Owlet Moths of Virginia, I. Subfamily Plusiinae
(Lepidoptera: Noctuidae)

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ABSTRACT

Twenty-five species of the noctuid moth subfamily Plusiinae are reported for Virginia based on recent collecting, museum specimens, literature records, and photographs. Four species, Autographa ampla (Walker), Polychrysa morigera (H. Edwards), Pseudeva purpurigera (Walker), and Syngrapha alias (Ottolengui), are recorded from the Commonwealth for the first time. Euxyla ridingii (Riley) may be extirpated in the state, whereas the status of E. fax (Grote), E. semicrocea (Guenée), and Plusia putnami Grote is unknown. Five additional members of the subfamily may occur in the state owing to their documented occurrence in adjacent or nearby states. Documented county and city records and capture dates are reported for all species.

Keywords: new state records, distribution, phenology.

INTRODUCTION

Noctuidae, commonly referred to as “owl moths,” is one of the largest families of Lepidoptera in both the world (ca. 1,089 genera and 11,772 species; van Nieukerken et al., 2011) and North America (>2,500 described species north of Mexico; Lafontaine & Schmidt, 2010) despite the recent splitting of the family into several families (e.g., Erebiidae, Euteliidae, Nolidae). At least 475 species of noctuids are known to inhabit Virginia (Roble, unpub. data). This is the first paper in a series that will document the composition, distribution, phenology, and conservation status of the diverse noctuid moth fauna of Virginia. This installment treats the relatively small subfamily Plusiinae (commonly known as loopers), which includes about 400 species worldwide (Powell & Opler, 2009) and 79 species in North America north of Mexico (Lafontaine & Poole, 1991; Lafontaine & Schmidt, 2010). Several plusiines are economically important pests of agricultural crops, but the vast majority are not. Miller et al. (2003) studied the temporal and spatial distribution and abundance of a community of 15 rare to uncommon plusiines in the Pacific Northwest that includes conifer, hardwood tree and shrub, and herbaceous-feeding species, and occupies a range of elevation and habitat types that include subalpine meadows and coniferous forests. These authors concluded that this plusine fauna represented an important component of the biodiversity within these local landscapes.

Eichlin & Cunningham (1978) reported 15 species of plusiines from Virginia, whereas Pogue (2005) attributed only 12 species to the state. Range maps currently provided on the Moth Photographers Group (hereafter MPG) website include Virginia records for only seven species. They are typically limited to only 1–3 records per species, and are apparently based mostly or entirely on photographs posted on other websites (e.g., BugGuide, Butterflies and Moths of North America) rather than voucher specimens.

As is true of Lafontaine & Poole’s (1991) treatment of the Plusiinae and most other fascicles in the landmark series Moths of North America, as well as systematic studies and older reviews of the Nearctic moth fauna, few records from Virginia are included. This is largely due to the historical paucity of sampling of the state’s native moth fauna by professional and amateur lepidopterists. Most major museum collections contain limited Virginia material, often dominated by the efforts of a single collector (e.g., the Ellison Smyth collection at
the National Museum of Natural History [NMNH],
primarily from Montgomery County, ca. 1895–1910, or
the John Franclemont collection (split between at least
NMNH, Cornell University, and the Canadian National
Collection of Insects, Arachnids, and Nematodes
[CNC]), the Virginia portion of which is almost entirely
from Arlington County, ca. 1948–1955) or multiple
collectors at the same site (e.g., Mountain Lake
Biological Station in Giles County).

The purpose of this paper is to present a more
complete summary of our current knowledge on
the composition, distribution, phenology, and
conservation status of the noctuid subfamily Plusiinae in
Virginia.

METHODS

Staff of the Virginia Department of Conservation and
Recreation, Division of Natural Heritage (VDCR-DNH),
including the author since 1992, have been sampling the
moth fauna of the state for the past three decades, relying
primarily on ultraviolet light traps, with more limited use
of mercury vapor lights, sugar baiting, Malaise traps,
diurnal netting, and other methods. Virtually no larval
sampling has been conducted. Most specimens of
Plusiinae have been retained from virtually all recent
VDCR-DNH samples and that material constitutes the
majority of the specimens that I examined for this study.
Most specimens collected by VDCR-DNH staff and
collaborators are deposited in the National Museum of
Natural History (NMNH), Smithsonian Institution,
Washington, DC, and the Virginia Museum of Natural
History (VMNH), Martinsville, VA, or are retained in a
reference collection at the agency’s headquarters in
Richmond, VA. Specimens collected in national parks
(e.g., Shenandoah National Park [SNP], Blue Ridge
Parkway [BRP], George Washington Memorial Parkway
[GWMP]) have been returned to the respective parks in
compliance with U.S. National Park Service policy.

I also searched for Virginia specimens in the
following institutional collections: National Museum of
Natural History (NMNH), Smithsonian Institution,
Washington, D.C.; American Museum of Natural
History (AMNH), New York, NY; Carnegie Museum of
Natural History (CMNH), Pittsburgh, PA; Academy of
Natural Sciences of Drexel University (ANSP),
Philadelphia, PA; McGuire Center for Lepidoptera and
Biodiversity (MGCL), Florida Museum of Natural
History, Gainesville, FL; Cornell University (CUIC),
Ithaca, NY; University of Kentucky (UK), Lexington,
KY; University of Connecticut (UConn), Storrs, CT;
University of Kansas (KU), Lawrence, KS; University of
Maryland (UMD), College Park, MD; Pennsylvania
State University (PSU), State College, PA; West
Virginia University (WVU), Morgantown, WV; Virginia
Museum of Natural History (VMNH), Martinsville, VA;
Virginia Polytechnic Institute and State University
(VPI&SU), Blacksburg, VA; Virginia Commonwealth
University (VCU), Richmond, VA; Virginia Military
Institute (VMI), Lexington, VA; and Radford University
(RU), Radford, VA. The private collections of Susan
Felder (Floyd, VA) and the late William R. Grooms
(Ashburn, VA), both currently in the possession of
VDCR-DNH, also were examined. Paul Dennehy
(Danville, PA), Steve Johnson (Sunbury, PA), and Kelly
Richers (Bakersfield, CA) provided records from their
private collections. In the species accounts below I have
included online (SCAN website) museum records from
the University of California-Davis (UCD), Cleveland
Museum of Natural History (CLMNH), and Northern
Arizona University (NAU), but did not examine those
specimens.

No readily accessible database exists for the many
plusine specimens examined for the monograph on the
North American fauna prepared by Lafontaine & Poole
(1991; J.D. Lafontaine, pers. comm.), which mostly
included records from NMNH and CNC. Consequently,
I have attempted to estimate the county (or city) of origin
for Virginia records based on the position of dots on the
range maps in that paper if I was unable to find the likely
covering specimen(s) during my own museum
searches (included NMNH but not CNC).

I also reviewed published and unpublished literature
sources (including the annual Season Summary
published by The Lepidopterists’ Society [SS-TLS] and
Virginia regional reports in Southern Lepidopterists’
News [SLN]), selected internet websites (including
SCAN, LepNet, Yale Peabody Museum, iDigBio, MPG,
Butterflies and Moths of North America [BAMONA],
BugGuide [BG], iNaturalist [iNat], Maryland
Biodiversity Project, North Carolina Biodiversity
Project, and the Society of Kentucky Lepidopterists
[Covell et al., 2018]), and other readily available
photographs (some sent directly to me) for relevant
records. Photographic records are listed below only if a
voucher specimen is not known to exist from the
respective county or city. The generalized range
maps in Beadle & Leckie (2012) were not considered
authoritative for the purpose of determining county or
state records.

ANNOTATED CHECKLIST

Twenty-five species of Plusiinae have been
documented or reported from Virginia. The checklist
numbers of Lafontaine & Schmidt (2010) and Hodges et
al. (1983), respectively,_precede the species’ names.
Common names (in brackets) were taken from Covell
(1984), Wagner et al. (2011), Beadle & Leckie (2012), Leckie & Beadle (2018), and the Moth Photographers Group website. The abbreviations MONA and EC78 refer to Lafontaine & Poole (1991) and Eichlin & Cunningham (1978), respectively. Adults of most of the following species are illustrated in popular field guides such as those by Covell (1984), Beadle & Leckie (2012), and Leckie & Beadle (2018), and many are included in the color plates in Pogue (2005). Illustrations of the adults of all of these species can be found in Lafontaine & Poole (1991) and various websites (e.g., MPG, BAMONA, BugGuide, and iNaturalist). Wagner et al. (2011) provided detailed life history summaries and color photos of the larvae for many eastern plusiines, as well as some adult images.

**Family Noctuidae**

**Subfamily Plusiinae**

**Tribe Abrostolini**

931162/8880 *Abrostola ovalis* Guénée
[Oval Nettle Moth, White-shouldered Nettle Moth]

**MONA:** One record is plotted in either northern Virginia (perhaps Arlington Co.) or the District of Columbia (original source unknown).


**Virginia flight dates:** 1 May–20 August

Comments: Most of the known Virginia records of *A. ovalis* are from mountains in the western portion of the state (Fig. 1), ranging up to 1210 m (3970’) in elevation, but it has also been observed near sea level in the Coastal Plain and northern Piedmont. I have not been able to determine the source of the material seen by Eichlin & Cunningham (1978) or Lafontaine & Poole (1991). The paucity of Virginia records for this and the following species is surprising given the fact that their larvae feed on stinging nettle (*Urtica dioica* L.) and probably native species of nettles, which are relatively common plants in the mountain and Piedmont regions of the state (Weakley et al., 2012; Virginia Botanical Associates, 2018). This northern moth ranges south to Kentucky, North Carolina, and Tennessee (Lafontaine & Poole, 1991; Pogue, 2005). Forbes (1954) regarded it as a rare species. Due to the limited number of Virginia records, *A. ovalis* is currently placed on the VDCR-DNH Animal Watchlist (Roble, 2016).

931162/8881 *Abrostola urenitis* Guénéé
[Spectacled Nettle Moth; Nettle Looper]

**MONA:** Like the preceding species, one record is plotted in either northern Virginia (perhaps Arlington Co.) or the District of Columbia (original source unknown). Forbes (1954) recorded it from the District of Columbia.

Other published Virginia records: State only (EC78), Fairfax Co. (Steuery et al., 2007).

VDCR-DNH records: None

Other Virginia records: [City of Richmond], University of Richmond [presumably collected on the campus], 30 May 1936, C.C. Walton (VMNH, 1 [ex University of Richmond collection]); same data but 19 April 1937.

Virginia flight dates: 19 April–26 July, 14 September

Comments: There are very few known records for *A. urenitis* in Virginia (Fig. 1). Both specimens from the 1930s have pre-printed “University of Richmond” labels, neither of which contains any annotations identifying an alternate collecting locality (only date and collector’s name). However, it should be noted that some of the insects collected by C.C. Walton during the mid-late 1930s were captured in Clifton Forge, Alleghany County (so noted by handwritten annotations on specimen labels) in the western, mountainous area of the state. I have not been able to determine the source of the material seen by Eichlin & Cunningham (1978) or Lafontaine & Poole (1991). This northern moth ranges south to western North Carolina, with an isolated record from southeastern Texas (Lafontaine & Poole, 1991). Powell & Opler (2009) listed South Carolina as the southern range limit in the East. Pogue (2005) did not record *A. urenitis* in Great Smoky Mountains National Park, but suggested that it probably occurs there.
Tribe Argyrogrammatini

931166/8885 *Argyrogramma verruca* (F.)
[Golden Looper Moth]

MONA: One or two records are plotted in Virginia (original sources unknown): one dot is in either northern Virginia (perhaps Arlington Co.) or the District of Columbia and the other appears to be in Giles County (probably Mountain Lake area).

Other published Virginia records: State only (EC78); VDCR-DNH records: Amherst Co., George Washington National Forest, Little Piney Road at Dismal Mountain Road, 1 October 2019, E.C. Orcutt (1).

Other Virginia records: Lancaster Co., 1 mile north of Kilnmanock, 4 September 2012 and 17 October 2012, P. Denney (P. Denney collection, 2); City of Salem, 23 July 1939, Engel (CMNH, 1).

Photo records: Chesterfield Co., 1 September 2016, J. LeBlanc (BAMONA), Fairfax Co., 1 August 2014, M. O’Donnell (BG, iNat). City of Richmond, 16 August 2015, A. Belden (BAMONA).

Virginia flight dates: 23 July–17 October

Comments: This migratory, tropical species is infrequently found in Virginia (Fig. 2).

931167/8886 *Enigmogramma basigera* (Walker)
[Pink-washed Looper Moth]

MONA: The lone Virginia dot appears to be plotted in the City of Virginia Beach (original source unknown).

Other published Virginia records: State only (EC78); Hanover Co. (Ludwig, 2009); City of Virginia Beach (Bastian, 2011; photograph).

VDCR-DNH records (7 specimens): Accomack, Chesterfield, Hanover, and Northampton counties and City of Virginia Beach.

Other Virginia records: Arlington (CUIC, 1), Floyd (S. Felker collection, 1), Lancaster (P. Denney collection, 9), and New Kent (CMNH, 2) counties; City of Suffolk (UCD, 1).

Photo records: Fairfax Co. (BAMONA, BG, iNat), City of Richmond (BAMONA).

Virginia flight dates: 16 July–28 October

Comments: Most of the few known Virginia records for this species are from the eastern portion of the state (Fig. 3). It was formerly placed in the genus *Argyrogramma* (Covell, 1984).

931168/8887 *Trichoplusia ni* (Hübner)
[Cabbage Looper Moth]

MONA: Up to four records are plotted in Virginia (original sources unknown), which I estimate as Arlington, Frederick, Montgomery, and Prince William counties for the purposes of Figure 4.

Other published Virginia records: State only (EC78); Hanover Co. (Ludwig, 2000, 2009); Tazewell Co. (Stein, 1993); City of Virginia Beach (Bastian, 2011).

VDCR-DNH records (15 specimens): Brunswick/Dinwiddie, Hanover, Highland, Northampton, and Patrick counties and City of Virginia Beach.

Other Virginia records: Loudoun (W.R. Grooms collection, 1), Montgomery (UK, 1, VPISU, 1), and Westmoreland (NAU, 1) counties and the cities of Norfolk (VPISU, 1) and Virginia Beach (CLMNH, 1).

Photo records: Carroll (W. Cook), Fauquier (BAMONA, larva) and Stafford (BG) counties and the cities of Newport News (BG, larva) and Richmond (BAMONA).

Virginia flight dates: 15 June–30 October

Comments: This species occurs in a wide variety of habitats in Virginia. It feeds on many species of herbaceous plants and can be a serious pest of cabbage crops (Powell & Opler, 2009). The New World range extends south into tropical America (Forbes, 1954). According to Lafontaine & Poole (1991), *T. ni* is “the most widespread species of Plusiinae and one of the more globally distributed species in the family Noctuidae.” Previously thought to be an Old World species that is now widely distributed on several continents, including North America (Zahiri et al., 2017; supplemental Table S3), recent genetic evidence suggests the Old and New World populations may represent distinct species (J.D. Lafontaine, pers. comm.).

Regarding the status of *T. ni* in the Northeast, Wagner (2005) noted “In recent years it has become curiously scarce...” He also stated that the northern latitude at which North America populations of *T. ni* successfully overwinter is unknown and migrants from the south reestablish northern populations each spring.

931169/8889 *Ctenoplusia oxygramma* (Geyer)
[Sharp-stigma Looper Moth]

MONA: One or two records are plotted in Virginia (original sources unknown): one dot is in either northern Virginia (perhaps Arlington Co.) or the District of Columbia and the other is in the City of Virginia Beach.

Other published Virginia records: State only (EC78); Fairfax Co. (Steury et al., 2007); Hanover Co. (Ludwig, 2000, 2009).

VDCR-DNH records (17 specimens): Amherst, Brunswick, Craig, Hanover, Isle of Wight, Montgomery, New Kent, and Prince William counties and the City of Virginia Beach.
Fig. 1. County and city distribution of *Abrostola ovalis* (dark shading = voucher specimens, diagonal shading = photographs) and *A. urentis* (light shading; voucher specimens) in Virginia. Both species have been documented in Arlington County (cross hatching) and/or the District of Columbia.

Fig. 2. County and city distribution of *Argyrogramma verruca* (dark shading = voucher specimens, medium shading = photographs; stippling = estimated county or city locations of points mapped by Lafontaine & Poole [1991]) and *Rachiplusia ou* (diagonal hatching = photographs; cross hatching = estimated county or city locations of points mapped by Lafontaine & Poole [1991]) in Virginia. The range maps in Lafontaine & Poole (1991) for both species include a point in or near Arlington County (light shading) or the District of Columbia.
Fig. 3. County and city distribution of *Enigmogramma basigera* in Virginia (dark shading = voucher specimens, light shading = photographs).

Fig. 4. County and city distribution of *Trichoplusia ni* in Virginia (dark shading = voucher specimens, light shading = photographs, diagonal hatching = estimated county or city locations of points mapped by Lafontaine & Poole [1991]).
Other Virginia specimen records: Lancaster Co. (P. Dennehy collection, 9); City of Hampton (VPISU, 1).
Photo records: Chesterfield (BAMONA, BG), Powhatan (J. Reilly), and Tazewell (BAMONA) counties; City of Richmond (BAMONA).
Virginia flight dates: 3 June; 2 August–2 November.
Comments: This species apparently occurs sporadically in Virginia (Fig. 5). Its range extends southward into tropical America (Forbes, 1954). It was formerly placed in the genus Agrapha (Covell, 1984).

931170/8890 Chrysodeixis includens (Walker)
[Soybean Looper Moth]

MONA: As many as seven widely scattered dots are plotted in Virginia (original sources unknown) for this widespread, primarily tropical species. For the purposes of Figure 6, I estimate these locations correspond to sites in Arlington, Augusta, Frederick, James City, Prince George, and Montgomery counties and the City of Virginia Beach.
Other published Virginia records: State only (EC78); Fairfax (Steyr et al., 2007), Hanover (Ludwig, 2000, 2009), and Wise (Holl, 1996) counties; City of Virginia Beach (Bastian, 2011).
Other Virginia records: Giles (VPISU, 3), Lancaster (P. Dennehy collection, 5), Loudoun (W.R. Grooms collection, 5), Madison (UCD, 1), Montgomery (VPISU, 1), Pulaski (UCD, 1), and Rockingham (K. Richers collection, 3) counties and the cities of Manassas (MGCL, 1), Norfolk (VPISU, 2), Richmond (VCU, 1), Suffolk (VPISU, 1), and Virginia Beach (CLMNH, 1).
Photo records: Arlington (BAMONA, BG, iNat), Clarke (iNat), Gloucester (T. Kain), Henrico (BAMONA), James City (BAMONA, iNat), Page (BG), Pittsylvania (iNat), Powhatan (J. Reilly), Shenandoah (BAMONA), Stafford (BG), Tazewell (BAMONA), Warren (BAMONA, iNat), Westmoreland (iNat), and York (BAMONA) counties and the cities of Alexandria (iNat), Chesapeake (BAMONA, iNat), Colonial Heights (BAMONA), and Hampton (BG).
Virginia flight dates: 7 January; 17 April–3 November.
Comments: I collected an adult C. includens at the incandescent porch light of my residence in Chesterfield County on 7 January 2008, presumably an unusually late rather than early date. This is the most common and widespread plusiine in Virginia (Fig. 6), probably occurring in every county in the state. Most records may be of moths that have migrated north in the spring and summer from more southerly latitudes to establish temporary breeding populations that persist until the onset of freezing temperatures. Its range extends southward into tropical America (Forbes, 1954). Chrysodeixis includens is an economically important species as its common name implies. It was formerly placed in the genus Pseudoplusia (Covell, 1984; Lafontaine & Schmidt, 2010).

931176/8895 Rachiplusia ou (Guenée)
[Gray Looper Moth]

MONA: Like Ctenoplusia oxygramma, one dot is plotted in either northern Virginia (perhaps Arlington Co.) or the District of Columbia and a second dot corresponds to the City of Virginia Beach (original sources unknown). Other published Virginia records: State only (EC78).
VDCR-DNH records: None.
Photo records: Augusta Co., Staunton, 7 September 2012, M. Morris (BG).
Virginia flight dates: 7 September.
Comments: I have not been able to determine the source of the material seen by Eichlin & Cunningham (1978) or Lafontaine & Poole (1991). Apparently, there are very few records of this species from Virginia (Fig. 2). Its range extends south to Ecuador (Powell & Oppler, 2009).

931177/8898 Allagraphe aerea (Hübner)
[Unspotted Looper Moth]

MONA: Surprisingly, only three dots are plotted in Virginia (original sources unknown) for this common species, which I estimate correspond to Giles and Smyth counties and the City of Suffolk.
Other published Virginia records: State only (EC78); Augusta (Butler et al., 2001), Bath (Skinner, 1921; CMNH, 1), Fairfax (Steyr et al., 2007), and Hanover (Ludwig, 2000, 2001, 2002, 2009) counties; City of Virginia Beach (Bastian, 2011).
Other Virginia records: Bedford (VPISU, 1), Floyd (S. Felker collection, 1), Giles (VPISU, 1), Loudoun (W.R.
Fig. 5. County and city distribution of *Ctenoplusia oxygramma* in Virginia (dark shading = voucher specimens, light shading = photographs, cross hatching = estimated county or city locations of points mapped by Lafontaine & Poole [1991]).

Fig. 6. County and city distribution of *Chrysodeixis includens* in Virginia (dark shading = voucher specimens, light shading = photographs, diagonal hatching = estimated county or city locations of points mapped by Lafontaine & Poole [1991]).
Grooms collection, 2; VPISU, 1), Montgomery (VPISU, 1), Rockbridge (US Forest Service non-target gypsy moth study, J. Peacock et al., unpub. data), and Rockingham (K. Richers collection, 1) counties; City of Radford (S. Felker collection, 1).

Photo records: Culpeper (iNat) and Powhatan (J. Reilly) counties; cities of Lynchburg (iNat), Richmond (BAMONA), and Salem (iNat).

Virginia flight dates: 8 May–25 October

Comments: This species is widespread in Virginia (Fig. 7).

931178/8896 *Diachrysia aeroides* (Grote)

[Dark-spotted Looper Moth, Lined Copper Looper]

MONA: No records, but there is a locality plotted in extreme southeastern Kentucky near the Virginia border. Covell (1999) reported *D. aeroides* from two localities in Kentucky, including Big Black Mountain, Harlan County, which borders Lee County, VA, the westernmost county in the state.

Published Virginia records: Fairfax Co. [Great Falls Park, 14 August 2004, J. Glaser, GWMP, 1] (Steury et al., 2007; B. Steury, pers. comm.).


Virginia flight dates: 7 July–14 August

Comments: This attractive, pink and gold moth has a transcontinental range in northern North America (Newfoundland and Nova Scotia to British Columbia and northern California), extending south in the East to Maryland, Kentucky, and western North Carolina (LaFontaine & Poole, 1991). Covell (1999) noted that *D. aeroides* is rare in Kentucky. Butler & Strazanac (2014) listed records for five counties in eastern West Virginia, and Pogue (2005) reported four specimens, each from a different site, in Great Smoky Mountains National Park near the North Carolina-Tennessee border.

*Diachrysia aeroides* was not recorded for Virginia by Eichlin & Cunningham (1978) or LaFontaine & Poole (1991). Apparently the first Virginia specimen was not collected until 1999. Most of the few Virginia records of this species are from high elevation sites (1073–1676 m [3520–5500 ft]; Fig. 8), but there is a recent collection from much lower elevation (≤100 m) in Great Falls Park in the northern Piedmont (Steury et al., 2007).

931179/8897 *Diachrysia balluca* Geyer

[Green-patched Looper Moth, Hologram Moth, Splendid Brass Looper]

MONA: One record is plotted in western Virginia, probably at or near Mountain Lake in Giles County (original source unknown). There is also a record from extreme southeastern Kentucky near the Virginia border. Covell (1999) reported *D. balluca* from two localities in Kentucky, one of which is Big Black Mountain in Harlan County (borders Virginia), and regarded this species as rare in that state.


Other Virginia records: None known.

Virginia flight dates: 15 June–20 September. This range of dates exceeds that of the rangewide collection period of “late July to early September” reported by LaFontaine & Poole (1991).

Comments: This is the largest plusiine in Virginia (wingspan 40–50 mm; Forbes, 1954) and perhaps the most beautiful, possessing metallic gray green forewings with a hint of pink. It was first collected in the state more than a century ago by Morgan Hebard, an entomologist from the Academy of Natural Sciences in Philadelphia, and has been taken only three times in the past three decades during statewide sampling by VDCR-DNH biologists. Two of the recent records are from sites on the same mountain as the cabin occupied by Hebard (exact location unknown) in the summer of 1916. One of the recent Warm Springs Mountain sites is a xeric pitch pine-scrub oak ridgetop barren (Bald Knob, 1289 m [4229’]), whereas the other site is in a nutrient rich forest (945 m), as is the Washington County site (762 m). All Virginia records are from mountainous areas (Fig. 8), including two lower elevation sites at or below 762 m (2500’).

Pogue (2005) recorded *D. balluca* from one peak (1475–1501 m) in the North Carolina portion of Great Smoky Mountains National Park at or near its southern range limit. The 19th century Titian Peale collection at ANSP contains two specimens of *D. balluca*, one each
Fig. 7. County and city distribution of *Allagapha aerea* in Virginia (dark shading = voucher specimens, light shading = photographs, diagonal hatching = estimated county or city locations of points mapped by Lafontaine & Poole [1991]).

Fig. 8. Distribution of *Diachrysia aereoides* (circles) and *D. balluca* (squares) in Virginia (voucher specimens). Both species were collected on Bald Knob, Warm Springs Mountain (triangle) in Bath County. One location for *D. balluca* (mapped at Mountain Lake, Giles Co.) is estimated based on the lone Virginia record plotted on the range map in Lafontaine & Poole (1991).
from the District of Columbia (mounted between 1846 and 1863) and York County, Pennsylvania (no date; ANSP website). Neither of these localities appears on the range map in Lafontaine & Poole (1991). This species is likely extirpated in at least the Washington area. Due to the limited number of Virginia records, _D. balluca_ is currently placed on the VDCR-DNH Animal Watchlist (Roble, 2016).

931183/8902 _Polychrysis morigera_ (H. Edwards)
[No common name] (Fig. 15)
**NEW STATE RECORD**

This is one of the rarest North American plusiines despite having a widespread distribution (Lafontaine & Poole, 1991). It has apparently expanded its range eastward in recent decades.

The range map in Eichlin & Cunningham (1978) includes records for only five western states, whereas Lafontaine & Poole (1991) reported that it occurs as far east as Tennessee, Kentucky, West Virginia, and western Pennsylvania. Covell (1999) stated that _P. morigera_ is local and uncommon in Kentucky (records for nine counties), with the first known specimen record for that state taken in 1976, and the first in Tennessee a decade later. Butler et al. (2001) reported a single capture during a 2-year survey (1995–96) on the Monongahela National Forest in Pocahontas County, West Virginia, not far from the Virginia border (see comments below). Pogue (2005) collected four specimens in the North Carolina portion of Great Smoky Mountains National Park.

The first known Virginia specimen of _P. morigera_ was collected by the late Douglas C. Ferguson of the National Museum of Natural History, Smithsonian Institution: Smyth Co.: Walker Mountain, north of Marion, 36° 54' N 81° 32' W, 3650', 18 June 1992 (NMNH, 1). VDCR-DNH staff have since taken 13 additional specimens at six sites in the southwestern portion of the state (Fig. 9), mostly in limestone habitats: Botetourt Co., private timber tract along Catawba Creek, 22 May 2001, A.C. Chazal and K.L. Derge (2); same site but 15 June 2001, A.C. Chazal and C.S. Hobson (1). Dickenson Co.: Breaks Interstate Park, Russell Fork River, Garden Hole, 3 June 2008, S.M. Roble and A.C. Chazal (1). Lee Co.: The Cedars Natural Area Preserve, Dry Creek barrens, 25 May 2000, C.S. Hobson (2). Montgomery Co.: Allen Hollow, 18 June 2003, J.C. Ludwig and I.T. Wilson (3); Slaughterpen Hollow, 10 June 2001, J.C. Ludwig (1). Russell Co.: Cleveland Barrens Natural Area Preserve, 23–24 May 2001, C.S. Hobson (3).

Virginia flight dates: 22 May–18 June

Comments: One specimen of _P. morigera_ was captured on the George Washington National Forest in Augusta County (L. Butler & J. Straznac, unpub. data) during the long-term (1995–2001) non-target gypsy moth study discussed by Butler et al. (2001; only 1995–1996 data were summarized for this paper), but it was not retained (absent from WVU collection, pers. obs.). Due to the limited number of Virginia records, _P. morigera_ is currently placed on the VDCR-DNH Animal Watchlist (Roble, 2016). Powell & Opler (2009) reported that this species is not very attracted to lights although it sometimes occurs at them in good numbers. The larvae feed on wild larkspurs (_Delphinium_ spp.) (Lafontaine & Poole, 1991).

931184/8899 _Pseudoa purpurigera_ (Walker)
[Straight-lined Looper Moth]
**NEW STATE RECORD**

Published Virginia records: None known.

Other Virginia records: None known.
Virginia flight dates: 10 June–6 July

Comments: This species was not recorded for Virginia by Eichlin & Cunningham (1978) or Lafontaine & Poole (1991), and I have not found any other published sources attributing this moth to the Virginia fauna. The range of _P. purpurigera_ is primarily northern (Atlantic Coast to Rocky Mountains), extending south in the East to Delaware, Kentucky, and North Carolina (Lafontaine & Poole, 1991). Glaser et al. (unpublished) recorded this species from two sites in far western Maryland (Garrett Co.), and Butler & Straznac (2014) listed one record for each of three counties (Lincoln, Preston, Wayne) in West Virginia. Pogue (2005) collected one specimen of _P. purpurigera_ in the North Carolina portion of Great Smoky Mountains National Park. Powell & Opler (2009) stated that South Carolina is the southern range limit in the East, whereas Wagner et al. (2011) reported the mountains of Georgia.

This species is uncommon to rare southward and the larvae feed on meadow-rue (_Thalictrum_) (Covell, 1984). Concerning the status of _P. purpurigera_ in Delaware, Jones (1928–1939) wrote “Rarely seen unless bred from the larvae, which some seasons are fairly abundant.” The Virginia records (Fig. 10) essentially fill the gap between
Fig. 9. County and city distribution of Polychrysa morigera in Virginia (dark shading = voucher specimens, light shading = discarded specimen [see text]).

Fig. 10. Distribution of Autographa ampla (triangles), Exyra ridingsii (square), and Pseudeva purpurigera (circles) in Virginia (voucher specimens). Autographa ampla and P. purpurigera were collected at two sites each on Warm Springs Mountain in Bath County.

931186/8904 *Chrysanympha formosa* (Grote)  
[Formosa Looper Moth; Beautiful Looper]

**MONA:** One record is plotted in western Virginia (perhaps Alleghany or Bath Co.; original source unknown). There is also a record shown in extreme southeastern Kentucky near the Virginia border. Covell (1999) reported *C. formosa* from four localities in Kentucky, including Pine Mountain State Resort Park in Bell County, the latter of which is adjacent to Lee County, VA, the westernmost county in the state.  
Other published Virginia records: State only (EC78); Augusta (Butler et al., 2001), Bath (Skinner, 1921; ANSP, 1); Giles (Milne & Milne, 1944), Hanover (Ludwig, 2001, 2002, 2009), Madison (Manderino et al., 2014), Montgomery (SLN, September 1988), Page (Manderino et al., 2014), Rappahannock (Manderino et al., 2014), and Rockbridge (Wagner et al., 1995) counties.  
VDCR-DNH records (36 specimens): Alleghany, Bath, Bedford, Botetourt, Craig, Dickens, Fauquier, Floyd, Frederick, Hanover, Isle of Wight, King and Queen, Patrick, Prince William, Rockbridge, and Wise counties and the cities of Suffolk and Virginia Beach.  
Other Virginia records: Amherst (CMNH, 1), Giles (NMNH, 1), Montgomery (NMNH, 3), Nelson (NMNH, 1), and Rockingham (K. Richers collection, 2) counties and the City of Virginia Beach (NMNH, 3).  
Virginia flight dates: 19 May–23/26 July  
Comments: This species is widely distributed in Virginia but not often collected (Fig. 11). Most specimens were captured in June. During the WVU non-target gypsy moth study conducted on the George Washington National Forest in Augusta County, 164 adult specimens of *C. formosa* were captured during 102 successful sampling events (1.6 specimens/trap, nearly all of which were discarded), more than double the combined total (n = 70) captures for the eight other plusines recorded (L. Butler & J. Strazanac, unpub. data).

*Chrysanympha formosa* ranges south to the mountains of Georgia (Wagner et al., 2011). Pogue (2005) recorded this species at only four sites in Great Smoky Mountains National Park near the North Carolina–Tennessee border.

931187/8905 *Eosphoropteryx thyatyroides*  
(Guenée)  
[Pink-patched Looper Moth]

**MONA:** One record appears to be plotted in extreme northwestern Virginia (perhaps Frederick Co. or the City of Winchester; original source unknown). The range map also displays a record in extreme southeastern Kentucky. Covell (1999) reported *E. thyatyroides* from 11 Kentucky counties, including Harlan Co. (Big Black Mountain), which borders Lee County, VA, the westernmost county in the state.  
Other published Virginia records: State only (Holland, 1903; Forbes, 1954; Eichlin & Cummingham, 1978); Giles (SS-TLS, 1992), Page, Rappahannock, and Warren counties (all Manderino et al., 2014).  
Photo records: Tazewell Co. (BAMONA).  
Virginia flight dates: 17 June–7 October  
Comments: This species is collected infrequently in the mountains of western Virginia (Fig. 12). During a 2011 non-target gypsy moth study, Manderino et al. (2014, Appendix S2; four trapping periods) collected 10 adult specimens of *E. thyatyroides* at six of 15 sampling sites near Skyline Drive in Shenandoah National Park. The range of this species extends south to the mountains of Georgia (Wagner et al., 2011). The larvae feed on meadow-rues (*Thalictrum* spp.) and wild columbine (*Aquilegia*) (Powell & Opler, 2009), and possibly also on lousewort (*Pedicularis*; Wagner et al., 2011).

931188/9021 *Exyra fax* (Grote)  
[Pitcher Plant Moth; Pitcherplant Looper; Epauelled Pitcher-plant Moth]  
No map

931189/9024 *Exyra semicrocea* (Guenée)  
[Pale Shoulder Pitcherplant Looper; Pitcherplant-mining Looper]  
No map

931190/9023 *Exyra ridingsii* (Riley)  
[Riding’s Pitcherplant Looper]  

*Exyra* is a small but fascinating genus of small noctuid moths. All three of its members are pitcher plant (*Sarracenia* spp.) specialists, their larvae feeding on the leaves (pitchers) of these carnivorous plants and the adults often taking refuge inside of them (Jones, 1921; Folkerts & Folkerts, 1996; Wagner et al., 2011). Jones
Fig. 11. County and city distribution of *Chrysanympha formosa* in Virginia (voucher specimens).

Fig. 12. County and city distribution of *Eosphoropteryx thyutyroides* in Virginia (dark shading = voucher specimens, light shading = photographs, diagonal hatching = estimated county or city locations of points mapped by Lafontaine & Poole [1991]).
(1921) reported that two of these species are associated with only one species of pitcher plant each, whereas the third (E. semicrocea) is found on several species of pitcher plants. He stated that North Carolina was the northern range limit for both E. ridingsii and E. semicrocea, whereas E. fax (= E. rolandiana Grote) is a more widespread species, ranging from Canada south to the Gulf of Mexico. Holland (1903) and Forbes (1954) reported New Jersey as the northern range limit of E. semicrocea, and the latter author remarked that E. ridingsii was “found as far north as North Carolina at least.” Schweitzer et al. (2011) concluded that reports of E. ridingsii from New Jersey were based on misidentifications of the superficially similar Pontometia semiflava (Guenée). Lafontaine & Poole (1991), Hall et al. (1999), and Schweitzer et al. (2011) all listed the range of E. ridingsii as the Coastal Plain (and Sand Hills region) from North Carolina south to Florida and west to Alabama; Wagner et al. (2011) cited a similar range (minus Alabama) for this species. Genetic differences have been documented between populations of E. semicrocea (Stephens et al., 2011).

No Virginia records for any species of Exyra were plotted on the detailed range maps prepared by Lafontaine & Poole (1991), whereas the text and generalized maps in Folkerts & Folkerts (1996) indicate that E. ridingsii and E. semicrocea reach their northern limits in southeastern Virginia. This is plausible based on the known ranges of their hostplants, but I was unable to determine the source(s) of these Virginia records. No Virginia specimens of Exyra are included in the Folkerts collection at Auburn University (M. Callahan, pers. comm.). However, I found two previously unsorted specimens of E. ridingsii in the Virginia Museum of Natural History with the following label data (brackets added): [Prince George Co.:] South of Petersburg, in pitcher plants in bog, 25 June 1936, C. Williams (VMNH [ex. University of Richmond collection], 2). The collector, Carroll E. Williams, was an undergraduate student in the biology department at the University of Richmond at that time and later became a renowned professor at Harvard University, eventually being elected to the National Academy of Sciences (Telfer, 1992; Pappenheimer, 1995). On this date in 1936, Williams accompanied several of his professors and renowned Harvard University botanist Merritt Lyndon Fernald to rare or unusual habitats in southeastern Virginia in search of rare plants (Fernald, 1937: 323).

The hostplant of E. ridingsii is Sarracenia flava L. (yellow pitcher plant or trumpets), an austral species that is very rare in Virginia, with documented records for only nine counties and cities in the southeastern corner of the state (Porter, 1991; Weakley et al., 2012; Virginia Botanical Associates, 2018). Most of the historically known populations of S. flava in Virginia are now extirpated as a result of habitat destruction (e.g., ditching, draining, filling), degradation (e.g., heavy grazing/trampling), or succession (woody plant encroachment due to prolonged fire suppression), including a large (“many acres”; Fernald, 1937) boggy depression southeast of Petersburg in northwestern Prince George County. The precise location of this destroyed bog is unknown but is estimated (Fig. 10) based on information in Fernald (1937) and the VDCR-DNH rare species database. The habitat and rare plants (S. flava was “gratifyingly abundant”) of the bog where Williams collected E. ridingsii were described by Fernald (1937: 325–326, 334–335). Elsewhere in his narrative, Fernald lamented the destruction of other pitcher plant bogs by ditching or their severe degradation by livestock (Fernald, 1937: 335, 338–339). Currently, less than five extant native populations of S. flava are known in Virginia, most of which are very small (VDCR-DNH rare species database). Consequently, E. ridingsii may be extirpated in the state. This species is currently placed on the VDCR-DNH Rare Animal List (Roble, 2016).

I did not find data on any Virginia specimens of E. fax or E. semicrocea. It is unclear from the generalized map in Folkerts & Folkerts (1996) if Virginia is included in the range of E. fax. The larvae of this species feed on Sarracenia purpurea L. (purple pitcher plant), a primarily northern species that was historically documented in 16 counties and cities in coastal Virginia (Virginia Botanical Associates, 2018), but is now reduced to about 15 remnant populations (VDCR-DNH rare species database). Perhaps E. fax will eventually be found at one of these sites. The larvae of E. semicrocea feed on S. flava and other, more southern congeners that are not native to Virginia. It is unlikely that this moth still inhabits Virginia, if it ever did.

Stephens et al. (2011) and Stephens & Folkerts (2012) reported that pitcher plant bogs in the southeastern United States Coastal Plain have been reduced to about 3% of their former range due to habitat loss and fragmentation, and indicated that Exyra moths are thus deserving of conservation concern.

931191/8908 Autographa precationis (Guenée) [Common Looper Moth]

MONA: At least four widely scattered dots are plotted in Virginia (original sources unknown) for this common eastern North American species, including 2–3 in northern Virginia, another apparently corresponding to
the City of Virginia Beach, and 1–2 others in southwestern Virginia (presumably including Giles Co.). Other published Virginia records: State only (EC78); Augusta (Butler et al., 2001), Bath (Skinner, 1921; CMNH, 3), Fairfax (Steuart et al., 2007), Giles (Milne & Milne, 1944), Grayson (SLN 22[3], 2000), Hanover (Ludwig, 2000, 2009), Madison (Manderino et al., 2014), and Rappahannock (Manderino et al., 2014) counties; City of Virginia Beach (Bastian, 2011). VDCR-DNH records (123 specimens): Accomack, Augusta, Bath, Bedford, Botetourt, Chesterfield, Craig,Dickenson, Fairfax, Fauquier, Floyd, Halifax, Hanover, Henrico, Isle of Wight, Lee, Montgomery, New Kent, Northampton, Nottoway, Prince William, Pulaski, Roanoke, Rockingham, Russell, Scott, Smyth, Stafford, and Wise counties and the cities of Chesapeake and Suffolk.

Other Virginia records: Giles (VPISU), Loudoun (W.R. Grooms collection, 5; VPISU), Madison (UCD, 2), Montgomery (VPISU), and Rockingham (CMNH, 1; K. Richers collection, 7) counties and the cities of Martinsville (VPISU), Norfolk (VPISU) and Virginia Beach (CLMNH, 1).

Photo records: Arlington (BAMONA, BG, iNat), Carroll (W. Cook), Powhatan (J. Reilly), Shenandoah (BAMONA), Spotsylvania (iNat), Tazewell (BAMONA), Warren (BAMONA, BG, iNat), and Westmoreland (iNat) counties and the cities of Alexandria (iNat), Radford (BG), and Richmond (BAMONA).

Virginia flight dates: 3 April–22 November 1992. Comments: A. ampla was not recorded for Virginia by Eichlin & Cunningham (1978) or Lafontaine & Poole (1991), and I have not found any other literature reports for the state. This is a widespread northern species that ranges south in the East to Kentucky and North Carolina, and in the West to Arizona and New Mexico (Lafontaine & Poole, 1991). Both known Kentucky localities are in Harlan County (Covell, 1999), which borders Lee County, VA, the westernmost county in the state. Glaser et al. (unpublished) considered it rare in Maryland, with records limited to the two westernmost counties in that state. Pogue (2005) recorded A. ampla from four sites in Great Smoky Mountains National Park near the North Carolina-Tennessee border. Wagner et al. (2011) listed the Georgia mountains as the southern range limit. With the exception of the Montgomery County location (671 m [2200’]), this species is known in Virginia only from the higher mountains (Fig. 10; elevational range 1036–1289 m [3400–4230’]). It is currently placed on the VDCR-DNH Animal Watchlist because of the limited number of Virginia records (Roble, 2016).

931209/8923 Megalographa biloba (Stephens)
[Bilobed Looper Moth]

MONA: Up to four widely scattered dots are plotted in Virginia (original sources unknown) for this common New World species. For the purposes of Figure 14, I estimated the corresponding counties for which I lacked other records as Arlington and Smyth counties.

Other published Virginia records: State only (EC78); Hanover Co. (Ludwig, 2000, 2002, 2009); City of Virginia Beach (Bastian, 2011). VDCR-DNH records (14 specimens): Augusta, Bedford, Dickenson, Floyd, Hanover, Highland, Montgomery, Northampton, and Russell counties and the City of Suffolk.

Other Virginia records: Augusta Co., George Washington National Forest, WVU non-target gypsy moth study, 1995–2001, total of one capture (L. Butler & J. Strazanac, unpub. data). Floyd (S. Felker collection, 3), Giles (VPISU, 1), Lancaster (P. Dennehay collection, 1), Loudoun (W.R. Grooms collection, 1), Montgomery (UK, 1; VPISU, 7), Prince George (MCGL, 1), and Rockingham (CMNH, 1) counties.

Photo records: Powhatan Co. (J. Reilly).

Virginia flight dates: 8 April–15 October 1992. Comments: Megalographa biloba is probably more
Fig. 13. County and city distribution of *Autographa precationis* in Virginia (dark shading = voucher specimens, light shading = photographs, diagonal hatching = estimated county or city locations of points mapped by Lafontaine & Poole [1991]).

Fig. 14. County and city distribution of *Megalographa biloba* in Virginia (dark shading = voucher specimens, light shading = photographs, diagonal hatching = estimated county or city locations of points mapped by Lafontaine & Poole [1991]).
common in Virginia than the available records (Fig. 14) suggest. It exhibits migratory behavior, with records from Great Britain suggestive of trans-Atlantic movements. Its native range extends from Canada south to Argentina (Lafontaine & Sullivan, 2009). Areas with freezing winters are recolonized each summer and early fall from more southerly locations (Powell & Opler, 2009). This species was formerly placed in the genus *Autographa* (Covell, 1984; Wagner et al., 2011).

931225/8939 *Syngapha alias* (Ottolengui)
[Hooked Silvery Y Moth, Spruce Looper] (Fig. 15)

**NEW STATE RECORD**

Published Virginia records: None known.
VDCR-DNH records (14 specimens): Grayson Co.: Jefferson National Forest, Whitetop Mountain, 30 June 2010, S.M. Roble and P. Bedell (1); same data but S.M. Roble (2); same data but 11 July 2012, S.M. Roble (1); same data but 22–23 July 2014, S.M. Roble (2); Grayson Highlands State Park, Haw Orchard Mountain (near Cox Visitor Center), 30 June 2011, S.M. Roble (5); Grayson Highlands State Park, Massie Gap, Wilburn Ridge, 23 July 2014, S.M. Roble (1). Highland Co.: George Washington National Forest, Bearwallow Run, 4 August 2011, S.M. Roble (1); same data but Newman Run, 4 August 2016 (1).
Virginia flight dates: 30 June–4 August
Comments: My recent collections of this species in the highest portions of the Blue Ridge Mountains in southwestern Virginia near the North Carolina border are the first known records of this species in the state. I have also taken two specimens near the West Virginia border in Highland County. All sites are dominated by red spruce (*Picea rubens* Sargent), the presumed larval hostplant in the state. The elevational range of these sites is 1067–1676 m (3500–5500'). Due to the limited number of Virginia records and its restricted habitat, *S. alias* is currently placed on the VDCR-DNH Rare Animal List (Roble, 2016). This is potentially the plusiinae most vulnerable to the effects of global climate warming because of its relictual, high elevation distribution in the southern Appalachians.

The range map in Lafontaine & Poole (1991) shows a potentially disjunct population in the mountains of western North Carolina, the next nearest record being in New Jersey. My collections (Fig. 16), plus records from West Virginia (Albu & Metzler, 2004; S. Johnson, unpub. data), partially fill in this gap. Pogue (2005) reported the collection of eight specimens of *S. alias* from the higher mountains (1603–1829 m) of North Carolina and Tennessee in Great Smoky Mountains National Park at its southern range limit.

Fig. 15. (top to bottom; scale bar 1 cm): *Autographa ampla* (Bath Co., VA, 7 July 1999); *Polychrysa morigera* (Lee Co., VA; 22 May 2000); *Syngapha alias* (Grayson Co., VA, 30 June 2011).

931127/8942 *Syngapha rectangula* (W. Kirby)
[Salt-and-pepper Looper Moth]

VDCR-DNH records (2 specimens): Highland Co.: near cabin off Rt. 642 at VA-WV state line, 4 August 2011, S.M. Roble (1); 2 km S Mustoe, 25 August 2016, S.M. Roble (1).
Other Virginia records: None known.
Virginia flight dates: 7 July–25 August
Comments: This species inhabits the mountains of western Virginia (Fig. 16), but apparently occurs at lower elevations than S. alias and not always in areas where red spruce is present. Perhaps some populations of S. rectangula in Virginia utilize eastern white pine (Pinus strobus L.) or eastern hemlock (Tsuga canadensis [L.]) as their hostplant.

Covell (1984) stated that S. rectangula is active by day, at dusk, and at night, and cited the range as Newfoundland to Pennsylvania, west through Canada, and south to Minnesota. The range map in Lafontaine & Poole (1991) includes only three records of this boreal species south of Pennsylvania, including one in Virginia (presumably Mountain Lake, Giles Co.) and two in western North Carolina. Butler & Strazanac (2014) listed one record for each of three counties in West Virginia, and Pogue (2005) recorded S. rectangula from four sites in North Carolina and Tennessee in Great Smoky Mountains National Park at its southern range limit. Due to the limited number of Virginia records, S. rectangula is currently placed on the VDCR-DNH Rare Animal List (Roble, 2016).

931234/8924 Anagraphe falcifera (W. Kirby)
[Celery Looper Moth]

MONA: Between two and four dots appear to be plotted in Virginia (original sources unknown) for this common North American species. For the purposes of Figure 17, I estimate that Arlington was the only corresponding county for which I lacked records from other sources. Other published Virginia records: State only (EC78); Augusta (Butler et al., 2001), Bath (Skinner, 1921; CMNH, 4), Fairfax (Steury et al., 2007), Hanover (Ludwig, 2000, 2009), Madison (Manderino et al., 2014), Tazewell (Stein, 1993), and Wise (Holl, 1996) counties; City of Virginia Beach (Bastian, 2011).

VDCR-DNH records (61 specimens): Accomack, Alleghany, Bath, Botetourt, Dinwiddie, Fairfax, Fauquier, Floyd, Frederick, Grayson, Halifax, Hanover, Isle of Wight, Madison, Northampton, Page, Prince William, Pulaski, Richmond, and Tazewell counties and the City of Virginia Beach.

Other Virginia records: Floyd (S. Felker collection, 2), Giles (VPISU, 4), Loudoun (W.R. Grooms collection, 7; R. Lyon collection, 1), Montgomery (UK, 3; VPISU, 37), and Rockingham (CMNH, 2; K. Richers collection, 3) counties and the cities of Newport News (VPISU, 1), Roanoke (VPISU, 2), and Suffolk (VPISU, 3).

Photo records: Carroll (W. Cook), Chesterfield (BAMONA), Mecklenburg (iNat), Powhatan (J. Reilly), and Westmoreland (iNat) counties; City of Richmond (BAMONA).

Virginia flight dates: 2 April–5 November
Comments: This species is common and widely distributed in Virginia (Fig. 17). Powell & Opler (2009) characterized it as “very adaptable and invasive,” occurring in weedy or cultivated habitats as well as natural habitats.

931236/8950 Plusia putnami Grote
[Putnam’s Looper Moth]

Published Virginia records: State only (Eichlin & Cunningham, 1978; Covell, 1984).

VDCR-DNH records: None.

Other Virginia records: None known.

Virginia flight dates: No data.
Comments: This Holarctic species was recorded (without details) for Virginia by Eichlin & Cunningham (1978) and Covell (1984; latter perhaps based on the former), but not Lafontaine & Poole (1991). My museum searches failed to locate any Virginia specimens of P. putnami, but NMNH has a century old specimen from West Virginia collected by renowned lepidopterist W.H. Edwards (1822–1909; see Calhoun, 2014) which lacks a specific locality and date (but presumably was collected post-1863, the year West Virginia gained statehood) on the label. Given the lack of any modern records from Virginia and neighboring states, the validity of the report by Eichlin & Cunningham (1978) should be considered dubious until a voucher specimen from the state has been located or collected anew. If it is indeed a member of the Virginia fauna, this would be the southernmost known record for P. putnami in the East according to the range map in Lafontaine & Poole (1991) and all other sources that I have checked.

DISCUSSION

Twenty-five species of the noctuid moth subfamily Plusiinae have been documented or reported from Virginia. Wagner (2005) stated that there are 50 Eastern species of plusiines, thus half of these are recorded from Virginia. The Virginia faunal tally compares favorably to the totals for North Carolina and Ohio, and exceeds the figures for Kentucky, West Virginia, and Maryland (Table 1). Pogue (2005) recorded 17 plusiines during intensive sampling of Great Smoky Mountains National Park. He also cited higher species diversity totals for more northern states such as Maine (31), New York (30), and New Hampshire (26) (Pogue, 2005).

The following five additional species of Plusiine may also occur in Virginia, with the species of Syngrapha perhaps having the greatest potential:
Fig. 16. Distribution of *Syngrapha alias* (circles) and *S. rectangula* (triangles) in Virginia (voucher specimens). Some symbols represent multiple proximate collecting sites.

Fig. 17. County and city distribution of *Anagraphe falciifa* in Virginia (dark shading = voucher specimens, light shading = photographs, diagonal shading = estimated county or city locations of points mapped by Lafontaine & Poole [1991]).
Table 1. Comparative Plusiinae faunas of Virginia and neighboring states plus Ohio.

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<th>KY</th>
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<td>x</td>
</tr>
<tr>
<td><em>A. pseudogamma</em></td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>x</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td><em>A. ampla</em></td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
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<td>x</td>
</tr>
<tr>
<td><em>Anagraphe falcifera</em></td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td><em>Syngrapha octoscripta</em></td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>x</td>
</tr>
<tr>
<td><em>S. epigaea</em></td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td><em>S. alias</em></td>
<td>x</td>
<td>-</td>
<td>x</td>
<td>-</td>
<td>x</td>
<td>-</td>
</tr>
<tr>
<td><em>S. abstrusa</em></td>
<td>-</td>
<td>x(?)</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>x</td>
</tr>
<tr>
<td><em>S. rectangular</em></td>
<td>x</td>
<td>-</td>
<td>x</td>
<td>-</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td><em>Plusia putnami</em>*</td>
<td>x</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td><em>P. contexta</em></td>
<td>x</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>x</td>
<td>x</td>
</tr>
</tbody>
</table>

Total species: 25 20 25 21 22 24

*One specimen of *Autographa californica* was collected in Maryland far out of range (Glaser et al., unpublished; USNM).

** *Plusia venusta* was collected in the 1800s in Washington, DC (Lafontaine & Poole, 1991).

Data sources: Lafontaine & Poole (1991); Rings et al. (1992); Covell (1999); Albu & Metzler (2004); Pogue (2005); Butler & Strazanac (2014); Covell et al. (2018); Glaser et al., unpublished; Line (Moths of Maryland); Maryland Biodiversity Project; North Carolina Biodiversity Project; Moth Photographers Group; BugGuide; USNM; this paper.
Autoplusia egena (Guenée) [Bean-lead Skeletonizer Moth] is a southern species that ranges north to southwestern North Carolina, with a vagrant record from near Detroit, Michigan (Lafontaine & Poole, 1991).

Syngrapha abstrusa Eichlin [Abstruse Looper Moth] is a northern, conifer-feeding species that ranges south as far as New Jersey and Ohio in the East (Lafontaine & Poole, 1991). A purported photo record from eastern Maryland (Line [Moths of Maryland website]; Maryland Biodiversity Project) is best treated as unconfirmed because differentiation of this species from S. alias requires genitalic dissection. Pogue (2005) did not document S. abstrusa in the Smokies. This species should be sought in the higher mountains of western Virginia.

Syngrapha epigaea (Grote) [Epigaea Looper Moth, Inscribed Looper, Pirate Looper] is another northern, conifer-feeding species. It reportedly ranges south to northern Ohio and central Pennsylvania in the East (Lafontaine & Poole, 1991). However, within the past decade this species has been recorded much farther south at Spruce Knob, Pendleton County, West Virginia, the highest point in that state (1482 m [4863 ft]) on at least five occasions: 3 July 2010, P. Dennehy (P. Dennehy collection, 1; photograph of specimen at BugGuide #1210658); 9 July 2011, J.D. Hooper (NMNH, 1); 10–12 July 2011 and 2–7 July 2012, S. Johnson (S. Johnson collection, 2); 11 July 2014, K. Lebo (photo; BAMONA #102590). Butler & Strazanac (2014) did not include S. epigaea in their list of West Virginia moths in the WVU collection. This species may occur in the red spruce forests of northwestern Highland County, Virginia, which are less than 15 km southwest of Spruce Knob, but at an elevation about 300 m (1000 feet) lower.

Plusia contexta Grote [Connected Looper Moth] is the most commonly collected species of Plusia in the East, ranging south to New Jersey, Pennsylvania, and Ohio (Lafontaine & Poole, 1991). Butler & Strazanac (2014) reported this species from Morgantown and Natrium, West Virginia. It has also been collected in two Maryland counties (Glaser et al., unpublished; Maryland Biodiversity Project; specimens in NMNH).

Plusia venusta Walker [White-streaked Looper Moth] has a more boreal distribution than P. contexta, but surprisingly, its southernmost known locality in the East is the District of Columbia (Lafontaine & Poole, 1991). This nearly century-and-a-half old record is mentioned in the original description of P. striatella Grote, a junior synonym (Grote, 1873). Eichlin & Cunningham (1978) recorded P. venusta from Maryland, but there are no records in Glaser et al. (unpublished) or the Maryland Biodiversity Project database, thus casting doubt on the validity of their report. Lafontaine & Poole (1991) remarked that P. venusta is the most rarely collected of the three Eastern members of this genus.

ACKNOWLEDGEMENTS

Numerous VDCR-DHN staff, especially Anne Chazal, Chris Hobson, Chris Ludwig, Megan Ayers, Ellison Orcutt, Maureen Dougherty, Art Evans, Kathy Gipe (nee Derge), and Tom Smith, have contributed to the agency’s efforts to document and assess the moth fauna of Virginia during the past three decades. This work has been supported directly and indirectly by numerous grants from multiple sources, as well as the citizens of Virginia.

For facilitating my visits and/or granting permission to examine specimens in their care I thank Michael Pogue, Paul Goldstein, John Brown, and the late Douglas Ferguson (NMNH), Eric Quinter (AMNH), John Rawlins and Robert Davidson (CMNH), Jon Gelhaus and Jason Weintraub (ANSP), Charles Covell and Andrew Warren (MGCL), James Liebher and Jason Dombrowski (CUIC), Eric Chapman (UK), David Wagner and Jane O’Donnell (UCon), Zachary Falin (KU), Charles Mitter (UMD), Andrew Deans (PSU), John Strazanac (WVU), the late Richard Hoffman and Kal Ivanov (VMNH), Eric Day and Paul Marek (VPISU), Karen Kester (VCU), Paul Moosman (VMI), and Karen Powers (RU). I would also like to thank Melissa Callahan for checking the Auburn University collection for Euxra specimens from Virginia (none were found). Paul Dennehy, Steve Johnson, and Kelly Richers graciously provided records from their private collections and Susan Felker and the late William Grooms (via the late Robert Lyon) donated their collections to VDCR-DHN. I thank Teta Kain and James Reilly for sharing their photos of Virginia moths.

David Wagner, Dale Schweitzer, and Christopher Hecksher collectively made me aware of Jones’ (1928–1939) unpublished manuscript on Delmarva Lepidoptera and generously provided a photocopy of it. Dale also identified some of the VDCR-DHN specimens cited above. The late John Glaser provided a copy of his unpublished manuscript (Glaser et al.) on the moth fauna of Maryland. John Strazanac shared a summary of the unpublished results of the long-term (L. Butler & J. Strazanac, 1995–2001) WVU non-target gypsy moth study conducted on the George Washington National Forest in Virginia and the Monongahela National Forest in West Virginia (few voucher specimens were retained; only data from 1995–1996 were summarized in Butler et al., 2001). John Peacock and Laura Neale shared the
results of the first year of a similar unpublished study (1991–1993) conducted in Rockbridge County, Virginia. Finally, I thank Charles Covell, Steve Hall, Thomas Henry, Steve Johnson, and especially John Brown, for reviewing the manuscript.

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