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Euteliidae of Virginia (Lepidoptera: Noctuoidea)

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ABSTRACT

Seven widespread, eastern North American species of the moth family Euteliidae are reported for Virginia based on recent field work, museum specimens, literature records, and photographs. County and city records and capture dates are reported for all species. The euteliid fauna of Virginia is identical to that of Kentucky, Maryland, and Ohio; North Carolina and West Virginia share six of the seven species recorded from Virginia.

Keywords: distribution, *Eutelia*, *Marathyssa*, moths, *Paectes*, phenology.

INTRODUCTION

This is the second installment in what is projected to be a series of papers documenting our current knowledge of the composition, distribution, phenology, and conservation status of the moth fauna of Virginia. The first contribution dealt with the superfamily Cossoidea (Roble, 2018), and this one treats the family Euteliidae.

Euteliidae is a small family of "macromoths" with its greatest diversity in the tropics. Formerly considered a subfamily of Noctuidae, it was recently elevated to family status (Zahiri et al., 2010). Worldwide, the family includes 29 genera and 520 described species (van Nieukerken et al., 2011). The fauna of North America north of Mexico is depauperate, represented by only 18 species (Lafontaine & Schmidt, 2010), including seven widespread Eastern species (Wagner et al., 2011), all of which occur in Virginia. The larvae of most Eastern euteliids feed on poison ivy (*Toxicodendron radicans* [L.] Kuntze), sumac (*Rhus* spp.) or sweetgum (*Liquidambar styraciflua* L.).

METHODS

Staff of the Virginia Department of Conservation and Recreation, Division of Natural Heritage (VDCR-DNH), including the author since 1992, have been surveying the moth fauna of the state for the past three decades to determine its composition, distribution, and conservation status. Sampling has primarily relied 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. Specimens of Euteliidae have been retained from virtually all of these sampling events and constitute the majority of the material that I examined for this study. I also visited the following collections to search for Virginia specimens: National Museum of Natural History (NMNH), Smithsonian Institution, Washington, DC; American Museum of Natural History, New York, NY (AMNH); 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; 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; West Virginia University (WVU), Morgantown, WV; Virginia Museum of Natural History (VMNH), Martinsville, VA; Virginia Polytechnic Institute and State University (VPISU), 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 Felker (Floyd, VA) and the late William Grooms (Ashburn, VA), both currently in the possession of VDCR-DNH, also were examined. Kelly

Richers (Bakersfield, CA) provided records from his private collection. Most specimens collected by VDCR-DNH staff and collaborators have been deposited in the National Museum of Natural History, Smithsonian Institution, Washington, DC, and the Virginia Museum of Natural History, Martinsville, VA, or retained in a reference collection at the agency's headquarters in Richmond, VA. Specimens collected in national parks (e.g., Shenandoah National Park, Blue Ridge Parkway, George Washington Memorial Parkway) have been returned to the respective parks in compliance with U.S. National Park Service policy.

I also reviewed published and unpublished literature sources, including the annual Season Summary published by The Lepidopterists' Society and regional reports in the Southern Lepidopterists' News, for Virginia records relevant to this paper. I searched various internet websites, including LepNet, SCAN, Yale Peabody Museum, Moth Photographers Group, Butterflies and Moths of North America, BugGuide, iNaturalist, iDigBio, Maryland Biodiversity Project, North Carolina Biodiversity Project, and the Society of Kentucky Lepidopterists (Covell et al., 2018) for records. I have included two online museum records from the University of California-Davis (UCD) obtained from SCAN, but did not examine those specimens. I also reviewed readily available photographs on other websites as well as some that were shown or sent to me.

ANNOTATED CHECKLIST

Seven species of Euteliidae are documented from Virginia. Covell (1984) provided an illustration and brief species account for all but one of these species (*Paectes abrostolella*), whereas Beadle & Leckie (2012) and Leckie & Beadle (2018) included all seven species in their field guides. Photographs of the adults of all species also can be found on several internet websites (e.g., Moth Photographers Group, Butterflies and Moths of North America, BugGuide). The checklist numbers of Lafontaine & Schmidt (2010) and Hodges et al. (1983), respectively, precede the species' names in the following list. Numbers with decimal points represent taxonomic changes subsequent to the Hodges et al. (1983) list. Common names (in brackets) are taken from Covell (1984) and Beadle & Leckie (2012). Photographic records are listed below only if a voucher specimen is not known to exist from the corresponding county or city. The range maps in Beadle & Leckie (2012) were not considered authoritative for the purpose of determining county or state records.

931103/8955 *Marathyssa inficita* (Walker) Map 1
[Dark Marathyssa]

Published Virginia records: Fairfax (Steury et al., 2007) and Hanover (Ludwig, 2000, 2009) counties; City of Virginia Beach (Bastian, 2011). I presume this species was recorded from the state in older references, but did not locate any of these.

VDCR-DNH records (41 specimens): Brunswick, Chesterfield, Dinwiddie, Halifax, Hanover, Isle of Wight, James City, Montgomery, New Kent, Nottoway, Prince William, Russell, Scott, Sussex, and York counties, and the cities of Suffolk and Virginia Beach.

Other Virginia records: Fairfax (NMNH, 3), Floyd (VPISU, 1), Franklin (UK, 1), and Rockingham (K. Richers collection, 2) counties and the cities of Newport News (UCD, 1), Virginia Beach (NMNH, 1), and Williamsburg (UCD, 1).

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

Virginia flight dates: 10 May–28 August

Hostplants: Staghorn sumac (Forbes, 1954; Covell, 1984); also poison ivy (Beadle & Leckie, 2012).

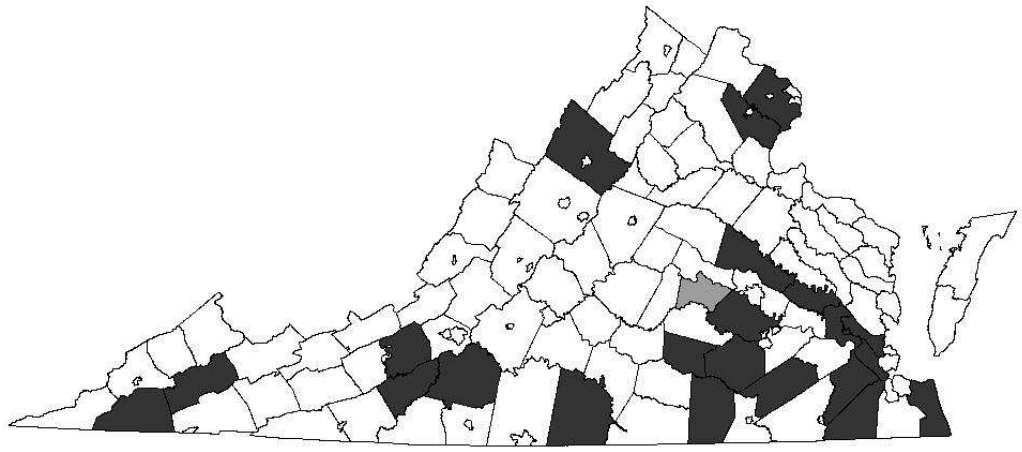
Comments: This widespread eastern North American species is common in Virginia. Males have serrate antennae in contrast to the bipectinate antennae present in all of the following species.

931104/8956 *Marathyssa basalis* Walker Map 2
[Light Marathyssa]

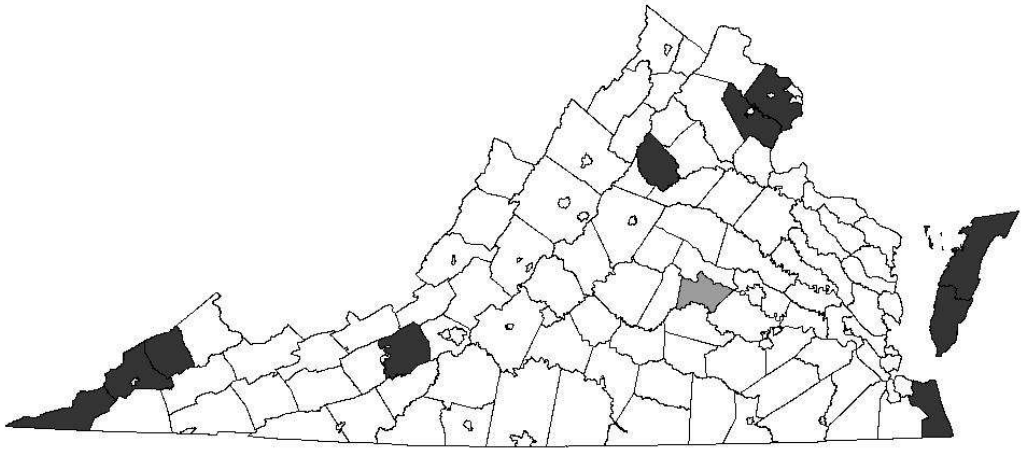
Published Virginia records: I have not seen any published source that specifically records this widespread eastern North American species from Virginia except Bastian (2011), who described it as "occasional" in his little known, self-published book on the natural history of Virginia Beach. I presume this species was recorded from the state in some older references also.

VDCR-DNH records (17 specimens): Dickenson, Fairfax, Lee, Madison, Northampton, Prince William, and Wise counties and City of Virginia Beach.

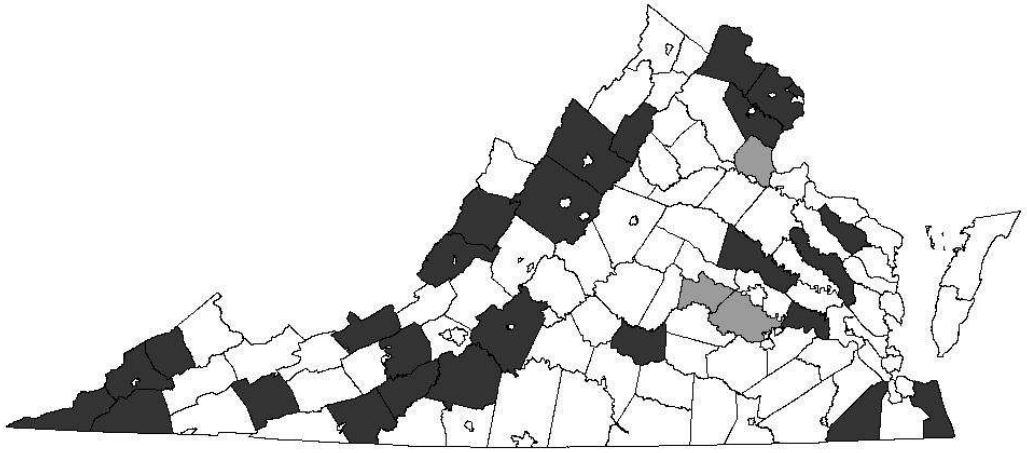
Other Virginia records: Fairfax (NMNH, 4) and Montgomery (NMNH, 1; VPISU, 1) counties.



Map 1. County and city distribution of *Marathyssa inficita* in Virginia (dark shading = voucher specimens, light shading = photographs).



Map 2. County and city distribution of *Marathyssa basalis* in Virginia (dark shading = voucher specimens, light shading = photographs).



Map 3. County and city distribution of *Paectes oculatrix* in Virginia (dark shading = voucher specimens, light shading = photographs).

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

Virginia flight dates: 16 April–16 June

Hostplant: poison ivy (Forbes, 1954; Covell, 1984).

Comments: This is another widespread eastern North American species that is somewhat less common than the preceding species (Covell, 1984). *Marathyssa basalis* is less frequently collected in Virginia and has a shorter flight period than *M. inficita*. Forbes (1954) characterized the former species as "rare."

931106/8957 *Paectes oculatrix* (Guenée) Map 3
[Eyed Paectes]

Published Virginia records: Augusta (Butler et al., 2001), Bath (Skinner, 1921), Fairfax (Steury et al., 2007: Brown, 2008), and Hanover (Ludwig, 2000, 2009) counties; City of Virginia Beach (Bastian, 2011).

VDCR-DNH records (69 specimens): Alleghany, Bath, Bedford, Carroll, Charles City, Dickenson, Fairfax, Floyd, Franklin, Hanover, Lee, Page, Prince William, Richmond, Rockingham, Scott, Smyth, and Wise counties and the cities of Suffolk and Virginia Beach.

Other Virginia records: Arlington (NMNH, 1), Fairfax (NMNH, 4), Giles (VPISU, 1), Loudoun (NMNH, 2; W.R. Grooms collection, 5), Montgomery (NMNH, 3), and Prince Edward (NMNH, 1) counties; City of Suffolk (AMNH, 1).

Photo records: Chesterfield (P. Bedell, iNaturalist), Powhatan (J. Reilly), and Stafford (J. Shuman, BugGuide) counties.

Virginia flight dates: 18 April–2 September

Hostplants: Poison ivy (Forbes, 1954; Covell, 1984); also reared on poison sumac (Wagner, 2005; Wagner et al., 2011).

Comments: This is another widespread eastern North American species that may be locally common (Covell, 1984). It has a broad distribution in Virginia, but there are no confirmed records from the Eastern Shore to my knowledge, despite the abundance of poison ivy. Jones (1928–1939) recorded it from the north end of the Delmarva Peninsula in New Castle County and Wilmington, Delaware.

931107/8959 *Paectes pygmaea* Hübner Map 4
[Pygmy Paectes]

Published Virginia records: Augusta (Butler et al., 2001) and Hanover (Ludwig, 2000, 2001, 2002, 2009) counties; City of Virginia Beach (Bastian, 2011).

VDCR-DNH records (34 specimens): Alleghany, Amherst, Botetourt, Dickenson, Dinwiddie, Fauquier, Halifax, Hanover, James City, King and Queen, Nelson, Prince William, Scott, Southampton, and Wise counties; City of Suffolk.

Other Virginia records: Fairfax Co. (NMNH, 2), City of Suffolk (D.F. Schweitzer collection, 1; specimen currently at VDCR-DNH).

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

Virginia flight dates: 2 May–17 August

Hostplant: Reared on winged sumac, *Rhus copallinum* L. (Wagner, 2005). There are older reports from sweetgum (Forbes, 1954; Covell, 1984), but Wagner (2005) and J.B. Sullivan (pers. comm.) provided contradictory evidence in favor of winged sumac.

Comments: This is a common, widespread species in eastern North America (Covell, 1984). Records are lacking from the Eastern Shore of Virginia.

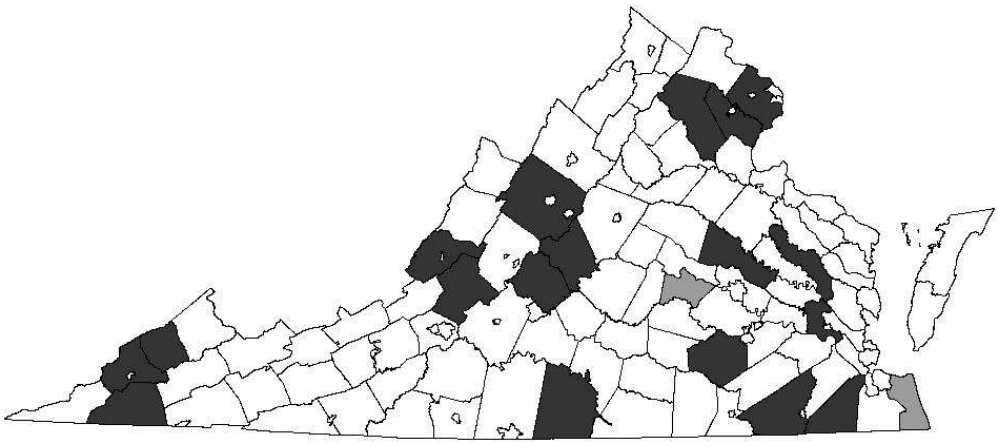
931108/8959.1 *Paectes abrostolella* (Walker) Map 5
[Barrens Paectes]

Published Virginia records: Lee Co. (Metzler et al., 2005; based on the records listed below).

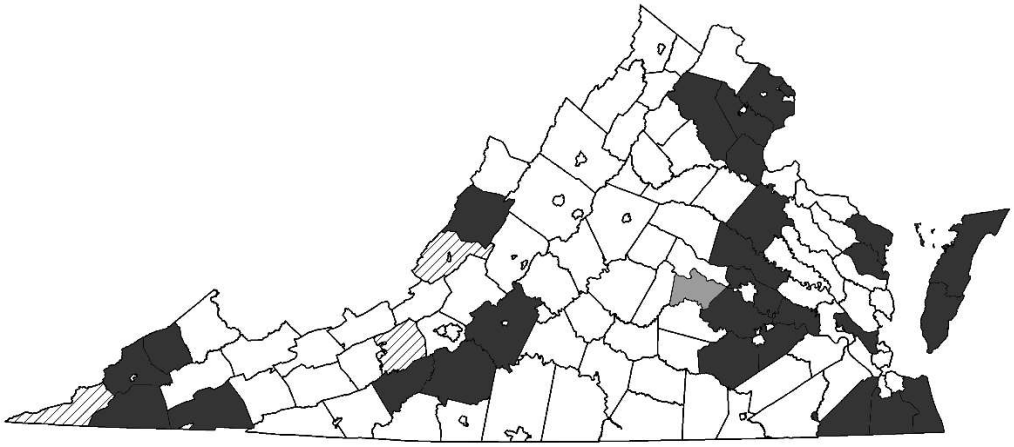
VDCR-DNH records (17 specimens): Alleghany Co., Johnsons Creek Natural Area Preserve, 9 May 2001, S.M. Roble and A.C. Chazal (1). Lee Co., The Cedars Natural Area Preserve, 4 km WSW Jonesville, 5–6 May 1999, S.M. Roble, A.C. Chazal, and C.S. Hobson (2); same but Dry Creek tract, 10 km W Jonesville, 6 May 1999, S.M. Roble, A.C. Chazal, and C.S. Hobson (12); same but off Co. Rt. 622 near Natural Bridge, 22 July 2004, C.S Hobson, A.C. Chazal, and M.E. Bradford (1). Montgomery Co., Sweet Spring Hollow, 1 May 2003, J.C. Ludwig and I.T. Wilson (1).

Other Virginia records: None

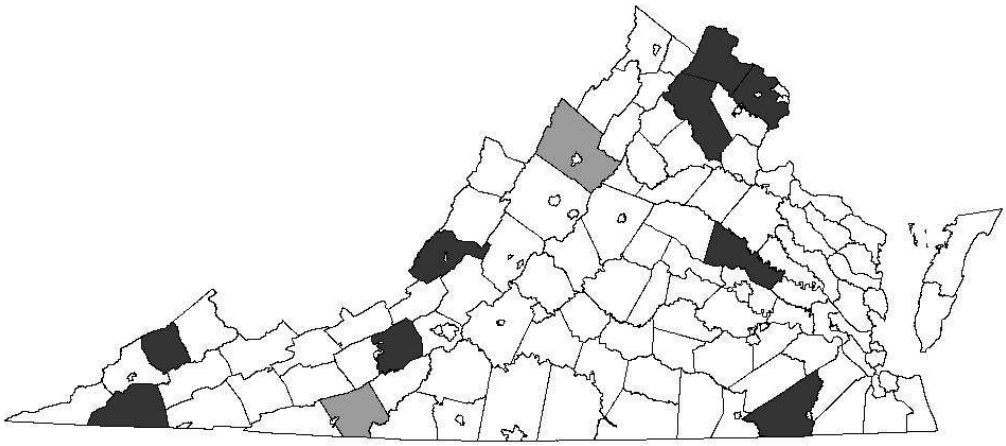
Virginia flight dates: 1 May–22 July



Map 4. County and city distribution of *Paectes pygmaea* in Virginia (dark shading = voucher specimens, light shading = photographs).



Map 5. County and city distribution of *Paectes abrostoloides* (dark shading = voucher specimens, light shading = photographs) and *P. abrostolella* (diagonal hatching; voucher specimens) in Virginia.



Map 6. County and city distribution of *Eutelia pulcherrimus* in Virginia (dark shading = voucher specimens, light shading = photographs).

Hostplant: Wagner et al. (2011) suspected the hostplant is fragrant sumac (*Rhus aromatica* Aiton), which has been confirmed for Ontario populations and is likely true throughout the range of *P. abrostolella* in eastern North America (B.C. Schmidt, pers. comm.).

Comments: Metzler & Franclemont (1991) resurrected this predominantly western species from the synonymy of *P. pygmaea* and reported that it ranges east to Ohio and Kentucky, occurring in remnant prairies in the East. Metzler et al. (2005) plotted records east to the coast in New York, Maryland (Chesapeake Bay region), and Florida (records for latter state are based on misidentifications, B.C. Schmidt, pers. comm.). The lone Virginia record on their map was based on VDCR-DNH collections (cited above) made at three nearby sites in Lee County in the extreme southwestern corner of the state. "The Cedars" region of Lee County is underlain by Ordovician dolomite; the Dry Creek barrens site is characterized by numerous grassy openings surrounded by rich deciduous forest (Ludwig, 1999). *Rhus aromatica* is common in this habitat and is the presumed hostplant of the *P. abrostolella* population, although this has not been confirmed.

The Kentucky and Tennessee records for *P. abrostolella* are quite distant from the Virginia sites, with those for the former state being clustered in four adjoining counties near the Ohio border (Covell, 1999; Metzler et al., 2005). This species has not yet been documented in North Carolina (North Carolina Biodiversity Project) or West Virginia (Butler & Strazanac, 2014; MPG range map).

Paectes abrostolella is a rare species in Virginia and of conservation concern in the state (Roble, 2016). It appears to be associated with barrens habitats, some of which may require active management such as prescribed burning to maintain the proper habitat conditions. All of the currently known populations of *P. abrostolella* in Virginia occur on state natural area preserves.

931111/8962 *Paectes abrostoloides* (Guenée) Map 5
[Large Paectes]

Published Virginia records: Fairfax (Steury et al., 2007), Hanover (Ludwig, 2000, 2002, 2009), and Henrico (Belden & Derge, 2003) counties; City of Virginia Beach (Bastian, 2011).

VDCR-DNH records (115 specimens): Accomack, Bath, Bedford, Caroline, Charles City, Chesterfield, Dickenson, Dinwiddie, Fairfax, Fauquier, Franklin, Hanover, Henrico, Northampton, Northumberland, Prince George, Prince William, Scott, Stafford, Washington, Wise, and York counties and the cities of Chesapeake, Suffolk, and Virginia Beach.

Other Virginia records: Arlington (NMNH, 3), Fairfax (NMNH, 4), Floyd (S. Felker collection, 1), and Northampton (NMNH, 1) counties and the cities of Franklin (NMNH, 1) and Suffolk (AMNH, 1; NMNH, 2; VPISU, 5).

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

Virginia flight dates: 2 April–7 November

Hostplant: Sweetgum (Forbes, 1954; Covell, 1984), but also found in areas lacking this plant (J.B. Sullivan, pers. comm.), thus suggesting use of an alternate hostplant.

Comments: This common, widespread species of eastern North America (Covell, 1984) is common in Virginia and has the longest flight period of any euteliid in the state.

931118/8968 *Eutelia pulcherrimus* (Grote) Map 6
[Beautiful Eutelia]

Published Virginia records: Fairfax (Steury et al., 2007) and Hanover (Ludwig, 2009) counties.

VDCR-DNH records (10 specimens): Alleghany, Dickenson, Fauquier, Hanover, Scott, and Southampton counties.

Other Virginia records: Loudoun (W.R. Grooms collection, 1) and Montgomery (VPISU, 1) counties.

Photo records: Carroll Co. (W. Cook); Rockingham Co. (J. Reilly).

Virginia flight dates: 19 April-8 June

Hostplants: Poison sumac (Forbes, 1954; Covell, 1984).

Comments: This beautifully marked species is collected infrequently in Virginia. It is widely distributed, but uncommon and local in eastern North America (Covell, 1984). It is regarded as "moderately common" in Kentucky (Covell, 1999). Poison sumac is uncommon in the Coastal Plain physiographic province of Virginia, and rare in the Piedmont and mountain regions (VBA, 2018), which, in addition to its early flight season (when sampling has been less frequent), probably accounts for the relatively few records of *E. pulcherrimus*.

DISCUSSION

Seven species of the noctuoid moth family Euteliidae have been documented from Virginia. The same seven widespread species inhabit Kentucky (Covell, 1999), Maryland (Glaser et al., ms; Maryland Biodiversity Project), and Ohio (Rings et al., 1992). The North Carolina fauna also includes seven species, with six of them (all but *P. abrostolella*) shared with Virginia. There is also one record of *P. nubifera* Hampson, a Deep South and Middle American species, from the North Carolina Piedmont (North Carolina Biodiversity Project). The same six species occur in West Virginia (Butler & Strazanac, 2014). Barring the future discovery of undetected sibling species, or perhaps a stray occurrence of *P. nubifera*, no additional members of the family Euteliidae are expected to occur in Virginia.

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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), Eric Chapman (UK), David Wagner and Jane O'Donnell (UConn), Zachary Falin (KU), Charles Mitter (UMD), 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). Kelly Richers provided records from his private collection and Susan Felker and William Grooms (via Robert Lyon) donated their collections to VDCR-DNH. James Reilly shared his photographic records.

Christopher Heckscher, David Wagner, and Dale Schweitzer collectively made me aware of Jones' (1928–1939) unpublished manuscript on Delmarva Lepidoptera and graciously provided a photocopy of it. Dale also identified or verified some of the VDCR-DNH specimens cited above. The late John Glaser provided a copy of his unpublished manuscript on the moth fauna of Maryland.

Finally, I thank John Brown, Bo Sullivan, Steve Hall, Don Lafontaine, Chris Schmidt, Charlie Covell, Eric Quinter, and Dale Schweitzer for reviewing the manuscript and providing helpful comments.

LITERATURE CITED

Bastian, S. F. 2011. Virginia Beach Naturally: A Guide to Enjoying the Wildlife of Virginia Beach, VA. Privately published. Printed by Thomson-Shore, Inc., Dexter, MI. 504 pp.

Beadle, D., & S. Leckie. 2012. Peterson Field Guide to Moths of Northeastern North America. Houghton Mifflin Harcourt Publishing Company, Boston, MA. 611 pp.

Belden, A., Jr., & K. L. Derge. 2003. The flora and fauna of Virginia Army National Guard OMS No. 1 and No. 2 near Sandston, Henrico County, Virginia. Banisteria 22: 22–42.

Brown, J. W. 2008. Moths and butterflies. Pp. 57–61 *In* A. V. Evans (coordinator), The 2006 Potomac Gorge Bioblitz. Banisteria 32.

BugGuide. https://bugguide.net. (Accessed October–November 2018).

Butler, L., V. Kondo, & J. Strazanac. 2001. Light trap catches of Lepidoptera in two Central Appalachian forests. Proceedings of the Entomological Society of Washington 103: 879–902.

Butler, L., & J. Strazanac. 2014. Catalog of Lepidoptera in the West Virginia Collection. West Virginia University Agricultural and Forestry Experiment Station. USDA FHTET-2014-2. CD-ROM.

Butterflies and Moths of North America (BAMONA). https://www.butterfliesandmoths.org/. (Accessed October–November 2018).

Covell, C. V., Jr. 1984. A Field Guide to the Moths of Eastern North America. Houghton Mifflin Company, Boston, MA. 496 pp. (reprinted in 2005 as Virginia Museum of Natural History Special Publication Number 12)

Covell, C. V., Jr. 1999. The butterflies and moths (Lepidoptera) of Kentucky: An annotated checklist. Kentucky State Nature Preserves Commission, Scientific and Technical Series 6: 1–220.

Covell, C. V., Jr., B. D. Marcus, & J. M. Marcus. 2018. Kentucky Butterfly Net: An Interactive Web Database to facilitate Lepidoptera research and education in Kentucky. http://www.kylepidopterists.org/database.html. Society of Kentucky Lepidopterists. (Accessed December 2018).

Forbes, W. T. M. 1954. Lepidoptera of New York and Neighboring States. Part III. Noctuidae. Cornell University Agricultural Experiment Station Memoir 329. 433 pp.

Glaser, J., H. G. Stevenson, & D. C. Ferguson. Moths of Maryland: An annotated list. Unpublished manuscript.

Hodges, R. W., T. Dominick, D. R. Davis, D. C. Ferguson, J. G. Franclemont, E. G. Munroe, & J. A. Powell. 1983. Check List of the Lepidoptera of America North of Mexico. E. W. Classey Ltd. and The Wedge Entomological Research Foundation, London. 284 pp.

iNaturalist. https://www.inaturalist.org. (Accessed November 2018).

Integrated Digitized Biocollections (iDigBio). https://www.idigbio.org/portal/search. (Accessed December 2018).

Jones, F. M. 1928–1939. Lepidoptera of Delaware, Peninsular Maryland and Virginia. Unpublished manuscript, Claude E. Phillips Herbarium, Delaware State University, Dover, DE. Unpaginated.

Lafontaine, J. D., & B. C. Schmidt. 2010. An annotated check list of the Noctuoidea (Insecta, Lepidoptera) of North America north of Mexico. Zookeys 40: 1–239.

Leckie, S., & D. Beadle. 2018. Peterson Field Guide to Moths of Southeastern North America. Houghton Mifflin Harcourt Publishing Company, Boston, MA. 652 pp.

Lepidoptera of North America (LepNet). https://www.lep-net.org. (Accessed December 2018).

Ludwig, J. C. 1999. The flora of dolomite and limestone barrens in southwestern Virginia. Castanea 64: 209–230.

Ludwig, J. C. 2000. A survey of macrolepidopteran moths near Vontay, Hanover County, Virginia. Banisteria 15: 16–35.

Ludwig, J. C. 2001. An update to the survey of macrolepidopteran moths near Vontay, Hanover County, Virginia. Banisteria 17: 42–47.

Ludwig, J. C. 2002. Second update to the survey of macrolepidopteran moths near Vontay, Hanover County, Virginia. Banisteria 19: 17–19.

Ludwig, J. C. 2009. An updated list of macrolepidopteran moths collected near Vontay, Hanover County, Virginia 1996–2003. Banisteria 34: 38–44.

Maryland Biodiversity Project. https://www.marylandbiodiversity.com. (Accessed December 2018).

Metzler, E. H., & J. G. Franclemont. 1991. A review of four species names of *Paectes* from North America (Noctuidae: Euteliinae). Journal of the Lepidopterists' Society 45: 34–41.

Metzler, E. H., J. A. Shuey, L. A. Ferge, R. A. Henderson, & P. Z. Goldstein. 2005. Contributions to the understanding of tallgrass prairie-dependent butterflies and moths (Lepidoptera) and their biogeography in the United States. Ohio Biological Survey Bulletin (New Series) 15(1). 143 pp.

Moth Photographers Group. http://mothphotographersgroup.msstate.edu/. (Accessed October–November 2018).

North Carolina Biodiversity Project. http://nc-biodiversity.com/. (Accessed October–November 2018).

Rings, R. W., E. H. Metzler, F. J. Arnold, & D. H. Harris. 1992. The Owlet Moths of Ohio (Order Lepidoptera, Family Noctuidae). Bulletin of the Ohio Biological Survey, Volume IX (New Series), Number 2. 219 pp.

Roble, S. M. 2016. Natural heritage resources of Virginia: Rare animals. Natural Heritage Technical Report 16-07. Virginia Department of Conservation and Recreation, Division of Natural Heritage, Richmond, VA. 56 pp.

Roble, S. M. 2018. Carpenter and leopard moths of Virginia (Lepidoptera: Cossoidea: Cossidae, Dudgeoneidae). Banisteria 51: 23–32.

Skinner, H. 1921. Moths collected at Hot Springs, Virginia (Lepid.). Entomological News 32: 65–71.

Steury, B., J. Glaser, & C. S. Hobson. 2007. A survey of the macrolepidopteran moths of Turkey Run and Great Falls National Parks, Fairfax County, Virginia.

Banisteria 29: 17–31.

Symbiota Collections of Arthropods Network (SCAN). http://scan-bugs.org/portal/. (Accessed December 2018).

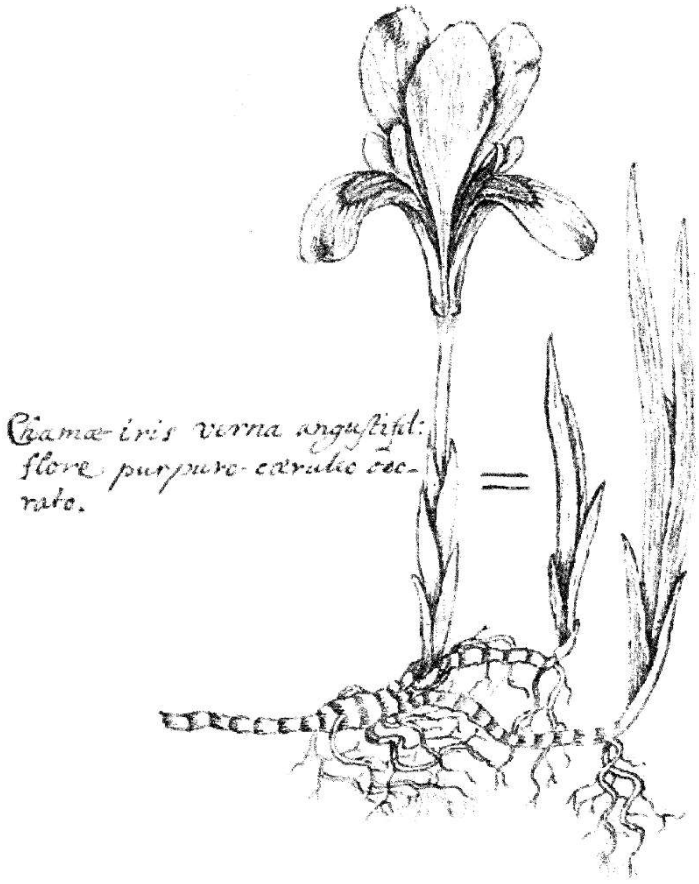
van Nieukerken, E. J. and 50 coauthors. 2011. Order Lepidoptera Linnaeus, 1758. Pp. 212–221 *In* Z.-Q. Zhang (ed.). Animal biodiversity: An outline of higher-level classification and survey of taxonomic richness. Zootaxa 3148.

Virginia Botanical Associates (VBA). 2018. Digital Atlas of the Virginia Flora. http://www.vaplantatlas.org. c/o Virginia Botanical Associates, Blacksburg, VA. (Accessed December 2018).

Wagner, D. L. 2005. Caterpillars of Eastern North America. Princeton University Press, Princeton, NJ. 512 pp.

Wagner, D. L., D. F. Schweitzer, J. B. Sullivan, & R. C. Reardon. 2011. Owlet Caterpillars of Eastern North America. Princeton University Press, Princeton, NJ. 576 pp.

Zahiri R., I. J. Kitching, J. D. Lafontaine, M. Mutanen, L. Kaila, J. D. Holloway, & N. Wahlberg. 2010. A new molecular phylogeny offers hope for a stable family level classification of the Noctuoidea (Lepidoptera). Zoological Scripta doi:10.1111/j.1463-6409.2010.00459.x



Iris verna Linnaeus (Dwarf Iris)

Original drawing by John Banister; sent to Bishop D. H. Compton in 1689.
Figure 48 in folio in Sir Hans Sloane's MS 4002 in the British Museum.
Photocopy courtesy of Joseph and Nesta Ewan.