
**THE MIDWESTERN NAIAD
UNIOMERUS TETRALASMUS
IN WEST VIRGINIA**

Ralph W. Taylor
Department of Biological Sciences
Marshall University
Huntington, West Virginia 25701

into siliceous sediments of the Monterey Shale in Monterey Bay, California. The rocks were reported to be chert and to have a hardness of seven on the Mohs scale.

The presence of burrows of *P. conradi* in nephrite seems to substantiate the findings of Smith (1969) that the species uses chemical assistance for boring and Haderlie (1976, 1979, 1980) that it somehow bores into substrata much harder than its shell. Further studies are necessary to elucidate the method of substratum dissolution.

Acknowledgments

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The shells of *Penitella conradi* and selected specimens of nephrite with pholadid burrows are in the Natural History Museum of Los Angeles County, Invertebrate Paleontology Section (LACMIP) as hypotypes 2480-2482.

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Marshall University
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ABSTRACT

Uniomerus tetralasmus is typically considered to be a midwestern species. Two locality records for this species within the State of West Virginia constitute a significant increase in its known range. Additional notes on habitat, age and size of individuals, and population densities are included.

Murray and Leonard (1962), Parmalee (1967), and LaRocque (1967) all give a geographic distribution for *Uniomerus tetralasmus* that

generally centers around the Mississippi River valley. LaRocque (1967) gives the easternmost localities: one from the Scioto River in central

Ohio and a second locality from the Licking River in central Kentucky. David Stansbery (pers. comm.) has a recent single specimen from the headwaters of the Muskingum River system in eastern Ohio. I have been unable to find any previous record of this species occurring in West Virginia. This paper presents data on two localities within the state.

Locality #1

Three Ohio River specimens of *U. tetralasmus* are currently housed in the Marshall University Malacological Collections. All are from the same locality (River Mile 178.1) at the upstream end of Halfway Island near Parkersburg, West Virginia. They were found as fresh dead shells and therefore cannot be sexed. Their measurements are as follows.

Specimen #	L.	H.	W.	Age
1	40 mm	23 mm	11 mm	3
2	50 mm	27 mm	n.m.	4
3	84 mm	42 mm	26 mm	5

These specimens obviously represent a stable, though small, population. These are the only specimens found even though many collecting trips to this area have been made in recent years. One specimen was collected in 1979 and the other two in May 1982. Little can be said about the habitat where they were found as they were dead and had been washed or carried ashore. They were, however, in the vicinity of the long sand and gravel bar that extends upstream from the island.

Locality #2

This locality is a far more interesting find for a variety of reasons. First, it is represented by a population of literally hundreds of living specimens; secondly, the population is located in a rather small (less than .5 acres) farm pond; and thirdly, it is anyone's guess as to how they arrived and became established there. This small pond is located about 65 km east of the Ohio River. It is, however, close to the Kanawha River, but the lower Kanawha has been essentially devoid of mussel life for many years (Taylor, 1983). The pond is located on private property near the village of Scott Depot, Putnam County, WV.

Discussion

In July of 1984, Ms. Brenda West, a graduate student at Marshall University, brought in several large mussels to be checked for parasites as part of a Parasitology lab. The shells were brought to me for identification; they proved to be *Unio merus tetralasmus*. I sought and got information on the location of the pond and returned to the site in September. I and a student, Mr. Chris Estep, surveyed the pond using SCUBA gear to ascertain the size of the population, the pond depth, type of substrate, and the habitat preference of any of the mussels in the pond. What we found is as follows:

1. *U. tetralasmus* is the only naiad currently living in the pond.
2. It is a spring-fed pond and is quite cold even though local daily temperatures at this time of year average around 30°C.
3. The substrate consists in places of fine clean sand and pebble-size gravel. In other places there is a 30-40 cm thick layer of silt.
4. The mussels seem to have no preference as to substrate. In many instances they are buried in the sand and gravel under the silt.
5. Individuals show no preference for depth as they appear to be equally distributed throughout the pond from the deepest part (approximately 3 m) to water less than 10 cm deep.
6. They are present in large numbers.
7. They are reproducing as several size and age classes are represented in the series collected.

The Putnam County pond specimens were collected 11 September 1984. They were returned to the laboratory where the soft tissues were removed and preserved for future study. None of the 32 live-taken specimens dissected showed any evidence of being gravid with glochidia even though this is very close to the dates when Utterback (1916) reported finding gravid *U. tetralasmus* in Missouri.

These specimens are quite large. Ten specimens were arbitrarily selected to show the size

and age class range. These data are included in the following chart.

Specimen #	L.	H.	W.	Approx. Age.
1	149 mm	71 mm	48 mm	14
2	145 mm	72 mm	47 mm	15
3	148 mm	73 mm	49 mm	12
4	136 mm	66 mm	43 mm	10
5	127 mm	61 mm	39 mm	10
6	120 mm	58 mm	38 mm	9
7	111 mm	56 mm	36 mm	10
8	105 mm	53 mm	33 mm	8
9	101 mm	51 mm	32 mm	9
10	96 mm	49 mm	31 mm	8

Most of the specimens are in the 140-150 mm size class. Utterback's (1916) largest figured specimen was 80 mm long and Murray and Leonard (1962) figured a 4½ inch (= approx. 115 mm) specimen.

The current owner of the pond property, Mr. E. D. Hardman, has owned the farm for 30 years and the pond was present when he purchased the land. The age of the pond is unknown. It is man-made with an earth dam.

The occurrence of *U. tetralasmus* in West Virginia is quite a surprise for several reasons. It is well outside the previously known range. The large size of the Putnam County pond specimens and also the large number of individuals appear to indicate that living conditions are not marginal. They can live and do remarkably well under these environmental conditions.

One must now ask, how did it get there? The only reference to a host fish species was given by Sterns and Felder (1978). They used anecdotal evidence and concluded that the Golden Shiner was the host fish for *U. tetralasmus* in

Louisiana. The Golden Shiner's range does not come to within a thousand miles of the State of West Virginia. Glochidia could have been brought in attached to bait minnows which had originally been seined in some southern or mid-western stream. Several naiadologists suspect that larval clams may be distributed as a result of being attached, via byssel threads, to aquatic birds' feet and then releasing in a different pond at a later time.

It would appear that in order to address the many unanswered questions about this population we must first determine what fish is serving as a larval host. Are there other populations in similar ponds in the immediate area? When is, and what is the length of, the breeding season for this species in this area? It is hoped that some light will be shed on these questions as I intend to monitor this population for years to come.

Voucher specimens have been placed with the Ohio State University Museum of Zoology and Marshall University Malacological Collections.

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NEWS

OF SEA AND SHORE, a popular magazine on shelling, has ceased publication after thirteen fruitful years of serving amateur conchologists. Tom Rice, the editor, will continue his Sheller's Directory of Clubs, Books, Periodicals and Dealers and his Catalog of Dealers' Prices for Marine Shells. He will also expand his activities at the "Of Sea and Shore Museum" in Port Gamble, Washington. Tom will join the editorial staff of the new popular magazine, "Shells and

Sea Life" which is headed by Steve Long and Sally Bennett (505 East Pasadena, Phoenix, AZ 85012). If you were a subscriber to *Of Sea and Shore*, and are owed numbers, you will be sent *Shells and Sea Life* as substitutes. Tom's last number was vol. 13, no. 2. We all thank him for giving the general public such an interesting magazine on shelling and wish *Shells and Sea Life* a prosperous and long future.

-R. Tucker Abbott