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## RESEARCH ARTICLE

# THE COLEOPTERA OF THE SMITHSONIAN ENVIRONMENTAL RESEARCH CENTER. 2023 SUPPLEMENT.

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## ABSTRACT

We report 145 Coleoptera species new to the inventory at the Smithsonian Environmental Research Center (SERC) for 2023. This brings the total number of beetle species documented at SERC to 957. The families Aderidae and Stenotrachelidae are reported from SERC for the first time. Five species of Staphylinidae are recorded from Maryland for the first time.

**Keywords:** Beetles, biodiversity, insects, Maryland.

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## INTRODUCTION

This is a continuation of our inventory work at the Smithsonian Environmental Research Center (SERC), located in Edgewater, Maryland. Previous work had documented 815 Coleoptera species in 78 families (Staines & Staines 2019, 2020a-d, 2021a-f, 2022). For a detailed description of SERC habitats see Staines & Staines (2020a).

## MATERIALS AND METHODS

For 2023 we set three Lindgren funnel traps and left them stationary throughout the season. They were baited with USDA exotic bark beetle lure and ethanol. They were set on 22 March 2023 and checked weekly or every two weeks depending on the weather until 25 September 2023.

Seven flight intercept traps were set on 25 May 2023 and planned to be checked every two weeks (as needed if there was heavy rain) until 25 September 2023.

Much of the actual collecting of terrestrial species was by visual survey of potential habitats. We checked the lights around Mathais Lab and the Reed Education Center near dawn, did bark peeling, beating vegetation, and sweeping vegetation in various areas.

Identifications were made by the senior author using published (See references) and on-line resources (Atkinson, 2023; Mercado, 2010). Voucher specimens are deposited in the SERC collection. Duplicate specimens are deposited in the National Museum of Natural History, Smithsonian Institution, and Towson University.

## RESULTS

### Family Aderidae

*Elonus basalis* (LeConte) has been taken on leaves of *Cornus* (Cornaceae), sweeping vegetation, and at lights (Ciegler, 2014). SERC specimens were taken in a flight intercept trap at Fox Point from 22-28 June 2023.

*Syzeton subfasciatus* (LeConte) has been collected on *Cornus florida* L., *Quercus* (Fagaceae), *Prunus* (Rosaceae), and at light (Ciegler, 2014). The single SERC specimen was taken by sweeping vegetation on 20 April 2023 along the Connector Trail between Fox Point Road and Java History Trail.

These are the first species of Aderidae species documented at SERC.

### Family Anthicidae

*Anthicus melancholicus* LaFerté-Sénéctère has an unknown biology. Other *Anthicus* species are scavengers on dead insects and feed on fungi (Werner, 1964). SERC specimens were taken sweeping vegetation along Contee Watershed Trail on 6 June 2023.

*Notoxus murinipennis* (LeConte) has an unknown biology. *Notoxus* species are commonly collected by beating and sweeping vegetation; adults are omnivores (Chandler, 1982). The single SERC specimen was taken beating vegetation around the Reed Education Center on 8 May 2023.

This brings the total number of Anthicidae species documented at SERC to four.

### Family Anthribidae

*Meconemus tuberculatus* Labram & Imhoff is a generalist in dead branches without fungi (Valentine, 1998). The single SERC specimen was taken in a Lindgren funnel trap from 31 July to 8 August 2023 in the pine plantation opposite the drive to Java House.

This brings the total number of Anthribidae species documented at SERC to six.

## Family Brentidae

*Trichapion contusum* (Smith) has been collected on *Robinia* (Fabaceae) and *Salix* (Salicaceae) (Kissinger, 1968). SERC specimens were taken sweeping vegetation in the meadow in front of Mathais Lab on 6 June 2023. Both *Robinia* and *Salix* grow adjacent to the meadow.

This brings the total number of Brentidae species documented at SERC to six.

## Family Buprestidae

*Agrilus crataegi* Frost larvae breed in *Amelanchier alnifolia* (Nutt.) Nutt. and *Crataegus* sp. (Rosaceae); adults have been collected from *C. crus-galli* L., *C. douglasii* Lindl, and *Juglans nigra* L. (Juglandaceae) (Paiero et al., 2012; Harpootlian & Bellamy, 2014). A single SERC specimen was taken in a flight intercept trap off Fox Point Road from 8-18 June 2021.

*Agrilus defectus* LeConte larvae bore in *Quercus*; adults have been collected from *Carya* (Juglandaceae), *Celtis* (Cannabaceae), *Cercis* (Fabaceae), and *Crataegus* (Harpootlian & Bellamy, 2014). The single SERC specimen was taken sweeping vegetation along Back Road near the deer checking station on 6 May 2023.

*Agrilus fallax* Say breeds in a various of hardwood trees (Harpootlian & Bellamy, 2014). SERC specimens were taken beating *Celtis occidentalis* L. along Squirrel Neck Loop on 24 May 2023.

*Agrilus imbellis* Crotch adults have been collected a variety herbaceous plants (Harpootlian & Bellamy, 2014). The single SERC specimen was taken beating *Fraxinus* (Oleaceae) in Zone 6 on 22 May 2023.

*Agrilus masculinus* Horn breeds in a variety of hardwood trees (Harpootlian & Bellamy, 2014). SERC specimens were taken sweeping vegetation around the water tower above the dorms on 20 May 2023, along Squirrel Neck Loop on 24 May 2023, and beating *Acer negundo* L. (Sapindaceae) around the Reed Education Center on 24 May 2024.

*Agrilus oblongus* Fisher breeds in *Vitis* (Vitaceae), adults have been collected on *Celtis* (Harpootlian & Bellamy, 2014). SERC specimens were taken beating *Celtis occidentalis* L. along Squirrel Neck Loop on 24 May 2023 and in Zone 2 on 1 June 2023.

*Agrilus paracelti* Knull larvae bore in *Celtis*; adults have been collected from *Carya*, *Quercus*, and *Ulmus* (Ulmaceae) (Harpootlian & Bellamy, 2014). The single SERC specimen was taken beating *Carya* along Contee Watershed Trail on 11 May 2023.

*Agrilus ruficollis* (Fabricius) larvae bore in *Rubus* (Rosaceae) (Harpootlian & Bellamy, 2014). SERC specimens were taken sweeping vegetation along the woods margin behind the Sellman House on 8 May 2023; sweeping *Rubus phoenicosis* Maxim. along the margins of the agricultural field along Contees Wharf Road on 23 May 2023 and along Back Road on 5 June 2023.

*Anthaxia fisheri* Obenberger larvae breed in *Prunus*; adults have been collected on *Acer* and *Gleditsia* (Fabaceae) (Harpootlian & Bellamy, 2014). The single SERC specimen was taken at light near the Reed Education Center on 3 July 2023.

*Anthaxia viridifrons* Gory larvae bore in *Amelanchier*, *Carya*, *Morus* (Moraceae), and *Ulmus*; adults are found on various hardwood trees (Harpootlian & Bellamy, 2014). The single SERC specimen was taken sweeping vegetation along Back Road near the NEON Tower on 6 May 2023.

*Brachys ovatus* (Weber) is a leaf miner on various *Quercus* (Harpootlian & Bellamy, 2014). SERC specimens were taken sweeping vegetation along Squirrel Neck Loop on 15 May 2023 and beating *Quercus* near the Java House ruins on 27 May 2023.

*Mastogenius crenulatus* Knull larvae bore in *Carya*, *Cercis*, *Diospyros* (Ebenaceae), and *Quercus*; adults have been found on *Acer* and *Salix* (Harpootlian & Bellamy, 2014). The single SERC specimen was taken sweeping vegetation along the woods margin behind the Sellman House on 8 May 2023.

This brings the total number of Buprestidae species documented at SERC to 20.

### **Family Cantharidae**

*Atalantycha dentigera* (LeConte) has no published biological information. SERC specimens were taken beating *Celtis occidentalis* along Squirrel Neck Loop on 24 May 2023.

*Cantharis tuberculatus* (LeConte) is found on shrubs and bushes in hardwood forests (Pelletier & Hébert, 2014). The single SERC specimen was taken in a Lindgren funnel trap at Fox Point from 27 April to 15 May 2023.

*Dichelotarsus cinctipennis* (LeConte) has been found in hardwood forests (Pelletier & Hébert, 2014). The single SERC specimen was taken sweeping vegetation along Contee Watershed Trail on 16 May 2023.

*Silis difficilis* LeConte is associated with marshes and bogs (Pelletier & Hébert, 2014). SERC specimens were taken sweeping vegetation in the meadow in front of Mathais Lab on 6 May 2023.

This brings the total number of Cantharidae species documented at SERC to 18.

### **Family Carabidae**

*Agonum pallipes* (Fabricius) is a lowland species found in old fields, pastures, and open woods (Larochelle & Larivière, 2003). The single SERC specimen was taken in a Lindgren funnel trap at Fox Point from 8-16 August 2023.

*Amara apricaria* (Paykull), an introduced species, has been found in fields, meadows, roadsides, and forest clearings (Bousquet, 2010). The single SERC specimen was taken sweeping vegetation along the woods margin behind the Sellman House on 8 May 2023.

*Bembidion impotens* Casey has been collected along rivers, lakes, ponds, and pools (Larochelle & Larivière, 2003). The single SERC specimen was taken in a Lindgren funnel trap near the meteorological tower behind Mathais Lab from 31 March to 14 April 2023.

*Chlaenius sericeus* (Forster) has been found along the margins of rivers, lakes, ponds, pools, marshes, and swamps (Larochelle & Larivière, 2003). SERC specimens were taken at lights around the Reed Education Center on 12 June 2023 and 3 July 2023.

*Gastrellarius honestus* (Say) has been found in deciduous and coniferous forests (Larochelle & Larivière, 2003). The single SERC specimen was taken under bark near the canoe shed on 5 June 2023.

*Lebia vittata* (Fabricius) adults are active on foliage and flowers (Evans, 2014). SERC specimens were taken sweeping *Solidago* at the intersection of Contees Wharf Road and the drive to Java House on 3 October 2023.

*Leptotrachelus dorsalis* (Fabricius) has been associated with marsh grasses, found in leaf litter, and at lights (Erwin & Medina, 2003; Ciegler, 2000). The single SERC specimen was taken at light near the Reed Education Center on 3 July 2023.

*Oodes amaroides* Dejean has been collected around ponds and under wet leaves (Erwin, 1981). The single SERC specimen was taken at light around the Reed Education Center on 22 April 2023.

This brings the total number of Carabidae species documented from SERC to 136.

### **Family Cerambycidae**

*Acanthocinus obsoletus* (Olivier) feeds on *Pinus* (Pinaceae) (Lingafelter, 2007). SERC specimens were taken at light around the Reed Education Center on 24 June 2023, 12 July 2023, and at light around Mathais Lab on 14 July 2023.

*Aegomorphus modestus* (Gyllenhal) larvae feed on a variety of hardwood trees (Lingafelter, 2007). SERC specimens were taken at lights around the Reed Education Center on 20 June 2023 and 8 July 2023, and in a Lindgren funnel trap at Fox Point from 28 June to 10 July 2023.

*Anelaphus moestus* (LeConte) breeds in a variety of hardwood trees (Lingafelter, 2007). SERC specimens were taken in a flight intercept trap at Fox Point from 30 May to 13 June 2023 and 28 June to 10 July 2023.

*Anelaphus pumilus* (Newman) larvae feed on *Quercus*, *Castanea* (Fagaceae), *Carya*, *Ulmus*, *Betula nigra* L. (Betulaceae), and *Tilia* (Tiliaceae); adults are attracted to lights (Yanega, 1996). A single SERC specimen was taken in a flight intercept trap in Frog Canyon from 8-18 June 2021.

*Anelaphus villosus* (Fabricius) is a twig pruner of many eastern hardwood trees and shrubs (Lingafelter, 2007). SERC specimens were taken in flight intercept traps at Back Road opposite the NEON tower and at Fox Point from 13-22 June 2023 and 28 June to 10 July 2023, in a Lindgren

funnel trap at Fox Point from 26 July to 1 August 2023, and at light near the Reed Education Center on 12 July 2023.

*Astylopsis macula* (Say) breeds in a number of hardwood trees (Lingafelter, 2007). SERC specimens were taken in Lindgren funnel traps near the meteorological tower behind Mathias Lab from 13 June to 22 July 2023, 16-30 August 2023, and in the pine plantation opposite the drive to Java House from 10-22 July 2023.

*Cyrtinus pygmaeus* (Say) breeds in dry branches of many hardwood trees, especially *Quercus* (Lingafelter, 2007). The single SERC specimen was taken beating vegetation around the Reed Education Center on 15 May 2023.

*Eupogonius pauper* LeConte breeds in numerous hardwood trees (Lingafelter, 2007). SERC specimens were taken at light around the Reed Education Center on 20 June 2023 and around Mathias Lab on 12 July 2023.

*Hyperplatyus aspersa* (Say) larvae bore in various hardwoods (Lingafelter, 2007). The single SERC specimen was taken sweeping vegetation along the woods margin behind the Sellman House on 8 May 2023.

*Liopinus mimetinus* Casey feeds in various hardwoods (Lingafelter, 2007). The single SERC specimen was taken in a Lindgren funnel trap in the pine plantation opposite the drive to Java House from 31 July to 8 August 2023.

*Megacyllene robiniae* (Forster) larvae bore in *Robinia pseudoacacia* L. and other locusts; adults are commonly found on *Solidago* flowers (Asteraceae) (Lingafelter, 2007). The single SERC specimen was taken sweeping *Solidago* along Contee Watershed Trail on 21 September 2023.

*Neoclytus scutellaris* (Olivier) breeds in various *Quercus* and *Carya* (Lingafelter, 2007). The single SERC specimen was taken in a Lindgren funnel trap near the meteorological tower behind Mathias Lab from 13-22 June 2023.

*Oberea perspicillata* Haldeman larvae are stem borers in *Rubus* and *Rosa* (Rosaceae) (Lingafelter, 2007). A single specimen was taken sweeping vegetation along Back Road near the NEON tower on 5 June 2023.

*Orthosoma brunneum* (Forster) larvae feed in hardwood and conifer trees; adults are attracted to lights (Lingafelter, 2007). SERC specimens were taken in Lindgren funnel traps near the meteorological tower behind Mathias Lab from 28 June to 31 July 2023, in the pine plantation opposite the drive to Java House from 22 July to 1 August, and at light around the Reed Education Center on 14 July 2023.

*Phymatodes amoenus* (Say) larvae mine in dead *Vitis* vines (Yanega, 1996). The single SERC specimen was taken in a Lindgren funnel trap at Fox Point from 31 March to 14 April 2023.

*Rhagium inquisitor* (L.) larvae feed on various conifers (Lingafelter, 2007). SERC specimens were taken in Lindgren funnel traps in the pine plantation opposite the drive to Java House from 22 March to 27 April 2023 and near the meteorological tower behind Mathais Lab from 31 March to 27 April 2023.

*Saperda lateralis* Fabricius larvae feed on various dead hardwoods and shrubs, especially *Acer* (Yanega, 1996). A single SERC specimen was taken in a flight intercept trap on Back Road opposite the NEON tower from 8-18 June 2021.

*Saperda puncticollis* Say feeds on dead and dying *Parthenocissus quinquefolia* (L.) Planch. (Vitaceae), *Toxicodendron radicans* (L.) Kuntze (Anacardiaceae), and *Vitis* (Lingafelter, 2007). The single SERC specimen was taken in a flight intercept trap in the pine plantation opposite the drive to Java House from 13-22 June 2023.

*Saperda tridentata* Olivier larvae feed on *Ulmus* (Lingafelter, 2007). The single SERC specimen was taken at light around the Reed Education Center on 14 July 2023.

*Typocerus lugubris* (Say) adults are found on many flowers (Lingafelter, 2007). The single SERC specimen was taken in a flight intercept trap on Back Road opposite the NEON tower from 13-22 June 2023.

*Urgleptes facetus* (Say) larvae feed on the branches of various hardwood trees (Lingafelter, 2007). The single SERC specimen was taken beating trees along the margin of the dirt road between zones 2 and 3 on 31 May 2023.

*Urgleptes querci* Fitch larvae feed in branches of numerous hardwoods, shrubs, and vines (Lingafelter, 2007). SERC specimens were taken in a flight intercept trap near Muddy Creek Road from 8-18 June 2021 and beating *Nyssa sylvatica* Marshall (Nyssaceae) along Contees Wharf Road on 23 May 2023.

This brings the total number of Cerambycidae species documented from SERC to 51.

### **Family Chrysomelidae**

*Acanthoscelides alboscuteillus* (Horn) adults have been collected on *Daucus carota* L. (Apiaceae); *Glycyrrhiza lepidota* (Nutt.) Pursh (Fabaceae); *Ludwigia alternifolia* L., and *L. palustris* (L.) Elliott (Onagraceae) (Kingsolver, 2004). The single SERC specimen was collected sweeping *Solidago* at the intersection of Contees Wharf Road and the drive to Java House on 3 October 2023.

*Anomoea laticlavata* (Forster) has been collected on a wide variety of plants (Wilcox, 1979). The single SERC specimen was taken beating vegetation in the woods above the Sellman House on 1 June 2023.



*Bassareus lituratus* (Fabricius) has been collected on *Pycnanthemum* (Lamiaceae) and *Desmodium* (Fabaceae) (Riley & Enns, 1979; Flowers et al., 1994). A single SERC specimen was taken sweeping vegetation in the meadow in front of Mathais Lab on 6 June 2023.

*Cryptocephalus quadruplex* Newman adults have been collected on *Vaccinium* (Ericaceae), *Salix bebbiana* Richards, and *Comptonia peregrina* (L.) Coult. (Myricaceae) (LeSage, 1986). The single SERC specimen was taken sweeping vegetation along the woods margin behind the Sellman House on 8 May 2023.

*Lema trivittata* Say has been associated with *Datura stramonium* L., *D. quercifolia* H.B.K., *Hyocyanus*, *Physalis*, *Atropa belladonna* L., *Solanum*, *Chamaesaracha conoides* Britton (Solanaceae), and *Melilotus indica* (L.) All. (Fabaceae) (White, 1993). A single SERC specimen was taken sweeping vegetation along Squirrel Neck Loop on 15 May 2023.

*Dibolia borealis* Chevrolat adults and larvae feed on the leaves of *Plantago lanceolata* L. and *P. major* L. (Plantaginaceae) (Wilcox, 1979). SERC specimens were taken sweeping *P. major* along Back Road on 5 June 2023.

*Disonycha leptolineata* Blatchley has been found on *Itea virginica* L. (Iteaceae) (Watts, 1990). A single SERC specimen was taken sweeping vegetation along Back Road on 20 June 2023.

*Orthaltica copalina* (Fabricius) is commonly collected on *Rhus* (Anacardiaceae) (Wilcox, 1979). The single SERC specimen was taken beating vegetation in Zone 2 on 31 May 2023.

*Oulema palustris* (Blatchley) feeds on *Cirsium arvense* (L.) Scop. (Asteraceae) (Wilcox, 1979). A single SERC specimen was taken sweeping vegetation in the field opposite the Sellman House on 8 May 2023.

*Paria scutellaris* (Notman) has been collected on *Cornus* (Wilcox, 1957), *Polygonum*, and *Rumex verticillatus* L. (Polygonaceae) (Riley & Enns, 1979). SERC specimens were taken sweeping vegetation along the woods margin behind the Sellman House on 8 May 2023, along Squirrel Neck Loop on 15 May 2023, in the woods opposite the Sellman House on 17 May 2023, and beating *Quercus* at Fox Point on 20 May 2023.

*Plagiometriona clavata* (Fabricius) feeds on various Solanaceae (Wilcox, 1979). SERC specimens were taken sweeping vegetation along Contee Watershed Trail on 24 May 2018 and in the Experimental Garden on 23 May 2023.

*Rhabdopterus praetextus* (Say) has been commonly found on *Vitis* (Wilcox, 1954). The single SERC specimen was taken in a flight intercept trap near the Java House ruins from 22-28 June 2023.

This brings the total number of Chrysomelidae species documented from SERC to 81.

## Family Cleridae

*Monophylla terminata* (Say) feeds on woodboring beetles on various trees (Leavengood, 2008). The single SERC specimen was taken sweeping vegetation along the woods margin behind the Sellman House on 8 May 2023.

*Phyllobaenus pubescens* (LeConte) is predaceous on a variety of insects (Leavengood, 2008). SERC specimens were taken sweeping vegetation at the intersection of Contees Wharf and Back Roads on 20 June 2023.

*Phyllobaenus unifasciatus* (Say) has been collected from a variety of plants infested with Cerambycidae and Curculionidae wood borers (Leavengood, 2008). SERC specimens were taken in a Lindgren funnel trap in the pine plantation opposite the drive to Java House from 29 May to 13 June 2023 and in a flight intercept trap at Fox Point from 30 May to 13 June 2023.

*Phyllobaenus verticalis* Say feeds on woodboring beetles on a variety of plants (Leavengood, 2008). The single SERC specimen was taken beating vegetation in Zone 1 on 31 May 2023.

*Placopterus thoracicus* (Olivier) has been collected on various trees and shrubs and feeds on species of woodboring Curculionidae (Leavengood, 2008). SERC specimens were collected beating vegetation in Zone 5 on 22 May 2023 and beating *Diospyros virginiana* near the Java House ruins on 27 May 2023.

*Thanasimus dubius* (Fabricius) is a predator of woodboring beetles attacking conifers (Leavengood, 2008). SERC specimens were taken in Lindgren funnel traps near the meteorological tower behind Mathais Lab from 22-31 March 2023 and in the pine plantation opposite the drive to the Java House from 22-31 March 2023.

This brings the total number of Cleridae species documented from SERC to 15.

## Family Coccinellidae

*Brachiacantha decempustulata* (Melsheimer) has an unknown biology. Other species of *Brachiacantha* prey on various Hemiptera (Gordon, 1976). The single SERC specimen was taken in a flight intercept trap on Back Road opposite the NEON tower from 1-8 August 2023.

*Diomus terminatus* (Say) feeds on aphids (Hemiptera: Aphididae) (Hentz & Nuesslyand, 2003). The single SERC specimen was taken sweeping the woods margin behind Sellman House on 31 August 2023.

*Nephus flavifrons* (Melsheimer) has an unknown biology. Other species of *Nephus* feed on mealybugs (Hemiptera: Pseudococcidae) (Gordon, 1976). The single SERC specimen was taken in a Lindgren funnel trap in the pine plantation opposite the drive to the Java House from 14-27 April 2023.

*Scymnus rubicaudus* Casey feeds on scale insects (Hemiptera) (Gordon, 1976). SERC specimens were taken sweeping vegetation in the meadow in front of Mathais Lab on 6 June 2023.

*Scymnus tenebrosus* Mulsant feeds on scale insects (Gordon, 1976). The single SERC specimen was taken sweeping vegetation in the cypress swamp on 6 June 2023.

This brings the total number of Coccinellidae species documented from SERC to 15.

### **Family Curculionidae**

*Acallodes saltoides* Dietz has an unknown biology. The single SERC specimen was taken sweeping vegetation near the water tower behind the dorms on 20 May 2023.

*Ambrosiodmus tachygraphus* (Zimmermann) larvae and adults feed in a variety of hardwood trees (Wood, 1982). The single SERC specimen was taken in a Lindgren funnel trap in the pine plantation opposite the drive to the Java House from 22-31 March 2023.

*Cophes obtentus* (Herbst) has been taken under bark, in hollow trees, and at light (Ciegler, 2010). SERC specimens were taken in flight intercept traps in the pine plantation opposite the drive to Java House from 22-28 June 2023, at Fox Point from 28 June to 10 July 2023, and near the meteorological tower behind Mathais Lab from 28 June to 10 July 2023.

*Cossonus corticola* Say has been collected under the bark of *Pinus* (Ciegler, 2010). The single SERC specimen was taken in a Lindgren funnel trap at Fox Point from 29 May to 13 June 2023.

*Epicaerus imbricatus* (Say) has been reported on a variety of plants (Blatchley & Leng, 1916). Two SERC specimens were taken sweeping vegetation in the field opposite the Sellman House on 8 May 2023.

*Gnathotrichus materiarius* (Fitch) larvae and adults feed on various conifer species (Wood, 1982). SERC specimens were taken in a Lindgren funnel trap in the pine plantation opposite the drive to the Java House from 22-31 March 2023.

*Hylurgops pinifex* (Fitch) bores in several species of *Pinus* (Wood, 1982). A single SERC specimen was taken in a flight intercept trap in the pine plantation opposite the drive to Java House from 22-28 June 2023.

*Ips calligraphus* (Germar) breeds in a number species of *Pinus* (Wood, 1982). SERC specimens were taken in Lindgren funnel traps in the pine plantation opposite the drive to the Java House and near the meteorological tower behind Mathias Lab from 31 March to 14 April 2023.

*Myrmex myrmex* (Herbst) has been reported on a variety of plants (Ciegler, 2010). The single SERC specimen was taken beating *Quercus* at Fox Point on 10 May 2023.

*Naupactus cervinus* Boheman, an introduced species, is found on many plants (Ciegler, 2010). The single SERC specimen was taken beating vegetation in Zone 1 on 31 May 2023.

*Sibariops confusa* (Boheman) has been taken at light, along the margins of a pond, on *Cyperus* (Cyperaceae) and other semiaquatic plants (Ciegler, 2010). The single SERC specimen was taken beating vegetation in Zone 6 on 22 May 2023.

*Tomicus piniperda* (Fabricius), an introduced species, feeds on various Pinaceae (Haack & Rabaglia, 2013). SERC specimens were taken in a Lindgren funnel trap at Fox Point from 29 May to 13 June 2023; in flight intercept traps along Fox Point Road from 30 May to 13 June, on Back Road opposite the NEON tower from 25 May to 13 June 2023; and beating vegetation around the Java House ruins on 6 June 2023.

*Xyleborinus saxesenii* (Ratzeburg), an introduced species, larvae and adults feed on a wide variety of trees and shrubs (Wood, 1982). SERC specimens were taken in Lindgren funnel traps near the meteorological tower behind Mathais Lab from 22 March to 29 May 2023, in the pine plantation opposite the drive to the Java House from 22 March to 29 May 2023, and at Fox Point from 22 to 29 May March 2023.

This brings the total number of Curculionidae species documented from SERC to 99.

### **Family Elateridae**

*Agriotes mancus* (Say) has an unknown biology. SERC specimens were taken in a Lindgren funnel trap at Fox Point from 1-15 May 2023 and beating *Quercus* at Fox Point on 20 May 2023.

*Athous acanthus* (Say) is commonly taken on the lower foliage of hardwood trees (Downie & Arnett, 1996). SERC specimens were taken in a Lindgren funnel trap at Fox Point from 15-29 May 2023, sweeping vegetation along the Connector Trail on 20 May 2023, beating vegetation of the woods margin of the agricultural field along Contees Wharf Road on 23 May 2023, and beating vegetation in Zone 6 on 23 May 2023.

*Hadromorphus inflatus* (Say) has been beaten from the foliage of hardwood trees (Downie & Arnett, 1996). SERC specimens were taken in a flight intercept trap in the pine plantation opposite the drive to the Java House ruins from 30 May to 13 June 2023.

*Melanactes morio* (Fabricius) adults are attracted to lights (Evans, 2014). The single SERC specimen was taken beating vegetation in the woods near the guard booth on 17 May 2023.

*Strophenron hamata* (Say) has been found on *Quercus* and other deciduous trees and shrubs and is attracted to lights (Evans, 2014). The single SERC specimen was taken beating *Quercus* at Fox Point on 10 May 2023.

This brings the total number of Elateridae species documented from SERC to 39.

### **Family Endomychidae**

*Lycoperdina ferrugina* LeConte has been found in *Apioperdon pyriforme* (Schaeff.) Vizzini (Lycoperdaceae) and other fungi (Evans, 2014). The single SERC specimen was taken in a Lindgren funnel trap at Fox Point from 29 May to 13 June 2023.

This brings the total number of Endomychidae species documented from SERC to three.

### **Family Erotylidae**

*Ischyryus quadripunctatus* (Olivier) feeds on fungi on logs, adults are found under bark and in rubbish (Skelley, 1998). The single SERC specimen was taken at light near the Reed Education Center on 6 July 2023.

This brings the total number of Erotylidae species documented from SERC to seven.

### **Family Eucnemidae**

*Dirrhagofarsus ernae* Otto, Muona, & McClarin has been collected in flight intercept traps, Lindgren funnel traps, and emerged from *Acer saccharum* L. branches (Otto et al., 2014). SERC specimens were collected in flight intercept traps along Fox Point Road from 25-30 May 2023 and in the pine plantation opposite the drive to Java House from 13-22 June 2023..

*Isarthrus rufipes* (Melsheimer) has been reared from decaying *Fagus* (Muona, 2000). The single SERC specimen was taken in a flight intercept trap on Back Road opposite the NEON tower from 28 June to 10 July 2023.

This brings the total number of Eucnemidae species documented from SERC to seven.

### **Family Histeridae**

*Aeletes politus* (LeConte) has been found in forest floor litter, decaying logs, bracket fungi, and compost (Bousquet & Laplante, 2006). The single SERC specimen was taken in a flight intercept trap near the Java House ruins from 30 May to 13 June 2023.

*Margarinotus brunneus* (Fabricius), an introduced species, is found in carrion and decaying vegetation (Bousquet & Laplante, 2006). The single SERC specimen was taken in a flight intercept trap near the meteorological tower behind Mathais Lab from 22-28 June 2023.

This brings the total number of Histeridae species documented from SERC to seven.

### **Family Hydrophilidae**

*Cercyon assecla* Smetana is found in decaying organic matter, especially rotting plant debris (Smetana, 1978). The single SERC specimen was taken at light near the Reed Education Center on 8 May 2023.

This brings the total number of Hydrophilidae species documented from SERC to 17.

### **Family Laemophloeridae**

*Charaphloeus adustus* (LeConte) has an unknown biology. The single SERC specimen was taken in a flight intercept trap on Back Road opposite the NEON tower from 25 May to 13 June.

This brings the total number of Laemophloeridae species documented from SERC to two.

### **Family Lampyridae**

*Ellychnia corrusca* (L.) is found on flowers, on tree trunks, under loose bark, and sometimes on shrubs (Downie & Arnett, 1996). SERC species were taken by visual survey on Back Road near the NEON tower on 4 and 8 April 2023.

*Photinus pyralis* (L.) is found in meadows and the margins of woodlands (Case, 2004). The single SERC specimen was taken at light around the Reed Education Center on 15 July 2023.

*Pollaclasis bifaria* (Say) has an unknown biology. A single SERC specimen was taken beating *Quercus* in the meadow in front of Mathias Lab on 20 June 2023.

*Pyractomena borealis* (Randall) is found in mesic forests (Lloyd, 1966). Other species of *Pyractomena* feed on Gastropoda (Mollusca) (Buschman, 1984). The single SERC specimen was taken at light around Mathias Lab on 22 April 2023.

This brings the total number of Lampyridae species documented from SERC to 15.

### **Family Lycidae**

*Erotides sculptilis* (Say) larvae are found in rotting *Pinus* (Evans, 2014). The single SERC specimen was taken sweeping vegetation along Back Road near the NEON tower on 5 June 2023.

*Eros humeralis* (Fabricius) adults have been collected under pine bark or on vegetation (Evans, 2014). SERC specimens were taken beating *Quercus* at Fox Point on 15 May 2023 and sweeping vegetation along Back Road on 20 June 2023.

This brings the total number of Lycidae species documented from SERC to five.

### **Family Lymexlidae**

*Hylecoetus lugubris* (Say) bores in a number of hardwood trees (Solomon, 1995). A single SERC specimen was taken in a flight intercept trap at Fox Point from 22–28 June 2023.

This brings the total number of Lymexlidae species documented from SERC to two.

### Family Melandryidae

*Symphora flavicollis* (Haldeman) has been taken on *Cornus* leaves and at light (Ciegler, 2014). SERC specimens were taken beating vegetation along Contees Wharf Road on 23 May 2023, beating *Quercus* at Fox Point on 20 May 2023, in a flight intercept trap at Fox Point from 25-30 May 2023, and in a Lindgren funnel trap near the meteorological tower behind Mathais Lab from 15-29 May 2023.

This brings the total number of Melandryidae species documented from SERC to six.

### Family Meloidae

*Lytta aenea* Say adults have been reported on flowers of *Amelanchier*, *Crataegus*, *Prunus* (peach, plum), and *Pyrus* (Rosaceae) (Selander, 1960). SERC specimens were found by visual survey on 12 April 2023 on Back Road near the deer checking station and at light around Mathais Lab on 22 April 2023.

This brings the total number of Meloidae species documented from SERC to five.

### Family Melyridae

*Hypebaeus oblitus* (LeConte) has an unknown biology. The single SERC specimen was taken sweeping vegetation along the Connector Trail on 20 May 2023.

This brings the total number of Melyridae species documented from SERC to three.

### Family Mordellidae

*Falsomordellistena bihamata* (Melsheimer) has been taken at light (Ciegler, 2014). SERC specimens were taken sweeping along the Connector Trail on 20 May 2023 and beating vegetation along the woods margin along the agricultural field along Contees Wharf Road on 23 May 2023.

*Falsomordellistena liturata* (Melsheimer) has been collected on *Callicarpa* (Lamiaceae) and *Ceanothus* (Rhamnaceae), at UV light, by sweeping (Ciegler, 2014). SERC specimens were taken in a flight intercept trap at Fox Point from 13-22 June 2023.

*Falsomordellistena pubescens* (Fabricius) has been collected on a number of flowering plants (Ciegler, 2014). SERC specimens were taken in flight intercept traps near the Java House ruins from 28 June to 10 July 2023 and in the pine plantation opposite the drive to Java House from 28 June to 10 July 2023.

*Glipodes sericans* (Melsheimer) has been taken at light (Ciegler, 2014). The single SERC specimen was taken in a Lindgren funnel trap at Fox Point from 28 June to 10 July 2023.

*Mordellistena aspersa* (Melsheimer) has been collected from flowers of numerous plant species (Ford & Jackman, 1996). SERC specimens were taken in Lindgren funnel traps and flight intercept

traps near the meteorological tower behind Mathais Lab from 22-26 July 2023, Fox Point from 10-22 July 2023, along Fox Point Road from 10-26 July 2023, Back Road opposite the NEON tower from 10-26 July 2023, and near Java House ruins from 10-26 July 2023.

*Mordellistena pallipes* Smith has an unknown biology. The single SERC specimen was taken in a flight intercept trap at Fox Point from 10-22 July 2023.

*Paramordellaria triloba* (Say) has an unknown biology. SERC specimens were taken in flight intercept traps at Fox Point from 13-22 June 2023, near the Java House ruins from 13-22 June 2023, by sweeping vegetation at the intersection of Contees Wharf and Back Roads on 20 June 2023.

This brings the total number of Mordellidae species documented from SERC to 25.

### **Family Nitidulidae**

*Carpophilus discoideus* LeConte has an unknown biology. A single SERC specimen was taken in a flight intercept trap at Fox Point from 13-22 June 2023.

*Colopterus truncatus* (Randall) has been taken on fallen fruit and at sap flows (Connell, 1956). SERC specimens were taken in a Lindgren funnel trap near the meteorological tower behind Mathais Lab from 31 March to 14 April 2023.

*Conotelus obscurus* Erichson adults are found in many flowers (Evans, 2014). The single SERC specimen was taken beating *Datura stramonium* L. (Solanaceae) near the wet area near Squirrel Neck Loop on 31 August 2023.

*Thalycra carolina* (Wickham) is a coastal plain species associated with *Rhizopogon* (Rhizopogonaceae) (Howden, 1961). SERC specimens were taken in a flight intercept trap in the pine plantation opposite the drive to the Java House ruins from 30 May to 22 June 2023.

This brings the total number of Nitidulidae species documented from SERC to 24.

### **Family Oedemeridae**

*Asclera puncticollis* (Say) has been collected on flowers of *Daucus* and *Prunus* (Ciegler, 2014). The single SERC specimen was taken beating flowering *Crataegus* in the meadow in front of Mathias Lab on 20 April 2023.

This brings the total number of Oedemeridae species documented from SERC to three.

### **Family Ptinidae**

*Byrrhodes intermedius* (LeConte) has been reared from fungi, taken in flight intercept traps, beating vegetation, and Lindgren funnel traps (Arango & Young, 2012). SERC specimens were



taken in flight intercept traps near the Java House ruins from 13-22 June 2023 and along Fox Point Road from 22-28 June 2023.

This brings the total number of Ptinidae species documented from SERC to 14.

### **Family Pyrochroidae**

*Dendroides canadensis* Latreille has been collected at light and under bark (Ciegler, 2014). The single SERC specimen was taken at light at the Reed Education Center on 5 August 2023.

This brings the total number of Pyrochroidae species documented from SERC to four.

### **Family Scarabaeidae**

*Copris minutus* (Drury) has been taken from dung, carrion, rotting fruit, and at lights (Price & Ratcliffe, 2023). The single SERC specimen was taken in a flight intercept trap in the pine plantation opposite the drive to Java House from 9-25 September 2023.

*Euetheola rugiceps* (LeConte) is associated with *Zea mays* L. (Poaceae) and *Gossypium* (Malvaceae) and has been taken at lights (Price & Ratcliffe, 2023). SERC specimens were taken at light around the Reed Education Center on 1 August 2023.

*Phyllophaga balia* (Say) adults have been collected on the leaves of *Fagus* (Fagaceae) and *Juglans* (Luginbill & Painter, 1953). The single SERC specimen was taken at light around Mathais Lab on 22 April 2023.

*Phyllophaga crenulata* (Froelich) adults are found on a wide variety of plants (Luginbill & Painter, 1953). The single SERC specimen was taken at light around Mathais Lab on 20 June 2023.

This brings the total number of Scarabaeidae species documented from SERC to 64.

### **Family Silvanidae**

*Telephanus atricapillus* Erichson is found under rubbish and is attracted to lights (Thomas, 1993). The single SERC specimen was taken sweeping vegetation along Contee Watershed Trail on 16 May 2023.

This brings the total number of Silvanidae species documented from SERC to three.

### **Family Staphylinidae**

*Anotylus rugosus* (Fabricius), an introduced species, has been found in dung, carrion, and decomposing organic matter (Newton et al., 2001). SERC specimens were taken in fox dung along Contee Watershed Trail on 6 June 2023. Brattian et al. (2019) reported this species from Virginia. **NEW STATE RECORD.**

*Hesperus stehri* Moore has an unknown biology. The single SERC specimen was taken in a Lindgren funnel trap at Fox Point from 15-29 May 2023.

*Homaeotarsus badius* (Gravenhorst) has an unknown biology. Members of this genus are found generally in riparian areas (Webster & DeMerchant, 2012). Brattian et al. (2019) reported this species from the District of Columbia and Virginia. SERC specimens were taken under a log near a vernal pool on Back Road near the deer checking station on 12 April 2023 and in a flight intercept trap near the meteorological station behind Mathais Lab from 28 June to 10 July 2023. **NEW STATE RECORD.**

*Phanerota fasciata* (Say) is found in mushrooms (Ashe, 1981). SERC specimens were taken in *Russula brevipes* Peck (Russulaceae) mushrooms along Contee Watershed Trail on 23 August 2023. Brattian et al. (2019) reported this species from Virginia. **NEW STATE RECORD.**

*Philonthus debilis* (Gravenhorst), an introduced species, is found in many types of decaying organic material (Smetana, 1995). SERC specimens were taken in Lindgren funnel traps near the meteorological tower behind Mathais Lab from 22-31 March 2023 and in the pine plantation opposite the drive to the Java House from 22-31 March 2023.

*Platydracus maculosus* (Gravenhorst) has been found in deciduous forests and open areas; on carrion or dung; in leaf litter and rotting fungi (Brunke et al., 2011). The single SERC specimen was taken under a road barrier at the intersection of Fox Point and Back Roads on 15 May 2023.

*Siagonium americana* (Melsheimer) has been found under bark of decaying trees, especially conifers (Newton et al., 2001). The single SERC specimen was taken in a flight intercept trap on Back Road opposite the NEON tower from 25 May to 13 June 2023. Brattian et al. (2019) reported this species from the District of Columbia and Virginia. **NEW STATE RECORD.**

This brings the total number of Staphylinidae species documented from SERC to 70.

### **Family Stenotrachelidae**

*Cephaloon lepturides* Newman larvae are found in rotting wood and adults have been collected off a variety of plants (Young, 2002). SERC specimens were taken sweeping vegetation along the woods margin behind the Sellman House on 8 May 2023 and in a Lindgren funnel trap at Fox Point from 1-15 May 2023.

This is the first species of Stenotrachelidae species documented from SERC.

### **Family Tenebrionidae**

*Helops aereus* Germar has been taken on *Quercus* bark, in hollow tree, and at carrion (Ciegler, 2014). The single SERC specimen was taken in a Lindgren funnel trap at Fox Point from 1-15 May 2023.

*Hymenorus obesus* Casey has been taken at lights, in peach tree (*Prunus*), and in rotten pine (*Pinus*) branch (Ciegler, 2014). SERC specimens were taken in a Lindgren funnel trap at Fox Point from 22-28 June 2023 and a flight intercept trap along Back Road opposite the NEON tower from 22-26 July 2023.

*Hymenorus picipennis* Casey has been taken at light (Ciegler, 2014). The single SERC specimen was taken in a Lindgren funnel trap at Fox Point from 26 July to 1 August 2023.

*Statria gagatina* Melsheimer has been collected in *Liriodendron* (Magnoliaceae) flowers and at lights (Ciegler, 2014). The single SERC specimen was taken beating *Robinia pseudoacacia* L. along Contees Wharf Road on 6 May 2023.

This brings the total number of Tenebrionidae species documented from SERC to 44.

### **Family Trogidae**

*Trox foveicollis* Harold has been found on dead mouse (Mammalia: Rodentia) and squirrel (Mammalia: Scuridae), on chicken feathers (*Gallus gallus domestica* (L.)- Aves: Phasianidae), owl pellets (Aves: Strigiformes), and at lights (Ratcliffe & Paulsen, 2008; Kriska & Young, 2002). The single SERC specimen was taken in a flight intercept trap near the Java House ruins from 25-30 May 2023.

This brings the total number of Trogidae species documented from SERC to four.

### **Family Zopheridae**

*Hyporhagus punctulatus* Thomson has been collected on *Castanea* (Fagaceae) flowers, in dead tree trunk, at light, and in Lindgren funnel traps (Ciegler, 2014). SERC specimens were taken in a Lindgren funnel trap at Fox Point from 1-15 May 2023.

This brings the total number of Zopheridae species documented from SERC to two.

## **DISCUSSION**

The 957 beetle species in 80 families documented from our six year survey at SERC compares favorably with other mid-Atlantic state projects. Brown (2008) summarized the published beetle records for Plummers Island (Montgomery County, Maryland). From 1901 to 2008 there were 672 species recorded in 20 families. This does not represent the total number of beetle species collected on Plummers Island since many of the families have no published records. In a one year project there were 400 beetle species in 54 families collected at Eastern Neck National Wildlife Refuge (Kent County, Maryland) (Staines & Staines 2006, 2012, 2023). The most beetle species documented project is the 24 year effort along the George Washington Memorial Parkway (Fairfax County, Virginia; Montgomery County, Maryland). To date the project has published records for 1418 species in 46 families (Brattain et al., 2019; Cavey et al., 2013; Chandler & Steury, 2023; Evans & Steury, 2012; Johnson & Steury, 2021; Steury, 2017, 2018ab, 2019, 2020, 2021, 2023a,b; Steury & Chandler, 2023; Steury & Leavengood, 2019; Steury

& MacRae, 2012, 2014; Steury & Paulson 2022; Steury & Steiner, 2020, 2021; Steury et al., 2013, 2018, 2020, 2023). These results document most of the speciose beetle families but few of the less species rich ones.

We have been focusing on woodboring beetles for the past two seasons. This year was extremely productive in capturing 45 species new to SERC- 12 Buprestidae, 21 Cerambycidae, eight Curculionidae, two Eucnemidae, one Anthribidae, and one Lymexlidae. The most productive woodboring beetle collecting method was Lindgren funnel traps (14 species) followed by flight intercept traps (13 species), sweeping vegetation (eight species), beating vegetation (seven species), and lights (one species).

Overall collecting method results were sweeping vegetation (32 species, 23.3%), Lindgren funnel traps (30 species, 21.9%), flight intercept traps (29 species, 21.1%), beating vegetation (23 species, 16.7%), at light (15 species, 10.9%), visual survey (three species, 2.1%), under bark (two species, 1.4%), and in dung (one species, 0.7%).

We noted that the flight intercept traps needed to be checked after almost every rain as the screening funneled the water into the trap bottles, diluting the alcohol and flooding them. In very hot, dry spells, the alcohol evaporated. This was in contrast to the Lindgren funnel traps which only flooded with heavy rain and the propylene glycol did not evaporate quickly.

Only seven (5.1%) of the 137 species newly species documented species are adventive. This brings the total number of adventive species documented at SERC to 50 (5.2%).

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