Annotated List of the Metallic Wood-boring Beetles
(Insecta: Coleoptera: Buprestidae) of the George Washington
Memorial Parkway, Fairfax County, Virginia

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ABSTRACT

Twenty-three species in nine genera of metallic wood-boring beetles (Coleoptera: Buprestidae) are documented from a national park site in Fairfax County, Virginia. Paragrilus tenus (LeConte) and Pachyschelus purpureus purpureus (Say) are reported for the first time from Virginia.

Key words: Buprestidae, George Washington Memorial Parkway, National Park, new state record, Pachyschelus purpureus, Paragrilus tenus, Virginia.

INTRODUCTION

As early as the mid-1800s North American entomologists were attracted to the family of beetles commonly known as the metallic wood-borers (Coleoptera: Buprestidae) (LeConte, 1860), undoubtedly due to the alluring nature of their glossy, metallic, iridescent colors and distinctive, often jewel-like, form. These hard-bodied beetles can be recognized by a combination of features including serrate antennae, down turned (hypognathous) head, dextro-sinistral metasternal suture, and basally connate abdominal sterna. Most adults feed on leaves, flowers and pollen, but species of Agrilus and Chrysobothris occasionally feed on the spores of fungi. Usually, eggs are inserted into cracks and crevices of wood, or for leaf-miners, deposited on the surface of the leaf and covered with a sticky substance that hardens into a protective cap. Larvae feed while burrowing through dead wood or cambium layers or while mining leaves and stems of herbaceous or woody plants (Bellamy & Nelson, 2002).

Compared to most other beetle families, the distribution of North American buprestids is fairly well known (Nelson, 1975; Nelson & Westcott, 1976; Bellamy, 1982; Nelson et al., 1982; Walters & Bellamy, 1982; Nelson, 1987; MacRae, 1990; Nelson & Nelson
et al., 1996; MacRae & Nelson, 2003; MacRae, 2006; Nelson et al., 2008). Despite the popularity of Buprestidae, recent surveys in a national park (George Washington Memorial Parkway) in northern Virginia, and examinations of local collections, have revealed two species previously unreported from the Commonwealth. We include those species, _Paragrinulus tenuis_ (LeConte) and _Pachyschelin purpureus purpureus_ (Say), along with an annotated list of twenty-one other buprestids documented from the park.

### STUDY SITES

Inventories were conducted on lands managed by the National Park Service as units of the George Washington Memorial Parkway (GWMP) at Great Falls Park, Turkey Run Park, Dyke Marsh Wildlife Refuge, and Little Hunting Creek, Fairfax County, Virginia, an area covering approximately 850 ha. Great Falls and Turkey Run parks lie in the Piedmont physiographic province while Dyke Marsh and Little Hunting Creek are situated on the Coastal Plain. Most of the study sites are dominated by maturing, second growth, deciduous woodlands, but more open, herbaceous dominated habitats can be found in narrow bands along the Potomac River and at Dyke Marsh. The vascular flora of the GWMP is diverse, with 1313 taxa recorded, 1020 from Great Falls Park alone (Steuery et al., 2008; Steury, 2011).

### METHODS

The number of buprestid species documented from the GWMP has grown since the first park records for this family, accounting for five species, were published based on surveys conducted on 23-25 June 2006 as part of the Potomac Gorge Bioblitz (Evans et al., 2008). Inventories conducted subsequent and prior to the Bioblitz survey have added buprestid specimens to the collections from GWMP, primarily as by-catch from studies targeting other arthropods that employed the following methods: 1) pan traps (blue, white, and yellow) to inventory bees at Great Falls Park in 2007 and 2008 (Steuery et al., 2009); 2) Malaise traps (n = 6) operated at Great Falls and Turkey Run parks from 2006 through 2008 (Flint, 2011); 3) hand picking, pitfall, Lindgren funnel, and black light traps set at Great Falls Park, Turkey Run Park, Dyke Marsh Wildlife Refuge, and along Little Hunting Creek in 2010 and 2011; and 4) pit fall or Malaise traps operated at Dyke Marsh from 1998 through 2003 (Kjar & Barrows, 2004). To determine new Virginia records we reviewed published literature, the distribution database of Ted C. MacRae, and conducted searches of collections at the Virginia Museum of Natural History, Martinsville, Virginia (VMNH), National Museum of Natural History, Smithsonian Institution, Washington, DC (NMNH), George Washington Memorial Parkway (GWMP), and the private collections of Arthur V. Evans, Richmond, Virginia (AVEC) and Ted C. MacRae, Chesterfield, Missouri.

### RESULTS AND DISCUSSION

Twenty-three taxa in nine genera were documented from the park. _Paragrinulus tenuis_ (LeConte) and _Pachyschelin purpureus purpureus_ (Say) are reported for the first time from Virginia. The only methods which proved successful in capturing buprestids were Malaise traps (20 species), hand netting (6), and pan traps (3). Sixteen buprestid species were captured at Great Falls Park, 12 at Dyke Marsh, and six at Turkey Run Park. The Little Hunting Creek area, where only Lindgren funnel and pitfall traps were set, failed to capture any buprestids.

_Private_ is represented by four species north of Mexico, with only _P. tenuis_ (LeConte), known from the eastern United States (Hespelenheide, 2002). Its maximum length is 5.5 mm and, as in all _Paragrinulus_, the antennae are received in grooves. The host plants of larval and adult _P. tenuis_ have been reported as _Hibiscus moscheutos_ L. (Weiss & Dickerson, 1919; Hespelenheide, 2002) including _spp. iasiocarpos_ (Cav.) O. J. Blanchard (Nelson, 1987; MacRae, 1991; MacRae, 2006). _Hibiscus laevis_ All. is a reported host only in adults (MacRae, 2006). _Hibiscus moscheutos_ _spp. moscheutos_ is a common plant in Dyke Marsh where _P. tenuis_ was collected. The reported distribution of _P. tenuis_ is Georgia (Franklin & Lund 1956), Delaware, Pennsylvania, Maryland, New Jersey, and New York (Nelson 1987), Florida, Illinois, Mississippi, and North Carolina (Nelson & MacRae 1990), Missouri (MacRae 1991) and the District of Columbia (Downie & Arnett, 1996). We add Virginia to the known distribution of _P. tenuis_ based on the following specimens: Arlington Co.: 15 June 1903, Shoemaker (NMNH, 1). Charles City Co.: VCU Rice Center wetland, 1 May-17 June 2010, Evans (AVEC, 7). Fairfax Co.: Black Pond reared on _Hibiscus_, 25 May 1919, Craighead (NMNH, 5); Black Pond, 19 June 1919, Middleton (NMNH, 1); Black Pond, 17 June 1920, Fisher (NMNH, 11); Great Falls, 16 June 1919, Middleton (NMNH, 1); Dyke Marsh, 24 June-19 July 1998, Barrows (GWMP, 2). Nelson Co.: 29 July 1910, Robinson (NMNH, 1).

The _Pachyschelin_ fauna of America north of Mexico includes eight species and one additional subspecies (Hespelenheide, 2003). North American
Pachyschelus rarely exceed 3 mm in length and have a large, triangular scutellum giving them an obovate periphery. Pachyschelus purpureus is the only eastern North American species with white pubescence on the elytra. The pubescence occurs in a diagonal or subtransverse line just before the apices. The elytra of the nominate subspecies are predominately dark blue and those of subspecies P. p. uraldei Knall are reddish-purple. The larvae of P. p. purpureus are leaf miners of Geranium (Hespenheide, 2003). Two species, Geranium carolinianum L. and G. maculatum L., have been documented from the collection site at Great Falls Park, with G. maculatum being the more commonly observed species (Steyer et al., 2008). MacRae (1991) found P. p. purpureus leaf mining G. maculatum in Missouri. The reported North American distribution of P. purpureus is Oklahoma (Nelson, 1987), Missouri (MacRae, 1991), Alberta, Ontario, Alabama, Illinois, Indiana, Iowa, New Jersey, New York, Ohio, and Texas (Downie & Arnett, 1996), and Arizona, Connecticut, District of Columbia, Illinois, Indiana, Iowa, Massachusetts, Michigan, New York, North Carolina, Pennsylvania, Rhode Island, Tennessee, and Wisconsin (Hespenheide, 2003).

We add Virginia to the known distribution of P. p. purpureus based on the following specimens: Arlington Co.: Glencaryn, 1 May 1910, Knab (NMNH, 4); Glencaryn, 18 June 1912, Shoemaker (NMNH, 1); Glencaryn, June 1925, Bridwell (NMNH, 1). Fairfax Co.: 25 June 1911, s.n. (NMNH, 2); 20 June 1912, s.n. (NMNH, 1); Great Falls Park, 1-20 May 2009, Steury (GWMP, 1).

LIST OF SPECIES

Nomenclature follows Nelson et al. (2008). Taxa are listed alphabetically. The number of specimens in the GWMP collection is given in parentheses followed by the collection site acronyms: Dyke Marsh Wildlife Preserve (DM), Great Falls Park (GF), and Turkey Run Park (TR). Methods of collection are given as hand netted (hn), Malaise trap (mt), or pan trap (pt). The early and late dates of collection are given (including the entire length of a trap set).

*Acmaeodera pulchella* (Herbst)–(1); GF; pt; 30 Jun

*Acmaeodera tubulus* (Fabricius)–(9); GF; pt; 9 Apr-23 May

*Agrilus bilineatus* (Weber)–(10); DM, GF; hn, mt; 21 May-13 Jul

*Agrilus cephalicus* LeConte –(2); DM; mt; 10-28 May

*Agrilus lecontei lecontei* Saunders–(3); DM, GF, TR; mt; 19 Jun-2 Jul

*Agrilus obsoletoguttatus* Gory–(8); DM, GF, TR; hn, mt; 19 Jun-21 Jul

*Agrilus paracelti* Knall–(2); GF; mt; 1 May-30 Jun

*Agrilus sp. (otiosus group)–(1)♀; TR; mt; 19-30 Jun

*Agrilus ruficollis* (Fabricius)–(2); GF; hn; 19-30 Jun

*Agrilus subincisus* Gory–(1); DM; mt; 6-14 Jun

*Anthisia* (Haplanthisia) viridifrons Gory–(2); DM, TR; hn, mt; 20 Jun-2 Jul

*Brachys aerosus* Melsheimer–(1); GF; mt; 30 Jun-13 Jul

*Buprestis* (Knalliobuprestis) rufipes (Oliver)–(2); DM, TR; hn, mt; 24 Jun-8 Oct

*Chrysobothris azurea* LeConte–(2), GF; mt; 19-30 Jun

*Chrysobothris sexsignata* (Say)–(3); DM, GF; mt; 20 Jun-13 Jul

*Chrysobothris shawnee* Wellso & Manley–(2); DM, GF; mt; 6 Jun-26 Jul

*Chrysobothris viridiceps* Melsheimer–(2); DM, GF; mt; 14 Jun-26 Jul

*Dicerca obscura* (Fabricius)–(1); DM; mt; 17-28 May

*Pachyschelus laevigatus* (Say)–(4); GF; hn, pt; mt; 24 Jun-17 Jul

*Pachyschelus purpureus purpureus* (Say) –(1); GF; mt; 1-20 May

*Paragris tenuis* (LeConte)–(2); DM; mt; 24 Jun-19 Jul

*Taphrocerus nicolayi* Obenberger–(17); GF, TR; mt; 30 Jun-21 Nov

*Taphrocerus schaefferi* Nicolay–(1); GF; mt; 10-30 April
ACKNOWLEDGMENTS

We gratefully acknowledge the help of Glenn Curtis, Mary Jo Detweiler, Marilyn Greene, Julie Heminway, Melanie LaForce, Alex Luxon, Erin Minnick, Mireya Pasa, Christine Camp-Price, Cheryl Rash-Jones, Jessica Roberts, Lynn Scholz, Suzanne Updike, and Jane Whitaker for sorting beetle specimens from Malaise trap samples. David Smith operated Malaise traps at Turkey Run and Great Falls parks and Edd Barrows' Malaise traps at Dyke Marsh captured the specimens of Paragraulis tenus. Steve Lingafelter, Deblyn Mead, Chris Wirth, and Norm Woodley contributed specimens during the 2006 Potomac Gorge Bioblitz. Art Evans determined some specimens cited in this paper. Richard Hoffman and Norm Woodley checked the collections at VMNH and NMNH, respectively.

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