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RESEARCH ARTICLE

THE COLEOPTERA OF EASTERN NECK NATIONAL WILDLIFE REFUGE, MARYLAND

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ABSTRACT

A total of 278 species of Coleoptera representing 51 families were collected in a 2003 citizen science inventory project at Eastern Neck National Wildlife Refuge. Eight beetles are documented from Maryland for the first time: Anthicidae (1), Chrysomelidae (1), Coccinellidae (1), Elateridae (2), Histeridae (2), and Leiodidae (1).

Keywords: beetles, biodiversity, citizen science, insects, new state record.

INTRODUCTION

The two primary objectives of the 2003 inventory were the beetles inhabiting seasonal woodland pools and the subfamily Cicindelinae (Carabidae). Staines & Staines (2005) documented 17 species of Dytiscidae and 25 of Hydrophilidae from seasonal woodland pools. Staines & Staines (2012) documented the five species of Cicindelinae and 75 species of Carabidae in other subfamilies collected on the refuge. Staines (2006) reported that *Cicindela hirticollis hirticollis* Say quickly colonized a restored beach.

The secondary objective was to inventory all beetles by general collecting to lay groundwork for further study. Except for the family Staphylinidae this paper documents the beetles captured for the secondary objective.

Eastern Neck National Wildlife Refuge south of Rock Hall, Kent County, Maryland (39.0149°N, 76.1341°W) is a 2285-acre (914 ha) Chesapeake Bay island at the mouth of the

Chester River (Fig. 1). Habitats include 860 acres (344 ha) of brackish tidal marsh, 550 acres (220 ha) of cropland (primarily corn and soybeans with some clover and winter wheat), 700 acres (280 ha) of forest (composed of loblolly pine, hardwoods, and mature oak-sweetgum forest), 30 acres (12 ha) of grassland, and 40 acres (16 ha) of open water impoundments. The elevation varies from 13 to 23 feet (2.9 to 6.9 m) above mean sea level.

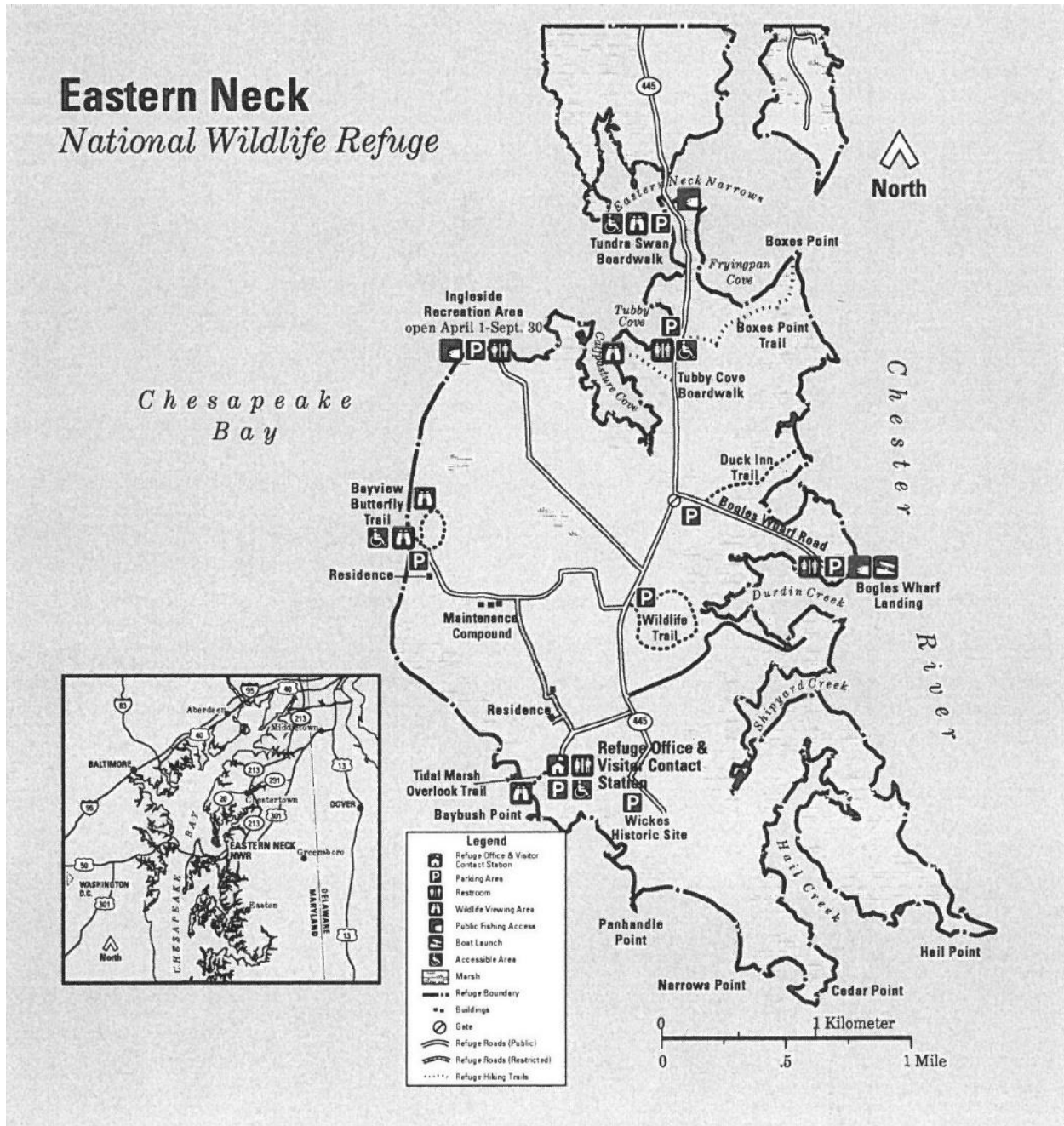


Figure 1. Map of Eastern Neck National Wildlife Refuge.

MATERIALS AND METHODS

Volunteers were recruited from the Friends of Eastern Neck and Washington College in Chesterton, Maryland. Instruction and laboratory training were given on inventory methods, handling samples, alpha sorting of samples, and mounting and labelling of specimens. A total of 42 individuals completed the training and participated in the field work.

We used four methods to collect beetles on the refuge. A series of 10 unbaited barrier pitfall traps containing soapy water as a killing agent were placed in 12 locations on the island and the contents were collected daily and transferred into vials containing 70% ethanol for processing.

Visual encounter surveys as well as sweeping and beating vegetation were conducted in specific habitats throughout the island. Finally, we used four black lights for several nights each month, resulting in the collection of numerous species.

Limited preliminary collecting was done in early June 2002 to provide data for the initial grant proposals and these species are included in this manuscript. The main inventory effort was conducted from 1 April to 20 September 2003.

Species identifications were done by the authors using published and online resources. Voucher specimens have been deposited in the collections of Eastern Neck National Wildlife Refuge and the National Museum of Natural History, Smithsonian Institution.

RESULTS

Family Anthicidae

Anthicus cervinus LaFerté-Sénéctère has been found on *Glycine max* (L.) Merr., (Fabaceae) (Bechinski & Pedigo, 1982), *Helianthus* (Asteraceae) (Royer & Walgenbach, 1991), *Asparagus officinalis* L. (Asparagaceae) (Latta, 1928), in salt marshes (Cameron, 1972), freshwater marshes (Williams et al., 1995), cobble beaches (Eastwood et al., 2009), grasslands (Bulan & Barrett, 1971), bat guano (Whitaker et al., 1991), occasionally associated with stored grain (Bousquet, 1990); and along the shore of a lake and on a coastal beach (Majka, 2011). A single specimen was taken near the staff residence on 26 June 2003 at black light.

Notoxus filicornis Casey is a coastal species collected on a variety of vegetation (Chandler, 1982). Numerous specimens were taken at black light near Headquarters on 26 June 2003. Chandler (1982) reported this species from Florida and New Jersey. It is not listed in the Maryland Biodiversity Project (MBP, 2022). **NEW STATE RECORD.**

Notoxus murinipennis (LeConte) has been collected on a wide variety of plants and flowers (Chandler, 1982). A single specimen was taken at black light at Boxes Point on 26 June 2003.

Tomoderus constrictus (Say) is commonly found at light and under debris (Downie & Arnett, 1996); at carrion and black light (Ciegler, 2014). A single specimen was taken in a pitfall trap at Wicke's Historic Site on 26 June 2003. This species is not listed in MBP (2022). Werner (1958) reported this species from Maryland.

Family Anthribidae

Euparius marmoreus (Olivier) is generally associated with fungi and dead *Quercus* spp. (Fagaceae) (Anderson, 1992); associated with polypore fungi (Valentine, 1998; Bloem et al., 2002). In Wisconsin, it has been found in polypore fungi on fallen dead logs of *Populus grandidentata* Michaux. (Salicaceae), on the underside of *Trametes hirsuta* (Wulfen) Lloyd (Polyporaceae), and in *Stereum*-infested dead oak branches (Janicki & Young, 2017). A single specimen was taken at black light near the staff residence on 25 July 2003.

Trigonorhinus limbatus (Say) adults breed in the heads and stems of various flowers in Asteraceae, especially in those of *Helenium* (Janicki & Young, 2017). Numerous specimens were found by visual survey at Cedar Point on 30 May 2003. This species is not listed in MBP (2022). Downie & Arnett (1996) reported this species from Pennsylvania to Florida.

Family Bostrichidae

Lichenophanus bicornis (Weber) is found under loose bark of many hardwood trees (Downie & Arnett, 1996). Numerous specimens were taken at black light at Boxes Point, Headquarters, Ingleside Recreation Area, and along Ingleside Road from 26 June to 8 August 2003.

Trogoxylon parallelolidum (Melsheimer), an introduced species, breeds in living and dried wood (Robinson, 2005). A single specimen was taken at black light on 26 June 2003 at Boxes Point.

Family Brentidae

Trichapion nigrum (Herbst) breeds in *Robinia pseudacacia* L. (Fabaceae) (Kissinger, 1968). A single specimen was taken feeding on *R. pseudacacia* along Duck Inn Trail on 8 August 2003. This species is not reported in MBP (2002). Downie & Arnett (1996) reported it from Maryland.

Family Buprestidae

Acmaeodera tubulus (Fabricius) breeds in a wide variety of hardwood trees (Knull, 1925; Westcott et al., 1979; Wellso, 1973; Nelson et al., 2008; MacRae, 1991; MacRae & Nelson, 2003; MacRae, 2006; Carlton et al., 2018). Adults are often collected on the flowers of numerous herbaceous plants (Nelson et al., 2008). Two specimens were taken in a pitfall traps in Field 25 on 9 May 2003 and at Wicke's Historic Site on 17 June 2003.

Anthaxia quercata (Fabricius) breeds in a variety of deciduous and coniferous trees (Paiero et al., 2012). A single specimen was taken by visual survey at Cedar Point on 30 May 2003.

Paragrilus tenuis (LeConte) breeds in several species of *Hibiscus* (Malvaceae) (Paiero et al., 2012). Numerous specimens were taken on *Hibiscus* on 24 July 2003 at Cedar Point and on 25 July 2003 at Boxes Point.

Taphrocerus gracilis (Say) breeds in the leaves of *Scirpus fvlviatilis* (Torr.) A. Gray (Cyperaceae) (Knull, 1925) and *Rhynchospora corniculata* Lam. (Cyperaceae) (MacRae, 2004); observed

feeding on *Carex hyalinolepis* Steud. (Cyperaceae) (MacRae, 2004). A single specimen was taken by visual survey on 22 August 2003 at Cedar Point.

Family Byrrhidae

Curimopsis strigosa (Melsheimer) has been collected from an unidentified moss (Ulke, 1902). A single specimen was taken at black light at the Ingleside Recreation Area on 8 August 2003. This species is not reported in MBP (2022). Staines & Staines (2019) reported the species from Maryland.

Family Byturidae

Byturus unicolor Say breeds in the fruit of various *Rubus* species (Rosaceae) (Springer & Goodrich, 1983). A single specimen was taken in a pitfall trap at Bogles Wharf on 3 May 2003.

Family Callirhipidae

Zenoa picea Beauvois larvae are found in dead wood and decaying logs (Petersen, 1953), most commonly in dry upland woods (Blatchley, 1910). Adults are attracted to lights (Staines, 1983); they have been collected under driftwood and debris on a sandy beach, in *Sassafras albidum* (Nutt.) Nees (Lauraceae), on rotten wood at the base of a standing dead *Quercus rubra* L., reared from *Castanea dentata* (Marsh.) Borkh. (Fagaceae) (Hoffman et al., 2002); in a sap flow on *Morus* sp. (Moraceae), and in wood at the base of a hollow beech (Freese, 2013). A single specimen was taken at black light near Headquarters on 25 July 2003.

Family Cantharidae

Cantharis sp. a single specimen which we could not identify to species using existing keys was collected along Duck Inn Trail on 17 May 2003.

Chauliognathus marginatus (Fabricius) has been collected on *Asclepias syriaca* L. (Apocynaceae) and *Napaea dioica* L. (Malvaceae) (Williams, 2006a). Numerous specimens we observed on flowers around Headquarters on 7 June 2003.

Chauliognathus pensylvanicus (DeGeer) has been collected on flowers of 183 species in 29 families in Wisconsin (Williams, 2006b). Numerous specimens were observed on flowers around Headquarters on 7 June 2003.

Malthodes sp. a single specimen which we could not determine to species using existing keys was collected at Cedar Point on 30 May 2003.

Podabrus modestus (Say) is commonly found in maple forests (Pelletier & Hébert, 2014). Numerous specimens were taken at black light near Headquarters on 30 May 2003.

Podabrus rugosulus LeConte is common in semi-open areas, thicket and second growth fields, fir plantations, apple orchards, tamarack bogs, alvars, and river shores; collected on *Cornus*

alternifolia L. (Cornaceae), *Crataegus* (Rosaceae), *Solidago* (Asteraceae), and *Salix* (Pelletier & Hébert, 2014). Two specimens were taken at black light at Boxes Point on 29 May 2003 and in area GTR 2 & 3 on 26 June 2003.

Polemium laticornis (Say) is found along the margin of damp woods (Pelletier & Hébert, 2014). Numerous specimens were found by visual survey near Headquarters on 8 June 2002.

Rhaxonycha carolinus (Fabricius) has been found in open shrubby fields at the edge of hardwood forests (Pelletier & Hébert, 2014). Numerous specimens were collected along the Wildlife Trail on 30 May 2003.

Family Cerambycidae

Anelaphus parallelus (Newman) are twig pruners of *Quercus*, *Crataegus*, *Celtis* (Cannabaceae), and *Betula* (Betulaceae) (Lingafelter, 2007). Numerous specimens were taken at black light on 30 May 2003 along Wildlife Trail.

Astyleiopsis variegatus (Haldeman) breeds in a wide variety of plants (Lingafelter, 2007). A single specimen was taken at black light at Boxes Point on 26 June 2003.

Ataxia crypta (Say) breeds in branches of various hardwood trees, vines, and herbaceous plants (Lingafelter, 2007). A single specimen was taken at black light near Headquarters on 25 July 2003.

Eburia quadrigeminata (Say) bores in the heartwood of *Quercus*, *Fagus* (Fagaceae), *Fraxinus* (Oleaceae), *Carya* (Juglandaceae), *Acer* (Aceraceae), and *Ulmus* (Ulmaceae); attracted to light (Staines, 1987a). A single specimen was taken at black light along Ingleside Road on 8 August 2003.

Elaphidion mucronatum (Say) has been reared from at least 31 genera of both angiospermous and gymnospermous plants (Linsley, 1963; Kirk, 1969, 1970; Gosling, 1984; Rice et al., 1985; Boldt & Robbins, 1987; MacRae, 1994; MacRae & Rice, 2007). Specimens were taken at black light on 24 July 2003 at Cedar Point, on 25 July 2003 near Headquarters, and on 8 August 2003 at Ingleside Recreation Area.

Enaphalodes rufulus (Haldeman) bores into oaks of the red and white oak groups (Solomon, 1995) and is attracted to lights (Staines, 1987a). Two specimens were taken at black light on 27 July 2003 at Cedar Point and on 12 August 2003 at Cedar Point.

Graphisurus fasciatus (DeGeer) breeds in numerous hardwood trees (Lingafelter, 2007). A single specimen was taken at black light at Boxes Point on 23 June 2003.

Graphisurus triangulifer (Haldeman) breeds in *Celtis* and *Acer* (Lingafelter, 2007). A single specimen was taken at black light at Cedar Point on 24 July 2003. This species is not listed in MBP (2022). Linsley & Chemsak (1984) reported the species from eastern North America. Staines (1987a) did not locate any Maryland specimens.

Megacyllene robiniae (Forster) breeds in *Robinia*, adults are often found on *Solidago* (Asteraceae) flowers (Staines, 1987a). Numerous specimens were observed on *Solidago* flowers near Headquarters on 13 September 2022.

Molorchus bimaculatus Say has been collected from flowers of *Cornus* and *Viburnum* (Adoxaceae), larvae mine dead branches of hardwoods (Staines, 1987a). Numerous specimens were collected at black light at Boxes Point on 29 May 2003.

Neanda brunnea (Fabricius) feeds on rotting logs of *Acer*, *Tilia* (Malvaceae), *Quercus*, *Populus*, *Castanea*, *Liriodendron tulipifera* L. (Magnoliaceae), *Ulmus*, and *Pyrus* (Rosaceae); attracted to light (Linsley, 1962). Numerous specimens were collected at black light between 30 May and 24 July 2003 at Cedar Point, Headquarters, and along Wildlife Trail.

Phymatodes amoenus (Say) breeds in dead *Vitis* (Vitaceae) stems (Lingafelter, 2007). Specimens were taken at black light along Wildlife Trail on 30 May 2003.

Smodicum cucijiforme (Say) breeds in various hardwood trees (Lingafelter, 2007). Specimens were taken at black light on 25 July 2003 at Headquarters, on 8 August 2003 at Ingleside Recreation Area, and on 8 August 2003 along Ingleside Road.

Sternidius punctatus (Haldeman) breeds in a variety of hardwood trees (Lingafelter, 2007). A single specimen was taken at black light along Duck Inn Trail on 21 August 2003.

Tetraopes tetrophthalmus (Forster) larvae and adults feed on *Asclepias* spp. (Apocynaceae) (Staines, 1987a). Numerous specimens were found around Headquarters on *Asclepias* on 13 September 2002.

Xylotrechus colonus (Fabricius) larvae develop in nearly all eastern United States hardwood trees (Lingafelter, 2007). Numerous specimens were taken at black light from 30 May to 8 August 2003 at Headquarters, Ingleside Recreation Area, and along Ingleside Road.

Xylotrechus sagittatus (Germar) breeds in conifers, especially *Pinus* (Pinaceae) (Lingafelter, 2007). A single specimen was taken at black light on Duck Inn Trail on 21 August 2003.

Family Chrysomelidae

Acanthoscelides distinguendus (Horn) breeds in *Mimosa* and *Rhynchosia* (Fabaceae) (Kingsolver, 2004). Two specimens were taken: one sweeping vegetation along Duck Inn Trail on 17 May 2003 and the other by visual inspection near Headquarters on 8 August 2003.

Altica chalybea Illiger adults and larvae feed on *Vitis* (Isely, 1920). A single specimen was taken along Wildlife Trail on 30 May 2003.

Amblycerus robiniae (Fabricius) breeds in *Gleditisa* (Fabaceae) and *Robinia* (Kingsolver, 2004). A single specimen was taken at black light near Headquarters on 25 July 2003.

Althaeus hibisci (Olivier) breeds in *Abutilon* (Malvaceae) and *Hibiscus* (Kingsolver, 2004). A single specimen was taken in a *Hibiscus* flower near Headquarters on 25 July 2003.

Anomoea laticlava laticlava (Forster) is associated with numerous plant families (Burke et al., 1994; Riley & Enns, 1979; Balsbaugh & Hays, 1972; Moldenke, 1970; Wilcox, 1954; Blatchley, 1924; Douglass, 1929). LeSage & Stieffel (1996) reported on the biology of this species. Specimens were taken beating woody vegetation on 27 June 2003 at Boxes Point and in a pitfall trap near the Lodge on 7 June 2003.

Brachypnoea clypealis (Horn) has been collected on *Amaranthus spinosus* L. (Amaranthaceae) (Balsbaugh & Hayes, 1972); on *Desmodium* (Fabaceae) (Rouse & Medvedev, 1972); on *Eupatorium* and *Ambrosia* (Asteraceae) (Flowers et al., 1994). A single specimen was taken beating *Salix* on 7 June 2002 near Headquarters.

Brachypnoea tristis (Horn) has been found it on many trees and herbaceous plants (Riley & Enns, 1979). Specimens were taken by visual survey on *Datura* (Solanaceae) at Cedar Point on 24 July 2002, at staff residence on 26 July 2002, and at Wicke's Historic Site on 25 July 2002; and on *Eupatorium* near Headquarters on 11 July 2003.

Capraita suturalis (Fabricius) has been collected from numerous plants (Blatchley, 1910). A single specimen was taken at black light along Duck Inn Trail on 21 August 2003.

Chaetocnema confinis Crotch feeds on various members of the Convolvulaceae (White, 1996). A single specimen was taken sweeping vegetation near Headquarters on 7 June 2002.

Chaetocnema denticulata (Illiger) has been collected from a wide variety of plants (White, 1996). Specimens were taken sweeping on 25 July 2003 at Wicke's Historic Site and in a pitfall trap near Headquarters on 19 April 2003.

Chrysochus auratus (Fabricius) feeds on various species of *Apocynum* (Apocynaceae) (Wilcox, 1979). Specimens were taken feeding on *Apocynum* on 25 July 2003 along Duck Inn Trail, on 7 June 2002 near Headquarters, and on 25 July 2003 in maintenance area.

Colaspis brunnea (Fabricius) feeds on plants in numerous families (Blake, 1974; Riley & Enns, 1979; Altieri & Whitcomb, 1979; Wheeler & Mengel, 1984). Specimens were taken at black light on 24 July 2003 at Cedar Point, on 25 July 2003 near Headquarters, on 8 August 2003 along Ingleside Road, and 21 August 2003 in maintenance area.

Cryptocephalus leucomelas Suffrian has been collected on "*Salix presidio*", *Helianthus tuberosus* L., flowers of *Malva* (Malvaceae), *Rhododendron* leaf (Ericaceae), *Gossypium* (Malvaceae) (White, 1968); *Salix interior* Rowlee, *S. humilis* Marsh., and *Juglans nigra* L. (Riley & Enns, 1979). A single specimen was taken feeding on *Salix* on 7 June 2002 near Headquarters.

Cryptocephalus quadruplex Newman has been collected on *Vaccinium* (Ericaceae), *Salix bebbiana* Richards, and *Comptonia peregrina* (L.) Coult. (Myricaceae); on *Quercus palustris* Muenchh. and

Rhus glabra L. (Anacardiaceae) (LeSage, 1986b; Riley & Enns, 1979). A single specimen was taken by visual survey on 30 May 2003 along Wildlife Trail.

Diabrotica undecimpunctata howardi Barber adults are found on many species of plants (Wilcox, 1979; Hilgendorf & Goeden, 1981; Wheeler & Mengel, 1984; Wheeler & Hoebeke, 1985; Messina & Root, 1980). Specimens were collected at black light at Cedar Point on 24 July 2003, on 25 July 2003 in maintenance area; by visual survey on 21 August 2003 along Duck Inn Trail, and on 7 June 2006 on 8 August 2003 in Ingleside Recreation Area.

Disonycha xanthomelas xanthomelas (Dalman) recorded hosts are *Amaranthus spinosus* L., *Beta vulgaris* L., *Chenopodium album* L., *Spinacia oleracea* L. (Amaranthaceae), and *Stellaria media* (L.) Cyrillo (Caryophyllaceae) (Wilcox, 1979). Specimens were taken by visual survey on 30 May 2003 at Cedar Point and in a pitfall trap near Headquarters on 23 May 2003.

Distigmoptera impennata Blake this rarely collected beetle has an unknown biology. A single specimen was taken at black light near Headquarters on 14 June 2003. This species is not recorded in MBP (2022). Blake (1943) mentioned specimens from Maine, Massachusetts, Washington, DC, and West Virginia. This is the first documentation of this species from Maryland. **NEW STATE RECORD.**

Epitrix brevis Schwarz has been found on a number of solanaceous plants (Wilcox, 1979). A single specimen was taken sweeping vegetation at Wicke's Historic Site on 25 July 2003.

Epitrix fuscata Crotch has been found on a number of solanaceous plants (Wilcox, 1979). Specimens were taken feeding on *Solanum carolinense* L. on 7 June 2002 near Headquarters and on 25 July 2003 at Wicke's Historic Site.

Epitrix hirtipennis (Melsheimer) has been found on a number of solanaceous plants (White & Barber, 1974). A single specimen was taken sweeping vegetation at Wicke's Historic Site on 25 July 2003.

Exema canadensis Pierce adults have been collected on numerous plant species (Karren, 1966). Specimens were taken sweeping vegetation on 26 June 2003 at Boxes Point, 22 August 2003 at Cedar Point, and on 21 August 2003 along Duck Inn Trail.

Kuschelina gibbitarsa (Say) adults and larvae develop and feed on *Teucrium canadense* L. (Lamiaceae) (Clark et al., 2004); on flowers of *Achillea* (Asteraceae) and *Hydrangea* (Hydrangeaceae) (Blatchley, 1910). A single specimen was taken by visual survey at Ingleside Recreation Area on 8 August 2003.

Leptinotarsa juncta juncta (Germar) feeds on *Solanum carolinense* (Clark et al., 2004). Specimens were found feeding on *S. carolinense* on 7 June 2002 and 3 July 2003 near Headquarters.

Longitarsus testaceus Melsheimer has been collected on *Cirsium* (Wilcox, 1979) and *Eupatorium perforatum* L. (Riley & Enns, 1979). Specimens were taken feeding on *Eupatorium* near Headquarters on 7 June 2002.

Mantura chrysanthemi floridana (Koch) has been observed feeding on *Persicaria perforatum* (L.) H. Gross (Polygonaceae) (Wheeler & Mengel, 1984). A single specimen was taken feeding on *Rumex* near Headquarters on 17 May 2003.

Neochlamisus gibbosus (Fabricius) has been collected on *Rubus* (*Eubatus*), *Phleum pratense* L. (Poaceae), *Quercus*, *Salix*, and *Triticum* (Poaceae) (Karren, 1972). Specimens were collected by visual survey on 30 May 2003 at Cedar Point, near Headquarters, and along Wildlife Trail.

Ophraella notulata (Fabricius) larvae and adults have been observed feeding on *Iva oraria* (Bartlett) Fern. & Griseb. (Asteraceae) (LeSage, 1986a). Welch (1978) described the biology of this species. Specimens were taken feeding on *Iva* on 25 July 2003 along Duck Inn Trail and one 27 July 2003 at Boxes Point.

Oulema melanopus (L.) this introduced species feeds on cereals and grasses, including *Hordeum vulgare* L., *Avena sativa* L., and *Triticum aestivum* L. (Poaceae) (White, 1993). A single specimen was taken by visual survey near Headquarters on 30 May 2003.

Pachybrachis subfasciatus LeConte has been collected at lights (Rouse & Medvedev, 1972). A single specimen was taken beating *Robinia pseudacacia* on 14 June 2003 along Duck Inn Trail.

Paria fragariae Wilcox adult feeding has been observed on leaves of *Physocarpus opulifolius* (L.) Maxim. (Rosaceae) (Wheeler & Hoebeke, 1985) and *Lythrum salicaria* L. (Lythraceae) (Hight, 1990). Specimens were taken in pitfall traps on 19 April 2003 at Bogles Wharf and along Wildlife Trail; at black light on 29 May 2003 at Boxes Point, on 21 August 2003 along Duck Inn Trail, on 25 June 2003 in areas GTR 2 & 3, and on 27 June 2003 at Ingleside Recreation Area; and by visual survey on 5 April 2003 near Headquarters.

Paria thoracica (Melsheimer) is commonly found on *Solidago* (Riley & Enns, 1979); *Amaranthus retroflexus* L., *Aster*, *Fragaria virginiana* Duch. (Rosaceae), and *Trifolium* (Balsbaugh & Hays, 1972). Specimens were taken by visual survey on 14 June 2003 along Wildlife Trail and on 30 May 2003 at Cedar Point.

Phyllotreta striolata (Fabricius) has been collected on numerous cruciferous plants (Smith, 1985). A single specimen was taken in a pitfall trap at Cedar Point on 19 April 2003.

Trirhabda bacharidis (Weber) develops on *Baccharis halimifolia* L. and *B. neglecta* Britt. (Asteraceae) (Boldt & Robbins, 1987). Boldt (1989) reported on the life history of this species. Specimens were taken feeding on *Baccharis* on 25 July 2003 at Boxes Point and on 21 August 2003 along Duck Inn Trail.

Tymnes tricolor (Fabricius) has been recorded from numerous plant species (Clark et al., 2004). Specimens were taken at black light on 24 July 2003 at Cedar Point, on 21 August 2003 along Duck Inn Trail, and on 26 June 2003 in areas GTR 2 & 3.

Family Cleridae

Enoclerus nigripes (Say) is a predator of various Curculionidae borers in conifers (Knull, 1951). A single specimen was taken at black light on 8 August 2003 along Ingleside Road.

Family Coccinellidae

Coccinella septempunctata L. this introduced species feeds on aphids (Hemiptera: Aphididae) (Gordon, 1985). A single specimen was taken by visual survey on 17 May 2003 at Boxes Point.

Coleomegilla maculata lengi Timberlake feeds on aphids (Gordon, 1985) and many other insects (Cottrell & Yeorgan, 1998). Specimens were taken by visual survey on 7 June 2002 near Headquarters and 17 May 2003 at Boxes Point.

Cycloneda munda (Say) feeds on aphids (Gordon, 1985). A single specimen was taken by visual survey on 7 June 2003 near Headquarters.

Harmonia axyridis (Pallas) this introduced species feeds on scale insects (Hemiptera) and aphids (Chapin & Brou, 1991). Specimens were taken by visual survey on 17 May 2003 at Boxes Point; at black light on 24 July 2003 at Cedar Point, on 24 July 2003 in area GTR 2 & 3, and on 27 July 2003 near the staff residence.

Hippodamia convergens Guérin-Ménéville feeds on aphids, whiteflies (Hemiptera: Aleyrodidae), and other soft-bodied insects (Hamilton et al., 1999). Specimens were taken by visual survey on 7 June 2002 near Headquarters and on 30 May 2003 at Cedar Point.

Naemia seriata seriata (Melsheimer) feeds on scale insects and pollen (Rinehart & Long, 2019). Specimens were taken by visual survey on 13 June 2003 near Headquarters and by black light on 26 June 2003 at Boxes Point.

Nephus intrusus (Horn) has an unknown biology. A single specimen was taken by visual survey on 17 May 2003 at Boxes Point.

Scymnus fraternis LeConte feeds on scale insects (Gordon, 1985). A single specimen was taken by visual survey on 7 June 2002 near Headquarters. This species is not recorded in MBP (2022). Gordon (1985) records this species throughout the eastern United States.

Scymnus iowensis Casey has an unknown biology. A single specimen was taken by visual survey on 17 May 2003 at Bogles Wharf. This species is not recorded in MBP (2022). Gordon (1985) recorded this species from Maryland.

Scymnus kansanus Casey feeds on scale insects (Gordon, 1976). A single specimen was taken by visual survey on 30 May 2003 along Wildlife Trail. This species is not recorded in MBP (2022). Gordon (1985) recorded this species from New Jersey and Virginia. **NEW STATE RECORD.**

Scymnus rubicaudus Casey feeds on scale insects (Gordon, 1976). A single specimen was taken sweeping on 25 July 2003 at Wicke's Historic Site. This species is not recorded in MBP (2022). Gordon (1985) recorded this species throughout the eastern United States.

Scymnus semiruber Horn has an unknown biology. A single specimen was taken by visual survey on 30 May 2003 at Cedar Point. This species is not recorded in MBP (2022). Gordon (1985) recorded this species from Maryland.

Family Cryptophagidae

Henoticus serratus (Gyllenhal) is usually found in leaf litter, fungi, under bark of dead or dying trees, and on the leaves of trees and shrubs (Bousquet, 1989). A single specimen was collected by visual survey on 30 May 2003 at Cedar Point. This species is not recorded in MBP (2022). Pelletier & Hébert (2019) recorded this species from eastern Canada to Alabama.

Family Curculionidae

Aphrastus taeniatus Say breeds in various coarse Poaceae (Blatchley & Leng, 1916) and is found on various Asteraceae and deciduous shrubs (Evans, 2014). A single specimen was taken in a pitfall trap at Wicke's Historic Site on 23 July 2003.

Apteromechus ferratus (Say) larvae and pupae have been found within the bark of a recently (year or so) fallen branch of *Sassafras albidum* (Nuttall) Ness, larvae appeared to mine mostly the bark of the branch without going deeply into the wood, pupation takes place in a cell made in the bark (Kissinger, 1963); on many trees but not *Quercus*, common on *Persea borbonia* (L.) Spreng. (Lauraceae) (Ciegler, 2010). A single specimen was taken at black light on 26 June 2003 at Boxes Point.

Ceutorhynchus rapae Gyllenhal this introduced species breeds on several members of Brassicaceae; occasionally on *Cannabis sativa* L. (Cannabaceae) (Colonnelli, 2004); and *Barbarea vulgaris* R. Br. [Brassicaceae] (Salsbury & Dinkins, 1979). A single specimen was taken sweeping vegetation on 25 July 2003 at Boxes Point. This species is not recorded in MBP (2022). This species is widespread in North America (Colonnelli, 2004).

Conotrachelus nenuphar (Herbst) is a pest of fruits of many Rosaceae (Schoof, 1942). Specimens were taken at black light near Headquarters on 14 June 2003 and in a pitfall trap along Wildlife Trail on 19 April 2003.

Cossonus impressifrons Boheman is found under bark of dead deciduous hardwoods, including oak, sycamore, and elm (Evans, 2014) and has been captured in Lindgren funnel traps (Webster et al., 2016). A single specimen was taken under debris on beach near Headquarters on 14 June 2003.

Cyrtepidomus castaneus (Roelofs) this introduced, parthenogenetic species feeds on a wide variety of trees but prefers *Quercus* and *Castanea* in Asia (Bright & Bouchard, 2008); it has been collected by sweeping in grassy areas (Salsbury & Dinkins, 1979). A single specimen was taken at black light near Headquarters on 25 July 2003.

Glucianus punctiger (Gyllenhal) this introduced species breeds in *Taraxacum officinale* (L.) Weber ex. F. H. Wegg. (Asteraceae) (McAvoy et al., 1983). A single specimen was taken by visual survey along Wildlife Trail on 30 May 2003. This species is not listed in MBP (2022). Found throughout eastern North America (Dillon & Dillon, 1961).

Listronotus caudatus (Say) has been collected on *Carex*, *Persicaria hydropiperoides* (Michx.) Small (Polygonaceae), and *Sagittaria* (Alismataceae) (Ciegler, 2010). A single specimen was taken at black light near the staff residence on 25 July 2003. This species is not recorded in MBP (2022). The species is found throughout most of North America (Ciegler, 2010).

Listronotus tuberosus LeConte breeds in *Sagittaria latifolia* Willd. (Ciegler, 2010). A single specimen was taken at black light near Headquarters on 25 July 2003.

Listronotus sp. a single specimen which we could not place to species using existing keys was taken at black light at Ingleside Recreation Area on 12 August 2003.

Lixus concavus Say breeds in stems of *Rumex* (Polygonaceae) (Salsbury & Dinkins, 1979); adults have been collected on *Carduus/Cirsium*, *Helianthus* (Asteraceae), (Ciegler, 2010). A single specimen was taken feeding on *Rumex* sp. near Headquarters on 7 June 2002.

Magdalis olyra (Herbst) has an unknown biology. A single specimen was taken sweeping vegetation along Duck Inn Trail on 17 May 2003. This species is not listed in MBP (2022). O'Brien & Wibmer (1982) report it from most of eastern North America.

Odontocorynus umbellae (Fabricius) has been collected on the flowers of many plants (Ciegler, 2010). Specimens were taken by visual survey on 5 August 2003 near headquarters and in pitfall traps on 5 August 2003 near the Lodge and along Wildlife Trail.

Otiorhynchus rugostriatus (Goeze), an introduced species, feeds on the roots of many Rosaceae (Mattson et al., 1994). A single specimen was taken in a pitfall trap at Bogles Wharf on 3 May 2003.

Panscopus erinaceus (Say) has an unknown biology. Specimens were taken in pitfall traps at Bogles Wharf on 30 May 2003 and along Wildlife Trail on 19 April 2003. This species is not recorded in MBP (2022). O'Brien & Wibmer (1982) recorded it from Maryland.

Phyllobius oblongus (L.) this introduced species feeds on the foliage of many hardwood trees (Evans, 2014). A single specimen was taken by visual survey near Headquarters on 30 May 2003.

Pityogenes hopkinsi Swaine breeds in *Pinus strobus* L. (Wood, 1982). Specimens were taken at black light along Wildlife Trail on 30 May 2003.

Pseudobaris sp. a single specimen we were unable to identify to species using existing keys was taken sweeping vegetation at Wicke's Historic Site on 25 July 2003.

Pseudoedophrys hilleri (Faust) this introduced species feeds on the foliage of a wide variety of woody plants (Bright & Bouchard, 2008). A single specimen was taken at black light near Headquarters on 25 July 2003.

Pseudoneorhinus bifasciatus (Roelofs) this introduced species feeds on a wide variety of plants mostly in shady areas or along the woods edge (Staines & Staines, 1988). Specimens were taken sweeping vegetation at Boxes Point on 27 June 2003 and at Cedar Point on 22 August 2003; in pitfall traps at Ingleside Recreation Area on 17 June 2003 and at Wicke's Historic Site on 17 June 2003.

Rhinocyllus conicus (Froelich) this European species was introduced for the biological control of *Carduus* and *Cirsium* thistles (Shelton, 2022). A single specimen was taken by visual survey at Boxes Point on 17 May 2003.

Rhysomatus annectans (Casey) breeds on *Asclepias incarnata* L. (Blatchley & Leng, 1916). A single specimen was taken by visual survey along Duck Inn Trail on 25 July 2003. This species is not recorded in MBP (2022). The recorded range of the species is from New York to South Carolina (Ciegler, 2010).

Sitona hispidulus Fabricius, an introduced species, is a pest of *Medicago sativa* L. (Fabaceae), *Trifolium*, and other legumes (Bright, 1994). Specimens were taken at black light at Boxes Point on 26 June 2003 and near Headquarters on 14 June 2003.

Sitona sp. a single specimen which we could not place to species using existing keys was taken sweeping vegetation along Duck Inn Trail on 17 May 2003.

Sitophilus granaries (L.) is a serious pest of stored grain (Ciegler, 2010). A single specimen was taken at black light on 26 June 2003 at Boxes Point. This species is not listed in MBP (2022). The distribution is cosmopolitan (Ciegler, 2010).

Sphenophorus deficiens Chittenden has an unknown biology. Specimens were taken by visual survey on 7 June 2003 near Headquarters and in a pitfall trap at Wicke's Historic Site on 17 June 2003. This species is not recorded by MBP (2022). The distribution is New York to Florida (O'Brien & Wibmer, 1982).

Sphenophorus inaequalis (Say) breeds on *Cynodon dactylon* (L.) Pers. (Poaceae) (Ciegler, 2010). A single specimen was taken in a pitfall trap near Headquarters on 17 June 2003.

Sphenophorus melanocephalus (Fabricius) breeds on *Leersia oryzoides* (L.) Sw. (Poaceae), adults feed on various grasses (Ciegler, 2010). A single specimen was taken in a pitfall trap in Field 25 on 17 May 2003. This species is not recorded in MBP (2022). The distribution is throughout the eastern United States (O'Brien & Wibmer, 1982).

Sphenophorus pertinax (Olivier) feeds on *Spartina* (Poaceae) (O'Brien & Wibmer, 1982). A single specimen was found under beach debris near Headquarters on 17 May 2003.

Sphenophorus venatus (Say) the preferred host is *Cyperus esculentus* L., but this species is also found on *Scirpus validus*, *Cynodon dactylon*, *Triticum aestivum*, and *Phleum pratense* L. (Poaceae) (Vaurie, 1951). Specimens were taken in pitfall traps at Field 25 on 25 June 2003 and near Headquarters on 7 August 2003.

Tychius picirostris (Fabricius), an introduced species, feeds on *Trifolium* sp. (Fabaceae) (Anderson & Howden, 1994). A single specimen was taken by visual survey along Wildlife Trail on 30 May 2003.

Xyleborus affinis Eichhoff breeds in a wide variety of trees (Wood, 1982). A single specimen was taken at black light along Duck Inn Trail on 21 August 2003.

Xyleborus pubescens Zimmerman feeds on *Pinus* (Wood, 1982). A single specimen was taken at black light along Wildlife Trail on 30 May 2003.

Xylosandrus crassiusculus Motschulsky this introduced species feeds on plants in 46 families (Haack & Rabaglia, 2013). Specimens were taken at black light at Boxes Point on 26 June 2003 and near Headquarters on 25 July 2003.

Family Dermestidae

Dermestes caninus Germar there is little biological information on this species but like all members of the genus is associated with carrion (Corrêa et al., 2021). Specimens were collected feeding on dead fish near Headquarters on 17 May 2002 and in bluebird box with dead chick at Ingleside Recreation Area on 23 May 2003. This species is not recorded in MBP (2022). It is found throughout North America (Beal, 2003).

Family Derodontidae

Derodontus esotericus Lawrence is a generalist feeding on a variety of fungi (Leschen, 1994). A single specimen was taken at black light at Ingleside Recreation Area on 8 August 2003.

Family Disteniidae

Elytrimitatrix undata (Fabricius) has an unknown biology. A single specimen was taken at black light along Duck Inn Trail on 12 August 2003.

Family Elateridae

Aeolus amabilis (LeConte) has an unknown biology. A single specimen was taken at black light on 8 August 2003 at Ingleside Recreation area. This species is not recorded in MBP (2022). Downie & Arnett (1996) reported the species from Indiana, New York, and Ohio. **NEW STATE RECORD.**

Aeolus mellillus Say is found in grasslands and gardens over much of North America. The larvae were originally reported to feed on the roots of many crops (Forbes, 1894; Lugger, 1899).

Subsequent research showed that they are predators (King, 1928; Stirret, 1936; Doane, 1977). Males are very uncommon and the species is thought to be parthenogenetic (Jewett, 1940). Specimens were taken by visual survey on 26 June 2003 in area GTR 2 & 3, on 26 June near Headquarters, on 30 May 2003 at Wicke's Historic Site; and at black light on 8 August 2003 at Ingleside Recreation Area.

Ampedus sanguinipennis (Say) has been beaten from *Crataegus* foliage (Downie & Arnett, 1996). A single specimen was taken by visual survey at Boxes Point on 17 May 2003.

Athous cucullatus (Say) larvae are found under bark on downed logs where they feed on woodboring beetle larvae (Kirk, 1922); and in forest litter and rotting logs (Glen, 1950); adults are attracted to lights (Becker, 1974). Specimens were taken at black light on 8 August 2003 along Ingleside Road and on 25 July 2003 in maintenance area.

Conoderus bellus Say adults hibernate beneath rubbish in damp locations, attracted to lights (Blatchley, 1910); larvae have been collected in corn fields in Indiana (Belcher & Tenne, 1987). A single specimen was taken by visual survey on 30 May 2003 near Headquarters.

Conoderus lividus (DeGeer) has been beaten from branches of *Juglans*, *Carya*, and other trees (Blatchley, 1910); larvae have been found in corn fields (Belcher & Tenne, 1987). Specimens were taken at black light on 24 July 2003 at Cedar Point, on 24 August 2003 along Duck Inn Trail, on 25 July 2003 near Headquarters, on 8 August 2003 along Ingleside Road, on 25 July 2003 in maintenance area, on 25 July 2003 near staff residence, and on 17 June 2003 at Wicke's Historic Site.

Conoderus vespertinus (Fabricius) adults are attracted to light (Evans, 2014). Specimens were taken at black light on 24 August 2004 along Duck Inn Trail, on 26 July near Headquarters, on 27 June 2003 at Ingleside Recreation Area, and on 25 July 2003 near staff residence.

Ctenicera pyrrhos (Herbst) has been taken on *Juglans*, *Carya*, and other trees (Dillon & Dillon, 1961). The exact generic placement of this species is unknown (Johnson, 2002). A single specimen was taken at black light near Headquarters on 25 July 2003.

Elater abruptus Say has been found in hollow trees (Majka & Johnson, 2008). Specimens were taken by visual survey on 24 July 2003 at Cedar Point and on 25 July 2003 near Headquarters.

Gambrinus griseus (Beauvois) has been taken sweeping grasses, beating vegetation, and under objects (Blatchley, 1910 as *Limonius interstitialis*); sifting forest litter, at light, in mixed forests, sweeping vegetation (Al Dhafer, 2009). Specimens were taken at black light on 24 June 2003 in area GTR 2 & 3 and on 7 June 2003 along Wildlife Trail.

Gambrinus plebejus (Say) has an unknown biology. A single specimen was taken at black light on 27 June 2003 in area GTR 2 & 3. This species is not recorded in MBP (2022). Downie & Arnett (1996) reported the species from Massachusetts, New York, Indiana, and Florida. **NEW STATE RECORD.**

Glyphonyx testaceus (Melsheimer) has an unknown biology. A single specimen was taken at black light near Headquarters on 14 June 2003. This species is not listed in MBP (2022). Downie & Arnett (1996) listed Maryland in the distribution.

Horistonotus curiatus (Say) has been collected from *Quercus* foliage (Downie & Arnett, 1996). A single specimen was taken at black light in area GTR 2 & 3 on 26 June 2003.

Lacon marmoratus (Fabricius) has been swept from vegetation, collected at light (Smith & Enns, 1977), and under bark of logs (Evans, 2014). A single specimen was taken at black light near staff residence on 25 July 2003.

Limonius agonus (Say) has an unknown biology. Specimens were taken at black light on 21 August 2003 along Duck Inn Trail and on 25 July 2003 near staff residence. MBP (2022) does not list this species. Al Dahfer (2009) reports this species from Maryland.

Limonius basilaris Say is found on *Quercus* sp. (Downie & Arnett, 1996). A single specimen was taken by visual survey along Wildlife Trail on 30 May 2003.

Melanotus castanipes (Paykull) adults have been collected beneath bark of *Pinus* (Blatchley, 1910); in flight intercept traps (Levesque & Levesque, 1993). Glen et al. (1943) reported that larvae of many *Melanotus* prefer heavier, wetter soils. Specimens were taken at black light on 24 June 2003 at Boxes Point, on 24 July 2003 at Cedar Point, on 24 June 2002 in area GTR 2 & 3, on 25 July 2003 near Headquarters, and on 7 June 2003 along Wildlife Trail.

Melanotus communis (Gyllenhal) larvae feed on corn and adults are taken at lights (Blatchley, 1910). Fenton (1926) reported that overwintering adults are found in rotting logs and under bark and readily feed on pollen; larvae prefer wet soils and overwinter in the soil; and pupation occurs in the soil. Specimens were taken by visual survey at Boxes Point on 17 May 2003 and near Headquarters on 30 May 2003; at black light on 26 June 2003 at Boxes Point, on 24 July 2003 at Cedar Point, and on 25 July 2003 near Headquarters; in pitfall traps on 3 July 2003 at Ingleside Recreation Area and on 20 June 2003 at Wicke's Historic Site.

Melanotus similis (Kirby) has been collected in *Rubus* (Rosaceae) plantations and pine woods (Levesque & Levesque, 1993). This is the so-called "corn wireworm" of midwestern and southern regions. The larva is a soil predator in meadow, field, and ecotonal areas, and facultatively feeds on sprouting corn and other seeds in agricultural situations (Majka & Johnson, 2008). Specimens were taken by visual survey on 30 May 2003 at Cedar Point and along Wildlife Trail; at black light on 14 June 2003 near Headquarters; and in pitfall traps on 12 April 2003 in Field 25 and on 9 May 2003 near the Lodge.

Melanotus spadax (Erichson) has an unknown biology. A single specimen was taken at black light on 24 July 2003 at Cedar Point. MBP (2022) does not list this species. Downie & Arnett (1996) reported Maryland in the distribution data.

Neopristilopus aethiops (Herbst) has an unknown biology. Specimens were taken in pitfall traps on 8 July 2003 at Bogles Wharf and 11 July 2003 at Ingleside Recreation Area.

Orthostethus infuscatus (Germar) adults are attracted to light (Evans, 2014). Specimens were taken at black light on 24 July 2003 at Cedar Point and on 26 June 2003 near Headquarters.

Parallelostethus attenuatus (Say) has been found beneath bark of decaying *Juglans*, *Morus* (Moraceae), and other logs (Blatchley, 1910); and is commonly found in rotting logs feeding on decaying wood (Kirk, 1922). A single specimen was taken at black light in maintenance area on 25 July 2003.

Pherhimus fascicularis (Fabricius) adults are attracted to lights (Evans, 2014). Specimens were taken at black light on 26 June 2006 in area GTR 2 & 3 and on 25 July 2003 near staff residence.

Family Erotylidae

Tormarus pulchellus (LeConte) are found on leaves and limbs of trees and shrubs and are attracted to lights (Evans, 2014). Specimens were collected at black light on 25 July 2003 near Headquarters and on 8 August 2003 at Ingleside Recreation Area. MBP (2022) does not list this species. Evans (2014) recorded the species from Ontario to Florida.

Family Geotrupidae

Bolbocerosoma tumefactum (Beauvois) has been taken in mushrooms (Brimley, 1938) and at lights (Howden, 1955). A single specimen was taken in a pitfall trap on 19 August 2003 along Wildlife Trail.

Eucanthus lazarus (Fabricius) has been collected in pastures, at lights (Staines, 1984) and in flight intercept traps (Kriska & Young, 2002). Specimens were taken at black light on 26 June 2003 at Boxes Point, on 24 July 2003 at Cedar Point, and on 26 June 2003 near Headquarters.

Family Gyrinidae

Dineutus nigrior Roberts is found in lakes and ponds (Ciegler, 2003). A single specimen was taken at black light on 12 June 2003 at Ingleside Recreation Area.

Family Heteroceridae

Heterocerus pallidus Say is gregarious and inhabits the immediate vicinity of permanent or temporary, flowing or stagnant, clear or murky bodies of water, where the surface of sand is covered with a thin layer of mud (Kaufmann & Stansly, 1979). Specimens were taken at black light on 26 June 2003 at Boxes Point, on 24 July 2003 at Cedar Point, on 27 June 2003 at Ingleside Recreation Area, on 8 August 2003 along Ingleside Road, on 25 July in maintenance area, on 25 July 2003 near staff residence, and on 30 May 2003 along Wildlife Trail.

Tropicus pusillus (Say) is collected on margins of ponds (Blatchley, 1910); consistently collected from intermittent creek beds, drainage ditches, and sandy ponds, attracted to lights (King & Lago, 2012). Specimens were taken at black light on 24 July 2003 at Cedar Point, on 8 August 2003 at Ingleside Recreation Area, and on 27 July 2003 in maintenance area.

Family Histeridae

Atholus bimaculatus (L.) has been found in dung and decaying plant material (Majka, 2008). Specimens were taken at black light at Cedar Point on 24 July 2003 and by visual survey on 24 July 2003 near Headquarters. MBP (2022) does not list this species. Downie & Arnett (1996) record the species from Michigan and New York. **NEW STATE RECORD.**

Euspilotus assimilis (Paykull) is a generalist predator which occurs in many types of decomposition but most frequently in carrion (Majka, 2008). Specimens were taken in pitfall traps in Field 25 on 30 June 2003, at Hail Point on 29 July 2003, near Headquarters on 16 July 2003, at Ingleside Recreation Area on 8 July 2003, and near the Lodge on 5 August 2003.

Euspilotus conformis (LeConte) is attracted to carrion (Bousquet & Laplante, 2006). A single specimen was taken in a pitfall trap at Ingleside Recreation Area on 17 June 2003. MBP (2022) does not list this species. Downie & Arnett (1996) give the distribution from Ontario to Georgia.

Hister foedatus LeConte has an unknown biology. Specimens were taken by visual survey on 30 May 2003 at Cedar Point and in pitfall traps in Field 25 and near the Lodge on 13 June 2003. MBP (2022) does not list this species. Downie & Arnett (1996) record this species from Maryland.

Margaronotus immunis (Fabricius) has been collected under debris (Downie & Arnett, 1996); and carrion (Bousquet & Laplante, 2006). Specimens were taken in pitfall traps on 7 June 2003 at Boxes Point and on 8 July 2003 at Hail Point. MBP (2022) lists *Margaronotus* sp. Downie & Arnett (1996) record this species from Ontario to Pennsylvania. **NEW STATE RECORD.**

Margaronotus interruptus (Beauvois) has been collected under debris (Downie & Arnett, 1996); in litter, dung, and carrion (Bousquet & Laplante, 2006). A single specimen was taken in a pitfall trap at Boxes Point on 23 June 2003. MBP (2022) lists *Margaronotus* sp. Downie & Arnett (1996) record this species from Maryland.

Onthophilus deflectus Helava has been found in polypore fungi, leaf litter, dung, and carrion (Bousquet & Laplante, 2006). A single specimen was taken in a pitfall trap along Wildlife Trail on 19 April 2003. MBP (2022) does not list this species. Downie & Arnett (1996) record the species from Maryland.

Saprinus imperfectus LeConte has been collected on carrion (Downie & Arnett, 1996). A single specimen was taken in a pitfall trap at Boxes Point on 21 July 2003. MBP (2022) does not list this species. Downie & Arnett (1996) mention records from Pennsylvania to Georgia.

Saprinus pennsylvanicus Paykull has been collected on cow dung (Blume, 1985) and dead fish (Downie & Arnett, 1996). A single specimen was taken by visual survey at Cedar Point on 30 May 2003. MBP (2022) does not list this species. Evans (2014) records this coastal species from Massachusetts to Florida.

Spilodiscus biplagitus (J. E. LeConte) has been collected under debris in sandy fields (Downie & Arnett, 1996). Specimens were taken by visual survey at Cedar Point on 30 May 2003 and near

Headquarters on 13 June 2003. MBP (2022) does not list this species. Downie & Arnett (1996) give the distribution as New York to Georgia.

Family Laemophloeidae

Laemophloeus biguttatus Say breeds in *Hypoxylon* prob. *atropunctatum* (Schweinitz ex. Fries) Cooke (Xylariaceae) (Lawrence, 1977). A single specimen was taken at black light on 8 August 2003 at Ingleside Recreation Area.

Family Lampyridae

Lucidota atra (Olivier) has been captured in pitfall traps (Levesque & Levesque, 1997); is found in low herbage and trunks of trees in woods (Blatchley, 1910); and in open woodlands (Luk et al., 2011). Specimens were taken at black light on 26 June 2003 at Boxes Point and on 26 June 2003 near Headquarters.

Photinus pyralis (L.) is found in meadows and edges of woodlands (Case, 2004). Specimens were taken at black light on 24 July 2003 at Cedar Point, on 26 June 2003 near Headquarters, on 8 August 2003 at Ingleside Recreation Area, and on 7 June 2003 along Wildlife Trail.

Photuris lucicrescens Barber is found in forested floodplains and adjacent upland forests (Heckscher, 2012). Specimens were taken at black light along Wildlife Trail on 7 June 2003.

Photuris pensylvanicus (DeGeer) larvae are found in subterranean burrows during the day, feeding on soft-bodied insects, earthworms, and snails on the surface at night (Keiper & Solomon, 1972); has been captured in pitfall traps (Levesque & Levesque, 1997); found in high quality freshwater emergent, shrub, and floodplain peatlands (Heckscher, 2012). Specimens were taken at black light on 26 June 2003 at Boxes Point and on 7 June 2003 along Wildlife Trail. MBP (2022) does not list this species. Downie & Arnett (1996) reported the species from Delaware and Maryland.

Pyropyga decipiens (Harris) has been taken in fields, along the margins of streams and ponds, and in Malaise traps (Barrows et al., 2008; Majka, 2012). A single specimen was taken at black light on 26 June 2003 in area GTR 2 & 4.

Family Latridiidae

Corticaria serrata (Paykull), an introduced species, is found in stored grains and decaying plant material (Majka et al., 2009). A single specimen was taken at black light near Headquarters on 14 June 2003. MBP (2022) does not list this species. Majka et al. (2009) reports this species from eastern Canada to Florida.

Melanophthalma americana Mannerheim is found in coniferous and mixed forests (Majka et al., 2009). Specimens were taken beating vegetation at Boxes Point on 27 June 2003 and along Duck Inn Trail on 15 May 2003. MBP (2022) does not list this species. Majka et al. (2009) reports this species from eastern Canada to Florida.

Family Leiodidae

Agathidium compressidens Fall is found under conifer bark and from various litter sources including maple-poplar forest, leaves, logs and bark, and a deciduous stump, “fleshy fungus”, *Arcyria denudata*, and an *omatricha*-like slime mold (Miller & Wheeler, 2005). A single specimen was taken in a pitfall trap on 12 April 2003 in Field 25. MBP (2022) does not list this species. Miller & Wheeler (2005) record the species from Canada to South Carolina.

Nemadus gracilicornis Fall is found in the nests of *Formica exsectoides* Forel. (Hymenoptera: Formicidae) (Peck & Newton, 2017). A single specimen was taken in a pitfall trap on 19 April 2003 along Wildlife Trail. MBP (2022) does not list this species. Peck & Newton (2017) record this species from Canada to New Jersey. **NEW STATE RECORD.**

Prionochaeta opaca (Say) has an unknown biology. A single specimen was taken in a pitfall trap on 19 April 2003 along Wildlife Trail.

Family Lucanidae

Dorcus parallelus Say breeds in oak, maple, and linden logs; adults are attracted to lights (Staines, 1984). Specimens were taken at black light on 26 June 2003 in area GTR 2 & 3.

Lucanus capreolus (L.) breeds in decaying hardwood stumps; adults are attracted to lights (Staines, 1984). Specimens were taken at black light on 27 July 2003 at Cedar Point and on 12 August 2003 at Ingleside Recreation Area.

Family Melandryidae

Dircaea liturata LeConte is commonly found at lights (Evans, 2014); under back of dead *Pinus*, in Lindgren funnel trap, and at black light (Ciegler, 2014). Specimens were taken in a pitfall trap on 23 June 2003 at Boxes Point and at black light on 26 June 2003 in area GTR 2 & 3 and on 25 July 2003 near Headquarters.

Family Meloidae

Epicauta pennsylvanica (DeGeer) adults are found on flowers in later summer and fall; larvae are ectoparasites of grasshopper eggs (Rees, 1973). Specimens were taken by visual survey near Headquarters on 13 September 2003.

Epicauta vittata Fabricius adults are found on flowers in later summer and fall; larvae are ectoparasites of grasshopper eggs (Adams & Selander, 1979). Specimens were taken at black light on 24 July 2003 at Cedar Point, on 26 June 2003 and 25 July 2003 near Headquarters, on 8 August at Ingleside Recreation Area, on 8 August 2003 along Ingleside Road, and on 25 July near staff residence.

Family Melyridae

Collops quadrimaculata (Fabricius) is a predator on a wide variety of soft-bodied arthropods such as aphids (Hemiptera: Aphididae), whiteflies (Hemiptera: Aleyrodidae), mites (Arachnida: Acari), and eggs and caterpillars (Lepidoptera) (Ellsworth et al., no date). Specimens were taken by visual survey near Headquarters on 30 May 2003.

Family Mordellidae

Falsomordellistena liturata (Melsheimer) has been taken on herbaceous vegetation (Lisberg & Young, 2003). Specimens were taken at black light near Headquarters on 25 July 2003.

Hoshihananomia octopunctata (Fabricius) adults are common on flowers of many species (Liljebald 1945; Lisberg & Young, 2003); larvae have been reared from *Fagus grandifolia* (Ford & Jackman, 1996); it was collected by hand, using sweep nets, and in flight intercept, Malaise, and yellow pan traps in oak savannas, oak barrens, and prairie-forest ecotones (Lisberg & Young, 2003). A single specimen was taken by visual survey at Boxes Point on 25 July 2003.

Mordella atrata Melsheimer adults occur on flowers of many species (Liljebald, 1945). Specimens were taken by visual survey near Headquarters on 8 August 2003.

Mordellina pustulata (Melsheimer) has been reared from stems of many Asteraceae (Lisberg & Young, 2003). A single specimen was taken beating vegetation along Duck Inn Trail on 17 May 2003.

Family Mycetophagidae

Litargus nebulosus LeConte has been collected at black light (Ciegler, 2014). A single specimen was taken by visual survey at Boxes Point on 25 July 2003. MBP (2022) does not list this species. Parsons (1975) records this species from Maryland.

Litargus sexpunctatus (Say) has been collected at black light, in *Quercus* log, and dead tree trunks (Ciegler, 2014). A single specimen was taken at black light near Headquarters on 14 June 2003.

Mycetophagus flexuosus Say has been found in hardwood forests with *Acer saccharum* and *Fagus grandifolia*, an old red oak (*Quercus rubra*) forest, mixed forests, and an old (180-year-old) red pine (*Pinus resinosa* Ait.) forest. This species was found in partially dried *Pleurotus* (Pleurotaceae) species on dead, standing *A. saccharum*, on a dead, standing *Populus tremuloides* Michx., in a decayed log covered with gilled mushrooms and polypore fungi, in a pile of moldy corncobs and cornhusks, and at an ultraviolet light. Specimens were also captured in Lindgren funnel traps at several localities (Webster et al., 2012); associated with *Pleurotus ostreatus* Fries (Cline & Leschen, 2005). Specimens were taken around a vernal pool at Bogles Wharf on 12 April 2003.

Mycetophagus punctatus Say has been found under loose bark and in polypore fungi (Majka, 2010). Specimens were taken in pitfall traps at Bogles Wharf and Boxes Point on 23 June 2003, near Headquarters on 14 June 2003, and at black light on 24 July 2003 at Cedar Point.

Mycetophagus serrulatus (Casey) adults have been collected in hardwood forests (Majka, 2010). A single specimen was taken at black light on 26 June 2003 at Boxes Point.

Typhaea stercorea L., an introduced species, is associated with corn fields and products (Majka, 2010). Specimens were taken at black light on 8 August 2003 at Ingleside Recreation Area.

Family Nitidulidae

Amphicrossus ciliatus (Olivier) is found on sap in the spring and on various flowers in the fall (Parsons, 1943). It has been captured in Lindgren funnel traps baited with either banana (*Musa*, Musaceae) and fermenting brown sugar or fermenting brown sugar and bread dough, or cantaloupe (*Cucumis melo cantalupo* Ser., Cucurbitaceae) traps, flight intercept traps, light traps, at sap flows of *Quercus* sp. and *Acer* sp., on the bark of *Ulmus* sp. and *Quercus velutina* Lamarck, and from a fleshy, gilled fungus on a standing live tree (Price & Young, 2006). Specimens were taken at black light on 14 June 2003 near Headquarters.

Carpophilus lugubris Murray is attracted to a wide variety of ripe fruits or fermenting vegetable material, is a pest of *Zea mays* L. (Poaceae) (Connell, 1956). It has been captured in Lindgren funnel traps, baited with either fermenting brown sugar and bread dough or banana and fermenting brown sugar, cantaloupe traps, flight intercept traps, banana traps, barrier pitfall traps, Townes Malaise traps, recently cut stumps/sawdust of *Acer* sp., banana, a rotting fruit pile, a leaf litter sample, dried melon, flowers of *Prunus americana* Marshall (Rosaceae), scat on fallen tree, and decaying tomatoes (*Solanum lycopersicum* L., Solanaceae) (Price & Young, 2006). Specimens were taken by visual survey near staff residence on 26 July 2003.

Carpophilus marginatus Erichson adults are associated with cut oak (Parsons, 1943). Specimens were taken by visual survey on 7 June 2003 near Headquarters. MBP (2022) does not list this species. Parsons (1943) reports this species from New York to Florida.

Carpophilus melanopterus Erichson feeds on various species of *Yucca* (Asparagaceae) (Connell, 1956). Specimens were taken feeding on *Yucca* flowers near Headquarters on 8 June 2002.

Cryptarcha ampla Erichson has been collected from sap of *Acer* and *Salix* (Parsons, 1943); at sap flows of *Quercus* and *Carya*, in fungi, at lights (Downie & Arnett, 1996); in oak wilt fungal mats (*Bretziella fagacearum* (Bretz) de Boer, Marincowitz, Ducha, & Wingfield, Ceratocystidaceae) (Cease & Juzwik 2001); fresh oak wounds (Juzwik et al., 2004); on *Quercus rubra* (Majka & Cline, 2006); in Lindgren funnel traps baited with banana or bread dough and fermenting brown sugar (the most successful strategy), cantaloupe traps, flight intercept traps, human dung/malt/molasses pitfall traps, light traps, Malaise traps, soil at the base of a fermenting oak tree wound, a willow tree damaged by a species of *Sternochetus* (Coleoptera: Curculionidae), on rotting *Prunus perisica* (L.) Batsch (Rosaceae), reared from the stem of a *Asclepias syriaca* L. (Asclepiadaceae) (Price & Young, 2006). Specimens were taken at black light on 24 July 2003 at Cedar Point, on 14 June 2003 near Headquarters, on 27 June 2003 at Ingleside Recreation Area, and on 30 May 2003 along Wildlife Trail.

Eupraea rufa (Say) is found in leaf litter, at sap, in fungi, on tree bark, on driftwood, and reared from fallen seeds of *Acer saccharum* Marsh. (Parsons, 1943; Price & Young, 2006). A single specimen was taken at black light on 14 June 2003 near Headquarters.

Glischrochilus obtusus (Say) has been found on sap flows on hardwood trees (Vogt, 1950). Specimens were taken at black light on 30 May 2003 along Wildlife Trail.

Meligathes nigrescens Stephens adults are found in the flowers of numerous plants (Connell, 1956). Specimens were abundant in various flowers near Headquarters on 17 May 2003. MBP (2022) does not list this species. Downie & Arnett (1996) record the species from Maryland.

Pocadius helvolus Erichson is associated with fungi (Connell, 1956). Specimens were taken at black light on 30 May 2003 along Wildlife Trail. MBP (2022) does not list this species. Downie & Arnett (1996) record the species from Ontario to Florida.

Prometopia sexmaculata (Say) has been found on sap of various trees and overwinters beneath bark (Parsons, 1943); in flight intercept traps, at blacklight, from Lindgren funnel traps, and beneath the bark of *Quercus ellipsoidalis* E. J. Hill and *Q. velutina* (Price & Young, 2006). Specimens were taken at black light on 26 June 2003 at Boxes Point, on 21 August along Duck Inn Trail, on 26 June 2003 in area GTR 2 & 3, on 25 July 2003 near Headquarters, and on 30 May 2003 along Wildlife Trail.

Stelidota geminata (Say) feeds on the ripe fruit of *Fragaria* (Rosaceae), *Prunus persica*, and other plants (Weber & Connell, 1975; Williams et al., 1996); in flight intercept traps, human dung/malt/molasses-baited pitfall traps, cantaloupe traps, Lindgren funnel traps baited with banana and brown sugar, rotting fruit, under scat, in leaf litter, and from a large shelf fungus growing on an old growth (100+ year old) maple tree (Price & Young, 2006). Specimens were taken at black light on 22 August 2003 at Boxes Point, on 14 June 2003 near Headquarters, and on 8 August 2003 at Ingleside Recreation Area; in pitfall traps on 19 April 2003 in Field 25, on 17 June 2003 at Wicke's Historic Site, and on 19 April 2003 along Wildlife Trail.

Family Oedemeridae

Alloxaxis dorsalis (Melsheimer) has an unknown biology. A single specimen was taken at black light near the staff residence on 25 July 2003. MBP (2022) does not list this species. Arnett (1951) records this species from Maryland.

Nacерdes melanura (L.), an introduced species, breeds in driftwood and pilings in fresh and brackish water (Arnett, 1984). Specimens were taken at black light on 26 June 2003 at Boxes Point and by visual survey near Headquarters on 24 June 2003.

Family Passalidae

Odontotaenius disjunctus (Illiger) is found in decaying logs (Staines, 1984). Specimens were taken at black light on 8 August 2003 along Ingleside Road and in a pitfall trap on 7 June 2003 near the Lodge.

Family Passandridae

Catogenus rufus (Fabricius) larvae are ectoparasites of Cerambycidae and Braconidae (Hymenoptera) pupae (Evans, 2014). A single specimen was taken peeling bark on 26 June 2003 at Boxes Point.

Family Phalacridae

Olibrus sp. specimens we could not place to species using existing keys were taken at black light on 14 June 2003 near Headquarters, on 8 August 2003 in Ingleside Recreation Area, and by visual survey on 30 May 2003 along Wildlife Trail.

Stilbus apicalis (Melsheimer) has an unknown biology. Specimens were taken at black light on 24 July 2003 at Cedar Point and on 26 June 2003 near Headquarters.

Stilbus sp. a single specimen we could not place to species using existing keys was taken in a pitfall trap on 19 April 2003 along Wildlife Trail.

Family Ptilodactylidae

Anchytarsus bicolor (Melsheimer) adults have been collected in leaf litter at the margins of streams and at lights (LeSage & Harper, 1976). Specimens were taken at black light on 7 June 2003 along Wildlife Trail. MBP (2022) does not list this species. Stribling (1986) records the species from Quebec to Georgia.

Ptilodactyla sp. female specimens were taken at black light on 24 July 2003 at Cedar Point, on 14 June 2003 near Headquarters, and on 27 June 2003 at Ingleside Recreation Area.

Family Ptinidae

Lasioderma serricorne (Fabricius) is a common pest of many stored products (Arango & Young, 2012). Specimens were found in numbers at black light along Wildlife Trail on 7 June 2003.

Family Pyrochoridae

Dendroides canadensis Latreille is found under loose bark (Downie & Arnett, 1996) and at black light (Ciegler, 2014). A single specimen was taken at black light on 26 June 2003 at Boxes Point.

Neopyrochroa femoralis (LeConte) is found under bark and by beating vegetation (Downie & Arnett, 1996) and at black light (Ciegler, 2014). Specimens were taken at black light on 30 May 2003 along Wildlife Trail and on 26 June 2003 in area GTR 2 & 3.

Family Scarabaeidae

Anomala binotata (Gyllenhal) is found on foliage and is attracted to lights (Staines, 1984). Specimens were taken at black light from 26 June to 8 August 2003 at Boxes Point, Cedar Point,

Field 25, area GTR 2 & 3, near Headquarters, Ingleside Recreation Area, along Ingleside Road, and near staff residence.

Anomala marginata (Fabricius) is found in pastures (Potts, 1977). Specimens were taken at black light from 26 June to 21 August 2003 at Cedar Point, along Duck Inn Trail, near Headquarters, in maintenance area, near staff residence, Wicke's Historic Site, and along Wildlife Trail.

Ataenius figurator Harold has been found at light, in sheep manure, and carrion (Harpootlian, 2001). Specimens were taken at black light on 8 August 2003 at Ingleside Recreation Area. MBP (2022) does not list this species. Staines (1984) records this species from Maryland.

Ataenius imbricatus (Melsheimer) is attracted to light and found in dung (Harpootlian, 2001). A single specimen was taken at black light on 26 June 2003 near Headquarters.

Ataenius spretulus (Haldeman) has been taken in dung, fungi, on dead cicada, and at light (Staines, 1984); hand collected in flight from cultivated grasses (sports fields, golf courses, lawns) (Kriska & Young, 2002). Specimens were taken in pitfall traps on 8 July 2003 at Bogles Wharf and on 26 June 2003 near Headquarters; and at black light on 8 August 2003 at Ingleside Recreation Area.

Ateuchus histeroides Weber has been collected in dung, fungi, dead fish, and at light; it is most common in wooded areas (Staines, 1984). Specimens were taken at black light on 14 June 2003 near Headquarters.

Blackburneus stercocorsus (Melsheimer) has been collected in dung and at lights (Staines, 1984); in pitfall traps baited with human or pig dung, and in leaf litter near a fallen tree in mesic hardwood forest (Kriska & Young, 2002). Specimens were taken at black light on 26 June 2003 at Boxes Point, on 25 July 2003 near Headquarters, on 27 June 2003 at Ingleside Recreation Area, on 25 July 2003 in maintenance area, on 25 July 2003 near staff residence, and on 30 May 2003 along Wildlife Trail.

Copris minutus (Drury) has been found in dung, carrion, and is attracted to light (Staines, 1984). Specimens were taken in pitfall traps and by visual survey from 12 April to 29 July 2003 at Bogles Wharf, Boxes Point, Field 25, near Headquarters, Ingleside Recreation Area, and along Ingleside Road.

Cyclocephala lurida Bland is a pest of turfgrass (Potter & Braman, 1991); adults have been taken in Japanese beetle traps and at light (Staines, 1984). Specimens were taken at black light on 24 July 2003 at Cedar Point, on 25 July 2003 near Headquarters, on 8 August 2003 along Ingleside Road, and 25 July 2003 near staff residence.

Diplotaxis liberta (Germar) has been found on poplar roots and at light (Vaurie, 1960). Specimens were taken at black light on 21 August 2003 along Duck Inn Trail.

Dynastes tityus Linnaeus feeds in decaying logs and is taken at light (Glaser, 1976). A single male specimen was taken at black light near Headquarters on 25 July 2003.

Dyscinetus morator (Fabricius) has been taken at lights and remains in the area hiding under debris during the day (Woodruff, 1970), feeds on *Oryza sativa* L. (Poaceae) (Anonymous, 1953), *Digitaria decumbens* Stent. (Poaceae) (Anonymous, 1956), *Caladium x hortulanum* (Araceae), *Vaccinium macrocarpon* Ait. (Ericaceae) (Woodruff, 1970), *Zea mays* L. (Poaceae) (Anonymous, 1980), *Daucus carota* L. (Apiaceae), *Raphanus sativus* L. (Brassicaceae), *Lactuca sativa* L. (Asteraceae) (Foster et al., 1986), *Eichhornia crassipes* (Mart.) Solm (Pontederiaceae) and is associated with wet soils and marshy areas (Buckingham & Bennett, 1989). Numerous specimens were taken at black light from 29 May to 8 August 2003 at Boxes Point, Cedar Point, along Duck Inn Trail, area GTR 2 & 3, near Headquarters, Ingleside Recreation Area, along Ingleside Road, near staff residence, and along Wildlife Trail.

Hoplia trifasciata Say has been taken on *Salix* (Salicaceae), *Lonicera* (Caprifoliaceae), oak, and rosaceous flowers (Staines, 1984). A single specimen was taken at black light on 30 May 2003 along Wildlife Trail.

Maladera castanea (Arrow), an introduced species, has been collected on the foliage of many plants and at lights (Hawley & Hallock, 1936; Staines, 1984). Specimens were taken at black light and pitfall traps from 26 June to 8 August 2003 at Bogles Wharf, Cedar Point, area GTR 2 & 3, near Headquarters, Ingleside Recreation Area, along Ingleside Road, in maintenance area, and near staff residence.

Onthophagus hecate (Panzer) has been collected in dung, fungi, carrion, rotten vegetables, malt traps, and at light (Howden & Cartwright, 1963); in pitfall traps baited with carrion or human or pig dung, and in flight intercept traps (Kriska & Young, 2002). Specimens were taken in pitfall traps from 24 May to 13 September 2003 at Bogles Wharf, Boxes Point, Field 25, Hail Point, near Headquarters, and near the Lodge,

Onthophagus orpheus (Panzer) has been found in dung, bird and mammal nests, and at malt traps (Howden & Cartwright, 1963). A single specimen was taken in a pitfall trap on 19 August 2003 in Ingleside Recreation Area.

Onthophagus pennsylvanicus Harold has been found on dung, carrion, and fungi (Howden & Cartwright, 1963). Specimens were taken in pitfall traps on 13 June 2003 in Field 25 and on 29 July 2003 in Wicke's Historic Site.

Onthophagus striatulus (Beauvois) has been found in dung, fungi, and carrion (Howden & Cartwright, 1963). Specimens were taken in pitfall traps on 30 June 2003 at Boxes Point and on 19 August 2003 near Headquarters.

Onthophagus subaeneus (Beauvois) is rarely collected and is associated with rabbit dung (Harpootlian, 2001). It is known from Pennsylvania to Florida and west to Texas (Harpootlian, 2001) but was not included in Staines (1984). Specimens were taken in pitfall traps on 20 June 2003 in Ingleside Recreation Area, on 27 August along Ingleside Road, and on 29 July 2003 at Wicke's Historic Site.

Oscarinus rusicola (Melsheimer) has been collected in dung and at light (Gordon, 1983); in pitfall traps baited with human or pig dung, and in flight intercept traps (Kriska & Young, 2002). Specimens were taken at black light on 26 June 2003 at Boxes Point, on 21 August 2003 along Duck Inn Trail, on 26 June in area GTR 2 & 3, on 14 June 2003 near Headquarters, on 27 June 2003 in Ingleside Recreation Area, and on 30 May 2003 and 7 June 2003 along Wildlife Trail.

Osmoderma eremicola (Knoch) has been found in rotten logs and is attracted to lights (Blatchley, 1910; Staines, 1984). A single specimen was taken in a pitfall trap on 19 August 2003 at Boxes Point.

Parataenius simulator Harold is found at lights (Harpootlian, 2001). A single specimen was taken at black light on 25 July 2003 near staff residence.

Pelidnota punctata (Linnaeus) has been collected on *Vitis* (Vitaceae) (Blatchley, 1910); at light (Staines, 1984); three adults were reared from pupae found in an unidentified, very decayed tree stump (Kriska & Young, 2002). Specimens were taken at black light from 26 June to 25 July 2003 at Cedar Point, area GTR 2 & 3, near Headquarters, in maintenance area, and near staff residence.

Phyllophaga anxia (LeConte) has been collected from the leaves of *Fagus*, *Betula*, *Cornus* (Cornaceae), *Ulmus*, *Juglans*, and *Salix* (Luginbill & Painter, 1953); in cranberry beds (Katovich et al., 1998); at UV light and in turf grasses and irrigated silvicultural sites (Kriska & Young, 2002). Specimens were taken at black light on 29 May 2003 at Boxes Point, on 25 July 2003 near Headquarters, and 30 May 2003 along Wildlife Trail.

Phyllophaga fusca (Frolich) has been collected on the foliage of many hardwood trees (Luginbill & Painter, 1953). Specimens were taken at black light on 26 June 2003 in area GTR 2 & 3.

Phyllophaga futilis (LeConte) has been collected from the leaves of *Fagus*, *Betula*, *Ulmus*, *Acer* (Aceraceae), *Morus* (Moraceae), *Juglans*, and *Salix* (Luginbill & Painter, 1953); at light; adults are common in gardens and at porch lights (Kriska & Young, 2002). Specimens were taken in pitfall traps on 8 July 2003 in Ingleside Recreation Area.

Phyllophaga hirticula (Knoch) has been collected from the leaves of *Fagus*, *Betula*, *Ulmus*, *Lonicera*, *Magnolia* (Magnoliaceae), *Rosa*, and *Salix* (Luginbill & Painter, 1953); at light (Kriska & Young, 2002). Specimens were taken at black light from 29 May to 21 August 2003 at Boxes Point, Cedar Point, along Duck Inn Trail, area GTR 2 & 3, near Headquarters, Ingleside Recreation Area, Wicke's Historic Site, and along Wildlife Trail.

Phyllophaga latifrons (LeConte) has been collected from the leaves of *Fagus* and *Juglans* and in Japanese beetle traps (Luginbill & Painter, 1953). Specimens were taken at black light from 14 June to 25 July 2003 at Cedar Point, area GTR 2 & 3, near Headquarters, Ingleside Recreation Area, and in maintenance area.

Serica peregrina Chapin is attracted to light (Staines, 1984). A single specimen was taken at black light on 30 May 2005 along Wildlife Trail.

Serica serica Illiger is attracted to light (Staines, 1984). Specimens were taken at black light and pitfall traps from 12 April to 25 July 2003 at Boxes Point, in Field 25, area GTR 2 & 3, near staff residence, and along Wildlife Trail.

Serica vespertina Gyllenhal has an unknown biology. Specimens were taken at black light from 9 May to 25 July 2003 at Bogles Wharf, Boxes Point, area GTR 2 & 3, near Headquarters, in maintenance area, and along Wildlife Trail.

Tomarus gibbosus (DeGeer) has been collected on plant roots and at light (Woodruff, 1973). Specimens were taken at black light on 26 June 2003 at Boxes Point, area GTR 2 & 3, near Headquarters; on 27 June 2003 at Ingleside Recreation Area; and on 30 May 2003 along Wildlife Trail.

Tomarus relictus (Say) has been found under rubbish and is attracted to light (Staines, 1984). Specimens were taken at black light on 14 June 2003 near Headquarters and on 8 August 2003 at Ingleside Recreation Area.

Family Scirtidae

Contacyphon neopadi (Klausnitzer) is sometimes common on vegetation in swamps and bogs (Downie & Arnett, 1996, as *Cyphon padi* (L.)); and is attracted to black light (Ciegler, 2003). Specimens were taken by visual survey on 17 May 2003 at Bogles Wharf and on 30 May 2003 along Wildlife Trail; taken at black light on 21 August 2003 along Duck Inn Trail. MBP (2022) does not list this species. Downie & Arnett (1996) reports the species from Ontario to Florida.

Contacyphon variabilis (Thunberg) has been collected sweeping vegetations in bogs (Young, 1988). Specimens were taken at black light and by visual survey from 30 May to 27 June 2003 at Boxes Point, area GTR 2 & 3, near Headquarters, Ingleside Recreation Area, and along Wildlife Trail.

Nyholmia collaris (Guérin) adults are found resting on vegetation (Evans, 2014). Specimens were taken by visual survey on 17 May 2003 along Duck Inn Trail and at Bogles Wharf, and on 30 May 2003 along Wildlife Trail.

Sarabandus robustus (LeConte) has an unknown biology. Specimens were taken at black light from 14 June to 21 August 2003 at Boxes Point, Cedar Point, along Duck Inn Trail, area GTR 2 & 3, Ingleside Recreation Area, and maintenance area.

Scirtes orbiculatus (Fabricius) adults are found on vegetation in wetlands (Evans, 2014). Specimens were taken at black light from 30 May to 8 August 2003 at Cedar Point, near Headquarters, Ingleside Recreation Area, and along Wildlife Trail.

Family Scraphiidae

Pentaria trifasciata (Melsheimer) adults are found on the flowers of trees and shrubs (Evans, 2014). Specimens were taken at black light on 24 July 2003 at Cedar Point and on 25 July 2003

near Headquarters.

Family Silphidae

Necrophila americana (Linnaeus) may be found on carrion or fungi during the day and is equally active in wooded and exposed areas (Cole, 1942; Shubeck, 1971). Specimens were taken in pitfall traps and by visual survey from 13 June to 27 July 2003 at Bogles Wharf, Boxes Point, Field 25, Hail Point, near Headquarters, and Ingleside Recreation Area.

Nicrophorus investigator Zetterstedt is active throughout the day and is found from mid-June until frost (Anderson & Peck, 1985). Specimens were taken in pitfall traps on 3 July 2003 near Headquarters and on 13 August 2003 along Wildlife Trail. MBP (2022) does not list this species. Anderson & Peck (1985) record the species as widely distributed in eastern North America.

Nicrophorus orbicollis Say is nocturnal and more commonly found on cold-blooded carrion (Shubeck, 1976). Anderson (1982) found this species more commonly in forested areas and is attracted to light. Specimens were taken in pitfall traps, by visual survey, and at black light from 9 May to 16 July 2003 at Bogles Wharf, Boxes Point, Field 25, area GTR 2 & 3, Hail Point, Ingleside Recreation Area, near the Lodge, Wicke's Historic Site, and along Wildlife Trail.

Nicrophorus pustulatus Herschel is one of the rarer North American species (Anderson & Peck, 1985). Specimens were taken at black light on 24 July 2003 at Cedar Point.

Nicrophorus tomentosus Weber is a diurnal species which is found on carrion of all types (Staines, 1987b). Specimens were taken in pitfall traps from 13 June to 29 July 2003 at Bogles Wharf, Hail Point, along Ingleside Road, and along Wildlife Trail.

Oiceoptoma inaequale (Fabricius) is a diurnal species which may be found year-round in carrion especially in exposed locations (Cole, 1942; Shubeck, 1971). Specimens were found on dead bluebird chicks in nest box on 9 May 2003 at Ingleside Recreation Area.

Family Staphylinidae

Scaphidium quadriguttatum Say has been found on *Trametes versicolor* (L.) Lloyd (Polyporaceae) (Weiss & West, 1920). Specimens were taken by visual survey on 30 May 2003 at Cedar Point and on 14 August 2003 at Wicke's Historic Site.

Family Synchronoidae

Synchroa punctata Newman has been found in both coniferous and deciduous forests, collected with flight-intercept traps (Bouchard & Pollock, 2006); found on *Abies balsamea* (L.) Mill. (Pinaceae) (Dearborn & Donahue, 1993). Larvae feed on fungal material and rotting wood (Payne, 1931). Specimens were taken at black light on 24 July 2003 at Cedar Point, on 26 June 2003 in area GTR 2 & 3, and on 8 August 2003 along Ingleside Road.

Family Tenebrionidae

Alobates pennsylvanica (DeGeer) has been taken on fungi, under bark, at UV light, in deciduous forest, oak savanna, and oak barrens (Dunford & Young, 2004). Specimens were taken at black light on 30 May 2003 along Wildlife Trail.

Arthromacra aenea (Say) adults have been beaten from the foliage of shrubs and trees, usually along the borders of marshes (Blatchley, 1910). Larvae feed on plant debris and are found under bark and in stumps (Majka et al., 2008). Specimens were taken at black light on 26 June 2003 in area GTR 2 & 3 and along Wildlife Trail on 7 May 2003.

Isomira quadristriata Couper has been found under debris and on bark (Dunford & Young, 2004) and at black light (Ciegler, 2014). Specimens were found in numbers at black light along Wildlife Trail on 7 June 2002.

Neomida bicornis (Fabricius) has been collected on fungi, under bark, at UV light, in deciduous forest, pine plantation, sand prairie (Triplehorn, 1965); associated with *Pleurotus ostreatus* (Cline & Leschen, 2005); and *Trametes* sp. (Epps & Arnold, 2010). Specimens were taken at black light on 30 May 2003 along Wildlife Trail.

Family Trogidae

Omorgus monochus (Herbst) has been found in carrion and bird nests; adults are attracted to lights (Staines, 1984). Specimens were taken in pitfall traps and at black light from 30 May to 8 August 2003 at Bogles Wharf, Boxes Point, Cedar Point, Field 25, area GTR 2 & 3, Hail Point, Ingleside Recreation Area, maintenance area, near staff residence, and along Wildlife Trail.

Omorgus suberosus (Fabricius) has been found in carrion, dung, and feathers; adults are attracted to lights (Staines, 1984). A single specimen was taken at black light on 26 June 2003 at Boxes Point.

Trox aequalis Say has been found in bird and mammal nests (Vaurie, 1955). Specimens were taken at black light on 26 June 2003 in area GTR 2 & 3 and near Headquarters.

Trox scaber L. has been found in bird and mammal nests and carrion; adults are attracted to lights (Staines, 1984). A single specimen was found dead at the Lodge on 16 May 2003.

Trox spinulosus Robinson has been found in carrion and owl pellets; adults are attracted to lights (Staines, 1984). Specimens were taken in pitfall traps and at black light from 9 May to 26 June 2003 at Boxes Point, Cedar Point, Field 25, area GTR 2 & 3, near Headquarters, Ingleside Recreation Area, Wicke's Historic Site, and along Wildlife Trail.

Trox tuberulatus DeGeer has been found in owl pellets and carrion (Staines, 1984). Specimens were taken in pitfall traps and at black light from 30 May to 7 August 2003 at Bogles Wharf, Boxes Point, Cedar Point, and along Wildlife Trail.

Trox variolatus Melsheimer has been found in carrion, dung, and owl pellets; adults are attracted to lights (Staines, 1984). Specimens were taken in pitfall traps and at black light from 12 April to 7 June 2003 at Bogles Wharf, Boxes Point, Field 25, Hail Point, near Headquarters, and Wicke's Historic Site.

Family Trogossitidae

Tenebriodes americanus Kirby has been found under the bark of many trees, adults are active at night and are attracted to lights (Barron, 1971; White, 1983). Other species in the genus are predaceous (Drooz, 1985). Adults have been collected in baited Lindgren funnel traps (Schoeller & Allison, 2013). Specimens were taken at black light on 26 June 2003 at Boxes Point and area GTR 2 & 3.

Tenebroides mauritanicus Linnaeus is a predator of insects attacking stored grain (Barron, 1971). Specimens were taken at black light on 30 May 2003 along Wildlife Trail. MBP (2022) does not list this species. Barron (1971) records this species throughout North America.

Family Zopheridae

Endeitoma granulata (Say) is found near the ground under loose bark of conifers and hardwoods (Stephan, 1989) and at black light (Ciegler, 2014). A single specimen was taken at black light on 25 July 2003 near headquarters.

DISCUSSION

These 278 species in 51 families indicate a diverse and abundant beetle fauna. This brings the total number of species documented from Eastern Neck Island to 400 in 54 families (Staines & Staines, 2005, 2012). Due to time and resource limitations, the family Staphylinidae has not been identified but specimens are deposited in both the Eastern Neck and Smithsonian collections.

Our hope had been that this inventory would provide the baseline data to justify a long-term study of the beetles on Eastern Neck Island. The data gathered will still be useful to any future project on the beetles of Eastern Neck. Publishing it is making the results available for any future worker to study changes in the beetle fauna in this time of global insect decline (Wagner, 2020).

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REFERENCES

- Adams, C. L., & R. B. Selander. 1979. Vittata group of the genus *Epicauta* (Coleoptera: Meloidae). *Bulletin of the American Museum of Natural History* 162: 137–266.
- Al Dhafer, H. M. 2009. Revision of the North American species of *Limonius* (Coleoptera: Elateridae). *Transactions of the American Entomological Society* 135: 209–352.
- Altieri, M. A., & W. H. Whitcomb. 1979. Predaceous arthropods associated with Mexican tea in north Florida. *Florida Entomologist* 62: 175–182.
- Anderson, R. S. 1982. Resource partitioning in the carrion beetle fauna of southern Ontario: Ecological and evolutionary considerations. *Canadian Journal of Zoology* 60: 1314–1325.
- Anderson, R. S. 1992. Curculionoidea of southern Florida: An annotated checklist (Coleoptera: Curculionoidea [excluding Curculionidae, Scolytinae, Platypodinae]). *Insecta Mundi* 6: 193–200.
- Anderson, R. S., & A. T. Howden. 1994. *Tychius meliloti* Stephens new to Canada with a brief review of the species of *Tychius* Germar introduced into North America (Coleoptera: Curculionidae). *Canadian Entomologist* 126: 1363–1368.
- Anderson, R. S., & S. B. Peck. 1985. The carrion beetles of Canada and Alaska Coleoptera: Silphidae and Agyrtidae. *The Insects and Arachnids of Canada* 13. 126 pp.
- Anonymous. 1953. USDA Cooperative Economic Insect Report 3: 725.
- Anonymous. 1956. USDA Cooperative Economic Insect Report 6: 1079.
- Anonymous. 1980. USDA Cooperative Economic Insect Report 5: 66.
- Arango, R. A., & D. K. Young. 2012. Deathwatch and spider beetles of Wisconsin (Coleoptera: Ptinidae). United States Department of Agriculture, Forest Service, General Technical Report FPL–GTR–209. 158 pp.
- Arnett, R. H. 1951. A revision of the Nearctic Oedemeridae (Coleoptera). *American Midland Naturalist* 45: 257–391.
- Arnett, R. H. 1984. The false blister beetles of Florida (Coleoptera: Oedemeridae). Florida Department of Agriculture and Consumer Services, Entomology Circular 259. 4 pp.
- Balsbaugh, E. U., & K. L. Hays. 1972. Leaf beetles of Alabama. Auburn University Agricultural Experiment Station Bulletin 441: 1–223.
- Barron, J. R. 1971. A revision of the Trogositidae of America north of Mexico (Coleoptera: Cleroidea). *Memoirs of the Entomological Society of Canada* 75: 1–143.
- Barrows, E. M., S. B. Arsenault, & N. P. Grenier. 2008. Firefly (Coleoptera: Lampyridae) flight periods, sex ratios, and habitat frequencies in a United States mid-Atlantic freshwater tidal marsh, low forest, and their ecotone. *Banisteria* 31: 47–52.
- Beal, R. S. 2003. Annotated checklist of Nearctic Dermestidae with revised key to the genera. *The Coleopterists Bulletin* 57: 391–404.
- Bechinski, E. J., & L. P. Pedigo. 1982. Evaluation of methods for sampling predatory arthropods in soybeans. *Environmental Entomology* 11: 756–761.
- Becker, E. C. 1974. Revision of the Nearctic species of *Athous* (Coleoptera; Elateridae) east of the Rocky Mountains. *Canadian Entomologist* 106: 711–758.
- Belcher, D. W., & F. D. Tenne. 1987. Elateridae larvae and control obtained with Terbufos and Phorate in first-year cornfields in Indiana. *Journal of the Kansas Entomological Society* 60: 127–132.

- Blake, D. H. 1943. The generic position of *Hypolampus pilosa* (Illiger) and some related new species (Coleoptera: Halticidae). *Proceedings of the Entomological Society of Washington* 45: 207–221.
- Blake, D. H. 1974. The costate species of *Colaspis* in the United States (Coleoptera: Chrysomelidae). *Smithsonian Contributions to Zoology* 181: 1–76.
- Blatchley, W. S. 1910. An illustrated descriptive catalogue of the Coleoptera or beetles known to occur in Indiana. Nature Publishing Co., Indianapolis. 1385 pp.
- Blatchley, W. S. 1924. The Chrysomelidae of Florida. *Florida Entomologist* 7: 33–39; 49–57; 8:1–7; 17–23.
- Blatchley, W. S., & C. W. Leng. 1916. Rhynchophora or weevils of eastern North America. Nature Publishing Company, Indianapolis. 682 pp.
- Bloem, S., R. F. Mizell, & C. W. O'Brien. 2002. Old traps for new weevils: New records for curculionids (Coleoptera: Curculionidae), brentids (Coleoptera: Brentidae) and anthribids (Coleoptera: Anthribidae) from Jefferson Co., Florida. *Florida Entomologist* 85: 632–644.
- Blume, R. R. 1985. A checklist, distributional record, and annotated bibliography of the insects associated with bovine droppings on pastures in American north of Mexico. *Southwestern Entomologist Supplement No. 9*. 55 pp.
- Boldt, P. E. 1989. Biology and host specificity of *Trirhabda bacharidis* (Coleoptera: Chrysomelidae) on *Baccharis* (Asteraceae: Astereae). *Environmental Entomology* 18: 78–84.
- Boldt, P. E., & T. O. Robbins. 1987. Phytophagous insect fauna of *Baccharis neglecta* (Compositae) in Texas. *Environmental Entomology* 16: 887–895.
- Bouchard, P., & D. A. Pollock. 2006. Understanding saproxylic beetles: New records of Tetratomidae, Melandryidae, Synchronidae, and Scaptiidae from the Maritime provinces of Canada (Coleoptera: Tenebrionoidea). *Zootaxa* 1248: 45–68.
- Bousquet, Y. 1989. A review of the North American genera of Cryptophaginae (Coleoptera: Cryptophagidae). *The Coleopterists Bulletin* 43: 1–17.
- Bousquet, Y. 1990. Beetles associated with stored products in Canada: An identification guide. Ottawa, Ontario: Research Branch, Agriculture Canada, Publication 1837. 220 pp.
- Bousquet, Y., & S. Laplante. 2006. The insects and arachnids of Canada Coleoptera Histeridae. Part 24. NRC Research Press. 485 pp.
- Bright, D. E. 1994. Revision of the genus *Sitona* (Coleoptera: Curculionidae) of North America. *Annals of the Entomological Society of America* 87: 277–306.
- Bright, D. E., & P. Bouchard. 2008. Insects and Arachnids of Canada. Part 25. Coleoptera, Curculionidae, Entiminae. NRC Research Press, Ottawa, Ontario, Canada. 327 pp.
- Brimley, C. S. 1938. The insects of North Carolina. North Carolina Department of Agriculture, Division of Entomology, Raleigh. 560 pp.
- Buckingham, G. R., & C. A. Bennett. 1989. *Dyscinetus morator* (Coleoptera: Scarabaeidae) adults attack waterhyacinth, *Eichhornia crassipes* (Pontederiaceae). *The Coleopterists Bulletin* 43: 27–33.
- Bulan, C. A., & G. W. Barrett. 1971. The effects of two acute stresses on the arthropod component of an experimental grassland ecosystem. *Ecology* 52: 597–605.
- Burke, H. R., J. A. Jackman, & M. Rose. 1994. Insects associated with woody ornamental plants in Texas. <http://leviathan.tamu.edu.70/Oh/pubs/entomolo/woody.html>
- Cameron, G. N. 1972. Analysis of insect trophic diversity in two salt marsh communities. *Ecology* 53: 58–73.

- Carlton, C. E., T. C. MacRae, A. K. Tishechkin, V. L. Bayless, & W. Johnson 2018. Annotated checklist of the Buprestidae (Coleoptera) from Louisiana. *The Coleopterists Bulletin* 72: 351–367.
- Case, J. F. 2004. Flight studies on photic communication in *Photinus pyralis*. *Integrative and Comparative Biology* 44: 250–258.
- Cease, K. R., & J. Jurwik. 2001. Predominate nitidulid species (Coleoptera: Nitidulidae) associated with spring oak wilt mats in Minnesota. *Canadian Journal of Forest Research* 31: 635–643.
- Chandler, D. S. 1982. A revision of North American *Notoxus* with a cladistic analysis of the New World species (Coleoptera: Anthicidae). *Entomography* 1: 333–438.
- Chapin, J. B., & V. A. Brou. 1991. *Harmonia axyridis* (Pallas), the 3rd species of the genus to be found in the United States (Coleoptera, Coccinellidae). *Proceedings of the Entomological Society of Washington* 93: 630–635.
- Ciegler, J. C. 2003. Water beetles of South Carolina (Coleoptera: Gyrinidae, Haliplidae, Noteridae, Dytiscidae, Hydrophilidae, Hydraenidae, Scirtidae, Elmidae, Dryopidae, Limnichidae, Heteroceridae, Psephenidae, Ptilodactylidae, and Chelonariidae). *Biota of South Carolina. Volume 3*. Clemson University, Clemson, SC. 207 pp.
- Ciegler, J. C. 2010. Weevils of South Carolina (Coleoptera: Nemonychidae, Attelabidae, Brentidae, Ithyceridae, and Curculionidae). *Biota of South Carolina. Volume 6*. Clemson University, Clemson, SC. 276 pp.
- Ciegler, J. C. 2014. Tenebrionoidea of South Carolina (Coleoptera: Mycetophagidae, Archeocrypticidae, Tetratomidae, Melandryidae, Mordellidae, Ripiphoridae, Zopheridae, Tenebrionidae, Synchronidae, Oedemeridae, Stenotrachelidae, Meloidae, Mycteridae, Boridae, Pythidae, Pyrochroidae, Salpingidae, Anthicidae, Ischaliidae, and Aderidae). *Biota of South Carolina, Volume 8*. Clemson University, Clemson, SC. 243 pp.
- Clark, S. M., D. G. LeDoux, T. N. Seeno, E. G. Riley, A. J. Gilbert, & J. M. Sullivan. 2004. Host plants of leaf beetle species occurring in the United States and Canada (Coleoptera: Megalopodidae, Orsodacnidae, Chrysomelidae, excluding Bruchinae). *Coleopterists Society Special Publication No. 2*. 476 pp.
- Cline, A. R., & R. A. B. Leschen. 2005. Coleoptera associated with the oyster mushroom, *Pleurotus ostreatus* Fries, in North America. *Southeastern Naturalist* 4: 409–420.
- Cole, A. C. 1942. Observations of three species of *Silpha*. *American Midland Naturalist* 28: 161–163.
- Colonnelli, E. 2004. Catalogue of Ceutorhynchinae of the world, with a key to genera (Insecta: Coleoptera: Curculionidae). *Argania Editio*, Barcelona. 124 pp.
- Connell, W. A. 1956. Nitidulidae of Delaware. *University of Delaware, Agricultural Experiment Station Bulletin* 318. 67 pp.
- Corrêa, R. C., R. R. F. Carmo, A. R. George, & J. K. Tomberlin. 2021. Effect of intraspecific larval aggregation and diet type on life history traits of *Dermestes maculatus* and *Dermestes caninus* (Coleoptera: Dermestidae): Species of forensic importance. *Journal of Clinical and Health Sciences* 6: 83–89.
- Cottrell, T. E., & K. V. Yeagan. 1998. Effect of pollen on *Coleomegilla maculata* (Coleoptera: Coccinellidae) population density, predation, and cannibalism in sweet corn. *Environmental Entomology* 27: 1402–1410.
- Dearborn, R. G., & C. P. Donahue. 1993. An annotated list of insects collected and recorded by the Maine Forest Service: Order Coleoptera, Beetles. *Maine Forest Service, Technical Report* 32. Augusta, Maine. 101 pp.

- Dillon, E. S., & L. S. Dillon. 1961. A manual of common beetles of eastern North America. Row, Peterson and Company. 894 pp.
- Doane, J. F. 1977. The flat wireworm, *Aeolus mellillus* (Say): Studies on seasonal occurrence of adults and incidence of the larvae in the wireworm complex attacking wheat. *Environmental Entomology* 6: 818–820.
- Douglass, J. R. 1929. Chrysomelidae of Kansas. *Journal of the Kansas Entomological Society* 2: 2–15, 26–38.
- Downie, N. M., & R. H. Arnett. 1996. The beetles of northeastern North America. The Sandhill Crane Press. Gainesville, Florida. 1721 pp.
- Drooz, A. T. 1985. Insects of eastern forests. United States Department of Agriculture, Forest Service, Miscellaneous Publication Number 1926. 608 pp.
- Dunford, J. C., & D. K. Young. 2004. An annotated checklist of Wisconsin darkling beetles (Coleoptera: Tenebrionidae) with comparisons to the western Great Lakes fauna. *Transactions of the American Entomological Society* 130: 57–76.
- Eastwood, M. N., K. Quinby, R. H. Seeley, C. Bogdanowicz, H. Weeks, & W. E. Bemis. 2009. Borror's species checklist for the Isles of Shoals Archipelago. Shoals Marine Laboratory, Cornell University, Ithaca, New York, USA. 65 pp.
- Ellsworth, P. E., A. Mostafa, L. Brown, & S. Naranjo. No date. Soft-Bodied *Collops* Likes Soft Bodies. University of Arizona Cooperative Extension. <https://www.ars.gov/arsuserfiles/4056/CollopsVFplo.pdf> (usda.gov). (Accessed 31 October 2022).
- Epps, M. J., & A. E. Arnold. 2010. Diversity, abundance and community network structure in sporocarp-associated beetle communities of the central Appalachian Mountains. *Mycologia* 102: 785–802.
- Evans, A. V. 2014. Beetles of eastern North America. Princeton University Press. 560 pp.
- Fenton, F. A. 1926. Observations on the biology of *Melanotus communis* and *Melanotus pilosus*. *Journal of Economic Entomology* 19: 502–504.
- Flowers, R. W., D. G. Furth, & M. C. Thomas. 1994. Notes on the distribution and biology of some Florida leaf beetles (Coleoptera: Chrysomelidae). *The Coleopterists Bulletin* 48: 79–84.
- Forbes, S. A. 1894. A monograph of insect injuries to Indian com, Part I. Springfield, Illinois. 171 pp.
- Ford, E. J., & J. A. Jackman. 1996. New larval host plant associations of tumbling flower beetles (Coleoptera: Mordellidae) in North America. *The Coleopterists Bulletin* 50: 361–368.
- Foster, R. E., J. P. Smith, R. H. Cherry, & D. G. Hall. 1986. *Dyscinetus morator* (Coleoptera: Scarabaeidae) as a pest of carrots and radishes in Florida. *Florida Entomologist* 69: 431–432.
- Freese, E. L. 2013. Distribution records for *Zenoa picea* (Palisot de Beauvois, 1805) (Coleoptera: Callirhipidae) from the United States. *Great Lakes Entomologist* 46: 120–132.
- Glaser, J. D. 1976. The biology of *Dynastes tityus* (Linn.) in Maryland (Coleoptera: Scarabaeidae). *Coleopterists Bulletin* 30: 133–138.
- Glen, R. 1950. Larvae of the elaterid beetles of the tribe Lepturoidini (Coleoptera: Elateridae). *Smithsonian Miscellaneous Collections* 111(11). 246 pp.
- Glen, R., K. King, & A. Arnason. 1943. The identification of wireworms of economic importance in Canada. *Canadian Journal of Research* 21: 358–387.
- Gordon, R. D. 1976. The Scymnini (Coleoptera: Coccinellidae) of the United States and Canada: Key to genera and revision of *Scymnus*, *Nephus*, and *Diomus*. *Bulletin of the Buffalo Society of Natural Sciences* 28: 1–362.

- Gordon, R. D. 1983. Studies on the genus *Aphodius* of the United States and Canada (Coleoptera: Scarabaeidae): VII. Food and habitat; distribution; key to eastern species. *Proceedings of the Entomological Society of Washington* 85: 633–652.
- Gordon, R. D. 1985. The Coccinellidae (Coleoptera) of America north of Mexico. *Journal of the New York Entomological Society* 93: 1–912.
- Gosling, D. C. L. 1984. Cerambycid host plants in a southwestern Michigan woodland (Coleoptera: Cerambycidae). *Great Lakes Entomologist* 17: 69–78.
- Haack R. A., & R. J. Rabaglia. 2013. Exotic bark and ambrosia beetles (Coleoptera: Curculionidae: Scolytinae) in the United States: Potential and current invaders. pp. 48–74. In Peña J. E. (ed). *Potential invasive pests of agricultural crops*. CABI International, Wallingford, UK.
- Hamilton, R. M., E. B. Doğan, G. B. Schaalje, & G. M. Booth. 1999. Olfactory response of the lady beetle *Hippodamia convergens* (Coleoptera: Coccinellidae) to prey related odors, including a scanning electron microscopy study of the antennal sensilla. *Environmental Entomology* 28: 812–822.
- Harpootlian, P. J. 2001. Scarab beetles (Coleoptera: Scarabaeidae) of South Carolina. *Biota of South Carolina*. Volume 2. Clemson University, Clemson, SC. 157 pp.
- Hawley, I. M., & H. C. Hallock. 1936. Life history and control of the Asiatic garden beetle. *United States Department of Agriculture Circular* 246: 1–20.
- Heckscher, C. M. 2012. Delaware *Photuris* fireflies (Coleoptera: Lampyridae): New state records, conservation status, and habitat associations. *Entomological News* 121: 498–505.
- Hight, S. D. 1990. Available feeding niches in populations of *Lythrum salicaria* (purple loosestrife) in the northeastern United States. pp. 269–278. In Delfosse, E. S. (ed.). *Proceedings of the VIIth. International Symposium on the Biological Control of Weeds*, 6-11 March 1988, Rome, Italy.
- Hilgendorf, J. H., & R. D. Goeden. 1981. Phytophagous insects reported from cultivated and weedy varieties of the sunflower, *Helianthus annuus* L., in North America. *Bulletin of the Entomological Society of America* 27: 102–108.
- Hoffman, R. L., S. M. Roble, & W. E. Steiner, Jr. 2002. Thirteen additions to the known beetle fauna of Virginia (Coleoptera: Scirtidae, Bothrideridae, Cleridae, Tenebrionidae, Melyridae, Callirhipidae, Cerambycidae, Chrysomelidae). *Banisteria* 20: 53–61.
- Howden, H. F. 1955. Biology and taxonomy of North American beetles of the subfamily Geotrupinae, with revisions of the genera *Bolbocerosoma*, *Eucanthus*, *Geotrupes*, and *Peltotrupes* (Scarabaeidae). *Proceedings of the United States National Museum* 104(3342): 151–319.
- Howden, H. F., & O. L. Cartwright. 1963. Scarab beetles of the genus *Onthophagus* Latreille North of Mexico (Coleoptera Scarabaeidae). *Proceedings of the United States National Museum* 114(3467): 1–135.
- Isely, D. 1920. Grapevine flea-beetles. *United States Department of Agriculture Bulletin* 901. 27 pp.
- Janicki, J., & D. K. Young. 2017. Nemonychidae and Anthribidae of Wisconsin (Coleoptera Curculionoidea). *Insecta Mundi* 0579: 1–36.
- Jewett, H. H. 1940. Observations on the life history of *Aeolus mellillus* (Say). *Journal of Economic Entomology* 33: 816.

- Johnson, P. J. 2002. Family 58. Elateridae Leach 1815. pp. 160–173 In R. H. Arnett, M. C. Thomas, P. E. Skelley, & J. H. Frank (eds.). American Beetles. Volume II. Polyphaga: Scarabaeoidea through Curculionoidea. CRC Press, Boca Raton, FL. 861 pp.
- Juzwik, J., T. C. Skalbeck, & M. F. Neuman. 2004. Sap beetle species (Coleoptera: Nitidulidae) visiting fresh wounds on healthy oaks during spring in Minnesota. *Forest Science* 50: 757–764.
- Karren, J. B. 1966. A revision of the genus *Exema* of America north of Mexico. *University of Kansas Science Bulletin* 48: 647–695.
- Karren, J. B. 1972. A revision of the subfamily Chlamisinae of America north of Mexico. *University of Kansas Science Bulletin* 49: 875–988.
- Katovich, K., S. J. Levine, & D. K. Young. 1998. Characterization and usefulness of soil-habitat preferences in identification of *Phyllophaga* (Coleoptera: Scarabaeidae) larvae. *Annals of the Entomological Society of America* 91: 288–297.
- Kaufmann, T., & P. Stansly. 1979. Bionomics of *Neoheterocerus pallidus* Say (Coleoptera Heteroceridae) in Oklahoma. *Journal of the Kansas Entomological Society* 52: 656–577.
- Keiper, R. R. & L. M. Solomon. 1972. Ecology and yearly cycle of the firefly *Photuris pennsylvanica* (Coleoptera: Lampyridae). *Journal of the New York Entomological Society* 80: 43–47.
- King, J. G., & P. K. Lago. 2012. The variegated mud-loving beetles (Coleoptera: Heteroceridae) of Mississippi and Alabama, with discussion and keys to the species occurring in the southeastern United States. *Insecta Mundi* 0275: 1–53.
- King, K. 1928. Economic importance of wireworms and false wireworms in Saskatchewan. *Scientific Agriculture* 8: 693–706.
- Kingsolver, J. M. 2004. Handbook of the Bruchidae of the United States and Canada (Insecta, Coleoptera). Volume 1. United States Department of Agriculture, Agricultural Research Service, Technical Bulletin Number 1912. 324 pp.
- Kirk, H. B. 1922. Biological notes on Elateridae and Melasidae (Col.). *Entomological News* 33: 236–240.
- Kirk, V. M. 1969. A list of the beetles of South Carolina Part 1- Northern coastal plain. *South Carolina Agricultural Experiment Station Technical Bulletin* 1033: 1–117.
- Kirk, V. M. 1970. A list of the beetles of South Carolina Part 2- Mountain, piedmont, and southern coastal plain. *South Carolina Agricultural Experiment Station Technical Bulletin* 1038: 1–117.
- Kissinger, D. G. 1963. Notes on the habits of some North American Curculionidae (Coleoptera). *The Coleopterists Bulletin* 17: 53–57.
- Kissinger, D. G. 1968. Curculionidae subfamily Apioninae of North and Central America, with reviews of the world genera of Apioninae and world subgenera of *Apion* Herbst (Coleoptera). Taxonomic Publications, South Lancaster, MA. 559 pp.
- Knull, J. N. 1925. The Buprestidae of Pennsylvania (Coleoptera). The Ohio State University Studies, Contributions from the Department of Zoology and Entomology, No. 87, vol. II, no. II, 77 pp.
- Knull, J. N. 1951. The checkered beetles of Ohio (Coleoptera: Cleridae). *Ohio Biological Survey Bulletin* 8(42): 268–350.
- Kriska, N. A., & D. K. Young. 2002. An annotated checklist of Wisconsin Scarabaeoidea (Coleoptera). *Insecta Mundi* 16: 31–48.

- Latta, R. 1928. The effect of extreme temperatures of Dec. 7, 8, and 9, 1927 on hibernating *Crioceris asparagi* L. and *Hippodamia convergens* Guer. at Ames, Iowa. *Psyche* 35: 229–231.
- Lawrence, J. F. 1977. Coleoptera associated with an *Hypoxylon* species (Ascomycetes: Xylariaceae). *The Coleopterists Bulletin* 31: 309–312.
- LeSage, L. 1986a. A taxonomic monograph of the Nearctic galerucine genus *Ophraella* Wilcox (Coleoptera: Chrysomelidae). *Memoirs of the Entomological Society of Canada* 133: 1–75.
- LeSage, L. 1986b. The eggs and larvae of *Cryptocephalus quadruplex* Newman and *C. venustus* Fabricius, with a key to the known immature stages of the Nearctic genera of Cryptocephalinae leaf beetles (Coleoptera: Chrysomelidae). *Canadian Entomologist* 118: 97–111.
- LeSage, L., & P. P. Harper. 1976. Notes on the life history of the toed-winged beetle *Anchytarsus bicolor* (Melsheimer) (Coleoptera: Ptilodactylidae). *The Coleopterists Bulletin* 30: 233–238.
- LeSage, L., & V. L. Stieffel. 1996. Biology and immature stages of the North American clytrines *Anomoea laticlavata* (Forster) and *A. flavokansiensis* Moldenke (Coleoptera: Chrysomelidae: Clytrinae). pp. 217–238 In P. H. A. Jolivet, & M. L. Cox (eds.). *Chrysomelidae Biology. Volume 3. General Studies*. SPB Academic Publishing, Amsterdam, Netherlands.
- Leschen, R. A. B. 1994. Fungal host use in two species of *Derodontus* LeConte (Coleoptera: Derodontidae). *The Coleopterists Bulletin* 48: 126–130.
- Levesque, C., & G-Y. Levesque. 1993. Abundance and seasonal activity of Elateroidea (Coleoptera) in a raspberry plantation and adjacent sites in southern Quebec, Canada. *The Coleopterists Bulletin* 47: 269–277.
- Levesque, C., & G-Y. Levesque. 1997. Abundance and seasonal activity of Cantharidae, Lampyridae and Lycidae (Coleoptera) in a raspberry plantation and adjacent sites in southern Quebec (Canada). *Entomological News* 108: 239–244.
- Liljebald, E. 1945. Monograph of the family Mordellidae (Coleoptera) of North America, north of Mexico. *Miscellaneous Publications, Museum of Zoology, University of Michigan* 62. 229 pp.
- Lingafelter, S. W. 2007. Illustrated key to the longhorned woodboring beetles of the eastern United States. *The Coleopterists Society Special Publication* 3. 206 pp.
- Linsley, E. G. 1962. The Cerambycidae of North America part II. Taxonomy and classification of the Parandrinae, Prioninae, Spondylinae, and Aseminae. *University of California Publications in Entomology* 19. 102 pp.
- Linsley, E. G. 1963. The Cerambycidae of North America part IV. Taxonomy and classification of the subfamily Cerambycinae, tribes Elaphidionini through Rhinotragini. *University of California Publications in Entomology* 21. 165 pp.
- Linsley, E. G., & J. A. Chemsak 1984. The Cerambycidae of North America. VII(1): Taxonomy and classification of the subfamily Lamiinae, tribes Parmenini through Acanthocini. *University of California Publications in Entomology* 102. 258 pp.
- Lisberg, A. E., & D. K. Young. 2003. An annotated checklist of Wisconsin Mordellidae (Coleoptera). *Insecta Mundi* 17: 195–202.
- Lugger, O. 1899. Beetles injurious to fruit producing plants. *University of Minnesota Agricultural Experiment Station Bulletin* 66: 85–332.
- Luk S. P. L., S. A. Marshall, & M. A. Branham. 2011. The fireflies (Coleoptera; Lampyridae) of Ontario. *Canadian Journal of Arthropod Identification* 16: 1–105.

- Luginbill, P., & H. R. Painter. 1953. May beetles of the United States and Canada. United States Department of Agriculture Technical Bulletin 1060. 182 pp.
- MacRae, T. C. 1991. The Buprestidae (Coleoptera) of Missouri. *Insecta Mundi* 5: 101–126.
- MacRae, T. C. 1994. Annotated checklist of the longhorned beetles (Coleoptera: Cerambycidae and Disteniidae) occurring in Missouri. *Insecta Mundi* 7: 223–252.
- MacRae, T. C. 2004. Notes on the host association of *Taphrocerus gracilis* (Say) (Coleoptera: Buprestidae) and its life history in Missouri. *The Coleopterists Bulletin* 58: 588–590.
- MacRae, T. C. 2006. Distributional and biological notes on North American Buprestidae (Coleoptera), with comments on variation in *Anthaxia* (*Haplanthaxia*) *cyanella* Gory and *A. (H.) viridifrons* Gory. *Pan Pacific Entomologist* 82: 166–199.
- MacRae, T. C., & G. H. Nelson. 2003. Distributional and biological notes on Buprestidae (Coleoptera) in North and Central America and the West Indies, with validation of one species. *The Coleopterists Bulletin* 57: 57–70.
- MacRae, T. C., & M. E. Rice. 2007. Biological and distributional observations on North American Cerambycidae (Coleoptera). *The Coleopterists Bulletin* 61: 227–263.
- Majka, C. G. 2008. Contributions to the knowledge of Atlantic Canadian Histeridae (Coleoptera). *Zookeys* 2: 189–202.
- Majka, C. G. 2010. The Mycetophagidae (Coleoptera) of the Maritime provinces of Canada. *ZooKeys* 64: 9–23.
- Majka, C. G. 2011. The Anthicidae and Ischaliidae (Coleoptera) of Atlantic Canada. *Journal of the Acadian Entomological Society* 7: 50–64.
- Majka, C. G. 2012. The Lampyridae (Coleoptera) of Atlantic Canada. *Journal of the Acadian Entomological Society* 8: 11–29.
- Majka, C. G., & A. R. Cline. 2006. Nitidulidae and Kateretidae (Coleoptera: Cucujoidea) of the Maritime provinces of Canada. I. New records from Nova Scotia and Prince Edward Island. *Canadian Entomologist* 138: 314–322.
- Majka, C. G., & P. J. Johnson. 2008. The Elateridae (Coleoptera) of the Maritime Provinces of Canada: Faunal composition, new records, and taxonomic changes. *Zootaxa* 1811: 1–33.
- Majka, C. G., P. Bouchard, & Y. Bousquet. 2008. Tenebrionidae (Coleoptera) of the Maritime Provinces of Canada. *Canadian Entomologist* 140: 690–713.
- Majka, C. G., D. Langor, & W. H. Rucker. 2009. Latridiidae (Coleoptera) of Atlantic Canada: New records, keys to identification, new synonyms, distribution, and zoogeography. *Canadian Entomologist* 141: 317–370.
- Maryland Biodiversity Project (MBP). 2022. <https://www.marylandbiodiversity.com>. (Last accessed 9 November 2022).
- Mattson W. J., P. Niemela, I. Millers, & Y. Inguanzo. 1994. Immigrant phytophagous insects on woody plants in the United States and Canada: An annotated list. General Technical Report NC-169. USDA Forest Service, North Central Forest Experiment Station. St. Paul, MN. 27 pp.
- McAvoy, T. J., L. T. Kok, & J. T. Trumble. 1983. Biological studies of *Ceutorhynchus punctiger* (Coleoptera: Curculionidae) on dandelion in Virginia. *Annals of the Entomological Society of America* 76: 971–674.
- Messina, F. J., & R. B. Root. 1980. Association between leaf beetles and meadow goldenrods (*Solidago* spp.) in central New York. *Annals of the Entomological Society of America* 73: 641–646.

- Miller, K. B., & Q. D. Wheeler. 2005. Slime-mold beetles of the genus *Agathidium* Panzer in North and Central America. Part II. Coleoptera: Leiodidae. Bulletin of the American Museum of Natural History 291: 167 pp.
- Moldenke, A. R. 1970. A revision of the Clytrinae of North America north of the Isthmus of Panama. Stanford University. 310 pp.
- Nelson, G. H., G. C. Walters, R. D. Haines, & C. L. Bellamy. 2008. A catalog and bibliography of the Buprestoidea of America north of Mexico. The Coleopterists Society. 274 pp.
- O'Brien, C. W., & G. J. Wibmer. 1982. Annotated checklist of the weevils (Curculionidae sensu lato) of North America, Central America, and the West Indies (Coleoptera: Curculionoidea). Memoirs of the American Entomological Institute, Number 34. 382 pp.
- Paiero, S. M., M. D. Jackson, A. Jewiss-Gaines, T. Kimoto, B. D. Gill, & S. A. Marshall. 2012. Jewel beetles of northeastern North America. 411 pp.
- Parsons, C. T. 1943. A revision of Nearctic Nitidulidae (Coleoptera). Bulletin of the Museum of Comparative Zoology 92: 121–278.
- Parsons, C. T. 1975. Revision of Nearctic Mycetophagidae (Coleoptera). The Coleopterists Bulletin 29: 93–108.
- Payne, N. N. 1931. Food requirements for the pupation of two coleopterous larvae, *Synchroa punctata* Newm. and *Dendroides canadensis* LeC. (Melandryidae, Pyrochroidae). Entomological News 42: 13–15.
- Peck, S. B., & A. F. Newton. 2017. An annotated catalog of the Leiodidae (Coleoptera) of the Nearctic Region (Continental North America North of Mexico). The Coleopterists Bulletin 71: 211–258.
- Pelletier, G., & C. Hébert. 2014. The Cantharidae of eastern Canada and northeastern United States. Canadian Journal of Arthropod Identification 5: 1–246.
- Pelletier, G., & C. Hébert. 2019. The Cryptophagidae of Canada and the northern United States of America. Canadian Journal of Arthropod Identification No. 40. 305 pp.
- Peterson, A. 1953. Larvae of insects Part II. Coleoptera, Diptera, Neuroptera, Mecoptera, Trichoptera. Edward Brothers, Ann Arbor, Mich. 416 pp.
- Potter, D. A., & S. K. Braman. 1991. Ecology and management of turfgrass insects. Annual Review of Entomology 36: 383–406.
- Potts, R. L. 1977. Revision of the Scarabaeidae: Anomalinae 3. A key to the species of *Anomala* of America north of Mexico. Pan-Pacific Entomologist 53: 34–42.
- Price, M. D., & D. K. Young. 2006. An annotated checklist of Wisconsin sap and short-winged flower beetles (Coleoptera: Nitidulidae, Kateretidae). Insecta Mundi 20: 69–84.
- Rees, N. E. 1973. Arthropod and nematode parasites, parasitoids and predators of Acrididae in America north of Mexico. United States Department of Agriculture Technical Bulletin 1460. 288 pp.
- Rice, M. E., R. H. Turnbow, & F. T. Hovore. 1985. Biological and distributional observations on Cerambycidae from the southwestern United States (Coleoptera). The Coleopterists Bulletin 39: 18–24.
- Riley, E. G., & W. R. Enns. 1979. An annotated checklist of Missouri leaf beetles (Coleoptera: Chrysomelidae). Transactions of the Missouri Academy of Science 13: 53–82.
- Rinehart, S., & J. D. Long. 2019. Conspecifics, not pollen, reduce omnivore prey consumption. PLoS ONE 14: e0215264. <https://doi.org/10.1371/journal.pone.0215264>
- Robinson, W. H. 2005 Handbook of urban insects and arachnids: A handbook of urban entomology Cambridge University Press. 481 pp.

- Rouse, E. P., & L. N. Medvedev. 1972. Chrysomelidae of Arkansas. Arkansas Academy of Science Proceedings 26: 77–82.
- Royer, T. A., & D. D. Walgenbach. 1991. Predacious arthropods of cultivated sunflower in eastern South Dakota. Journal of the Kansas Entomological Society 64: 112–116.
- Salsbury, G. A., & R. L. Dinkins. 1979. A contribution to the knowledge of the Curculionidae of Kansas. Journal of the Kansas Entomological Society 52: 583–590.
- Schoeller, E. N., & J. D. Allison. 2013. Flight phenologies of the southeastern *Ips* species (Coleoptera: Curculionidae: Scolytinae) and some associated Coleoptera in central and southern Louisiana. Environmental Entomology 42: 1226–1239.
- Schoof, H. F. 1942. The genus *Conotrachelus* Dejean (Coleoptera, Curculionidae) in the North Central United States. Illinois Biological Monographs 19: 9–170.
- Shelton, A. 2022. Biological control: A guide to natural enemies in North America. <https://biocontrol.entomology.cornell.edu/index.php>. (Accessed 31 October 2022).
- Shubeck, P. P. 1971. Diel periodicities of certain carrion beetles. The Coleopterists Bulletin 25: 41–46.
- Shubeck, P. P. 1976. Carrion beetle responses to poikilotherm and homoiotherm carrion. Entomological News 87: 265–269.
- Smith, E. H. 1985. Revision of the genus *Phyllotreta* Chevrolat of America north of Mexico. Part I. The maculate species (Coleoptera, Chrysomelidae, Alticinae). Fieldiana: Zoology, New Series, No. 28, Publ. 1364: 1–168.
- Solomon, J. D. 1995. Guide to insect borers in North American broadleaf trees and shrubs. United States Department of Agriculture, Forest Service, Agricultural Handbook 706. 735 pp.
- Springer, C. A., & M. A. Goodrich. 1983. A revision of the family Byturidae (Coleoptera) for North America. Coleopterists Bulletin 37: 183–192.
- Staines, C. L. 1983. The Rhipiceridae (Coleoptera) of Maryland. Maryland Entomologist 2: 38–40.
- Staines, C. L. 1984. An annotated checklist of the Scarabaeoidea (Coleoptera) of Maryland. Maryland Entomologist 2: 79–89.
- Staines, C. L. 1987a. An annotated checklist of the Cerambycidae (Coleoptera) of Maryland. Maryland Entomologist 3: 1–10.
- Staines, C. L. 1987b. The Silphidae (Coleoptera) of Maryland. Maryland Entomologist 3: 13–18.
- Staines, C. L. 2006. *Cicindela hirticollis hirticollis* Say (Coleoptera: Cicindelidae) naturally colonizing a restored beach in the Chesapeake Bay, Maryland. Cicindela 37: 79–80.
- Staines, C. L., & S. L. Staines. 1988. Observations on, and new host records for, *Callirhopalus (Pseudocneorhinus) bifasciatus* (Roleofs) (Coleoptera: Curculionidae), with a review of host plants. Maryland Entomologist 3: 33–39.
- Staines, C. L., & S. L. Staines. 2005. The Dytiscidae and Hydrophilidae (Insecta: Coleoptera) of Eastern Neck National Wildlife Refuge, Maryland. Maryland Naturalist 47: 14–20.
- Staines, C. L., & S. L. Staines. 2012. The Carabidae (Coleoptera) of Eastern Neck National Wildlife Refuge, Maryland. Banisteria 38: 71–84.
- Staines, C. L., & S. L. Staines. 2019. Notes on the family Byrrhidae (Coleoptera) of the District of Columbia, Maryland, and Virginia. Proceedings of the Entomological Society of Washington 121: 532–534.
- Stephan, K. 1989. The Bothrideridae and Colydiidae of America north of Mexico (Coleoptera Clavicornia and Heteromera). Occasional Papers of the Florida State Collection of Arthropods 6: 1–79.

- Stirret, M. 1936. Notes on the flat wireworm *Aeolus mellillus* (Say). Canadian Entomologist 36: 117–118.
- Stribling, J. B. 1986. Revision of *Anchytarsus* (Coleoptera: Dryopodidea) with a key to the New World genera of Ptilodactylidae. Annals of the Entomological Society of America 79: 219–234.
- Triplehorn, C. A. 1965. Revision of Diaperini of American north of Mexico with notes on extralimital species (Coleoptera: Tenebrionidae). Proceedings of the United States National Museum 117(3515): 349–458.
- Ulke, H. 1902. A list of beetles of the District of Columbia. Proceedings of the United States National Museum 25: 1–57.
- Valentine, B. D. 1998. A review of Nearctic and some related Anthribidae (Coleoptera). Insecta Mundi 12: 251–296.
- Vaurie, P. 1951. Revision of the genus *Calendra* (formerly *Sphenophorus*) in the United States and Mexico (Coleoptera, Curculionidae). Bulletin of the American Museum of Natural History 98: 33–186.
- Vaurie, P. 1955. Revision of the genus *Trox* in North America (Coleoptera, Scarabaeidae). Bulletin of the American Museum of Natural History 106(1): 1–90.
- Vaurie, P. 1960. Revision of the genus *Diploaxis* Part 2 (Coleoptera, Scarabaeidae, Melolonthinae). Bulletin of the American Museum of Natural History 120(2): 161–434.
- Vogt, G. B. 1950. Occurrence and records of Nitidulidae. The Coleopterists Bulletin 4: 81–91.
- Wagner, D. L. 2020. Insect declines in the Anthropocene. Annual Review of Entomology 65: 457–480.
- Weber, R. G., & W. A. Connell. 1975. *Stelidota geminata* (Say): Studies of its biology (Coleoptera: Nitidulidae). Annals of the Entomological Society of America 68: 649–653.
- Webster, R. P., R. S. Anderson, V. L. Webster, C. A. Alderson, C. C. Houghes, & J. D. Sweeney. 2016. New Curculionoidea records from New Brunswick, Canada with an addition to the fauna of Nova Scotia. ZooKeys 573: 367–386.
- Webster, R. P., J. D. Sweeney, & I. DeMerchant. 2012. New Coleoptera records from New Brunswick, Canada: Mycetophagidae, Tetratomidae, and Melandryidae. Zookeys 179: 215–242. doi: 10.3897/zookeys.179.2598
- Weiss, H. B., & E. West. 1920. Fungous insects and their hosts. Proceedings of the Biological Society of Washington 33: 1–20.
- Welch, K. A. 1978. Biology of *Ophraella notulata* (Coleoptera: Chrysomelidae). Annals of the Entomological Society of America 71: 134–136.
- Wellso, S. G. 1973. A new species of *Anthaxia* with notes on other buprestids (Coleoptera: Buprestidae). The Coleopterists Bulletin 27: 165–168.
- Werner, F. G. 1958. A revision of the Nearctic species of *Tomoderus* (Coleoptera: Anthicidae). Psyche 64: 51–59.
- Westcott, R. L., W. F. Barr, G. H. Nelson, & D. S. Verity. 1979. Distributional and biological notes on North and Central American species of *Acmaeodera* (Coleoptera: Buprestidae). The Coleopterists Bulletin 33: 169–181.
- Wheeler, A. G., & E. R. Hoebeke. 1985. The insect fauna of ninebark, *Physocarpus opulifolius* (Rosaceae). Proceedings of the Entomological Society of Washington 87: 356–370.
- Wheeler, A. G., & S. A. Mengel. 1984. Phytophagous insect fauna of *Polygonum perfoliatum*, an Asiatic weed recently introduced to Pennsylvania. Annals of the Entomological Society of America 77: 197–202.

- Whitaker, J. O., P. Clem, & J. R. Munsee. 1991. Trophic structure of the community in the guano of the evening bat *Nycticeius humeralis* in Indiana. *American Midland Naturalist* 126: 392–398.
- White, R. E. 1968. A review of the genus *Cryptocephalus* in America north of Mexico (Coleoptera: Chrysomelidae). *United States National Museum Bulletin* 290: 1–124.
- White, R. E. 1983. A field guide to the beetles of North America. Houghton Mifflin Co., Boston. 368 pp.
- White, R. E. 1993. A revision of the subfamily Criocerinae (Chrysomelidae) of North America north of Mexico. *United States Department of Agriculture Agricultural Research Service Technical Bulletin* 1805: 1–158. 123 figs.
- White, R. E. 1996. A revision of the genus *Chaetocnema* of America north of Mexico (Coleoptera: Chrysomelidae). *Contributions of the American Entomological Institute* 29(1). 158 pp.
- White, R. E., & H. S. Barber. 1974. Nomenclature and definition of the tobacco flea beetle, *Epitrix hirtipennis* (Melsh.), and of *E. fasciata* Blatchley (Coleoptera: Chrysomelidae). *Proceedings of the Entomological Society of Washington* 76: 397–400.
- Wilcox, J. A. 1954. Leaf beetles of Ohio (Coleoptera: Chrysomelidae). *Ohio Biological Survey Bulletin* 43: 353–506.
- Wilcox, J. A. 1979. Leaf beetle host plants in northeastern North America (Coleoptera: Chrysomelidae). *Biological Research Institute of America, Inc., Kinderhook, New York*. 30 pp.
- Williams, A. H. 2006a. First report of *Chauliognathus marginatus* (Coleoptera: Cantharidae) from Wisconsin. *Great Lakes Entomologist* 39: 87.
- Williams, A. H. 2006b. A friend unmasked: Notes on *Chauliognathus pensylvanicus* (Coleoptera: Cantharidae) and the nature of natural history. *Great Lakes Entomologist* 39: 200–218.
- Williams, R. N., M. S. Ellis, & D. S. Fickle. 1995. Insects in the Killbuck Marsh Wildlife Area: 1993 Survey. *Ohio Journal of Science* 95: 226–232.
- Williams, R. N., M. S. Ellis, D. S. Fickle, & S. T. Bloom. 1996. A migration study of *Stelidota geminata* (Coleoptera: Nitidulidae). *Great Lakes Entomologist* 29: 31–35.
- Wood, S. L. 1982. The bark and ambrosia beetles of North and Central America (Coleoptera: Scolytidae), a taxonomic monograph. *Great Basin Naturalist Memoirs* 6: 1–1359.
- Woodruff, R. E. 1970. The “rice beetle”, *Dyscinetus morator* (Fab.) (Coleoptera: Scarabaeidae). *Florida Department of Agriculture and Consumer Services Entomology Circular Number* 103. 2 pp.
- Woodruff, R. E. 1973. Scarab beetles of Florida (Coleoptera: Scarabaeidae). Part I. The Laparostici (subfamilies Scarabaeinae, Aphodiinae, Hybosorinae, Ochodaeinae, Geotrupinae, Acanthocerinae). *Arthropods of Florida and Neighboring Land Areas* 8. 220 pp.
- Young, D. K. 1988. Marsh beetles (Coleoptera: Scirtidae) of Pine Hollow and the UW-Milwaukee Field Station. *Field Station Bulletin* 21: 1–9.