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Pseudoscorpions from Plummers Island, Maryland, with the Reported Use of Empty Snail Shells by Arthropods

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Abstract.—Two species of pseudoscorpions, *Tuberocreagris rufula* (Banks) and *Chthonius virginicus* Chamberlin, are reported from Plummers Island, Maryland. Several specimens of *C. virginicus* were found in empty snail shells, and although this behavior has been reported previously, it is not well documented.

Key words.—*Tuberocreagris rufula*, *Chthonius virginicus*, landsnails.

Plummers Island is a small feature located along the northern shore of the Potomac River near Cabin John, Montgomery County, Maryland, approximately 14.5 km northwest of central Washington, D.C. The site was owned by the Washington Biologists' Field Club from 1901–1959; it is now a part of the Chesapeake and Ohio (C&O) Canal National Historical Park. Between 1994 and 2005 I surveyed landsnails on the Island and the adjacent mainland. While searching for and collecting snails, many other invertebrates also were collected. This note reports two species of pseudoscorpions found during that survey work.

Pseudoscorpions were common on both the Island and the mainland in soil litter, under logs, beneath the bark of dead trees, and in empty snail shells; they were rarely found beneath rocks. Series of specimens from a variety of habitats were collected and preserved in 90% ethyl alcohol.

Two species of pseudoscorpions were represented in the Plummers Island collections: *Tuberocreagris rufula* (Banks) and *Chthonius virginicus* Chamberlin. Since *C. virginicus* is notably smaller than *T. rufula*, it usually was possible to separate the two taxa in the field. According to my field notes, *C. virginicus* outnumbered *T. rufula* by at least two to one. Although I am aware of no previous records of pseudoscorpions from Plummers Island or the immediate vicinity, both of these species have been reported from Washington, D.C. (Čurčić 1978, Muchmore 1994), and *C. virginicus* is recorded from Great Falls, just upstream of Plummers Island (Muchmore, in litt.).

Taylor et al. (1977) reported the occurrence of pseudoscorpions in empty snail shells in West Virginia. Although it does not seem surprising that small terrestrial invertebrates would seek shelter in empty snail shells, such behavior is not well documented. As part of a survey focused on land snails, the empty

shells of numerous species were collected and placed in closed plastic or glass containers. Later, when they were examined for identification and measured, other invertebrates occasionally were found in the bottom of the storage container. Most were small beetles, other insects, or spiders, usually represented by single individuals. Those probably were chance occurrences. However, pseudoscorpions occurred in empty snail shells with regularity, and several dozen individuals were examined; all were *C. virginicus*. Although this was the most abundant species on Plummers Island, these observations suggest that this species seeks out empty snail shells while *T. rufula* does not.

Individuals of *C. virginicus* were recovered from the shells of *Ventridens ligera* (Say) and *Mesodon thyroidus* (Say). No individuals were recovered from containers not including one of these two species. While most of the other snails collected were very small, *Triodopsis juxtidentis* (Pilsbry) had a shell volume generally comparable to that of *V. ligera* and *M. thyroidus*, but no pseudoscorpions were recovered from shells belonging to that species.

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