

The Ant-like Leaf Beetles (Coleoptera, Aderidae) of the George Washington Memorial Parkway, Fairfax County, Virginia

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ABSTRACT

Malaise trap samples collected during a 20-year period (1998–2018) from four national park sites in northern Virginia were sorted for ant-like leaf beetles (Coleoptera, Aderidae). Nine species and one undetermined taxon were documented. The most common species in the study area is *Zonantes subfasciatus* (LeConte). The first Virginia records were documented for *Aderus brunnipennis* (LeConte), *Emelinus melsheimeri* (LeConte), and *Vanonus calvescens* Casey, with the latter representing a southern range extension. Periods of adult activity, based on dates of capture, are given for each species. Relative abundance is noted for each species based on the number of captures. Images are provided showing variation in elytral markings of *Zonantes fasciatus* (Melsheimer) and *Z. subfasciatus* from Virginia.

Keywords: Malaise trap, national park, new state records, Potomac River Gorge.

INTRODUCTION

Little is known concerning the bionomics of ant-like leaf beetles (Coleoptera, Aderidae). Their heads have a somewhat ant-like appearance and the largest North American species are only 4 mm long. They are most often collected on the underside of the leaves of woody angiosperms and seem to have a special affinity to oaks (*Quercus* sp.) in North America and Mexico (Chandler, 2002). Larvae have been found in rotting wood, leaf litter, under loose bark, and in the nests of bees and termites (Chandler, 2002). Although the family was revised by Werner (1990), the fauna of western North America contains many undescribed species, especially in the south where Neotropical genera reach their northern limits (Chandler, 2002). There are about 50 described genera containing nearly 1,000 species worldwide, but concentrated in the tropics. In North America, there are 11 genera containing 48 described species (Chandler, 2002). All 11 genera and 37 species are found in eastern North America (Evans, 2014). Aderid beetles are often found in Baltic and Bitterfeld amber deposits dating from 20 to 40 million years ago (Alekseev & Grzymala, 2015).

STUDY SITES

The study area lies within the George Washington Memorial Parkway (GWMP) in Fairfax County, Virginia, and is managed by the National Park Service. Two study sites, Great Falls and Turkey Run parks, are in the Piedmont physiographic province, whereas the other two, Dyke Marsh Wildlife Preserve and Little Hunting Creek, are on the Coastal Plain. A map of these park sites is provided in Steury (2011). All sites are situated near the shore of the Potomac River and contain primarily upland and floodplain deciduous woodlands.

MATERIALS AND METHODS

Six Townes style Malaise traps were set at Dyke Marsh from April 1998–December 1999 in narrow-leaf cattail (*Typha angustifolia* L.) marsh, in floodplain forest dominated by red and silver maple (*Acer rubrum* L. and *A. saccharinum* L.) and tulip poplar (*Liriodendron tulipifera* L.), and at the marsh/forest ecotone. Three Malaise traps were also set at Great Falls and Turkey Run parks from March 2006–November 2009 in upland and floodplain deciduous forest, and in a deciduous

swamp forest. Four more traps were set at Little Hunting Creek from March–November 2017–2018, in upland forest dominated by an ericaceous understory and a canopy of oaks (*Quercus* sp.), hickory (*Carya* sp.), American beech (*Fagus grandifolia* Ehrh.), and some Virginia pine (*Pinus virginiana* Mill.). Beetles were removed from the samples by citizen science volunteers and aderedid beetles were removed from these subsamples by the author. Collectors included C. Acosta, E. Barrows, C. Davis, A. Evans, D. Smith, and B. Steury. Specimens were pinned, labeled, and deposited in the collections maintained at the GWMP, Turkey Run Park Headquarters in McLean, Virginia. State record determinations were based on reviews of Werner (1990), Downie & Arnett (1996), Ciegler (2014), and Gompel (2017).

RESULTS AND DISCUSSION

Three tribes, containing three subtribes, five genera, nine species, and one undetermined taxon were documented from the study areas. The most commonly collected species at the study sites was *Zonantes subfasciatus* (LeConte). Three species new to Virginia, *Aderus brunnipennis* (LeConte), *Emelinus melsheimeri* (LeConte), and *Vanonus calvescens* Casey, were documented from the study area. The *V. calvescens* record represents a southern range extension from Pennsylvania (Downie & Arnett, 1996). The ten taxa recorded in the study area is more than the total (n=9) found in all of Canada (Majka, 2011) but only about half of the South Carolina fauna (n=19; Ciegler, 2014). Brown (2008) did not include aderedid beetles in the

checklist of the invertebrate fauna of the Potomac River Gorge, located between Maryland and Virginia, an area with over 100 years of biodiversity studies. Thus, all species captured during this study, each of which was collected in Great Falls or Turkey Run parks, represent the first records for the gorge. An undetermined female *Vanonus* sp. (near *uniformis* Werner) collected in Great Falls Park may be the undescribed female of *V. uniformis*.

LIST OF SPECIES

Taxonomic order of tribes and subtribes follows Chandler (2002). Species are listed alphabetically. The number of specimens in the GWMP collection is indicated in parentheses or listed as “common” if the species was too abundant to save all specimens. Collection sites are abbreviated as follows: Dyke Marsh Wildlife Preserve (DM), Great Falls Park (GF), Little Hunting Creek (LH), and Turkey Run Park (TR). The periods of adult activity are given based on dates when Malaise traps were set and collected. Dates separated by a hyphen indicate that the taxon was documented on at least one day during each month within this continuum of months, whereas dates separated by a comma represent individual observation dates. For traps set over multiple weeks, the first day of the set is used as the earliest date and the last day of the set as the last date.

Aderidae

Tribe Euglenesini

Subtribe Euglenesina

Zonantes fasciatus (Melsheimer) (Fig. 1a-b) – (10); DM, GF, LH; 1 June–21 October.

Zonantes hubbardi Casey – (3); GF, TR; 22 Jun–25 Aug.

Zonantes subfasciatus (LeConte) (Fig. 2a-d) – (common); GF, LH; 1 May–1 December. Capture dates are based on a subset of captured specimens retained for the collection (n = 13).

Tribe Emelinini

Emelinus melsheimeri (LeConte) – (3); GF, LH; 2 June–21 October. **NEW STATE RECORD.** This species has been documented from Florida to northeastern Mexico and eastern Arizona, north to Illinois and Massachusetts. It has been recorded from the District of Columbia, Maryland, Pennsylvania, and West Virginia (Werner, 1990; Downie & Arnett, 1996), so it is not surprising to find it in Virginia.



Fig. 1a-b. *Zonantes fasciatus* (Melsheimer) from Dyke Marsh Wildlife Preserve (left) and Little Hunting Creek (right), Fairfax County, Virginia, showing variation in the length of the dark, median elytral band.



Fig. 2a-d. *Zonantes subfasciatus* (LeConte), all from Great Falls Park, Fairfax County, Virginia, showing variation in markings of the median elytral band.

Tribe Aderini

Subtribe Aderina

Aderus brunnipennis (LeConte) – (5); DM, GF, TR; 1 May–5 June, 19 Sep–21 Oct. **NEW STATE RECORD.** The documented range of *A. brunnipennis* extends from Florida to eastern Texas, north to Pennsylvania and Kansas. It is also recorded from the District of Columbia, Maryland, Pennsylvania, and West Virginia (Werner, 1990; Downie & Arnett, 1996; Gompel, 2017). The GWMP records close a narrow gap in its documented range.

Subtribe Syzetoninina

Vanonus calvescens Casey – (1); GF; 14–26 July. **NEW STATE RECORD.** This record represents a southern range extension from Pennsylvania. The species has been documented from Québec, Canada, along the East Coast south to Pennsylvania and west to Wisconsin (Werner, 1990; Downie & Arnett, 1996).

Vanonus sp. (near *uniformis* Werner) – (1♀); GF; 16–30 July. The elytra pubescence of this specimen is most similar to descriptions of male *V. uniformis*, a species for which the female has not been described (Werner, 1990). However, this specimen differs from descriptions of male *V. uniformis* in being only 1.4 mm long, instead of 1.63 mm, having slightly shorter antennae than reported in males, and possessing the antebasal transverse depression of the pronotum not present in males.

Vanonus uniformis is documented only from Florida to Arkansas (Werner, 1990).

Vanonus vigilans Casey – (1); GF; 27 July–14 August.

Elonus basalis (LeConte) – (9); GF, LH, TR; 1 June–30 July. This genus was recently reviewed by Gompel (2017).

Elonus nebulosus (LeConte) – (7); LH, TR; 1–20 June, 5–25 August.

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LITERATURE CITED

- Alekseev, V. I., & T. L. Grzymala. 2015. New Aderidae (Coleoptera: Tenebrionoidea) from Baltic and Bitterfeld amber. *Zootaxa* 3956: 239–257.
- Brown, J. W. 2008. The invertebrate fauna of Plummers Island, Maryland. Contribution XXX to the Natural

- History of Plummers Island, Maryland. *Bulletin of the Biological Society of Washington* 15: 1–226.
- Chandler, D. S. 2002. Anthicidae. Pp. 549–558. *In* R. H. Arnett, Jr., M. C. Thomas, P. E. Skelley, & J. H. Frank (eds.), *American Beetles Volume 2, Polyphaga: Scarabaeoidea through Curculionoidea*. CRC Press, Washington, DC.
- Ciegler, J. C. 2014. Tenebrionoidea of South Carolina. *Biota of South Carolina*. Volume 8. Clemson University, Clemson, SC. 244 pp.
- Downie, N. M., & R. H. Arnett, Jr. 1996. *The Beetles of Northeastern North America*. Volume 2. Sandhill Crane Press, Gainesville, FL. 830 pp.
- Evans, A. V. 2014. *Beetles of Eastern North America*. Princeton University Press, Princeton, NJ. 560 pp.
- Gompel, N. 2017. A review of North American *Elonus* species, with description of *E. gruberi* n. sp. (Coleoptera: Tenebrionoidea: Aderidae). *Zootaxa* 4338: 433–545.
- Majka, C. G. 2011. The Aderidae (Coleoptera) of the Maritime Provinces of Canada. *Journal of the Acadian Entomological Society* 7: 65–69.
- Steury, B. W. 2011. Additions to the vascular flora of the George Washington Memorial Parkway, Virginia, Maryland, and the District of Columbia. *Banisteria* 37: 3–20.
- Werner, F. G. 1990. Revision of the Aderidae of eastern North America. *Journal of the New York Entomological Society* 98: 187–232.