

Ground Beetles from the Quantico Marine Corps Base: 2. Thirty-six Additional Species from Recent Collections (Coleoptera: Carabidae)

Richard L. Hoffman

Virginia Museum of Natural History
Martinsville, Virginia 24112

ABSTRACT

The use of black light (UV) traps for collection of nocturnal insects at several sites on Quantico Marine Corps Base, Virginia, resulted in the accumulation of numerous phototropic carabid beetles, 36 species of which were not documented during an earlier inventory based on pitfall-trapping techniques in the same area. Collectively, the present total of 114 species compares favorably with the 117 species found during the past 60 years at Plummers Island, Maryland, a thoroughly-collected nearby site. Four species (*Elaphropus saturatus*, *Bradycellus tantillus*, *Agonum galvestonicum*, and *Lebia atriceps*) are newly documented as members of the Virginia fauna, the last-named far out of range and probably the result of an anthropogenic event. On the basis of known distributions, as many as 40 additional carabid species may be discovered at Quantico with future collecting. The problem of distinguishing *Diplocheila assimilis* from *D. impressicollis* is discussed, and the male genitalia of a specimen considered to be the latter taxon are illustrated.

Key words: Beetles, Carabidae, Virginia, Quantico, distribution, *Diplocheila*.

The carabid beetle fauna of Quantico Marine Corps Base (QMCB), in Stafford and Prince William counties, Virginia, was documented 15 years ago (Anderson et al., 1995), at which time 78 species were known from the area. Since that report was based entirely upon specimens captured in pitfall traps, species partial to arboreal or riparian biotopes were notably under-represented. This bias was reflected in the disparity of carabid totals between Quantico and nearby Plummers Island, Maryland, where such habitats had been intensely sampled for nearly a century (Erwin, 1981) with 112 species collected there during the past 60 years. Subsequent collections reported by Stork (1984) bring the new recent total for the island to 117 species.

The effectiveness of other collecting techniques in supplementing pitfalls was dramatically demonstrated in the summers of 1998 and 1999 when personnel of the Division of Natural Heritage, Virginia Department of Conservation and Recreation operated UV light traps at several streamside localities within QMCB. While such traps are especially useful in sampling the nocturnal adults of such insects as mayflies, stoneflies, and caddisflies, they also attract a wide spectrum of beetles and heteropterans (often species rarely found by traditional manual techniques). These several collections, on being

processed at the Virginia Museum of Natural History (VMNH), were found to contain no fewer than 36 species of Carabidae not included in the 1995 list, which is now extended to 114 species. There can be little doubt that additional collection efforts could yield an eventual total of 150 species for this relatively small area. Many of these "probables" are already recorded for the adjoining Prince William Forest Park.

The sequence of taxa in the following list is that of the comprehensive checklist by Bousquet & Laroche (1993). Collectors' names are omitted in the following entries: collections made in 1998 were by Anne C. Chazal and J. C. Ludwig, those in 1999 by Chazal alone. The numbers shown in parentheses reflect only voucher specimens retained at VMNH: often the actual series taken in the light traps was far greater.

Clivinini

***Clivina americana* Dejean.** Chopawamsic Creek, 0.2 km below US Hy. 1, 20 July 1999 (4). New Breckenridge Road boat landing, 19 July 1999 (4). Cedar Run at Camp Upshur, 7 June 1999 (4). R14 grassland, 7 June 1999 (1).

***Clivina punctigera* LeConte.** Cedar Run at Camp

Upshur, 7 June 1999 (1). This species is fairly widespread in Virginia east of the Blue Ridge, but has not been documented for Plummers Island.

***Clivina dentipes* Dejean.** New Breckenridge Road boat landing, 19 July 1999 (1). Cedar Run at Camp Upshur, 7 June 1999 (1). Widespread and usually abundant statewide.

Bembidiini

***Bembidion cordatum* (LeConte).** 0.8 km west of Belfair Crossroads, Range 14 grassland site, 7 June 1999 (1). This very distinctive species is widespread in Virginia at low elevations, but infrequently collected: VMNH has only 12 specimens from five counties. It is not listed for Plummers Island.

***Bembidion affine* Say.** New Breckenridge Road boat landing, 19 July 1999 (2). Cedar Run at Camp Upshur, 7 June 1999 (3). David's Crossroads, 3 August 1998 (2).

***Bembidion patrule* Dejean.** New Breckenridge Road boat landing, 19 July 1999 (2).

***Bembidion americanum* Dejean.** South Fork Quantico Creek at Rt. 618 bridge, 20 July 1999 (1). This species and the two preceding are generally distributed in Virginia.

***Bembidion rapidum* (LeConte).** Range 14 grassland site, 4 August 1998 (1). David's Crossroads, 3 August 1998 (1). This species is statewide in Virginia, but with only a few sporadic localities known for the Coastal Plain. It is curious that at QMCB, it was found in 1998 but not in the more extensive 1999 collections.

***Polyderis laevis* (Say).** New Breckenridge Road boat landing, 19 July 1999 (1). This smallest of Virginia's carabid species is widespread in eastern United States and probably statewide in Virginia at low to moderate elevations, although all VMNH specimens are from localities east of the Blue Ridge.

***Paratachys oblitus* (Casey).** Cedar Run at Camp Upshur, 7 June 1999 (1). Widespread in Virginia east of the Blue Ridge. Not recorded for Plummers Island.

***Paratachys proximus* (Say).** New Breckenridge Road boat landing, 19 July 1999 (4). Cedar Run at Camp Upshur, 7 June 1999 (1). Chopawamsic Creek, 0.2 km below US Hy. 1, 20 July 1999 (1).

***Paratachys scitulus* (LeConte).** Site by old US Hy. 1, bottomland hardwoods, 24 August 1998 (5). Widespread in Virginia west of the Fall Line; only one Coastal Plain site (Greensville County) in the VMNH material.

***Elaphropus saturatus* (Casey). New state record!** New Breckenridge Road boat landing, 19 July 1999 (1). Although documented for five adjoining states by Bousquet & Laroche (1993), this common species has apparently not been recorded previously for Virginia. It is known, however, from the Maryland side of the Potomac River at both Plummers Island (Erwin, 1981) and Bear Island (Evans, 2008).

Chlaeniini

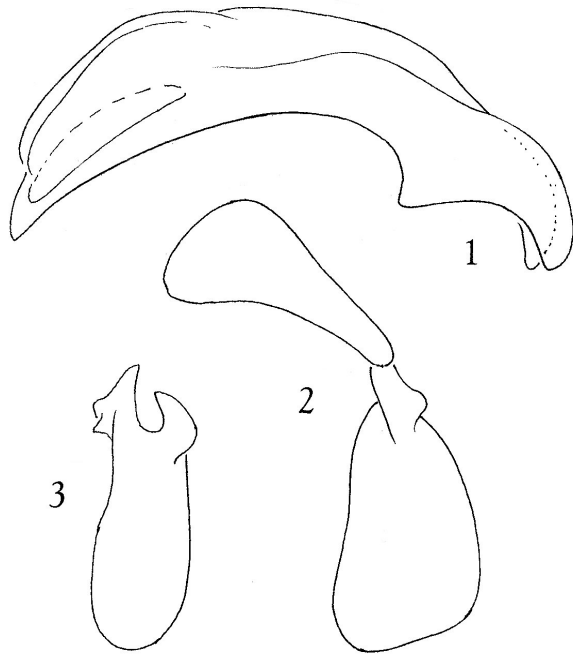
***Chlaenius sericeus sericeus* (Forster).** Chopawamsic Creek, 0.2 km downstream from US Hy. 1, 20 July 1999 (1). Although widespread in Virginia, this species has most often been captured east of the Blue Ridge. It is not, however, an austral species because several of the western records are from sites above 3000 feet. Like other members of this genus, *C. sericeus* is not usually attracted to black light traps.

***Chlaenius pennsylvanicus pennsylvanicus* Say.** Chopawamsic Creek, 0.5 km downstream from US Hy. 1, 20 July 1999 (1). Cedar Run near Camp Upshur, 7 June 1999 (1). Although this species appears to occur over most of eastern United States, all but one of the VMNH records are for Coastal Plain (or Fall Line) localities.

Licinini

***Diplocheila impressicollis* (Dejean).** Cedar Creek at Camp Upshur, 7 June 1999 (1). This identification is made with some diffidence, because the published distinctions between *D. impressicollis* and *D. assimilis* LeConte (e.g., by Lindroth, 1968: 941, 943) rely upon characters that are subjective, variable, and trivial. The lateral profile of the aedeagus (Fig. 1) resembles the drawing provided by Lindroth (op. cit., fig. 480b) in being apically acuminate, while the shape of the prothorax more closely approximates that shown (op. cit., Fig. 479c) for *D. assimilis*.

The deciding factor has been the virtual obliteration of the 7th elytral stria, a feature stressed as diagnostic for *D. impressicollis*. As Lindroth's drawings of the male genitalia do not adequately show the form of the parameres, I take this occasion to illustrate their form at least as it is manifested in the Virginia material (Figs. 2, 3). I could see no trace of the fine apical crenulation of



Figs. 1-3. 1. *Diplocheila impressicollis*, aedeagus in right lateral aspect. 2. Parameres in ventral aspect to show outline of sclerites detached from aedeagus and flattened (right paramere above, left below). 3. Left paramere in a different orientation to show basal lobes. Drawings made to same scale.

the aedeagus indicated for both species in Lindroth's cited figures.

Distributional data given by Bousquet & Larochelle (1993) imply that both of these nominal species occur widely in eastern North America, with *D. assimilis* somewhat more northern in its range. Virginia is listed among the known states of record for *D. impressicollis*, on what basis is not specified. Owing both to the close similarity of the two, and previous confusion about application of the names, perhaps their actual distribution remains to be established by re-examination of all museum material standing under the two names.

VMNH possesses material apparently conspecific with the Quantico specimen from several localities in the Coastal Plain: *Greensville Co.*: DF site at end of Rt. 666, 1 mile E of Claesville, 9 May 1993 (1), 3 June 1993 (1). *Isle of Wight Co.*: Antioch Pines Natural Area Preserve, 5 km S of Zuni, 21 May 1996 (1). *Middlesex Co.*: Dragon Run at Rt. 603 bridge, 12 May 1979 (1). *City of Suffolk*: Williamson Ditch, Great Dismal Swamp National Wildlife Refuge, 16 May 1998 (1). *City of Virginia Beach*: False Cape State Park, Wash Woods, 18-21 May 1998 (1).

Harpalini

Acupalpus indistinctus Dejean. Range L7 grassland, 5.5 km SW jct. Rts. 610 and 641, 20 July 1999 (1). Apparently eastern in Virginia, but few Coastal Plain records. Not recorded for Plummers Island.

Acupalpus rectangulus Chaudoir. Cedar Run at Camp Upshur, 7 June 1999 (2). Site by old US Hy. 1, 24 August 1998 (2).

Agonoderus lecontei (Chaudoir). Chopawamsic Creek at New Breckenridge Road, 7 July 1999 (1). Garrisonville, 8 September 1999 (1). Cedar Creek at Camp Upshur, 7 June 1999 (1). South Fork Quantico Creek, 21 September 1998 (2).

Anisodactylus dulcicollis (LaFerté-Sénéctère). Old field PF site 2, off MCB Rt. 1, 15 May 1991, J. C. Mitchell (2). These specimens were identified after publication of the first report. The range of this southern species is transcontinental, with an interior extension as far north as Nebraska, and another on the Atlantic Coast to Virginia. The Quantico site is apparently the northernmost locality known in this latter projection.

Bradycellus tantillus (Dejean). **New state record!** Cedar Run at Camp Upshur, 7 June 1999 (1). Although recorded for several adjoining states, this minute harpaline has apparently not been documented previously for Virginia.

Stenolophus ochropezus (Say). New Breckenridge Road boat landing, 24 August 1999 (1). Garrisonville, 8 September 1999 (2). David's Crossroads, 3 August 1998 (1). Chopawamsic Creek, 22 June 1998 (1). Cedar Run south of Camp Upshur, 7 June 1999 (2). This small harpaline is probably the most abundant carabid in the Virginia fauna (documented from 50 counties). The species is usually represented in black light traps operated anywhere in the state except at elevations above 3000 feet, but exhibits a marked partiality for low, moist habitats. At Plummers Island, Stork (1984) found it only in the primary floodplain.

Platynini

Agonum aeruginosum Dejean. South Fork Quantico Creek at Rt. 618, 20 July 1999 (3). Chopawamsic Creek, 20 July 1999 (1). Cedar Run at Camp Upshur, 7 June 1999 (2). This common species is essentially statewide in Virginia, ranging from sea level to about 4000 feet. It is

generally associated with wet habitats, from streamsides to small bogs and seeps, and the majority of the 96 VMNH specimens were collected in Coastal Plain counties where such conditions are prevalent. The only capture noted for Plummers Island is dated 1919.

***Agonum collare* (Say).** Site by old US Hy. 1, 24 August 1998 (1); 0.8 km W of Belfair Crossroads, 7 June 1999 (1).

***Agonum galvestonicum* (Casey). New state record!** Chopawamsic Creek, 0.2 km downstream of US Hy. 1, 20 July 1999 (1). This rarely-collected species was listed by Bousquet & Laroche (1993) for only five states, all but South Carolina in the interior of the continent. Our specimen is slightly teneral, but agrees in every respect with Lindroth's (1966) description. Aside from several features in general habitus, the lack of basal prothoracic setae is particularly diagnostic.

Perigonini

***Perigona nigriceps* (Dejean).** Range L7 grassland, 5.5 km SW jct. Rts. 610 and 641, 20 July 1999 (1). The majority of our Virginia records for this small beetle are in the Coastal Plain, but it has been found occasionally in the Piedmont as far west as Pittsylvania County. All of the 23 VMNH specimens were taken at black light traps.

Odocanthini

***Leptotrachelus dorsalis* (Fabricius).** Cedar Run at Camp Upshur, 7 June 1999 (1). Essentially statewide in Virginia, but most records are from the Piedmont and Coastal Plain. The species is not recorded for Plummers Island.

Lebiini

***Calleida viridipennis* (Say).** Chopawamsic Creek at Breckenridge Road, 7 June 1999 (2). This species is frequently found beneath loose bark, and is occasionally attracted to UV light. It is widespread in Virginia, most often captured in the Piedmont and Coastal Plain.

***Plochionus timidus* Haldeman.** Chopawamsic Creek at Breckenridge Road, 7 June 1999 (1); also 24 August 1999 (1). Bottomland hardwood forest near old US Hy. 1, 24 August 1998 (1).

***Lebia atriceps* LeConte. New state record!** Cedar Run at Camp Upshur, 7 June 1999 (1). Since the known range of this species (Madge, 1967, Fig. 141) is

centered on the Rocky Mountains between central Alberta and western Texas (thus west of the 100th meridian), the capture of a specimen in Stafford County, Virginia is certainly remarkable. The identification was made independently by Arthur V. Evans and myself on the authority of Madge's (1967) revision of *Lebia*, and is beyond question.

That this locality is part of the species' natural range seems very implausible, and the possibility of anthropogenic transport (perhaps from a western military base) must be accounted. A somewhat analogous situation has been recorded (Hoffman, 2009) for the gnaphosid spider *Nodocion rufothoracicus* Worley, the range of which is likewise west of the 100th meridian except for a single capture in Cumberland County in the Virginia Piedmont, far from any developed areas.

***Lebia atriventris* Say.** Breckenridge Road, 22 June 1998 (1). This species occurs in much of eastern United States, but was previously known in Virginia only from a few localities in Fairfax County (Madge, 1967). VMNH has a considerable number of specimens, all except one of them from sites west of the Fall Line.

***Lebia grandis* Hentz.** Chopawamsic Creek at Breckenridge Road, 7 June 1999 (1). Statewide and frequently collected in Virginia, from sea level to nearly 3000 feet at Burkes Garden (Tazewell Co.).

***Lebia ornata* Say.** Chopawamsic Creek at boat landing, 22 June 1998 (1). Statewide in Virginia, from sea level to 5200 feet at Mount Rogers.

***Lebia viridis* Say.** New Breckenridge Road boat landing, 19 July 1999 (1). Statewide in Virginia, from sea level to 3500 feet, probably occurring in every county.

***Pinacodera limbata* (Dejean).** Pond R6, 22 June 1998 (1). New Breckenridge Road boat landing, 24 August 1999 (2). Bottomland hardwood forest near old US Hy. 1, 24 August 1998 (1). Like the preceding, this beetle occurs throughout the Commonwealth.

***Dromius piceus* Dejean.** Range L7 grassland, 5 km SW jct. Rts. 610 and 641, 20 July 1999 (1). Statewide and common in Virginia.

SUMMARY

Despite their geographic proximity (only about 50 km apart) and relatively adequate level of sampling for carabids, several factors discourage comparison between the faunas of Quantico Marine Corps Base and Plummers

Island, Maryland (whence 117 species of carabids have been documented in recent years). The surface areas involved are totally disparate, with Plummers Island scarcely larger than several of the individual sites inventoried at Quantico, which embraces a much wider range of habitat types. Furthermore, collecting techniques employed at the two areas have been completely dissimilar: neither pitfall nor black light trapping were used through the long period of sampling at Plummers Island, while both constituted the total collecting effort at Quantico, where none of the traditional "hand capture" techniques was used.

Nonetheless, a few observations may be of some interest. One outstanding generalization for Plummers Island reflects the ephemeral composition of the carabid fauna. Out of a total of 220 species documented since 1905 by Erwin (1981) and Stork (1984), about 43% (94), are known only from captures made prior to 1925. Such paucity surely reflects the serendipitous discovery of transient individuals, fluvial or aeolian waifs. That Stork was able to add six species to the number tabulated by Erwin in just a few days of collecting by hand that yielded 78 different carabids implies that the end of the current resident total has not yet been reached. In addition to the occasional instability imposed by flood stages of the Potomac River, natural influences such as vegetational succession certainly affect the carabid diversity through time.

With these reservations, it may be noted that of the 114 carabid species now recorded for QMCB, no fewer than 58 have not been found at Plummers Island! This number includes such widespread and abundant forms as *Poecilus lucublandus* (152 Quantico specimens), *Pterostichus coracinus* (183), *Cyclotrachelus spoliatus* (324), and *Harpalus pensylvanicus* (397).

The island fauna had no species of *Carabus*, against four species at Quantico. Six species of *Dicaelus* were trapped at Quantico in some quantity, only three in small numbers at Plummers Island.

Possibly the almost completely forested condition of Plummers Island has excluded a considerable number of carabids, like those just specified, which are partial to open, ruderal habitats which occur widely at QMCB. That collection sites at Quantico represent an 18 kilometer east-west transect across the base from Coastal Plain habitats to upland Fall Line sites is surely a factor in the differences noted in the carabid faunas.

Virtually all of the Quantico carabids are widespread in eastern North America. A few (e.g., *Carabus serratus*, *Pterostichus moestus*, and *Harpalus penalis*) are basically boreal in distribution and other records for them are on or west of the Blue Ridge. Quantico species

reflecting a distinctly austral distribution pattern include *Loxandrus inferus*, *Anatrichis minuta*, and *Diplocheila impressicollis*.

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