

SUPPLEMENT TO
BIOLOGICAL ABSTRACTS
OF
UNIONID MOLLUSKS
RECORDED FROM OHIO

Prepared for the
Ohio Heritage Program
Ohio Department of Natural Resources
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These abstracts were prepared for species that have been listed as endangered, threatened, or of special interest in the state since Stansbery, Borrer, and Newman (1982) prepared the original abstracts for Ohio Unionidae. No attempt has been made to bring those original abstracts up to date with more recent collection records.

The format established by the original abstracts was followed here. The scientific name used is the listed name. In all cases but one it is the earliest valid name for the species as determined by use of the International Code of Zoological Nomenclature. The only exception is Epioblasma phillipsii (Reeve, 1864) which is a synonym of Epioblasma cincinnatiensis (Lea, 1840). This priority is clearly established in the abstract. The common name of each species is that found in Turgeon et al. (1988). The systematics of each species is followed by a treatment of the species' classification, characteristics, similar species, total historic range, range in Ohio, and habitat. A reference section is included for each species.

Stansbery, Borrer and Newman (1982) outline many of the hazards or factors responsible for the decline of our native freshwater mollusks. It has become apparent within the last few years that at least one other factor has been responsible for, and will continue to cause, a decline in the native populations of Ohio Unionidae. That additional factor is an introduced species, Dreissena polymorpha (Zebra Mussel). Not only does this species out compete the native unionid mollusks where they occur together, but they use the shell of the native mollusk as habitat. When they become attached they feed from the currents produced by that mollusks. They remove the food from the stream of water before it can reach the native mollusk. It will not take this introduced species long to spread throughout the state. As its range increases it will severely impact the native species in our streams and lakes.

The fact that other abstracts are needed for Ohio Unionidae speaks to the fact that our streams are still in decline. That habitats have not improved for these animals since the original abstracts were prepared. The hazards identified in the earlier abstracts are still very much present today. They continue to result in declining populations of native species within the state. The following abstracts identify those species which were once more common and are now in decline, extirpated from Ohio, or extinct.

Literature Cited:

- Stansbery, David H., Kathy G. Borrer and Kathy E. Newman
1982 Biological Abstracts of Selected Species of Unionid Mollusks Recorded
from Ohio.
Ohio Heritage Program, Ohio Dept. Nat. Res.
- Turgeon, Donna D, Arthur E. Bogan, Eugene V. Coan, William K. Emerson, William
G. Lyons, William L. Pratt, Clyd F.E. Roper, Amelie Scheltema, Fred G. Thompson,
and James D. Williams.
1988 Common and Scientific Names of Aquatic Invertebrates from the United
States and Canada, Mollusks.
American Fisheries Society Special Publication 16, 277 pp.

ANODONTA SUBORBICULATA SAY, 1831
Flat Floater

SYNONYMY:

- Anodonta suborbiculata Say, 1831. (Say, 1831)
Type Locality: Ponds near Wabash River (Simpson, 1914:400)
- Margarita (Anodonta) suborbiculata (Say, 1831). (Say, 1836:52)
- Anodon suborbiculata (Say, 1831). (Catlow & Reeve, 1845:68)
- Margaron (Anodonta) suborbiculata (Say, 1831). (Say, 1852:51)
- Anodon suborbiculatus (Say, 1831). (Sowerby, 1867: pl. 5, fig. 11)

CLASSIFICATION:

- Family Unionidae (Fleming, 1828) Ortmann, 1911.
Subfamily Anodontinae (Rafinesque, 1820) Morrison, 1955.
Genus Anodonta Lamarck, 1799.

CHARACTERISTICS: Shell large (up to 155 mm in length), subcircular, compressed, thin; umbo flattened, not produced above the dorsal margin, sculpture consisting of four to five pairs of slightly nodulous, broken, double-looped ridges; posterior ridge low but distinct, produced dorsally into slight wing behind the umbo; periostracum light yellow to dark brown, rayed in young specimens; surface of valve smooth and shiny, except for darkened growth lines and dark posterior slope; hinge edentulous; nacre silvery, iridescent along the margin and cream colored within the shallow umbo cavity.

SIMILAR SPECIES: The absence of hinge teeth, nearly circular outline, and flattened dorsal margin make this mussel easy to recognize. Anodonta grandis grandis Say, 1829 and Anodonta grandis corpulenta Cooper, 1834 are large, thin shelled species with edentulous hinge structure and double-looped to nodulous umbo sculpture. However, in both subspecies the umbo extends beyond the dorsal margin and the outline of the shell is elongate to subrhomboid, inflated. Anodonta imbecillis Say, 1829 is the only other thin shelled Ohio species with a flattened umbo that lacks hinge dentition. However, this species is distinctly elongate, usually inflated and much smaller than suborbiculata.

RANGE: Parmalee (1967:48) stated that the species' range was:

"Southern portion of the Mississippi River system; Nebraska, Iowa and Illinois, south to Louisiana."

RANGE IN OHIO: Prior to the 1990 field season, this species had only been found once in Ohio. One dead specimen was recovered from the banks of the Ohio River in Clermont County. In 1990-1991, Hoggarth (1992:257) took three specimens from the Little Miami River in Warren County and reported finding another specimen from the Whitewater River in Hamilton County. This accounts for the entire known range of the species in the state. However, the species is apparently just now beginning to extend its range into the state. It is likely that it will become more widely distributed in southwestern Ohio than indicated by these records.

HABITAT: In describing the ecology of this species Parmalee (1967:48) stated that:

"[Although] least common of the Anodonta group in the state [of Illinois],...in some local, well-suited habitats (quiet, mud bottom sloughs and river pools), the Heel-splitter may become numerous. In Illinois, this species is restricted to the Mississippi River, its backwater areas, and major tributary systems (Illinois, Sangamon, Kaskaskia)."

Watters (1993:27) noted that the flat floater:

"prefers sluggish water."

The typical habitat of this species is in soft stable sediment in pools, backwaters, and in low flow reaches of larger rivers. It is perhaps, not to surprising that the species is extending its range into some of the lower reaches of Ohio's larger rivers. Abundant silt and other fine sediments deposited upon the bottom of the river bed produces favorable habitat for this species.

SELECTED REFERENCES:

Hoggarth, Michael A.

- 1992 The Unionidae and Corbiculidae of the Little Miami River system in southwestern Ohio.
Walkerana, 6(16):247-293.

Parmalee, Paul W.

- 1967 The fresh-water mussels of Illinois.
Ill. State Mus. Pop. Sci. Ser., 8:i-ix, 1-108, 35 pl., 4 fig.,
frontispiece of 11 col. fig.

Say, Thomas

- 1831 Descriptions of some new terrestrial and fluviatile shells of North America.
The New Harmony Disseminator of Useful Knowledge, New Harmony, Indiana.

Simpson, Charles T.

1914 A descriptive catalogue of the naiades, or pearly fresh-water mussels.
Bryant Walker, Detroit, Michigan. 1540 pp.

Watters, G. Thomas

1993 A Guide to the Freshwater Mussels of Ohio, Revised Edition.
The Ohio Department of Natural Resources, Division of
Wildlife. 106 pp.

CYCLONAIAS TUBERCULATA (RAFINESQUE, 1820)
Purple Wartyback

SYNONYMY:

- Obliquaria (Rotundaria) tuberculata Rafinesque 1820. (Rafinesque, 1820:103)
Type Locality: "...dans l'Ohio et les rivieres adjacentes"
Type Locality: "Ohio River and adjacent streams" (Simpson, 1914:904)
- Unio verrucosa Barnes, 1823. (Barnes, 1823:123)
Type Locality: "Hab. Ouisconsin River. Mr. Schoolcraft."
"Lake Erie. Major Danfield."
- Mya verrucosa (Barnes, 1823). (Eaton, 1826:216)
- Unio verrucosa purpureus Hildreth, 1828. (Hildreth, 1828:281)
Type Locality: "Muskingum [River]"
- Unio tuberculatus (Rafinesque, 1820). (Conrad, 1836:43)
- Margarita (Unio) verrucosus (Barnes, 1823). (Lea, 1836:16)
- Unio graniferus Lea, 1838. (Lea, 1838:69)
Type Locality: "Ohio River, Cincinnati, O."
- Margarita (Unio) graniferus (Lea, 1838). (Lea, 1838:15)
- Margaron (Unio) graniferus (Lea, 1838). (Lea, 1852:22)
- Margaron (Unio) verrucosus (Barnes, 1823). (Lea, 1852:22)
- Rotundaria tuberculata (Rafinesque, 1820). (Agassiz, 1852:48)
- Quadrula verrucosus (Barnes, 1823). (Baker, 1898:85)
- Quadrula tuberculata (Rafinesque, 1820). (Simpson, 1900:795)
- Quadrula graniferus (Lea, 1838). (Simpson, 1900:795)
- Quadrula graniferus Pusilla Simpson, 1900. (Simpson, 1900:795)
Type Locality: "Green River, Ky."
- Cyclonaias tuberculata (Rafinesque, 1820). (Ortmann & Walker, 1922:18)

CLASSIFICATION:

Family Unionidae (Fleming, 1828) Ortmann, 1911.
Subfamily Amblesinae (Rafinesque, 1820) Morrison, 1955.
Genus Cyclonaias Pilsbry in Ortmann and Walker, 1922.

CHARACTERISTICS: Shell circular, compressed, up to 127 mm in length, solid, often with a low dorsal wing; umbo prominent, with numerous fine, broken, zigzag ridges; disc covered with pustules and short dorso-ventral ribs; ribs prominent on posterior slope; hinge short, massive, with heavy pseudocardinal and lateral teeth; periostracum yellowish-brown to dark brown, often rayed with green in young specimens; nacre purple.

SIMILAR SPECIES: Other pustulate species with circular outlines, such as Quadrula pustulosa pustulosa (Lea, 1831), Plethobasus striatus (Rafinesque, 1820), and Cyprogenia stegaria (Rafinesque, 1820), might be superficially similar to this species but none of these have purple nacre. Other species with purple nacre, such as Elliptio dilatata (Rafinesque, 1820), Elliptio crassidens crassidens (Lamarck, 1819), Potamilus alatus (Say, 1817), and Epioblasma obliquata obliquata (Rafinesque, 1820), are neither circular in outline or pustulate and would not be confused with this species. Specimens of Obovaria retusa (Lamarck, 1819) are circular in outline and often have purple nacre inside of the pallial groove, but this species is not pustulate and would therefore not be confused with tuberculata.

RANGE: LaRocque (1967:151) stated that the species' range was:

"Mississippi drainage generally; Lake St. Clair drainage; Detroit River and Lake Erie; Ohio River and its drainage."

Parmalee (1967:27) adds:

"Cumberland and Tennessee river systems"

RANGE IN OHIO: The present distribution of this species in Ohio includes both the Ohio River and Lake Erie drainage basins.

Sterki (1907:390) gave:

"Ohio River, Little Miami River; Tuscarawas River...Maumee and Tiffin rivers, near Defiance."

This species has been recorded for the Scioto, Great Miami, Sandusky, Huron, Little Miami, Maumee, St. Joseph, Walhonding, and Auglaize rivers as well as Big Walnut Creek, Tymochtee Creek, Ohio Brush Creek, Salt Creek, Fish Creek, and Big and Little Darby creeks in Ohio. Extant populations have been confirmed recently in Fish Creek and the St. Joseph River, including the West Branch (Hoggarth, 1987:20), Big and Little Darby creeks (Watters, 1990:25), and the Walhonding (Hoggarth in prep.) and the Great Miami rivers (personal collection records).

HABITAT: Parmalee (1967:29) described the preferred habitat of this species as in:

"a gravel/mud bottom, usually in areas of current..."

Buchanan (1980:32) reported that:

"Cyclonaias tuberculata was found in a silt, sand, gravel and cobble or cobble and boulder substrate, but was found most often in a gravel and cobble substrate. It occurred in 1 inch to 5 feet of water in slow (less than 0.2 ft./sec. at the bottom) to moderate (1.4 ft./sec. at the bottom) current."

In Ohio this species most often occurs in medium to large streams in riffle and run reaches. It is generally found in a firm, stable substrate but may also occur in mud in very slow moving reaches of a stream.

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Am. Jour. Sci. & Arts, 14:276-291.

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Bryant Walker, Detroit, Michigan. 1540 pp.
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1907 A preliminary catalogue of the land and fresh-water Mollusca of Ohio.
Ohio State Acad. Sci. Spec. Pap. No. 12:365-402.
- Watters, G. Thomas
1990 1990 survey of the unionids of the Big Darby Creek system.
Final Rept. Nature Concervancy Ohio Chapter, 36 pp.

EPIOBLASMA LEWISI (WALKER, 1910)
Forkshell

SYNONYMY:

- Truncilla lewisi Walker, 1910. (Walker, 1910:42)
Type Locality: Holston River, Tennessee (Bogan and Parmalee, 1983:31)
- Dysnomia (Dysnomia) lewisi (Walker, 1910). (Frierson, 1928:93)
- Epioblasma lewisi (Walker, 1910). (Stansbery, 1973:22)
- Plagiola (Epioblasma) lewisi (Walker, 1910). (Johnson, 1978:283)

CLASSIFICATION:

- Family Unionidae (Fleming, 1828) Ortmann, 1911.
Subfamily Lampsilinae (Von Ihering, 1901) Ortmann, 1910.
Genus Epioblasma Rafinesque, 1831.

CHARACTERISTICS: Shells demonstrate extreme sexual dimorphism; males quadrate, solid with a broad sulcus; females triangular, thinner, with a finger-like ventral projection and an extended posterior ridge; shell moderately compressed, up to 80 mm in length; umbo prominent with faint corrugated sculpture; periostracum light greenish-yellow to tan with narrow, greenish rays; hinge well developed with thick pseudocardinal teeth and interrupted lateral teeth, complete in the left valve, and often reduced to one lateral tooth in the right valve; the second lateral tooth may be present as a slight swelling at the hinge; nacre white.

SIMILAR SPECIES: Epioblasma flexuosa (Rafinesque, 1820) is medium size, subcompressed to subinflated, solid; median ridge high, rounded with indistinct nodules; female ventral projection higher and broader.

RANGE: Simpson (1914:21) stated that other than the type locality, that this species occurred:

"Also, Clinch River and Holston River, Knox Co., Tenn., and Cumberland River, Port Burnside, Ky."

Museum records at The Ohio State University Museum of Biological Diversity include a single specimen from the Tennessee River, 3/2 subfossil specimens from Caney Fork River, and one dead specimen from the Ohio River at Cincinnati, Ohio.

RANGE IN OHIO: The species is probably extinct (Stansbery, 1970:19). It once occurred in the Ohio River at Cincinnati, but it is not found here today. It has not been recorded for any other location in the state.

HABITAT: Epioblasma lewisi probably occurred in the shallow riffles of big rivers
(Stansbery, 1971:8)

SELECTED REFERENCES:

Bogan, Arthur E., and Paul W. Parmalee

- 1983 Tennessee's Rare Wildlife, Volume II: The Mollusks.
Tennessee Wildlife Resource Agency, Ellington Agricultural
Center, Nashville, Tennessee 37204 or Tennessee Heritage
Program, Department of Conservation, 701 Broadway,
Nashville, Tennessee 37203. 123 pp.

Simpson, Charles T.

- 1914 A descriptive catalogue of the naiades, or pearly fresh-water mussels.
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Stansbery, David H.

- 1970 Eastern freshwater mollusks (I) The Mississippi and St. Lawrence River
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- 1971 Rare and endangered mollusks in eastern United States. Pages 5-18. In:
S.E. Jorgenson and R.E. Sharp (eds.) Proceedings of a symposium on
rare and endangered mollusks (naiads) of the U.S.
Bureau of Sport Fisheries and Wildlife, U.S. Department of the
Interior, Twin Cities, Minnesota 55111.

EPIOBLASMA PHILLIPSII (REEVE, 1864)
no common name

SYNONYMY:

- Unio cincinnatiensis Lea, 1840. (Lea, 1840:285)
Type Locality: Ohio River, Cincinnati, O. (Simpson, 1914:26)
- Unio phillipsii Reeve, 1864. (Reeve, 1864:pl.IV, fig. 15)
Type Locality: North America (Johnson, 1978:261)
- Epioblasma cincinnatiensis (Lea, 1840). (Stansbery et al., 1985:298)

CLASSIFICATION:

- Family Unionidae (Fleming, 1828) Ortmann, 1911.
Subfamily Lampsilinae (Von Ihering, 1901) Ortmann, 1910.
Genus Epioblasma Rafinesque, 1831.

CHARACTERISTICS: This species should actually be referred to as Epioblasma cincinnatiensis (Lea, 1840) which is sometimes listed as a subspecies of Epioblasma torulosa and sometimes as a separate species. In fact we may never know the relationship of this species to the other members of the genus because it is extinct. Shell irregular ovate, subinflated to inflated, solid, umbo prominent. The most striking feature of this species is the sharp row of knobs on the anterior ridge, sometime with a few knobs on the posterior ridge. The sulcus between these ridges is wide and shallow. Female shell greatly expanded and thin posteriorly; sexual dimorphism in shells pronounced; periostracum yellowish with fine green rays; hinge teeth well developed with stout pseudocardinal teeth and high but short lateral teeth; nacre white.

SIMILAR SPECIES: Epioblasma torulosa torulosa (Rafinesque, 1820) has fewer knobs and a much different distribution of knobs and is generally larger than this species. The inflation of the female shell is more compressed in torulosa than in cincinnatiensis.

RANGE: LaRocque (1967:283) reports that this species was restricted to the Ohio River in the vicinity of Cincinnati. Bogan and Parmalee (1983:37) report subfossil specimens removed from archeological sites in the Pickwick Basin and from Davidson County, Tennessee. Ohio State University Museum records include one dead specimen taken from the Ohio River at Cincinnati, and subfossil specimens taken from Carlston Annis Mound, Kentucky.

RANGE IN OHIO: The species was found in the Ohio River at Cincinnati. It is extinct today (Watters, 1993:106).

HABITAT: No information is available on the habitat of this species but it was probably an inhabitant of the riffles of large rivers (Stansbery, 1970:8).

SELECTED REFERENCES:

- Bogan, Arthur E., and Paul W. Parmalee
1983 Tennessee's Rare Wildlife, Volume II: The Mollusks.
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Program, Department of Conservation, 701 Broadway,
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- Johnson, Richard I.
1978 Systematics and zoogeography of *Plagiola* (=Dysnomia=Epioblasma), an
almost extinct genus of freshwater mussels (*Bivalvia:Unionidae*) from
middle North America.
Bull. Mus. Comp. Zool., 148(6):239-320.
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1967 Pleistocene Mollusca of Ohio.
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1993 A Guide to the Freshwater Mussels of Ohio, Revised Edition.
Prepared for the Division of Wildlife, Ohio Department of
Natural Resources, Columbus, Ohio. 106 pp.

EPIOBLASMA TRIQUETRA (RAFINESQUE, 1820)
Snuffbox

SYNONYMY:

- Truncilla triqueter Rafinesque, 1820. (Rafinesque, 1820:301)
Type Locality: "...qu'aux chutes de l'Ohio." [Falls of the Ohio River at
Louisville, Kentucky.]
- Unio triangularis Barnes, 1823. (Barnes, 1823:272)
Type Locality: "Inhabits Bois-blanc Isle, Detroit River, Major Danfield."
- Unio cuneatus Swainson, 1823. (Swainson, 1823:112)
- Unio furmosus Lea, 1834. (Lea, 1834:111)
- Truncilla triquetra Rafinesque, 1820. (Simpson, 1900:517)
- Dysnomia triquetra (Rafinesque, 1820). (Ortmann & Walker, 1922:65)
- Epioblasma triquetra (Rafinesque, 1820). (Stansbery, 1972:22)
- Plagiola (Truncillopsis) triquetra (Rafinesque, 1820). (Johnson, 1978:248)

CLASSIFICATION:

- Family Unionidae (Fleming, 1828) Ortmann, 1911.
Subfamily Lampsilinae (Von Ihering, 1901) Ortmann, 1910.
Genus Epioblasma Rafinesque, 1831.

CHARACTERISTICS: Shell triangular, inflated, solid, with a maximum length of 70 mm; male and female shells similar; drawn to a point posteriorly, umbos low, anterior margin rounded; female with slightly expanded posterior margin, expansion ribbed, ribs extending to the ventral margin and terminating in sharp points; shell yellowish to yellowish brown with green chevrons forming broken rays; hinge well developed with short, compressed pseudocardinal teeth, and short, rounded lateral teeth; umbo with coarse double-looped ridges; nacre white.

SIMILAR SPECIES: Truncilla donaciformis (Lea, 1827) and Truncilla truncata Rafinesque, 1820 may be of comparable size and shape, but neither of these species is as inflated as triquetra and both species have finer umbo sculpture. The female shell of triquetra would not be confused with any other species.

RANGE: Simpson (1914:6) listed this species for the:

"Ohio River drainage; western New York to southern Michigan; Iowa; eastern Nebraska to Indian Territory."

LaRocque (1967:285) found the general distribution of this species to included:

"Western New York and southern Ontario west to Nebraska and Kansas, south the West Virginia, Tennessee and northern Alabama, and north to Wisconsin and Michigan. Lake Huron; Lake St. Clair and its drainage; Detroit River; Lake Erie and its drainage."

RANGE IN OHIO: Within the Ohio River drainage basin it has been recorded from Alum Creek, the Olentangy River, Little Salt Creek, the Scioto River, Big Walnut Creek, Whetstone Creek, the Hocking River, the Stillwater River, Deer Creek, Salt Creek, Little Darby Creek, Big Darby Creek, the Little Miami River, Caesar Creek, the Walhonding River, Scioto Brush Creek, and the South Fork of Scioto Brush Creek. In the Lake Erie drainage basin it has been found in the Grand River, the Sandusky River, and Swan Creek (Museum records, LaRocque, 1967:285, Watters, 1992, Hoggarth, 1992, in prep.).

HABITAT: Parmalee (1967:64) stated that:

"It usually inhabits bottoms composed of sand and coarse gravel, often in riffles in running water, and most individuals bury themselves deeply in sand..."

Buchanan (1980:63) found that this species was found:

"...in gravel and cobble, cobble, or gravel, cobble and boulder substrates, often entirely buried beneath the substrate. It was collected in 2 inches to 2 feet of water in moderate (1.2 ft./sec. at the bottom) to swift (1.7 ft./sec. at the bottom) current."

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1823 On the genera Unio and Alasmidonta, with introductory remarks by D.W. Barnes. Am. Jour. Sci. & Arts, O.S. 6(1):107-127; 6(2):258-280.

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Malacology Data Net, 3(1-4):56-90.

LAMPSILIS FASCIOLA RAFINESQUE, 1820
Wavy-Rayed Lampmussel

SYNONYMY:

- Lampsilis fasciola Rafinesque, 1820. (Rafinesque, 1820:299)
Type Locality: Kentucky River (LaRocque, 1967:217)
- Unio multiradiatus Lea, 1829. (Lea, 1829:434)
Type Locality: Ohio. (Simpson, 1914:56)
- Lampsilis multiradiata (Lea, 1829). (Sterki, 1907:388)
- Ligumia fasciola (Rafinesque, 1820). (Goodrich, 1932:109)

CLASSIFICATION:

- Family Unionidae (Fleming, 1828) Ortmann, 1911.
Subfamily Lampsilinae (Von Ihering, 1901) Ortmann 1911.
Genus Lampsilis Rafinesque, 1820.

CHARACTERISTICS: Shell elliptical to oval, inflated, with low umbos. Male shell narrowly pointed posteriorly while the female shell is more broadly pointed. Periostracum yellowish to yellowish green with numerous thin, wavy green rays fanning out across the valve. Shell up to 100 mm, without sculpture except at the umbo where coarse, irregular, corrugated, double-looped ridges are found. Hinge teeth well developed with thick pseudocardinal and short, thin lateral teeth. Nacre white.

SIMILAR SPECIES: This species will not be confused with any other. The combination of size, shape and especially the density and intensity of the rays are unique to this species in Ohio. Other members of the genus Lampsilis are generally larger (ventricosa, ovata, teres, abrupta and luteola) and if rayed, those rays are broader and fewer in number.

RANGE: Parmalee (1967:65) stated that the species' range was:

"Entire Ohio drainage; southern Michigan."

LaRocque (1967:217) added:

"Great Lakes and their drainage, but not in their entirety."

RANGE IN OHIO: In Ohio this species has been recovered from Lake Erie, the St. Joseph River, Fish Creek, the West Branch of the St. Joseph River, the Blanchard River, the Sandusky River, the Little Miami River, the East Fork of the Little Miami River, the Great Miami River, the Stillwater River, Greenville Creek, the Scioto River, the

Olentangy River, Big Darby Creek, Little Darby Creek, Big Walnut Creek, Alum Creek, Deer Creek, the Mohican River, the Walhonding River, Captina Creek, West Fork of Little Beaver Creek, and North Fork of Little Beaver Creek (museum records, Hoggarth, 1987, 1992, in prep, Watters, 1990, 1992). Today this species is limited to just a small portion of its former range in the state. The species still occurs in Fish Creek, the West Branch of the St. Joseph River, the Little Miami River, the Stillwater River, the Olentangy River, Big Darby Creek, Little Darby Creek, the Walhonding River, Captina Creek, West Fork of Little Beaver Creek, and North Fork of Little Beaver Creek. This represents a 50% decrease in range.

HABITAT: In describing the ecology of this species Parmalee (1967:67) stated that specimens were found:

"on a coarse sand and gravel bottom, with little mud, in current, and in less than one foot of water."

This species is generally encountered in fast flowing to swift water in one foot to three feet of water on a bottom of cobble to sand. It is usually completely buried except for the posterior end. The female will often have a rust colored mantle flap that can be observed from late July to October.

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LIGUMIA RECTA (LAMARCK, 1819)
Black Sandshell

SYNONYMY:

- Unio recta Lamarck, 1819. (Lamarck, 1819:74)
Type Locality: Lake Erie (LaRocque, 1967:265)
- Unio latissima Rafinesque, 1820. (Rafinesque, 1820:297)
Type Locality: Ohio River (LaRocque, 1967:267)
- Unio sageri Conrad, 1836. (Conrad, 1836:53)
Type Locality: Detroit River, Michigan. Also, Red River of the North
(Simpson, 1914:96)
- Lampsilis recta (Lamarck, 1819). (Sterki, 1907:389)
- Ligumia recta (Lamarck, 1819). (Baker, 1928:255)

CLASSIFICATION:

- Family Unionidae (Fleming, 1828) Ortmann, 1911.
Subfamily Lampsilinae (Von Ihering, 1901) Ortmann, 1910.
Genus Ligumia Swainson, 1840.

CHARACTERISTICS: Shell elongate, up to 260 mm in length. dorsal and ventral margins nearly parallel for most of their length giving this shell a rectangular appearance. Shell solid, inflated, rounded anteriorly and narrowly pointed (males) to broadly pointed (female) posteriorly. Umbos low, with faint double-looped beak sculpture. Periostracum dark green to black with broad dark green rays in lighter and/or younger specimens. The rays may be almost obliterated by the darkness of the shell. Hinge complete with large triangular pseudocardinal teeth and long lateral teeth. Nacre purple or bluish-white to white, often with a flush of purple in the umbo cavity.

SIMILAR SPECIES: Lampsilis teres (Rafinesque, 1820) approaches the shape and size of this species, but that species is generally yellow in color and has a shining periostracum. Elliptio dilatata (Rafinesque, 1820) may be confused with smaller specimens of this species but that species has coarse beak sculpture, a more cloth-like periostracum, and is more elliptical rather than rectangular.

RANGE: Parmalee (1967:74) gives the range of this species as:

"Mississippi River drainage; western New York west to South Dakota and Kansas, north to Minnesota; Manitoba, Ontario, and Quebec, Canada; south to Louisiana, Alabama, and Georgia."

RANGE IN OHIO: Watters (1993:61) stated that this species occurs:

"Throughout most of the state in rivers, large creeks, and lakes."

Records indicate that this species once occurred in the Grand River, Muzzy Lake, Lake Erie, the St. Joseph River, the West Branch of the St. Joseph River, Fish Creek, the Maumee River, the Little Miami River, the Scioto River, Big Darby Creek, the Olentangy River, the Muskingum River, the Walhonding River, Meigs Creek, and the Little Muskingum River (museum records, Stansbery and King, 1983, Hoggarth, 1987, 1992, in prep., Watters, 1990). Today the species appears to be limited to the St. Joseph River, the West Branch of the St. Joseph River, Big Darby Creek, the Muskingum River, and the Walhonding River within Ohio.

HABITAT: In describing the ecology of this species Parmalee (1967:75) stated that:

"This mussel is usually found in areas of strong current, on coarse sand or gravel bottoms, and at depths varying from a few inches to 3-4 feet."

In the Walhonding River this species was found in shallow water near the margin of the river in areas of swift current to slack water habitats. The specimens were usually only partly buried in the substrate. In the St Joseph River and the West Branch of the St. Joseph River this species was found in 3-5 feet of water in moderate current almost completely buried in the sand and gravel substrate.

SELECTED REFERENCES:

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The Ohio Dept. Nat. Res., Division of Wildlife, 106 pp.

PLEUROBEMA BOURNIANUM (LEA, 1840)
Scioto Pigtoe

SYNONYMY:

Unio bournianum Lea, 1840. (Lea, 1840:288)

Type Locality: Scioto River near Chilicothe, Ohio (Simpson, 1914:741)

Pleurobema bournianum (Lea, 1840). (Simpson, 1900:747)

CLASSIFICATION

Family Unionidae (Fleming, 1828) Ortmann, 1911.

Subfamily Amblesinae (Rafinesque, 1820) Morrison, 1955.

Genus Pleurobema Rafinesque, 1820.

CHARACTERISTICS: Shell triangular, solid, and inflated with high umbos. Maximum length to approximately 50 mm. Periostracum yellowish with broad, broken green rays. Hinge complete with broad pseudocardinal teeth and thick, curved lateral teeth. Nacre white (Lea, 1840:288, Simpson, 1914:741)

SIMILAR SPECIES: This high triangular species with a shining yellow periostracum with broad green rays will not be confused with any other species.

RANGE: The species is only know from its type locality.

RANGE IN OHIO: This species has not been collected in Ohio in well over 150 years. It is believed to be extinct.

HABITAT: Nothing is know about the habitat of this species but like the other members of the genus, it probably inhabited gravel and sand substrate in flowing water (run to riffle) habitats.

SELECTED REFERENCES:

Lea, Isaac

1840 Descriptions of new fresh water and land shells.
Proc. Amer. Philos. Soc. Phila., 1:284-289.

Simpson, Charles T.

1914 A descriptive catalogue of the naiades, or pearly fresh-water mussels.
Bryant Walker, Detroit, Michigan, 1540 pp.

M.A. Hoggarth
21 March 1994

PLEUROBEMA SINTOXIA (RAFINESQUE, 1820)
Round Pigtoe

SYNONYMY:

- Obliquaria sintoxia Rafinesque, 1820. (Rafinesque, 1820:310)
Type Locality: "Dans l'Ohio" (Rafinesque, 1820:310)
- Unio coccineus Conrad, 1836. (Conrad, 1836:29)
Type Locality: Mahoning River near Pittsburgh (LaRocque, 1967:165)
- Unio catillus Conrad, 1836. (Conrad, 1836:30)
- Unio solidus Lea, 1838. (Lea, 1838:13)
Type Locality: Ohio River, Cincinnati; Mahoning River, Ohio (Simpson, 1914:885)
- Quadrula paupercula Simpson, 1900. (Simpson, 1900:789)
Type Locality: Niagra Falls (LaRocque, 1967:167)
- Quadrula coccineus (Conrad, 1836). (Sterki, 1907:392)
- Pleurobema obliquum coccineum (Conrad, 1836). (Ortmann, 1919:78)
- Pleurobema obliquum paupercula (Simpson, 1900). (Ortmann, 1919:83)
- Pleurobema coccineum paupercula (Simpson, 1900). (Ortmann and Walker, 1922:24)
- Pleurobema coccineum (Conrad, 1836). (Baker, 1928:113)
- Pleurobema cordatum coccineum (Conrad, 1836). (Goodrich, 1932:90)
- Pleurobema cordatum paupercula (Simpson, 1900). (Goodrich, 1932:90)
- Pleurobema sintoxia (Rafinesque, 1820). (Stansbery, 1985:181)

CLASSIFICATION:

- Family Unionidae (Fleming, 1828) Ortmann, 1911.
Subfamily Ambleminae (Rafinesque, 1820) Morrison, 1955.
Genus Pleurobema Rafinesque, 1820.

CHARACTERISTICS: Pleurobema sintoxia is one of the most variable of Ohio species. It is subrotund and compressed in smaller streams to subtriangular and inflated in larger rivers. It reaches a length of about 150 mm. The umbos are slightly elevated and generally appose one another (they face each other). The posterior ridge is rounded

and the umbo sculpture consists of coarse, irregular ridges. The hinge is complete with heavy, triangular pseudocardinal teeth and curved, short lateral teeth. The periostracum is yellowish green to dark brown, often rayed in young shells. Umbo cavities are shallow and nacre is white, rarely pink, orange, or rose.

SIMILAR SPECIES: Pleurobema sintoxia belongs to a complex of very similar species. Both Pleurobema cordatum (Rafinesque, 1820) and Pleurobema rubrum (Rafinesque, 1820) have a prominent sulcus with anteriorly directed umbos. Pleurobema plenum (Lea, 1840) is closest to sintoxia but can be distinguished by its more cloth-like periostracum and more triangulate shape. Fusconaia flava (Rafinesque, 1820) may look very much like this species but generally is much more yellow, has a deeper umbo cavity, and is usually much more triangulate.

RANGE: Baker (1928:115) stated that this species was distributed in:

"the upper Mississippi drainage and St. Lawrence drainage. Its range is apparently bounded by western New York on the east, Iowa and Kansas on the west, Michigan and Wisconsin on the north, and Alabama and Arkansas on the south."

RANGE IN OHIO: This species was once widely distributed within the Ohio River and Lake Erie drainage basins in the state. Museum records and recent surveys (Hoggarth, 1987, 1992, in prep., Watters 1990, 1992) have documented this species from Lake Erie, the Vermillion River, the St. Joseph River, the East Branch of the St. Joseph River, the West Branch of the St. Joseph River, Silver Creek, Fish Creek, the Maumee River, the Sandusky River, Tymochtee Creek, the Huron River, the Grand River, the Scioto River, Big Walnut Creek, the Olentangy River, Big Darby Creek, Little Darby Creek, Alum Creek, Caesar Creek, Salt Creek, the Rocky Fork of Scioto Brush Creek, the Muskingum River, the Walhonding River, the Mohican River, the Hocking River, and the Little Muskingum River. The range of this species has severely declined with recent records from only a few of these streams including the St. Joseph River and its tributaries in Williams County, the Olentangy River, Big Darby Creek, Little Darby Creek, Caesar Creek, and the Walhonding River.

HABITAT: Buchanan (1980:35) stated that this species:

"was found in a variety of substrates from silt to gravel, cobble and boulder, but occurred most commonly in a gravel and cobble substrate. It was found in 1 inch to 5 feet of water in standing (0.0 ft./sec. at the bottom) to moderately-flowing (1.5 ft./sec. at the bottom) water."

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Wisc. Geol. Nat. Hist. Surv. Bull., 70:1-482.

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Missouri Dept. of Conservation, Aquatic Series No. 17, 68 pp.

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Walkerana, 6(16):56-90.

M.A. Hoggarth
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VILLOSA FABALIS (LEA, 1831)
Rayed Bean

SYNONYMY:

<u>Unio fabalis</u> Lea, 1831. Type Locality: Ohio River (LaRocque, 1967:269)	(Lea, 1831:86)
<u>Unio capillus</u> Say, 1831.	(Say, 1831:528)
<u>Unio lapillus</u> Say, 1832.	(Say, 1832:pl. 41)
<u>Micromya fabalis</u> (Lea, 1831).	(Sterki, 1907:388)
<u>Lemiox fabalis</u> (Lea, 1831).	(Frierson, 1927:93)
<u>Villosa fabalis</u> (Lea, 1831).	(Stein, 1963:19)

CLASSIFICATION:

Family Unionidae (Fleming, 1828) Ortmann, 1911.
Subfamily Lampsilinae (Von Ihering, 1901) Ortmann, 1910.
Genus Villosa Frierson, 1927.

CHARACTERISTICS: Shell very small, to 25 mm in length; solid, ovate to elliptical; male compressed with a narrowly pointed posterior margin; female more inflated with a broadly rounded posterior margin; umbos a little raised above the hinge line with low coarse ridges; otherwise the shell is without sculpture; hinge complete with low, thick pseudocardinal teeth and short, thick lateral teeth; periostracum dark green with numerous darker thin wavy rays; nacre white to bluish near the margin.

SIMILAR SPECIES: This species is distinct. It is most like Villosa iris iris (Lea, 1829) which is much thinner, larger and has prominent umbo sculpture, and Toxolasma parva (Barnes, 1823) which is often darker, lacks the thin wavy rays, and is much thinner.

RANGE: Bogan and Parmalee (1983:74) stated that this species is:

"widely but discontinuously distributed in the St. Lawrence, Ohio, and Tennessee river drainages."

RANGE IN OHIO: This species is, perhaps, more widely distributed than its current known range would suggest. It is a small secretive species that is very difficult to locate.

Watters (1993:96) stated that:

"Once widespread, this species now occurs in only a few places. Some recent

records include the Stillwater River, Fish Creek, Big Darby Creek, and Scioto Brush Creek."

To this list we can add Little Darby Creek, the Little Miami River, the East Fork of the Little Miami River, the Walhonding River, and Swan Creek (collection records, Hoggarth, 1992, in prep.).

HABITAT: Ortmann (1919:264) found this species in and near riffles, generally in water weeds, and deeply buried in sand and gravel bound together by roots. This description is identical to the types of habitats I have found this species as well.

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21 March 1994