

Mussels of the Green River, Kentucky

BILLY G. ISOM

Environmental Biology Branch, Division of Environmental Planning,
Tennessee Valley Authority, Muscle Shoals, Alabama 35660

ABSTRACT

Seventy-seven species of unionid mussels and the Asiatic clam (*Corbicula*) are listed from the Green River, Kentucky, and an additional species from a nearby pond. These data further confirm the conclusions of Ortmann (1926) and Clench and van der Schalie (1944) that the mussels in the Green River belong to either the Ohioan or the interior basin fauna or are of unknown origin. No mussels of Cumberlandian origin have ever been found in the Green River.

The Green River Basin presently has one of the most diverse mussel faunas of any stream in the country. Historically, Ortmann (1926) synthesized known information on mussel fauna of the Green River, Kentucky, drainage. A compilation of historical and recent collections of mussels include those by Ortmann (1926), Clench and van der Schalie (1944), Stansbery (1965), Williams (1969), collections by Isom in 1970 and 1971, and collections in 1961 and 1965 by personnel of the Academy of Natural Sciences of Philadelphia in the vicinity of the Paradise Steam Plant between Miles 82 and 108 on the Green River under contract with the Tennessee Valley Authority (Table 1). Subspecific designations in Table 1 were retained for the purpose of comparing current data with historical records; however, in the opinion of the author, subspecific designations noted are questionable.

The records of Isom, Stansbery, and Williams probably represent the presently known fauna of the Green River Basin. These rather extensive collections include 77 species and confirm that the mussels in the Green River belong to either the Ohioan or the interior basin fauna or are of unknown origin and also confirm the absence of mussels of Cumberlandian origin as noted by Ortmann (1926) and Clench and van der Schalie (1944).

Recently there has been some concern about the mussel fauna of the Green River

because of the development of oil fields. Imlay (1971) indicated that potassium contained in "petroleum brine waste" had ruined the commercial mussel harvest from Green River. Based on observations made by Isom in 1970 and 1971 and those by Williams (1969), it is apparent that there is no correlation between mussel populations in the Green River and the presence of potassium from petroleum brine waste. Williams (1969) stated that, "Good beds of living mussels were found just below all dams on the river with the exception of Dam 2 at Calhoun, Kentucky." He noted that the present Dam 2 was relatively new and was relocated downstream of an original structure that accounted, at least in part, for lack of mussels. In addition, some commercial mussels were harvested on the Green River in 1965, about 5 years after the problem of oil well brine waste was reportedly alleviated.

Data on water quality indicate that potassium levels do not exceed 3 mg/l between Miles 81.8 and 108.0 on the Green River; this is less than the lowest lethal range of 4 to 7 mg/l reported by Imlay (1971) for long-term exposures. However, 3 mg/l could well be exceeded elsewhere in the drainage.

Williams (1969) included *Lampsilis cariosa* in his list of mussels from the Green River. This probably is an error, because the distribution of *L. cariosa* is confined to streams of the Atlantic coast

TABLE 1.—MUSSEL FAUNA OF THE GREEN RIVER IN KENTUCKY, AS SHOWN BY HISTORICAL AND RECENT COLLECTIONS. O = ORTMANN (1926), S = STANSBERRY (1965), C = CLENCH AND VAN DER SCHALIE (1944), W = WILLIAMS (1969), AND I = ISOM (COLLECTIONS OF 1970, 1971; AND IN 1961 BY BATES AND 1965 BY FULLER OF THE PHILADELPHIA ACADEMY OF NATURAL SCIENCES)

Species	Collector
<i>Cumberlandia monodonta</i> (Say)	- S - - -
<i>Fusconaia undata</i> Ort.	- - C W I
<i>Fusconaia ebenus</i> (Lea)	O - - W -
<i>Fusconaia flava</i> (Raf.)	O S C W -
<i>Fusconaia flava trigona</i> (Lea)	O - - - -
<i>Fusconaia subrotunda</i> (Lea)	O S C W I
<i>Fusconaia subrotunda kirtlandiana</i> (Lea)	O - - - -
<i>Megaloniaias gigantea</i> (Bar.)	O S C W I
<i>Amblema costata</i> Raf.	O S C W I
<i>Amblema costata peruviana</i> (Lam.)	O - C - -
<i>Quadrula quadrula</i> (Raf.)	O S C W -
<i>Quadrula pustulosa</i> (Lea)	O S C W I
<i>Quadrula nodulata</i> (Raf.)	- - C W -
<i>Quadrula metanevra</i> (Raf.)	O S - W I
<i>Quadrula metanevra wardi</i> (Lea)	O - - - -
<i>Quadrula cylindrica</i> (Say)	O S C W -
<i>Tritogonia verrucosa</i> (Raf.)	O S C W I
<i>Cyclonaias tuberculata</i> (Raf.)	O S C W I
<i>Cyclonaias tuberculata granifera</i> (Lea)	O - - - -
<i>Plethobasus cooperianus</i> (Lea)	O - C - -
<i>Plethobasus cyphyus</i> (Raf.)	O S - W -
<i>Pleurobema clava</i> (Lam.)	O S C W -
<i>Pleurobema cordatum cordatum</i> (Raf.)	O S C W I
<i>Pleurobema cordatum plenum</i> (Lea)	O - - W -
<i>Pleurobema cordatum coccineum</i> (Con.)	O S C W -
<i>Pleurobema cordatum pyramidatum</i> (Lea)	O S C - -
<i>Pleurobema cordatum catillus</i> (Con.)	O S C - -
<i>Elliptio crassidens</i> (Lam.)	O S C W I
<i>Elliptio dilatatus</i> (Raf.)	O S C W -
<i>Lastena lata</i> (Raf.)	O S - - -
<i>Arcidens confragosus</i> (Say)	O - C W -
<i>Lasmigona costata</i> (Raf.)	O S C W -
<i>Lasmigona complanata</i> (Barnes)	- - C W I
<i>Anodonta imbecillis</i> (Say)	O - C - I
<i>Anodonta grandis</i> (Say)	O - C - -
<i>Anodonta suborbiculata</i> (Say)	O - - - -
<i>Anodontoides ferussacianus</i> (Lea)	O - - W -
<i>Alasmidonta calceolus</i> (Lea)	O S C - -
<i>Alasmidonta marginata</i> (Say)	O S C - -
<i>Strophitus undulatus</i> (Say)	O S C - -
<i>Simpsoniconcha ambigua</i> (Say)	- S - - -
<i>Ptychobranhus fasciolaris</i> (Raf.)	O S C W I
<i>Obliquaria reflexa</i> (Raf.)	O - C W I
<i>Cyprogenia irrorata</i> (Lea)	O - C - -
<i>Obovaria olivaria</i> (Raf.)	- - - W -

TABLE 1. Continued

Species	Collector
<i>Obovaria subrotunda</i> (Raf.)	O S C - I
<i>Obovaria subrotunda lens</i> (Lea)	O - - - -
<i>Obovaria retusa</i> (Lam.)	O S - W -
<i>Actinonaias carinata</i> (Bar.)	O S C W -
<i>Truncilla truncata</i> (Raf.)	O S C W -
<i>Truncilla donaciformis</i> (Lea)	O - C W I
<i>Plagiola lineolata</i> (Raf.)	O - C W I
<i>Leptodea fragilis</i> (Raf.)	O S C - -
<i>Leptodea leptodon</i> (Raf.)	- S - - -
<i>Leptodea laevisissima</i> (Lea)	- S - W I
<i>Proptera alata</i> (Say)	O S C W I
<i>Proptera capax</i> (Green)	- - - W -
<i>Carunculina parva</i> (Bar.)	O S - W -
<i>Carunculina glans</i> (Lea)	O - C - -
<i>Ligumia recta</i> (Lam.)	O S C W I
<i>Ligumia subrostrata</i> (Say)	O - - - -
<i>Villosa fabalis</i> (Lea)	O S - - -
<i>Villosa nebulosa</i> (Con.)	O - - - I
<i>Villosa ortmanni</i> (Walker)	O S C - I
<i>Villosa lienosa</i> (Con.)	O S C - I
<i>Lampsilis anodontoides</i> (Lea)	O S C W I
<i>Lampsilis anodontoides fallaciosa</i> (Smith)	O - C W -
<i>Lampsilis radiata siliquoidea</i> (Bar.)	O S C W I
<i>Lampsilis luteola</i> (Lam.)	- - - W -
<i>Lampsilis ovata ovata</i> (Say)	O S C W -
<i>Lampsilis ovata ventricosa</i> (Bar.)	O S C - I
<i>Lampsilis fasciola</i> (Raf.)	O S C - -
<i>Dysnomia triquetra</i> (Raf.)	O S C W -
<i>Dysnomia sulcata</i> (Lea)	- - C - -
<i>Dysnomia torulosa</i> (Raf.)	O S - - -
<i>Dysnomia torulosa gubernaculum</i> (Reeve)	O - - - -
<i>Dysnomia flexuosa</i> (Raf.)	O - - - -
<i>Corbicula manilensis</i> Philippi	- - - W I

drainage (Simpson 1914). Williams (1969) listed *Lampsilis fallaciosa* and *Actinonaias ligamentina*, but these are listed in this paper as *L. anodontoides fallaciosa* and *A. carinata*, respectively.

Mussels collected by Isom are deposited at the University of Michigan at Ann Arbor, those collected by Bates and Fuller for the Academy of Natural Sciences of Philadelphia are deposited at the Academy, and those collected by Williams are deposited at The Ohio State Museum at Columbus.

Henry van der Schalie, Curator, Mollusk Division, University of Michigan, confirmed

identification of some mussels collected from the Green River by the author.

LITERATURE CITED

- CLENCH, W. J., AND H. VAN DER SCHALIE. 1944. Notes on naiades from the Green, Salt, and Tradewater Rivers in Kentucky. *Mich. Acad. Sci., Arts, Lett.*, pp. 223-228.
- IMLAY, M. 1971. Bioassay tests with naiads. Proceedings of a symposium on rare and endangered mollusks (naiads) of the U.S. U.S. Dept. Interior, pp. 38-41.
- ORTMANN, A. E. 1926. V. The naiades of the Green River drainage in Kentucky. *Ann. Carnegie Mus.* 17(1):167, 188.
- SIMPSON, C. T. 1914. A descriptive catalogue of the naiades or pearly fresh-water mussels. Published by Bryant Walker, Detroit, Mich., 1,540 pp.
- STANSBERRY, D. H. 1965. The naiad fauna of the Green River at Munfordville, Kentucky. *Amer. Malacol. U. Ann. Rept.* 1965:13-14.
- WILLIAMS, J. C. 1969. Mussel fishery investigation, Tennessee, Ohio, and Green Rivers, final report, Murray State University, Biological Station, State of Ky. Proj. No. 4-19-R, 107 pp.



Isom, Billy G. 1974. "Mussels of the Green River, Kentucky." *Transactions of the Kentucky Academy of Science* 35(1-2), 55-57.

View This Item Online: <https://www.biodiversitylibrary.org/item/107531>

Permalink: <https://www.biodiversitylibrary.org/partpdf/336982>

Holding Institution

Smithsonian Libraries and Archives

Sponsored by

Biodiversity Heritage Library

Copyright & Reuse

Copyright Status: Permission_to_digitize_granted_by_rights_holder

Rights Holder: Kentucky Academy of Science

Rights: <https://www.biodiversitylibrary.org/permissions/>

This document was created from content at the **Biodiversity Heritage Library**, the world's largest open access digital library for biodiversity literature and archives. Visit BHL at <https://www.biodiversitylibrary.org>.