

is about 120 air kilometers south-southwest of the new Virginia record in Washington County. Millard Cave, where the single male specimen (Virginia Museum of Natural History) was collected on 18 September 1996, is developed in the lower Ordovician to upper Cambrian carbonate rocks of the Conococheague Formation. It is a small cave, encompassing about 60 m of accessible passage. The milliped was collected on dry driftwood in a small passage that extends northward from the main passage. This side passage contains a series of rimstone dams of precipitated calcite. They were dry during the September 1996 visit, but during December of 1996, were flooded up to two feet in depth. The cave is located on private property 2.3 km southwest of the town of Wallace in Washington County, Virginia (UTM zone 17, 4054780 N, 397405 E).

With characteristic kindness, Henrik Enghoff forwarded to us new records of *Ameractis satis* that have reached him since his 1982 revision, and permitted us to publish them. They include a new first record for the state of Georgia. The new North Carolina record deserves comment because it is obviously not from a cave, as are all previous records of *A. satis*; instead it comes from a high elevation locality on the Blue Ridge. This ridge should be checked by further collecting, and the species searched for at other high elevation epigeal sites. Ability to disperse to epigeal sites would help to explain the wide distribution of *A. satis*. All specimens mentioned below are in the Florida State Collection of Arthropods, Gainesville:

Alabama: Jackson Co., Coon Creek Cave, 9.6 km NE of Pisgah, 28 August 1965, S. Peck; Indian Rocks Cave, 5.6 km S of Skyline, 1 August 1967, S. Peck. **North Carolina:** Graham Co., 0.96 mi. SE of Beech Gap, 4700', 28 May 1958, L. Hubricht, 2 females. **Georgia:** Dade County, Morrison Cave, 3.2 mi. E of Trenton, 13 July 1965, S. Peck.

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NEW DISTRIBUTIONAL RECORD FOR *ORCONECTES VIRILIS* HAGEN, 1870, IN THE NEW RIVER, VIRGINIA – The northern crayfish, *Orconectes (Gremicambarus) virilis* Hagen, 1870, is a species common to the midwestern United States and Canada. Hobbs (1989) listed the range from Saskatchewan to Ontario, and from Montana and Utah to Arkansas, New York, and Maine. It has been introduced into California, Maryland, parts of New England, Alabama, Tennessee, Mississippi, West Virginia, Pennsylvania, parts of Mexico, and possibly into other states (Cooper et al., 1998; Hobbs, 1989; Jezerinac et al., 1995). Schwartz et al. (1963) collected *O. virilis* in pristine and polluted sections of the Patapsco River, Maryland. Physical habitat of the individual reaches ranged from 4.8 to 107 m in width, 0.3 to 1.5 m in average depth, and included gravel, mud, cobble, sand, and sludge. *Orconectes virilis* is abundant in ponds, where it is commonly cultured for bait and food and sold alive by biological supply houses (Jezerinac et al., 1995). In Virginia, it was first collected in 1928 in Indian Creek, Powell River (Lee County) (USNM 129405), and has since been reported from Broad Run, Potomac River (Loudoun County) (23 July 1977, USNM 148123). *Orconectes virilis* was first recorded in West Virginia in 1970 from the New River in Summers County (USNM 13344; Jezerinac et al., 1995). Herein we

report the first record for *O. virilis* from the New River in Virginia.

On 19 September 1997, a Form I male of *O. virilis* (VMNH 0276) was collected from the New River at the Radford Army Ammunition Plant (RAAP) in Pulaski County, Virginia, during a two year species inventory of the area. The habitat can be described as a large river, 150 to 200 m wide, with shallow riffles and deep pools and a substratum consisting of boulders and cobble intermixed with sand and gravel. The specimen was captured by hand in 20 cm deep water, 2 m from the river's edge. We believe that the presence of *O. virilis* in Virginia is the result of a fisheries bait introduction, or an upstream migration of the West Virginia population. Crayfishes are popular as bait used by anglers in the New River (Roell & Orth, 1993) and their release, either accidental or intentional, is a major source of introductions across North America (Taylor et al., 1996). There are no barriers in the New River between the West Virginia population and the Virginia site, and crayfish could move unimpeded as far upstream as Claytor Dam.

The impact of *O. virilis* on native species in the New River is still unclear. When established outside of their native ranges, introduced crayfishes can displace indigenous crayfish species and alter interrelationships of species in aquatic systems (Bouchard, 1978; Taylor et al., 1996). The spread of *Orconectes (Procericambarus) rusticus* (Girard, 1952) has significantly reduced the abundance of aquatic macrophytes in northern Wisconsin lakes (Loman & Magnuson, 1978). Bovbjerg (1970) reported that *O. virilis* excluded and outcompeted the smaller *Orconectes (Trisellescens) immunis* (Hagen, 1870) from its shelters. Other crayfish species we collected at the RAAP site by the authors *Cambarus (Cambarus) sciotensis* Rhoades, 1944 and *Orconectes (Procericambarus) spinosus* (Bundy, 1877). Further studies are necessary to document the expanding distribution of *O. virilis*, and the potential impacts that it may have on native crayfishes.

Acknowledgments

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