightly curved at costa then angulate to posterior margin. Subterminal line is a series of dark brown spots between wing veins that can be obscure in some specimens. Hindwing is white variously suffused with brown being darker along posterior margin to completely brown with a faint discal spot.

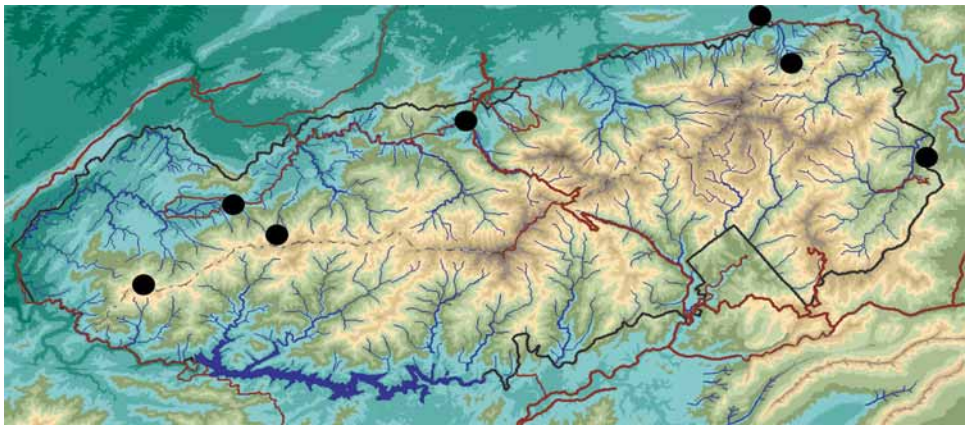
Flight period: May.

Collected localities: North Carolina: Haywood Co., Cataloochee just off paved road to Cosby. Tennessee: Blount Co., Cades Cove Ranger Station, Cold Spring Gap, 0.1 mi west of Gregory Bald; Cocke Co., Cosby Ranger Station, Foothills Parkway, Foothills Parkway south overlook; Sevier Co., Park Headquarters (10 specimens)

Elevation range: 1480–4929 ft. (451–1502 m)

General distribution: Distribution is from Maine to Florida and west from Kentucky and Michigan to Kansas and Texas.

Larval hosts: This is a deciduous tree-feeding species reared from red oak (*Quercus rubra* L., Fagaceae) and water oak (*Q. nigra* L., Fagaceae) (Godfrey 1972).



MAP 52. Collecting localities of *Ulolonche culea*.

52. *Ulolonche modesta* (Morrison) Modest Quaker
(Figs. 103–104, Map 53)

Identification: Forewing length 10–13 mm. Forewing ground color is gray. This is a variable species than can either be lightly marked (Fig. 103) or heavily marked (Fig. 104). Lightly marked specimens have a faint to absent basal line; antemedial line faint, zig-zag; medial line dark gray from costa to dark gray spot at end of discal cell then slightly angulate and continuing to posterior margin; orbicular and reniform spots absent; postmedial line faint, parallel to medial line and converging with medial line at a faint dark gray spot on the posterior margin; subterminal line can be absent or a series of small spots; terminal area dirty white, barely contrasting with ground color. Heavily marked specimens have an angulate, black basal line; antemedial line black, zig-zag; orbicular spot white with a pale gray center; ground color from base to medial line pale gray; medial line black, bolder from costa to black spot obscuring base of reniform spot then angulate to posterior margin; reniform spot white with pale gray center; postmedial line black and pale gray, curving around reniform spot and converging with medial line at a black spot on the posterior margin; subterminal line an irregular border with pale gray terminal area; area from medial line to subterminal line dark gray; terminal line a series of black dashes between wing veins. Hindwing is dark gray with a faint discal spot.

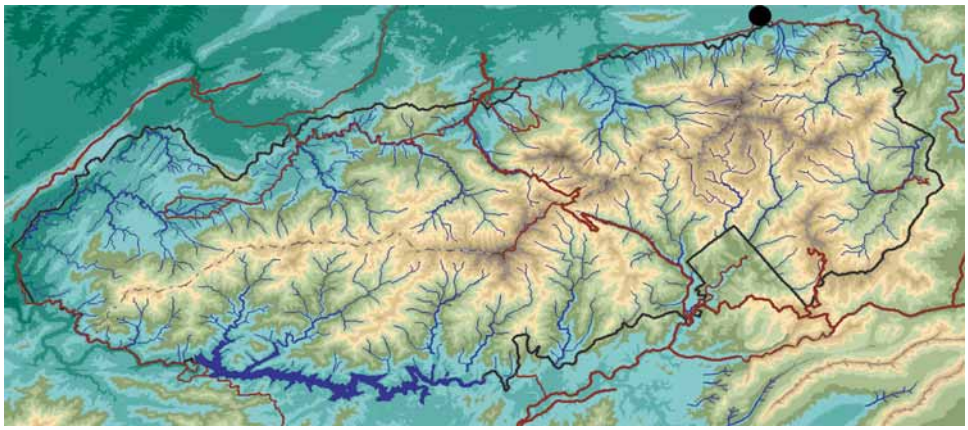
Flight period: Mid-May in Park.

Collected localities: Tennessee: Cocke Co., Foothills Parkway south overlook. (2 specimens)

Elevation range: 1860 ft. (567 m)

General distribution: This is an eastern species distributed from Maine to North Carolina west to Tennessee, Michigan, and Indiana. This species is associated with sandy soils in Ohio,

Larval hosts: Unknown.



MAP 53. Collecting localities of *Ulolonche modesta*.

Discussion

The Hadeninae of Great Smoky Mountains National Park are widely distributed throughout the Park and found in 160 localities (Map 1), which range in elevation from 1,000 to 6,650 feet [305–2027 m]). Dividing elevation into zones of low (below 2,500 feet [762 m]), medium (2,500–4,500 feet [762–1372 m]), and high (above 4,500 feet [1372 m]) results in both the high and low zones being the most species-rich with 43 species and the medium zone with 30 species. The species richness in the elevational zones is similar to those of the Noctuinae from GSMNP (Pogue 2006). The number of localities and specimens collected from the low altitude zone was 81 and 762, respectively; the medium zone had 39 and 304, respectively; and the high altitude zone had 48 and 917, respectively. The three most diverse localities in the Park were Purchase Knob with 44 species (492 specimens), Big Cove Road with 32 species (193 specimens) and Foothills Parkway with 24 species (124 specimens). These data show that the unevenness of the collection effort probably affected the above estimates on species-richness within elevational zones and between localities. There was a resident collector at Purchase Knob.

The most widespread species in the Park was *Pseudorthodes vecors* from 59 localities (Map 50). Other wide spread species include *Morrisonia latex* from 51 localities (Map 8), *Polia detracta* from 48 localities (Map 20), *Orthodes cynica* from 45 localities (Map 47), *Mythimna unipuncta* from 46 localities (Map 34), and *Polia nimbosa* (Map 22) from 42 localities. The most abundant species were *Polia detracta* with 210 specimens, *Orthodes cynica* with 187 specimens, *Pseudorthodes vecors* with 179 specimens, and *Polia nimbosa* with 162 specimens.

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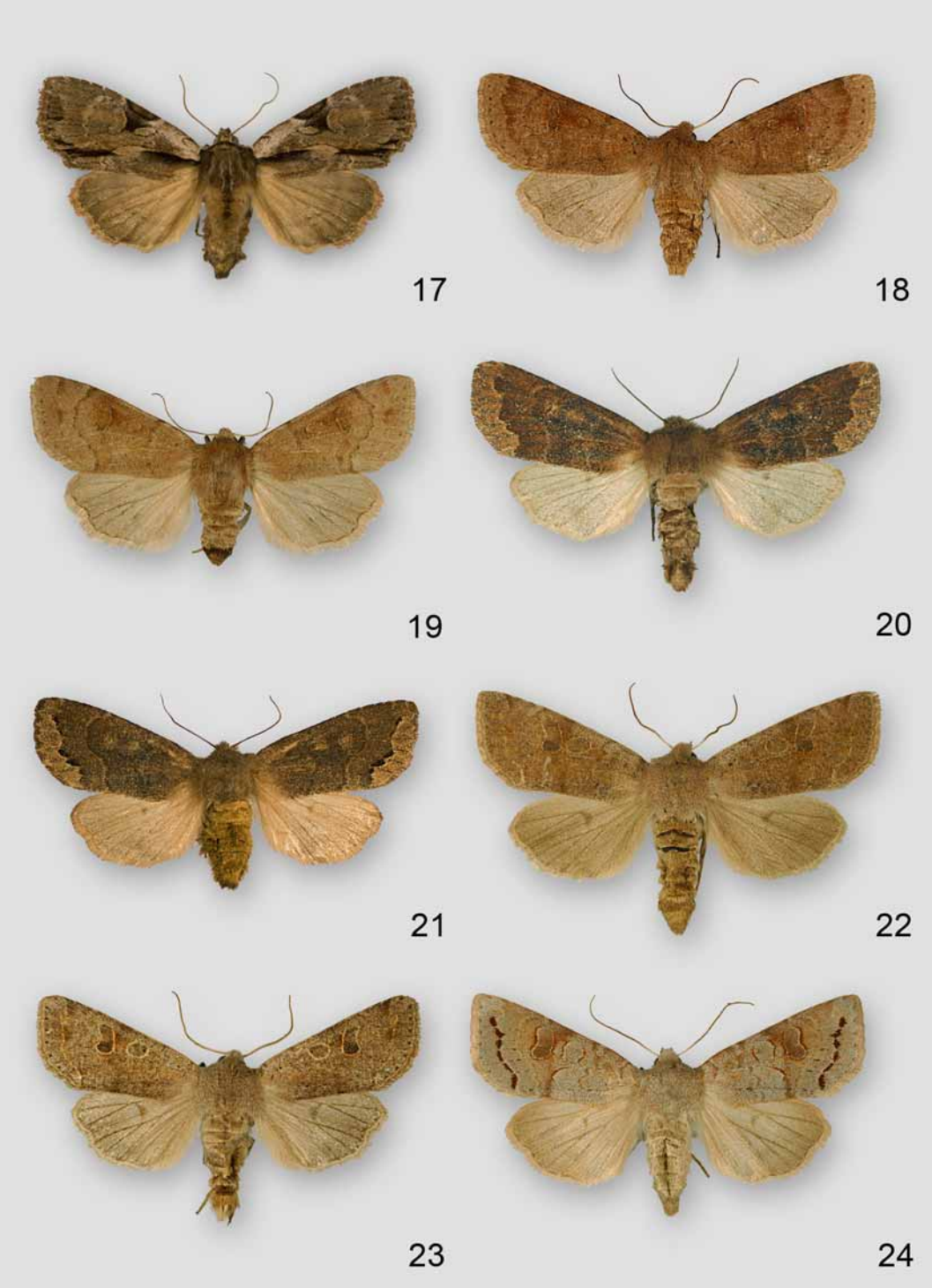
FIGURES 1–8. Adults. 1, *Achatia distincta*, f, Maryland, Montgomery Co., Seneca, Sycamore Landing, 21 Apr. 1979, D.C. Ferguson; 2, *Crocigrapha normani*, m, Maryland, Montgomery Co., Colesville, 17 Apr. 1976, D.C. Ferguson; 3, *Crocigrapha normani*, f, Maryland, Montgomery Co., Colesville, 17 Apr. 1976, D.C. Ferguson; 4, *Egira alternans*, m, North Carolina, Haywood Co., Cataloochee, just off paved road to Cosbey, 2600 ft., 18 May 2005, M.G. Pogue, USNMENT 00254451; 5, *Egira alternans*, m, North Carolina, Haywood Co., Cataloochee, just off paved road to Cosbey, 2600 ft., 18 May 2005, M.G. Pogue, USNMENT 00254466; 6, *Himella fidelis*, f, South Carolina, Charleston Co., McClellanville, Wedge Plantation, 19 Mar. 1968, D.C. Ferguson; 7, *Himella fidelis*, m, Texas, Anderson Co., Tennessee Colony, 14 Mar. 1966, A. & M.E. Blanchard; 8, *Himella fidelis*, m, New York, Tompkins Co., Ithaca, Forest Home, Golf Course Woods, 21 Feb. 1962, D.C. Ferguson.

FIGURES 9–16. Adults. 9, *Morrisonia confusa*, m, Maryland, Montgomery Co., Seneca, Sycamore Landing, 21 Apr. 1979, D.C. Ferguson; 10, *Morrisonia evicta*, f, Canada, Nova Scotia, Armdale, 30 May 1948, , D.C. Ferguson; 11, *Morrisonia evicta*, m, Canada, Nova Scotia, Halifax Co., Halifax Watershed Area, 7 May 1951, D.C. Ferguson; 12, *Morrisonia evicta*, m, Canada, Nova Scotia, Halifax Co., Halifax Watershed Area, 9 May 1951, D.C. Ferguson; 13, *Morrisonia evicta*, m, Canada, Nova Scotia, Halifax Co., Halifax Watershed Area, 25 May 1957, D.C. Ferguson; 14, *Morrisonia latex*, f, North Carolina, Swain Co., 13.5 mi NE GSMNP ent. on 441, Thomas Divide Trail, 4634 ft., 10 June 2003, M.G. Pogue, USNMENT 00155645; 15, *Morrisonia latex*, f, North Carolina, Swain Co., 15.2 mi NE GSNMP ent. on 441, Deep Creek Trail, 8 June 2003, M.G. Pogue, USNMENT 00155673; 16, *Morrisonia triangula*, m, South Carolina, Charleston Co., South Santee River, Wedge Plantation, 22 Apr. 1974, D.C. Ferguson.



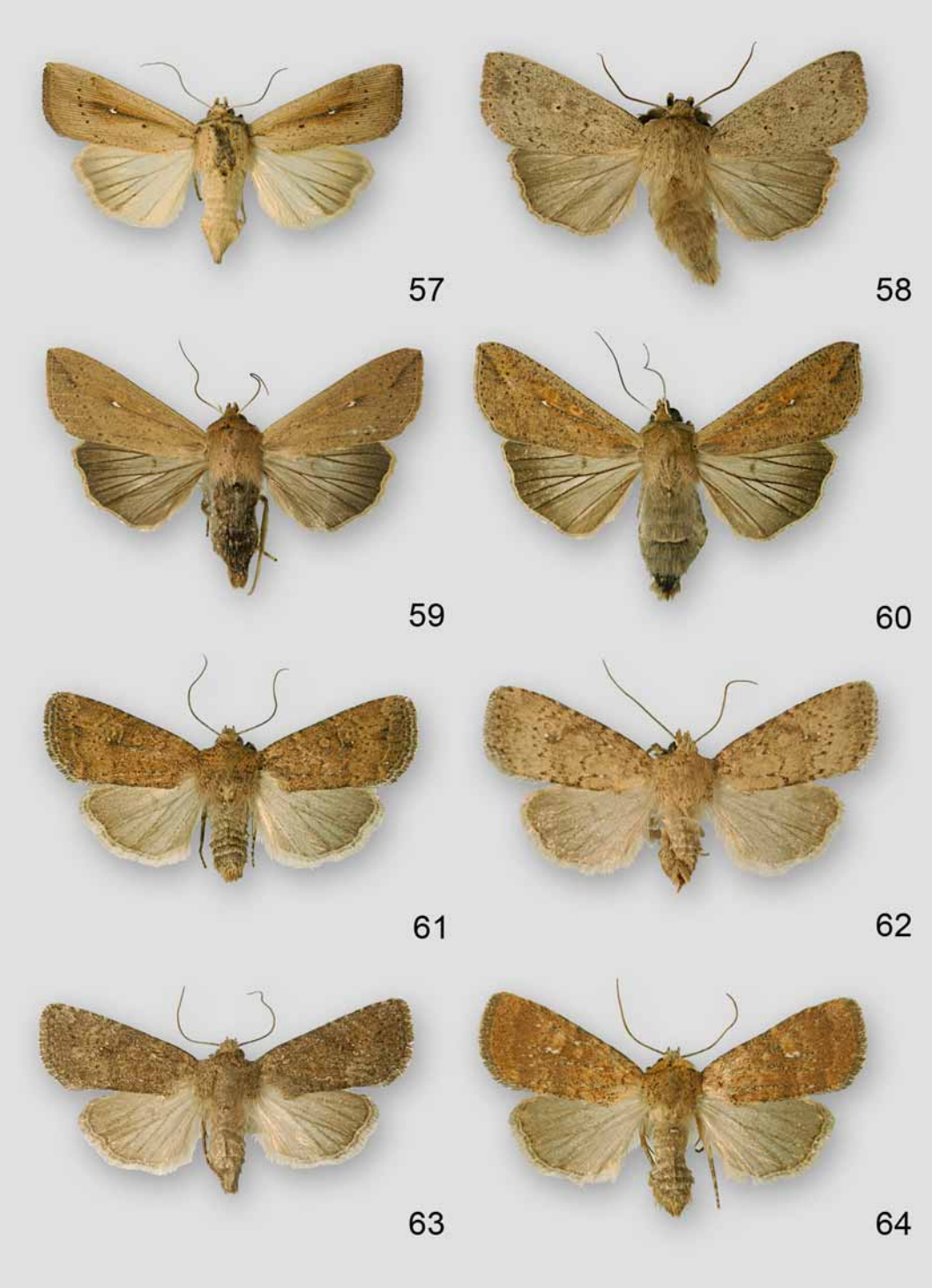
FIGURES 17–24. Adults. 17, *Morrisonia triangula*, f, South Carolina, Charleston Co., McClellanville, Wedge Plantation, 7 Apr. 1977, D.C. Ferguson; 18, *Orthosia alurina*, f, New York, Tompkins Co., Ithaca, Forest Home, Golf Course Woods, 23 Apr. 1961, D.C. Ferguson; 19, *Orthosia alurina*, f, New York, Tompkins Co., Ithaca, Forest Home, Golf Course Woods, 23 Apr. 1961, D.C. Ferguson; 20, *Orthosia garmani*, f, Connecticut, New Haven Co., Bethany, 6 Apr. 1969, D.C. Ferguson; 21, *Orthosia garmani*, f, Pennsylvania, Bucks Co., Reading, 9 Apr. 1959; 22, *Orthosia hibisci*, f, New York, 30 Mar. 1905; 23, *Orthosia hibisci*, m, Connecticutt, New Haven Co., New Haven, Yale Preserve, 17 Apr. 1964, D.C. Ferguson; 24, *Orthosia revicta*, f, New York, Tompkins Co., Ringwood Reserve near Dryden, 2 May 1965, D.C. Ferguson.

FIGURES 25–32. Adults. 25, *Orthosia revicta*, m, New York, Tompkins Co., Ringwood Reserve near Dryden, 2 May 1965, D.C. Ferguson. 26, *Orthosia rubescens*, m, Connecticut, New Haven Co., Bethany, 13 Apr. 1968, D.C. Ferguson; 27, *Orthosia rubescens*, m, New York, Long Island, 11 Apr. 1901; 28, *Orthosia rubescens*, m, Connecticut, New Haven Co., Bethany, 13 Apr. 1968, D.C. Ferguson; 29, *Nephelodes minians*, m, Tennessee, Cocke Co., Foothills Parkway, second overlook East, 1800 ft., 21 Sep. 2001, D.R. Davis, USNMENT 00153373; 30, *Dargida diffusa*, m, New Mexico, Union Co., Clayton, 5.3 mi NW of Hwy. 87 on 370, 5214 ft., 23 Aug. 2004, M.G. Pogue; 31, *Dargida diffusa*, m, Colorado, Fremont Co., Coaldale, Hayden Creek, 6800 ft., 9 July 1982, D.C. Ferguson; 32, *Hadena ectypa*, f, Illinois, Cook Co., Chicago, 10 July 1927.

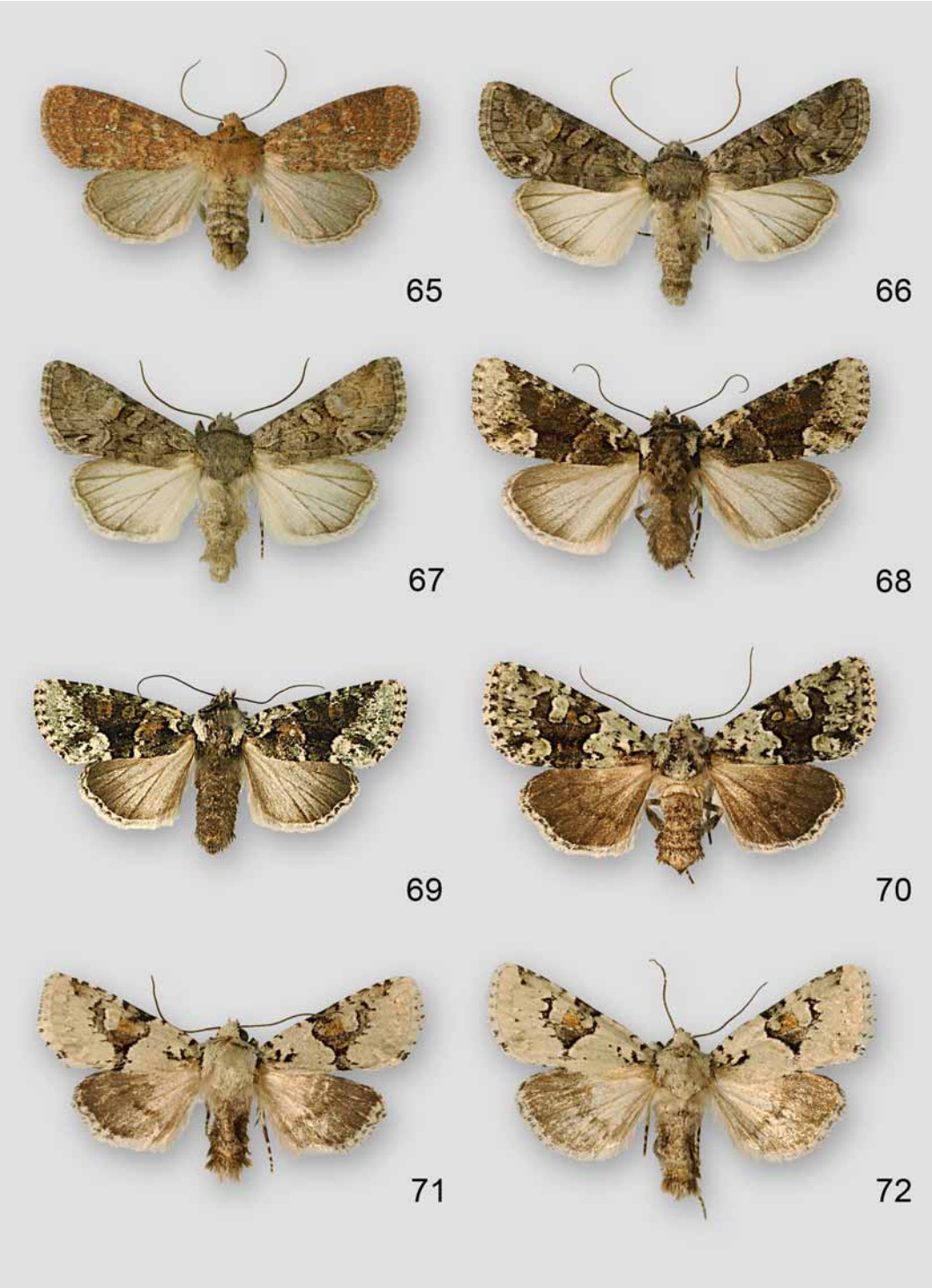
FIGURES 33–40. Adults. 33, *Melanchra adjuncta*, m, Virginia, Montgomery Co.; 34, *Melanchra assimilis*, m, Canada, Newfoundland, Doyles, Codroy Valley, 8 July 1959, D.C. Ferguson; 35, *Polia detracta*, m, North Carolina, Haywood Co., Purchase Knob, 4924 ft., 8 June 2002, J. Adams, USNMENT 00153850; 36, *Polia detracta*, m, Tennessee, Sevier Co., Campsite 20, 2520 ft., 22 June 2004, M.G. Pogue, USNMENT 00220921; 37, *Polia detracta*, m, North Carolina, Swain Co., 15.2 mi NE GSMNP ent. on 441, Deep Creek Trail, 4815 ft., 8 June 2003, M.G. Pogue, USNMENT 00155420; 38, *Polia imbrifera*, m, North Carolina, Haywood Co., Polls Gap, Rough Fork Trail, 5140 ft., 28 June 2004, M.G. Pogue, USNMENT 00221234; 39, *Polia nimbosa*, m, North Carolina, Swain Co., 5.6 mi SW of Jct. 441 & Clingmans Dome Rd., Noland Divide Trail, 5950 ft., 28 July 2003, M.G. Pogue, USNMENT 00156519; 40, *Polia nimbosa*, m, Tennessee, Sevier Co., 1.3 mi W of Jct. 441 & Clingmans Dome Rd., Road Prong Trail, 28 July 2003, M.G. Pogue, USNMENT 00156574.

FIGURES 41–48. Adults. 41, *Sideridis congermana*, m, Canada, Nova Scotia, Queens Co., Lake Keijimukujik, 18 June 1957, D.C. Ferguson; 42, *Spiramater lutra*, m, Tennessee, Blount Co., 0.1 mi W of Gregory Bald, 4929 ft., 27 May 2003, M.G. Pogue, USNMENT 00155153; 43, *Spiramater lutra*, m, Tennessee, Blount Co., Parsons Bald, 9 June 2002, L. & B. Merrit & M. Meyers, USNMENT 00153969; 44, *Trichordestra legitima*, m, North Carolina, Haywood Co., Purchase Knob, NE of house, field, 4925 ft., 2 Aug. 2003, M.G. Pogue, USNMENT 00218875; 45, *Leucania adjuta*, m, North Carolina, Swain Co., 8.3 mi NW GSMNP ent. on 441, Kephart Prong Trail, 2825 ft., 12 Oct. 2003, M.G. Pogue, USNMENT 00219269; 46, *Leucania adjuta*, f, North Carolina, Haywood Co., Purchase Knob, NE of house, field, 4925 ft., 31 July 2003, M.G. Pogue, USNMENT 00156845; 47, *Leucania inermis*, m, Canada, Nova Scotia, Acaciaville, 29 June 1951, D.C. Ferguson; 48, *Leucania inermis*, m, Canada, Nova Scotia, Queens Co., Lake Kejimukujik, 12 June 1958, D.C. Ferguson.

FIGURES 49–56. Adults. 49, *Leucania inermis*, f, North Carolina, Avery Co., Grandfather Mtn., 5280 ft., 14 July 1974, D.C. Ferguson; 50, *Leucania linda*, m, Maryland, Montgomery Co., Colesville, 16 June 1975, D.C. Ferguson; 51, *Leucania linda*, m, Maryland, Montgomery Co., Colesville, 9 June 1974, D.C. Ferguson; 52, *Leucania multilinea*, m, Canada, Nova Scotia, Victoria Co., Kelley Mtn. near Englishtown, 28 July 1970, D.C. Ferguson; 53, *Leucania phragmatidicola*, f, Oklahoma, Cimarron Co., Black Mesa State Park, E end of primative area, 4312 ft., 24 Aug. 2004, M.G. Pogue; 54, *Leucania phragmatidicola*, f, Connecticut, New Haven Co., Hamden, 6 June 1966, D.C. Ferguson; 55, *Leucania pseudargyria*, m, New York, 3 July 1900; 56, *Leucania scirpicola*, f, Florida, Highlands Co., Lake Placid, Archbold Biological Station, 19 Feb. 1985, D.C. Ferguson.

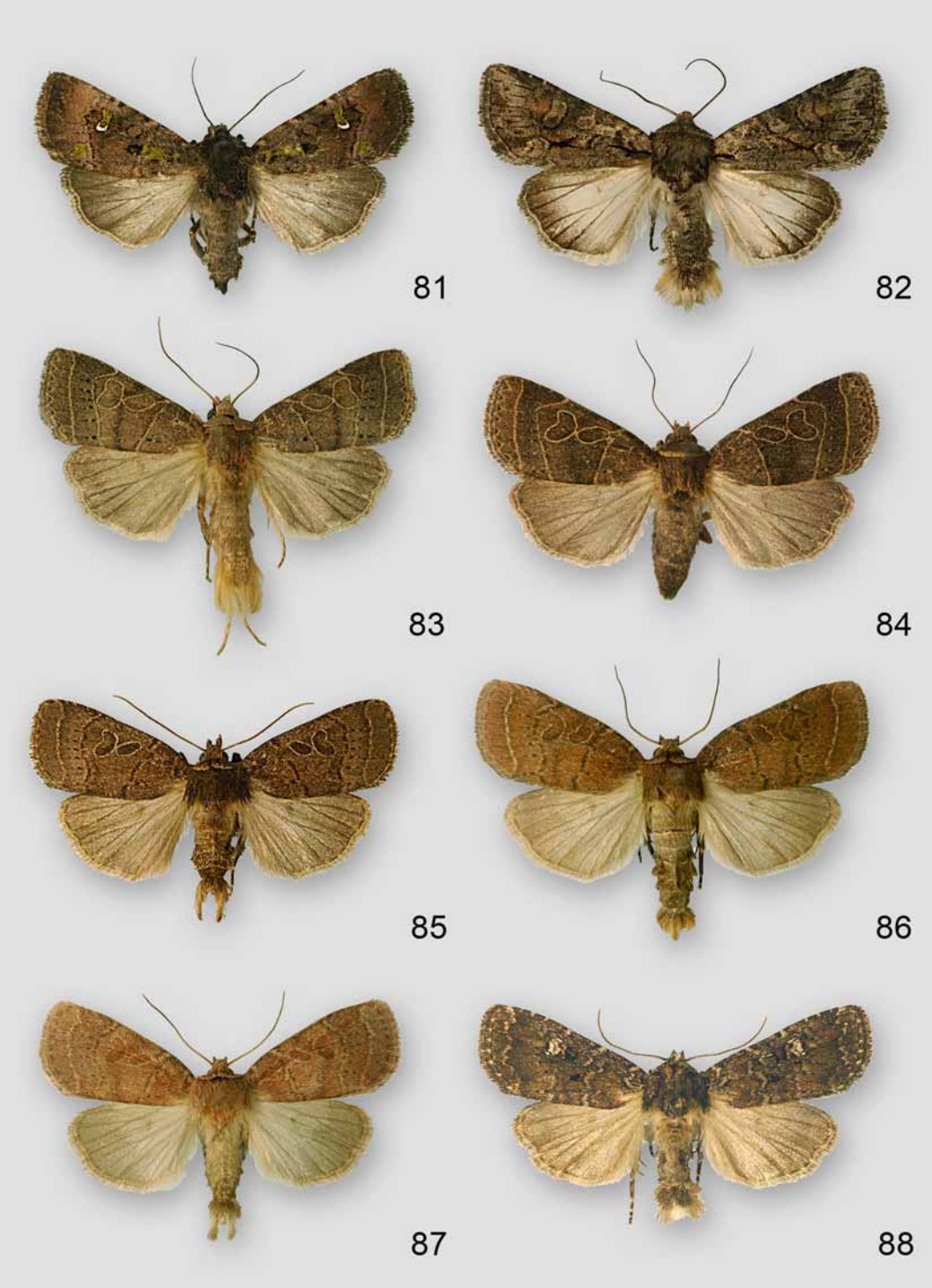


FIGURES 57–64. Adults. 57, *Leucania scirpicola*, m, Florida, Highlands Co., Lake Placid, Archbold Biological Station, 5 Apr. 1962, D.C. Ferguson; 58, *Leucania ursula*, m, Tennessee, Blount Co., Campsite 6 along Scott Mtn. Trail, 3324 ft., 5 Aug. 2003, M.G. Pogue, USNMENT 00219091; 59, *Mythimna unipuncta*, f, North Carolina, Swain Co., 3.3 mi NE Clingmans Dome parking lot, on Fork Ridge Trail, 5780 ft., 4 June 2003, M.G. Pogue, USNMENT 00155405; 60, *Mythimna unipuncta*, f, North Carolina, Swain Co., 1.2 mi NE Clingmans Dome parking lot, Noland Divide Trail, 6000 ft., 30 July 2003, M.G. Pogue, USNMENT 00156724; 61, *Homorthodes furfurata*, f, California, Del Norte Co., Rowdy Creek Road, 6 mi E Smith River, ca. 2000 ft., 25 July 1990, D.C. Ferguson; 62, *Homorthodes furfurata*, f, Canada, Nova Scotia, Hunts Co., Smiley Brook Prov. Park, nr. Brooklyn, 20 July 1970, D.C. Ferguson; 63, *Homorthodes furfurata*, f, South Dakota, Pennington Co., Hill City, Joe Dollar Gulch, 13 July 1964, D.C. Ferguson; 64, *Homorthodes lindseyi*, f, New Jersey, Ocean Co., Lake Hurst, 11 Aug. 1920, F. Lemmer.

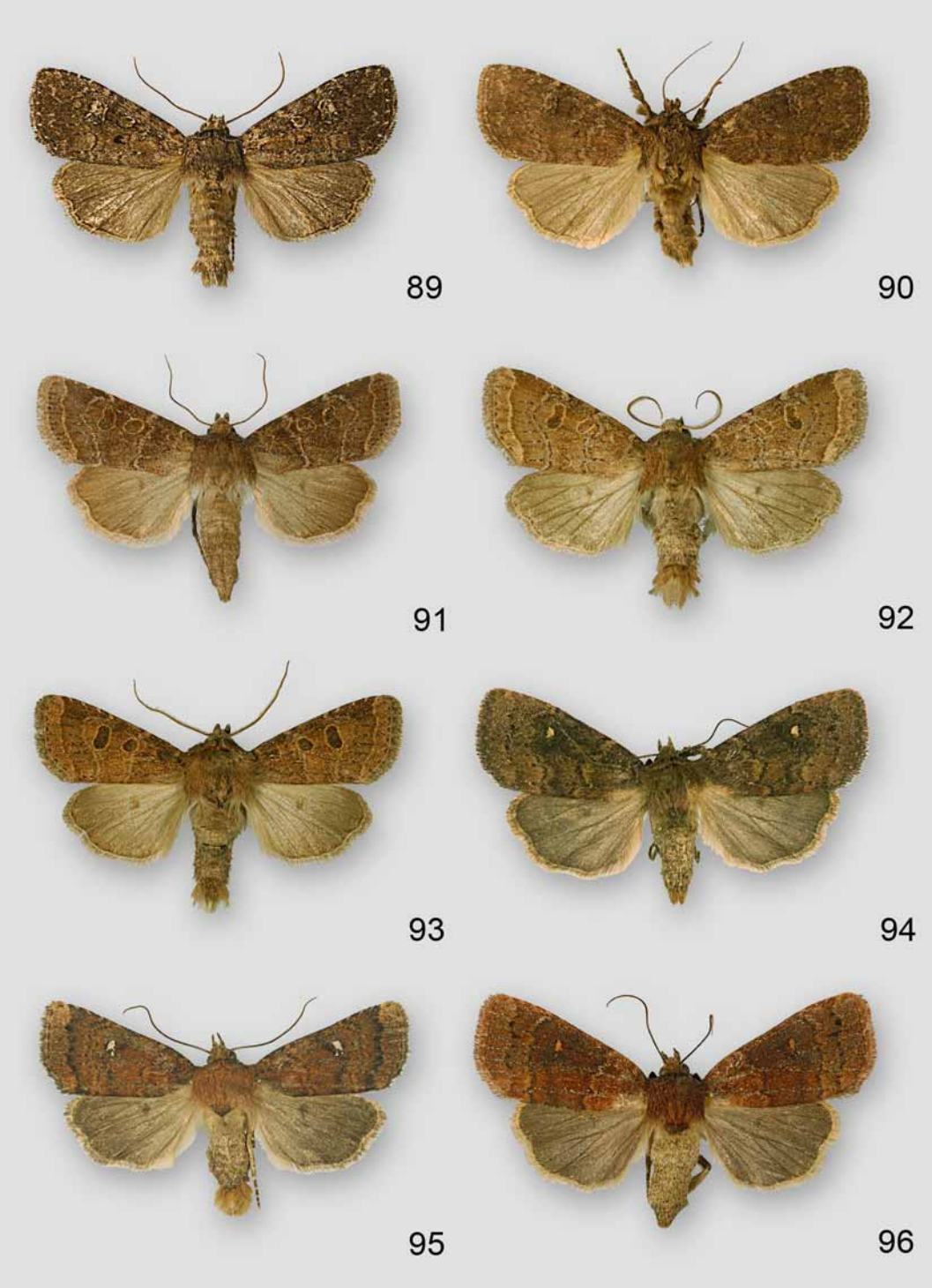


FIGURES 65–72. Adults. 65, *Homorthodes lindseyi*, f, Maryland, Montgomery Co., Colesville, 29 May 1975, D.C. Ferguson; 66, *Lacinipolia anguina*, m, Connecticut, New Haven Co., New Haven, West Rock Park, 24 May 1966, D.C. Ferguson; 67, *Lacinipolia anguina*, m, Connecticut, New Haven Co., New Haven, West Rock Park, 24 May 1966, D.C. Ferguson; 68, *Lacinipolia explicata*, f, South Carolina, Charleston Co., McClellanville, Wedge Plantation, 8 Apr. 1970, D.C. Ferguson; 69, *Lacinipolia explicata*, f, Maryland, Anne Arundel Co., South Haven, 15 Aug. 1992, H.G. Stevenson; 70, *Lacinipolia implicata*, f, Tennessee, Cocke Co., Foothills Parkway, second overlook East, 21 Sep. 2000, D. & M. Davis, USNMENT 00153263; 71, *Lacinipolia implicata*, m, Tennessee, Cocke Co., Foothills Parkway, second overlook East, 21 Sep. 2000, D. & M. Davis, USNMENT 00153261; 72, *Lacinipolia implicata*, m, Tennessee, Cocke Co., Foothills Parkway, second overlook East, 21 Sep. 2000, D. & M. Davis, USNMENT 00153260.

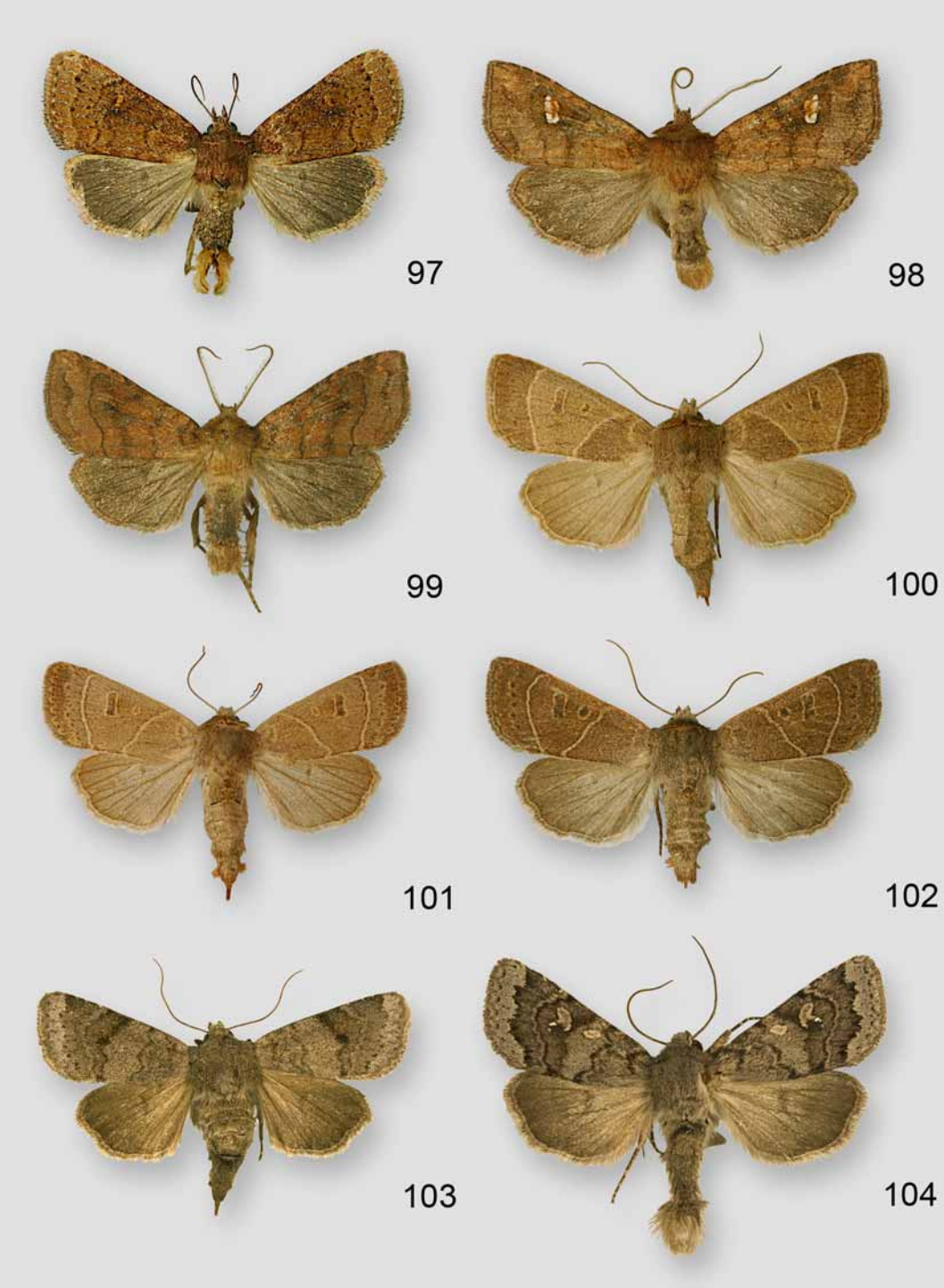
FIGURES 73–80. Adults. 73, *Lacinipolia laudabilis*, m, Virginia, Fairfax Co., Alexandria (Rose Hill), 1 Sep. 1976, P.A. Opler; 74, *Lacinipolia laudabilis*, f, South Carolina, Charleston Co., McClellanville, Wedge Plantation, 25 Apr. 1980, D.C. Ferguson; 75, *Lacinipolia lorea*, m, Tennessee, Blount Co., Tremont Env. Ctr., 1360 ft., 8 June 2002, M.G. Pogue, USNMENT 00153791; 76, *Lacinipolia meditata*, m, Tennessee, Cocke Co., Foothills Parkway, second overlook East, 21 Sep. 2000, D. & M. Davis, USNMENT 00153309; 77, *Lacinipolia olivacea*, m, Tennessee, Sevier Co., 1.3 mi W Jct. 441 & Clingmans Dome Road, Road Prong Trail, 5260 ft., 28 July 2003, M.G. Pogue, USNMENT 00156550; 78, *Lacinipolia olivacea*, f, North Carolina, Haywood Co., Purchase Knob, E of house, forest, 4838 ft., 31 July 2003, M.G. Pogue, USNMENT 00156911; 79, *Lacinipolia olivacea*, f, North Carolina, Haywood Co., Purchase Knob, NE of house, field, 4925 ft., 2 Aug. 2003, M.G. Pogue, USNMENT 00218845; 80, *Lacinipolia renigera*, m, North Carolina, Haywood Co., Purchase Knob, N of house, forest, 4998 ft., 1 Aug. 2003, M.G. Pogue, USNMENT 00218653.



FIGURES 81–88. Adults. 81, *Lacinipolia renigera*, f, North Carolina, Haywood Co., Cataloochee, NW of Palmer Chapel, 2650 ft., 19 May 2005, M.G. Pogue, USNMENT 00254492; 82, *Lacinipolia teligera*, m, Tennessee, Cocke Co., Foothills Parkway, second overlook East, 1800 ft., 21 Sep. 2000, D. &. M. Davis, USNMENT 00153254; 83, *Orthodes majuscula*, m, North Carolina, Haywood Co, Balsam Mtn. Rd. 6.1 mi N of Jct. Blue Ridge Parkway, on Hemphill Bald Trail, 5125 ft., 8 Oct. 2003, M.G. Pogue, USNMENT 00219202; 84, *Orthodes majuscula*, f, Tennessee, Sevier Co., Jake's Creek Trail, below Campsite #27, 3595 ft., 24 July 2004, M.G. Pogue, USNMENT 00147176; 85, *Orthodes cynica*, m, Maryland, Montgomery Co., Colesville, 6 June 1975, D.C. Ferguson; 86, *Orthodes cynica*, m, Canada, Nova Scotia, Halifax Co., Halifax Watershed, Bog E of Big Indian Lake, 26 June 1968, D.C. Ferguson; 87, *Orthodes cynica*, f, New York, Kings Co., Brooklyn, 6 June 1901; 88, *Orthodes goodelli*, m, North Carolina, Jackson Co., Balsam, 3200 ft., 20 June 1974, D.C. Ferguson.



FIGURES 89–96. Adults. 89, *Orthodes goodelli*, m, Maryland, Howard Co., Patuxent State Park, Hipsley's Mill, 22 May 1981, D.C. Ferguson; 90, *Orthodes goodelli*, m, Canada, Ontario, Hymers, 8 June 1910; 91, *Protorthodes oviduca*, f, Canada, Ontario, Hymers, 13 June 1912; 92, *Protorthodes oviduca*, m, Canada, Nova Scotia, Anig. Co., Brierly Brook, 28 June 1954, D.C. Ferguson; 93, *Protorthodes oviduca*, m, Canada, Nova Scotia, Halifax Co., Halifax Watershed, near Big Indian Lake, 6 June, D.C. Ferguson; 94, *Pseudorthodes vecors*, f, Tennessee, Cocke Co., 1.2 mi from state route 32 on road to Cosby campground, 1910 ft., 28 July 2007, M. Pogue, D. Adamski, M. Metz, GSMNP 1022; 95, *Pseudorthodes vecors*, m, Tennessee, Cocke Co., Cosby, vic. ATBI house, 1750 ft., 22–25 June 2001; 96, *Pseudorthodes vecors*, f, Tennessee, Sevier Co., Jake's Creek Trail, above campsite #27, 3600 ft., 23 July 2004, M.G. Pogue, USNMENT 00221814.



FIGURES 97–104. Adults. 97, *Pseudorthodes vecors*, m, North Carolina, Haywood Co., Balsam Mtn. picnic area, on Flat Creek Trail, 5265 ft., 28 June 2004, M.G. Pogue, USNMENT 00221059; 98, *Tricholita signata*, m, North Carolina, Haywood Co., Purchase Knob, NE of house, field, 4925 ft., 31 July 2003, M.G. Pogue, USNMENT 00156862; 99, *Tricholita signata*, m, North Carolina, Haywood Co., Purchase Knob, NE of house, field, 4925 ft., 2 Aug. 2003, M.G. Pogue, USNMENT 00218886; 100, *Ulolonche culea*, f, New York, 4 June 1901; 101, *Ulolonche culea*, f, New York, Long Island, 6 June 1901; 102, *Ulolonche culea*, f, Maryland, Montgomery Co., Colesville, 30 May 1988, D.C. Ferguson; 103, *Ulolonche modesta*, f, New Jersey, Ocean Co., Lakehurst, Wrangle Brook Rd., 3 June 1956, D.C. Ferguson; 104, *Ulolonche modesta*, m, Indiana, Newton Co., Conrad Savanna, 41° 06.4' N, 87° 26.5' N, 23 May 1997, E.H. Metzler.

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