

OBSERVATIONS ON THE HABITAT DISTRIBUTION OF THE
NAIAD CUMBERLANDIA MONODONTA (SAY, 1829)

DAVID H. STANSBERY

The Ohio State Museum and The Ohio State University
Columbus, Ohio

(ABSTRACT)

Efforts to build a naiad research collection at the Ohio State Museum have led to the employment of almost every reasonable method of obtaining series of all available species from nature. Satisfactory series of the common or more widespread species have been readily obtained in our stream survey work. Species having restricted ranges or specialized habits, however, have been found only through persistent searching. Some of these rarer species have yet to be found and some may well be extinct.

Early in our collecting a search was made for *Cumberlandia monodonta* (Say, 1829), the Spectacle-Case Mussel of the clammers. It was not to be found in the Ohio River proper nor in the lower reaches of several of its larger tributaries where it had been commonly taken half a century before. The first evidence that it was still among the living species was the collection of several fresh, dead shells from the Clinch River in western Virginia. All accessible naiad habitat in the vicinity of these finds were searched thoroughly for living specimens but without success.

Several years later *Cumberlandia* was found in numbers at a site on the Gasconade River in the Ozark Plateau of Missouri. Here most of the specimens were found in a verticle position in the rather firm mud around the roots of a bed of eel grass, *Vallisneria americana*. While there was a rushing current only a matter of a few inches to a foot away all specimens were found in the relatively quiet shallow water of the bed of eel grass. The only other specimens of *Cumberlandia* at this site were found imbedded in the firm mud between large boulders adjacent to the rapid current of a chute. In both habitats the species was imbedded up to 80% of its length in firm mud, in quiet water, very near rapid water. Although many hundreds of living mussels were observed in the firm sandy-gravel substrates of the nearby runs and riffles, no *Cumberlandia* were found outside the two microhabitats mentioned.

Collecting in 1965 in the Stones River of the Cumberland system revealed *Cumberlandia* in the firm mud beneath boulders in fast water. Here again all specimens found were immediately adjacent to the main current and imbedded in very fine sediments. This same summer the upper Clinch River was systematically collected from its several origins to the head of Norris Reservoir. Dead shells of *Cumberlandia* were rare or absent until the Kyles Ford station was reached. Although many living naiads were found, no living *Cumberlandia* were seen until its particular habitats were collected. The species was found living in numbers in the mud between boulders adjacent to a rapids and in the mud which had accumulated in the slack water beneath individual boulders midstream in the riffles.

The size of some aggregation of *Cumberlandia* is impressive. Although the area of the microhabitat occupied may be surprisingly small, the number of individuals may reach a density of well over a dozen per square foot. A mud-filled crack between boulders may be literally stuffed with this species and a

single double handful from a selected spot in the Gasconade River habitat yielded 18 individuals.

Over the past decade we have collected living specimens of *Cumberlandia monodonta* from the Gasconade, Clinch, Stones, Green, and Tennessee rivers. With the exception of the Tennessee River specimens, which were taken with a crow-foot dredge, all living specimens were found:

- a) imbedded in fine sediments, usually a firm mud.
- b) in relatively quiet water in beds of vegetation or down in protective cracks between boulders.
- c) very close to (but never quite in) rapids or turbulent water of some description.

The above facts, considered in the light of the fragile shell of this animal, makes the habitat(s) described very logical. Here apparently is a naiad which requires highly oxygenated (or low carbon dioxide) water and yet cannot survive when exposed directly to the vicissitudes of a rocky torrent. While species such as *Lastena lata* (Raf.) and *Leptodea leptodon* (Raf.) have "solved" this problem by burrowing in the riffle substrates, *C. monodonta* occupies a marginal habitat between standing and rapid water. Thus do they benefit from the advantageous characteristics of two diverse environments.