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EASTERN NORTH AMERICA

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ABSTRACT

The new bryocorine genus and species *Pycnoderiella virginiana* is described from 19 specimens collected in drift-fence pitfall traps at Seashore State Park, Virginia Beach, Virginia. This striking mirid, possibly the smallest known bryocorine, is distinguished by its small size, unusually modified submacropterous hemelytra, and unique male genitalia. Speculation on the host plant and discussion of its relationship to other North American eccritotarsine Bryocorinae are provided.

Key Words: Heteroptera, Miridae, Bryocorinae, Eccritotarsini, plant bug, new genus, new species, Virginia.

In 1990, Richard Hoffman (Virginia Museum of Natural History, Martinsville) contacted me about a bryocorine mirid that Kurt Buhlmann (Division of Natural Heritage, Richmond) had collected in a pitfall trap at Seashore State Park in southeastern Virginia. Three things were immediately striking about this mirid: the size is very small (length ca 2.00 mm), the hemelytra are peculiarly modified and constricted along the

midlateral margin of the corium, and the male genitalia are quite different from those of other U.S. Bryocorinae. Subsequent examination of additional specimens and further study of male genitalia indicated that this mirid represented a new genus and species.

The Nearctic Region is relatively depauperate in bryocorine Miridae, a subfamily that is a predominant element in most tropical parts of the world, especially the Neotropics. Henry & Wheeler (1988) listed only nine genera (one of which is based on an intercepted specimen or a misidentification) and 45 species of the largest bryocorine tribe Eccritotarsini for the United States (none recorded from Canada), of which only six genera and 25 species occur east of the Mississippi River. It therefore is unusual and of great interest to discover not only a new species, but a new genus as well, from the eastern state of Virginia. This species is the smallest known North American bryocorine (the next smallest is *Monalocoris americanus* Wagner & Slater at about 2.50 mm) and may well be the smallest in the world.

In this paper, I provide a habitus illustration of the adult male and SEM micrographs of selected structures and figure male genitalia to aid in recognition of this distinctive new mirid.

*Pycnoderiella*, new genus

Type species: *Pycnoderiella virginiana*, new species.

Diagnosis: Bryocorinae: Eccritotarsini. Characterized by a combination of the small size (ca 2.00 mm for males; 1.70 mm for females); the greatly modified male hemelytra (Figs. 1, 3) that are constricted on the basal third of the corium, flared just before the base of the cuneus, and again narrowed from the base to the apex of the slender cuneus; the modified female hemelytra having the cuneus and membrane narrowed to give an overall rounded appearance; and the unique male genital capsule and parameres (see species description).

Description: oblong oval. Head: broader than long, uniformly set with short, semierect setae, basal margin straight, contiguous with anterior margin of pronotum; eyes small, combined widths of both eyes ca one-third width of head, strongly granulate, posterior edge weakly wrapping around anterior angle of pronotum; vertex deeply punctate along posterior edge, frons shiny, smooth, bordered by a half-ring pattern of punctures connecting each antennal base, nearly touching at middle the punctures on vertex. Rostrum (Fig. 4): stout, extending to bases of metacoxae;

segment I very broad, more than 2x wider than other segments; segment II most slender and longest, length subequal to combined lengths of segments III and IV; segments III and IV each nearly half the width of segment I. Antenna: segment I shortest and stoutest; segments II-IV subequal in length; III-IV most slender; all segments with semierect setae

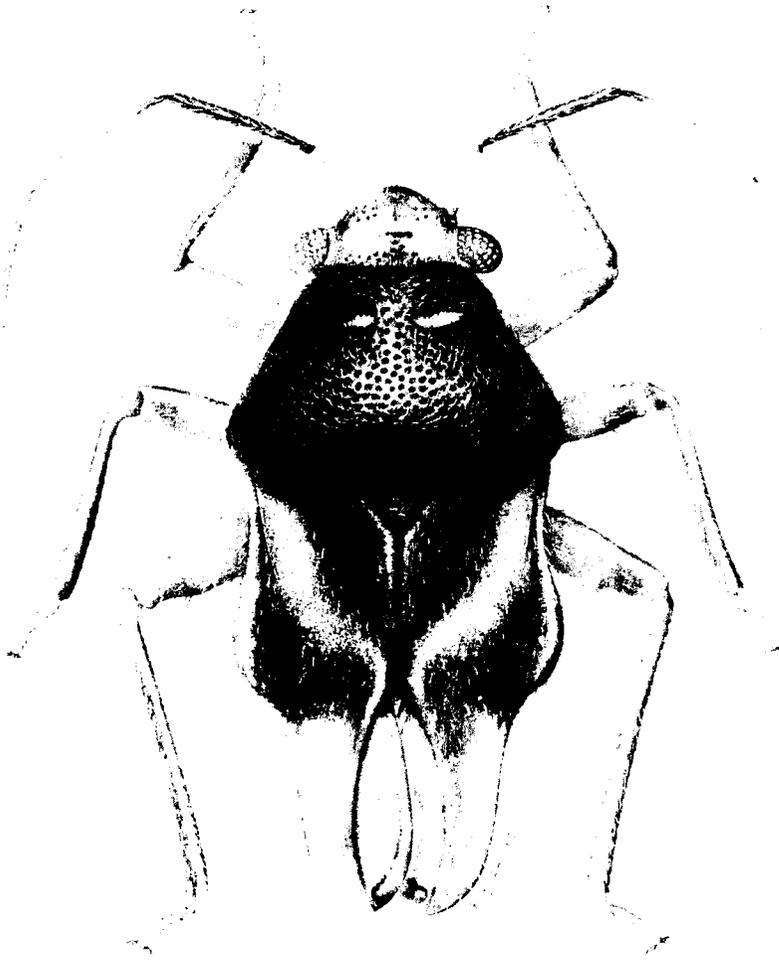
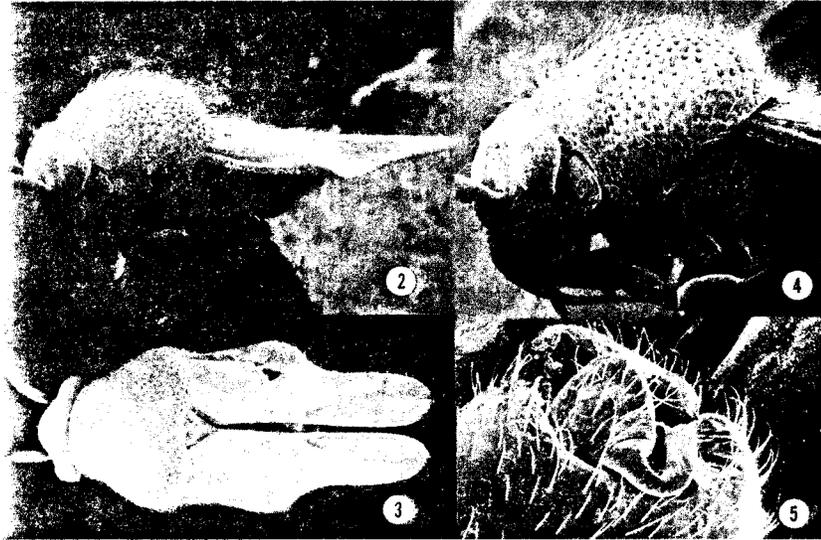


Figure 1. *Pycnoderiella virginiana*, male dorsal habitus.

subequal in length to diameters of segments. Pronotum: trapeziform, weakly constricted laterally at level even with calli, discal area strongly swollen, highest point much higher than elevation of head; evenly and deeply punctate, except for smoothly polished calli; scutellum small, equilateral, punctate, weakly raised at middle, mesoscutum and base of scutellum covered by posterior edge of pronotum. Male hemelytron (Figs. 1, 3): submacropterous, constricted laterally on basal third of corium, widely flared laterally on apical third of corium and basal area of cuneus; cuneus greatly elongated and narrowed, extending apically to apex of greatly narrowed and reduced membrane, cuneus and membrane together strongly narrowed, much narrower than hemelytral area anterior to

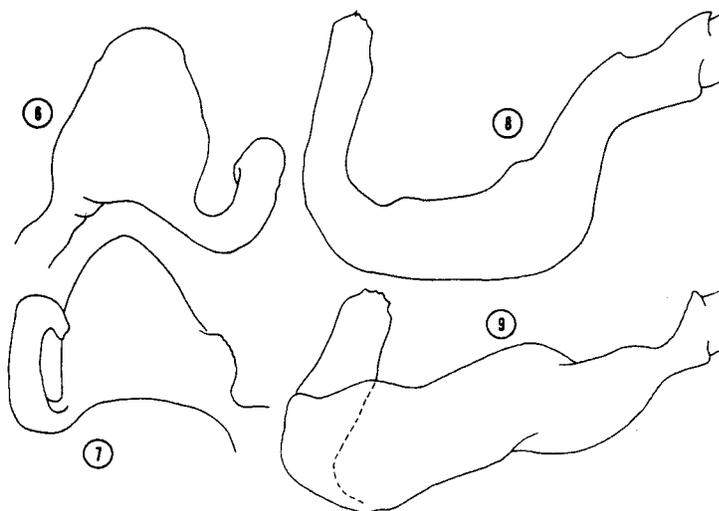


Figures 2-5. Scanning electron micrographs of *P. virginiana*, male. 2) lateral aspect (54.9X); 3) dorsal aspect (47.4X); 4) lateral aspect of head and thorax (97.1X); 5) genital capsule (283X).

cuneus, inner margin of membrane bordered by a thickened vein; emboliar area thickened, especially on flared posterior third. Female hemelytron: submacropterous, lateral corial margins nearly straight, not strongly constricted as in male, area beyond base of cuneus gradually narrowed giving the hemelytra an overall rounded appearance; membrane greatly reduced, bordered along inner margin by a thickened vein, actual membranal area very narrow. Ostiole: opening and peritreme reduced,

indistinct, not visible in lateral aspect. Legs: stout; pro- and mesofemora evenly thickened, metafemur strongly swollen on basal two-thirds and abruptly narrowed apically; tibiae lacking spines, bearing only semierect simple setae; tarsi with segment III equal to or longer than combined lengths of segments I and II; claws strongly curved, with large fleshy pulvilli. Male genitalia: capsule (Fig. 5) smooth, rounded, lacking tubercles; vesica simple, membranous; right paramere (Figs. 8-9) stout, roughly C-shaped; left paramere (Figs. 6-7) broadly oval, with a short, slender, lateral arm.

Name: This name is constructed from the existing generic name *Pycnoderes* and the diminutive suffix "ella" to imply a smaller, superficially similar taxon. The gender is feminine.



Figures 6-9. *Pycnoderiella virginiana*. 6) left paramere, caudal aspect; 7) left paramere, inner or posterior aspect; 8) right paramere, dorsal aspect; 9) right paramere, caudal aspect.

Remarks: Relationships in the Eccritotarsini are not sufficiently well known to place *Pycnoderiella* in a phylogenetic context. However, this genus will key to *Halticotoma* Townsend in Slater & Baranowski (1978) based on the presence of the forewing membrane (although abbreviated in *Pycnoderiella*), the clavus and corium well differentiated, the eyes not stalked, the labium extending posteriorly to the hind coxae, and the pronotal calli not strongly swollen. It will key to *Pycnoderes* Guérin-

Méneville or *Sixeonotus* Reuter in Blatchley (1926) based on the punctate, collarless pronotum, scutellum without a discal impression, the hind lobe of the pronotum strongly (*Pycnoderes*) or moderately (*Sixeonotus*) convex, and the hemelytral embolium broadly flattened, its width as great as that of hind femora (*Pycnoderes*) or linear and somewhat thickened (*Sixeonotus*).

*Pycnoderiella* differs externally from these genera in having swollen, apically narrowed metafemora and peculiarly modified hemelytra and from all, except *Halticotoma*, in having the rostrum extending to the metacoxae. Additionally, it differs in male genital characteristics. The genital capsule lacks a large tubercle on the left side of the aperture (above the right paramere), and the right paramere is greatly shortened; all North American eccritotarsines (except the monotypic *Sixeonotopsis* Carvalho & Schaffner) have a large, stout tubercle on the genital capsule above the left paramere, and the right paramere is always very long, curving across the aperture and extending to the base of the tubercle or beyond.

The male genitalia of *Pycnoderiella* are most like those of *Sixeonotopsis* Carvalho & Schaffner (1973) in lacking a tubercle on the genital capsule and having a shortened, more curved, right paramere. Also, the hind femora are similarly swollen and narrowed apically. *Pycnoderiella*, however, has a much longer and stouter rostrum that extends to the metacoxae (in *Sixeonotopsis* it extends only to the middle of the mesosternum), the second antennal segment is slender (swollen in *Sixeonotopsis*), and the hemelytra are much different.

*Pycnoderiella virginiana*, new species  
(Figures 1-9)

Diagnosis: This species (Fig. 1) is separated from all other North American eccritotarsines by a combination of the small size, long rostrum, modified hemelytra (Figs. 1, 3), swollen apically tapered metafemora, and male genitalia (Figs. 5-9) as described under the genus and below.

Description: Male (N=7, mean and holotype measurements in parentheses): length 1.92-2.12 mm ( $\bar{x}$ =2.04 mm; 2.00 mm); width across widest area of corium 0.88-0.90 mm ( $\bar{x}$ =0.89 mm; 0.90 mm). Head: width across eyes 0.56-0.60 mm ( $\bar{x}$ =0.57 mm; 0.56 mm). Vertex: width 0.36-0.38 mm ( $\bar{x}$ =0.37 mm; 0.38 mm). Rostrum: length 0.52-0.60 mm ( $\bar{x}$ =0.60 mm; 0.58 mm), extending to bases of metacoxae. Antenna: segment I, length 0.18-0.20 mm ( $\bar{x}$ =0.19 mm; 0.20 mm); II, 0.38-0.42

mm ( $\bar{x}$ =0.40 mm; 0.40 mm); III, 0.42-0.48 mm ( $\bar{x}$ =0.45 mm; 0.44 mm); IV, 0.36-0.46 mm ( $\bar{x}$ =0.42 mm; 0.36 mm). Pronotum: length 0.60-0.62 mm ( $\bar{x}$ =0.61 mm; 0.60 mm); basal width 0.88-0.92 mm ( $\bar{x}$ =0.91 mm; 0.90 mm).

Female (N=2): length 1.68 mm; width 0.90-0.92. Head: width 0.58-0.60 mm. Vertex: width 0.38 mm. Rostrum: length 0.58-0.60 mm, extending to bases of metacoxae. Antenna: segment I, length 0.14-0.18 mm; II, 0.32-0.34 mm; III, 0.36 mm (one missing); IV, 0.44 mm (one missing). Pronotum: length 0.60-0.62 mm; basal width 0.88 mm.

Head: reddish brown, basal area of vertex and median line on frons more brown, punctures brown to fuscous, semierect setae pale or whitish. Rostrum: stout, pale or whitish. Antenna: segment I pale or whitish; segment II fuscous, slightly paler at base; segment III brown; segment IV pale with narrow basal area brown; setae on all segments pale or whitish. Pronotum: shiny fuscous or black, evenly distributed punctures black; set with semierect pale setae; calli polished, impunctate; scutellum black. Hemelytron: mostly pale or whitish, with clavus and middle and apical region of corium across flared lateral margin brown or dark brown, basal  $\frac{1}{2}$  of corium pale; cuneus pale with inner margin pale brown; membrane pale with inner margin (thickened vein) brown. Undersurface of thorax shiny black; abdomen shiny brown, slightly darker laterally. Legs: pro- and mesofemora pale, sometimes tinged with tan or brown apically; metafemora pale with narrow apical third brown; tibiae brown, often becoming paler apically; tarsi pale; claws brown.

Male genitalia: vesica typically bryocorine with only a membranous sheath surrounding a simple gonoporal opening; left paramere (Figs. 5-7) with a stout, convex or broadly rounded basal lobe and a slender, recurved or hooked arm; right paramere (Figs. 8-9), somewhat C-shaped, tapering apically.

Name: The specific epithet comes from the noun Virginia, the state in which this mirid was collected.

Type data: Holotype: male, USA: Virginia, Virginia Beach, Seashore State Park, dune drift-fence site, 5 July 1989, K. A. Buhlmann collector, taken in drift-fence pitfall trap (deposited in the Virginia Museum of Natural History, Martinsville). Paratypes (all specimens collected by K. A. Buhlmann from same locality as holotype in drift-fence pitfall traps): 1 male, dune drift-fence site, 5 July 1989; 8 males, 2 females, dune drift-fence site, 18 August 1989; 1 male, 1 female, mesic drift-fence site, 8 September 1989; 1 male, dune drift-fence site, 13 October 1989; 1 male,

1 female, dune drift-fence site, 4 Jan. 1990; 1 male, mesic drift-fence site, 5 February 1990; 1 male, dune drift-fence site, 4 April 1990 (deposited in the American Museum of Natural History, U.S. National Museum of Natural History, and the Virginia Museum of Natural History).

Host and habitat: All 19 specimens of this species were collected in five-gallon drift-fence pitfall traps within the boundaries of the 2,770 acre Seashore State Park. A drift fence is made of 26 cm high strips of sheet metal arranged into a three-armed pinwheel configuration, with each arm of the wheel 7.5 m long. A five-gallon bucket is buried flush with the ground at the end of each arm to capture small walking organisms that are channeled along the fence. Most specimens were taken at the "dune" site, which consists of old, 17-20 meter high, tree- and shrub-covered dunes. Only three specimens were collected at the "mesic" site, which is similar to the dune site, but represents the swale or valley area between the dune ridges and has swampy black-water pools nearby supporting stands of bald cypress, *Taxodium distichum* (L.) Rich.

On 11 September 1992, I traveled to the park (with Kurt Buhlmann and David Young) in an attempt to discover the host of *P. virginiana*. That all North American bryocorines feed on herbs or ferns (not shrubs and trees) suggested that this bug likewise should have such a host. Unfortunately, no definite host association was made, but one plant, partridgeberry (*Mitchella repens* L.) [Rubiaceae], was present at both sites and appears to be a likely host candidate. The plants showed discolored foliage and drops of black excrement on the lower leaf surfaces, symptoms and signs that characterize eccritotarsine feeding. The trailing, mat-forming habit of this plant and the bug's small size would help explain why this mirid has been overlooked.

#### ACKNOWLEDGMENTS

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