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## **The Noctuinae (Lepidoptera: Noctuidae) of Great Smoky Mountains National Park, U.S.A.**

MICHAEL G. POGUE



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## The Noctuidae (Lepidoptera: Noctuidae) of Great Smoky Mountains National Park, U.S.A.

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## Abstract

Forty-eight species of Noctuidae are recorded from Great Smoky Mountains National Park, Tennessee and North Carolina, U.S.A., with 17 species in the tribe Agrotini and 31 species in the tribe Noctuini. Images of adults, description/diagnosis, flight period, collected localities, abundance, elevational range, general distribution, and larval hosts are presented for each species. The greatest diversity of Noctuidae species (n=29) was recorded from four combined localities along Big Cove Road, Swain Co., North Carolina.

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

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

The Noctuidae can be recognized by the lack of surface hair on the eye, the presence of rows of setae on the middle and hind tibiae, and the adult resting posture in which the forewings are held flat in a horizontal plane and overlap so the costae or leading edges are almost parallel to the midline of the body (Kitching and Rawlins 1999). The Agrotini have a frons that is either bulging or with a central process, and the foretibia usually has rows of setae on both sides, with enlarged apical seta on each side. The Noctuini have a smooth frons, and in most groups the foretibial setae are reduced in number or absent. When present, the setae often are obscured by a fringe of long scales (Lafontaine 1998).

Fifty-five species of Noctuidae are discussed here. Forty-eight species have been collected in the Park, and an additional seven species could occur in the Park based on their distributions elsewhere.

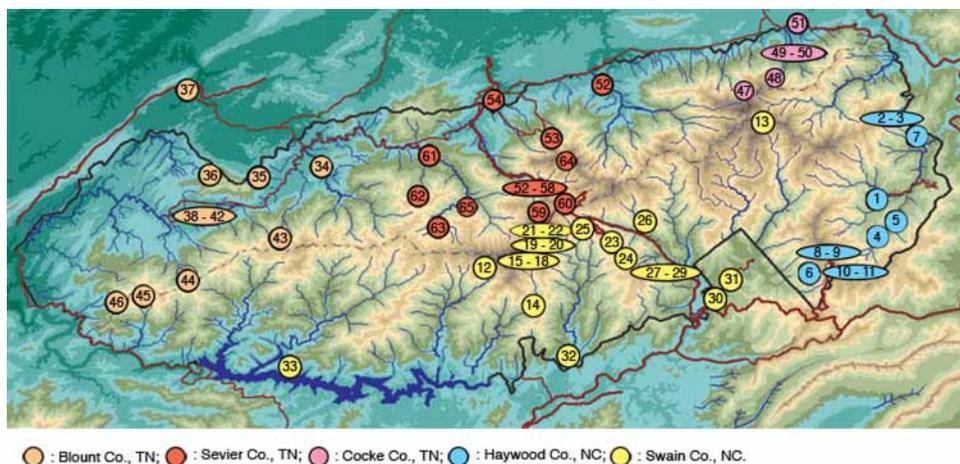
As collecting continues in the Park, an update of the total number of species of Noctuidae will be included in future publications. Since Pogue (2005), the number of Noctuidae species recorded in the Park has risen by two for a total of 492. Using the Chao 1 species estimator,  $Chao\ 1 = S_{obs} + a^2/2b$ , where “ $S_{obs}$ ” is the number of observed species (492), “a” is the number of species represented by one specimen (69), and “b” is the number of species represented by two specimens (52), 538 species of Noctuidae are estimated to be present. The number of Noctuidae species collected is approximately 91.4% of that predicted. These numbers will continue to fluctuate as additional specimens are collected.

## Method and materials

Methods and materials were discussed in Pogue (2005). Adult common names are from Covell (1984) and larval names from Lafontaine (1998, 2004). Scientific names of plants were verified using The Plants Database (USDA, NRCS 2005).

Flight period refers to adult phenology within GSMNP, except for those species that are not yet recorded from the Park. Elevation range is only within GSMNP. Larval hosts include the known range of host plants for each species across their entire range.

The Noctuidae were collected in 108 localities within GSMNP (Map 1). Localities on Map 1 are numbered and correspond with data provided in Table 1. Some localities within close proximity of each other were included as a single dot. Localities at Cataloochee, Purchase Knob, Flat Creek Trail on Balsam Mountain Road, and Polls Gap Hemphill Bald Trail, Haywood Co., North Carolina; Kephart Prong Trail, and Big Cove Road, Swain Co., North Carolina; Foothills Parkway, Coker Co., Tennessee; Scott Mountain Trail at Campsite 6, Cades Cove house and Ranger Station, and Gregory Bald, Blount Co., Tennessee; and Jake's Creek Trail at Campsite 27, Sevier Co., Tennessee, have multiple localities as a single map number.



**MAP 1.** Collecting localities of Noctuidae. Numbers refer to localities in Table 1.

## Species accounts

### Checklist

The following is a checklist of the Noctuidae of Great Smoky Mountains National Park. The higher-level classification of the Agrotini follows Lafontaine (2004) and the Noctuidae follows Fibiger and Lafontaine (2005). The species nomenclature follows Lafontaine (1987, 1998, 2004), except original spellings are used (Poole 1989). The author and year of publication follow the species name. Species denoted with an asterisk (\*) are not yet recorded from the Park, but are likely to be represented and are treated in the text. The species in the checklist are listed in alphabetical order within each tribe and subtribe, except in *Xestia*, where closely related species are placed next to each other to facilitate identification. The arrangement in the text follows the checklist.

TABLE 1. Collecting localities of GSMNP Noctuidae.

Map No.	State	County	Locality	UTM N	UTM E	Latitude	Longitude	Elev. ft / m
1	NC	Haywood	Cataloochee	3945813	311668	35.6400 N	83.0800 W	2600 / 792
1	NC	Haywood	Cataloochee, just off paved road to Cosby	3945240	311307	35.6348 N	83.0839 W	2600 / 792
1	NC	Haywood	Cataloochee, NW of Palmer Chapel	3944491	308804	35.6275 N	83.1113 W	2650 / 808
1	NC	Haywood	Cataloochee, pull off at Sal Patch Gap	3945719	313330	35.6395 N	83.0616 W	3440 / 1049
2	NC	Haywood	Mt. Sterling	3952772	308014	35.7020 N	83.1220 W	5820 / 1774
3	NC	Haywood	Mt. Sterling Trail	3952634	309278	35.7010 N	83.1080 W	4400 / 1341
4	NC	Haywood	Purchase Knob	3939847	312149	35.5863 N	83.0733 W	4924 / 1501
4	NC	Haywood	Purchase Knob	3938381	311511	35.5730 N	83.0800 W	4000 / 1219
4	NC	Haywood	Purchase Knob at house	3939810	312176	35.5860 N	83.0730 W	4800 / 1463
4	NC	Haywood	Purchase Knob by Ferguson cabin	3939198	312279	35.5805 N	83.0717 W	4600 / 1402
4	NC	Haywood	Purchase Knob cabin	3939314	312176	35.5815 N	83.0729 W	4360 / 1329
4	NC	Haywood	Purchase Knob E of house, field	3939986	312217	35.5858 N	83.0726 W	4914 / 1498
4	NC	Haywood	Purchase Knob E of house, forest	3939962	312841	35.5875 N	83.0657 W	4838 / 1475
4	NC	Haywood	Purchase Knob house	3939833	312122	35.5862 N	83.0736 W	4924 / 1501
4	NC	Haywood	Purchase Knob house	3939816	312124	35.5860 N	83.0736 W	4924 / 1501
4	NC	Haywood	Purchase Knob ATBI Plot	3940433	313346	35.5918 N	83.0602 W	4320 / 1317
4	NC	Haywood	Purchase Knob in trees on road	3939138	312434	35.5800 N	83.0700 W	4570 / 1393
4	NC	Haywood	Purchase Knob N of house, forest	3940175	312026	35.5875 N	83.0748 W	4950 / 1509
4	NC	Haywood	Purchase Knob N of house, forest	3939947	311970	35.5872 N	83.0753 W	4998 / 1523
4	NC	Haywood	Purchase Knob NE of house, field	3939888	312141	35.5867 N	83.0734 W	4925 / 1501

to be continued

TABLE 1 (continued).

Map No.	State	County	Locality	UTM N	UTM E	Latitude	Longitude	Elev. ft / m
4	NC	Haywood	Purchase Knob, nr. 1 <sup>st</sup> gate	3938555	312525	35.5748 N	83.0689 W	4400 / 1341
4	NC	Haywood	Purchase Knob, on road in meadow	3939582	312443	35.5840 N	83.0700 W	4520 / 1378
4	NC	Haywood	Purchase Knob, 0.5 mi N of gate	3939394	312401	35.5814 N	83.0704 W	4640 / 1414
5	NC	Haywood	Purchase house, 1 mi SE off Purchase Road	3938997	312581	35.5787 N	83.0681	4630 / 1411
6	NC	Haywood	Flat Creek trail on Balsam Mountain Road	3936384	302922	35.5533 N	83.1742 W	4890 / 1490
6	NC	Haywood	Balsam Mountain Road 5.2 mi N of Jct. Blue Ridge Parkway on Flat Creek Trail	3936615	303690	35.5537 N	83.1658 W	4931 / 1503
7	NC	Haywood	Piney Mountain	3946085	314573	35.643 N	83.048 W	3880 / 1183
8	NC	Haywood	Balsam Mountain picnic area on Flat Creek Trail	3939314	302279	35.5706 N	83.1818 W	5265 / 1605
9	NC	Haywood	Balsam Mountain campground	3937914	302953	35.5653 N	83.1743 W	5320 / 1622
10	NC	Haywood	Polls Gap on Rough Fork Trail	3937696	304142	35.5654 N	83.1611 W	5140 / 1567
11	NC	Haywood	Balsam Mountain Road 6.1 mi N of Jct. Blue Ridge Parkway on Hemphill Bald Trail	3937708	304176	35.5638 N	83.1608 W	5125 / 1562
11	NC	Haywood	Polls Gap on Hemphill Bald Trail	3937790	302929	35.5660 N	83.1745 W	5400 / 1646
12	NC	Swain	Mt. Buckley	3938060	272869	35.5620 N	83.5060 W	6560 / 1999
13	NC	Swain	Tricorner Knob	3938615	275060	35.6945 N	83.2567 W	5960 / 1817
14	NC	Swain	Noland Creek	3934305	276494	35.5290 N	83.4650 W	3540 / 1079
15	NC	Swain	Clingman's Dome	3938155	273506	35.5630 N	83.4990 W	6640 / 2024
16	NC	Swain	1 rd mi N of Clingman's Dome	3938526	274937	35.5667 N	83.4833 W	5960 / 1817
17	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

to be continued

TABLE 1 (continued).

Map No.	State	County	Locality	UTM N	UTM E	Latitude	Longitude	Elev. ft / m
17	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
18	NC	Swain	Upper Noland Divide Trail ca. Clingman's Dome	3938560	275059	35.5670 N	83.4820 W	5930 / 1807
19	NC	Swain	3 rd mi N of Clingman's Dome	3940588	276085	35.5855 N	83.4712 W	5920 / 1804
20	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
21	NC	Swain	5 mi N of Clingman's Dome	3942376	277871	35.6020 N	83.4520 W	5460 / 1664
22	NC	Swain	Indian Gap on Clingman's Dome Road	3943184	278372	35.6108 N	83.4385 W	5286 / 1612
23	NC	Swain	13.5 mi NE of entrance to GSMNP on Thomas Divide Trail	3940265	282711	35.5841 N	83.3981 W	4634 / 1412
24	NC	Swain	Beetree Ridge	3939471	283062	35.5770 N	83.3940 W	4860 / 1481
25	NC	Swain	15.2 mi NE of entrance to GSMNP on Deep Creek Trail	3941998	280456	35.5992 N	83.4234 W	4815 / 1468
26	NC	Swain	Kephart Prong Trail	3940504	286261	35.5870 N	83.3590 W	2760 / 841
26	NC	Swain	8.3 mi NE of GSMNP entrance on 441, Kephart Prong Trail	3940562	286106	35.5875 N	83.3607 W	2805 / 855
26	NC	Swain	8.3 mi NW of GSMNP entrance on 441, Kephart Prong Trail	3940466	286398	35.5867 N	83.3575 W	2825 / 861
27	NC	Swain	Oconalufee River Smokemont Road	3939922	286918	35.5819 N	83.3516 W	2640 / 805
28	NC	Swain	Smokemont	3937410	290359	35.5560 N	83.3130 W	2250 / 686
29	NC	Swain	Oconalufee Staff Housing	3932597	290900	35.5168 N	83.3058 W	2020 / 616
30	NC	Swain	Big Cove Road, site b	3932935	291888	35.5200 N	83.2950 W	2120 / 646

to be continued

TABLE 1 (continued).

Map No.	State	County	Locality	UTM N	UTM E	Latitude	Longitude	Elev. ft./m
30	NC	Swain	Big Cove Road, site c	3931177	291121	35.5040 N	83.3030 W	2080 / 634
30	NC	Swain	Big Cove Road, site p	3932160	291779	35.5130 N	83.2960 W	2040 / 622
30	NC	Swain	Big Cove Road, site w	3931834	291499	35.5100 N	83.2990 W	2030 / 619
31	NC	Swain	Ravensford	3931836	291408	35.5100 N	83.3000 W	2020 / 616
32	NC	Swain	Deep Creek Ranger Station	3926502	278706	35.4592 N	83.4385 W	2120 / 646
33	NC	Swain	Weich Ridge, 300 ft. above Lake Fontana	3926205	251764	35.4502 N	83.7350 W	1720 / 524
34	TN	Blount	Tremont Environmental Center	3947301	256311	35.6413 N	83.6913 W	1360 / 415
35	TN	Blount	Scott Mountain Trail at Campsite 6, head of spring	3945205	249480	35.6207 N	83.7660 W	3292 / 1003
35	TN	Blount	Scott Mountain Trail at Campsite 6	3945124	249410	35.6201 N	83.7667 W	3324 / 1013
36	TN	Blount	Ace Gap Trailhead	3950872	243766	35.6703 N	83.8308 W	1700 / 518
37	TN	Blount	Foothills Parkway West at Little River	3956218	244705	35.7187 N	83.8222 W	1000 / 305
38	TN	Blount	Vicinity of Cades Cove	3943766	248319	35.6057 N	83.7784 W	1880 / 573
38	TN	Blount	Cades Cove near Ranger Station	3943351	248453	35.6037 N	83.7768 W	1900 / 579
38	TN	Blount	Cades Cove ATBI house, 2000 m SW	3943081	243315	35.6000 N	83.8333 W	1740 / 530
39	TN	Blount	Cades Cove campground	3943371	248704	35.6040 N	83.7740 W	1940 / 591
40	TN	Blount	Cades Cove Primitive Baptist Church	3943252	245073	35.6020 N	83.8140 W	1800 / 549
41	TN	Blount	Cades Cove Old Field ATBI Plot	242863	3942201	35.5920 N	83.8380 W	1720 / 524
42	TN	Blount	Gregory Cave	3944119	345824	35.6100 N	83.8060 W	2020 / 616
43	TN	Blount	Spence Field	3938824	252505	35.5640 N	83.7307 W	4887 / 1490
44	TN	Blount	Cold Spring Gap	3934731	242757	35.5229 N	83.8368 W	4240 / 1292

to be continued

TABLE 1 (continued).

Map No.	State	County	Locality	UTM N	UTM E	Latitude	Longitude	Elev. ft. / m
45	TN	Blount	Gregory Bald	3934368	240099	35.5207 N	83.8660 W	4949 / 1508
45	TN	Blount	Gregory Bald, 0.1 mi W	3934272	239987	35.5198 N	83.8672 W	4929 / 1502
45	TN	Blount	Gregory Bald Trail, E of Campsite 13	3934327	239598	35.5202 N	83.8715 W	4680 / 1426
45	TN	Blount	Gregory Bald Trail, N of Campsite 13	3934428	239574	35.5211 N	83.8718 W	4690 / 1430
46	TN	Blount	Wolf Ridge Trail, 0.2 mi NE of Parson's Bald	3934120	238721	35.5181 N	83.8811 W	4700 / 1433
47	TN	Cocke	Albright Grove ATBI Plot	3956563	293741	35.7333 N	83.2806 W	3400 / 1036
48	TN	Cocke	Snakeden Ridge ATBI Plot	3957561	299256	35.7434 N	83.2199 W	3060 / 933
49	TN	Cocke	Cosby ATBI house	3961350	299893	35.7777 N	83.2138 W	1760 / 536
49	TN	Cocke	Vicinity Cosby ATBI house	3961349	299908	35.7777 N	83.2137 W	1760 / 536
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 Ranger Station	3961387	299879	35.7780 N	83.2140 W	1750 / 533
50	TN	Cocke	0.25 mi inside entrance to Cosby	3965781	296995	35.8170 N	83.2470 W	1350 / 411
51	TN	Cocke	Foothills Parkway East	3946720	232843	35.6300 N	83.9500 W	2400 / 732
51	TN	Cocke	Foothills Parkway	3965602	299974	35.8160 N	83.2140 W	2400 / 732
51	TN	Cocke	Foothills Parkway	3966058	299442	35.8200 N	83.2200 W	2020 / 616
51	TN	Cocke	Foothills Parkway south overlook	3964861	298421	35.8090 N	83.2310 W	1860 / 567
51	TN	Cocke	Foothills Parkway, 2 <sup>nd</sup> overlook East	3964679	298127	35.8073 N	83.2342 W	1800 / 549
51	TN	Cocke	Foothills Parkway at I-40	3967869	302828	35.8370 N	83.1830 W	1330 / 405

to be continued

TABLE 1 (continued).

Map No.	State	County	Locality	UTM N	UTM E	Latitude	Longitude	Elev. ft. / m
51	TN	Cocke	Foothills Parkway N at 1 <sup>st</sup> overlook	3964617	297900	35.8067 N	83.2367 W	1680 / 512
51	TN	Cocke	Foothills Parkway, 2.1 mi W Hwy. 321	3955297	242007	35.7097 N	83.8517 W	1570 / 479
51	TN	Cocke	Foothills Parkway N, 4.5 mi from Hwy. 321	3966593	300358	35.8250 N	83.2100 W	1920 / 585
52	TN	Sevier	Greenbrier Ranger Station	3954195	284689	35.7100 N	83.3800 W	1700 / 518
53	TN	Sevier	Grotto Falls Trailhead	3951159	377264	35.6810 N	83.4612 W	3160 / 963
54	TN	Sevier	Park Headquarters	3952000	270417	35.6870 N	83.5370 W	1480 / 451
55	TN	Sevier	Chimney's picnic area, Rt. 441, 5 mi S Sugarlands Visitor Center	3946361	274286	35.6371 N	83.4927 W	2720 / 829
56	TN	Sevier	Chimney Tops Trail	3945963	273424	35.6340 N	83.4690 W	3480 / 1061
57	TN	Sevier	6 mi S of Sugarlands Visitor Center	3946660	274293	35.6398 N	83.4927 W	3320 / 1012
58	TN	Sevier	6.2 mi S of Sugarlands Visitor Center, cove hardwood forest	3946654	275444	35.4600 N	83.4800 W	3360 / 1024
59	TN	Sevier	Road Prong Trail, 1.3 mi W of Jct. 441 & Clingman's Dome Rd.	3943217	278342	35.6097 N	83.4472 W	5260 / 1603
60	TN	Sevier	7 mi S of Sugarlands Visitor Center	3946354	276778	35.6376 N	83.4652 W	3640 / 1109
61	TN	Sevier	Elkmont	3948440	266428	35.6540 N	83.5800 W	2200 / 671
62	TN	Sevier	Campsite 20 on Meigs Mountain Trail, nr. creek	3947793	263946	35.6476 N	83.6072 W	2570 / 783
63	TN	Sevier	Jake's Creek Trail, above campsite 27	3945002	264199	35.6225 N	83.6036 W	3600 / 1097
63	TN	Sevier	Jake's Creek Trail	3945069	264155	35.6231 N	83.6041 W	3640 / 1109
63	TN	Sevier	Jake's Creek Trail, near campsite 27	3945045	264277	35.6229 N	83.6033 W	3590 / 1094
63	TN	Sevier	Jake's Creek Trail, below campsite 27	3945057	264218	35.6230 N	83.6034 W	3595 / 1096
64	TN	Sevier	Brushy Mountain ATBI Plot	3950599	280000	35.6766 N	83.4308 W	4810 / 1466
65	TN	Sevier	Goshen Prong ATBI Plot	3943539	269680	35.6106 N	83.5427 W	3010 / 917

**Tribe Agrotini Rambur, 1848****Subtribe Austrandesiiina Angulo & Olivares, 1990**

*Anicla forbesi* (Franclemont, 1952)\*

*Anicla illapsa* (Walker, 1857)

*Anicla infecta* (Ochsenheimer, 1816)

*Anicla lubricans* (Guenée, 1852)\*

*Peridroma saucia* (Hübner, [1808])

**Subtribe Agrotina Rambur, 1848**

*Agrotis gladiaria* Morrison, 1874

*Agrotis ipsilon* (Hufnagel, 1766)

*Agrotis malefida* (Guenée, 1852)\*

*Agrotis venerabilis* Walker, [1857]

*Agrotis volubilis* Harvey, 1874\*

*Dichagyris acclivis* (Morrison, 1875)\*

*Euxoa bostoniensis* (Grote, 1874)

*Euxoa campestris* (Grote, 1875)

*Euxoa messoria* (Harris, 1841)

*Euxoa pleuritica* (Grote, 1876)

*Euxoa scholastica* McDunnough, 1920

*Euxoa tessellata* (Harris, 1841)\*

*Feltia geniculata* (Grote & Robinson, 1868)

*Feltia herilis* (Grote, 1873)

*Feltia jaculifera* (Guenée, 1852)

*Feltia subgothica* (Haworth, 1809)

*Feltia subterranea* (Fabricius, 1794)

*Feltia tricola* (Lintner, 1874)

**Tribe Noctuini Latreille, 1809****Subtribe Axyliina Fibiger & Lafontaine, 2005**

*Ochropleura implecta* Lafontaine, 1998

**Subtribe Noctuina Latreille, 1809**

*Abagrotis alternata* (Grote, 1864)

*Abagrotis anchocelioides* (Guenée, 1852)

*Abagrotis brunneipennis* (Grote, 1875)

*Abagrotis cupida* (Grote, 1865)  
*Abagrotis magnicupida* Lafontaine, 1998  
*Agnorisma badinodis* (Grote, 1874)  
*Agnorisma bollii* (Grote, 1881)  
*Anaplectoides brunneomedia* McDunnough, 1946  
*Anaplectoides prasina* ([Denis & Schiffermüller], 1775)  
*Aplectoides condita* (Guenée, 1852)  
*Cerastis fishii* (Grote, 1878)  
*Cerastis tenebrifera* (Walker, 1865)  
*Choephora fungorum* Grote & Robinson, 1868  
*Diarsia jucunda* (Walker, [1857])  
*Diarsia rubifera* (Grote, 1875)  
*Eueretagrotis attentus* (Grote, 1874)  
*Eueretagrotis perattentus* (Grote, 1876)  
*Eueretagrotis sigmoides* (Guenée, 1852)  
*Lycophotia phyllophora* (Grote, 1874)  
*Noctua pronuba* (Linnaeus, 1758)  
*Protolampra brunneicollis* (Grote, 1865)  
*Pseudohermonassa bicarnea* (Guenée, 1852)  
*Spaelotis clandestina* (Harris, 1841)  
*Xestia c-nigrum* (Linnaeus, 1758)\*  
*Xestia dolosa* Franclemont, 1980  
*Xestia dilucida* (Morrison, 1875)  
*Xestia elimata* (Guenée, 1852)  
*Xestia praevia* Lafontaine, 1998  
*Xestia normanianus* (Grote, 1874)  
*Xestia perquiritata* (Morrison, 1874)  
*Xestia smithii* (Snellen, 1896)

## Tribe Agrotini

### Subtribe Austrandesiiina

#### 1. *Anicla forbesi* (Franclemont)

(Fig. 1)

**Forewing length** 16.0–19.0 mm. *Anicla forbesi* can be confused with *A. illapsa* (Walker), but *A. forbesi* has a much larger proportion of the prothorax black than does *A. illapsa*. Forewing ground color is pale gray to reddish brown. The transverse lines on the forewing are represented by dark spots along the costa and can be faint in some specimens. Hindwing is white in male and slightly darker in female.

**Flight period:** Mid-June to early August.

**Collected localities:** This species is not recorded from the Park, but it is likely to occur there.

**General distribution:** Distributed from Nova Scotia to western Ontario and south to northern Ohio and Pennsylvania, along the Appalachian Mountains to southwest Virginia, and west to northern Michigan, central Wisconsin, and northern Minnesota (Lafontaine 2004).

**Larval hosts:** Reared on timothy (*Phleum pratense* L., Poaceae) and probably feeds on a variety of other grasses (Lafontaine 2004).

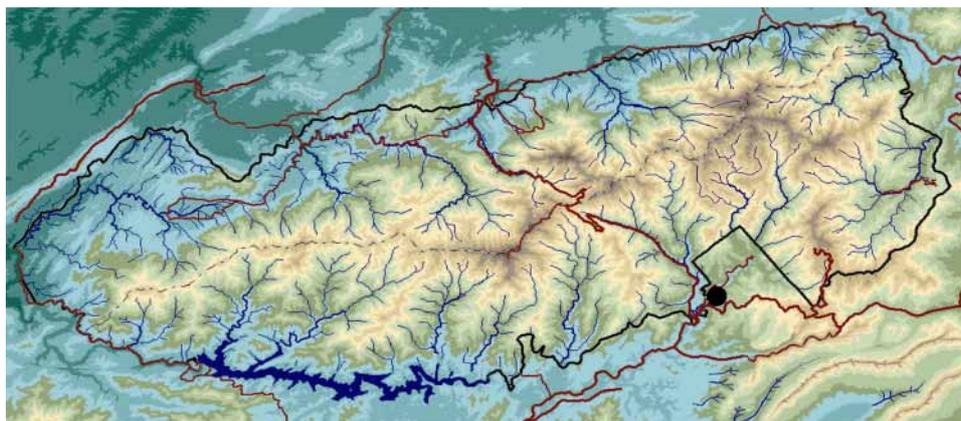
## 2. *Anicla illapsa* (Walker) Snowy Dart

(Figs. 2–3, Map 2)

**Identification:** Forewing length 14.0–17.0 mm. This species is usually smaller than *A. forbesi*, and the black patch on the prothorax is smaller in *A. illapsa*. Forewing ground color tends to be more reddish-brown than in *A. forbesi*. Forewing pattern is similar in both species. Hindwing is white in male and somewhat more darkly suffused in the female.

**Flight period:** Collected at the end of April.

**Collected localities:** North Carolina: Swain Co., Big Cove Road, site p. (1 specimen)



MAP 2. Collecting localities of *Anicla illapsa*.

**Elevation range:** 2040 ft. (622 m)

**General distribution:** Widely distributed from eastern Canada south to Florida, west to Texas, and Nebraska (Lafontaine 2004).

**Larval hosts:** Reared on timothy (*Phleum pratense* L., Poaceae) and probably feeds on a variety of other grasses (Lafontaine 2004).

## 3. *Anicla infecta* (Oschenheimer), Green Cutworm

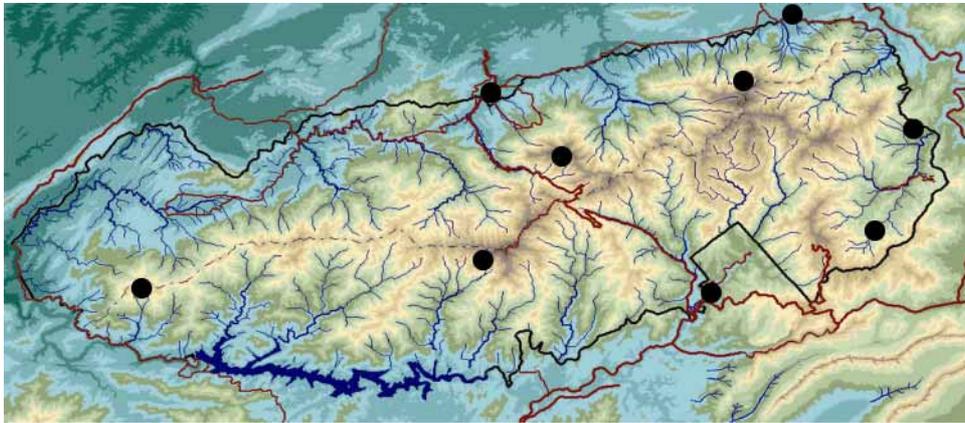
(Fig. 4, Map 3)

**Identification:** Forewing length 16.0–17.0 mm. Forewing ground color is gray; reniform

spot is outlined in white and rufous and consists of multiple black dots; subterminal line is a series of faint black dots; terminal area is dark rufous. Hindwing is white with apices of veins, costa, and thin margin dark gray. This species is easily distinguished from other *Anicla* occurring in the Park. This species has a prominent forewing reniform spot that is outlined in white and rufous and the thin dark gray margin of the hindwing that extends onto the veins.

**Flight period:** Collected from July to early November.

**Collected localities:** North Carolina: Haywood Co., Piney Mountain, Purchase Knob house, Purchase Knob NE of house field, Purchase Knob cabin; Swain Co., Big Cove Road site p; Mt. Buckley. Tennessee: Blount Co., Gregory Bald; Cocke Co., Albright Grove ATBI Plot, Foothills Parkway East, Foothills Parkway 2.1 mi W Hwy. 321; Sevier Co., Brushy Mountain ATBI Plot, Park Headquarters. (30 specimens)



MAP 3. Collecting localities of *Anicla infecta*.

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

**General distribution:** In Canada from southern Nova Scotia and southern Quebec, and in the United States from Maine south to Florida, west to Illinois, southern Kansas, northern New Mexico, central Arizona, and southern California (Lafontaine 2004).

**Larval hosts:** Mainly a grass feeder but also feeds on beets (*Beta* sp., Chenopodiaceae), clover (*Trifolium* sp., Fabaceae), plantain (*Plantago* sp., Plantaginaceae), purslane (*Portulaca* sp., Portulacaceae), and tobacco (*Nicotiana* sp., Solanaceae) (Crumb 1956).

#### 4. *Anicla lubricans* (Guenée), Slippery Dart

(Fig. 5)

**Identification:** Forewing length 15.0–19.0 mm. *Anicla lubricans* is similar to both *A. forbesi* and *A. illapsa*. *Anicla lubricans* can be distinguished by its overall darker gray and

reddish-brown coloration of the forewing and darker hindwing. *Anicla lubricans* has a narrow black band on the prothorax in contrast to the prominent band in *A. forbesi*. Forewing pattern is similar to both *A. forbesi* and *A. illapsa*. Hindwing in male is pale gray not white as in *A. forbesi* and *A. illapsa*, and is dark gray in the female of *A. lubricans*.

**Flight period:** Throughout the year.

**Collected localities:** This species is not recorded from the Park, but it is likely to occur there.

**General distribution:** This is a southeastern species ranging from North Carolina south to Florida and west to eastern Texas (Lafontaine 2004).

**Larval hosts:** Unknown (Lafontaine 2004).

##### 5. *Peridroma saucia* (Hübner) Variegated Cutworm Moth (adult), Variegated Cutworm (larva)

(Figs. 6–7, Map 4)

**Identification:** Forewing length 20.0–23.0 mm. *Peridroma saucia* has a general mottled look and is variable in the prominence of the forewing pattern typical of noctuids.

The forewing color is variable and includes dark grayish-brown, reddish-brown, and a lighter pale yellowish-gray. Orbicular spot is more prominent than the reniform spot. The lines making up the forewing pattern are either faint or represented only by spots on the costa. Hindwing has a white pearly sheen overlain with gray on the costa, outer margin, and wing veins; fringe is shiny white.

**Flight period:** Collected from March to September.

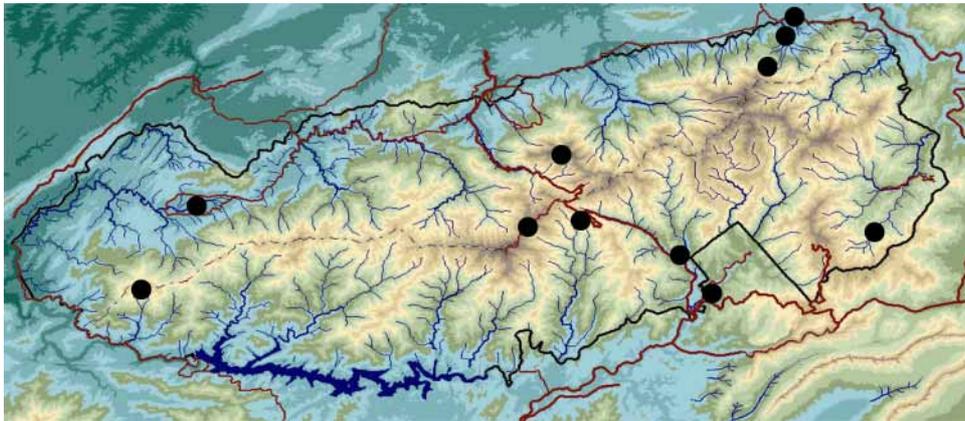
**Collected localities:** North Carolina: Haywood Co., Purchase Knob, Purchase Knob at house, Purchase Knob E of house field, Purchase Knob N of house forest, Purchase Knob NE of house field; Swain Co., Big Cove Road site p, Big Cove Road site w, 3.3 mi NE of Clingman's Dome Parking Lot Fork Ridge Trail, 15.2 mi NE GSMNP entrance on Rt. 441 Deep Creek Trail, Smokemont. Tennessee: Blount Co., Cades Cove Primitive Baptist Church, Gregory Bald; Cocke Co., vicinity Cosby ATBI house, Cosby Campground, vicinity of Trailhead, Foothills Parkway East, Snakeden Ridge ATBI Plot; Sevier Co., Brushy Mountain ATBI Plot. (34 specimens)

**Elevation range:** 1800–5780 ft. (549–1762 m).

**General distribution:** *Peridroma saucia* is worldwide in distribution. In the Western Hemisphere it has been found from tree line in Canada to Chile and Argentina. In the Old World it is widely distributed in Europe, North Africa, Asia Minor, and the Middle East; there have been reported isolated occurrences in Sri Lanka, China, Japan, and Taiwan. It also occurs on midoceanic islands such as Bermuda and Iceland in the North Atlantic and Gough Island and Tristan da Cunha in the South Atlantic as well as Hawaii and the Galapagos Islands in the Pacific (Lafontaine 2004).

**Larval hosts:** This is a polyphagous species and is considered a serious agricultural

pest. The larvae inflict significant damage to cultivated crops owing to their preference for feeding on flowers and developing fruit. More than 130 species of plants have been reported as larval hosts. Some of the more significantly damaged crops include alfalfa (*Medicago sativa* L., Fabaceae), beets (*Beta* sp., Chenopodiaceae), cabbage (*Brassica oleracea* L., Brassicaceae), cauliflower (*Brassica oleracea* L., Brassicaceae), globe artichoke (*Cynara scolymus* L., Asteraceae), lettuce (*Lactuca* sp. Asteraceae), peppers (*Capsicum* sp. Solanaceae), potato (*Solanum tuberosum* L., Solanaceae), tobacco (*Nicotiana* sp., Solanaceae), and tomato (*Solanum lycopersicum* L., Solanaceae) (Lafontaine 2004).



MAP 4. Collecting localities of *Peridroma saucia*.

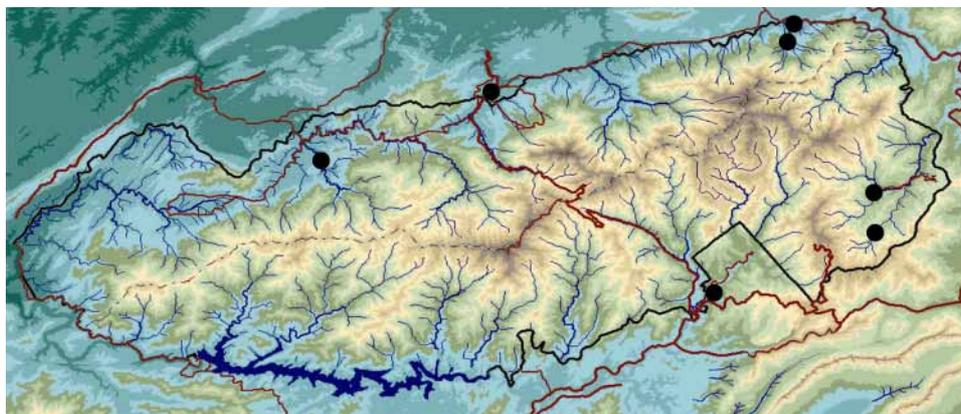
### Subtribe Agrotina

#### 6. *Agrotis gladiaria* Morrison, Swordman Dart (adult), Clay-backed Cutworm (larva) (Fig. 8, Map 5)

**Identification:** Forewing length 13.0–16.0 mm. *Agrotis gladiaria* resembles species of *Feltia*, but can be distinguished by the much longer pectinations in the male antenna. The gray forewing has thin black lines along the wing veins that are bordered by white, especially along M, Cu<sub>1</sub>, Cu<sub>2</sub>, and the anal vein. The subterminal line consists of a series of black dashes with an adjacent white spot. These markings are distributed between the wing veins. Hindwing is gray with a faint crescent-shaped discal spot.

**Flight period:** Collected in October.

**Collected localities:** North Carolina: Haywood Co., Cataloochee, Purchase Knob at house, Purchase Knob house, Purchase Knob N of house forest; 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., Tremont; Cocke Co., Cosby campground area, Foothills Parkway; Sevier Co., Park Headquarters. (34 specimens)



MAP 5. Collecting localities of *Agrotis gladiaria*.

**Elevation range:** 1360–4950 ft. (415–1509 m)

**General distribution:** In southeastern Canada from Nova Scotia to Ontario; in the United States from Maine to the panhandle of Florida, west to eastern Texas, eastern Kansas, eastern Nebraska, southern Wisconsin, and Michigan.

**Larval hosts:** Polyphagous on many agricultural crops including alfalfa (*Medicago sativa* L., Fabaceae), *Aster* sp. (Asteraceae), beans (Fabaceae), blackberry (*Rubus* sp., Rosaceae), bluegrass (*Poa* sp., Poaceae), bluestem (*Andropogon*, sp. Poaceae), cabbage (*Brassica oleracea* L., Brassicaceae), clover (*Trifolium* sp., Fabaceae), corn (*Zea mays* L., Poaceae), goldenrod (*Solidago* sp., Asteraceae), little barley (*Hordeum pusillum* Nutt. Poaceae), oats (*Avena* sp. Poaceae), onion (*Allium* sp., Liliaceae), sweetpotato (*Ipomoea batatas* (L.) Lam, Convolvulaceae), tobacco (*Nicotiana* sp., Solanaceae), and tomato (*Solanum lycopersicum* L., Solanaceae) (Lafontaine 2004). Lafontaine (2004) states that the presumed preferred host is clover based on infestation records.

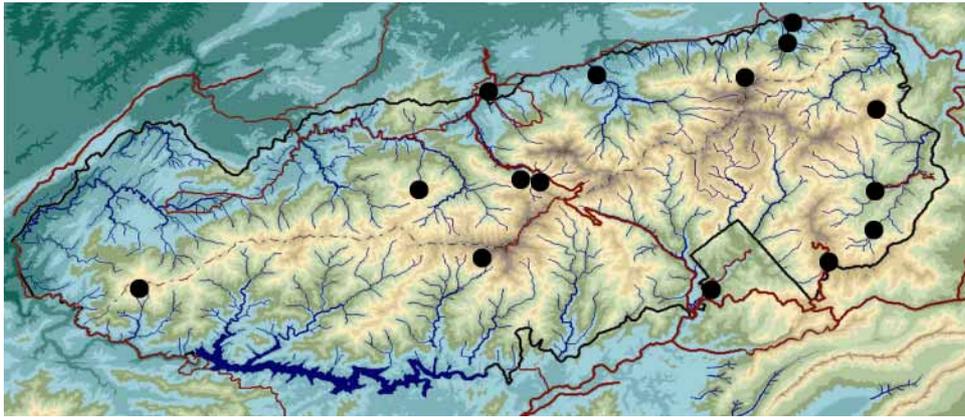
**7. *Agrotis ipsilon* (Hufnagel) Ipsilon Dart (adult), Black Cutworm (larva)**  
(Fig. 9, Map 6)

**Identification:** Forewing length 18.0–23.0 mm. *Agrotis ipsilon* has a dark gray forewing that contrasts with a paler area distal to the postmedial line. There are three triangular-shaped black dashes, one adjacent and distal to the reniform spot, and two in the terminal area, one distal to the reniform spot and the other below it. The hindwing is white with gray veins. The amount of gray suffusion in the hindwings is variable.

**Flight period:** Collected in every month from mid-March to mid-November.

**Collected localities:** North Carolina: Haywood Co., Cataloochee just off paved road to Cosby, Balsam Mountain Road 6.1 mi N of Jct. Blue Ridge Parkway on Hemphill Bald Trail, Mt. Sterling, Purchase Knob at house, Purchase Knob E of house field, Purchase

Knob E of house forest, Purchase Knob house, Purchase Knob N of house, Purchase Knob NE of house field; Swain Co., Big Cove Road site b, Big Cove Road site p, Mt. Buckley. Tennessee: Blount Co., vicinity of Cades Cove, Cades Cove near Ranger Station, Gregory Bald; Cocke Co., Albright Grove ATBI Plot, Cosby ATBI house, Cosby campground area, Cosby campground, Foothills Parkway East, Foothills Parkway south overlook, Foothills Parkway, 2<sup>nd</sup> overlook East; Sevier Co., Greenbrier Ranger Station, Campsite #20, Park Headquarters, Chimney's Picnic Area, 6.2 mi S of Sugarlands Visitor Center Cove Hardwood Forest. (55 specimens)



MAP 6. Collecting localities of *Agrotis ipsilon*.

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

**General distribution:** Widespread throughout North America except the arctic and sub-arctic regions. This is the most widely distributed cutworm in the world, occurring everywhere except the arctic and sub-arctic regions and Antarctica (Lafontaine 2004).

**Larval host:** Polyphagous, prefers herbaceous, broad-leaved plants to shrubs and grasses. Recorded larval hosts included asparagus (*Asparagus officinalis* L., Liliaceae), beans (Fabaceae), beets (*Beta* sp., Chenopodiaceae), cabbage (*Brassica oleracea* L., Brassicaceae), carrot (*Daucus carota* L. ssp. *sativus* (Hoffm.), Apiaceae), cauliflower (*Brassica oleracea* L., Brassicaceae), corn (*Zea mays* L., Poaceae), cotton (*Gossypium* sp., Malvaceae), cranberry (*Vaccinium macrocarpon* Ait., Ericaceae), lettuce (*Lactuca* sp. Asteraceae), onion (*Allium* sp., Liliaceae), potato (*Solanum tuberosum* L., Solanaceae), strawberry (*Fragaria* sp., Rosaceae), sugar beet (*Beta vulgaris* L., Chenopodiaceae), sugarcane (*Saccharum officinarum* L., Poaceae), sunflower (*Helianthus* sp. L., Asteraceae), tobacco (*Nicotiana* sp., Solanaceae), tomato (*Solanum lycopersicum* L., Solanaceae), and turnip (*Brassica rapa* L., Brassicaceae). *Agrotis ipsilon* is mainly a pest in eastern North America and California, and most economic losses occur on corn, cotton, tobacco, and vegetable crops (Lafontaine 2004).

**8. *Agrotis malefida* Guenée, Rascal Dart (adult), Palesided Cutworm (larva)**  
(Fig. 10)

**Identification:** Forewing length 18.0–23.0 mm. This is a distinct species with a pale gray forewing ground color and prominent black claviform and reniform spots. Prothoracic collar is black with pale gray tegulae. Hindwing is white in males and in females the veins are gray and the wings are more heavily suffused with gray.

**Flight period:** In the northern part of its range adults begin emerging in late January; they fly throughout the year in the south (Lafontaine 2004).

**Collected localities:** This species is not recorded from the Park, but it is likely to occur there.

**General distribution:** Mainly southern in distribution from North Carolina and Kentucky south to Florida, west to Arizona, and north to southern Kansas. It is also present in the Neotropics from Mexico to Argentina and Chile (Lafontaine 2004).

**Larval hosts:** Polyphagous, prefers broad-leaved herbaceous plants including cabbage (*Brassica oleracea* L., Brassicaceae), clover (*Trifolium* sp., Fabaceae), beans (Fabaceae), onion (*Allium* sp., Liliaceae), pea (*Pisum sativum* L., Fabaceae), peppers (*Capsicum* sp. Solanaceae), potato (*Solanum tuberosum* L., Solanaceae), tobacco (*Nicotiana* sp., Solanaceae), tomato (*Solanum lycopersicum* L., Solanaceae), and various weeds; pest of corn (*Zea mays* L., Poaceae) and cotton (*Gossypium* sp., Malvaceae) (Lafontaine 2004).

**9. *Agrotis venerabilis* Walker, Venerable Dart (adult), Dusky Cutworm (larva)**  
(Fig. 11, Map 7)

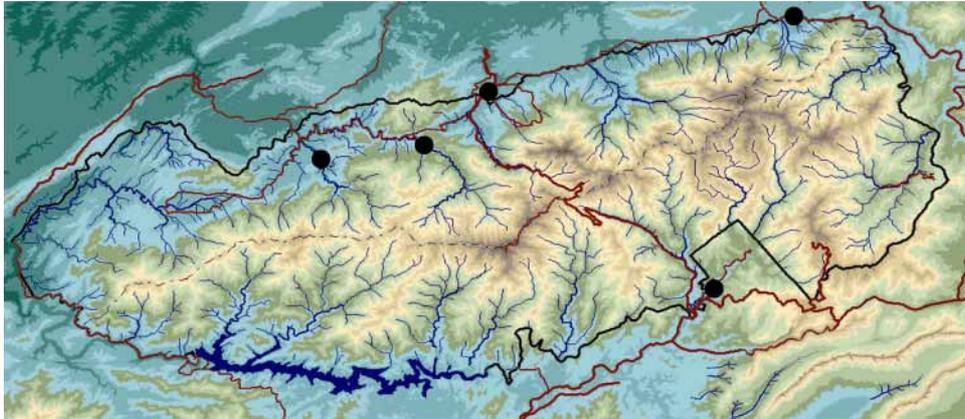
**Identification:** Forewing length 16.0–17.0 mm. This is a distinct species, and the male has bipectinate antennae. Forewing color is variable from completely dark gray to the dark gray area in the costal half extending to the reniform spot with the rest of the wing pale gray. Orbicular spot is an elongate oval, reniform spot is dark gray, and claviform spot is an elongate dark gray dash, with all spots outlined in black. Prothorax is black contrasting with pale gray tegulae. Hindwing varies from pale to dark gray.

**Flight period:** Collected in September and October.

**Collected localities:** North Carolina: 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., Tremont; Cocke Co., Foothills Parkway; Sevier Co., Elkmont, Park Headquarters. (16 specimens)

**Elevation range:** 1360–2200 ft. (415–671 m)

**General distribution:** Widespread in North America from Newfoundland to British Columbia in Canada and in the United States from Maine to Florida and west to the West Coast (Lafontaine 2004).



MAP 7. Collecting localities of *Agrotis venerabilis*.

**Larval hosts:** Polyphagous; hosts include alfalfa (*Medicago sativa* L., Fabaceae), beans (Fabaceae), chickweed (*Cerastium* sp., Caryophyllaceae), clover (*Trifolium* sp., Fabaceae), corn (*Zea mays* L., Poaceae), little barley (*Hordeum pusillum* Nutt., Poaceae), and tobacco (*Nicotania* sp., Solanaceae).

**10. *Agrotis volubilis* Harvey, Voluble Dart (adult)**  
(Fig. 12)

**Identification:** Forewing length 14.0–18.0 mm. The males have biserrate antennae. Forewing is dark gray in the costal half to the reniform spot, the rest pale rufous. Orbicular spot is ovate, reniform spot is dark gray, claviform spot is an elongate dash; all are outlined in black. Terminal area of forewing has a series of black triangular spots with second and third the largest. Hindwing is white with darker veins and darker scaling along the costa and outer margins.

**Flight period:** Mid-May to early July.

**Collected localities:** This species is not recorded from the Park, but it is likely to occur there.

**General distribution:** Widespread in North America from Newfoundland to British Columbia in Canada and in the United States from Maine to Florida and west to the West Coast (Lafontaine 2004).

**Larval hosts:** Polyphagous; hosts include alfalfa (*Medicago sativa* L., Fabaceae), beans (*Phaseolus* sp., Fabaceae), chickweed (*Cerastium* sp., Caryophyllaceae), clover (*Trifolium* sp., Fabaceae), corn (*Zea mays* L., Poaceae), little barley (*Hordeum pusillum* Nutt., Poaceae), and tobacco (*Nicotania* sp., Solanaceae).

**11. *Dichagyris acclivis* (Morrison)**

(Fig. 13)

**Identification:** Forewing length 14.0–18.0 mm. Forewing is dark gray with a contrasting lighter patch along costal half extending to the reniform spot. There is a distinct row of white spots between the forewing veins in the terminal area. Hindwing is dirty white suffused with gray along costa, outer margin, and veins.

**Flight period:** August to early September.

**Collected localities:** This species is not recorded from the Park, but it is likely to occur there.

**General distribution:** From southern Ontario and southern Massachusetts south to eastern Tennessee and western North Carolina, west to Illinois, Missouri, and Kansas and south to east central Texas (Lafontaine 2004).

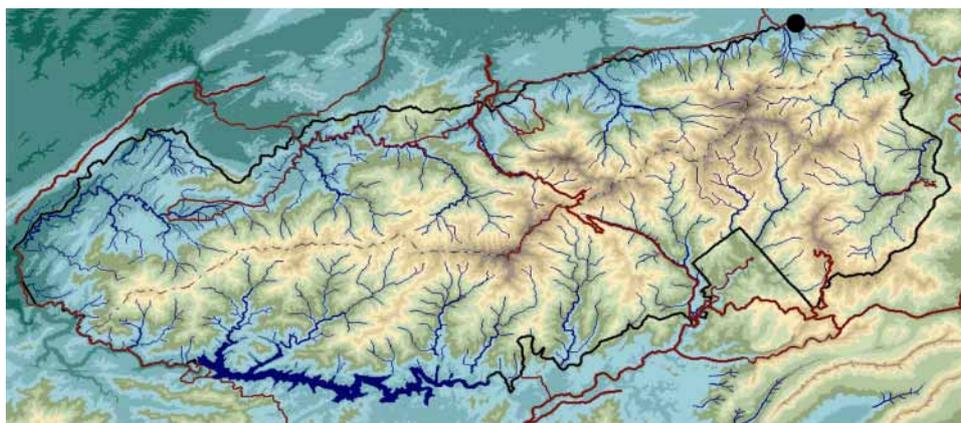
**Larval hosts:** Larvae feed on seeds of switchgrass (*Panicum virgatum* L., Poaceae) (Lafontaine 2004).

**12. *Euxoa bostoniensis* (Grote)**

(Figs. 14–15, Map 8)

**Identification:** Forewing length 15.0–17.0 mm. All the species of *Euxoa* treated here have a round unscaled frontal tubercle on the frons and biserrate male antennae. Forewing ground color is gray. The forewing lines, antemedial, median, postmedial, and subterminal are faint, slightly darker than the ground color, and extend from costa to posterior margin. Reniform spot is represented by a faint, small round dot at end of discal cell. Hindwing is white in the male and dark gray in the female.

**Flight period:** Collected in mid-October.



MAP 8. Collecting localities of *Euxoa bostoniensis*.

**Collected localities:** Tennessee: Cocke Co., Foothills Parkway N, 4.5 mi from Hwy. 321. (2 specimens)

**Elevation range:** 1680 ft. (512 m)

**General distribution:** In North America from southern Ontario, Canada and Massachusetts south to Virginia, Tennessee, and southern Missouri (Lafontaine 1987). There are two old specimens in the USNM, one from Florida and the other from South Dakota with no specific locality. These may or may not be accurate localities.

**Larval hosts:** Larvae reared on tobacco (*Nicotiana* sp., Solanaceae) (Lafontaine 1987).

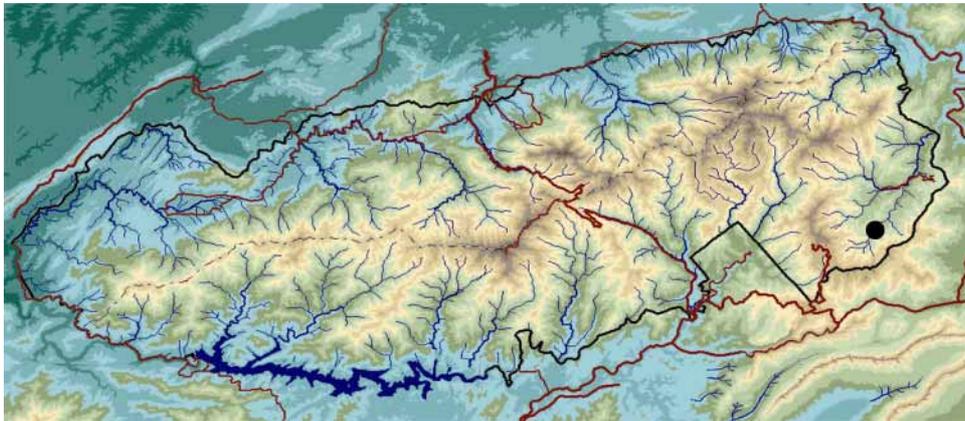
### 13. *Euxoa campestris* (Grote)

(Fig. 16, Map 9)

**Identification:** Forewing length 14.0–16.0 mm. Forewing ground color is reddish brown in basal and outer third and gray medially. Basal, antemedial, and postmedial lines are black; orbicular, claviform, and reniform spots are outlined in black. Hindwing is pale gray, wing veins gray, and a faint gray discal spot.

**Flight period:** Collected in early August.

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



MAP 9. Collecting localities of *Euxoa campestris*.

**Elevation range:** 4924 ft. (1501 m)

**General distribution:** In North America from Newfoundland to Alaska, south to New England and southern Canada from southern Quebec west to British Columbia. In the West it is distributed southward in the Rocky Mountains to southern New Mexico, east-central Arizona, and central Utah. In the East it occurs in the Appalachians in eastern Kentucky (Lafontaine 1987) and in the Park in western North Carolina.

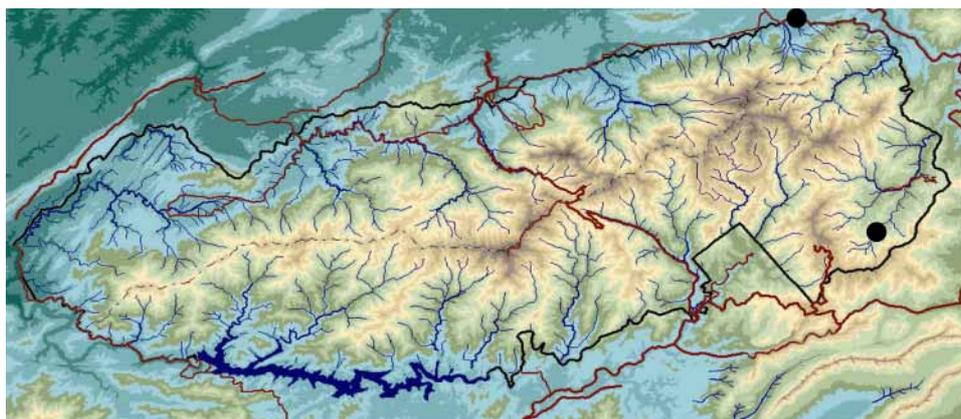
**Larval hosts:** Unknown (Lafontaine 1987).

**14. *Euxoa messoria* (Harris) Reaper Dart (adult), Darksided Cutworm (larva)**  
(Fig. 17, Map 10)

**Identification:** Forewing length 13.0–18.0 mm. Forewing ground color is light brown with a brown pattern. Orbicular and reniform spots are light brown outlined with black. Hindwing color is dirty white to light brown; costa, outer margin, and veins are dark.

**Flight period:** Collected in late August.

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



MAP 10. Collecting localities of *Euxoa messoria*.

**General distribution:** Another wide ranging species, recorded from Newfoundland west to Yukon and south to GSMNP and west to Missouri in the East and southern New Mexico, Arizona, and California in the West.

**Larval hosts:** A pest of apple trees (*Malus* sp. Rosaceae), cultivated flowers, vegetables and a variety of wild plants (Covell 1984). In the East it is a pest of tobacco (*Nicotiana* sp., Solanaceae). Broad-leaved plants are preferred, but it feeds on a variety of grasses and is an occasional pest of corn seedlings in the central United States (Lafontaine 1987).

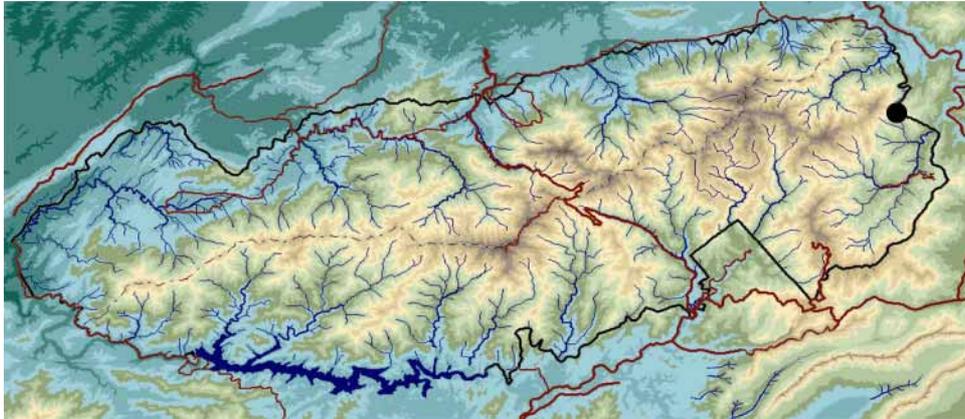
**15. *Euxoa pleuritica* (Grote)**  
(Fig. 18, Map 11)

**Identification:** Forewing length 14.0–18.0 mm. Forewing ground color is brown with basal, median, and subterminal areas cream. Orbicular and reniform spots are gray outlined in cream. Main wing veins (R, M, and Anal) are highlighted gray. Hindwing is dirty white with costa, outer margin, and veins gray.

**Flight period:** September.

**Collected localities:** North Carolina: Haywood Co., Mt. Sterling Trail. (1 specimen)

**Elevation range:** 4400 ft. (1341 m)



MAP 11. Collecting localities of *Euxoa pleuritica*.

**General distribution:** This is a boreal species occurring across southern Canada and the northern United States from southern Quebec and eastern Massachusetts west to British Columbia and southern Washington. In the Rocky Mountain region it occurs as far south as northern New Mexico, northeastern Arizona, and central Idaho (Lafontaine 1987).

**Larval hosts:** Only host record is that of Russian thistle (*Salsola kali* L., Chenopodiaceae) (Cook 1930).

#### 16. *Euxoa scholastica* McDunnough

(Fig. 19, Map 12)

**Identification:** Forewing length 15.0–18.0 mm. Forewing ground color is brown with a dark brown pattern. Orbicular and reniform spots are light brown outlined with black. Hindwing is dark brown. This species is easily confused with *E. messoria*, but can be distinguished by the small round orbicular spot versus the large oval orbicular spot in *E. messoria*. The overall appearance of the forewing in *E. scholastica* is more heavily marked with more lines and spots; and the hindwing is dark in *E. scholastica* and pale gray to white with a distinct marginal band in *E. messoria*.

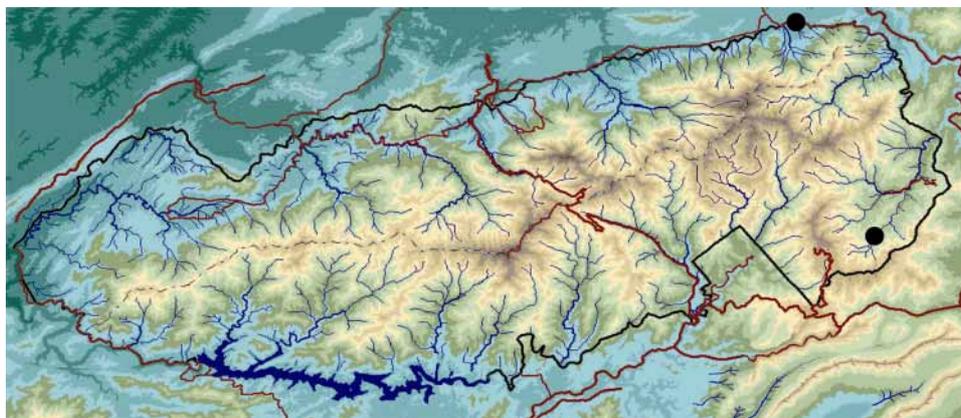
**Flight period:** Collected from mid-July to August.

**Collected Localities:** North Carolina: Haywood Co., Purchase Knob. Tennessee: Cocke Co., Foothills Parkway East. (2 specimens)

**Elevation range:** 2400 and 4924 ft. (732 and 1501 m)

**General distribution:** Another wide ranging species from Newfoundland west to Yukon and south to GSMNP and west to Missouri in the East and southern New Mexico, Arizona, and California in the West.

**Larval hosts:** Unknown (Lafontaine 1987).



MAP 12. Collecting localities of *Euxoa scholastica*.

**17. *Euxoa tessellata* (Harris) Tessellate Dart (adult), Striped Cutworm (larva)**  
(Fig. 20)

**Identification:** Forewing length 13.0–18.0 mm. Forewing ground color is dark brown with a faint pattern. Orbicular and reniform spots are lighter than ground color and at least partially outlined with black. A small triangular black patch is proximal to the orbicular spot and a larger trapezoidal black patch lies between orbicular and reniform spots. Claviform spot is absent. Hindwing color is dirty white to light brown; costa, outer margin, and veins are dark.

There are several forms of this species in eastern North America. The most common forms have reddish brown or gray forewings. A less common form lacks the black shading near the orbicular spot which could be confused with *E. messoria* and *E. pleuritica*. This form of *E. tessellata* has faint or indistinct forewing markings as compared with the more heavily marked forewings of *E. messoria* and *E. pleuritica*.

**Flight period:** Early June to late September, with most records from late June to early August (Lafontaine 1987).

**Collected Localities:** This species is not recorded from the Park, but it is likely to occur there.

**General distribution:** This is the most widespread species of *Euxoa*, occurring across North America from Newfoundland west to Alaska and south to North Carolina, Kansas, central New Mexico, Arizona, and southern California (Lafontaine 1987).

**Larval hosts:** This is a climbing cutworm, and larvae are a pest on tobacco (*Nicotiana* sp., Solanaceae), garden crops, and woody shrubs including cherry (*Prunus avium* (L.) L., Rosaceae), apple (*Malus* sp., Rosaceae), and pear (*Pyrus* sp., Rosaceae) (Lafontaine 1987).

**18. *Feltia geniculata* (Grote and Robinson)**

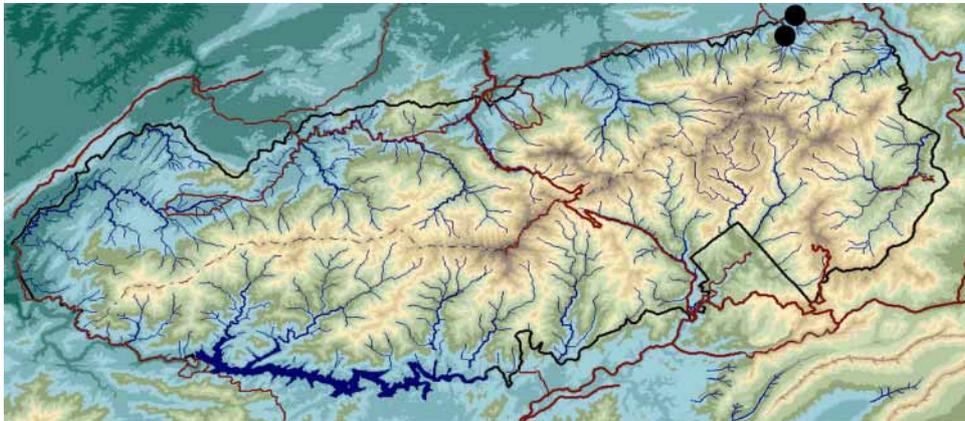
(Figs. 21–22, Map 13)

**Identification:** Forewing length 13.0–15.0 mm. This species is easily recognized by the pale gray forewing color and prominent trapezoidal black spot between the faint orbicular and reniform spots. Some specimens have the pattern more developed, with the orbicular and reniform spots more evident and the transverse lines more distinct.

**Flight period:** Collected from mid to late September.

**Collected localities:** Tennessee: Cocke Co., Cosby ATBI house, Foothills Parkway East, Foothills Parkway south overlook, Foothills Parkway 2<sup>nd</sup> overlook East. (14 specimens)

**Elevation range:** 1760–2520 ft. (549–768 m)



MAP 13. Collecting localities of *Feltia geniculata*.

**General distribution:** *Feltia geniculata* is distributed in southern Canada from Nova Scotia to Manitoba; in the United States from Maine to Wisconsin and south to northern Georgia and southern Texas (Lafontaine 2004).

**Larval hosts:** Unknown.

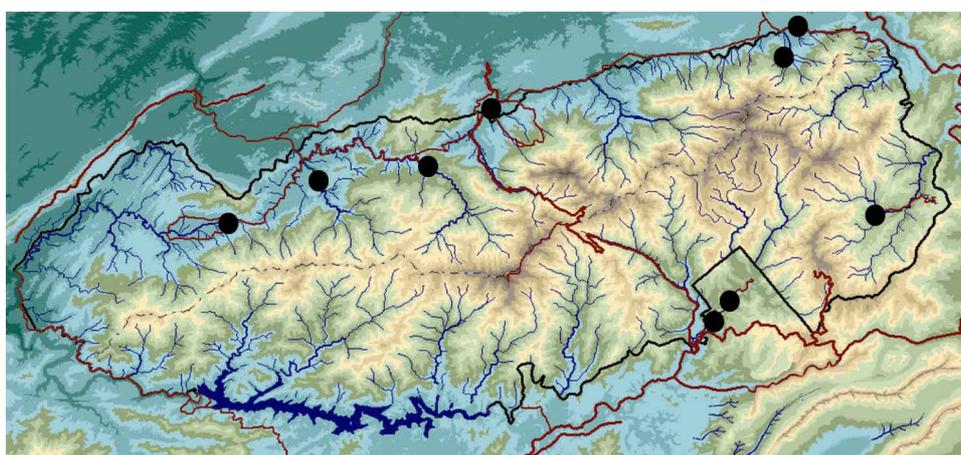
**19. *Feltia herilis* (Grote) Master's Dart**

(Fig. 23, Map 14)

**Identification:** Forewing length 15.0–19.0 mm. Forewing ground color is dark gray with contrasting blackish-gray discal area. Orbicular spot is cut almost in half by R vein and outlined in cream and black, reniform spot is cream, outlined in black. This species is distinguished by the cream-colored streak that extends along the M vein and turns ventrad between veins  $Cu_1$  and  $Cu_2$ . Hindwing is dark gray, becoming lighter basally with a faint discal spot.

**Flight period:** Collected from mid-August to mid-October.

**Collected localities:** North Carolina: Haywood Co., Cataloochee; Swain Co., Big Cove Road site b, Big Cove Road site c, Big Cove Road site p, Big Cove Road site w, Ravensford. Tennessee: Blount Co., vicinity of Cades Cove, Cades Cove near Ranger Station, Tremont; Cocke Co., Cosby ATBI house, Foothills Parkway East, Foothills Parkway, 2<sup>nd</sup> overlook East; Sevier Co., Elkmont, Park Headquarters. (31 specimens)



MAP 14. Collecting localities of *Felia herilis*.

**Elevation range:** 1360–2600 ft. (415–792 m)

**General distribution:** Widespread, from Newfoundland across Canada to Yukon and British Columbia; in the eastern United States from Maine to panhandle of Florida, west to North Dakota, Missouri, and south-central Texas; in the western United States in the Rocky Mountain region from Montana south to southern New Mexico and eastern Arizona, and in Washington, Oregon, and Idaho (Lafontaine 2004).

**Larval hosts:** The larva of *F. herilis* cannot be distinguished from that of the Dingy Cutworm (*F. jaculifera* (Guenée)). It is probably a general feeder (Lafontaine 2004).

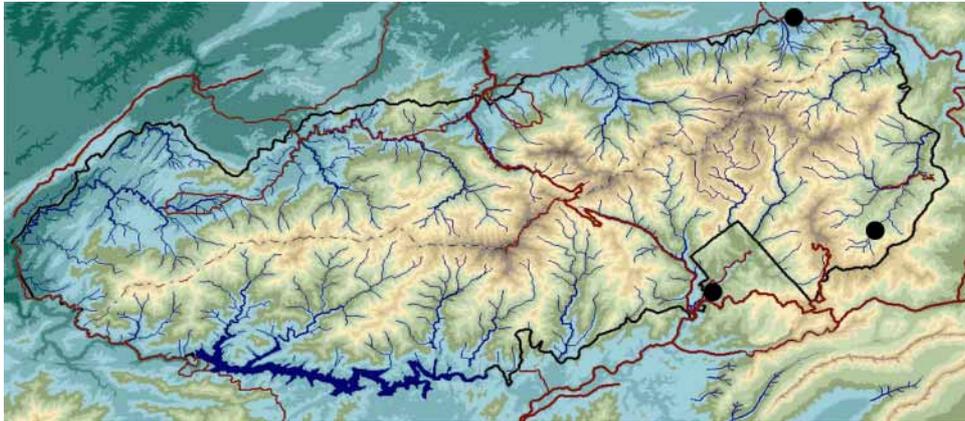
## 20. *Feltia jaculifera* (Guenée) Dingy Cutworm Moth (Figs. 24–25, Map 15)

**Identification:** Forewing length 15.0–17.0 mm. Forewing ground color is tan with patches of dark gray basally in area of claviform spot, discal, and terminal areas. Claviform spot is an elongate dark gray spot outlined in black that extends to reniform spot, with two proximal angled white bars. Orbicular spot is cut in half by R vein, white, outlined in black, reniform spot is cream outlined in black. Terminal area has black triangular spots between wing veins. Hindwing is white with gray outer margin and veins in male (Fig. 24) and gray in female (Fig. 25). *Feltia jaculifera*, *F. subgothica* (Haworth), and *F. tricosia* (Lintner) are all similar. *Feltia jaculifera* appears more streaked than the others.

**Flight period:** Collected from mid-August to mid-October.

**Collected localities:** North Carolina: Haywood Co., Purchase Knob; Swain Co., Big Cove Road site c, Big Cove Road site w; Tennessee: Cocke Co., Foothills Parkway, 2<sup>nd</sup> overlook East. (6 specimens)

**Elevation range:** 2030–4924 ft. (619–1501 m)



MAP 15. Collecting localities of *Feltia jaculifera*.

**General distribution:** Widespread across North America as far north as Alaska and Yukon and south to Sonora, Mexico (Lafontaine 2004).

**Larval hosts:** The larva is very similar to several species in the *Feltia subgothica* (Haworth) species complex, including *F. jaculifera*, *F. subgothica*, and *F. tricos*a. Lafontaine (2004) refers the following hosts to *F. jaculifera*: alfalfa (*Medicago sativa* L., Fabaceae), clover (*Trifolium* sp., Fabaceae), flax (*Flax* sp., Linaceae), “garden produce,” oats (*Avena* sp. Poaceae), raspberry (*Rubus idaeus* L., Rosaceae), tobacco (*Nicotiana* sp., Solanaceae), and wheat (*Triticum aestivum* L., Poaceae), though the actual host list is probably larger.

## 21. *Feltia subgothica* (Haworth) Subgothic Dart

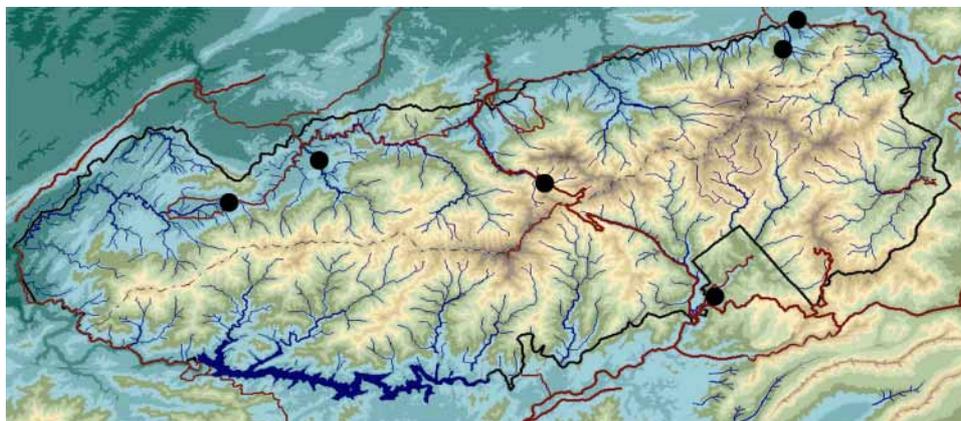
(Fig. 26, Map 16)

**Identification:** Forewing length 15.0–18.0 mm. Forewing ground color is gray with dark gray patches in the basal, discal, and terminal areas. Claviform spot does not extend to reniform spot and is usually shorter than in *F. jaculifera*. Orbicular and reniform spots are similar to those of *F. jaculifera*. R and M veins are highlighted with white. Hindwing in male is dirty white to gray with dark gray costa, outer margin, and veins, and in female it is dark gray.

**Flight period:** Collected from mid-August to mid-October.

**Collected localities:** North Carolina: 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, Tremont; Cocke Co., Cosby campground, Foothills Parkway East, Foothills Parkway; Sevier Co., 6 mi S of Sugarlands Visitor Center. (22 specimens)



MAP 16. Collecting localities of *Feltia subgothica*.

**Elevation range:** 1360–3320 ft. (415–1012 m)

**General distribution:** Widespread across southern Canada from Nova Scotia to Saskatchewan; in the United States from Maine to the southern Appalachians, west across the Great Plains and the Rocky Mountains to eastern Washington, southern Idaho, Utah, and western Arizona (Lafontaine 2004).

**Larval hosts:** Host plant records are unreliable due to the larval similarity discussed under *F. jaculifera*; probably has a broad larval host range (Lafontaine 2004).

## 22. *Feltia subterranea* (Fabricius) Venerable Dart (adult), Granulated Cutworm (larva)

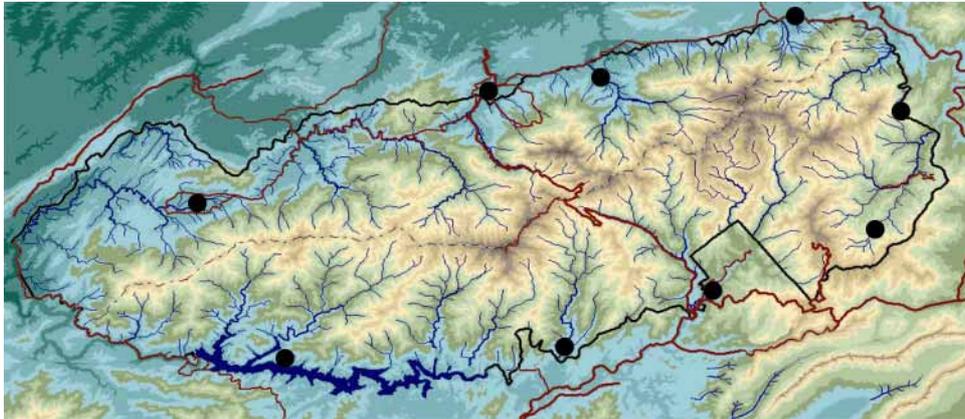
(Fig. 27, Map 17)

**Identification:** Forewing length in males 12.0–18.0 mm and in females 14.0–20.0 mm. Forewing ground color is gray with light brown costal half that extends from base to reniform spot and light brown terminal area. Claviform spot is represented by an indistinct black basal dash. Orbicular and reniform spots are small, light brown, and outlined in black. Hindwing is white in male, with slightly more gray suffusion and gray veins near outer margin in female. The forewing ground color is variable and in some specimens almost entirely light brown with only a subapical gray patch. This species is easily distinguished from other species of *Feltia*.

**Flight period:** Collected from late March and late June to early November. There are two to three broods per year in the central United States and five or six further south.

**Collected localities:** North Carolina: Haywood Co., Mt. Sterling Trail, Purchase Knob

hosue; Swain Co., Big Cove Road site b, Big Cove Road site c; Deep Creek Ranger Station, Welch Ridge 300 ft. above Lake Fontana. Tennessee: Blount Co., Cades Cove Primitive Baptist Church; Cocke Co., Foothills Parkway 2.1 mi W Hwy. 321; Sevier Co., Greenbrier Ranger Station, Park Headquarters. (12 specimens)



MAP 17. Collecting localities of *Feltia subterranea*.

**Elevation range:** 1480–4924 ft. (451–1501 m)

**General distribution:** This is a migratory species and ranges as far north as Nova Scotia and west to Wisconsin, Michigan, Illinois, and east Texas in the East; across the Great Plains to southeastern Wyoming and Colorado; in the West from southern Arizona and southern Nevada to as far north as San Francisco and Sacramento in California. It occurs in Bermuda, the West Indies, Mexico, Central America, and in South America as far south as Peru and Brazil (Lafontaine 2004).

**Larval hosts:** This is a polyphagous species and hosts include beans (Fabaceae), beets (*Beta* sp., Chenopodiaceae), cabbage (*Brassica oleracea* L., Brassicaceae), corn (*Zea mays* L., Poaceae), lettuce (*Lactuca* sp. Asteraceae), pea (*Pisum sativum* L., Fabaceae), potato (*Solanum tuberosum* L., Solanaceae), tobacco (*Nicotiana* sp., Solanaceae), tomato (*Solanum lycopersicum* L., Solanaceae), turnip (*Brassica rapa* L., Brassicaceae), and wheat (*Triticum aestivum* L., Poaceae) (Lafontaine 2004).

### 23. *Feltia tricosa* (Lintner)

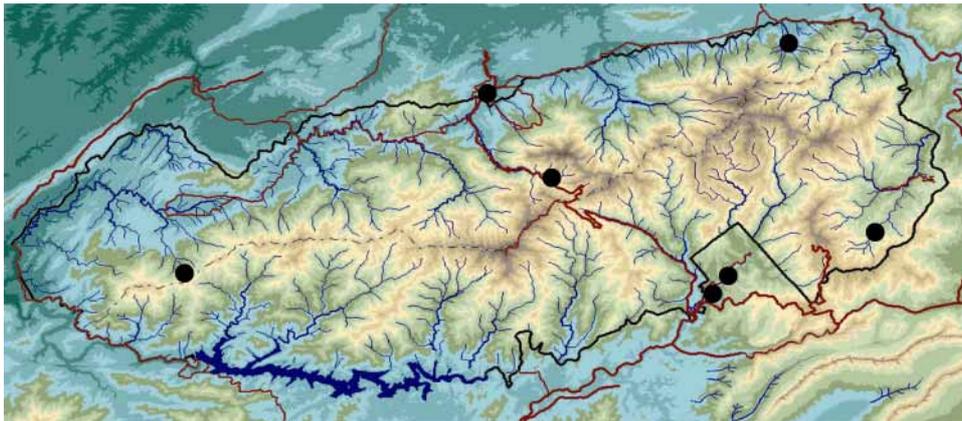
(Figs. 28–29, Map 18)

**Identification:** Forewing length 16.0–20.0 mm. *Feltia tricosa* is similar to *F. subgothica* in forewing color and pattern, but slightly larger. The apex of the spine-like setae of each antennal segment in the male of *F. tricosa* is curved and parallel with the longitudinal axis of the antenna. In contrast, the apex of the spine-like setae in males of *F. subgothica* is not curved and is perpendicular to the longitudinal axis of the antenna. Unlike *F. subgothica*,

the hindwing in the male of *F. tricosa* is entirely dark; that of the female is darker than in *F. subgothica*.

**Flight period:** Collected from mid-August to mid-September.

**Collected localities:** North Carolina: Haywood Co., Purchase Knob at house; Swain Co., Big Cove Road site b, Ravensford. Tennessee: Blount Co., Cold Spring Gap; Coker Co., Cosby campground area; Sevier Co., Park Headquarters, 6 mi S of Sugarlands Visitor Center. (10 specimens)



MAP 18. Collecting localities of *Feltia tricosa*.

**Elevation range:** 1480–4800 ft. (451–1463 m)

**General distribution:** This is mainly an eastern North American species, distributed from southeastern Canada south to northern Georgia, and west to Kansas. There are two disjunct populations: one in central Texas and another in the western Great Plains of Montana (Lafontaine 2004).

**Larval hosts:** Reported hosts are unreliable because of the similarity of the larva with those of *F. jaculifera* and *F. subgothica* (Lafontaine 2004).

## Tribe Noctuini

### Subtribe Axyliina

#### 1. *Ochropleura implecta* Lafontaine

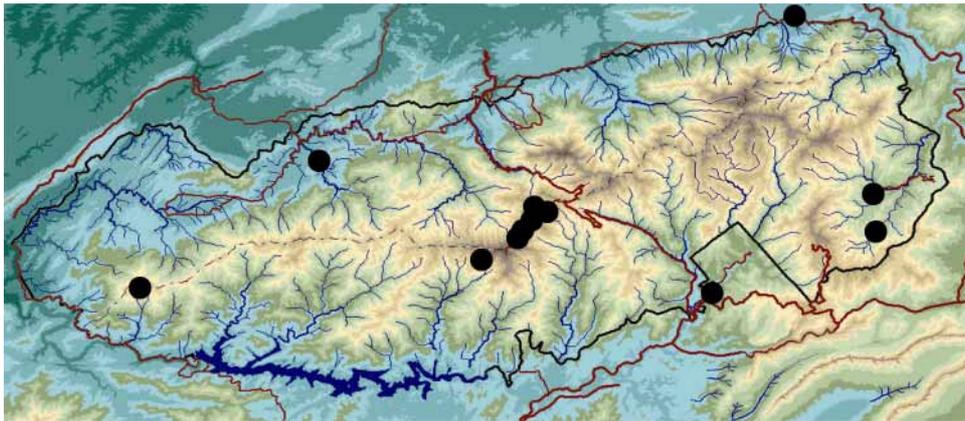
(Fig. 30, Map 19)

**Identification:** Forewing length 13.0–15.0 mm. This is an easily recognized species with dark reddish-brown forewings and bright white hindwings. A broad pale band along the costa of the forewings extends from wing base to subterminal line. Orbicular and reniform

spots are gray outlined in black with a black triangular patch proximal to the orbicular and a black rectangular patch between orbicular and reniform spots. A black basal dash is present below M vein. Postmedial line consists of a series of black dots on the wing veins and subterminal line is a series of irregular whitish spots between wing veins. Hindwings are shiny white with small black dashes along margin between veins.

**Flight period:** Collected from late April to September.

**Collected localities:** North Carolina: Haywood Co., Cataloochee, Cataloochee NW of Palmer Chapel, Purchase Knob, Purchase Knob at house, Purchase Knob E of house field, Purchase Knob NE of house field, Purchase Knob nr. 1<sup>st</sup> gate, Purchase Knob on road in meadow; Swain Co., Big Cove Road site b, Big Cove Road site p, Big Cove Road site w, 1 mi N Clingman's Dome, 1.2 mi NE Clingman's Dome parking lot Noland Divide Trail, 3.3 mi NE Clingman's Dome parking lot Fork Ridge Trail, 5.6 mi SW of Jct. 441 & Clingman's Dome Road Noland Divide Trail, Mt. Buckley, Upper Noland Divide Trail ca. Clingman's Dome. Tennessee: Blount Co., Gregory Bald, Tremont; Cocke Co., Foothills Parkway East; Sevier Co., 1.3 mi W of Jct. 441 & Clingman's Dome Rd. Road Prong Trail (46 specimens)



MAP 19. Collecting localities of *Ochropleura implecta*.

**Elevation range:** 1360–6560 ft. (415–1999 m)

**General distribution:** This is a common species in the boreal and north temperate zones from Labrador, Canada, to southern Alaska. In the eastern United States it ranges from Maine to North and South Dakota, south to North Carolina and eastern Texas; in the West it has been collected in western Nebraska, central Colorado, northeastern New Mexico, southeastern Arizona, Washington, and Oregon (Lafontaine 1998). The collections from GSMNP are new records for the state of Tennessee.

**Larval hosts:** Larval food plants include willow (*Salix* sp., Salicaceae) and a variety of herbaceous plants including clover (*Trifolium* sp., Fabaceae) and endive (*Cichorium* sp., Asteraceae) (Lafontaine 1998).

**2. *Abagrotis alternata* (Grote) Greater Red Dart (adult), Mottled Gray Cutworm (larva)**

(Fig. 31, Map 20)

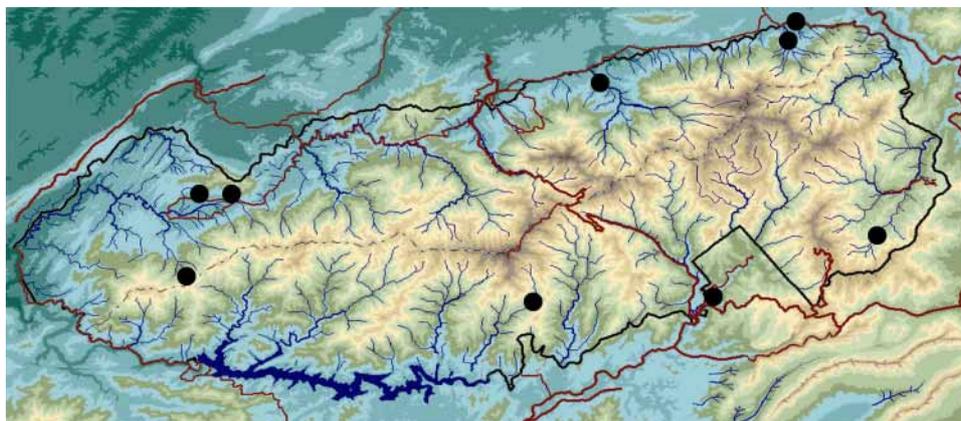
**Identification:** Forewing length 15.0–20.0 mm. *Abagrotis alternata* can easily be confused with *A. anchocelioides* (Guenée). The best way to separate these species is by the coloration of the middle segment of the labial palpus compared to head coloration. In *A. alternata* the labial palp is dark reddish brown contrasting with the lighter cream to buff colored head. In *A. anchocelioides* the labial palp is reddish brown, concolorous with the head. Forewing ground color varies from brown to reddish brown with a lighter cream to tan contrasting terminal band. In darker brown specimens the contrasting terminal band is less evident. Orbicular spot is ovate, slightly darker than ground color, outlined in cream, and is angled at 45° toward wing base. Hindwing is dark brown with a tan fringe.

**Flight period:** Collected from June to mid-October.

**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, Big Cove Road site w, Noland Creek. Tennessee: Blount Co., Cades Cove near Ranger Station, Cades Cove Primitive Baptist Church, Cold Spring Gap; Cocke Co., Cosby ATBI house, Foothills Parkway, Foothills Parkway 2<sup>nd</sup> overlook East; Sevier Co., Greenbrier Ranger Station (40 specimens)

**Elevation range:** 1700–4924 ft. (518–1501 m)

**General distribution:** Widely distributed in North America across southern Canada from Nova Scotia to Alberta; in the eastern United States from Maine to North Carolina and Tennessee west from Mississippi to Texas, in the Northern Great Plains from North and South Dakota, Montana, and northeastern Wyoming, and in the Rocky Mountains from Colorado, Utah, New Mexico, and central Arizona (Lafontaine 1998).



MAP 20. Collecting localities of *Abagrotis alternata*.

**Larval hosts:** This is a polyphagous species and feeds on a number of agriculturally important crops such as apple (*Malus* sp., Rosaceae), cherry (*Prunus avium* (L.) L., Rosaceae), plum (*Prunus* sp., Rosaceae), strawberry (*Fragaria* sp., Rosaceae), hickory (*Carya* sp., Juglandaceae), walnut (*Juglans* sp., Juglandaceae), oak (*Quercus* sp., Fabaceae), cabbage (*Brassica oleracea* L., Brassicaceae), tomato (*Solanum lycopersicum* L., Solanaceae), and potato (*Solanum tuberosum* L., Solanaceae). Larval populations usually are not sufficient to inflict economic damage, but occasionally the species is a serious pest of fruit trees and vegetable crops (Lafontaine 1998).

### 3. *Abagrotis anchocelioides* (Guenée)

(Fig. 32, Map 21)

**Identification:** Forewing length 15.0–18.0 mm. Forewing ground color is brown with contrasting tan terminal area. Orbicular spot is more round than in *A. alternata*, slightly darker than ground color, and outlined with cream. There is a small cluster of black scales at the costal apex of the subterminal line in *A. anchocelioides* that is absent in *A. alternata*. Hindwing is brown with tan fringe.

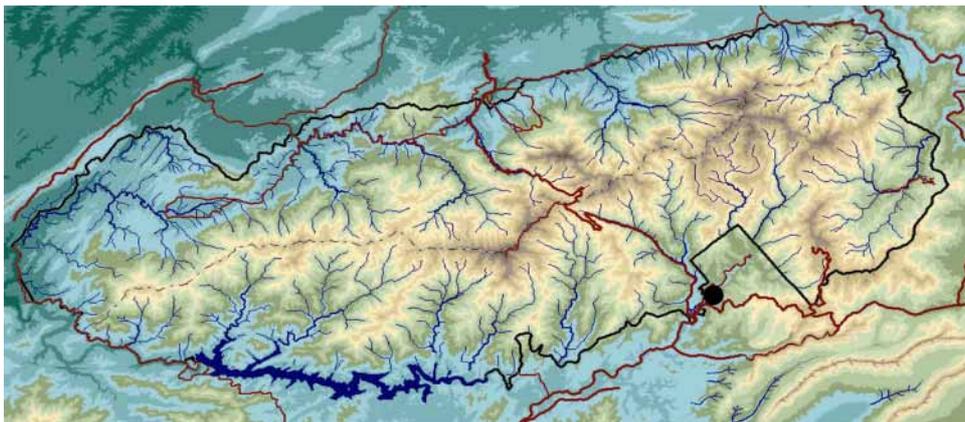
**Flight period:** Early September.

**Collected localities:** North Carolina: Swain Co., Big Cove Road site b. (3 specimens)

**Elevation range:** 2120 ft. (646 m)

**General distribution:** Occurs from southern Quebec to southern Manitoba south to North Carolina, west to Minnesota, Kentucky, and Missouri (Lafontaine 1998). The specimens from GSMNP are at the southern limits of its range.

**Larval hosts:** Unknown.



MAP 21. Collecting localities of *Abagrotis anchocelioides*.

#### 4. *Abagrotis brunneipennis* (Grote)

(Figs. 33–34, Map 22)

**Identification:** Forewing length 14.0–17.0 mm. *Abagrotis brunneipennis* is similar to *A. cupida* (Grote) and the two frequently are confused in collections. Forewing ground color is dark reddish brown in *A. brunneipennis* and pale reddish brown to grayish brown in *A. cupida*. The overall forewing pattern is faint to virtually absent in *A. brunneipennis*; the pattern in *A. cupida* is more distinct. Orbicular and reniform spots are only slightly darker and faint in *A. brunneipennis* and are slightly to much darker in *A. cupida*. The cluster of black scales at the apex of the subterminal line on the costa is faint or absent in *A. brunneipennis* but prominent in most specimens of *A. cupida*. Hindwing is dark gray in *A. brunneipennis* and gray to dark gray in *A. cupida*. The overall look of *A. brunneipennis* has a shiny greasy sheen to the wings; in *A. cupida* the wings are dull.

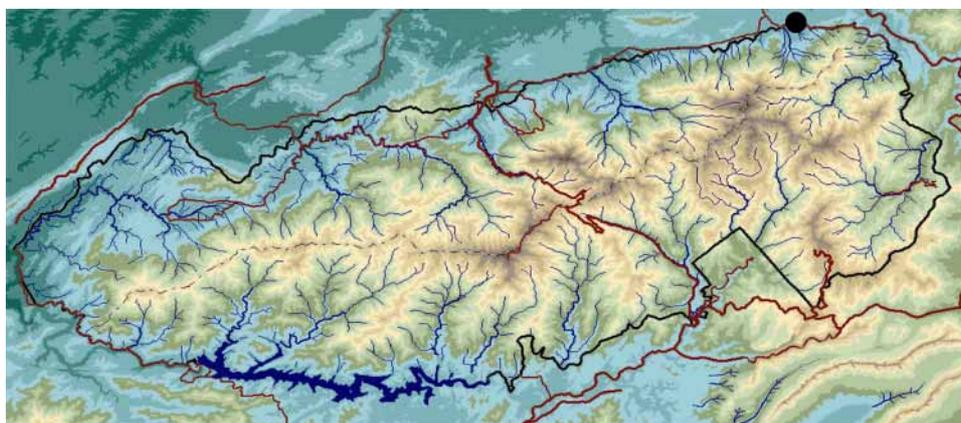
**Flight period:** June to July.

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

**Elevation range:** 1860 ft. (567 m)

**General distribution:** This species is widely distributed, but is most common in northeastern North America. It has been found from Newfoundland south to North Carolina, west through Pennsylvania and Michigan to North Dakota. There are scattered records in Manitoba, South Dakota, Colorado, Utah, British Columbia, Washington, and Oregon (Lafontaine 1998).

**Larval hosts:** Blueberry (*Vaccinium* sp., Ericaceae).



MAP 22. Collecting localities of *Abagrotis brunneipennis*.

#### 5. *Abagrotis cupida* (Grote)

(Figs. 35–37, 79, Map 23)

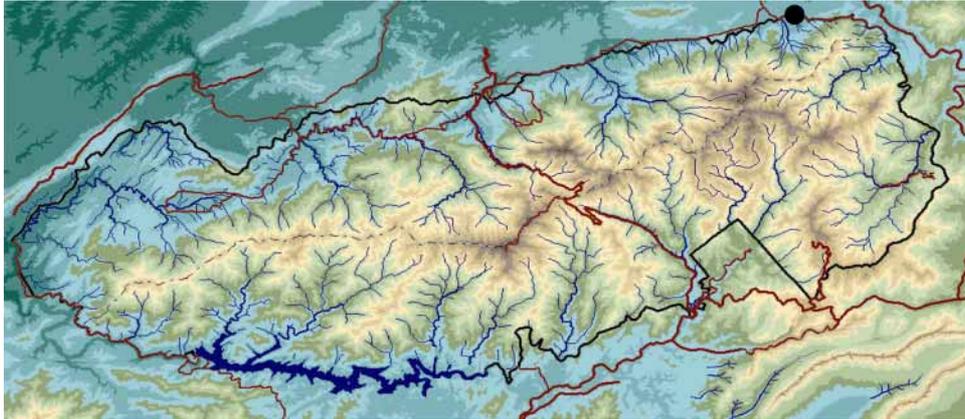
**Identification:** Forewing length 13.0–16.0 mm. Forewing ground color is pale reddish brown to grayish brown. Orbicular and reniform spots are slightly darker than ground

color to dark gray with a faint, pale outline. Antemedial, median, and postmedial lines are faint or consist of a series of black dots and dashes that are never connected. Hindwing is gray to dark gray.

**Flight period:** Collected in mid-May, mid-July, and mid-September.

**Collected localities:** Tennessee: Cocke Co., Foothills Parkway, Foothills Parkway East. (3 specimens)

**Elevation range:** 2020–2400 ft. (616–732 m).



MAP 23. Collecting localities of *Abagrotis cupida*.

**General distribution:** This species is widely distributed and is recorded from Newfoundland across Canada to British Columbia and in the United States from Maine to Tennessee and west to Minnesota. There are scattered records from South Dakota to Texas and west to Colorado, Utah, and Washington (Lafontaine 1998).

**Larval hosts:** Crumb (1956) lists willow (*Salix* sp., Salicaceae) and reports that larvae damage apple (*Malus* sp., Rosaceae), grape (*Vitis* sp., Vitaceae), and peach trees (*Prunus persica* (L.), Rosaceae) in Ohio.

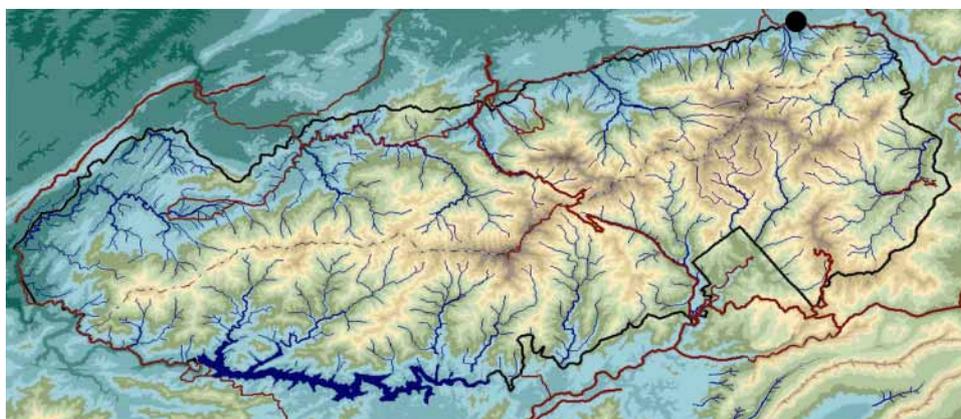
## 6. *Abagrotis magnicupida* Lafontaine

(Fig. 38, 80, Map 24)

**Identification:** Forewing length 15.0–18.0 mm. *Abagrotis magnicupida* is easily confused with *A. cupida*. Forewing ground color of *A. magnicupida* is reddish brown to grayish brown with a faint pattern of transverse lines. Orbicular and reniform spots are slightly darker to dark gray and with a pale outline. Black dot is prominent at apex of subterminal line. Hindwing is gray to dark gray, fringe tan. Male genitalia are very similar to *A. cupida*. The most distinguishing feature is the lack of a triangular projection at 1/3 length of valve on the costa in *A. magnicupida* (Fig. 80), whereas there is a prominent triangular projection on *A. cupida* (Fig. 79). *Abagrotis magnicupida* looks like a larger, washed out *A. cupida*.

**Flight period:** Collected in mid-September.

**Collected localities:** Tennessee: Cocke Co., Foothills Parkway 2<sup>nd</sup> overlook East. (1 specimen)



MAP 24. Collecting localities of *Abagrotis magnicipida*.

**Elevation range:** 1800 ft. (549 m).

**General distribution:** This species is distributed from southern Massachusetts west to Illinois, eastern Missouri, and central Nebraska, south to North Carolina, Tennessee, northern Mississippi and eastern Texas (Lafontaine 1998).

**Larval hosts:** Reared on chokecherry (*Prunus virginiana* L., Rosaceae) (Lafontaine 1998).

### 7. *Agnorisma badinodis* (Grote)

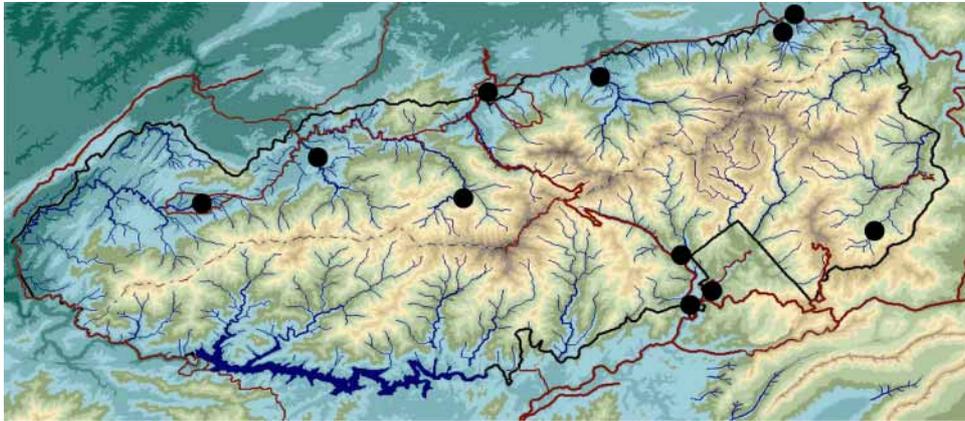
(Fig. 39, Map 25)

**Identification:** Forewing length 16.0–19.0 mm. *Agnorisma badinodis* has a distinct black prothoracic collar. Forewing ground color is brown with a dark brown subterminal area. Orbicular and reniform spots are faint, slightly darker than ground color and partially outlined in white. A rectangular patch concolorous with the subterminal area lies between the orbicular and reniform spots. Antemedial line is tan bordered by a darker distal line, there is a small patch of black scales proximal to orbicular spot, and postmedial line is tan bordered by a proximal line concolorous with subterminal area and curved from costa to posterior margin. Hindwing is brown with a faint discal spot.

**Flight period:** Collected from mid-August to early November.

**Collected localities:** North Carolina: Haywood Co., Purchase Knob, Purchase Knob house, Purchase house 1 mi SE off Purchase Road; Swain Co., Big Cove Road site b, Big Cove Road site c, Big Cove Road site p, Big Cove Road site w, Oconaluftee Staff Housing, Smokemont. Tennessee: Blount Co., Tremont, Cades Cove Old Field ATBI Plot; Cocke

Co., Cosby campground area, Cosby Ranger Station, Foothills Parkway; Sevier Co., Greenbrier Ranger Station, Park Headquarters. (55 specimens)



MAP 25. Collecting localities of *Agnorisma badinodis*.

**Elevation range:** 1320–4924 ft. (402–1501 m).

**General distribution:** This species is distributed from southern Quebec and Ontario west to North Dakota and south to Texas, Mississippi, and South Carolina (Lafontaine 1998).

**Larval hosts:** Crumb (1956) listed curly dock (*Rumex crispus* L., Polygonaceae) and chickweed (*Cerastium* sp., Caryophyllaceae) as preferred hosts. Other hosts listed by Crumb include clover (*Trifolium* sp., Fabaceae), hedgemustard (*Sisymbrium officinale* (L.) Scop., Brassicaceae), white heath aster (*Symphotrichum ericoides* (L.) Nesom, Asteraceae), and tobacco (*Nicotiana* sp., Solanaceae).

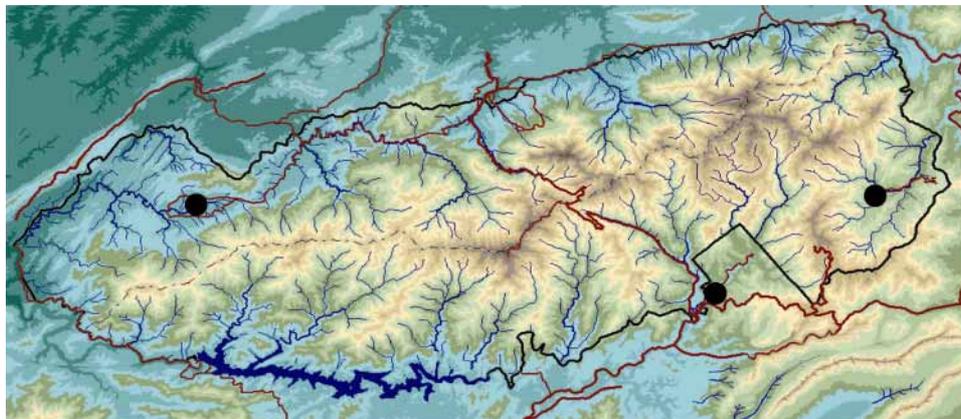
### 8. *Agnorisma bolli* (Grote)

(Fig. 40, Map 26)

**Identification:** Forewing length 14.0–16.0 mm. This species has a pattern similar to that of *A. badinodis*. The white-tipped dark gray scales on the forewing easily distinguish *A. bolli*. This same coloration occurs on the head and thorax, and the prothoracic collar is black. Orbicular and reniform spots are indistinct, a series of three black irregularly shaped patches occur distally to a white antemedial line from costa to below discal cell, a large black rectangular patch is present between orbicular and reniform spots. Postmedial line is white and gently curved from costa to posterior margin. Hindwing is dirty white basally and gradually becomes dark gray toward margin.

**Flight period:** Collected in mid-October.

**Collected localities:** North Carolina: Haywood Co., Cataloochee; Swain Co., Big Cove Road site b, Big Cove Road site c, Big Cove Road site p. Tennessee: Blount Co., Cades Cove Primitive Baptist Church. (9 specimens)



MAP 26. Collecting localities of *Agnorisma bolli*.

**Elevation range:** 1800–2600 ft. (549–792 m).

**General distribution:** This species has a somewhat disjunct distribution from the Chesapeake Bay area of Maryland, Great Smoky Mountains National Park, then west of the Appalachians from southern Ohio and southeastern Kansas south to Mississippi and Arkansas (Lafontaine 1998).

**Larval hosts:** Unknown (Lafontaine 1998).

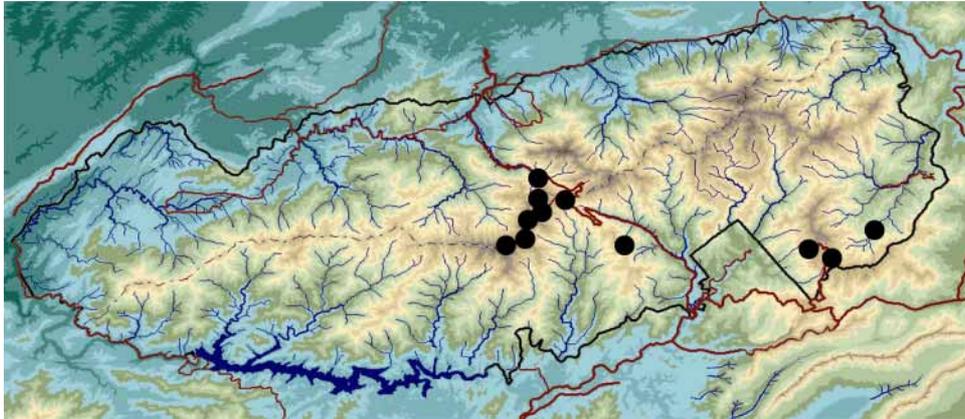
### 9. *Anaplectoides brunneomedia* McDunnough

(Fig. 41–42, Map 27)

**Identification:** Forewing length 19.0–21.0 mm. This is a distinct species with a pale green forewing and a large irregular black patch that surrounds the orbicular and reniform spots. The green color fades to white in worn specimens. Orbicular and reniform spots are distinct and are mostly white with various amounts of gray and green scales, and outlined in black. Subterminal line is a series of short and elongate black triangles that are between the wing veins. Hindwing is dirty white with a faint discal spot, faint median line, wide submarginal band, and a thin dark terminal line with white fringe.

**Flight period:** Collected from June to August.

**Collected localities:** North Carolina: Haywood Co., Balsam Mountain picnic area on Flat Creek Trail, Purchase Knob, Polls Gap on Rough Fork Trail; Swain Co., Beetree Ridge, 5 mi N of Clingman's Dome, 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, 5.6 mi SW of Jct. 441 and Clingman's Dome Road, upper Noland Divide Trail ca. Clingman's Dome. Tennessee: Sevier Co., 1.3 mi W of Jct. 441 and Clingman's Dome Road on Road Prong Trail, 6 mi S of Sugarlands Visitor Center, 7 mi S of Sugarlands Visitor Center. (45 specimens)



MAP 27. Collecting localities of *Anaplectoides brunneomedia*.

**Elevation range:** 3320–6000 ft. (1012–1829 m)

**General distribution:** This species is known from only a few localities in the Appalachian Mountains in West Virginia, Virginia, Kentucky, Tennessee, and North Carolina (Lafontaine 1998).

**Larval hosts:** Unknown (Lafontaine 1998).

#### 10. *Anaplectoides prasina* (Denis and Schiffermüller)

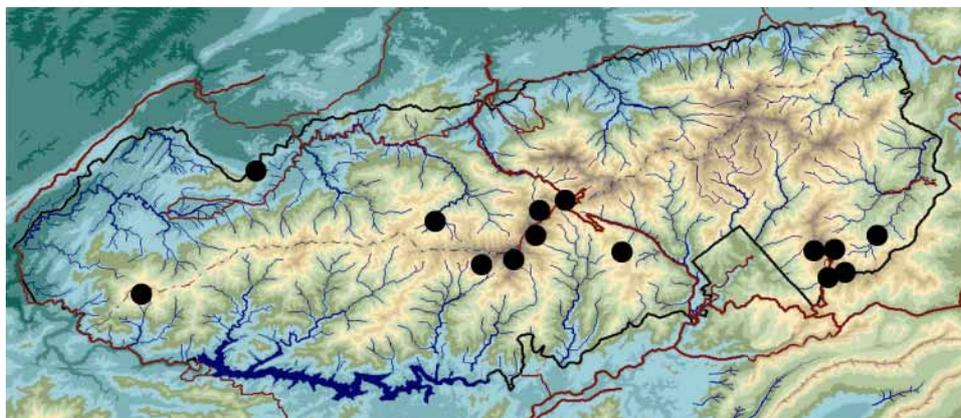
(Fig. 43, Map 28)

**Identification:** Forewing length 24.0–27.0 mm. The forewing color of this species is predominantly green with various amounts of scattered black scales. Orbicular and reniform spots are variously shaded green to gray including a mixture of these colors and outlined in black. The rectangular patch between these spots is green but can be gray in some specimens. A large white subterminal patch distal to reniform spot is diagnostic. Hindwing is dark gray with white fringe.

**Flight period:** Collected from late June to early August.

**Collected localities:** North Carolina: Haywood Co., Balsam Mountain Campground, Balsam Mountain picnic area on Flat Creek Trail, Purchase Knob at house, Purchase Knob E of house field, Polls Gap on Rough Fork Trail, Polls Gap on Hemphill Bald Trail; Swain Co., Beetree Ridge, 3.3 mi NE of Clingman's Dome parking lot on Fork Ridge Trail, 5.6 mi SW of Jct. 441 and Clingman's Dome Road, Mount Buckley. Tennessee: Blount Co., Campsite 6 along Scott Mountain Trail, Gregory Bald; Sevier Co., 1.3 mi W of Jct. 441 and Clingman's Dome Road on Road Prong Trail, Jakes Creek Trail Campsite 27, 7 mi S of Sugarlands Visitor Center. (46 specimens)

**Elevation range:** 3324–6560 ft. (1013–1999 m)



MAP 28. Collecting localities of *Anaplectoides prasina*.

**General distribution:** This species is a Holarctic boreal zone species that occurs in North America across central and southern Canada from Newfoundland to British Columbia. In the East it occurs south to New Jersey and in the Appalachians to North Carolina and Tennessee. In the West it occurs south to southern Oregon then east to Utah, Colorado, and New Mexico. In the Palaearctic it occurs from Great Britain to Japan and northeastern Siberia (Lafontaine 1998).

**Larval hosts:** Seems to be a general feeder on various herbaceous plants and shrubs including huckleberry (*Gaylussacia* sp., Ericaceae), hazelnut (*Corylus* sp., Betulaceae), maple (*Acer* sp., Aceraceae), whortleberry (*Vaccinium myrtillus* L., Ericaceae), willow (*Salix* spp., Salicaceae), foxglove (*Digitalis* sp., Scrophulariaceae), knotweed (*Polygonum* sp., Polygonaceae), dock (*Rumex* sp., Polygonaceae), and blackberry (*Rubus* sp., Rosaceae) (Crumb 1956, Bretherton et al., 1979).

### 11. *Aplectoides condita* (Guenée)

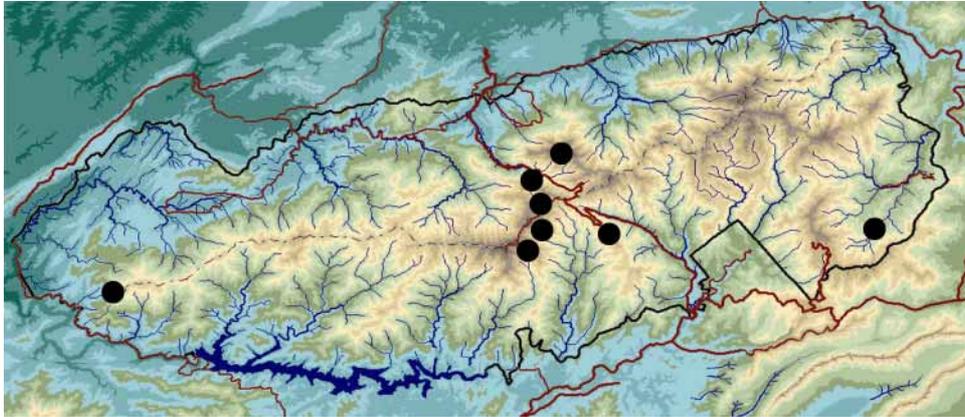
(Figs. 44–45, Map 29)

**Identification:** Forewing length 17.0–20.0 mm. Forewing ground color is brown to dark gray. Orbicular and reniform spots are concolorous with ground color, mixed with white in some specimens, and are partially outlined in black. This species can be distinguished from *A. pressus* (Grote) by the lack of longitudinal yellow streaks and by the presence of a short black basal dash below the M vein in the forewing of *A. condita*. Hindwing dirty white with a faint discal cell and obscure pale gray shading near the outer margin.

**Flight period:** Collected from end of May to July.

**Collected localities:** North Carolina: Haywood Co., Purchase Knob at house; Swain Co., 1 mi N of Clingman's Dome, 3 mi N of Clingman's Dome, 5 mi N of Clingman's Dome, 13.5 mi NE of entrance to GSMNP on Thomas Divide Trail. Tennessee: Blount

Co., 0.2 mi NE of Parson's Bald on Wolf Ridge Trail; Sevier Co., Brushy Mountain ATBI Plot, Chimney Tops Trail, ca. 7 mi S Sugarlands Visitor Center. (11 specimens)



MAP 29. Collecting localities of *Aplectoides condita*.

**Elevation range:** 3480–5960 ft. (1061–1817 m)

**General distribution:** This is a widely distributed boreal zone species that occurs across central and southern Canada from Newfoundland to British Columbia. In the East it occurs as far south as northern New Jersey and northern Pennsylvania, and west to Michigan and Wisconsin; it is found along the Appalachians in Virginia and North Carolina. In the West it occurs in Idaho and Oregon (Lafontaine 1998). The collections from GSMNP are new records for the state of Tennessee.

**Larval hosts:** McCabe (1988) reared larvae on tamarack (*Larix laricina* (Du Roi) K. Koch, Pinaceae), which seemed to be the preferred host, but larvae also accepted balsam fir (*Abies balsamea* (L.) P. Mill., Pinaceae).

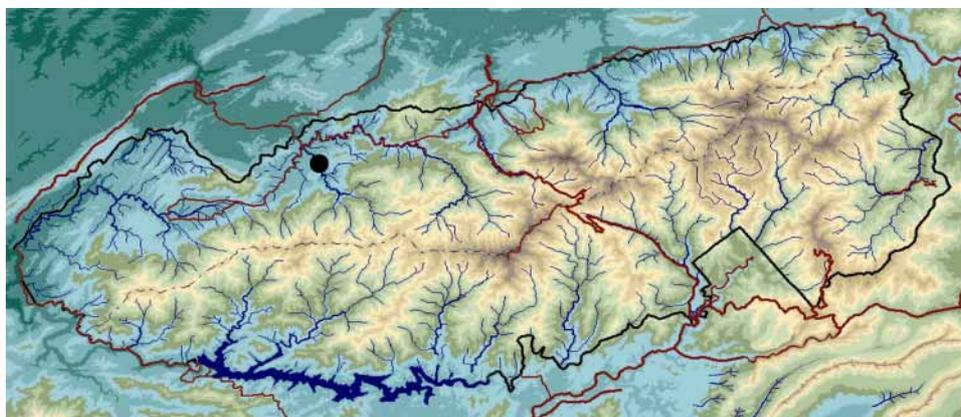
## 12. *Cerastis fishii* (Grote)

(Figs. 46–47, Map 30)

**Identification:** Forewing length 13.0–17.0 mm. Antennae are bipectinate in the male and filiform in the female. Forewing is reddish brown, significantly lighter than in *Cerastis tenebrifera* (Walker). Head and thorax are darker than forewing. Orbicular spot is absent on most specimens, when present, it consists of only a few black and white scales. Reniform spot is always present, and can be faint. It consists of a black interior bordered by white. There is a prominent black subapical spot on the costa of the forewing. The subterminal line is below this spot and consists of a series of small black spots that extend to the posterior margin. Hindwing is pale gray with a slightly darker, obscure marginal band.

**Flight period:** Collected in early March.

**Collected localities:** Tennessee: Blount Co., Tremont Environmental Education Center. (1 specimen)



MAP 30. Collecting localities of *Cerastis fishii*.

**Elevation range:** 1360 ft. (415 m)

**General distribution:** This species is distributed in eastern North America from Newfoundland to southern Ontario in Canada; in the United States from Maine west to Ohio, Michigan, and northern Wisconsin, then south to North Carolina (Lafontaine 1998). The collection from GSMNP is a new record for the state of Tennessee.

**Larval hosts:** Larvae feed on blueberry flowers then the leaves (*Vaccinium* spp., Ericaceae) (McCabe 1991).

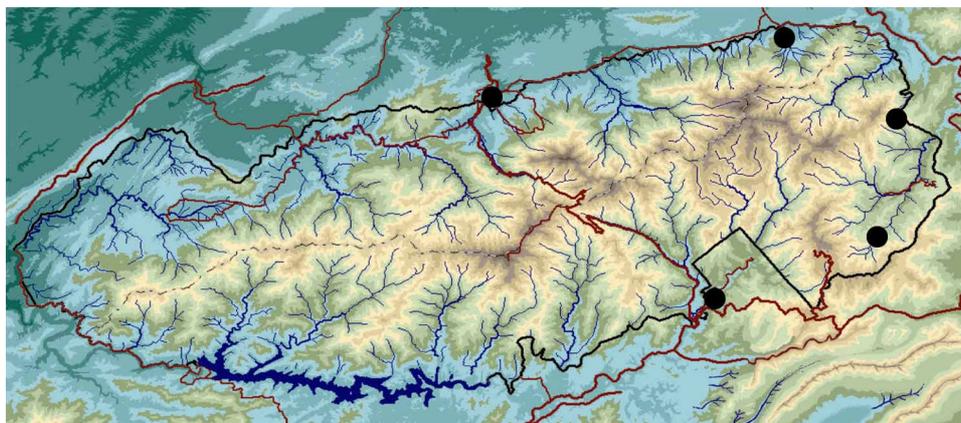
### 13. *Cerastis tenebrifera* (Walker) Reddish Speckled Dart (Figs. 48–49, Map 31)

**Identification:** Forewing length 15.0–18.0 mm. Male antennae are bipectinate. Forewing is dark reddish brown and concolorous with head and thorax, prothorax with a thin apical border of white. Orbicular and reniform spots are white with patches of white above both spots on costa. Antemedial and postmedial lines and area between them are slightly darker than ground color. Subterminal and terminal lines are thin and wavy. Hindwing is pale gray with a faint discal spot.

**Flight period:** Collected from mid-March through April.

**Collected localities:** North Carolina: Haywood Co., Mount Sterling Trail, Purchase Knob; Swain Co., Big Cove Road site b, Big Cove Road site p. Tennessee: Cocke Co., Cosby Ranger Station; Sevier Co., Park Headquarters. (10 specimens)

**General distribution:** This species is distributed in eastern North America from Newfoundland to southern Ontario, south to North Carolina, and east to Mississippi, eastern Texas, and eastern Kansas (Lafontaine 1998).



MAP 31. Collecting localities of *Cerastis tenebrifera*.

**Larval hosts:** Larvae accepted lettuce (*Lactuca* sp. Asteraceae), linden (*Tilia x vulgaris* Hayne (pro. sp.) [*cordata* x *platyphyllos*] Tiliaceae), grape (*Vitis* sp., Vitaceae), and common dandelion (*Taraxacum officinale* G. H. Weber ex Wiggers, Asteraceae) in captivity (Crumb 1956). McCabe (1991) reared larvae on common dandelion (*Taraxacum officinale* G. H. Weber ex Wiggers, Asteraceae), raspberry (*Rubus idaeus* L., Rosaceae), meadow willow (*Salix petiolaris* Sm., Salicaceae), chokecherry (*Prunus virginiana* L., Rosaceae), and paper birch (*Betula papyrifera* Marsh., Betulaceae).

#### 14. *Choephora fungorum* Grote and Robinson Bent-line Dart

(Fig. 50, Map 32)

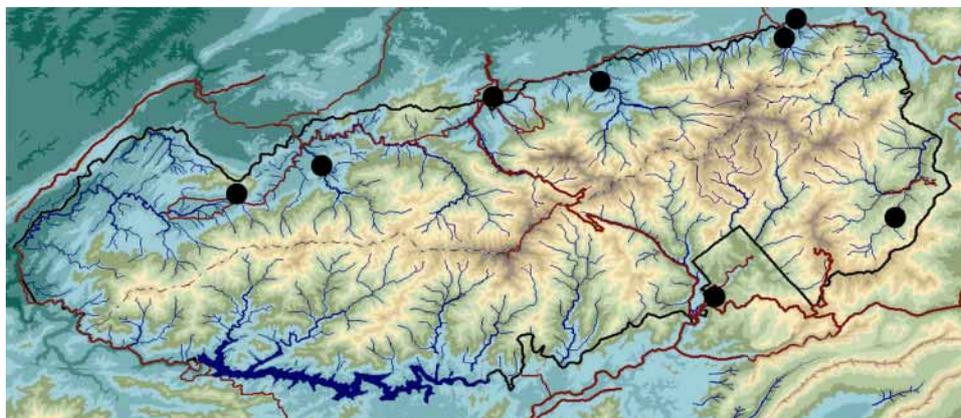
**Identification:** Forewing length 18.0–23.0 mm. This is an easily recognized species with a tan forewing and dark patch between the nonexistent orbicular and reniform spots. Male antennae are bipectinate. Head and thorax have numerous long, very fine hair-like scales giving a bushy appearance. Antemedial and postmedial lines are thin, with postmedial being recurved in apical fourth, then straight to posterior margin. Hindwing is pinkish tan with a faint subterminal line that is ventral to the forewing postmedial line.

**Flight period:** Collected from mid-September to early November.

**Collected localities:** North Carolina: Haywood Co., Purchase house 1 mi SE off Purchase Road; 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 Primitive Baptist Church, Tremont, Cocke Co., Cosby Campground area, Cosby Ranger Station, Foothills Parkway; Sevier Co., Greenbrier Ranger Station, Park Headquarters. (27 specimens)

**Elevation range:** 1360–4630 ft. (415–1411 m)

**General distribution:** This species is distributed from southern Ontario, Pennsylvania, and southern Michigan south to the Gulf coast of northern Florida and west to central Kansas and eastern Texas (Lafontaine 1998).



MAP 32. Collecting localities of *Choephora fungorum*.

**Larval hosts:** Crumb (1956) listed clover (*Trifolium* sp., Fabaceae), tobacco (*Nicotiana* sp., Solanaceae), and various herbaceous weeds. Larvae have been reared on common dandelion (*Taraxacum officinale* G. H. Weber ex Wiggers, Asteraceae) in captivity (Lafontaine 1998).

### 15. *Diarsia jucunda* (Walker) Smaller Pinkish Dart

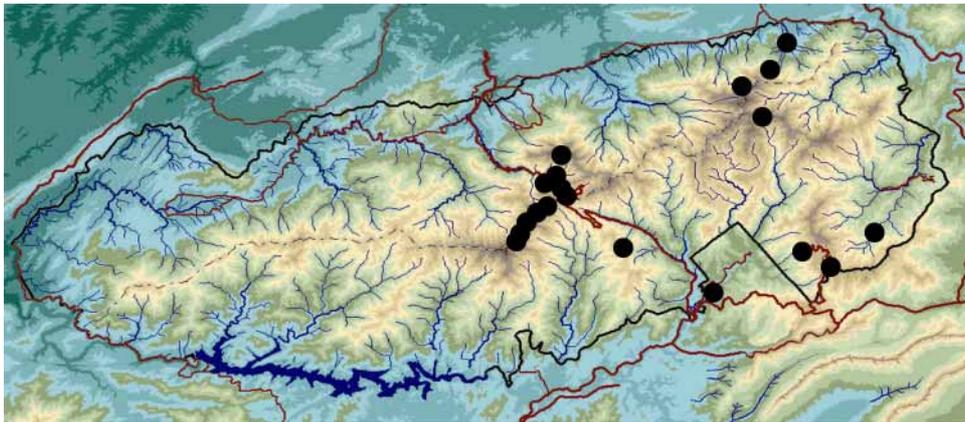
(Figs. 51-54, Map 33)

**Identification:** Forewing length 15.0–19.0 mm. This is a variable species with the forewing ground color ranging from reddish brown to dark gray. Distinguishing characters include the light cream to tan head and prothorax contrasting with the reddish brown thorax, the distal margin of the reniform spot is sharply angulate, black rectangular spot between orbicular and reniform spots, and in the males the long scales associated with the genitalia are bright reddish brown and tan. Hindwing is dirty white to pale gray with a faint discal spot and a very faint subterminal line in most specimens. Some specimens appear to have a washed-out appearance to the forewing with the rectangular spot absent and the pattern of lines and spots faint. Most of these specimens have a more uniform reddish brown forewing ground color.

**Flight period:** Collected from late June to early August.

**Collected localities:** North Carolina: Haywood Co., Balsam Mountain picnic area on Flat Creek Trail, Polls Gap on Hemphill Bald Trail, Purchase Knob, Purchase Knob E of house forest, Purchase Knob N of house forest, Purchase Knob ATBI Plot, Polls Gap on Rough Fork Trail; Swain Co., Beetree Ridge, Big Cove Road site c, 1.2 mi NE of Clingman's Dome parking lot on Noland Divide Trail, 5.6 mi SW of Jct. 441 and Clingman's Dome Road Noland Divide Trail, 3.3 mi NE of Clingman's Dome parking lot on Fork Ridge Trail, Indian Gap on Clingman's Dome Road, Tricorner Knob. Tennessee:

Cocke Co., Albright Grove ATBI Plot, 0.25 mi inside entrance to Cosby, Snakeden Ridge ATBI Plot; Sevier Co., Brushy Mountain ATBI Plot, Chimney Tops Trail, 1.3 mi W of Jct. 441 and Clingman's Dome Road on Road Prong Trail, 6 mi S of Sugarlands Visitor Center Cove Hardwood Forest, 7 mi S of Sugarlands Visitor Center, Jake's Creek Trail at Campsite 27. (130 specimens)



MAP 33. Collecting localities of *Diarsia jucunda*. Elevation range: 1480–4924 ft. (451–1501 m)

**Elevation range:** 1350–6000 ft. (411–1829 m)

**General distribution:** This species is distributed from Newfoundland and central Ontario, west to northern Michigan and Wisconsin, and south to Ohio. In the Appalachians it is found as far south as North Carolina (Lafontaine 1998). The collections from GSMNP are new records for the state of Tennessee.

**Larval hosts:** Little is known about the host plant preferences of this species, but it is probably a general feeder (Lafontaine 1998). Rockburne and Lafontaine (1976) reported larvae feeding on grasses (Poaceae), and McCabe (1991) fed larvae on common dandelion (*Taraxacum officinale* G. H. Weber ex Wiggers, Asteraceae).

#### 16. *Diarsia rubifera* (Grote)

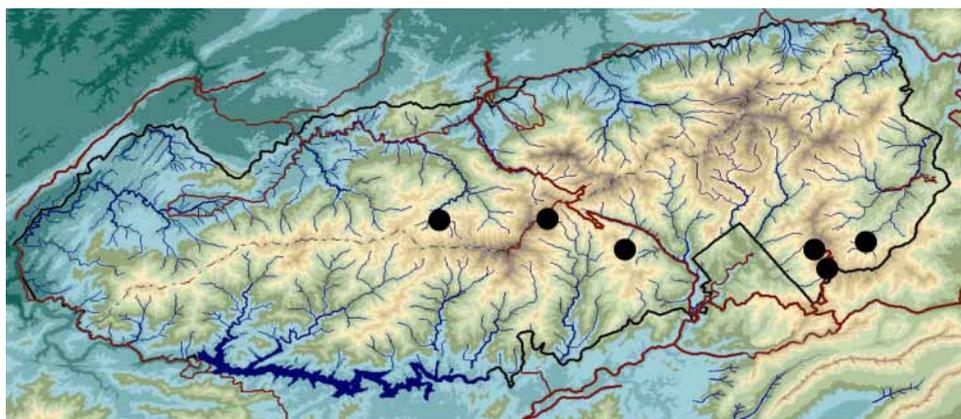
(Figs. 55-57, Map 34)

**Identification:** Forewing length 13.0–16.0 mm. This species is easily differentiated from *D. jucunda*. *Diarsia rubifera* has reddish brown forewing color, faint pattern, and a small black dot ventral to the orbicular spot in the area of the claviform spot. Orbicular and reniform spots are variable ranging from being slightly darker than ground color with a few white scales to being mostly white and outlined in white. The reniform spot is more likely to be mostly white than the orbicular spot, and is filled with black or gray in the ventral apex. Antemedial and postmedial lines are black with an adjacent tan line that is

proximal to antemedial and distal to postmedial. Subterminal line is tan to white. Hindwing is lighter than in *D. jucunda* being dirty white suffused with pale gray, a faint discal cell, and faint submarginal line.

**Flight period:** Collected from mid-July to early August.

**Collected localities:** North Carolina: Haywood Co., Flat Creek Trail on Balsam Mountain Road, Polls Gap on Hemphill Bald Trail, Purchase Knob E of house forest, Purchase Knob N of house forest; Swain Co., Beetree Ridge, Indian Gap on Clingman's Dome Road. Tennessee: Sevier Co., Jake's Creek Trail at Campsite 27. (18 specimens)



MAP 34. Collecting localities of *Diarsia rubifera*.

**Elevation range:** 3590–5400 ft. (1094–1646 m)

**General distribution:** This species is distributed from coast to coast and from central and southern Canada and the northern United States. In the East it occurs as far south as western North Carolina, and in the West it has been recorded from southwestern Montana and southwestern Colorado (Lafontaine 1998). The collections from GSMNP are new records for the state of Tennessee.

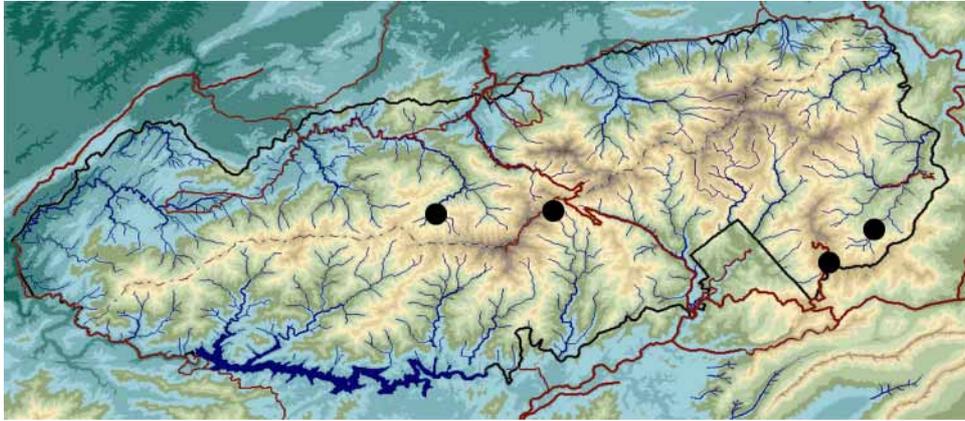
**Larval hosts:** Unknown (Lafontaine 1998).

### 17. *Eueretagrotis attentus* (Grote) Attentive Dart (Fig. 58, Map 35)

**Identification:** Forewing length 14.0–17.0 mm. *Eueretagrotis attentus* is an easily recognized species with a reddish-brown forewing with variable amounts of white scaling along costa from base to reniform spot. The most diagnostic character is the prominent black basal dash on the forewing. Orbicular and reniform spots are variable from ground color with a few white spots to mostly white and outlined in black. Antemedial and postmedial lines are white with darker shading, and subterminal line is white. Hindwing is white with a discal spot and thin fuscous marginal line.

**Flight period:** Collected in June and July.

**Collected localities:** North Carolina: Haywood Co., Polls Gap on Hemphill Bald Trail, Purchase Knob; Swain Co., Indian Gap on Clingman's Dome Road. Tennessee: Sevier Co., Jake's Creek Trail at Campsite 27. (5 specimens)



MAP 35. Collecting localities of *Eueretagrotis attentus*.

**Elevation range:** 3640–5400 ft. (1109–1646 m)

**General distribution:** This species is distributed across southern Canada from Nova Scotia to western Manitoba and in the United States from Maine to Minnesota, south along the Appalachians to western North Carolina (Lafontaine 1998).

**Larval hosts:** Reared on blueberry (*Vaccinium* spp., Ericaceae) and willow (*Salix* sp., Salicaceae) (Lafontaine 1998). McCabe (1991) has reared larvae in captivity on yellow birch (*Betula alleghaniensis* Britt., Betulaceae), common elderberry (*Sambucus* sp., Caprifoliaceae), and wild strawberry (*Fragaria* sp., Rosaceae).

### 18. *Eueretagrotis perattentus* (Grote) Two-spot Dart

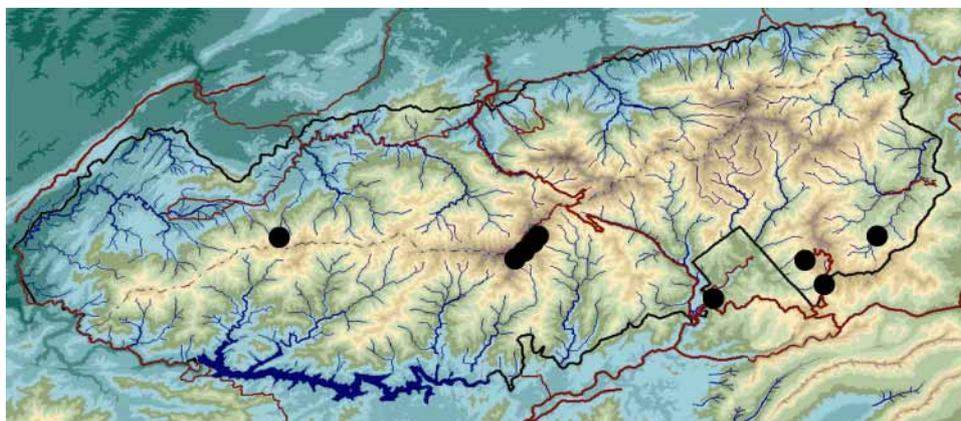
(Fig. 59, Map 36)

**Identification:** Forewing length 16.0–19.0 mm. This is a dark gray species with a black basal dash and black quadrate patch between the orbicular and reniform spots. There is a sharp contrast between the black prothorax and white tufted thorax. Orbicular and reniform spots are usually white, but can be mostly gray and outlined in black. The distal margin of the reniform is angulate. Antemedial and postmedial lines are black, shaded with white to reddish brown. Subterminal line is pale with a lighter colored terminal area in most specimens. Hindwing is dirty white suffused with pale gray with a faint discal cell and faint thin gray marginal line.

**Flight period:** Collected in June and July.

**Collected localities:** North Carolina: Haywood Co., Balsam Mountain picnic area on Flat Creek Trail, Polls Gap on Hemphill Bald Trail, Purchase Knob, Purchase Knob at

house, Polls Gap on Rough Fork Trail; Swain Co., Big Cove Rd., 1 mi N Clingman's Dome, Clingman's Dome, 3 mi N Clingman's Dome, 5 mi N Clingman's Dome, Indian Gap Clingman's Dome Road, Upper Noland Divide Trail ca. Clingman's Dome. Tennessee: Blount Co., Spence Field; Sevier Co., Jake's Creek Trail. (41 specimens)



MAP 36. Collecting localities of *Eueretagrotis perattentus*.

**Elevation range:** 2120–6640 ft. (646–2024 m)

**General distribution:** This species is distributed coast to coast across central and southern Canada, and in the northern United States, south along the Appalachians to western North Carolina and Tennessee, with a few scattered records along the Rockies from southwestern Montana to southeastern Arizona (Lafontaine 1998).

**Larval hosts:** Reared on blueberry (*Vaccinium* spp., Ericaceae) and pin cherry (*Prunus pennsylvanica* L., Rosaceae) (Lafontaine 1998).

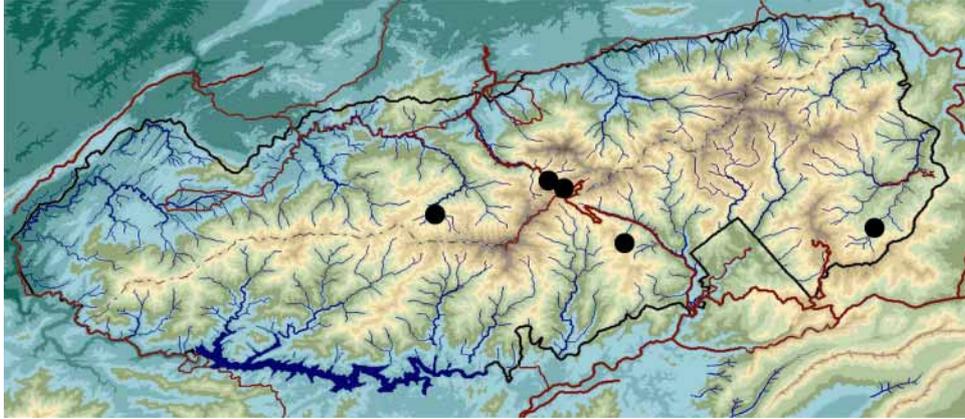
**19. *Eueretagrotis sigmoides* (Guenée) Sigmoid Dart**  
(Fig. 60, Map 37)

**Identification:** Forewing length 18.0–21.0 mm. *Eueretagrotis sigmoides* is slightly larger and browner than *E. perattentus*. In *E. sigmoides* the forewing ground color is brown with a gray M vein in fresh specimens. Costa of forewing from base to reniform spot is lighter than ground color and is a mixture of white, rufous, and tan scales. There is a black basal dash, a triangulate black patch proximal to orbicular spot, and a quadrate black patch between orbicular and reniform spot. Orbicular and reniform spots are a mixture of white, rufous, and gray scales and outlined in black. Claviform spot is faint and consists of a few black scales distal to the basal dash. Antemedial and postmedial lines are light with gray borders. Subterminal line is a mixture of white and rufous scales. Hindwing is gray and darker than *E. perattentus* with a faint discal cell.

**Flight period:** Collected in June and July.

**Collected localities:** North Carolina: Haywood Co., Purchase Knob; Swain Co.,

Beetree Ridge. Tennessee: Sevier Co., Jake's Creek Trail above campsite #27, 6 mi S Sugarlands Visitor Center, 7 mi S Sugarlands Visitor Center (10 specimens)



MAP 37. Collecting localities of *Eueretagrotis sigmoides*.

**Elevation range:** 3320–4860 ft. (1012–1481 m)

**General distribution:** This species is an eastern North America species distributed in southern Canada from Ontario to central Saskatchewan, and in the United States from Maine to Minnesota, south to western Maryland, Ohio, and western Kentucky (Lafontaine 1998). The collections from GSMNP are new records for the states of North Carolina and Tennessee and represent a southern range extension.

**Larval hosts:** Unknown (Lafontaine 1998).

## 20. *Lycophotia phyllophora* (Grote) Two-spot Dart

(Fig. 61, Map 38)

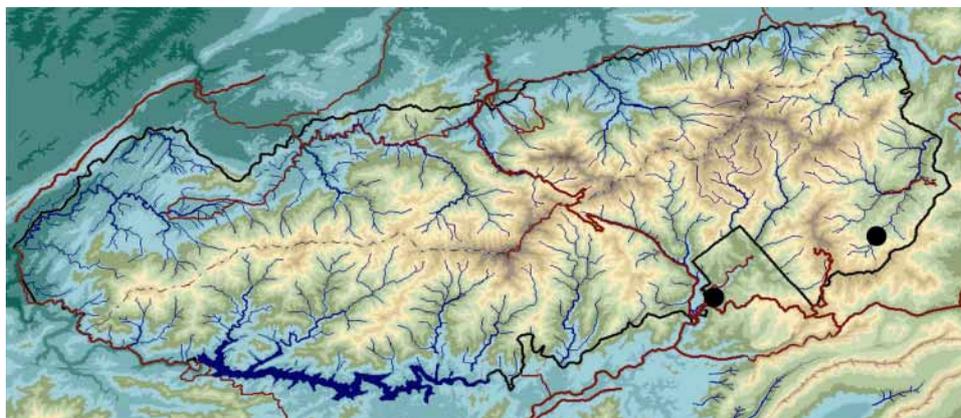
**Identification:** Forewing length 16.0–19.0 mm. Forewing ground color is pinkish brown, basal area mixed with white scales, and the median and subterminal areas darker than rest of wing. Orbicular spot is mostly white mixed with ground color and reniform spot is obscure, usually represented by a thin, white, proximal border. Antemedial and postmedial lines are reddish brown. Terminal area is pinkish brown. Hindwing is gray and discal cell is absent.

**Flight period:** Collected from late June to early August.

**Collected localities:** North Carolina: Haywood Co., Purchase Knob N of house forest; Swain Co., Big Cove Road site p. (3 specimens)

**Elevation range:** 2040 and 4998 ft. (622 and 1523 m)

**General distribution:** This species is distributed across southern and central Canada from New Brunswick and Nova Scotia to western Ontario, and in the northern United States from Maine to Minnesota, south to Ohio, and along the Appalachians to western North Carolina (Lafontaine 1998).



MAP 38. Collecting localities of *Lycophotia phyllophora*.

**Larval hosts:** Reared on willow (*Salix* sp., Salicaceae), birch (*Betula* sp., Betulaceae), alder (*Alnus* sp., Betulaceae), blueberry (*Vaccinium* spp., Ericaceae), viburnum (*Viburnum* sp., Caprifoliaceae), cherry (*Prunus avium* (L.) L., Rosaceae), and meadowsweet (*Spiraea* sp., Rosaceae) (Crumb 1956).

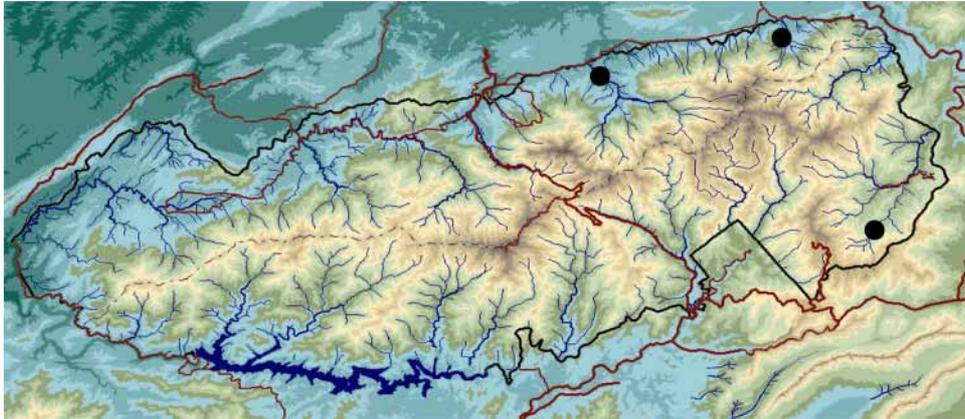
**21. *Noctua pronuba* (Linnaeus) Large Yellow Underwing Moth**  
(Fig. 62, Map 39)

**Identification:** Forewing length 25.0–27.0 mm. This species is easily identified by the yellow hindwing and black marginal band. Forewing can vary in coloration from grayish tan to dark brown with the costa from base to reniform spot a pale gray to tan, which is concolorous with the orbicular spot. Orbicular spot is less distinct on the paler, less mottled specimens. Reniform spot is dark gray to black with a sharply angled distal margin. There is a small black spot at the apex of the subterminal line at the costa. Antemedial line is present on heavily marked specimens, but on lighter individuals the transverse lines are a series of indistinct, black, short wavy lines in the posterior half of the wing below the M vein. Hindwing is yellow with black marginal band, discal cell is absent, and fringe is yellow.

**Flight period:** Collected from late June to early August.

**Collected localities:** North Carolina: Haywood Co., Purchase Knob, Purchase Knob at house, Purchase Knob NE of house field. Tennessee: Cocke Co., Cosby ATBI house; Sevier Co., Greenbrier near Ranger Station (6 specimens)

**Elevation range:** 1700–1860 and 4998 ft. (518–567 and 1523 m)



MAP 39. Collecting localities of *Noctua pronuba*.

**General distribution:** In the Old World *N. pronuba* is distributed from Europe and North Africa eastward to India. This species was introduced into North America at Halifax, Nova Scotia, Canada around 1979 (Neil 1981). It was first collected in the United States in Maine in 1985, and then spread throughout the northeast from Vermont and Massachusetts (1989) to New Hampshire (1990), New York and Maryland (1992), and Connecticut (1993) (Passoa and Hollingsworth 1996). It was first recorded in Pennsylvania in 1998 (Rawlins and Bier 1998). Since the initial introduction in 1979, it has gradually spread south to North Carolina (1997) and west to Colorado (1999), Wyoming (2000), California (2001) (Powell, personal correspondence), British Columbia (2002), and in Alaska (2005) (Lafontaine, personal correspondence).

**Larval hosts:** This is a polyphagous species whose hosts include, grass (*Poa annua* L., Poaceae), violets (*Viola* sp., Violaceae), primrose (*Oenothera* sp., Onagraceae), dock (*Rumex* sp., Polygonaceae), knotweed (*Polygonum* sp., Polygonaceae), saltbush (*Atriplex* sp., Chenopodiaceae), forget-me-not (*Myosotis* sp., Boraginaceae), common dandelion (*Taraxacum officinale* G. H. Weber ex Wiggers, Asteraceae), *Freesia* sp. (Iridaceae), *Gladiolus* sp. (Iridaceae), and various crops such as tomatoes (*Solanum lycopersicum* L., Solanaceae), potato (*Solanum tuberosum* L., Solanaceae), carrot (*Daucus carota* L. ssp. *sativus* (Hoffm.), Apiaceae), beets (*Beta* sp., Chenopodiaceae), cabbage (*Brassica oleracea* L., Brassicaceae), grape (*Vitis* sp., Vitaceae), and various Brassicaceae (Passoa and Hollingsworth 1996).

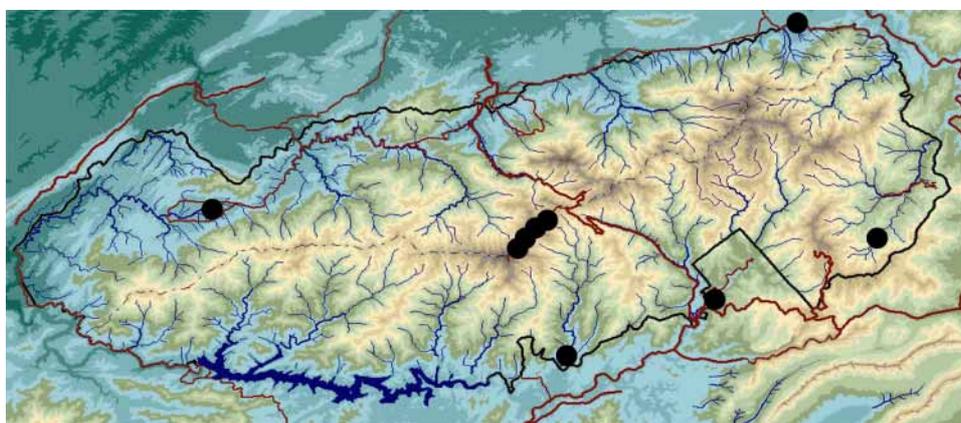
## 22. *Protolampra brunneicollis* (Grote) Brown-collared Dart (Fig. 63, Map 40)

**Identification:** Forewing length 16.0–18.0 mm. *Protolampra brunneicollis* can be identified by the dark brown to reddish brown head and prothoracic collar and light brown,

faintly marked forewings. Orbicular and reniform spots are the same as the ground color or slightly lighter, outlined in black. Transverse lines are indistinct, consisting at most of short wavy lines and small black dots. A conspicuous black triangular spot is present on costa between postmedial and subterminal lines. Hindwing is dirty white with slightly darker highlighted veins.

**Flight period:** Collected from late May to mid-October.

**Collected localities:** North Carolina: Haywood Co., Purchase Knob, Purchase Knob at house, Purchase Knob N of house forest, Purchase Knob NE of house field, Purchase Knob nr. 1<sup>st</sup> gate; Swain Co., Big Cove Road site b, Big Cove Road site c, Big Cove Road site p, Big Cove Road site w, Deep Creek Ranger Station. Tennessee: Blount Co., Cades Cove Primitive Baptist Church; Cocke Co., Foothills Parkway East, Foothills Parkway, Foothills Parkway south overlook, Foothills Parkway at I-40. (60 specimens)



MAP 40. Collecting localities of *Protolampra brunneicollis*.

**Elevation range:** 1330–4998 ft. (405–1523 m)

**General distribution:** This is a common species in eastern North America from New Brunswick to Alberta in southern Canada, and in the United States from Maine to North Carolina and Tennessee west to Mississippi, north to Minnesota, with scattered records in the West from North and South Dakota and Montana (Lafontaine 1998).

**Larval hosts:** Larvae have been reared on blueberry (*Vaccinium* spp., Ericaceae), common dandelion (*Taraxacum officinale* G. H. Weber ex Wiggers, Asteraceae), and sweet-fern (*Myrica asplenifolia* L., Myricaceae) (Crumb 1956). Lafontaine (1998) regarded this species as probably a general feeder.

### 23. *Pseudohermonassa bicarnea* (Guenée) Pink-spotted Dart (Fig. 64, Map 41)

**Identification:** Forewing length 15.0–19.0 mm. In the Park this species can be recognized

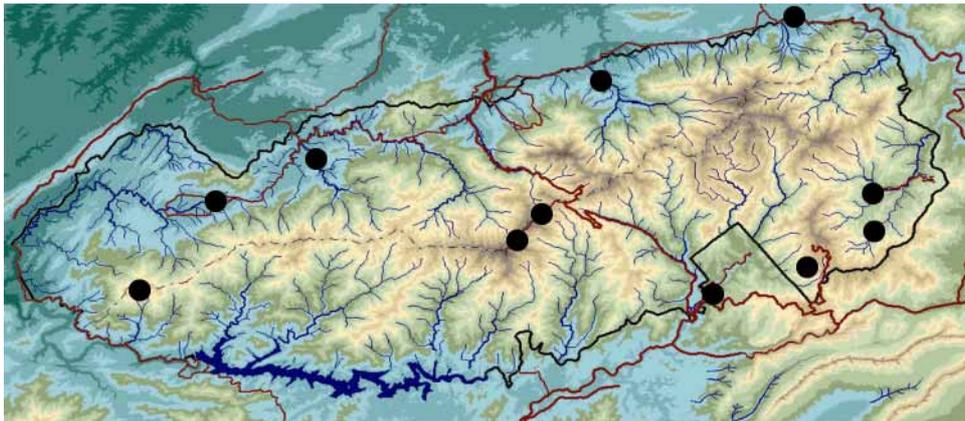
by the dark gray forewing with rufous basal area and subapical costal spot. Orbicular and reniform spots are generally ground color with a few rufous scales along the edges. A black irregularly shaped patch is present between rufous basal area and orbicular spot and a black quadrate patch between orbicular and reniform spots. Antemedial line is dark reddish brown at distal edge of basal area and may or may not extend to posterior margin. Postmedial line is rufous and lies in the middle of the subapical costal spot and may or may not extend to posterior margin as a series of black dots or short lines. Subterminal line is a series of white to tan irregularly shaped spots and dots that extend to near posterior margin. Hindwing is dark gray in fresh specimens and tends to lighten in color as specimens become more worn.

**Flight period:** Collected from late July to early October.

**Collected localities:** North Carolina: Haywood Co., 5.2 mi N of Jct. Blue Ridge Parkway & Balsam Mountain Rd. on Flat Creek Trail, Cataloochee, Purchase Knob, Purchase Knob at house, Purchase Knob E of house forest, Purchase Knob house, Purchase Knob NE of house field; Swain Co., Big Cove Road site b, Big Cove Road site c, Big Cove Road site p, Big Cove Road site w, 1.2 mi NE Clingman's Dome parking lot Noland Divide Trail, 3.3 mi NE Clingman's Dome parking lot Fork Ridge Trail. Tennessee: Blount Co., Cades Cove near Ranger Station, Cades Cove ATBI house 2000 m SW, Gregory Bald, Tremont; Cocke Co., Foothills Parkway East, Foothills Parkway 2<sup>nd</sup> overlook East; Sevier Co., Greenbrier Ranger Station. (38 specimens)

**Elevation range:** 1360–6000 ft. (414–1829 m)

**General distribution:** This is an eastern North American species that ranges as far west as south-central Saskatchewan, Canada and central North Dakota, and south to western North Carolina. (Lafontaine 1998). The collections from GSMNP are new records for the state of Tennessee.



MAP 41. Collecting localities of *Pseudohermonassa bicarnea*.

**Larval hosts:** Larval hosts seem to be the grasses *Glyceria maxima* (Hartman) Holmb. and *G. canadensis* (Michx.) Trin. (Poaceae) (McCabe1991). However, Crumb

(1956) listed blueberry (*Vaccinium* spp., Ericaceae), gray birch (*Betula populifolia* Marsh., Betulaceae), common dandelion (*Taraxacum officinale*, Asteraceae), maple (*Acer* sp., Aceraceae), and meadowsweet (*Spiraea alba* Du Roi var. *latifolia* (Ait.) Dippel, Rosaceae). In rearings by McCabe (1991) larvae rejected velvetleaf huckleberry (*Vaccinium mytillides* Michx., Ericaceae), common yarrow (*Achillea millefolium* L., Asteraceae), paper birch (*Betula papyrifera*, Betulaceae), raspberry (*Rubus idaeus*, Rosaceae), stinging nettle (*Urtica dioica* L., Urticaceae), spreading dogbane (*Apocynum androsaemifolium* L., Apocynaceae), and common elderberry (*Sambucus nigra* L. ssp. *canadensis* (L.) R. Bolli, Caprifoliaceae).

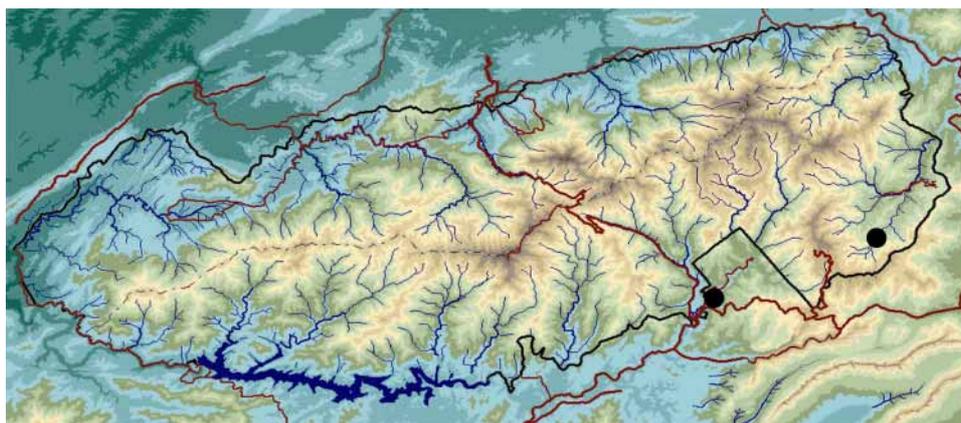
**24. *Spaelotis clandestina* (Harris) Clandestine Dart (adult), W-marked Cutworm (larva)**

(Fig. 65, Map 42)

**Identification:** Forewing length 16.0–22.0 mm. This is a drab species with a narrow forewing and reduced pattern. Forewing ground color is grayish brown. The forewing pattern varies from faint orbicular and reniform spots to faint antemedial and postmedial lines. Orbicular and reniform spots are ground color mixed with a few white scales and partially outlined in black, with the orbicular being more distinct. Antemedial and postmedial lines, when present, are a series of contiguous dark brown zigzag lines. Hindwing is dirty white suffused with brown toward margin and with highlighted veins.

**Flight period:** Collected from May to October.

**Collected localities:** North Carolina: Haywood Co., Purchase Knob at house, Purchase Knob, Purchase house 1 mi SE off Purchase Road; Swain Co., Big Cove Road site c. (5 specimens)



**MAP 42.** Collecting localities of *Spaelotis clandestina*.

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

**General distribution:** This is a widespread species distributed from coast to coast across Canada to southern Alaska, and in the eastern United States from Maine to western North Carolina, west to northern Ohio to North and South Dakota, Nebraska, and down the Rockies from Montana to southern Arizona (Lafontaine 1998).

**Larval hosts:** The W-marked cutworm is a pest on a variety of trees, shrubs, and herbaceous plants, including blueberry (*Vaccinium* spp., Ericaceae) (*Vaccinium* spp.), maple (*Acer* sp.), pine (*Pinus* sp., Pinaceae), beans (Fabaceae), cabbage (*Brassica oleracea* L., Brassicaceae), corn (*Zea mays* L. Poaceae), apple (*Malus* sp., Rosaceae), and strawberry (*Fragaria* sp., Rosaceae) (Tietz 1972).

## 25. *Xestia c-nigrum* (Linnaeus)

(Figs. 66, 81)

**Identification:** Forewing length 14.0–18.0 mm. *Xestia c-nigrum* and *X. dolosa* Franclemont are very similar and difficult to separate. The forewing length is less in *X. c-nigrum* than in *X. dolosa*. Habitats are also different; *X. c-nigrum* prefers more disturbed areas like abandoned orchards and farmland, whereas *X. dolosa* is associated with rich deciduous forests (Lafontaine 1998). The best character for separating these species is in the shape of the ostium bursae in the female genitalia, which is U-shaped with parallel sides in *X. c-nigrum* (Fig. 81) and V-shaped in *X. dolosa* (Fig. 82).

**Flight period:** There are two generations per year from early May to July and from July to early October (Lafontaine 1998).

**Collected localities:** This species is not yet recorded in the Park, but it is likely to occur there.

**General distribution:** This is a widespread species occurring from coast to coast across Canada and the northern United States to western Alaska. It occurs in the Rockies from Montana to southern Arizona and New Mexico. In the East it ranges from Maine to North Carolina (Lafontaine 1998). The collections from GSMNP are new records for the state of Tennessee.

**Larval hosts:** Larvae have been reared on Indianpipe (*Monotropa uniflora* L., Monotropaceae), raspberry (*Rubus idaeus* L., Rosaceae), and common plantain (*Plantago major* L., Plantaginaceae) (McCabe 1991). It was not until 1980 that *X. c-nigrum* was considered a different species from *X. dolosa* Franclemont. Based on habitat, other hosts probably attributed to *X. c-nigrum* include apple (*Malus* sp., Rosaceae), barley (*Elyhordeum* sp., Poaceae), corn (*Zea mays* L., Poaceae), clover (*Trifolium* sp., Fabaceae), and tobacco (*Nicotiana* sp., Solanaceae) (Rings, et al. 1992).

**26. *Xestia dolosa* Franclemont**

(Figs. 67, 82, Map 43)

**Identification:** Forewing length 18.0–24.0 mm. *Xestia c-nigrum* and *X. dolosa* are an easily recognized species group, but separating the two species is difficult as discussed under *X. c-nigrum*. Forewing ground color is reddish brown in males and dark gray in females. Orbicular spot is large, triangular, and cream colored that extends to costa, and contrasts with the black patch in the discal cell that extends from antemedial line to reniform spot. Reniform spot is reddish brown in apico-proximal quadrant with the remainder gray in both sexes. There is a small black patch at the apex of the subterminal line. The terminal area in the male is gray and contrasts with the forewing ground color, this area is concolorous with the forewing ground color in the female. Hindwing is dirty white with gray shading along the outer margin in the male and is a more uniform gray in the female.

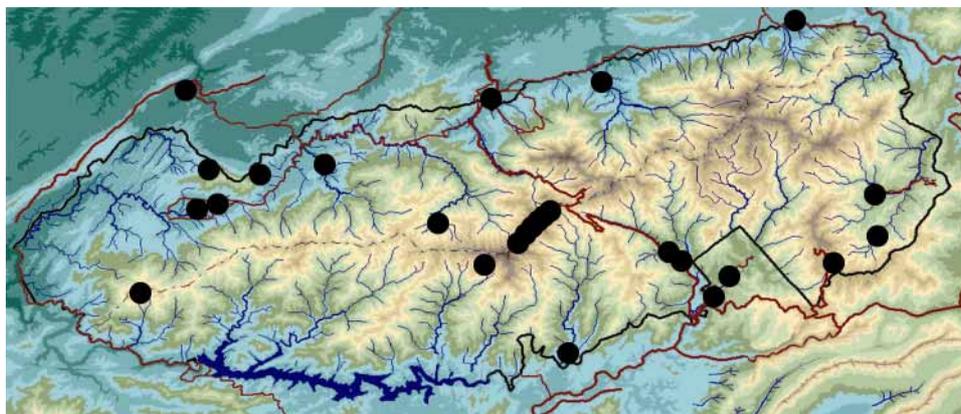
**Flight period:** Collected from April to October.

**Collected localities:** North Carolina: Haywood Co., Polls Gap Hemphill Bald Trail, Purchase Knob, Purchase Knob at house, Purchase Knob E of house field, Purchase Knob E of house forest, Purchase Knob N of house forest, Purchase Knob NE of house field, Purchase Knob nr. 1<sup>st</sup> gate, Purchase Knob on road in meadow, Purchase Knob 0.5 mi N of gate, Cataloochee NW of Palmer Chapel, Cataloochee just off paved road toward Cosby; Swain Co., Big Cove Road site b, Big Cove Road site c, Big Cove Road site p, Big Cove Road site w, 3 mi N Clingman's Dome, 5 mi N Clingman's Dome, 1.2 mi NE Clingman's Dome parking lot Noland Divide Trail, 3.3 mi NE Clingman's Dome parking lot Fork Ridge Trail, Deep Creek Ranger Station, Indian Gap Clingman's Dome Rd., 5.6 mi SW of Jct. 441 & Clingman's Dome Rd. Noland Divide Trail, Mt. Buckley, Oconaluftee River Smokemont Rd., Ravensford, Smokemont. Tennessee: Blount Co., Ace Gap Trailhead, Cades Cove, Campsite 6, Cades Cove near Ranger Station, Foothill Parkway West at Little River, Gregory Bald, Gregory Cave, Tremont; Cocke Co., Foothills Parkway, Foothills Parkway East, Foothills Parkway N at 1<sup>st</sup> overlook, Foothills Parkway N 4.5 mi from Hwy. 321; Sevier Co., Greenbrier Ranger Station, Jake's Creek Trail Campsite 27, 6 mi S Sugarlands Visitor Center. (101 specimens)

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

**General distribution:** This is an eastern North American species ranging from Nova Scotia to Manitoba across southern Canada and in the United States from Maine to northern Florida west to North and South Dakota, Nebraska, Kansas, and eastern Texas (Lafontaine 1998).

**Larval hosts:** *Xestia dolosa* is associated with rich deciduous forests; Rings et al. (1992) listed maple (*Acer* sp., Aceraceae) as a probable host.



MAP 43. Collecting localities of *Xestia dolosa*.

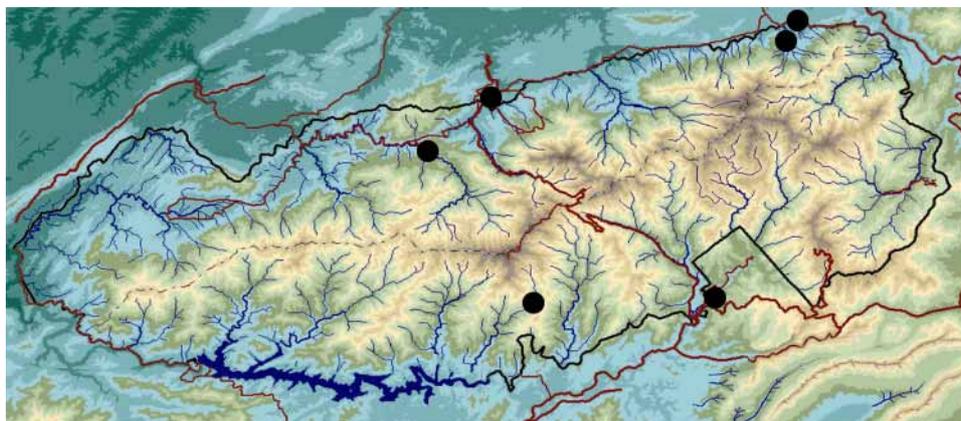
**27. *Xestia dilucida* (Morrison)**

(Figs. 68–69, Map 44)

**Identification:** Forewing length 17.0–22.0 mm. This species has dark reddish-gray forewing color with a contrasting dark reddish-brown thorax. Most specimens have the costal area from base to postmedial line pale gray. Orbicular spot is usually ground color barely outlined in dark reddish brown to black or can be faint to absent. Reniform spot is large and cream, with a few rufous scales and sometimes with a darker partial outline. Antemedial and postmedial lines are usually faint, but represented by black spots on the costa. Hindwing is dark gray with a pinkish cream fringe.

**Flight period:** Collected from September to early November.

**Collected localities:** North Carolina: Swain Co., Big Cove Road site b, Big Cove Road site p, Noland Creek. Tennessee: Cocke Co., Cosby campground area, Cosby Ranger Station, Foothills Parkway south overlook, Foothills Parkway 2<sup>nd</sup> overlook East; Sevier Co., Elkmont, Park Headquarters. (30 specimens)



MAP 44. Collecting localities of *Xestia dilucida*.

**Elevation range:** 1480–3540 ft. (451–1079 m)

**General distribution:** The range of *X. dilucida* extends from southern Maine to northern Florida, west to central Ohio, and eastern Texas (Lafontaine 1998).

**Larval hosts:** Larvae have been reared on blueberry (*Vaccinium* sp., Ericaceae) (Lafontaine 1998).

## 28. *Xestia elimata* (Guenée)

(Figs. 70–71, Map 45)

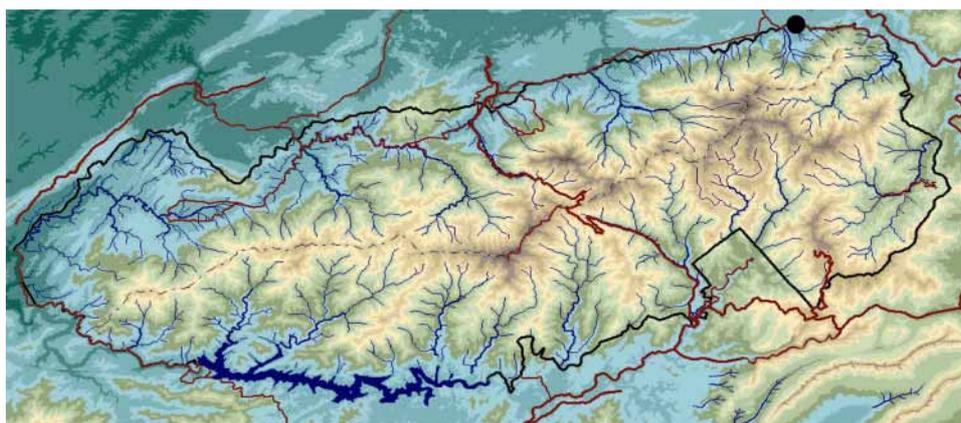
**Identification:** Forewing length 18.0–22.0 mm. The antennae are bipectinate in the male and filiform in the female. The forewing is pale gray with a whitish cast caused by white tips on some of the scales. Orbicular spot is large, elliptical, and white. Reniform spot is kidney-shaped and mostly white and centered with some ground colored scales. A black line runs along the CuA vein connecting the orbicular and reniform spots. Claviform spot is present, white, and bordered by black except proximally. Postmedial line is prominent with faint dark scallops that are bordered with faint white scales. Hindwing is dark gray with a slight tinge of pink on the fringe along the inner margin.

Flight period: Collected in mid–October.

**Collected localities:** Tennessee: Cocke Co., Foothills Parkway N 4.5 mi from Hwy. 321. (3 specimens)

**Elevation range:** 1680 ft. (512 m)

**General distribution:** This species ranges from southern Maine to the panhandle of Florida, west to southern Ohio, Kentucky, southern Missouri, western Louisiana, and east Texas (Lafontaine 1998). The collections from GSMNP are new records for the state of Tennessee.



MAP 45. Collecting localities of *Xestia elimata*

**Larval hosts:** Probably pine, but larval hosts have not been confirmed by collections (Lafontaine 1998).

**29. *Xestia praevia* Lafontaine**

(Figs. 72–75, Map 46)

**Identification:** Forewing length 17.0–21.0 mm. Forewing ground color is gray to reddish brown. Orbicular spot is large and ovate with white scales tinged with pale reddish brown. Reniform spot is large and concolorous with orbicular. There are two distinct forms of *X. praevia* present. The lightly marked form (Fig. 72) has a black line running along the M vein ventral to the orbicular and reniform spots. In the more heavily marked form (Figs. 73–75) this line becomes a band, and can expand dorsally in some specimens into a rectangular patch between the orbicular and reniform spots. The lightly marked form virtually lacks the postmedial, subterminal, and terminal lines. When present, the postmedial band is a black scalloped line with white shading distally. The subterminal area is reddish brown contrasting with the grayish brown scales that are tipped white in the terminal area.

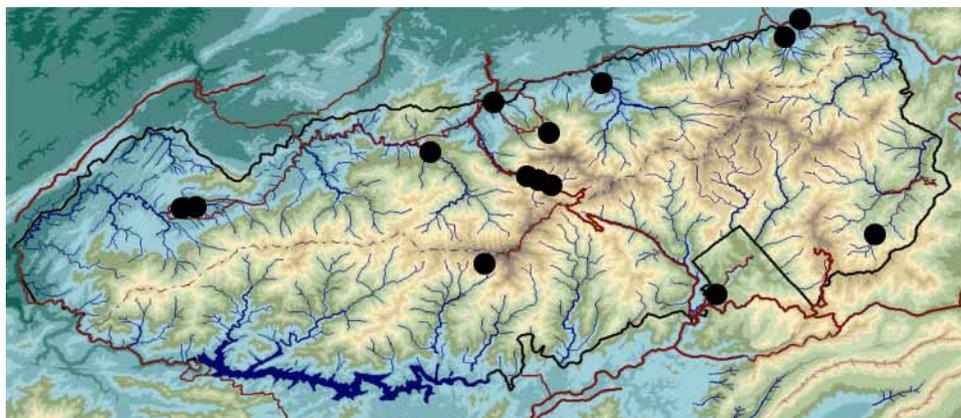
*Xestia praevia* belongs to the *elimata* species group, which contains five species: *X. elimata*, *X. badicollis* (Grote), *X. praevia*, *X. dilucida*, and *X. youngii* (Smith). Three of these, *X. dilucida*, *X. elimata*, and *X. praevia*, are known from the Park. There are no significant male or female genitalic differences between *X. elimata*, *X. badicollis*, and *X. praevia*. According to Lafontaine (1998), *X. praevia* flies from late June to mid-August, however, in the Park *X. praevia* flies from mid-July to early November. This extended flight period could possibly indicate a second fall brood. A series of *X. praevia* from different localities and flight periods were analyzed using mitochondrial DNA barcoding, by looking at short sequences of COI. The extremely limited genetic divergence suggests that these specimens are all one species (Hebert, personnel communication).

**Flight period:** Collected from mid-July to early November.

**Collected localities:** North Carolina: Haywood Co., Purchase Knob in trees on road; Swain Co., Clingman's Dome, Big Cove Road site b, Mt. Buckley. Tennessee: Blount Co., vicinity Cades Cove, Cades Cove near Ranger Station, Cades Cove ATBI house 2000 m SW, Cades Cove campground; Cocke Co., Cosby Ranger Station, Cosby ATBI house, Cosby campground area, Foothills Parkway East, Foothills Parkway south overlook, Foothills Parkway 2<sup>nd</sup> overlook East; Sevier Co., Greenbrier Ranger Station, Elkmont, Grotto Falls Trailhead, 5 mi S Sugarlands Visitor Center Chimney's picnic area, 6 mi S Sugarlands Visitor Center, 6.2 mi S Sugarlands Visitor Center Cove Hardwood Forest, Park Headquarters. (72 specimens)

**Elevation range:** 1480–6640 ft. (451–2024 m)

**General distribution:** This is a boreal species occurring across central and southern Canada from Nova Scotia to central, British Columbia. In the eastern United States it occurs from Maine to Massachusetts west to Michigan and Wisconsin. There is a disjunct population in the Appalachians from West Virginia to North Carolina (Lafontaine 1998). The collections from GSMNP are new records for the state of Tennessee.



MAP 46. Collecting localities of *Xestia praevia*.

**Larval hosts:** Larvae feed on a variety of Pinaceae including jack pine (*Pinus banksiana* Lamb., Pinaceae), lodgepole pine (*P. contorta* Dougl., Pinaceae), red pine (*P. resinosa* Ait., Pinaceae), white and black spruce (*Picea glauca* (Moench) Voss and *P. mariana* (Mill.) BSP., Pinaceae), balsam fir (*Abies balsamea* (L.) Mill., Pinaceae), and more rarely on tamarack (*Larix laricina* (DuRoi) K. Koch, Pinaceae), and hemlock (*Tsuga canadensis* (L.) Carr., Pinaceae) (Lafontaine 1998). In GSMNP this species is associated with red spruce (*Picea rubens* Sarg., Pinaceae) at the higher elevations and eastern white pine (*P. strobus* L., Pinaceae), pitch pine (*P. rigida* Mill., Pinaceae), and Virginia or scrub pine (*P. virginiana* Mill., Pinaceae) at elevations below 4,500 ft. (1372 m).

### 30. *Xestia normanianus* (Grote) Norman's Dart

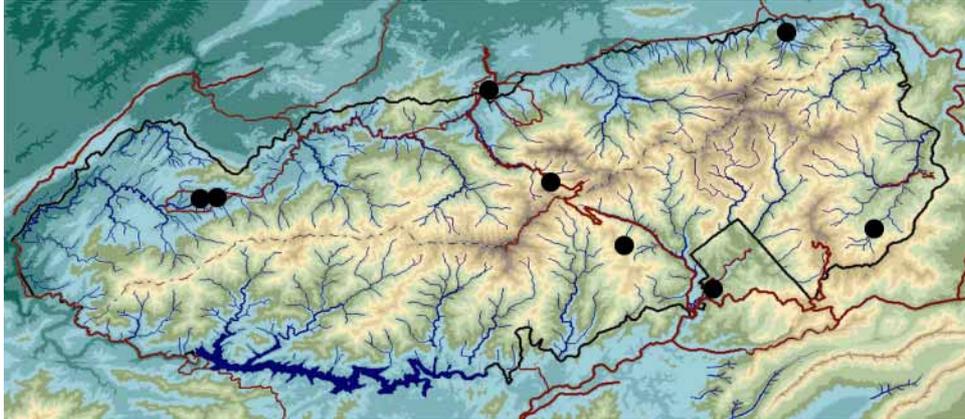
(Fig. 76, Map 47)

**Identification:** Forewing length 15.0–20.0 mm. *Xestia normanianus* is similar to *X. smithii* (Snellen), but has distinct triangular and quadrate black patches in the discal cell, which are absent in *X. smithii*. Forewing ground color is brown to reddish brown. Orbicular spot is concolorous with ground color and mixed with white scales and quadrilateral in shape. Reniform spot is concolorous with ground color and mixed with gray and rufous scales. Black patches in the discal cell consist of a triangular spot proximal to the orbicular spot and a quadrate spot between the orbicular and reniform spots. Antemedial and postmedial lines are thin, white, and bordered on both sides by rufous. There is a conspicuous black quadrate patch at apex of subterminal line on costa. Hindwing is dark gray, discal cell present, and fringe cream.

**Flight period:** Collected from mid-August to mid-October.

**Collected localities:** North Carolina: Haywood Co., Purchase Knob, Purchase Knob by Ferguson cabin, Purchase Knob in trees on road; Swain Co., Beetree Ridge, 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 campground; Cocke Co., Cosby ATBI house, Cosby campground area; Sevier Co., 6 mi S Sugarlands Visitor Center, 6.2 mi S Sugarlands Visitor Center Cove Hardwood Forest. (26 specimens)



MAP 47. Collecting localities of *Xestia normanianus*.

**Elevation range:** 1760–4924 ft. (579–1501 m)

**General distribution:** This species is found from Nova Scotia across southern and central Canada to Alberta. In the eastern United States it ranges from Maine to eastern Minnesota, and south along the Appalachians to western North Carolina (Lafontaine 1998). The collections from GSMNP are new records for the state of Tennessee.

**Larval hosts:** Hosts are mainly shrubs including blueberry (*Vaccinium* spp., Ericaceae), cherry (*Prunus avium* (L.) L., Rosaceae), raspberry (*Rubus* spp., Rosaceae), meadowsweet (*Spiraea* spp., Rosaceae), and sweet-fern (*Myrica* spp., Myricaceae) (Lafontaine 1998).

### 31. *Xestia perquiritata* (Morrison)

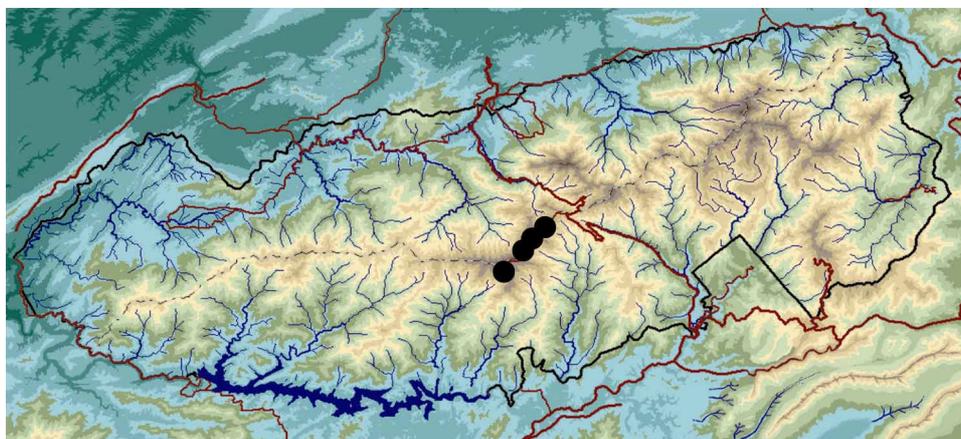
(Fig. 77, Map 48)

**Identification:** Forewing length 14.0–19.0 mm. This species is easily recognized by the contrasting black and white pattern. Orbicular spot is small and outlined in black. Reniform spot has a sharply angled distal margin and outlined in black. Antemedial is a black wavy line bordered by white patches proximally. Postmedial is a black wavy line bordered by white patches distally. Subterminal area has a series of black triangulate patches between veins. Terminal line is a series of small black triangular spots. Fringe is checked black and white.

**Flight period:** Collected from late July to early August.

**Collected localities:** North Carolina: Swain Co., Clingman's Dome, 1.2 mi NE

Clingman's Dome parking lot Noland Divide Trail, 3.3 mi NE Clingman's Dome parking lot Fork Ridge Trail, 5.6 mi SW of Jct. 441 & Clingman's Dome Rd. Noland Divide Trail. (16 specimens)



MAP 48. Collecting localities of *Xestia perquiritata*

**Elevation range:** 5780–6640 ft. (1762–2024 m)

**General distribution:** This is a boreal species occurring across North America from Newfoundland, Labrador, and northern New England west to central Yukon, British Columbia, and Washington. There are several disjunct populations, including GSMNP, the Rocky Mountains in Colorado, and a coastal bog in central Oregon. (Lafontaine 1998).

**Larval hosts:** Larvae are spruce-fir feeders reared on white and Englemann spruce (*Picea glauca* (Moench) Voss and *P. englemanni* Parry, Pinaceae) and balsam and subalpine fir (*Abies balsamea* (L.) Mill. and *A. lasiocarpa* (Hook.) Nutt., Pinaceae) (Lafontaine 1998).

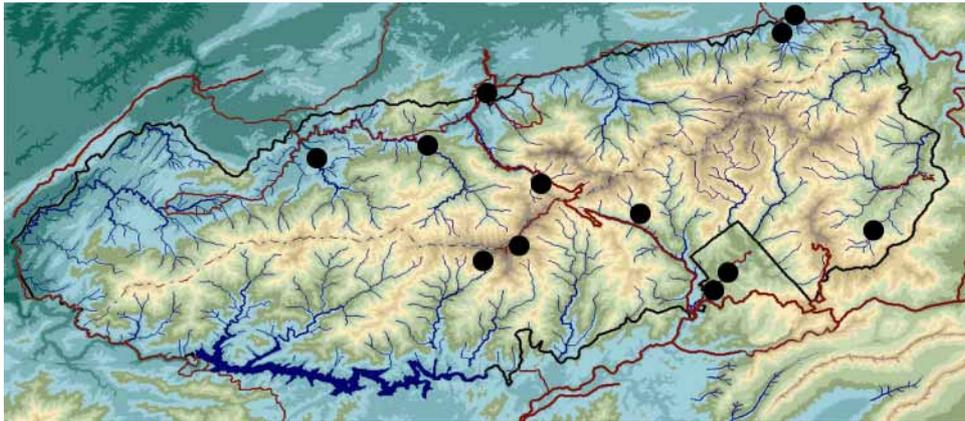
### 32. *Xestia smithii* (Snellen) Smith's Dart (Fig. 78, Map 49)

**Identification:** Forewing length 14.0–19.0 mm. *Xestia smithii* looks like an unmarked *X. normanianus*. Forewing ground color is brown with some dark rufous overtones. Orbicular spot is a lighter shade than ground color, with an ovate shape, and edged with dark reddish brown. Reniform spot is ground color shaded with dark gray, especially in the ventral half. Antemedial and postmedial lines are a lighter shade than ground color and faint. Two small black spots are present at apex of subterminal line on costa. Hindwing dark gray, discal spot faint, and fringe cream.

**Flight period:** Collected from late July to mid-October.

**Collected localities:** North Carolina: Haywood Co., Purchase Knob, 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, 8.3 mi NE of GSMNP entrance on Kephart Prong Trail, 8.3 mi NW of GSMNP entrance on Kephart Prong Trail Mt. Buckley, Ravensford, upper Noland Divide Trail ca. Clingman's Dome. Tennessee: Blount Co., Tremont; Cocke Co., Cosby ATBI house, Cosby campground area, Foothills Parkway East, Foothills Parkway 2<sup>nd</sup> overlook East; Sevier Co., Elkmont, 5 mi S Sugarlands Visitor Center Chimney's picnic area, 6 mi S Sugarlands Visitor Center. (34 specimens)



MAP 49. Collecting localities of *Xestia smithii*.

**Elevation range:** 1360–6560 ft. (415–1999 m)

**General distribution:** This species is widespread across northern North America from Newfoundland to Alaska. In the eastern United States it occurs from Maine to Virginia and south along the Appalachians to North Carolina. In the west it is found in the Black Hills in western South Dakota and northeastern Wyoming, in the Rocky Mountains from Montana to New Mexico, southeastern Arizona, and from Washington to east central California (Lafontaine 1998). The collections from GSMNP are new records for the state of Tennessee.

**Larval hosts:** Larvae feed on a variety of herbaceous and woody plants including strawberry (*Fragaria virginiana* Duchesne), raspberry (*Rubus idaeus*, Rosaceae), apple (*Malus* sp., Rosaceae), alder (*Alnus* sp., Betulaceae), common elderberry (*Sambucus nigra* L. ssp. *canadensis* (L.) R. Bolli, Caprifoliaceae), and violets (*Viola* sp., Violaceae) (Crumb 1956, McCabe 1991). Larvae have been known to cause serious damage to strawberry crops in Washington (Crumb 1956).

## Discussion

The Noctuidae of Great Smoky Mountains National Park are distributed throughout the Park (Map 1) and range in elevation from 1,000 to over 6,600 feet (304.8–2,012 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)) result in the low zone being the most species-rich with 34 species; the high zone had 33 species; and the medium zone had 28 species. The number of localities from the high altitude zone was 43; the medium zone had 29; and the lower elevation zone had 36. The most intensively collected general localities are Big Cove Road (183 specimens), Foothills Parkway (183 specimens), and Purchase Knob (141 specimens). These areas were also the most species-rich with 29 species recorded from Big Cove Road, 24 from Foothills Parkway, and 28 from Purchase Knob. These data indicated that species richness was greater at lower than at high elevations, and that species richness increased with collection effort. More collection effort at the medium elevation zone probably would increase the documented species richness there.

The most widely distributed species was *Xestia dolosa* (Map 41), documented from 25 localities; the following species each were documented from 14 localities: *Agrotis ipsilon* (Map 3), *Diarsia jucunda* (Map 29), and *Xestia praevia* (Map 44). *Diarsia jucunda* was the most abundant species with 130 specimens, and *X. dolosa* was second with 101 specimens.

In the eastern United States the Noctuidae are more species-rich in the northern climates, and as one progresses southward species richness declines. Great Smoky Mountains National Park has 48 species of Noctuidae, which is a relatively rich fauna when compared with North Carolina (45 species) and Tennessee (27 species). The species count for North Carolina increased by two and that for Tennessee by 12. The high species richness of GSMNP can be attributed to the high altitudes in the Park, which relate to the higher latitudes of the northern states, but also can be attributed to the intensive collecting conducted during the ATBI. The most species rich states in the East are Maine (89), New York (80), New Hampshire (72), Ohio (63) (Rings, et al. 1992), Pennsylvania and New Jersey (52), Maryland (46), Kentucky (45) (Covell 1999), Virginia and Florida (Kimball 1965) (26), and South Carolina (18). In contrast, the Noctuidae reach their greatest species richness in the West in Colorado (186), California (173), and Arizona (139).

### Acknowledgements

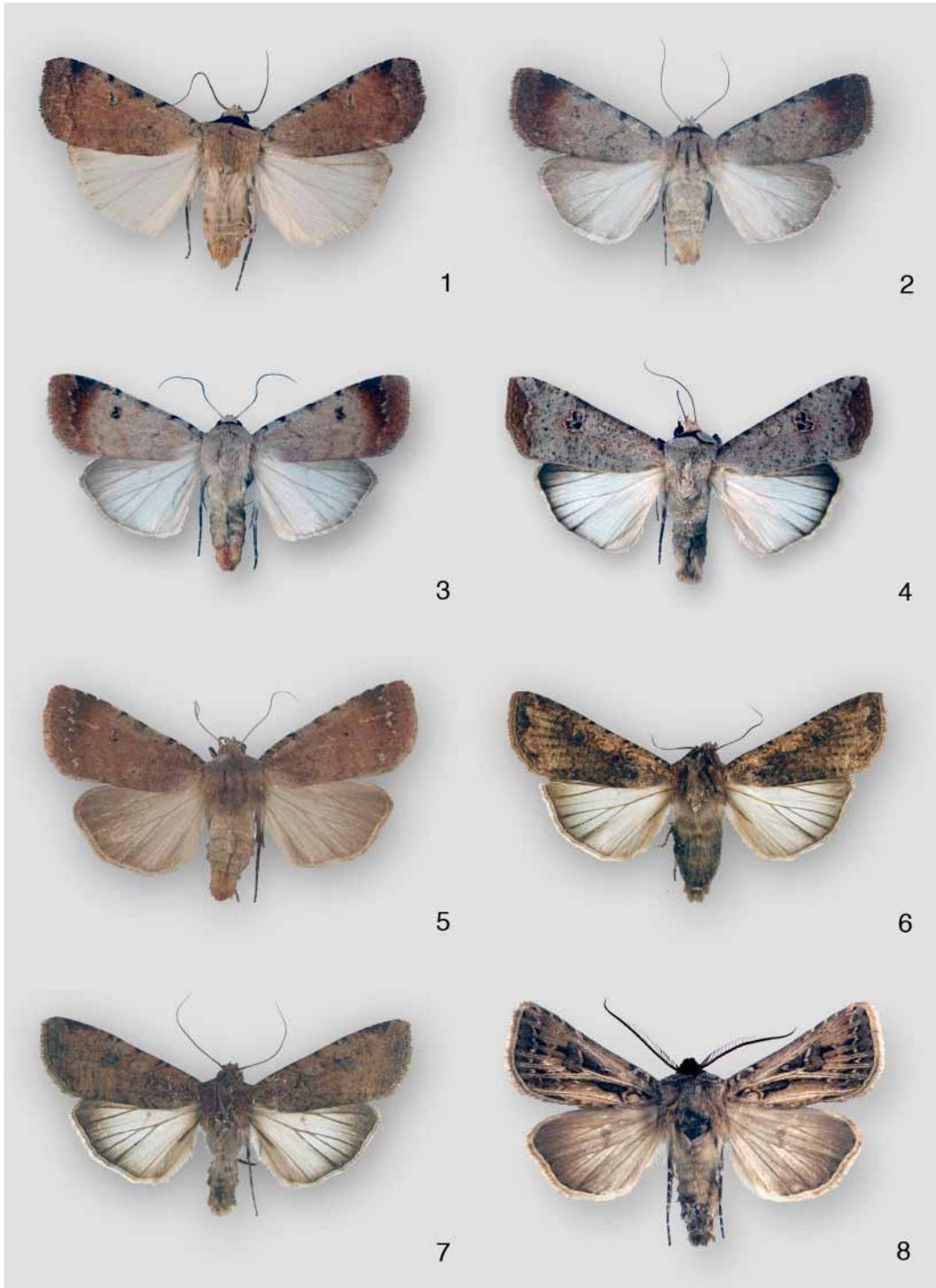
Discover Life in America (DLIA) provided partial funding for this project in 2003 and 2004. I thank Jeanie Hilten of DLIA for providing logistic support during my stays in GSMNP and Keith Langdon of the National Park Service for providing collecting permits. Thanks are extended to David L. Wagner, University of Connecticut, Storrs, CT and Brian Scholtens, College of Charleston, Charleston, SC for organizing and inviting me to participate in the Lepidoptera BioBlitzes held during 2000, 2002, and 2004. Many thanks to Brian Scholtens for critically reviewing the manuscript and for providing me with a database of specimens housed in the GSMNP collection and from other collectors associated with the BioBlitzes. I thank David Adamski, Systematic Entomology

Laboratory, U.S.D.A., Washington, DC, for preparing the maps and figures. For critically reviewing a draft of this paper, I thank J. Donald Lafontaine, Agriculture and Agri-Food Canada, Ottawa, Ontario; Thomas J. Henry and Sonja J. Scheffer of the Systematic Entomology Laboratory, U.S.D.A., Washington, DC., Eric Metzler, Alamogordo, NM.

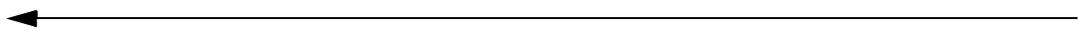
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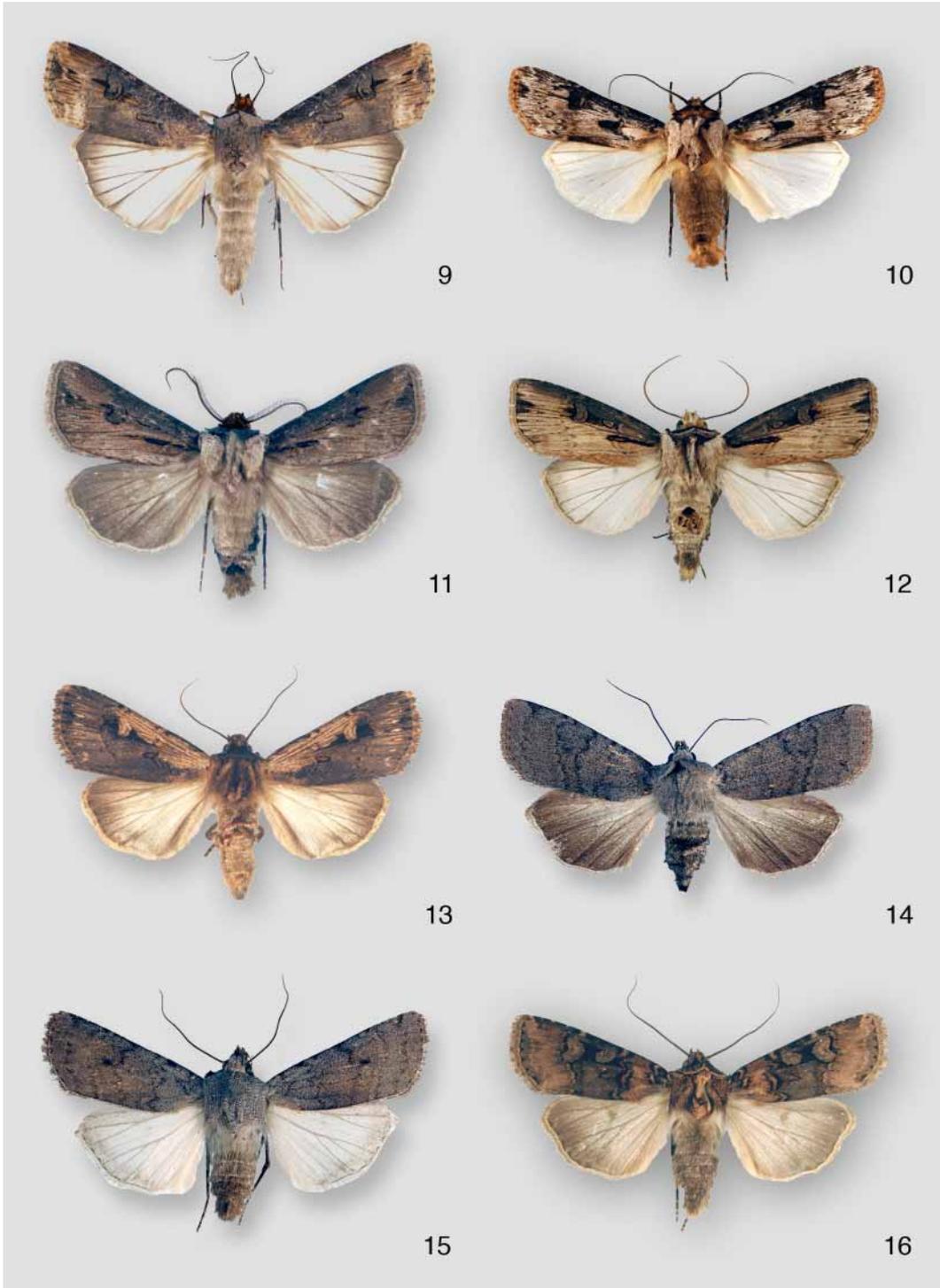
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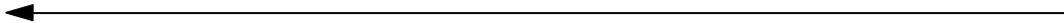


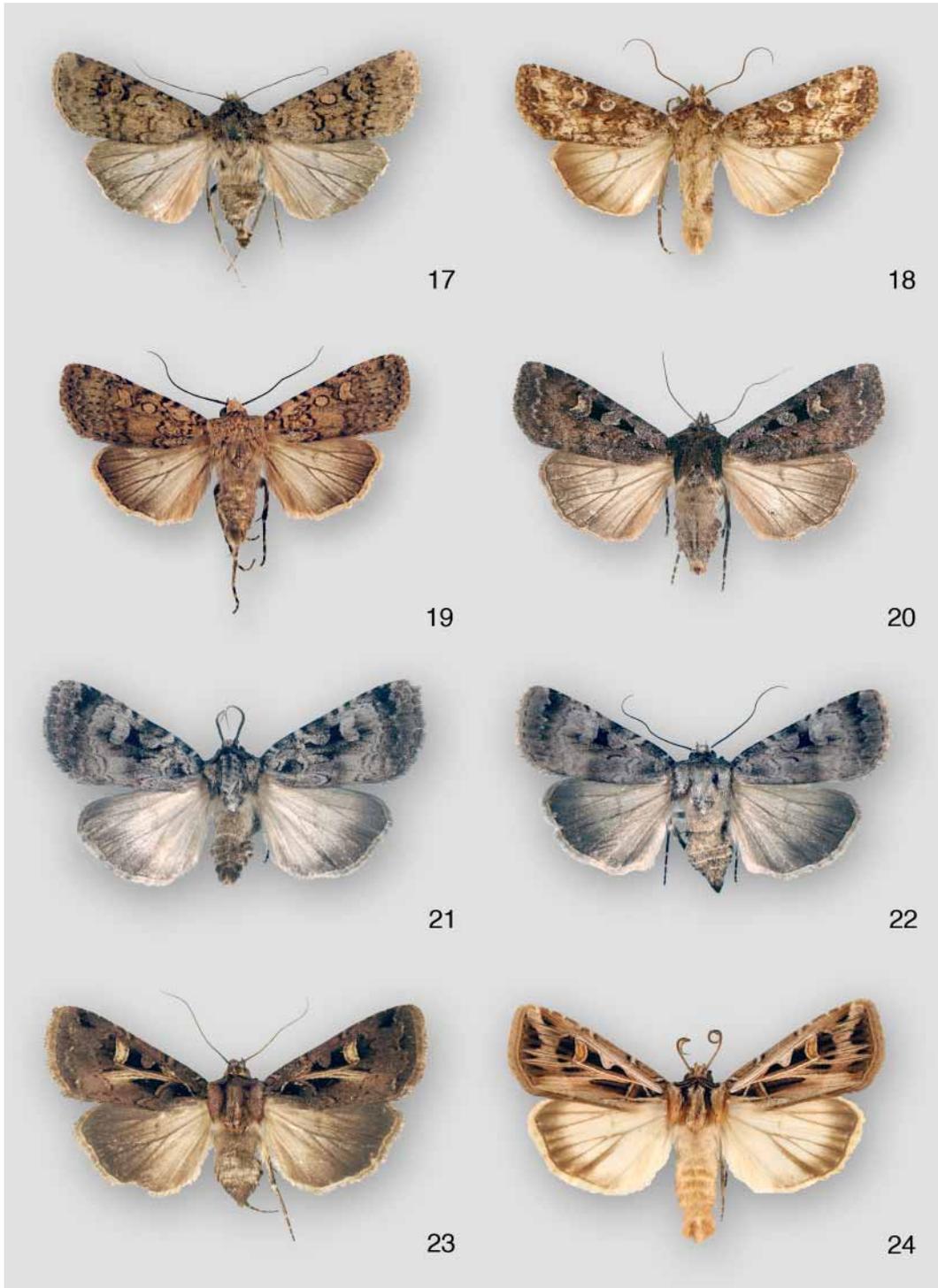
**FIGURES 1–8.** Adults. 1, *Anicla forbesi*, m, Michigan, Otsego Co., T 29 N, R 2 W, Sec. 18, 25 June 1964, M.C. Nelsen; 2, *Anicla illapsa*, f, Maryland, Montgomery Co., Colesville, 17 July 1978, D.C. Ferguson; 3, *Anicla illapsa*, f, New York, Brooklyn, 12 Aug. 1901; 4, *Anicla infecta*, f, North Carolina, Haywood Co., Purchase Knob, NE of house in field, GSMNP, 4925 ft., 31 July 2003, M.G. Pogue, USNMENT00156816; 5, *Anicla lubricans*, m, South Carolina, Charleston Co., McClellanville, Wedge Plantation, 3 Aug. 1968, D.C. Ferguson; 6, *Peridroma saucia*, m, Tennessee, Cocke Co., Cosby campground vic. at trailhead, GSMNP, 2315 ft., 22 June 2001, D.R. Davis, USNMENT00153532; 7, *Peridroma saucia*, m, North Carolina, Haywood Co., Purchase Knob, E of house, field, GSMNP, 4914 ft., 1 Aug. 2003, M.G. Pogue, USNMENT 00218727; 8, *Agrotis gladiaria*, m, Tennessee, Blount Co., Tremont, GSMNP, 1360 ft., 15 Oct. 2000, J.W. Brown, USNMENT 00153477.





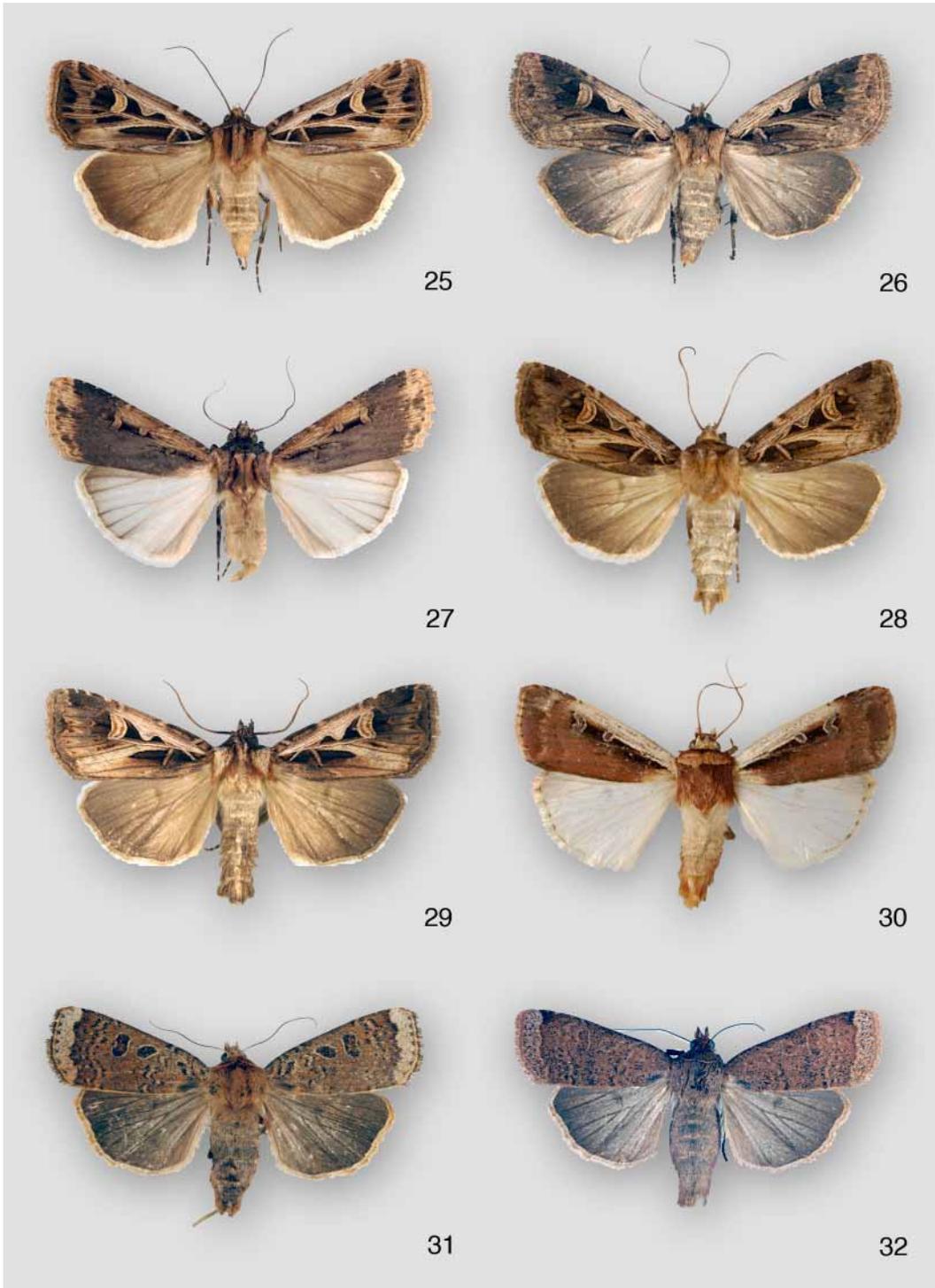
**FIGURES 9–16.** Adults. 9, *Agrotis ipsilon*, f, North Carolina, Haywood Co., Purchase Knob, NE of house in field, GSNMP, 4925 ft., 31 July 2003, M.G. Pogue, USNMENT 00156836; 10, *Agrotis malefida*, m, Bermuda, Smith's Parrish, Spittal Pond Nature Reserve, 13 Mar. 1988, D.C. Ferguson; 11, *Agrotis venerabilis*, m, Tennessee, Blount Co., Tremont, 1360 ft., 15 Oct. 2000, J.W. Brown, USNMENT 00153469; 12, *Agrotis volubilis*, m, Nova Scotia, Halifax, Boulderwood, 7 June 1959, D.C. Ferguson; 13, *Dichagyris acclivis*, m, Maryland, Montgomery Co., Colesville, 17 Aug. 1984, D.C. Ferguson; 14, *Euxoa bostoniensis*, f, New Jersey, Lakehurst, 21 Sep. 1930, F. Lemmer; 15, *Euxoa bostoniensis*, m, New York, [no specific locality], 25 Sep. 1900, A.C. Weeks; 16, *Euxoa campestris*, m, North Carolina, Jackson-Haywood Co. line, Richland, Balsam Mt., 6000 ft., 30 June 1967, D.C. Ferguson.



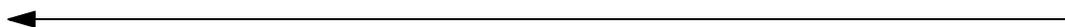


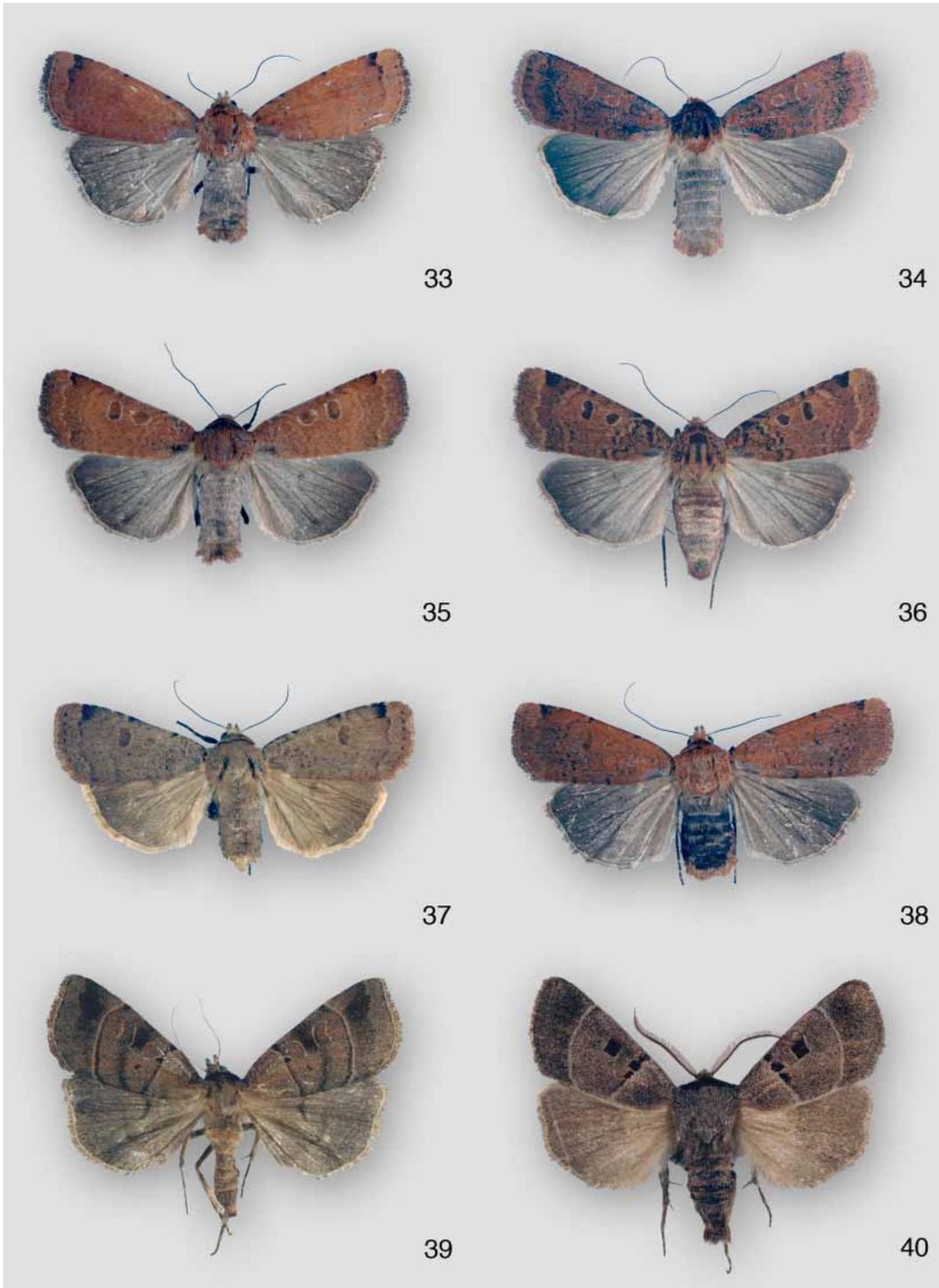
**FIGURES 17–24.** Adults. 17, *Euxoa messoria*, f, Nova Scotia, Halifax, 7 Sep. 1957, D.C. Ferguson; 18, *Euxoa pleuritica*, m, Manitoba, Cartwright; 19, *Euxoa scholastica*, m, North Carolina, Jackson Co., Balsam, 3200 ft., 21 June 1974, D.C. Ferguson; 20, *Euxoa tessellata*, f, Connecticut, New Haven Co., Hamden, July 1968, D.C. Ferguson; 21, *Feltia geniculata*, m, Tennessee, Cocke Co., Cosby ATBI house, GSMNP, 2520 ft., 20–21 Sep. 2000, D.R. Davis, USNMENT 00153542; 22, *Feltia geniculata*, f, Tennessee, Cocke Co., Foothills Parkway, 2<sup>nd</sup> overlook East, GSMNP, 1800 ft. 21 Sep. 2000, D.R. Davis, USNMENT 00153541; 23, *Feltia herilis*, f, Tennessee, Cocke Co., Cosby ATBI house, GSMNP, 2520 ft., 20–21 Sep. 2000, D.R. Davis, USNMENT 00153515; 24, *Feltia jaculifera*, m, New York, Catskill Mountain, Big Indian Valley, 14 July 1909.





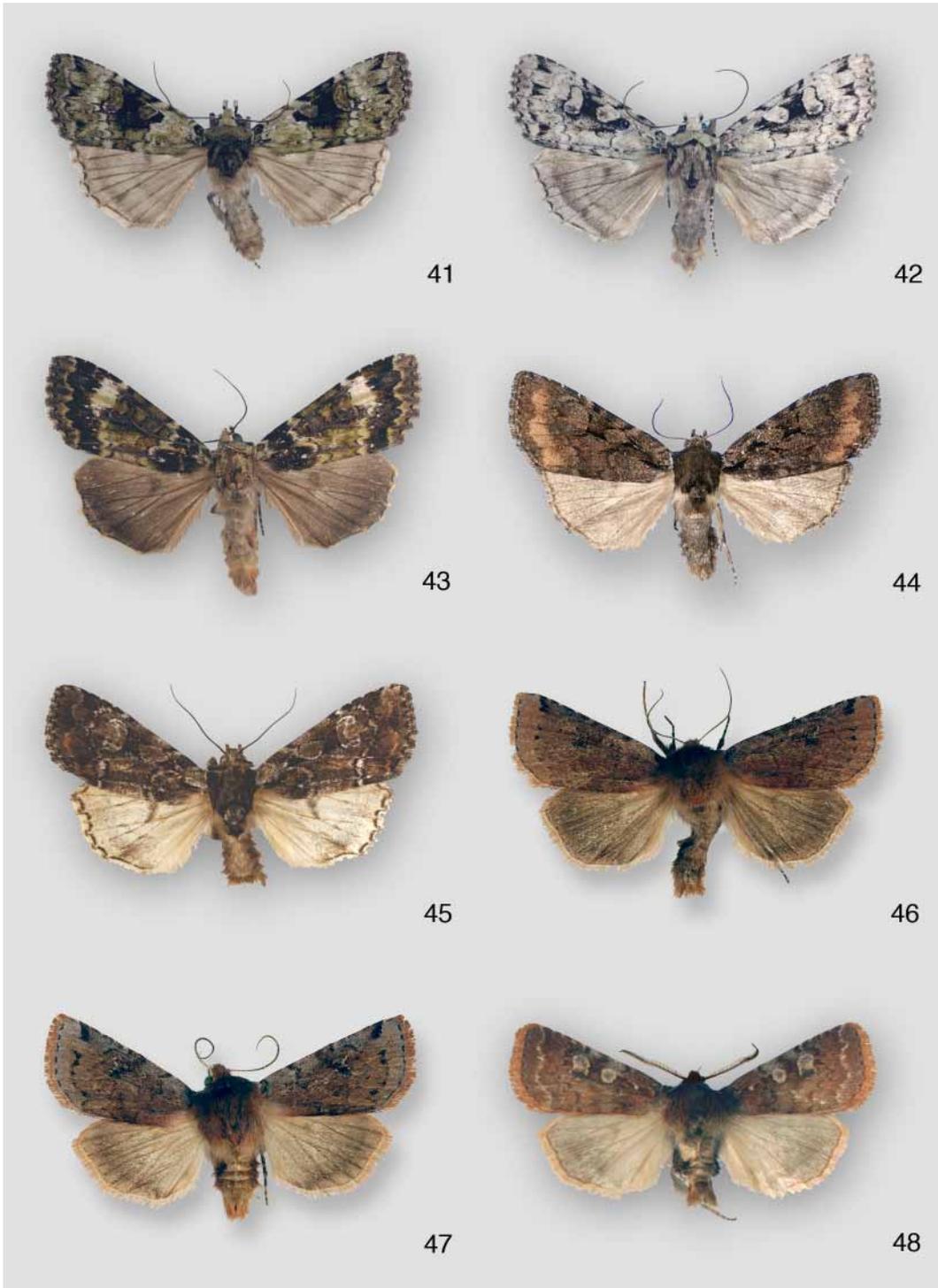
**FIGURES 25–32.** Adults. 25, *Feltia jaculifera*, f, Maryland, Prince George's Co., Adelphi, 22 Sep. 1973, D.C. Ferguson; 26, *Feltia subgothica*, f, Tennessee, Blount Co., Tremont Environmental Center, GSMNP, 1360 ft., 17–19 Sep. 2000, D.R. Davis, USNMENT 00153499; 27, *Feltia subterranea*, m, Virginia, Arlington Co., Arlington, 30 Aug. 1949, J.G. Franclemont; 28, *Feltia tricosa*, m, Kentucky, Oldham Co., Horner Bird Sanctuary, 19 June 1977, C.V. Covell, Jr., 29, *Feltia tricosa*, m, Maryland, Anne Arundel Co., Southaven, 12 Sep. 1986, H.G. Stevenson; 30, *Ochropleura implecta*, m, North Carolina, Swain Co., 3.3 mi NE Clingman's Dome parking lot, on Fork Ridge Trail, GSMNP, 5780 ft., 29 July 2003, M.G. Pogue, USNMENT 00156609; 31, *Abagrotis alternata*, m, Tennessee, Sevier Co., Greenbrier, near Ranger Station, GSMNP, 1700 ft., 20 Sep. 2001, J.W. Brown, USNMENT 00153726; 32, *Abagrotis anchocelioides*, Ohio, Franklin Co., Columbus.





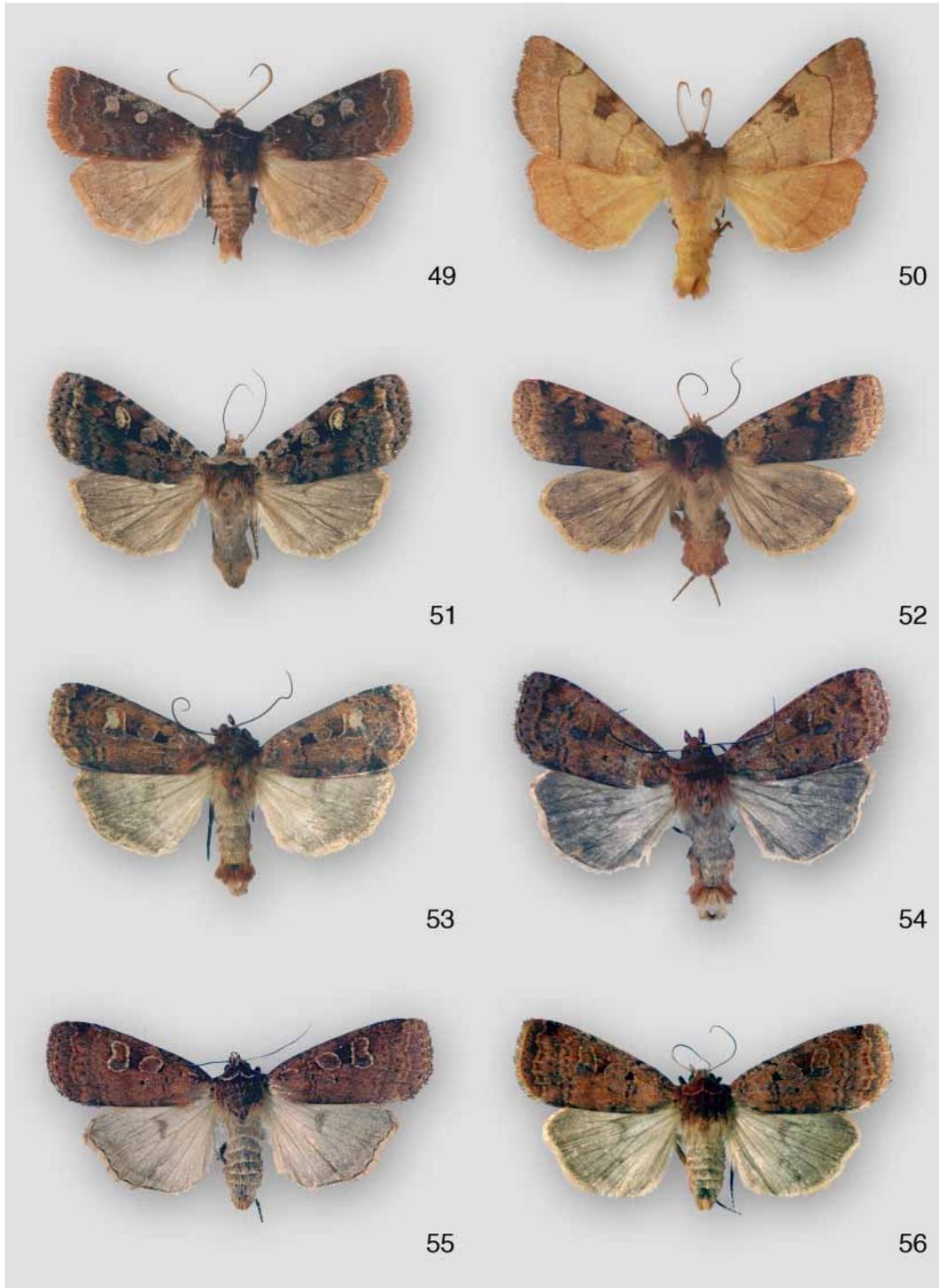
**FIGURES 33–40.** Adults. 33, *Abagrotis brunneipennis*, f, Pennsylvania, Northampton Co., Bethlehem, 11 Aug.; 34, *Abagrotis brunneipennis*, f, Nova Scotia, Sable Island, 11–13 Aug. 1978, D.C. Ferguson; 35, *Abagrotis cupida*, f, New Jersey, Ocean Co., Lakehurst, 10 July 1921, T.D. Mayfield; 36, *Abagrotis cupida*, m, Nova Scotia, Halifax Co., Armdale, 5 Aug. 1955, D.C. Ferguson; 37, *Abagrotis cupida*, m, Ohio, Erie Co., Sandusky, 27 June 1932; 38, *Abagrotis magnicupida*, f, Tennessee, Cocke Co., Foothills Parkway, 2<sup>nd</sup> overlook East, GSNMP, 1800 ft., 21 Sep. 2000, D.R. Davis, USNMENT 00153740; 39, *Agnorisma badinodis*, f, North Carolina, Haywood Co., 1mi SE Purchase house, off Purchase Road, GSNMP, 4630 ft., 10 Oct. 2003, M.G. Pogue, USNMENT 00219679; 40, *Agnorisma bolli*, m, Ohio, Greene Co., Wright-Patterson Air Force Base, Huffman Prairie, site G-6, 26 Sep. 1992, E.H. Metzler.



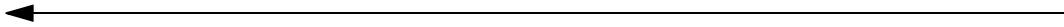


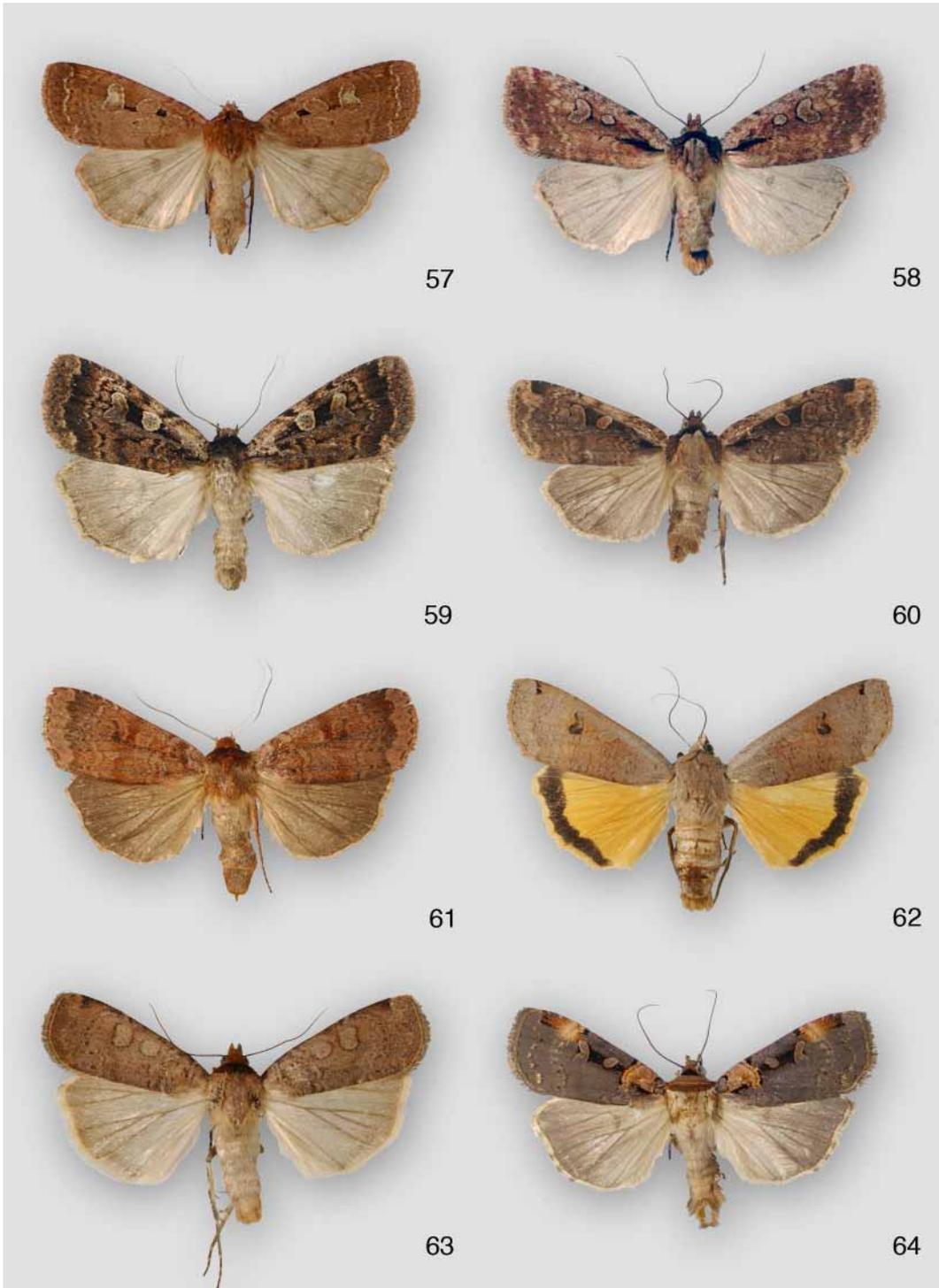
**FIGURES 41–48.** Adults. 41, *Anaplectoides brunneomedia*, m, North Carolina, Haywood Co., Polls Gap, Rough Fork Trail, GSMNP, 5188 ft., 28 June 2004, M.G. Pogue, USNMENT 00221226; 42, *Anaplectoides brunneomedia*, m, North Carolina, Haywood Co., Balsam Mountain Picnic area, on Flat Creek Trail, GSMNP, 5358 ft., 28 June 2004, M.G. Pogue, USNMENT 00221041; 43, *Anaplectoides prasina*, m, North Carolina, Haywood Co., Balsam Mountain picnic area, on Flat Creek Trail, GSMNP, 5265 ft., 28 June 2004, M.G. Pogue, USNMENT 00221052; 44, *Aplectoides condita*, m, Tennessee, Blount Co., 0.2 mi NE Parson Bald on Wolf Ridge Trail, 4700 ft., 28 May 2003, M.G. Pogue, USNMENT 00219302; 45, *Aplectoides condita*, m, North Carolina, Swain Co., 13.5 mi NE GSNMP entrance on 441, Thomas Divide trail, GSNMP, 4634 ft., 8 June 2003, M.G. Pogue, USNMENT 00155719; 46, *Cerastis fishii*, f, North Carolina, Craven Co., North Harlowe, 6 Mar. 1991, J.B. Sullivan; 47, *Cerastis fishii*, m, North Carolina, Craven Co., North Harlowe, 22 Feb. 1991, J.B. Sullivan; 48, *Cerastis tenebrifera*, m, New York, Tompkins Co., Golf Course Woods, Forest Home, Ithaca, 23 Apr. 1961, D.C. Ferguson.





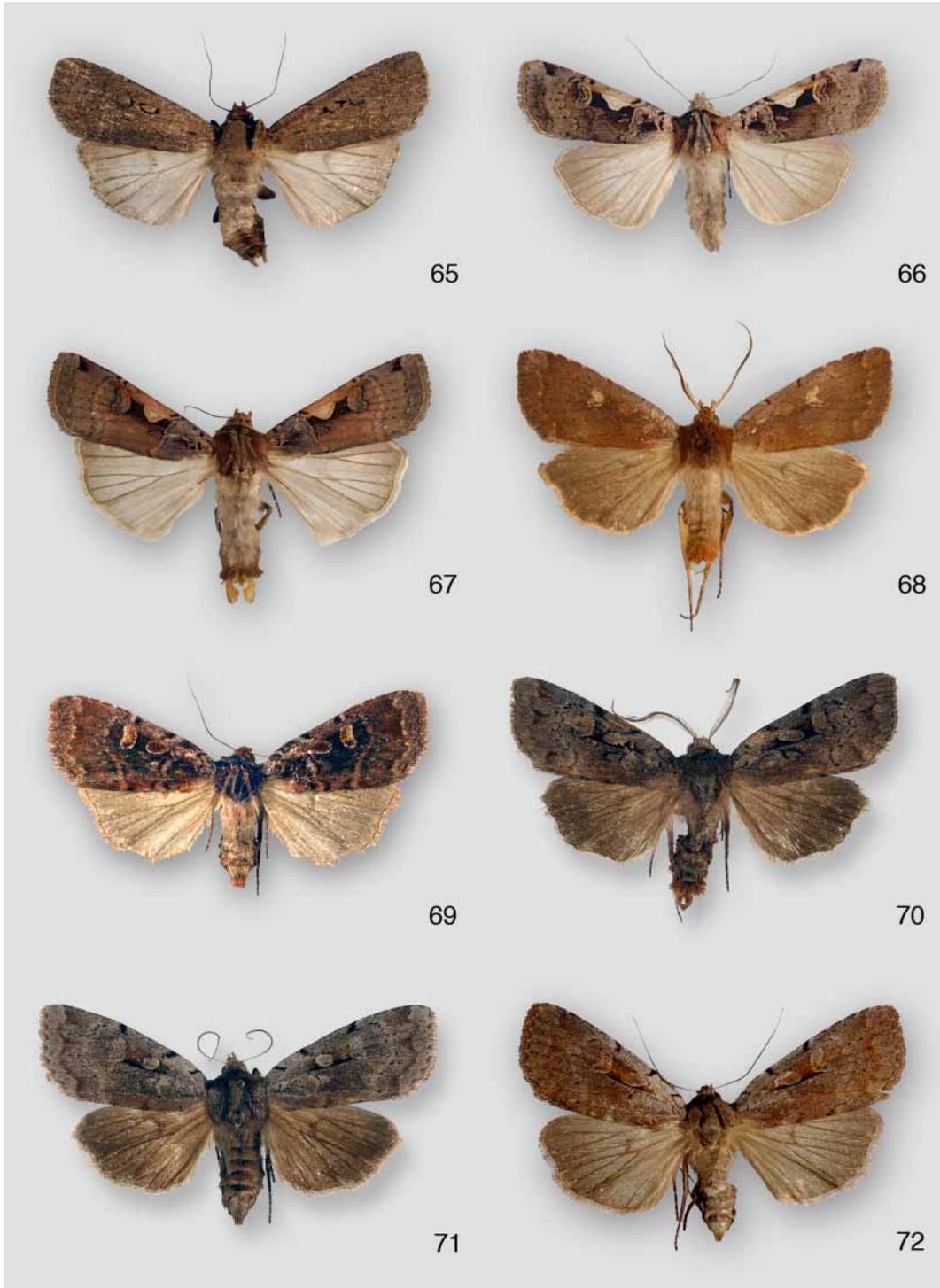
**FIGURES 49–56.** Adults. 49, *Cerastis tenebrifera*, m, Maryland, Montgomery Co., Sycamore Landing, Seneca, 1 Apr. 1978, D.C. Ferguson; 50, *Choephora fungorum*, m, North Carolina, Haywood Co., 1 mi SE Purchase house, off Purchase Road, GSMNP, 4630 ft., 11 Oct. 2003, M.G. Pogue, USNMENT 00219700; 51, *Diarsia jucunda*, f, North Carolina, Swain Co., 1.2 mi NE Clingman's Dome parking lot, Noland Divide trail, GSMNP, 6000 ft., 30 July 2003, M.G. Pogue, USNMENT 00156723; 52, *Diarsia jucunda*, m, Tennessee, Sevier Co., Jake's Creek trail nr. Campsite 27, GSMNP, 3590 ft., 22 July 2004, M.G. Pogue, USNMENT 00221792; 53, *Diarsia jucunda*, m, North Carolina, Haywood Co., Purchase Knob, N of house, GSMNP, 4998 ft., 1 Aug. 2003, M.G. Pogue, USNMENT 00218650; 54, *Diarsia jucunda*, m, Tennessee, Sevier Co., 6 mi S Sugarlands Visitor Center, 3320 ft., GSMNP, 24 June 2001, D.R. Davis, USNMENT 00153536; 55, *Diarsia rubifera*, f, Nova Scotia, Halifax, Williams' Lake, Powell's Cove Rd., 13 Aug. 1959, D.C. Ferguson; 56, *Diarsia rubifera*, f, Nova Scotia, Queens Co., Lake Kajimukujik, 6 Aug. 1961, D.C. Ferguson.





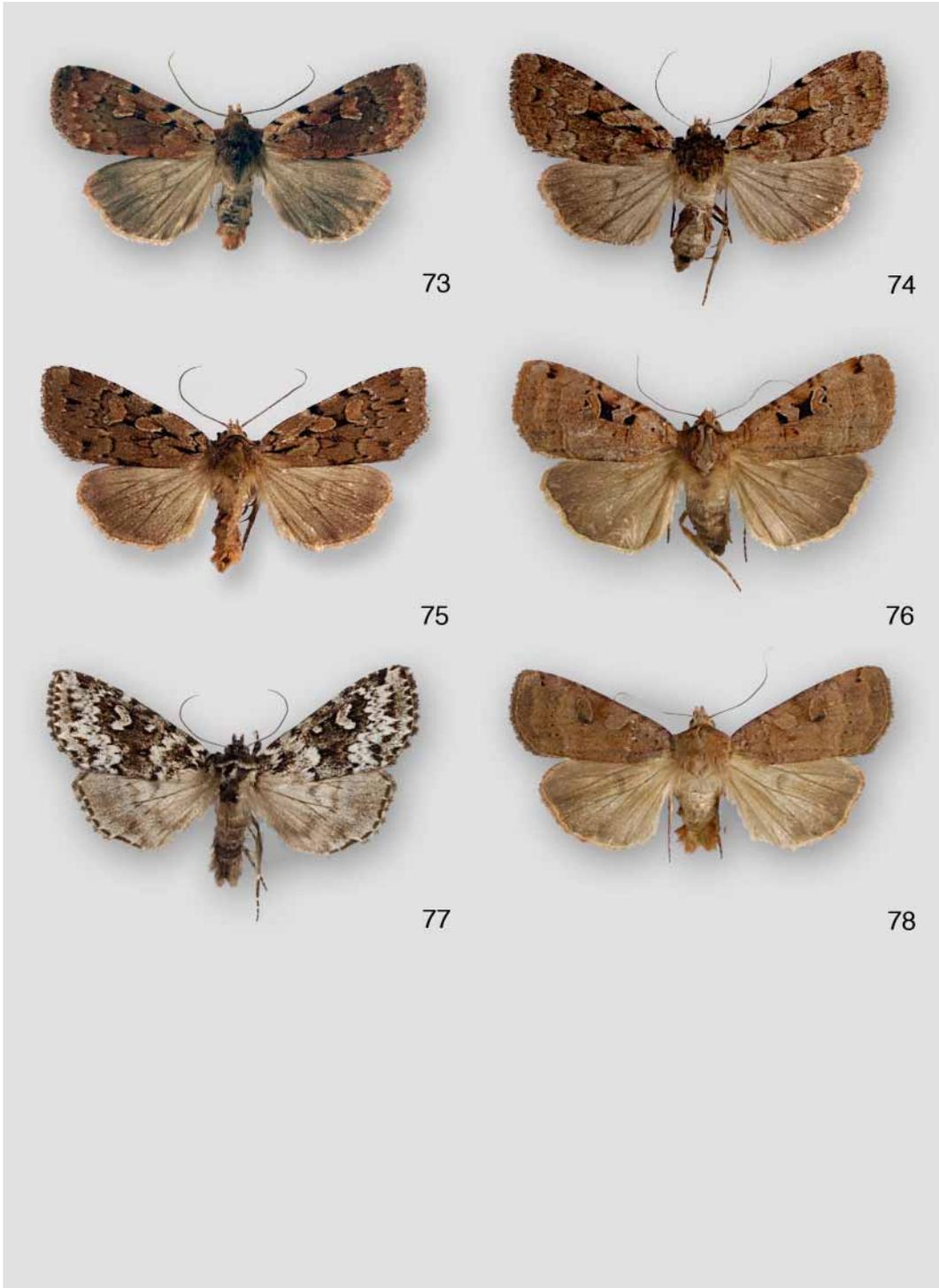
**FIGURES 57–64.** Adults. 57, *Diarsia rubifera*, f, Nova Scotia, Queens Co., Lake Kajimukujik, 9 Aug. 1961, D.C. Ferguson; 58, *Eueretagrotis attentus*, m, Nova Scotia, Halifax Co., West Dover, 18 July 1968, D.C. Ferguson; 59, *Eueretagrotis perattentus*, m, North Carolina, Swain Co., 1 rd. mi N Clingman's Dome, GSMNP, 5960 ft., 10 June 2002, Powell & Rubinoff, USNMENT 00153995; 60, *Eueretagrotis sigmoides*, m, Tennessee, Sevier Co., 6 mi S Sugarlands Visitor Center, 3320 ft., GSMNP, 24 June 2001, D.R. Davis, USNMENT 00153717; 61, *Lycophotia phyllophora*, f, North Carolina, Haywood Co., Purchase Knob, N of house, GSMNP, 4998 ft., 1 Aug. 2003, M.G. Pogue, USNMENT 00218665; 62, *Noctua pronuba*, m, North Carolina, Haywood Co, Purchase Knob, NE of house, field, 4925 ft., GSMNP, 31 July 2003, M.G. Pogue, USNMENT 00156838; 63, *Protolampra brunneicollis*, m, North Carolina, Haywood Co, Purchase Knob, NE of house, field, 4925 ft., GSMNP, 2 Aug. 2003, M.G. Pogue, USNMENT 00218834; 64, *Pseudohermonassa bicarnea*, m, North Carolina, Swain Co., 3.3 mi NE Clingman's Dome parking lot, Fork Ridge Trail, GSMNP, 5780 ft., 29 July 2003, M.G. Pogue, USNMENT 00156794.





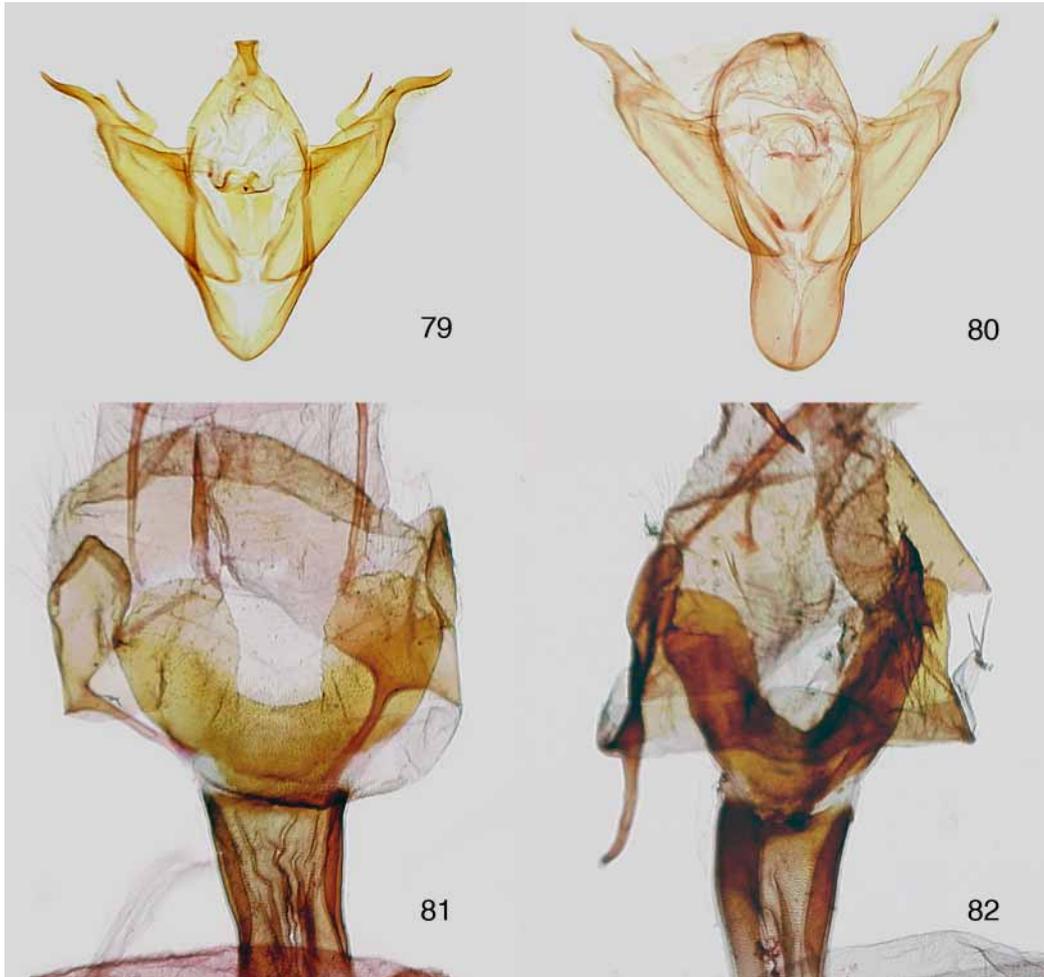
**FIGURES 65–72.** Adults. 65, *Spaelotis clandestina*, m, North Carolina, Haywood Co., 1 mi SE Purchase House, off Purchase Road, GSMNP, 4630 ft., 10 Oct. 2003, M.G. Pogue, USNMENT 00219681; 66, *Xestia c-nigrum*, m, Alaska, Matamuska, 8 June 1945, J.C. Chamberlain; 67, *Xestia dolosa*, m, Tennessee, Blount Co., Gregory Bald trail, E of campsite 13, GSMNP, 4680 ft., 26 May 2003, M.G. Pogue, USNMENT 00155094; 68, *Xestia dilucida*, m, Tennessee, Cocke Co., Foothills Parkway, 2<sup>nd</sup> overlook East, GSMNP, 1800 ft., 21 Sep. 2000, D.R. Davis, USNMENT 00153625; 69, *Xestia dilucida*, f, Tennessee, Cocke Co., Foothills Parkway, GSMNP, 2020 ft., 16 Oct. 2000, J.W. Brown, USNMENT 00219557; 70, *Xestia elimata*, m, North Carolina, Carteret Co., Jct. State Hwy. 101 & 181, 19 Oct. 1973, J.B. Sullivan; 71, *Xestia elimata*, f, North Carolina, Carteret Co., Jct. State Hwy. 101 & 181, 23 Oct. 1973, J.B. Sullivan; 72, *Xestia praevia*, f, Tennessee, Cocke Co., Foothills Parkway, 2<sup>nd</sup> overlook East, GSMNP, 1800 ft., 21 Sep. 2000, D.R. Davis, USNMENT 00153579.





**FIGURES 73–78.** Adults. 73, *Xestia praevia*, m, Tennessee, Sevier Co., 6 mi S of Sugarlands Visitor Center, GSMNP, 3320 ft., 21 Aug. 2000, D.R. Davis, USNMENT 00153605; 74, *Xestia praevia*, m, Tennessee, Sevier Co., 5 mi S of Sugarlands Visitor Center, GSMNP, 2720 ft., 21 Aug. 2000, D.R. Davis, USNMENT 00153607; 75, *Xestia praevia*, m, North Carolina, Swain Co., nr. Clingman's Dome, GSMNP, 6300 ft., 6 Aug. 1986, D.C. Ferguson, USNMENT 00254423; 76, *Xestia normanianus*, f, Tennessee, Sevier Co., 6 mi S Sugarlands Visitor Center, GSMNP, 3320 ft., 21 Aug. 2001, D.R. Davis, USNMENT 00153571; 77, *Xestia perquiritata*, m, North Carolina, Swain Co., 1.2 mi NE Clingman's Dome parking lot, Noland Divide trail, GSMNP, 6000 ft., 30 July 2003, M.G. Pogue, USNMENT 00156662; 78, *Xestia smithii*, m, Tennessee, Sevier Co., 6 mi S Sugarlands Visitor Center, GSMNP, 3320 ft., 21 Aug. 2001, D.R. Davis, USNMENT 00153564





**FIGURES 79–82.** Genitalia. 79, *Abagrotis cupida*, m, New York, genitalia slide USNM 46289; 80, *Abagrotis magnicupida*, m, Maryland, Montgomery Co., Colesville, 17 July 1975, D.C. Ferguson, genitalia slide USNM 46279; 81, *Xestia c-nigrum*, f, Utah, Utah Co., Provo, 17 Aug. 1908, T. Spalding, genitalia slide USNM 49706; 82, *Xestia dolosa*, f, Tennessee, Sevier Co., Greenbrier Ranger Station, 20 May 2001, J. Brown, USNMMENT 00153558, genitalia slide USNM 49701.

Principle entries are in **bold**.

- Abagrotis* 13, 14, 35, 36, 37, 38, 39  
*acclivis* **23**  
*Agnorisma* 14, 39, 40  
*Agrotina* 13, 18  
*Agrotini* 13, 14  
*Agrotis* 13, 18, 19, 21, 22, 67  
*alternata* **35**, 36  
*Anaplectoides* 14, 41, 42  
*anchocelioides* 35, **36**  
*Anicla* 13, 14, 15, 16  
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