

The Tumbling Flower Beetles (Coleoptera: Mordellidae) of the George Washington Memorial Parkway, Virginia, USA

Brent W. Steury^{1,3} and Warren E. Steiner, Jr.²

¹*United States National Park Service, 700 George Washington Memorial Parkway, Turkey Run Park Headquarters, McLean, Virginia 22101*

²*Department of Entomology, National Museum of Natural History, Smithsonian Institution, P.O. Box 37012, MRC 165, Washington, DC 20013-7012; steinerw@si.edu*

³*Corresponding author: brent_steury@nps.gov*

ABSTRACT: Examination of 3038 mordellid beetles collected over a 22-year period from a national park site (George Washington Memorial Parkway) in Virginia, and a review of collections maintained at the Smithsonian Institution, National Museum of Natural History, Washington, District of Columbia, rendered 66 mordellid taxa containing 65 species in 15 genera and three tribes. Four new species descriptions resulted from this study. Twenty-six species are reported for the first time from Virginia. Of the six capture methods utilized, Malaise traps proved to be the most successful. 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. Sex ratios and notes on morphological characteristics and habitats are provided for some species. Females of two recently described species are figured and images are provided for 35 taxa.

Keywords: biodiversity, citizen science, insects, Malaise traps, national park, new species, new state records, pintail beetles, Potomac Gorge.

INTRODUCTION

Mordellidae (Coleoptera: Polyphaga) includes a relatively homogeneous group characterized by a triangular-shaped, deflexed head; humped back; apically tapered elytra; five visible abdominal sterna; an exposed, awl-shaped pygidium; large metasternum (coxal plate) with a glabrous polished area basally; prostrate spiny ridges (sometimes called combs) at various locations on the tibiae and usually the tarsi of the hind legs; eleven antennomeres; and a tarsal formula of 5-5-4. The orientation and number of the spiny hind leg ridges have often been used as the basis for taxonomic keys (Liljeblad 1945, Ciegler 2014), however, these can vary within species and even between hind legs of an individual (Jackman and Lu 2002). Palpi and antennae can be important distinguishing features, but they can vary between sexes. The color of the head, pronotum, and elytra can also vary, as can the orientation of elytral pubescence in some species. Adults are phytophagous, feeding primarily on pollen, especially of umbelliferous and composite plants. They are strong fliers and probably important native pollinators due to their pollenophagous life histories. Oviposition is generally on plant stems (Jackman and Lu 2002).

Larvae are primarily herbivores and develop inside stems or leaves of woody plants and herbs, fungi, or decaying wood (Jackman and Lu 2002), but will opportunistically prey on other stem-inhabiting larvae (Rathcke 1976). A summary of known larval food plants is given by Ford and Jackman (1996). There appears to be no correlation between adult foraging behavior and larval food plant associations (Jackman and Lu 2002).

There are at least 1,500 species in 113 genera worldwide. There are only two subfamilies. Ctenidiinae Franciscolo contains one species from South Africa and Mordellinae Latreille with 5 tribes (two restricted to the old world). Seventeen genera containing at least 205 species have been documented in North America (Jackman and Lu 2002). Ciegler (2014) reported 55 species from South Carolina. We present the first known survey in Virginia, however Liljeblad (1945) recorded many species from Plummers Island, Maryland, adjacent to the survey area within the Potomac Gorge.

STUDY SITE

The study site is in Virginia (Fairfax County and the City of Alexandria) and includes lands managed by the National Park Service as units of the George Washington Memorial Parkway (GWMP). Park sites that received inventory effort included Dyke Marsh Wildlife Preserve, Great Falls Park, Little Hunting Creek, and Turkey Run Park, in Fairfax County, and Daingerfield Island, in the City of Alexandria. This area covers approximately 897 ha (2,217 ac). Great Falls and Turkey Run Parks fall within the Piedmont physiographic province while all other collection sites are on the Coastal Plain. Most sites are situated along the shore of the Potomac River, and Great Falls and Turkey Run Parks border the Potomac Gorge, an area known for high species richness of plants and animals (Brown 2008). Turkey Run Park and Great Falls Park are dominated by maturing, second growth (although some trees are over 200 years old [Abrams and Copenheaver 1999]), primarily upland, rich, deciduous woodlands. The woodlands at Little Hunting Creek are drier, sandier, and have more pine and ericaceous shrubs. More open herbaceous habitats can be found in moist, narrow bands along the shore of Potomac River and in the emergent, freshwater, tidal marshes at Dyke Marsh Wildlife Preserve. The vascular flora of the GWMP is diverse, with more than 1,313 taxa recorded, 1,020 from Great Falls Park alone (Steury et al. 2008, Steury 2011).

MATERIALS AND METHODS

The current list of 66 taxa is the result of 10 years of survey effort over a 22-year period (1998–2019) targeting arthropods using six collecting techniques as follows: yellow, blue, and white pan traps (96.1 mm [3.25 oz] white soufflé cups painted fluorescent yellow, fluorescent blue, or left non-fluorescent white and filled with a dilute mixture of detergent and water) in Great Falls Park (June 2007–May 2008); Malaise traps set at Dyke Marsh (1998–2000), Great Falls and Turkey Run Parks (2006–2009), and Little Hunting Creek (2017–2018); Lindgren funnel traps set at Dyke Marsh, Great Falls Park, Little Hunting Creek, and Turkey Run Park (2010); black-light shone on sheets at Great Falls and Turkey Run Parks (2006 and 2010); beating sheets used during the Potomac Gorge BioBlitz and occasionally at other times (2006 and 2010); and occasional opportunistic collecting by hand. A review of the collections at the Smithsonian

Institution, National Museum of Natural History (USNM), Washington, District of Columbia, uncovered one species from GWMP that was not found during the survey. Specimens were pinned and labeled and deposited in the collections maintained at the GWMP, Turkey Run Park Headquarters in McLean, Virginia. Holotypes of new species were deposited at the USNM. New Virginia records were determined based on reviews of Bright (1986), Downie and Arnett (1996), Evans (2008), and Liljeblad (1945). Mordellid specimens were sorted from Malaise trap collection jars by citizen science volunteers in the GWMP bug lab. Collectors were Christopher Acosta, Edward M. Barrows, John W. Brown, Collin Davis, Dana M. DeRoche, Arthur V. Evans, Thomas J. Henry, Steven W. Lingafelter, Deblyn Mead, David R. Smith, Warren E. Steiner, Brent W. Steury, and Christopher C. Wirth.

As noted above, the number of the spiny ridges on the hind leg has been important for designating species in taxonomic keys of Mordellidae. However, it has been recognized that these ridge counts are variable, especially in the addition of shorter ridges adjacent (usually anterior) to the main ridges. In this paper we used parentheses to indicate a short ridge: thus, a ridge count of 3-3(4)-1(2) indicates that three strong ridges are present on each hind tibia, three strong ridges and one weak ridge are present on the first (basal) tarsomere, and there is one strong ridge and one weaker ridge on the second tarsomere. We defined a weak ridge as consisting of at least 3 spines and less than half the length of a strong ridge. Occasionally, a strong ridge that should be present is absent. This is also expressed using parentheses. For example, a count expressed as 4(3) indicates that occasionally the fourth ridge is absent and only three (generally strong) ridges are observed. Leg ridges are black in all specimens. By convention the apical ridge of the tibia (which is always present) is not counted.

RESULTS

Examination of 3038 mordellids collected from the study site rendered 66 mordellid taxa in 15 genera and three tribes. *Mordella melaena* Germar, collected in 1915 at Great Falls Park, was added to the tally by reviewing the collections at USNM. *Tolidomordella discoidea* (Melsheimer) contains two subspecies, *T. d. discoidea* (Melsheimer) and *T. d. flaviventris* (Smith). The report of *Mordellistena andrea* LeConte from Great Falls Park by Evans (2008) is based on a misidentified specimen of a female *Mordellina ancilla* (LeConte) (see discussion below under *M. ancilla*). Four species found during the survey were described as new to science (Steury and Steiner 2020). Twenty-six species are reported for the first time from Virginia. The GWMP sites with the highest taxon richness of mordellid beetles were Great Falls Park (51), Turkey Run Park (48), Little Hunting Creek (44), and Dyke Marsh Wildlife Preserve (38). Malaise traps were the most successful method of capturing mordellid beetles, yielding 64 of 65 taxa captured during this survey, further evidence that these beetles are strong fliers with substantial dispersal power. The next most productive method of capture was beating sheets which yielded only 16 taxa. The most commonly collected mordellid beetles during this study were *Glipostenoda ambusta* (LeConte) (305), *Falsomordellistena pubescens* (Fabricius) (295), *Mordellistena trifasciata* (Say) (271), *Falsomordellistena hebraica* (LeConte) (155), *Falsomordellistena bihamata* (Melsheimer) (129), *Mordellistena limbalis* (Melsheimer) (121), *Mordellistena liturata* (Melsheimer) (109), *Mordellaria serval* (Say) (107) and

Mordellina pustulata (Melsheimer) (97). The most species rich genera were *Mordellistena* Costa (29) and *Mordellina* Schilsky (12).

The 66 mordellid taxa recorded from GWMP is more than recorded from South Carolina (55) (Ciegler 2014) and only two fewer than reported for Wisconsin (Lisberg and Young 2003). Brown (2008) did not include mordellid beetles in the list of the invertebrate fauna of the Potomac Gorge, between Virginia and Maryland, however, 60 taxa were documented from this area in Turkey Run and Great Falls Parks during this study and Liljeblad (1945) includes additional species from this area collected on Plimmers Island, Maryland.

Much remains to be learned about the taxonomy of mordellid beetles in eastern North America. That four new species were found during 10 years of sampling effort in an area of only 897 ha (2,217 ac) indicates that more new species are probably waiting to be discovered and described. Some taxa figured in this paper are probably new to science, but additional specimens are needed for them to be described and/or genetics work is required. Some older species descriptions lack sufficient detail to accurately discern a proper concept of the species and some holotypes are in bad condition or are poorly mounted. Sexual dimorphism in many species has undoubtedly led to males and females of the same species being described as separate species. During the study at least four taxa collected in series were represented only by male specimens: *Mordellina semiusta* (LeConte) (n=13), *Mordellina wimbledon* Steury and Steiner (n=3), *Mordellistena smithi* Dury (n=2), *Mordellistena* Costa sp. 1 (n=6), and probably *Mordellistena aspersa* (Melsheimer) (4♂, 1 undetermined) and *Mordellistena fuscata* (Melsheimer) (19♂, 10 undetermined) as well. Two taxa were documented only by females: *Mordellina ancilla* (n=7), *Mordellistena bicinctella* LeConte (n=5), and probably *Mordellistena militaris* LeConte (25 of 40 specimens determined as female, 15 left undetermined). Future field work should include attempts to capture mated pairs, perhaps using methods such as those described by Steury (2019). More dissections and imaging of the parameres of morphologically similar males would probably provide clues concerning how to separate those species but does not help with properly assigning females to males of the same species. Lab work focusing on analyzing the DNA of a series of recently collected morphospecies would be invaluable to the future of mordellid taxonomy.

LIST OF SPECIES

Taxa are listed alphabetically within families and tribes following the nomenclature and taxonomic order used by Ciegler (2014). Twenty-six mordellid species new to the Commonwealth of Virginia are marked by an exclamation point (!). The number of specimens in the collection is indicated in parentheses after each taxon. The repository is stated after this number if the specimen is not located at GWMP. Sites where specimens were collected are given for City of Alexandria: Daingerfield Island (DI); and Fairfax County: Dyke Marsh Wildlife Preserve (DM), Great Falls Park (GF), Little Hunting Creek (LH), and Turkey Run Park (TR). Collection methods are listed using the following abbreviations: black light shown on sheets (bl); beating sheet (bs); hand collecting (hc); Lindgren funnel (lf); Malaise trap (mt); and pan trap (pt). The periods of adult activity are given based on dates when live taxa have been collected in the park.

Dates separated by an en dash (–) 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 a gap in collection 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 latest date. The year and collector is given for the one specimen documented from GWMP by a specimen at USNM that was not captured during this study. Plant associations or habitats are given for taxa collected by hand.

Family Mordellidae – tumbling flower beetles, also known as pintail beetles

Subfamily Mordellinae

Tribe Mordellini Smith

Glipa hilaris (Say) – (12); DM, GF, TR; bs, mt; 20 Jun–17 Aug.

Glipa oculata (Say) – (32); DM, GF, LH, TR; bs, mt; 14 Jun–17 Aug.

Hoshihananomia octopuncta (Fabricius) – (72); DM, GF, LH, TR; bs, mt; 19 May–7 Sep.

Mordella atrata Melsheimer – (15); DI, DM, GF, LH; bs, hc (on Queen Anne's lace, *Daucus carota* L., and lateflowering thoroughwort, *Eupatorium serotinum* Michx.), mt; 2 Jun–2 Sep.

Mordella marginata Melsheimer – (67); DM, GF, LH, TR; bs (on lizard's tail, *Saururus cernuus* L.), mt, pt; 2 Jun–4 Sep.

Mordella melaena Germar – (1, USNM); GF; hc (on spotted beebalm, *Monarda punctata* L.); 11 August 1915, W. L. McAtee.

Mordella obliqua LeConte – (23); GF, LH; bl, bs (on *Saururus cernuus*), mt; 23 May–4 Sep. This beautiful black mordellid has iridescent elytra with turquoise and lavender reflections. It has likely been confused with the morphologically similar *Mordella lunulata* Helmuth. We used male specimens at USNM determined by Emil Liljeblad (1945) or Ciegler (2014) were sufficient for distinguishing them. Liljeblad and Ciegler both stated that *M. obliqua* differs in having a longer oblique humeral vitta (although Liljeblad stated it was “sometimes indistinct”) and a rounded (rather than subtruncate) apex of the scutellum. We found that length of the humeral vitta and shape of the scutellum, which is fringed in pubescence that often obscures its shape (Figure 1, bottom), were not sufficient for distinguishing *M. obliqua* and *M. lunulata*. However, at least in males, the antennomeres are much broader in *M. lunulata* (Figure 1, top left) than in *M. obliqua* (Figure 1, top right). This is especially noticeable in the shape and width of antennomere four.

! *Mordellaria fascifera* (LeConte) – (11; 5♂, 4♀, 2 undetermined); LH, TR; mt; 2 Jun–17 Aug. (Figure 2). Previous records of this rarely collected mordellid are from Florida, Texas, and the District of Columbia (Bright 1986). Although not mentioned in other descriptions of this species, in these specimens the silvery grey pubescence of the median elytral band extends along the suture to the base.

! *Mordellaria serval* (Say) – (107); DM, GF, LH, TR; mt; 21 May–25 Aug. The elytral color of our specimens is uniformly dark reddish brown or with the darker (near black) pronotal color extending onto the first quarter of the base of the elytra and a short distance further along the suture.

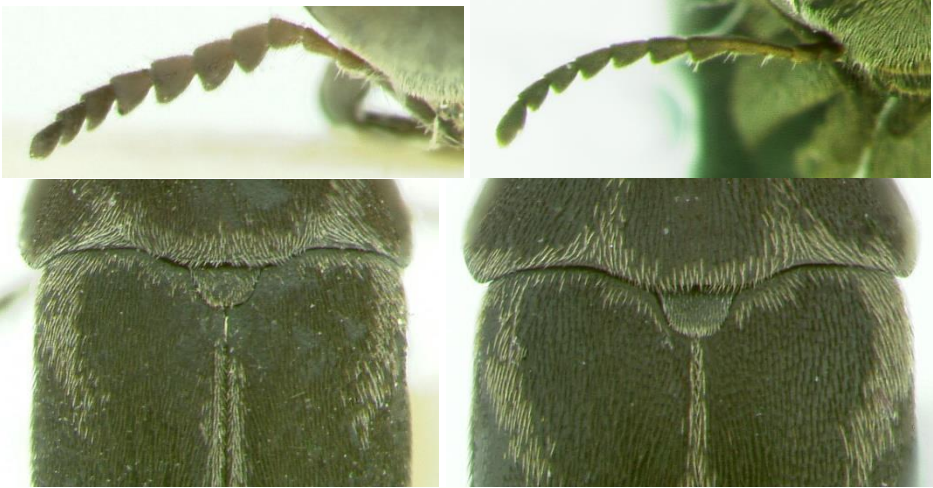


Figure 1. Top left, *Mordella lunulata* Helmuth. Male specimen at USNM collected in New York by J.B. Smith and determined by Emil Liljeblad in 1925, showing broader antennomeres than in *Mordella obliqua* LeConte (top right) collected in Great Falls Park, quarry, 23 May–5 June 2008, by David R. Smith and Brent W. Steury. Bottom: scutella of *M. lunulata* (left) and *M. obliqua* (right). Same specimens as in top images.



Figure 2. *Mordellaria fascifera* (LeConte). Male; left: dorsal; right: lateral. Little Hunting Creek, Malaise trap, 2–20 June 2017, Brent W. Steury, Christopher Acosta, and Colin Davis.

! *Mordellaria undulata* (Melsheimer) – (5); GF, LH, TR; mt; 1 Jun–26 Jul. This species reaches its previously documented southern range limit in Maryland.

Paramordellaria triloba (Say) – (79); DM, GF, TR; bl, mt; 1 Jun–21 Oct.

Tolidomordella discoidea discoidea (Melsheimer) – (88); GF, LH, TR; mt; 1 Jun–7 Sep.

All specimens have the pale humeral dash and elytral apices characteristic of this subspecies.

Tolidomordella discoidea flaviventris (Smith) – (2♀); GF, LH; mt; 14–28 Jun. Liljeblad (1945) considered this subspecies merely a color variety of *T. d. discoidea*, however Jackman and Lu (2002) listed it as a distinct subspecies. This is the only subspecies of *Tolidomordella* reported for South Carolina (Ciegler 2014).

! *Tomoxia lineella* LeConte – (77); DM, GF, LH, TR; lf, mt; 21 May–17 Aug.

! *Yakuhananomia bidentata* (Say) – (10); DM, GF, LH, TR; mt; 1 Jun–29 Aug.

Unknown genus and species (Tribe Mordellini) – (1); GF; mt; 14–26 Jul. (Figure 3). We were unable to assign this specimen to any North American genus. With a length of just 1.9 mm (0.07 in) to the tip of the elytra and 2.2 mm (0.09 in) to the tip of the pygidium, it is the smallest mordellid captured during the survey. The leg ridges are most similar to *Mordellaria* Ermisch and *Tolidomordella* Ermisch, however this male specimen lacks the securiform fourth maxillary palpomere of *Tolidomordella* and the leg ridges are weaker than in *Mordellaria* or *Tolidomordella*, except for the subapical tibial ridge. It lacks the emarginated and dilated penultimate tarsomere of the front and middle legs of *Paramordellaria* Ermisch. Its scutellum is rounded rather than trapezoidal shaped as in *Tomoxia* Costa. Its size is half that of any species from these genera in eastern North America. Its size, and shape of the antennae and palpi, are similar to *Isotrilophus* Liljeblad, however this genus has angular, vertical leg ridges on the tibia and first tarsomere and eyes that are not hairy—both characters lacking in this specimen. *Isotrilophus* also has a shorter, broader pygidium. This specimen has pale brown elytra, a black head and pronotum with sparse white pubescence, and hairy eyes. The leg ridges are weak, consisting of a very thin, almost segmented, dorsal ridge on the tibia and tarsomere one. It could be an introduced, non-native species new to North America, or it is a species new to science. Unfortunately, only one specimen was captured during this survey.

Tribe Mordellistenini Ermisch

Falsomordellistena bihamata (Melsheimer) – (129); DM, GF, LH, TR; mt; 10 Apr–25 Aug.

! *Falsomordellistena discolor* (Melsheimer) – (19); GF; mt; 15 Jun–30 Jul. (Figure 4). At lengths ranging from 5.4–5.8 mm (0.21–0.23 in), this is the largest of the four *Falsomordellistena* species found during this study (although *Mordellistena leporina* probably belongs in this genus and is nearly as large). Most specimens were captured in swamp or floodplain forest along streams. These collections represent a southern range extension from Pennsylvania.



Figure 3. Unknown genus and species, probably from tribe Mordellini. Male; **left:** dorsal; **right:** lateral. Great Falls Park, Malaise trap, 14–26 July 2006, David R. Smith and Brent W. Steury.



Figure 4. *Falsomordellistena discolor* (Melsheimer). Male; **left:** dorsal; **right:** lateral. Great Falls Park, swamp, Malaise trap, 1–15 July 2009, David R. Smith and Brent W. Steury.

Falsomordellistena hebraica (LeConte) – (155; 66♂, 89♀ and undetermined sex); DM, GF, LH, TR; bl, bs, mt; 10 Apr–11 Sep. Males of this species reportedly (Ciegler 2014) have a ferruginous head with a black vertex and a ferruginous pronotum with a dark oval spot. Females have an entirely black head and pronotum. Our male specimens exhibited more variability including two male specimens that have an entirely black head and pronotum. The dark oval spot on the pronotum was extended to the base (or close to it) in all other male specimens. In two specimens, a second smaller spot occurred above the basal spot, and in one specimen, the spot was contiguous with the apical and basal pronotal margins. The leg ridge formula for this species is reported as 3(4)-3(4)-2. Our specimens are better characterized as 3(4)-3(4)-2(1).

Falsomordellistena pubescens (Fabricius) – (295); DM, GF, LH, TR; bs, mt; 17 May–26 Jul. The leg ridge formula of this species has been reported as 3(4)-3-2 (Liljeblad 1945, Ciegler 2014). Our specimens would be better characterized as 3(4)-3(4)-2(1).

Glipostenoda ambusta (LeConte) – (305); DM, GF, LH, TR; bl, bs, mt; 2 Jun–25 Aug. Seven (possibly all female) specimens (Figure 5) captured in Turkey Run Park differ from others in the collection by being larger (5.9 mm [0.23 in] to the tip of the elytra and 6.3 mm [0.25 in] to the tip of the pygidium) and having a dark epidermal color on the central portions of the head, pronotum and elytra. Liljeblad (1945) and Ciegler (2014) give a length of just 4–5 mm (0.16–0.20 in) to the tip of the pygidium for *G. ambusta*.



Figure 5. *Glipostenoda* cf. *ambusta* (LeConte). Probable female; **left:** dorsal; **right:** lateral. Turkey Run Park, Malaise trap, 22 June–6 July 2006, David R. Smith and Brent W. Steury. This specimen is one of seven captured in Turkey Run Park that are larger than typical specimens and have a darker, central epidermal color on the head, pronotum, and elytra.

Mordellina ancilla (LeConte) – (7♀); GF, LH, TR; mt; 14 Jun–17 Aug. (Figure 6). This species concept has a long and confusing history. Three varieties were listed by Liljeblad (1945) under the name *Mordellistena andreae* LeConte: *M. andreae andreae* LeConte, *M. andreae ancilla* LeConte, and *M. andreae ustulata* LeConte. Jackman and Lu (2001) resurrected *Mordellistena ustulata* (LeConte) to species status and transferred it to *Mordellina*. Two years later, Lisberg (2003) proposed *M. ustulata* as a junior synonym of *Mordellistena ancilla* and transferred *M. ancilla* to *Mordellina*. We are of the opinion that the type specimen of *Mordellina ancilla* LeConte (visible at MCZ 2019) may be the female of the male described as *Mordellina semiusta* (LeConte) (also at MCZ 2019) in the same year (Le Conte [sic] 1862), however genetics work will be needed to confirm this. Khalaf (1971b) described the similar wing venation of *M. ancilla* and *M. semiusta*. The name *M. ancilla* would take precedence by page number. All specimens at GWMP and USNM that match the Museum of Comparative Zoology (MCZ) type of *M. ancilla* are female (n=19) and all specimens that match the type of *M. semiusta* are male (n=17). Until this supposition can be confirmed through genetic analysis or the capture of mated pairs, we have listed *M. ancilla* and *M. semiusta* (Figure 10) as separate species. However, we include *M. ustulata* as a valid species (see discussion below under *M. ustulata*). Although not captured in GWMP, we believe that *Mordellistena andreae* (both male and female holotypes at MCZ [2019], male listed under the name *Mordellistena grammica* LeConte), is probably a valid species. The penultimate segment of the anterior and middle tarsi is truncate in *M. ustulata* and emarginate in *M. andreae*, a character that separates genera according to Franciscolo (1967). However, both taxa possess an anterior ridge on the hind tarsi that crosses the entire width of the tarsus, a characteristic common in *Mordellina*, but not in *Mordellistena* (Jackman and Lu 2002).



Figure 6. *Mordellina ancilla* (LeConte). Female; **left:** dorsal; **right:** lateral. Great Falls Park, swamp, Malaise trap, 19–30 June 2009, David R. Smith and Brent W. Steury.

- ! *Mordellina floridensis* (Smith) – (1♂); GF; bs (hanging dead leaf cluster on fallen branch of cottonwood/poplar, *Populus* L.); 18 Jul. This species reaches its previously known northern distributional limits in Maryland.
- ! *Mordellina infima* (LeConte) – (7); GF; mt; 21 May–30 Jun, 18 Aug–1 Dec. (Figure 7). The apical tibial ridge is more oblique in this species than in most other *Mordellina*. *Mordellina infima* has been documented from other states near Virginia including Maryland and South Carolina (Bright 1986).



Figure 7. *Mordellina infima* (LeConte). Male; **left:** dorsal; **right:** lateral. Great Falls Park, quarry, Malaise trap, 21 May–18 June 2009, David R. Smith and Brent W. Steury.

- ! *Mordellina lecontei* (Ermisch) – (18; 1♂, 8♀, 9 undetermined sex); DM, GF, LH; mt; 10–30 Apr, 1 Jun–30 Jul. (Figure 8). This species is very similar to descriptions of *M. impatiens* (LeConte) (Le Conte [sic] 1862; Liljeblad 1945, Ciegler 2014). Both species are reported to have a 2-3-2 leg ridge count (Liljeblad 1945, Ciegler 2014). *Mordellina impatiens* is reportedly smaller (2.5 mm [0.10 in]) than *Mordellina lecontei* (3.3 mm [0.13 in]) (Ciegler 2014). Ciegler (2014) separated the two species in couplet 10 (Page 51) based on color of dorsal surface, “black or nearly so” leading to *M. impatiens*, however it is described in the text as having the head and apical margin of pronotum ferruginous. Liljeblad (1945) also used dorsal color to separate these species in couplet 34 with “upper surface more or less ferruginous, fulvous, or yellowish” leading to *M. lecontei* (then under the name *Mordellistena ruficeps* LeConte; see Jackman [1991] for the justified emendation of this species name from the preoccupied name, *M. ruficeps* LeConte), however the species is later described as “black; head ferruginous.” The pronotum of *M. lecontei* is described as all black (Liljeblad 1945, Ciegler 2014), however, the MCZ type specimen (MCZ 2019) of *M. lecontei* clearly shows some orange on the apex of the pronotum. The two species can reportedly be separated by

the shape of the terminal maxillary palpomeres which were reported by Liljeblad (1945) and Ciegler (2014) as scalene triangular in *M. impatiens* and an isosceles triangle in *M. lecontei*. In all these specimens (male and female) the terminal maxillary palpomeres have the outer and distal sides subequal (Figure 8, bottom right), thus they might be described as either scalene or isosceles, however, *M. lecontei* has been reported (Liljeblad 1945, Ciegler 2014) to have the inner (not outer) and terminal sides of equal length. The pronotal color of these 14 specimens varies from all black to black with various proportions of the apical quarter rufous (Figure 8, bottom left and bottom center). Size varies from 2.5 mm (0.10 in) (the male specimen with the apical fourth of the pronotum ferruginous) to 4.0 mm (0.16 in) in a female specimen (with an all-black pronotum), although some female specimens have ferruginous coloration along the anterior edge of the pronotum, especially centrally. Thus, eliminating pronotal color and shape of the terminal maxillary palpomeres as valid distinctions in these two species we relied on descriptions of antennal structure. *Mordellina impatiens* was reported (Liljeblad 1945) to have antennomeres 3–5 of equal length and *M. lecontei* to have antennomere 3 shorter than 4 and 5–10 subequal. These 18 specimens have antennomeres 1–2 wider and longer than 3, 3 shorter than 4, 4 one-fourth shorter than 5, and 5–11 subequal (Figure 8, top right). Thus, based on antennal structure, we assigned all our specimens to *M. lecontei*.

! *Mordellina nigricans* (Melsheimer) – (19; 9♂, 2♀, 8 undetermined sex); DM, GF, TR; mt; 7 Jun–17 Aug. (Figure 9). Sex was determined by examination of genitalia. Our specimens (both male and female) show intermediate traits compared with descriptions of *M. nigricans* and *Mordellina blatchleyi* (Liljeblad) (Liljeblad 1945, Ciegler 2014). *Mordellina blatchleyi* has antennomeres 3–5 described as “equal.” *M. nigricans* has antennomere 5 as long as 3 and 4 combined. *Mordellina nigricans* was described as having antennomeres 1–4 “rufo-testaceous” in males (the others black) and all black in females. Antennomeres of *M. blatchleyi* were described as all “fusco-ferruginous” (Liljeblad, 1945). *Mordellina blatchleyi* is one of the few species for which the antennae were not figured in Liljeblad (1945), despite it being described as a new species in that paper and distinguished from the similar *M. nigricans* only by antennomeres 3–5 being of equal length and the color of various body parts. *Mordellina blatchleyi* was described as having the palpi, middle tibiae and tarsi, and posterior tarsi, fusco-ferruginous. *Mordellina nigricans* was described as “black, with four basal segments of antennae and labrum rufo-testaceous; palpi a little darker; female entirely black.” Both species have a rufous labrum, however this must be inferred for *M. blatchleyi* by the statement in Liljeblad (1945) that it “resembles *M. nigricans*, differing mainly in the antennal segments, palpi, and in the color of the legs.” The palpi of *M. blatchleyi* and *M. nigricans* are not sufficiently described to discern differences from each other or these specimens. These 19 specimens differ from descriptions of *M. nigricans* in that the antennae are all pale (in males and females) as are the front legs and palps. Antennomere 3 is slightly shorter than 4, and 5 is longer and broader than 4 (Figure 9, bottom). The labrum is rufous and the front legs, tarsi and tibiae of the middle legs, antennae, and palps are pale (Figure 9). It differs from *M. blatchleyi* in that antennomere 5 is longer than (not equal to) antennomere 4. Thus, the antennomeres of these 19 specimens fit the shape and length described for *M. nigricans*, but differ in being all pale. These specimens have the other pale body parts described for *M. blatchleyi* as “fusco-ferruginous,” but differ by not

having antennomeres 3–5 being of equal length. *M. nigricans* is reportedly more widely distributed with a generally northern distribution. *M. blatchleyi* is more southern, reported only from Florida, Georgia, South Carolina, Illinois, and Ohio (Bright 1986). These Virginia specimens may demonstrate intermediate variation in a single species over a broad geographic range. *Mordellina nigricans* has priority in name by 100 years. Genetics work will be needed to parse out the *M. nigricans*/*M. blatchleyi* species complex.

Mordellina pustulata (Melsheimer) – (97); DM, GF, TR; bs, mt; 28 Apr–11 Oct. This was the only species of *Mordellina* transferred from *Mordellistena* by Jackman and Lu (2001) in which the first and second ridges of the tibiae are equal in length, neither crossing the face of a tibia. The third ridge of the first tarsomere is weaklier expressed than the first two in many of these specimens.



Figure 8. *Mordellina lecontei* (Ermisch). Female; **top left:** dorsal; **top center:** lateral; **top right:** antennae. Great Falls Park, swamp, Malaise trap, 16–30 July 2009, David R. Smith and Brent W. Steury. **Bottom left and bottom center:** variation in pronotal color, **left:** male, **right:** female. **Bottom right:** terminal maxillary palpomere of male.



Figure 9. *Mordellina nigricans* (Melsheimer). Male; top left: dorsal; top right: lateral; bottom left: full antennae showing pale color; bottom right: close-up of antennomeres 1–5 showing antennomere 5 as long as 3 and 4 combined and the rufous labrum. Turkey Run Park, river trail, Malaise trap, 31 July–17 August 2009, David R. Smith and Brent W. Steury.

Mordellina semiusta (LeConte) – (13♂); DM, GF, LH; mt; 10 Apr–30 Jul. (Figure 10). Four of these specimens differ from descriptions in Downie and Arnett (1996) and Ciegler (2014) by having a dark cloud on the pronotal base. In one specimen the humeral markings are very faint. Liljeblad (1945) noted “A slight variation in color has been observed. One specimen from Tennessee has a dark triangular area on the thorax in front of the scutellum and has the middle tibiae and tarsi pale; one from Wales, Maine, has the basal half of the thorax dark.” Our specimens fall within the variability noted by Liljeblad (1945) and we add Virginia to the geographic range of this variability. See further discussion above under *M. ancilla*. The holotype of *Mordellistena quadrinotata* Liljeblad examined during this study does not differ from the range of color variability or the structure of the antennae in *M. semiusta*. If determined to be a valid species, *Mordellistena quadrinotata* should be transferred to the genus *Mordellina*. Further work is needed to determine if these reputed species are distinct or should be synonymized.



Figure 10. *Mordellina semiusta* (LeConte). Male; **left:** dorsal; **center:** lateral; **right:** antennae of same specimen. Dyke Marsh Wildlife Preserve, Malaise trap, 16–30 June 1998, Edward M. Barrows.

! *Mordellina testacea* (Blatchley) – (1♂); GF; mt; 1–19 Jul. This specimen was determined after comparing it with the holotype of *M. testacea*. The specimen is male and the possibility exists that it is just an extremely pale form of *M. ustulata*. This probability is enhanced by Liljeblad (1945) being unable to locate a specimen of *M. testacea*, its rarity during this survey, the similar structure of the antennae of *M. testacea* and *M. ustulata* (see Steury and Steiner 2020), and that two male specimens included with *M. ustulata* lack black sutural margins and have a reduced amount of black color on the ventrites.

Mordellina ustulata (LeConte) – (116, 54♂, 32♀ with black mesosternum and metasternum, 30♀ with yellow mesosternum and black metasternum); DM, GF, LH, TR; bl, mt; 23 May–21 Oct. (Figure 11). This taxon is either highly variable in color or it represents a species complex. Typical males (n=53) (Figure 11, top left; middle row left; and bottom right two) have a yellow mesosternum and metasternum and yellow pronotum (rarely with a dark cloud at base); females have a black metasternum and either a black or yellow mesosternum (Figure 11, top center and top right). Females with a black metasternum and mesosternum (n=32) typically have darker pronota (Figure 11, middle row right). Females with a yellow metasternum and black mesosternum (n=30), typically have yellow pronota with some darker shading basally (Figure 11, middle row, center two). The two female color forms may be separate species, and if so, it is not known which female belongs to *M. ustulata* (thus the specimen tally for *M. ustulata* may not be correct and the total was not included in the results tally of the most common species). More confusing is that one male of the 54 specimens which could be attributable to *M. ustulata* has a black metasternum and mesosternum and a pronotum darkened basally (Figure 11, bottom, left two). The structure of the antennae is identical in all these specimens (Figure 11, bottom, right two). See also the discussion above under *M. ancilla* concerning confusion between these two species.



Figure 11. *Mordellina ustulata* (LeConte). **Top:** lateral views, **left:** male, **center:** female (near *M. ustulata*) with yellow mesosternum and black metasternum, **right:** female (near *M. ustulata*) with black mesosternum and metasternum. **Middle row:** pronota of *M. ustulata*, **left:** male, **center two:** female (near *M. ustulata*) with yellow mesosternum and black metasternum, **right:** female (near *M. ustulata*) with black mesosternum and metasternum. **Bottom:** male (near *M. ustulata*) with black mesosternum and metasternum, **left:** dorsal, **center:** lateral, **right two:** antennae of male *M. ustulata* (typical form). All specimens collected at George Washington Memorial Parkway.

Mordellina washingtonensis Steury and Steiner – (32; 2♂ USNM; 21♂, 9 probable ♀ GWMP); DM, GF, TR; mt; 23 May–29 Aug. This newly described species (Steury and Steiner 2020) is known only from the GWMP.

Mordellina wimbledon Steury and Steiner – (3; 1♂ USNM, 2♂ GWMP); LH, TR; mt; 1–20 Jun. The holotype specimen of this newly described species (Steury and Steiner 2020) was collected at Little Hunting Creek.

Mordellina Schilsky sp. – (1♂); TR; mt; 5–25 Aug. (Figure 12). This undetermined *Mordellina* appears closely allied to *Mordellistena heterocolor* Ray, a species known only from Big Bayou, Florida. It matches the description of *M. heterocolor* (Ray 1946) differing in the apical tibial leg ridge which is described as “somewhat longer” than the one below it in *M. heterocolor*, but in this specimen the apical ridge crosses the entire face of the tibia (as would be expected in *Mordellina*). Also, the elytral color of *M. heterocolor* is described as uniformly “fuscopiceous,” however in this specimen the elytra have a faintly reddish humerus on otherwise fuscopiceous elytra. Antennomeres 5–10 are described as “equal” in *M. heterocolor*, however in this specimen antennomere 7 is at least twice as long as antennomere 5 (Figure 12, top right). All other characters match the description given by Ray (1946), including the 2-3-2 leg ridge count and emarginated anterior margin of the eye. This specimen has a very long, narrow dorsal habitus compared to most other *Mordellina* (except perhaps *M. nigricans*) and Ray (1946) described the dorsal habitus of *M. heterocolor* as “elongate.” We hesitate to assign this specimen to *M. heterocolor* without examining the holotype because of the extraordinary range extension from southern Florida to Virginia and because *M. heterocolor* has not been found at any other site since it was first collected in 1920.

! *Mordellistena aspersa* (Melsheimer) – (5; 4♂, 1 undetermined); DM, GF, TR; mt; 1 May–5 Jun. (Figure 13). This is a black *Mordellistena* except for the front legs, mentum, palpomeres, first four antennomeres, and hind tibial spines which are paler. It seems to be most closely allied to *M. morula* and *M. convicta* (see discussion under *M. morula*). Male *M. aspersa* are easily separated from female *M. rubrifascia* by the longer, narrower, more erectly hairy antennomeres 4–5 in *M. aspersa* (Figure 13, right, and Figure 24, bottom left). We were unable to attribute any females to this species, however they may be quite similar to female *M. rubrifascia*. Liljeblad (1945) stated that specimens of *M. aspersa* have been seen from “nearly every State in the Union,” although Virginia has never been specifically cited (Bright 1986).

Mordellistena attenuata (Say) – (46; 30♂, 16♀); DM, GF, LH, TR; mt; 21 May–30 Jul. Males of this species have a rufous pronotum with a black T-shaped mark on the anterior margin. In females, the pronotum is all black.

! *Mordellistena bicinctella* LeConte – (5♀); DM, GF, TR; mt; 1 Jun–7 Jul. Liljeblad (1945) stated the pronotum of this species can be “either black or reddish yellow or with a cloud at base.” These five female specimens include all these pronotal color forms. The coxal plates vary in color from all black to orange in the ventral half and black dorsally. It is one of the smallest mordellids documented from the study area. The largest of these specimens measured only 2.4 mm (0.09 in) to the tip of the pygidium. This species reaches its previously documented southern range limit in the District of Columbia.



Figure 12. *Mordellina* Schilsky sp. (near *Mordellistena heterocolor* Ray). Male; **top left:** dorsal; **top center:** lateral; **top right:** antennomeres 1–8; **bottom:** leg ridges. Turkey Run Park, 5–25 August 2008, David R. Smith and Brent W. Steury.



Figure 13. *Mordellistena aspersa* (Melsheimer). Male; **left:** dorsal; **center:** lateral. Great Falls Park, quarry, Malaise trap, 1–20 May 2009, David R. Smith and Brent W. Steury; **right:** male terminal maxillary palpomeres and antennomeres 1–7.

! *Mordellistena convicta* LeConte – (3; 2♂, 1♀); TR; mt; 22 Jun–6 Jul. (Figure 14). All specimens were captured in the same Malaise trap sample. The leg ridges of this species are given as 3-3-2 (Liljeblad 1945). One of these female specimens fit this description, however the other two specimens have leg ridge formulas of 2-3-2 and 2-2(3)-1(2). It closely resembles *M. aspersa* and *M. morula* but the elytral pubescence occurs in four or five vittae that extend the length of the elytra. We follow the opinion of Liljeblad (1945) that the reputed type specimen in the collection at MCZ is not the specimen that was before LeConte when he described *M. convicta*, but is instead a specimen of *M. syntaenia*. See further discussion under *M. morula* and *M. syntaenia*.



Figure 14. *Mordellistena convicta* LeConte. Male; left: dorsal; right: lateral.
Turkey Run Park, ravine, Malaise trap, 22 June–6 July 2006, David R. Smith and Brent W. Steury.

! *Mordellistena dimidiata* Helmuth – (13; 1♂, 7♀, 5 undetermined); GF, LH, TR; bs, mt; 19 May–17 Jul. (Figure 15). These specimens were compared with macro-images provided by the University of Michigan Museum of Zoology (UMMZ) of the male (Figure 15, bottom left and right) and a female of *M. dimidiata* which were designated by Liljeblad (1945). The sex of eight specimens was determined by examination of the genitalia. Female leg ridge counts were reported by Ciegler (2014) as 2-3-2 and by Liljeblad (1945) as 2-2(3)-1(2), while in males the ridge count is reported as 2-2-1 (Liljeblad 1945). While not all specimens agree with the ridge counts cited for males and females of this species (the one male specimen has a ridge count of 2-3-2) all specimens (male and female) possess the distinctive antennal characteristic of *M. dimidiata* in which the fourth antennomere is longer than the third and fifth (Figure 15, top right). The ridge counts on these eight specimens varied from 2-2-1 to 2-3-2, however the most common expression was 2-2-2. The specimens have dark gray metathoracic wings with venation that often shows through the apical half to one-third of the yellowish, semitransparent elytra. The black lateral margins, and especially the sutural margins, reported by Liljeblad (1945) and Ciegler (2014) are obscure in some specimens but pronounced in others.



Figure 15. *Mordellistena dimidiata* Helmuth. Female; top left: dorsal; top center: lateral; top right: female antennae of same specimen showing antennomere 4 longer than 3 and 5. Great Falls Park, Malaise trap, 30 June–13 July 2006, David R. Smith and Brent W. Steury. Bottom: male from Illinois deposited at UMMZ collected by Emil Liljeblad; left: antennae showing antennomere 4 longer than 3 and 5; right: leg ridges showing a single ridge on tarsomere 2.

! *Mordellistena fuscata* (Melsheimer) – (29; 19♂, 10 undetermined); LH, GF, TR; bl, mt; 2 Jun–17 Aug. (Figure 16). Nineteen of the 29 specimens are males per examination of genitalia. This species has never been well described. Liljeblad (1945) was unable to locate the type specimen and considered it a “species of doubtful identity.” Bright (1986) previously documented it only in Pennsylvania, but Ciegler (2014) listed its range as New York to Florida, west to Indiana. Antennomeres 5–11 have a dense brush of short erect setae on the ventral side in males (Figure 16, bottom left and right). The antennae are entirely pale in most specimens, or occasionally, antennomeres 5–11 are darkened slightly. The ventrites are black with a posterior brown edge and the elytral apices are edged with brown. The tibial leg ridges are very oblique (Figure 16, top right), as in *Glipostenoda ambusta*. The fourth tarsomere of the front and middle legs is emarginated. No females could be attributed to this species. Perhaps it is a dark, male, color variation of *G. ambusta*, or a distinct species that should be assigned to that genus.



Figure 16. *Mordellistena fuscata* (Melsheimer). Male; top left: dorsal; top center: lateral; top right: male leg ridges; bottom left and bottom right: antennae of same specimen showing dense brush of erect setae on ventral surface. Turkey Run Park, gulch, Malaise trap, 1–15 July 2009, David R. Smith and Brent W. Steury.

Mordellistena fulvicollis (Melsheimer) – (8; 2♂, 6♀); DM, LH, TR; mt; 19 May–7 Jul. (Figure 17). One female specimen has a dark cloud in the posterior half of the pronotum, the other seven specimens have the pronotum entirely orange. The ridge counts on these specimens are 2-2-1 or 2-2(3)-1. Three female specimens have a weak third ridge on the first tarsomere. Liljeblad (1945) gives a ridge count of 2(3)-2(3)-1 for this species.

Mordellistena fuscipennis (Melsheimer) – (20); GF, LH, TR; mt; 1–30 Apr, 19 Jun–4 Sep. This species reaches its known southern limit in northern Virginia (Falls Church) (Liljeblad 1945, Bright 1986). It is a distinctive mordellid with an orange to rufous head, pronotum, ventral surface, and antennomeres 1–4. The elytra are black with a dense line of pale setae along the suture. Variation includes darker areas on the coxal plates and abdominal sterna, pale setae on the humeri, and dark antennomeres 3–4. The leg ridge formula in these specimens is also variable, ranging from 3-3-2-1(2) to 4(5)-4-2-2. It is one of only three species of *Mordellistena* found during this study with leg ridges on tarsomere 3, the other two being *M. vera* and *M. virginica*. Only 26.7% of the specimens had four strong tibial ridges. Body length was also variable ranging from 3.9–5.9 mm to the tip of the pygidium.



Figure 17. *Mordellistena fulvicollis* (Melsheimer). Female; **left:** dorsal; Turkey Run Park, powerline, 1–17 June 2019, B. Steury. Undetermined sex; **right:** lateral; Little Hunting Creek, Malaise trap, 19 May–2 June 2017, Brent W. Steury, Colin Davis, and Christopher Acosta. Note pale apices of the elytra in lateral image.

Mordellistena leporina LeConte – (3); LH; mt; 2 Jun–16 Jul. (Figure 18). The front and middle penultimate tarsomeres of these specimens are bilobed (Figure 18, right). Thus, it is better placed in the genus *Falsomordellistena* and it seems closely allied to *F. discolor*. Liljeblad (1945) discussed its similarities with *F. hebraica* and *F. pubescens* and considered it to be “very rare.” It has been previously documented from Virginia (Fredericksburg), Maryland (Plummers Island), North Carolina, South Carolina, Florida, and Tennessee (Liljeblad 1945, Bright 1986, Ciegler 2014).

Mordellistena limbalis (Melsheimer) – (121); DM, GF, LH, TR; mt; 10–30 Apr, 2 Jun–12 Sep.

Mordellistena liturata (Melsheimer) – (109); DM, GF, LH, TR; bl, hc (on tree trunk), mt; 10–30 Apr, 2 Jun–12 Sep. Ciegler (2014) indicated a leg ridge count of 3(4)-3-2 for this species. Some of our specimens also had weak additional ridges on the first and second tarsomeres.

! *Mordellistena marginalis* (Say) – (3); DM; mt; 14 Aug–26 Sep. (Figure 19). This species is closely allied to *Mordellistena cervicalis* LeConte and *Mordellistena divisa* LeConte. Ridge counts for *M. marginalis* are described as 3-4(5)-2 (Liljeblad 1945). Our male specimen has a ridge count of 3-4-2 and the other two specimens have ridge counts of 3-4(5)-2(3) and 3(4)-4(5)-2. Antennomeres of this species were described as black by Say (1824). Antennomeres 1–4 in these specimens are pale and 5–11 are pale brown. Antennomere 3 is the shortest, 4 is shorter than 5, and 5–11 are subequal. Antennomeres 3–11 are flattened and somewhat serrate (Figure 19, bottom left and bottom right). Say (1824) described the pronotum of this species as “dull yellow-rufous, with a black quadrate oblong spot extending from the middle to the scutellum, and another at each lateral angle.” Variation in pronotal color in these three specimens can be seen in (Figure 19). *Mordellistena marginalis* was reported by Liljeblad (1945) from



Figure 18. *Mordellistena leporina* LeConte. Male; **left:** dorsal; **center:** lateral; **right:** middle leg showing bilobed fourth tarsomere, indicating better placement in the genus *Falsomordellistena* Ermisch. Little Hunting Creek, Malaise trap, 2–20 June 2017, Brent W. Steury, Colin Davis, and Christopher Acosta.



Figure 19. *Mordellistena marginalis* (Say). **Top left:** female, 26 September 1999; **top center:** undetermined sex, 14 August 1999; **top right:** male, 14–28 August 1998; **bottom left:** antennae of male specimen; **bottom right:** antennae of female specimen. All from Dyke Marsh Wildlife Preserve, collected in Malaise traps run by Edward M. Barrows.

Plummers Island, Maryland, on the opposite shore of the Potomac River from Turkey Run Park. Liljeblad (1945) also reported *M. cervicalis* from Great Falls Park but stated that it may be only a variation of *M. marginalis*. Ciegler (2014) noted a leg ridge count of 2-3(4)-2 for *M. cervicalis* and described the head as having a black spot on the base and a ferruginous pronotum in males (see Figures 6.38 and 6.35 in Ciegler 2014). *Mordellistena divisa* LeConte (holotype available online at MCZ 2019) with a ridge count of 3-4-2 and a pronotum described as “partly rufo-testaceous, sometimes more yellow and somewhat cloudy along basal margin” has been reported from northern and midwestern states with one record from New Jersey (Liljeblad 1945, Bright 1986). *Mordellistena divisa* was synonymized with *M. marginalis* by Smith (1882), but Liljeblad (1945) considered it distinct stating that they differ “in color as well as in the antennal segments.” However, Liljeblad (1945) did not say what these differences were in his descriptions of the antennae of *M. marginalis* or *M. divisa*. See further discussion in Liljeblad (1945) under *M. marginalis* concerning other similar species.

! *Mordellistena masoni* Liljeblad – (31); DM, GF, LH, TR; mt; 2 Jun–25 Aug. This species is very similar to *M. liturata*. Keys in Ciegler (2014) and Liljeblad (1945) distinguish them by the addition of a leg ridge on the tibiae and first tarsomere and several spots of pubescence in the open areas between the setal bands. Our specimens of *M. liturata* and the count cited for *M. masoni* (Ciegler 2014) show some overlap (3[4]-3[4]-2[3] in *M. liturata* and 4[5]-4[5]-2 in *M. masoni*). The spots of pubescence in the open areas between the setal bands are distinctive in these 31 specimens when compared with all specimens of *M. liturata*. Specimens with spots (*M. masoni*) more often have 4 strong tibial leg ridges and those without spots (*M. liturata*) more often have 3 strong tibial ridges. However, specimens with spots that have only 3 strong tibial ridges are not uncommon. *Mordellistena masoni* has been documented in but five other states, all along the Atlantic Coast between Connecticut and Florida. Genetic studies of *M. liturata* and *M. masoni* may provide interesting insights into their taxonomic relationship.

! *Mordellistena militaris* LeConte – (40; 25♀, 15 undetermined); DM, LH, TR; bs (on eastern redcedar, *Juniperus virginiana* L.), mt; 31 May–18 Jul. (Figure 20). Twenty-five of these were captured in a Malaise trap set at Little Hunting Creek from 2–20 June. All specimens are likely female. *Mordellistena militaris* has been previously documented from only four other states: New York, North Carolina, South Carolina, and Ohio (Bright 1986, Ciegler 2014). It is a distinctive mordellid, typically with large pale oval patches on the humeri of black elytra. These specimens all have pale edging on the elytral apices, though this is not mentioned in descriptions of the species, or shown in illustrations of it (Ciegler 2014, Figure 6.32). The humeral oval patch is sometimes faint, or in the case of three specimens, the elytra are all black except for the pale apices. The ridge count is cited as 2-3-2, although some of these specimens have a weak third ridge on the tibia and the third ridge of the first tarsomere and second ridge of the second tarsomere is sometimes weak. Liljeblad (1945) and Ciegler (2014) described the color of the pronotum as “in male with apical half reddish yellow, and basal half blackish, in female with only a trace of reddish yellow at apex, remainder black.” However, in our specimens, the female pronotum varies from all orange to all black (Figure 20, bottom left and right) and we were unable to attribute any males to this species.



Figure 20. *Mordellistena militaris* LeConte. Top left: usual form with pale humeral angles; **top right:** unusual form with very faint pale marking on the humerus; **bottom left and bottom right:** two images showing extremes of variation in female pronotal color. All specimens from George Washington Memorial Parkway.

! *Mordellistena morula* LeConte – (6; 2♂, 3♀, 1 undetermined); DM; mt; 20 Jun–9 Aug. (Figure 21). This species reputedly differs from *M. aspersa* by having a strong third ridge on each tibia and having the elytral setae unevenly distributed (Ciegler 2014). The ridge count was given as 3-3-2 for *M. morula* and 2(3)-3-2 for *M. aspersa* (Ciegler 2014). It is an “all black” species 2–3 mm [0.08–0.12 in] long (Liljeblad, 1945). The type description (Le Conte [sic] 1862) does not mention the unevenly distributed elytral pubescence. This character was first noted by Blatchley (1910). Smith (1882) suspected *M. morula* and *M. aspersa* were the same species. Liljeblad (1945) stated that he was “unable to verify” this species. No author has described the antennae or palpomeres. The six specimens in our collection come close to matching this species concept in being all black (although in these specimens the first four antennomeres, the palps, and the hind tibial spurs are pale), having a 3-3-2 leg ridge count, and mottled elytral pubescence. In males, *M. morula* has longer antennomeres 2–4 than does *M. convicta* (Figure 21, bottom left and bottom center), and *M. aspersa* has longer antennomeres 4–5 than does *M. morula* (Figure 21, bottom right and bottom left). Additionally, *M. aspersa* and *M. convicta* are distinguished by their pattern of elytral pubescence (Figures 13 and 14).



Figure 21. *Mordellistena morula* LeConte. Male; top left: dorsal; top right: lateral; Dyke Marsh Wildlife Preserve, Malaise trap, 7–19 July 1998, Edward M. Barrows; bottom: comparison of male antennomeres 1–5 of *M. morula* (left), *M. convicta* (center), and *M. aspersa* (right), showing longer antennomeres 2–4 in *M. morula* than in *M. convicta* and longer antennomeres 4–5 in *M. aspersa* than in *M. morula*.

Mordellistena ornata (Melsheimer) – (75); DM, GF, LH, TR; bs, mt; 23 May–25 Aug.

Adding to the variability noted by Ciegler (2014) for this species, the yellowish sutural line can be absent, as it was in two of these specimens.

! *Mordellistena pallipes* Smith – (4); DM, LH; mt; 5 May–24 Jun. (Figure 22). These specimens represent a southern range extension from New York. Its dorsal habitus is identical to that of *M. pratensis* Smith as shown in Figure 6.39 in Ciegler (2014), however *M. pratensis* is reportedly half its length at only 1.5 mm (0.06 in) (there is no indication of whether this length included the pygidium). The leg ridge formula of *M. pratensis* was cited as 2-2-2 (Ciegler 2014) and *M. pallipes* as 2-3-1 (Smith 1882) or 2(3)-3-1 (Liljeblad 1945). *Mordellistena pratensis* has been reported only from South Carolina and Florida, and *M. pallipes* only from the northeastern United States. The South Carolina record for *M. pratensis* is based on a single specimen with a missing abdomen (J. Ciegler, in litt., 4 November 2016). These specimens measure 3.2 mm (0.13 in) long to tip of elytra and 4.0 mm (0.16 in) to tip of pygidium, which is larger than the lengths given for *M. pallipes* (2.5 mm [0.10 in] and 3 mm [0.12 in]). The ridge counts of our specimens are intermediate between *M. pallipes* and *M. pratensis*. Three of our specimens have ridge counts of 2-2(3)-2 and one has a count of 2(3)-2(3)-1(2). The leg color of our specimens is intermediate between the type description of “all pale” (Smith 1882) and the revised description of Liljeblad (1945) “anterior legs more

or less testaceous, middle legs darker; posterior femora and tibiae black, tarsi dark testaceous.” In these three specimens, only the middle and hind femora are dark. Liljeblad (1945) stated that the “insect seems to be very rare,” thus few specimens have been available for comparison. It is possible that *M. pallipes* and *M. pratensis* are forms of one species with the smaller form found in the south. *Mordellistena pallipes* has precedence in name.



Figure 22. *Mordellistena pallipes* Smith. Undetermined sex; **left:** dorsal; **center:** lateral; **right:** hind tibia and tarsi showing leg ridge formula of 2-3-1. Additional weak ridges can be seen on the tibia and second tarsi. The third ridge on the first tarsomere is weaker than the other two. Dyke Marsh Wildlife Preserve, Malaise trap, 12–24 June 1998, Edward M. Barrows.

Mordellistena picipennis Smith – (67; 20♂, 31♀, 16 undetermined); GF, LH, TR; mt; 1 Jun–30 Jul. (Figure 23). Ciegler (2014) gave a ridge count of 2-3-1(2) for this species. Liljeblad (1945) (who was not able to locate the type specimen) expanded it slightly to 2(3)-3-1(2). Our male specimens have variable ridge counts ranging from 3-3-2 to 2-2-1. Interpretation of ridge counts is difficult in this species due to the additional one or two, often very short, rows of black setae commonly found on the tibia and tarsomeres. Females, determined by examination of their genitalia (n=31), differ externally from males in having a more consistent 2(3)-3-1 ridge count and slightly shorter antennomeres 5–11, which are often all pale. The dorsal habitus is similar to *M. virginica*, but males of these two species differ in the size, shape, and pubescence of the male antennomeres (Figure 23, right; Steury and Steiner 2020) and *M. virginica* (males and females) have leg ridges on tarsomere 3 while *M. picipennis* does not.



Figure 23. *Mordellistena picipennis* Smith. Male; left: dorsal; center: ventral; right: antennae of same specimen. Turkey Run Park, gulch, Malaise trap, 19–30 June 2009, David R. Smith and Brent W. Steury.

- ! *Mordellistena rubrifascia* Liljeblad – (71; 30♂, 41♀); DM, GF, TR; mt; 23 May–6 Jul. (Figure 24). Ten males and 15 females were captured in the same Malaise trap in Turkey Run Park set from 22 June to 6 July 2006. The male specimens key directly to *M. rubrifascia* in Liljeblad (1945) and Ciegler (2014) using a leg ridge count of 2-3-2. It is described as black; frons rufotestaceous; antennomeres 1–4, palpi, front legs, middle femora, and tibia testaceous (Liljeblad 1945). However, in these 64 specimens, the rufotestaceous antennomeres extend beyond 4 or they may all be pale, and there are sometimes weak anterior ridges on the tibiae and tarsomere 1. Females are described as being similar to males but with antennae testaceous throughout and the middle legs black. The 41 females assigned to this species differ from this description by their lack of a rufous frons, often having at least antennomeres 1–4 pale, and having variably colored front and middle legs ranging from all black, to all yellow, to the front legs yellow and the middle ones black, or having each leg bicolored, yellow and black.
- ! *Mordellistena sexnotata* Dury – (2); LH, TR; mt; 19 May–28 Jun. (Figure 25). This species has been previously reported only from Ohio, Kentucky, New Mexico and Wisconsin (Bright 1986, Lisberg and Young 2003). The dark area near the middle of the pronotum is caused by a dense patch of black setae.
- Mordellistena smithi* Dury – (2♂); TR; mt; 31 Jul–17 Aug. (Figure 26). This species has a similar dorsal habitus to *M. militaris* but differs in that males have a black head and pronotum. No females were captured during this study, however some female specimens attributed to *M. militaris* (those with a black pronotum) closely resemble descriptions of female *M. smithi*. A ridge count of 3-3-2(1) was cited for *M. smithi* (Ciegler 2014). The ridge counts on our two specimens are 2(3)-3-1 and 3-3-1(2). The terminal maxillary palpomeres of these two specimens are scalene triangular with the outer and terminal sides the longest. It is possible that *M. smithi* and *M. militaris* are the same species, with *M. smithi* being the male and *M. militaris* the female.



Figure 24. *Mordellistena rubrifascia* Liljeblad. Male; top: lateral; bottom left: terminal maxillary palpomere and antennomeres 1–6, Turkey Run Park, Malaise trap, 22 June–6 July, David R. Smith and Brent W. Steury. Bottom center: male face; bottom right: female face. Palpomeres and antennae are the same in both sexes.



Figure 25. *Mordellistena sexnotata* Dury. Left: dorsal; right: lateral. Little Hunting Creek, Malaise trap, 14–28 June 2018, Brent W. Steury.



Figure 26. *Mordellistena smithi* Dury. Male; left: dorsal; right: lateral. Turkey Run Park, River Trail, Malaise trap, 31 July–17 August 2009, David R. Smith and Brent W. Steury.

! *Mordellistena syntaenia* Liljeblad – (8; 6♀, 2 undetermined); GF, LH, TR; mt; 21 May–29 Jun. (Figure 27). Liljeblad (1945) identified the leg ridge formula for this species as 3-3-2 in females and 2-3-2 in males. In these eight specimens, two females have a very weak apical ridge on tarsomere 1 and one has a single ridge on tarsomere 2. The pattern of elytral pubescence in this species is strikingly unique. This species was not known from south of Massachusetts until Ciegler (2014) reported it from South Carolina. Virginia is only the fifth state in which this species has been documented. Concerning the MCZ type of this species, Liljeblad (1945) stated that “in the Museum of Comparative Zoology the supposed type or first specimen of *Mordellistena convicta* Leconte [sic] belongs to the present species [*Mordellistena syntaenia*].” “I am of the opinion that the specimen now the first in the Leconte [sic] collection under the name of *convicta* is not the original specimen that was before that author when he described the species.”

Mordellistena trifasciata (Say) – (271; 89♂, 182♀); DM, GF, LH, TR; mt; 23 May–21 Oct. The male of this species has a yellow pronotum, mesosternum, and metasternum, and the first four ventrites are black with yellow ventral margins. The female has a black pronotum with a yellow base, black mesosternum and metasternum, and ventrites as in males. The sexes can also be separated by the shape of the terminal maxillary palpomere which is “boat-shaped” in males and elongate in females (Liljeblad 1945). Variation in the species includes the length of the apical tibial ridge, which in some specimens is nearly twice as long as the one below it.



Figure 27. *Mordellistena syntaenia* Liljeblad. Sex undetermined; **left:** dorsal; **right:** lateral. Great Falls Park, quarry, Malaise trap, 23 May–5 June 2008. David R. Smith and Brent W. Steury.

! *Mordellistena vera* Liljeblad – (75; 35♂, 40♀); DM, GF, LH, TR; mt; 19 May–30 Jul. (Figure 28). Males of this species are distinctive in having very long antennomeres 5–11 (4 to 5 times the length of number 4) that are densely covered by short, erect setae of equal height, except for a few longer erect setae at the apex of each antennomere. The only species with similar antennae are males of the recently described *M. virginica* (Steury and Steiner 2020). In females, antennomeres 5–11 are approximately half the length of males. The sexual differences in the antennae are not mentioned in Liljeblad (1945), who considered this beetle to be rare, or in Ciegler (2014). This is also one of only three species of *Mordellistena* captured during this study with leg ridges on tarsomere three. The leg ridge formula of this species is highly variable due to the occasional presence of numerous short ridges. A leg ridge formula of 3(2,4,5)-4(3)-2(3)-2(1) captures the number of leg ridges in these 75 specimens. One female has a ridge on tarsomere 5. The MCZ type of *M. unicolor* LeConte appears to be a female of this species (see further discussion in Liljeblad [1945] under entry for *M. unicolor*).

Mordellistena virginica Steury and Steiner – (20; 1♂, 1♀ USNM; 9♂, 9♀ GWMP); GF, TR; mt; 1 Jun–4 Sep. (Figure 29). The holotype of this species is from Great Falls Park (Steury and Steiner 2020). The male antennae of this species are similar to male *M. vera* and the dorsal habitus of males and females is similar to male and female *M. picipennis*. An image of a female is provided in Figure 29.



Figure 28. *Mordellistena vera* Liljeblad. Male; top left: dorsal; top right: lateral; bottom left: same specimen showing leg ridges; bottom right: antennae of same specimen. Great Falls Park, swamp, Malaise trap, 19–30 June 2009, David R. Smith and Brent W. Steury.



Figure 29. *Mordellistena virginica* Steury and Steiner. Female; left: dorsal; right: lateral. Great Falls Park, swamp, Malaise trap, 21 July–17 August 2009, David R. Smith and Brent W. Steury.

Mordellistena sp. (near *pallidoptera* Khalaf) – (11; 3♂, 5♀, 3 undetermined)); LH; mt; 18 May–28 Jun. (Figure 30). This species is most closely allied to *M. pallidoptera* Khalaf and *Mordellistena wenzeli* Liljeblad (Figure 31, not captured during this study). It differs from the holotype specimens of both species by having 2 rather than 1 leg ridge on tarsomere 2. It is also larger than *M. wenzeli* which is only 2.3 mm [0.09 in] long to the tip of the pygidium (this species is 3.5 mm [0.14 in] long) and has longer antennomeres (5 is only slightly longer than 4 in *M. wenzeli* and 5 is almost twice as long as 4 in this species). The type specimen of *M. pallidoptera* at NMNH is dissected and preserved as a slide mounted in polyvinyl alcohol making direct comparisons of some characters difficult. *Mordellistena pallidoptera* has been reported only from the type locality in Louisiana (Khalaf 1971a) and *M. wenzeli* only from Georgia and South Carolina (Ciegler 2014).



Figure 30. *Mordellistena* sp. (near *pallidoptera* Khalaf). **Top left:** dorsal; **top right:** lateral; **bottom left:** female antennae; **bottom right:** male antennomeres 2–6. Top specimen is from Little Hunting Creek, Malaise trap, 2–20 June 2017, Brent W. Steury, Christopher Acosta, Colin Davis.



Figure 31. *Mordellistena wenzeli* Liljeblad. (Not found during this study); **left:** dorsal; **right:** lateral; holotype from UMMZ, collected in Georgia.

Mordellistena Costa sp. 1 – (6♂); DM, GF, LH, TR; bs, mt; 2–30 Jun. (Figure 32). These six male specimens could not be assigned to any known taxon. They differ from *M. dimidiata* by their smaller length (4.2 mm [0.17 in] to the tip of the pygidium in *M. dimidiata* and 3.0 mm [0.12 in] in this species) and in the length of antennomere 4 compared to antennomeres 3 and 5 (Figure 32, right and Figure 15, top right and bottom left) (four being longer than five in *M. dimidiata* and four being much shorter than five in this species). The ridge counts in these specimens were best expressed as 2(3)-2(3)-2 which differs from other superficially similar species such as *M. wenzeli*. The dark elytral apices appear to be due to pigmentation in the integument rather than elytral transparency allowing a dorsal view of darkened hindwings.

Mordellistena Costa sp. 2 – (1); GF; mt; 10–30 Apr. (Figure 33). This distinctive *Mordellistena* of undetermined sex has proven difficult to identify. The ridge count on the specimen is 2-3(4)-(1). All but the first ridge of the tibia are small and weak. The head and pronotum are all black. The antennae are all pale and very short (reaching only to the midline of the pronotum). The ventral surface is black except for the tibia and tarsomeres which are pale, yellowish brown. The black elytra have two broad pale bands forming a pattern similar to those found in *M. minuta* Smith and *M. trifasciata*. This specimen has two tibial spurs, *M. minuta* and *M. trifasciata* have only one, and both have leg ridge counts of 2-2-1. Of the 269 specimens of *M. trifasciata* collected during this study, none had an all-black head or pronotum. Unfortunately, only one specimen was collected.

Mordellistena Costa sp. 3 – (1); DM; mt; 9–23 May. (Figure 34). This *Mordellistena* is distinctive in its leg ridge count and long, filiform antennae. It is all black with pale antennomeres 1–4 and dark-brown front and middle legs. The ridge count is 3(4)-4-2(3). All of the black species included in the key by Liljeblad (1945) with ridge counts between 3-4-2 and 4-4-3 are described as having short antennae, except for *M. aequalis* Smith, a species for which the antennae are not described (Smith 1882). Liljeblad did

not examine the holotype (now at MCZ) and the antennae are not visible in the holotype images, however the elytral pubescence in the MCZ type of *M. aequalis* from Illinois is not the same as in this specimen. It seems rather unlikely that Smith would not describe the antennae in a species with such distinctive antennomeres. Until additional specimens are obtained, the proper assignment of this *Mordellistena* will remain unknown.

! *Mordellochroa scapularis* (Say) – (29); GF, LH, TR; mt; 30 Apr–21 Jul. This species reaches its known southern distributional limits in Maryland.



Figure 32. *Mordellistena* Costa sp. 1. Male; left: dorsal; center: lateral; right: male antennomeres 1–9 showing 3 and 4 of equal length and 5 longer than 4. Little Hunting Creek, Malaise trap, 2–20 June 2017, Brent W. Steury, Christopher Acosta, and Colin Davis.



Figure 33. *Mordellistena* Costa sp. 2. Left: dorsal; right: lateral. Great Falls Park, quarry, Malaise trap, 10–30 April 2009, David R. Smith and Brent W. Steury.



Figure 34. *Mordellistena Costa sp. 3*. Top left: dorsal; top right: lateral; middle row: leg ridges; bottom left and bottom right: antennae and close up of antennomeres 1–7. Dyke Marsh, Malaise trap, 9–23 May 1999, Edward M. Barrows.



Figure 35. *Pseudotolida syphaxi Steury and Steiner*. Female; left: dorsal; center: lateral; right: terminal maxillary palpomeres. Little Hunting Creek, Malaise trap, 28 July–11 August 2017. Brent W. Steury, Colin Davis, Christopher Acosta.

Pseudotolida arida (LeConte) and *Pseudotolida lutea* (Melsheimer) – (40; 20♂, 20♀); DM, GF, LH, TR; bs, mt; 28 May–4 Sep. *Pseudotolida arida* is reportedly distinguished (Liljeblad 1945, Ciegler 2014), from *P. lutea* by its larger size (5.5 mm [0.22 in] to tip of the pygidium [Liljeblad 1945]) and by having one additional ridge on the hind first tarsomere. This appears to be a valid distinction in some specimens. However, 40 specimens of *Pseudotolida* Ermisch collected during this study that were analyzed for the morphological characteristics of body length, color, and the number of ridges on hind tarsomere 1, demonstrated that these characters are not sufficient for distinguishing either sex (males and females are easily separated in *Pseudotolida* by the shape of the apical maxillary palpomeres) using current taxonomic keys (Table 1). Taxonomic keys specify the anatomical requirements of *P. lutea* as < 3.8 mm [0.15 in], pale yellowish color, and two ridges on hind tarsomere 1 and for *P. arida* as > 5.4 mm [0.21 in], pale brown color, and three ridges on hind tarsomere 1. Ten of 40 specimens fall outside the size ranges given for either species. Of these ten, six were yellowish and four were pale brown. Two specimens had three tibial ridges, three had two ridges, and five had 2.5 ridges. Thus, none of these ten specimens can be clearly assigned to *P. arida* or *P. lutea*. Of the 21 specimens < 4.1 mm [0.16 in], only three met all three anatomical requirements of size, color, and number of leg ridges specified for *P. lutea*. If partial ridges are ignored, 17 of 21 specimens met the anatomical requirements needed to indicate *P. lutea*. Of the nine specimens > 5.0 mm [0.20 in], only three met the anatomical requirements for *P. arida*. Ignoring partial ridges did not change this proportion. Thus, 34 of 40 specimens were not attributable to either *P. arida* or *P. lutea* based on requirements used by taxonomic keys if partial ridges are counted on the first tarsomere and 20 specimens cannot be assigned to either species if partial ridges on the first tarsomere are ignored. Only six of 21 specimens < 4.1 mm were male. Three of nine specimens were male in the > 5.0 mm group and three of ten were male in the 4.1–5.0 mm group. The terms (coarse, smooth, and silky) used to describe differences in the elytral pubescence of *P. arida* and *P. lutea* are subjective and difficult to interpret. No differences in the density, length, or angulation of elytral pubescence, other than those attributable to individual size were observed in specimens < 4.1 mm versus those > 5.0 mm. Similarly, no differences in the structure of the maxillary palpus or antennomeres were observed in side-by-side comparisons of males and females from the < 4.1 mm and > 5.0 mm size classes. In a few dissected males examined, parameres did not differ in shape, only in size. The analysis showed a continuum of variability between specimens that key to *P. arida* and *P. lutea* demonstrating that a method to morphologically distinguish all specimens of these two reputed species does not exist. The documented ranges of *P. arida* and *P. lutea* overlap substantially, with *P. arida* reported from slightly farther south. *Pseudotolida lutea* is documented west to Arizona, north to New York, and south to Alabama. *Pseudotolida arida* is documented west to Arizona, north to New York, and south to Florida. *Pseudotolida lutea* has been reported from three states (Alabama, Delaware, and Georgia) where *P. arida* has not been reported and *P. arida* has been documented in five states (Florida, Massachusetts, Michigan, New Jersey, and Virginia) where *P. lutea* has not been recorded (Bright 1986, Burne 1987, Downie and Arnett 1996, Lisberg and Young 2003, Ciegler 2014). Since, according to current nomenclature, these taxa are considered separate species, we have included each one in the species tally and consider each to have been collected at each of the four sites listed.

Table 1. Forty specimens of *Pseudotolida* Ermisch collected from George Washington Memorial Parkway, Fairfax County, Virginia, analyzed by sex for the anatomical features of body length, color, and the number of ridges on the hind tarsomere. Taxonomic keys specify anatomical requirements for *P. lutea* (Melsheimer) as < 3.8 mm (0.15 in), pale yellowish color, and two ridges on hind tarsomere one, and for *P. arida* (LeConte) as > 5.4 mm (0.21 in), pale brown color, and three ridges on hind tarsomere one. Thirty-four of 40 specimens are not attributable to either *P. lutea* or *P. arida* based on requirements used by taxonomic keys if partial ridges are counted on the first tarsomere and 20 specimens cannot be assigned to either species if partial ridges on the first tarsomere are ignored.

Body Length	Sex	Color	Number of Ridges on Hind Tarsomere 1	Number of Specimens	Number of Specimens Outside Range of Keys (L=Length, C=Color, R=Ridges)	Number of Specimens Outside Range of Keys if Partial Ridges are Ignored (L=Length, C=Color, R=Ridges)
< 4.1 mm	♂	pale (yellowish)	2	3	0	0
< 4.1 mm	♂	pale (yellowish)	2.5	10	10 R	0
< 4.1 mm	♂	pale (yellowish)	3	0	0	0
< 4.1 mm	♂	darker (pale brown)	2	0	0	0
< 4.1 mm	♂	darker (pale brown)	2.5	1	1 C, R	1 C
< 4.1 mm	♂	darker (pale brown)	3	0	0	0
< 4.1 mm	♀	pale (yellowish)	2	0	0	0
< 4.1 mm	♀	pale (yellowish)	2.5	4	4 R	0
< 4.1 mm	♀	pale (yellowish)	3	0	0	0
< 4.1 mm	♀	darker (pale brown)	2	1	1 C	1 C
< 4.1 mm	♀	darker (pale brown)	2.5	1	1 C, R	1 C
< 4.1 mm	♀	darker (pale brown)	3	1	1 C, R	1 C, R
4.1–5.0 mm	♂	pale (yellowish)	2	1	1 L	1 L
4.1–5.0 mm	♂	pale (yellowish)	2.5	0	0	0
4.1–5.0 mm	♂	pale (yellowish)	3	0	0	0
4.1–5.0 mm	♂	darker (pale brown)	2	1	1 L	1 L
4.1–5.0 mm	♂	darker (pale brown)	2.5	1	1 L	1 L
4.1–5.0 mm	♂	darker (pale brown)	3	0	0	0
4.1–5.0 mm	♀	pale (yellowish)	2	0	0	0
4.1–5.0 mm	♀	pale (yellowish)	2.5	4	4 L	4 L
4.1–5.0 mm	♀	pale (yellowish)	3	1	1 L	1 L
4.1–5.0 mm	♀	darker (pale brown)	2	1	1 L	1 L
4.1–5.0 mm	♀	darker (pale brown)	2.5	0	0	0
4.1–5.0 mm	♀	darker (pale brown)	3	1	1 L	1 L

Body Length	Sex	Color	Number of Ridges on Hind Tarsomere 1	Number of Specimens	Number of Specimens Outside Range of Keys (L=Length, C=Color, R=Ridges)	Number of Specimens Outside Range of Keys if Partial Ridges are Ignored (L=Length, C=Color, R=Ridges)
> 5.0 mm	♂	pale	2	0	0	0
		(yellowish)				
> 5.0 mm	♂	pale	2.5	0	0	0
		(yellowish)				
> 5.0 mm	♂	pale	3	1	1 C	1 C
		(yellowish)				
> 5.0 mm	♂	darker	2	0	0	0
		(pale brown)				
> 5.0 mm	♂	darker	2.5	1	1 R	1 R
		(pale brown)				
> 5.0 mm	♂	darker	3	1	0	0
		(pale brown)				
> 5.0 mm	♀	pale	2	0	0	0
		(yellowish)				
> 5.0 mm	♀	pale	2.5	0	0	0
		(yellowish)				
> 5.0 mm	♀	pale	3	1	1 C	1 C
		(yellowish)				
> 5.0 mm	♀	darker	2	0	0	0
		(pale brown)				
> 5.0 mm	♀	darker	2.5	3	3 R	3 R
		(pale brown)				
> 5.0 mm	♀	darker	3	2	0	0
		(pale brown)				

Pseudotolida syphaxi Steury and Steiner – (22; 2♂ USNM, 11♂ GWMP, 9♀ GWMP); LH, TR; mt; 19 Jun–17 Aug. (Figure 35). The holotype of this species is from Turkey Run Park (Steury and Steiner 2020). The first image of a female is provided in Figure 35.

Tribe Conaliini Ermisch

Glipodes sericans (Melsheimer) – (72); DM, GF, LH, TR; mt; 10–30 Apr, 19 Jun–21 Oct. The size range for this species has been given as 9.0–10.0 mm (0.35–0.39 in), however our smallest specimen measured 7.8 mm (0.31 in). On the East Coast this species has only been recorded in Pennsylvania, Virginia, and South Carolina. It extends south to Central America (Bright 1986).

ACKNOWLEDGMENTS

The GWMP bug lab volunteers Judy Buchino, M’Shae Dunham, Pat Findikoglu, Tom Hahn, Sarah Hill, Ann Kelly, Eileen Miller, Meredith Reed, Lynn Scholz, Susan Sprenke, and Jerry Taylor sorted tumbling flower beetles from Malaise trap samples. Erika M. Tucker (Insect Collections Manager and Assistant Research Scientist, UMMZ, Ann Arbor, MI) provided loans of the holotypes of *Mordellistena quadrinotata* and *M. wenzeli*, and macro images of Liljeblad determined male and female *M. dimidiata*. Aaron D. Smith (Director, Purdue Entomological Research Collection, West Lafayette, IN) loaned the holotype of *Mordellina testacea*. Diane Pavek (Research Coordinator, Resource Stewardship & Science - Region 1 NCA, United States National Park Service) and Floyd W. Shockley (Collections Manager, USNM) facilitated task agreements for this project. Daniel K. Young (Professor of Entomology and Director, UW Insect Research Collection [WIRC], Department of Entomology, University of Wisconsin, Madison, WI), Eugene J. Scarpulla, and one anonymous reviewer provided helpful edits and comments on the draft manuscript.

LITERATURE CITED

- Abrams, M.D., and C.A. Copenheaver. 1999. Temporal variation in species recruitment and dendroecology of an old-growth white oak forest in the Virginia Piedmont, USA. *Forest Ecology and Management* 124(2–3):275–284.
- Blatchley, W.S. 1910. *An Illustrated Descriptive Catalogue of the Coleoptera or Beetles (Exclusive of the Rhynchophora) Known to Occur in Indiana with Bibliography and Descriptions of New Species*. Bulletin Number 1, Indiana Department of Geology and Natural Resources, Indianapolis, IN. The Nature Publishing Company. 1386 pp.
- Bright, D.E. 1986. *A Catalog of the Coleoptera of America north of Mexico. Family: Mordellidae*. Agricultural Handbook Number 529-125. United States Department of Agriculture – Agricultural Research Service, Washington, DC. 22 pp.
- Brown, J.W. 2008. The invertebrate fauna of Plummrs Island, Maryland. Contribution XXX to the Natural History of Plummrs Island, Maryland. *Bulletin of the Biological Society of Washington* 15:1–226.
- Burne, J.C. 1987. A morphometric analysis of *Mordellistena* Costa in the Southwestern United States (Coleoptera: Mordellidae). *The Pan-Pacific Entomologist* 63(3):224–235.
- Ciegler, J.C. 2014. *Tenebrionoidea of South Carolina*. Biota of South Carolina. Volume 8. Clemson University, Clemson, S.C. 244 pp.
- Downie, N.M., and R.H. Arnett. 1996. *The Beetles of Northeastern North America, Volume II: Polyphaga: Series Bostrichiformia through Curculionoidea*. The Sandhill Crane Press, Gainesville, FL. 891–1721.
- Evans, A.V. (Compiler). 2008. The 2006 Potomac Gorge BioBlitz: Overview and results of a 30-hour rapid biological survey. *Banisteria* 32:3–80.
- Ford, E.J., and J.A. Jackman. 1996. New larval host plant associations of tumbling flower beetles (Coleoptera: Mordellidae) in North America. *The Coleopterists Bulletin* 50(4):361–368.
- Jackman, J.A. 1991. Notes on the nomenclature of Mordellidae of America north of Mexico. *The Coleopterists Bulletin* 45(4):323–330.
- Jackman, J.A., and W. Lu. 2001. Nomenclatural changes for selected Mordellidae (Coleoptera) in North America. *Insecta Mundi* 15(1):31–34.
- Jackman, J.A., and W. Lu. 2002. Mordellidae Latreille 1802. Pages 423–430. In: R.H. Arnett, Jr., M.C. Thomas, P.E. Skelley, and J.H. Frank (Editors). *American Beetles. Volume 2. Polyphaga: Scarabaeoidea through Curculionoidea*. CRC Press. Boca Raton, FL. 861 pp.

- Khalaf, K.T. 1971a. Five new species of Mordellidae from Louisiana and Mississippi. *The Pan-Pacific Entomologist* 47(2):140–145.
- Khalaf, K.T. 1971b. Mordellidae from Louisiana and Mississippi. *Journal of the Kansas Entomological Society* 44(4):441–445.
- Le Conte [sic], J.L. 1862. Synopsis of the Mordellidae of the United States. *Proceedings of the Academy of Natural Sciences of Philadelphia* 14:43–51.
- Liljeblad, E. 1945. *Monograph of the Family Mordellidae (Coleoptera) of North America, North of Mexico*. Miscellaneous Publications, Museum of Zoology, University of Michigan, No. 62. University of Michigan Press, Ann Arbor, MI. 229 pp.
- Lisberg A.E., and D.K. Young. 2003. An annotated checklist of Wisconsin Mordellidae (Coleoptera). *Insecta Mundi* 17(3–4):195–202.
- MCZ (Museum of Comparative Zoology). 2019. Database, Museum of Comparative Zoology, Harvard University, Cambridge, MA. Available at: <https://mcz.harvard.edu/database>. Accessed June 2019.
- Melsheimer, F.E. 1845. Descriptions of new species of Coleoptera of the United States. *Proceeding of the Academy of Natural Sciences of Philadelphia* 2:302–318.
- Rathcke, B.J. 1976. Competition and coexistence within a guild of herbivorous insects. *Ecology* 57(1):76–87.
- Ray, E. 1946. Studies on North American Mordellidae, III (Coleoptera). *The Pan-Pacific Entomologist* 22(3):90–99.
- Say, T. 1824. Descriptions of coleopterous insects collected in the late expedition to the Rocky Mountains, performed by order of Mr. Calhoun, Secretary of War, under the command of Major Long (Continued). *Journal of the Academy of Natural Sciences of Philadelphia* 3(2):238–282.
- Smith, J.B. 1882. A synopsis of the Mordellidae of the United States. *Transactions of the American Entomological Society* 10(1):73–100.
- 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.
- Steury B.W. 2019. Beetles (Coleoptera) associated with flowers of lizard's tail, *Saururus cernuus* L. (Saururaceae), in Calvert County, Maryland. *The Maryland Entomologist* 7(3):9–14.
- Steury, B.W., and W.E. Steiner, Jr. 2020. Descriptions of four new species of tumbling flower beetles (Coleoptera: Mordellidae) from eastern North America. *The Coleopterists Bulletin* 74(4):699–709.
- Steury, B.W., G.P. Fleming, and M.T. Strong. 2008. An emendation of the vascular flora of Great Falls Park, Fairfax County, Virginia. *Castanea* 73(2):123–149.