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VILLOSA LIENOSA (CONRAD, 1834) IN OHIO

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Villosa lienosa (Conrad, 1834), a naiad species common in Gulf coastal states, has been collected in several midwestern states but has never been reported as occurring in Ohio. Recently, we and other collectors at The Ohio State University Museum of Zoology (OSUM) have found populations of this species in five separated streams in the southern third of Ohio (Fig. 1). These streams are East Fork of the Little Miami River, Whiteoak Creek, Scioto Brush Creek, Little Salt Creek and one tributary of Symmes Creek. These five streams are all relatively small (2-5m wide) and of low gradient (less than 12 ft./mi.) (Krolczyk, 1960) with sand and/or mud bottoms where the *V. lienosa* specimens were collected. These habitat observations are consistent with previously recorded habitat descriptions for this naiad (Clench and Turner, 1956; Parmalee, 1967).

Literature records of northern populations of *V. lienosa* exist for Illinois (Baker, 1922), Indiana (Blatchley and Daniels, 1903; Goodrich and van der Schalie, 1944) and Kentucky (Wilson and Clark, 1914; Ortmann, 1926; Stansbery, 1965) but not for Pennsylvania. The OSUM has one lot from the Hughes River in West Virginia, which appears to be a new record for that state. All of these sites are plotted on Fig. 1.

We have compared the known distribution records of *V. lienosa* with several stream-related factors in an attempt to explain why this naiad does not occur throughout the upper Ohio River system. Blatchley and Daniels (1903) mention that *V. lienosa* was common in the canal and White River at Indianapolis. Canals fit our concept of the habitat of *V. lienosa* and, approximately 125 years ago, canals connected the major midwestern drainage systems, affording potential access to more northern streams in several states. Our comparison

of the canal systems and the distribution records for *V. lienosa* failed to reveal any clear relationships.

A similar comparison was made of the distribution records for *V. lienosa* with bedrock composition. Midwestern bedrocks vary widely in their pH characteristics and are deposits of most Paleozoic periods. We found that the range of this naiad species extends over all bedrock types present in this area.

Geologic evidence suggests that, prior to the Pleistocene, midwestern stream drainage patterns were considerably different from those of the present. We compared the distribution of *V. lienosa* with the Teays drainage, the most widely accepted concept of a pre-glacial drainage pattern. The correlation we found was best for parts of streams south of the glacial boundary—areas where drainage patterns have changed very little.

Our final attempt was to correlate the distribution pattern of *V. lienosa* with the glacial patterns of the midwest. Three of the sites in Ohio are located south of any glacial boundary; the other two sites are located south of the Wisconsin glacial boundary, but within the area once covered by the Illinoian glacier. In Indiana, four sites are south of the Wisconsin glacial boundary (with one site in unglaciated terrain), while the other four are north of the Wisconsin boundary. In the state of Illinois the only records of which we are aware are those from the Big Vermilion River (Baker, 1922), a small stream located in a Wisconsin-glaciated area.

Goodrich and van der Schalie (1944) state that southern Indiana marks the northern limit of the range of *V. lienosa*. We have extended the known range of this species east into Ohio and West Virginia, and slightly to the north in Illinois, but we have not changed their basic observation that this area constitutes the northern limit of the range. We

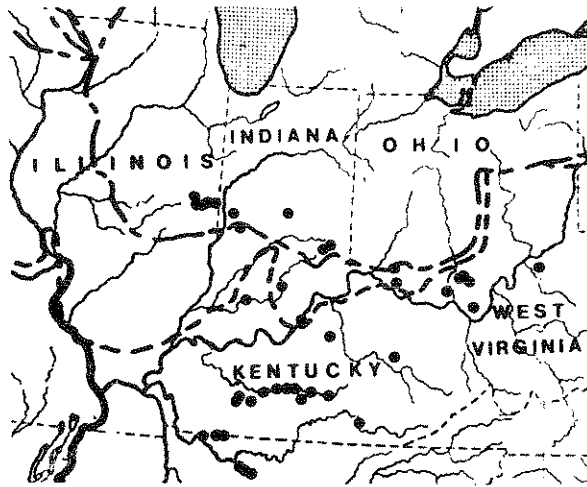


Figure 1. Localities at the northern edge of the range of *Villosa lienosa* (Conrad, 1834) taken from published accounts (see text) and from specimens at the Ohio State University Museum of Zoology. The long- and short-dashed line indicates the Wisconsin glacial boundary; the short-dashed line indicates the Illinoian glacial boundary.

have not examined specimens housed in other museums, nor have we collected widely in small streams outside of Ohio. Additional records from either of these sources would provide a better concept of the complete distribution pattern. Known records indicate that the distribution pattern of *V. lienosa* has at least some relationship with the Wisconsin glacial boundary: every known collection has been taken south of, or only slightly north of, this glacial feature. We are unaware of any characteristics of Wisconsin-glaciated areas which would preclude the introduction of *V. lienosa* by some fish host, or which would prevent the survival of *V. lienosa* specimens once they were introduced.

Further study and collection of additional specimens will be necessary before we can determine more precisely what factor or factors form this apparent barrier.

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