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## The Occurrence of *Arhapse carolina* Herrich-Schaeffer in Virginia: An Inexplicable Distributional Pattern (Heteroptera: Largidae)

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### ABSTRACT

The largid bug *Arhapse carolina* Herrich-Schaeffer is added to the insect fauna of Virginia on the basis of specimens from two Coastal Plain localities and a third in the Ridge and Valley province. This species was previously recorded from no farther north along the Atlantic coast than North Carolina.

*Key words:* *Arhapse*, Heteroptera, Largidae, Virginia.

On the recent occasion of collecting tiger beetles with Dr. C. B. Knisley on a hillside near Oriskany, Virginia, my attention was engaged by a small colorful insect resembling a mutillid wasp scurrying across the trail. Closer inspection disclosed the singular facies of a rare largid bug, *Arhapse carolina*, so far not recorded from this state.

The geographic range of this insect has been defined only very slowly. It was originally described (Herrich-Schaeffer, 1850) from "Carolina" without further details. Six decades later, the Van Duzee catalogue (1917) added only Georgia and Arizona. Blatchley

(1926) documented a few sites in Florida, Georgia, and Alabama. Brimley (1938) listed the species at Southern Pines, North Carolina, hitherto the northeasternmost published locality, and Froeschner (1944) added five counties in Missouri with the comment "A scarce species." Halstead (1972) summarized the range known at that time: "Known from North Carolina south to Florida, thence west through Tennessee to Arizona and Baja California", a statement that generally defines the classical "Lower Austral" biogeographic pattern (the apparently disjunct occurrence of *A. carolina* in Arizona and Mexico may require verification).

Discovery of the species in eastern Virginia has therefore seemed highly probable, and in fact VMNH had material from two lowland localities, taken prior to discovery of the highly unusual site in the central western Alleghenies.

*Botetourt Co.*: hillside above Rt. 615, 2.8 mi. NE of Oriskany, 18 April 2005, R. L. Hoffman & C. B. Knisley (1♀). *City of Richmond*: Hood's Nursery, 11 September 1933, G. W. Underhill (1♀). *City of Suffolk*: ca. 6 mi. SSE of Franklin, South Quay pine barrens, area 52 pitfall site, 17 June - 1 July 2003, S. M. Roble (1♂, 1♀).

The insect collection at North Carolina State University (NCSU) provided a greatly enhanced perception of the range of *A. carolina* in that state, with specimens from Alexander, Bladen, Iredell, New Hanover, Stanly, Union, and Wake counties in addition to the original record for Southern Pines. South Carolina specimens in the collection at Clemson University are from the western counties of Oconee and Pickens, as well as the coastal Berkeley County,

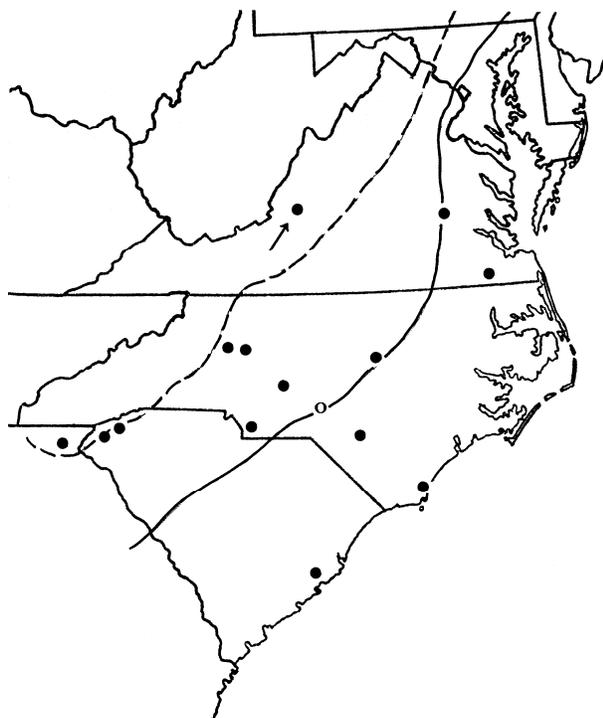


Fig. 1. Central eastern Atlantic region, showing distributional records for *Arhapse carolina* in the Carolinas and Virginia. The single published record, for Southern Pines, North Carolina, is represented by an open circle. The approximate course of the Fall Line is indicated by the solid line, the eastern edge of the Blue Ridge province by a dashed line.

implying a statewide distribution. The same is unquestionably true for Georgia, with the possible exception of two or three northern counties in the Blue Ridge. The range of the species in Virginia and North Carolina is therefore of primary interest at this time.

As indicated on the map (Fig. 1), most of the North Carolina localities are from the Piedmont region, and all are east of the Blue Ridge Escarpment. The paucity of records for the Coastal Plain is noteworthy. The collection site in Richmond, Virginia, is on the Fall Line, and that at South Quay in typical lower Coastal Plain. It is remarkable that *A. carolina* has not been found during extensive sampling in Virginia Beach during the past 15 years.

The population discovered near Oriskany seems clearly to be outside the lowland range to be expected on the basis of other known localities, and is difficult to explain. As the species is brachypterous, as well as decidedly uncommon, it is not a good candidate for the mechanism of aeolian dispersal. The possibility of reliction from a broader Hypsithermal range may be considered, and more recent migration inland via the valleys of the Roanoke River and Craig Creek cannot be discounted. Until more effective ways to collect this scarce bug are devised, knowledge about the details of its distribution may be augmented only slowly.

The subglobose head, color pattern, and quick movements of *Arhapse carolina* suggest that it may be a facultative mutillid mimic (Fig. 2).

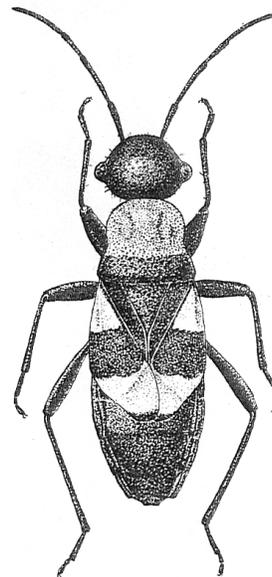


Fig. 2. *Arhapse carolina*, drawn from a Missouri specimen by Elsie H. Froeschner (from Henry & Froeschner, 1988; used with permission of Department of Entomology, Smithsonian Institution).

## ACKNOWLEDGMENTS

Anne C. Chazal (Virginia Department of Conservation and Recreation, Division of Natural Heritage) set the stage for capture of the Oriskany specimen: her discovery there of a specimen of *Cicindela limbalis* instigated a return visit to the site six years later by Dr. Knisley and me. Robert L. Blinn and Alfred G. Wheeler, Jr. kindly provided records for North Carolina and South Carolina, respectively. The Department of Entomology, Smithsonian Institution, granted permission for use of the habitus illustration of *Arhapha carolina*, which was originally published in *The American Midland Naturalist*, volume 31, 1944.

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