RICHARD J. NEVES Toxolasma cylindrellus

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Final No. 4

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TOXOLASMA CYLINDRELLUS (LEA, 1868)

by

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TOXOLASMA CYLINDRELLUS (LEA, 1868)

Synonymy

Unio cylindrellus Lea, 1868. Original Description: Proc. Acad. Nat. Sci. Phila. 20:144. Type Locality: "Duck Creek, Tenn.; Swamp Creek, Murray Co., Ga., Major Downie; and North Alabama, Prof. Tuomey." Further Description: J. Acad. Nat. Sci. Phila. 8, 1868:308, pl. 48, fig. 121; Obsv. Genus Unio 12, 1869:68, pl. 48, fig. 121. Holotype: "Figured holotype USNM 85300" is from North Alabama. (Johnson 1974:42).

Margaron (Unio) cylindrellus Lea, 1868. Lea, 1870, Syn. Family Unionidae:49.

Lampsilis cylindrella Lea, 1868. Simpson, 1900, Syn. Naiades: 565; Simpson, 1914, Descript. Cat. Naiades:155.

Toxolasma lividum Rafinesque, 1831 (in part). Ortmann, 1918, Nayades Upper Tenn. System, Proc. Amer. Philos. Soc. 57(6): 573.

Carunculina cylindrella (Lea, 1868). Ortmann, 1924, Naiad-fauna Duck River, Amer. Midl. Nat. 9(1):29.

Carunculina moesta cylindrella (Lea, 1868). Ortmann, 1925, Naiad-fauna Tenn. River below Walden Gorge, Amer. Midl. Nat. 9(8):353.

Carunculina glans cylindrella (Lea, 1868). Frierson, 1927, Class. Anot. List North Amer. Naiades:88.

Carunculina glans (Lea, 1831) (in part). Haas, 1969, Das Tierreich, 88:429.

Toxolasma cylindrella (Lea, 1868). Stansbery, 1971, Rare and endangered mollusks in eastern United States:14.

Taxonomic Status

The general taxonomic position of Toxolasma cylindrellus is clearly with those forms described as Toxolasma lividus Rafinesque, 1831 (October) and Unio glans Lea, 1831 ["latter end" according to Scudder (1885:3)]. Unio moestus Lea, 1841, is a synonym of T. lividus Raf. There exists some doubt as to the precise position of cylindrellus because of the paucity of material in collections upon which such a decision should be based. The number of lots with specific

locale data are very few, and most lots consist of only one or two specimens each. I presently consider this form a good species since it has distinct morphological characteristics which separate it from both T. l. lividus and from T. l. glans and since it occurs with T. l. lividus and has been collected in some numbers with it without evidence of intergrades.

The use of the generic name Toxolasma rests upon the identification of T. lividum Raf., 1831, as noted by Ortmann and Walker (1922:55). They believed T. lividum to be a nomen dubium since the description of this species could be interpreted as Villosa vanuxemi (Lea, 1838) which they believed to be found in this same region. A recent study (Stansbery 1976, in press) of the naiad fauna of the type locality of T. lividum, the Rockcastle River of the upper Cumberland system in eastern Kentucky, reveals a complete absence of V. vanuxemi. Several studies of the naiad fauna of the Cumberland River at Cumberland Falls (Wilson and Clark, 1914:50) (Neel and Allen, 1964:446) (Stansbery 1969:16) indicate that V. vanuxemi may, in fact, be absent from the entire region--perhaps as far downstream as the Big South Fork.

The only species found at the type locality, the Rockcastle River, that fits the description of T. lividum is the one later described by Lea (1841) as Unio moestus. Shortly after the description of T. lividum, Lea (1931) described Unio glans from the Ohio River. Both lividum Rafinesque, 1831, and glans Lea, 1831, appear to be subspecies of the same species hence:

Toxolasma lividus lividus Rafinesque, 1831.

Toxolasma lividus glans (Lea, 1831).

Toxolasma l. lividus is the subspecies of the Cumberland Plateau and the southern Appalchians while T. l. glans is found in the Interior Low Plateau.

Diagnostic Characteristics

The name "cylindrellus" is not an especially good name for this species in spite of Simpson's (1914:156) observation that the shell is "almost cylindrical." In his "Observations" even Lea (1969: 68) notes that the shell is "somewhat cylindrical." This contrast emphasizes the need for collections to contain ample numbers of lots from throughout the range of a form and for those lots or population samples to contain enough individuals to represent the variation present.

The Ohio State University Museum of Zoology possesses one such lot of this species. I have seen no others. Thanks to an industrious (or hungry) muskrat, a midden on Larkin Fork of Paint Rock

River yielded 26 shells of T. cylindrellus and 45 shells of T. l. lividus. An examination of this lot reveals this species to be as described by Lea (1869:68) and differing from related species by having an elongate elliptical shell, yellow periostracum with a nacre that may vary from white through light yellow to coppery tints of blue to purples. The nacre outside the pallial line remains light in color. It is faster growing and becomes distinctly larger than T. l. lividus in the same habitat. Sexual dimorphism is evident in the shell. The largest specimen of 26 measured is 44 mm long, 25 mm high, and 16 mm wide. It is the largest of a uniform series and is a male with a white macre. The largest of 45 specimens of T. l. lividus from the same collection is 37 mm long, 23 mm high, and 16 mm wide. It is a female with a deep purple nacre.

Former Distribution

A summary of distribution records from the literature (Lea, 1868:144) (Marsh, 1885:5) (Ortmann, 1924:13, 1925:353) indicates that T. cylindrellus is a small stream species restricted to the Tennessee River system. The only exception is a single record from "Swamp Creek, Murray Co., Georgia" (Lea, 1868:144), part of the Mobile system. It is not found in the Tennessee River proper (Ortmann 1925:353) (van der Schalie 1939:454), and there are no records for the upper Tennessee (Ortmann 1918:573) tributaries. The Duck River population(s) marks the known downstream extent of this Cumberlandian form which, incidentally, has yet to be found in the Cumberland River system.

Present Distribution

The only recent records (three only) of this rare species are from the Duck and Paint Rock River systems where it still survives as highly restricted headwater populations:

Mississippi River
Ohio River
Tennessee River
Duck River 1965 (OSUM 33121)
Paint Rock River
Larkin Fork 1966 (OSUM 19087, 22033)

Possible Reasons For Current Status

The data concerning the former and present distribution of this rare species are too meager to support any firm inferences as to what changes may have occurred and why. There is the clear indication that this is a headwater species of the lower Tennessee system in south central Tennessee and northern Alabama. The possibility

of a population in northwestern Georgia persists and should be investigated. Its presence in streams even as large as the Duck River at Columbia (Marsh, 1885:5) may have been marginal at best. Marsh notes that it was "Not abundant" at this site.

Recently published collection records of naiad species from streams within the range of T. cylindrellus include the Flint and Paint Rock Rivers (Isom and Yokley, 1973), Duck and Buffalo Rivers (Isom and Yokley, 1968b) (van der Schalie, 1973), Bear Creek (Isom and Yokley, 1968a), Indian Creek (Isom, 1968) and Elk River (Isom, Yokley and Gooch, 1973). None of these studies reported evidence of the continued existence of this species. It would appear that this species is disappearing from the headwaters as well as from downstream sites. The only recent collections appear to be the three unpublished records (OSUM) from the upper Duck and from Larkin Fork of the Paint Rock River system.

Potential Threats

The upper Duck River is threatened with impoundment by Normandy Dam. The Paint Rock River is threatened with stream channelization. It seems doubtful if this apparently sensitive species could withstand either of these major modifications.

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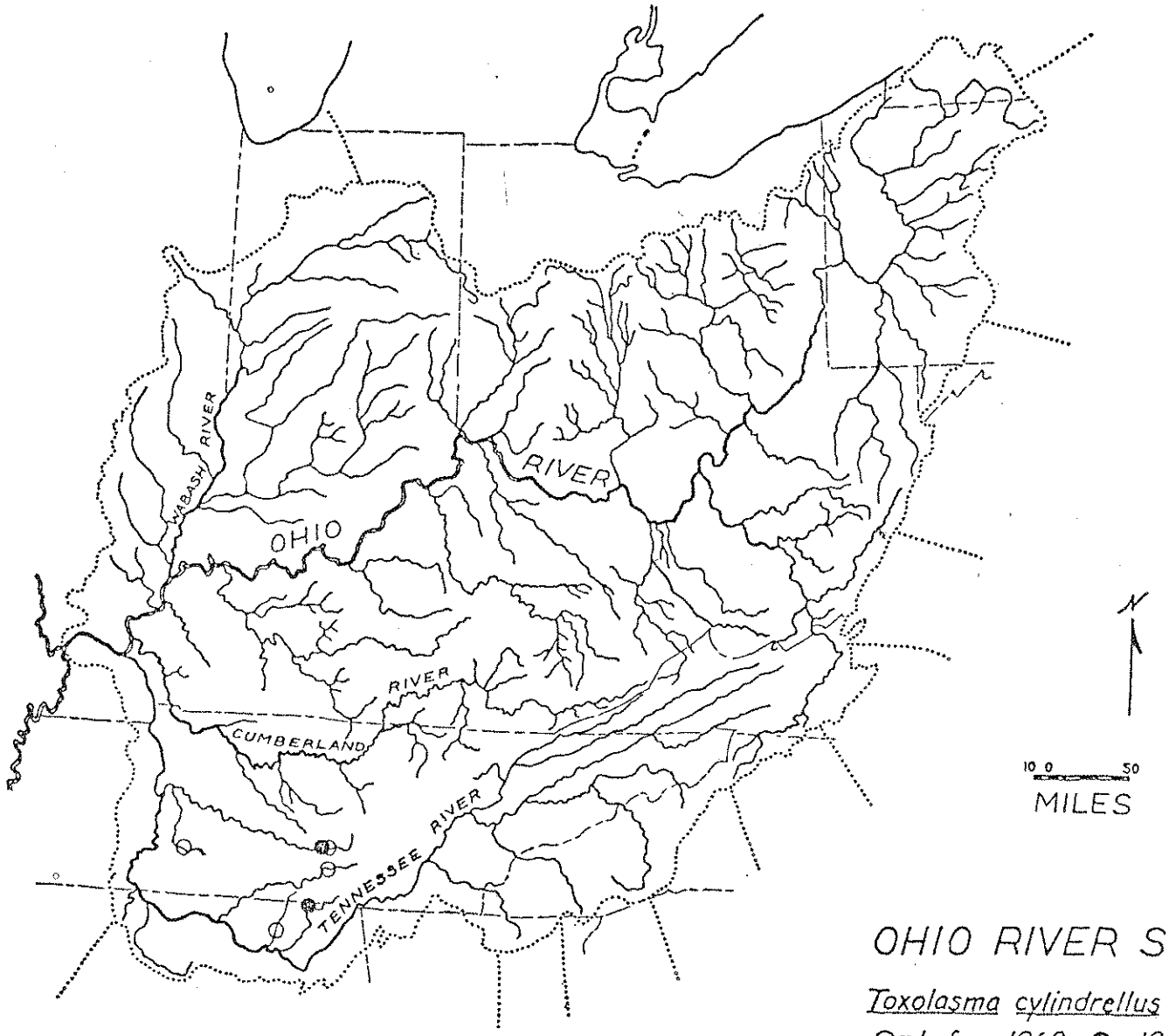
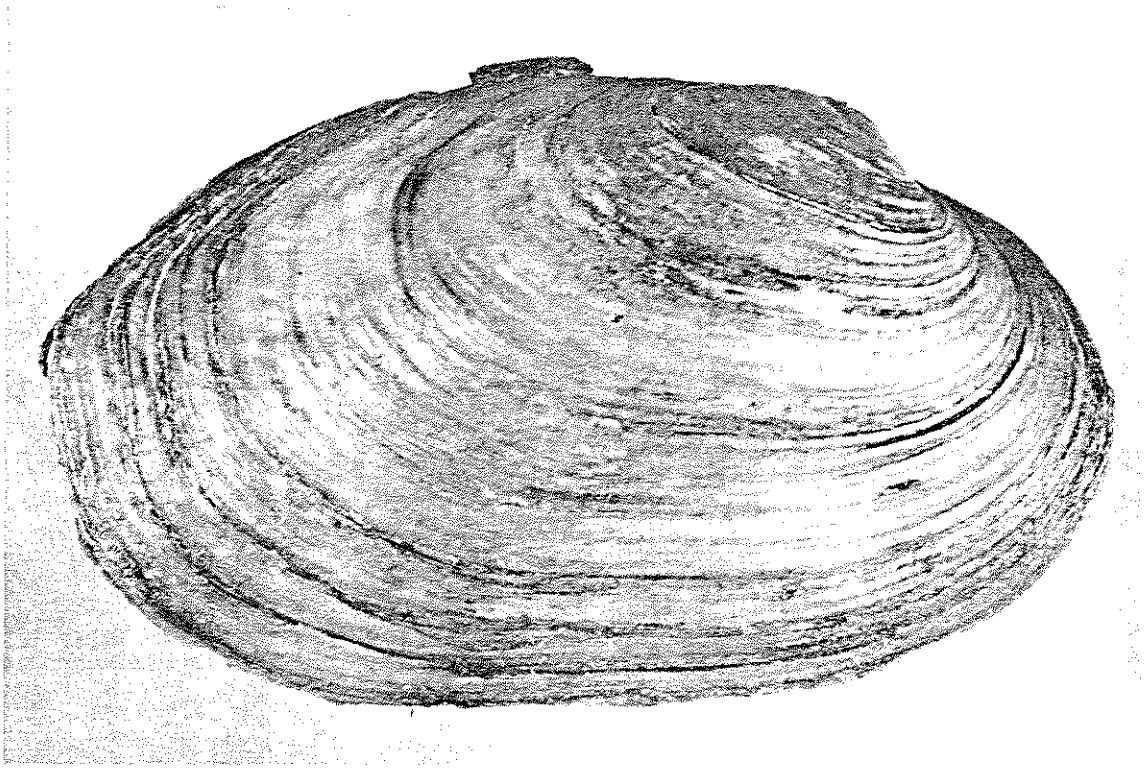


OHIO RIVER SYSTEM

Toxolasma cylindrellus (Lea, 1868).

○ = before 1960 ◍ = 1960-1976

KGB 1976



Toxolasma cylindrellus (Lea, 1868).
OSUM 19087.23, Larkin Fork Paint Rock River
1.5 mi. above its mouth, Jackson Co., Alabama.
29 Sept. 1966. L=40, H=23, W=15 mm.