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March 17, 2004

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CONTRIBUTIONS *in Biology and Geology*

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in Wisconsin**

*By Joan P. Jass*

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### Errata for MPM Contributions...N.99

- The hydrobiid *Cincinnatia integra* occurs in Wisconsin but records for it were omitted in error.
- Specimens upon which the *Patera pennsylvanica* records were based are not from Wisconsin.
- Theler, J.L. 1997. The modern terrestrial gastropod (land snail) fauna of western Wisconsin's hill prairies. *The Nautilus* 110(4):111-121.--this paper and its records were in error omitted from this compilation.

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**Distributions of Gastropods  
in Wisconsin**

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*Milwaukee Public Museum Contributions in Biology and Geology*

**Paul Mayer, Editor**

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R. T. Dillion, College of Charleston

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## Abstract

Wisconsin county records for freshwater and terrestrial gastropod mollusks are compiled, from the literature and from specimens in the Milwaukee Public Museum collection. 148 species from 29 gastropod families have been recorded in the state.

## Introduction

The health and status of molluscan faunas are vital concerns for those dedicated to protecting the diversity of life. Mollusks are among the most diverse of all animals in form, structure, habit, and number of species (Turgeon et al. 1998). Within the Mollusca, by far the greatest number of species belong to the group known as gastropods, the aquatic and terrestrial snails and slugs. Though slugs and snails have a basic familiarity due their presence in gardens and other habitats near our homes, the majority of gastropod species are unknown to the general public as well as to many biologists. In order for scientists, resource managers, and amateur naturalists to address conservation issues connected to these animals, it is important to take the initial step of determining current distributions for members of this large and diverse group.

This work is necessary for the determination of species ranges in the eastern United States (U.S.), which requires differentiating between actual distribution gaps and gaps due simply to lack of collecting.

Increase A. Lapham (1852, 1860) published the first lists of Wisconsin mollusk species but, in keeping with the standards of his day, he did not tie the records to voucher specimens. Some of his localities lack sufficient specificity for citing here; for example, "N.W. Territory." If he has named rivers that run through more than one county, these will be cited here only if more specific subsequent records are lacking.

A half century later, George H. Chadwick spent the summer of 1902 in the state and initiated an effort to document the Wisconsin molluscan fauna with the support of the Wisconsin Natural History Society. Chadwick's work was reported in two publications (1905, 1906), the second of which detailed the localities on voucher specimens deposited in the collection of the Milwaukee Public Museum. He also added Wisconsin locality data from notes found handwritten in the margins of various malacological works in the Smithsonian Miscellaneous Collections volumes of the Milwaukee Public Library and Museum libraries, but because of their uncertain origin these will not be repeated here.

Chadwick (1906) and his associates were able to confirm the presence in the state of 79 of the gastropod species that had been originally recorded by Lapham. Those Lapham listings that they were unable to confirm that have not been reported subsequently are not included here. Although it was

meant to be the initial step in a survey of the state, Chadwick's (1906) collaboration with the Wisconsin Natural History Society began with work in the Milwaukee vicinity but got no further.

Prior to the present work, statewide surveys of Wisconsin's gastropods were done by Baker (1928) for freshwater and by Levi and Levi (1950) for terrestrial species. Morrison (1929a, 1929b) was limited to Dane and Crawford, Solem (1952) to Door, and Teskey (1954) to Brown County mollusks. Roy's (1963) intended scope was statewide but he did not include a number of significant studies, such as Lapham (1852, 1860), Chadwick (1905, 1906) and Morrison (1929a, 1929b). Jass (1986) focused on Milwaukee Public Museum (MPM) collection specimens determined by Hubricht subsequent to his summary (Hubricht 1985) of distribution records.

In his recommendations for the future, Hubricht (1985) cited Wisconsin as one of the states in need of work on its terrestrial gastropod fauna.

This paper is an attempt to compile all Wisconsin county records, in the hopes that this synthesis may provide a basis and impetus for the more thorough look at the gastropod fauna that Hubricht called for. The exclusion of "gray literature" means that a number of records, from sources such as governmental reports on the federal and state level, will be absent from this compilation. However, the intent is to focus on those records available to all who search standard bibliographic sources. The current situation is still poor in terms of achieving a comprehensive picture of Wisconsin snail distributions, but this compilation shows that more is known than might have been assumed from some of the more narrowly focused perspectives of the past.

## Methods

Wisconsin gastropod distribution records presented here include data from two sources: 1) the first time a record for a particular county appears in the literature and 2) records from museum specimens, which unless otherwise stated are from the MPM collection. Each county, or series of counties if from the same source, is followed by a three-letter code in parentheses after the name(s) to indicate the source of the record (Table 1). If the record is from a bibliographic source, the code is also given after the appropriate entry in the Literature Cited section. Synonymies in Baker (1928), Basch (1963), Burch (1982), LaRocque (1970) and Roy (1963) guided the use of names from the older literature. In cases where the currently accepted name is significantly different, the older name used by the source author may be included following the three-letter code. If they have been placed under a Recent species name, records for Pleistocene fossils will be included here.

Figure 1 is a Wisconsin map with a number for each county in the accompanying alphabetical list.

Martin's (1965) geographical monograph was of some assistance in locating formerly used Wisconsin place names. Note that Menominee County

was for some years part of Shawano County; if an author has indicated a locality that can be assigned to the currently proper county, it will be reported there.

**TABLE 1** Reference codes.

BAK	—	Baker (1928)
CHA	—	Chadwick (1906)
ECW	—	Wiswall (1897)
HUB	—	Hubricht (1985)
JAS	—	Jass (1986)
LAP	—	Lapham (1852)
LA2	—	Lapham (1860)
L&L	—	Levi and Levi (1950)
MAR	—	Marston (1890)
MOA	—	Morrison (1929a)
MOB	—	Morrison (1929b)
M32	—	Morrison (1932)
P&J	—	Pilsbry and Johnson (1897-8)
SOL	—	Solem (1952)
TES	—	Teskey (1954)

## Results

The Wisconsin records include species from 29 (10 freshwater, 19 terrestrial) gastropod families. Table 2 shows their taxonomic relationships to each other and designates which are freshwater and which are terrestrial. The classification used is that of Turgeon et al. (1998). In parentheses following each family is the number of species that have been recorded from Wisconsin.

In the following review, freshwater species are presented first, followed by terrestrial ones, alphabetically by family, and under family, alphabetically by species. The author and date of the original description of each gastropod follows its genus and specific names. Each treatment also has a Remarks and a County records portion. The Remarks include a common name (often colorful!) if given by Turgeon et al. (1998), as well as any additional comments about range or other information.

Due to the high degree of uncertainty in the field of freshwater and terrestrial gastropod taxonomy currently, the construction of keys identifying species is best left to expert taxonomists. Reliable distinctions often depend on study of the internal anatomy of the animals. Because of the frequency with which immature snails may be encountered in the field, it is important to note that characteristic traits given for shell size (of course), but also for shape and sculpturing, hold true only in reference to the features of the adult

shell. Though some idea of family traits is briefly given here, only in some cases do all the member species share a feature or features that facilitate an easy family level identification.

### **Freshwater Gastropoda (68)**

Ten freshwater families have been reported from Wisconsin. Baker's (1928) sources will not be cited separately but instead all will be given the code BAK. Although Baker's subspecies have been lumped under their species listings here, his thorough monographic study sheds an invaluable light on intraspecific variation in the state's freshwater mollusks that still provides insights for researchers of today. Recent keys to freshwater families and genera are available in Smith (2001) and Thorp and Covich (2001).

Freshwater snail respiration is by gills or by an air-filled "lung," depending on the family. Some species are hermaphroditic but others have the sexes separate. Generally, eggs are laid from late spring to early fall, but a few species are ovoviviparous. Those snails that survive the winter do so by burrowing into the bottom or moving out to deeper water. Some species can live in temporary ponds by aestivating through dry periods and do this by secreting a thin sheet of mucus over the aperture. For information on the ecology of freshwater mollusks see Dillon (2000).

#### Ancylidae

Shells flat or conical, not spiraled. Freshwater limpets.

##### *Ferrissia fragilis* (Tryon 1863)

Remarks: common name = fragile ancylid.

County records (6): Barron, Door, Green Lake, Jefferson, Milwaukee, Winnebago (BAK).

##### *Ferrissia parallelus* (Haldeman 1841)

Remarks: common name = oblong ancylid.

County records (11): Bayfield, Brown, Door (BAK); Grant (MPM), Green Lake (BAK), Iron (M32), Milwaukee (CHA), Oneida (BAK), Vilas (M32), Waukesha & Winnebago (BAK).

##### *Ferrissia rivularis* (Say 1817)

Remarks: Milwaukee and Rock Rivers (Lapham 1852).

Common name = creeping ancylid.

County records (5): La Crosse (MPM), Milwaukee (CHA), Oneida (M32 *F. tarda*), St. Croix (MPM), Waukesha (BAK).

##### *Laevapex fuscus* (C.B. Adams 1841)

Remarks: Includes *L. kirklandi*.

Common name = dusky ancylid.

County records (11): Brown, Dane, Door, Green Lake, Jefferson, Milwaukee (BAK); Racine (MPM); Vilas, Waukesha, Winnebago (BAK), Wood (MPM).



Bithyniidae

Shells less than 20 mm high. Operculum calcareous, with a spiral nucleus.

*Bithynia tentaculata* (Linnaeus 1758)

Remarks: An introduced species.

Common name = mud bithynia.

County records (4): Calumet, Door, Kenosha, Winnebago (BAK).

Hydrobiidae

Shells less than 10 mm high. Operculum with spiral growth lines.

*Amnicola limosus* (Say 1817)

Remarks: common name = mud amnicola.

County records (10): Barron & Bayfield (BAK), Burnett (MPM), Dane & Door (BAK), Iron (M32), Milwaukee (CHA), Oneida (M32), Sauk (BAK), Vilas (BAK).

*Birgella subglobosus* (Say 1825)

Remarks: Rock River (LAP *Paludina isogona*).

Common name = globe slitsnail.

County records (6): Brown, Calumet, Jefferson, Kenosha, Milwaukee, Winnebago (BAK).

*Fontigens nickliniana* (I. Lea 1838)

Remarks: common name = watercress snail.

County records (1): Door (Hershler et al. 1990).

*Hoyia sheldoni* (Pilsbry 1890)

Remarks: common name = storm hydrobe.

County records (1): Racine (BAK).

*Lyogyrus pilsbryi* (Walker 1906)

Remarks: common name = lake duskysnail.

County records (4): Brown (BAK), Milwaukee, Washington, Waukesha (MPM).

*Lyogyrus walkeri* (Pilsbry 1898)

Remarks: common name = Canadian duskysnail.

County records (8): Bayfield, Columbia, Dane (BAK); Fond du Lac (MPM), Green Lake, Vilas, Waukesha, Winnebago (BAK).

*Pyrgulopsis lustrica* (Pilsbry 1890)

Remarks: common name = boreal marstonia.

County records (12): Barron, Bayfield (BAK); Dane (LAP Four Lakes), Door, Green Lake, Marinette (BAK); Milwaukee (CHA), Oneida (M32), Sauk (BAK *Amnicola oneida*), Vilas, Waukesha, Winnebago (BAK).

*Somatogyrus depressus* (Tryon 1862)

Remarks: common name = sandbar pebblesnail.

County records (6): Brown & Kenosha (BAK), Milwaukee (MPM), St. Croix, Sauk, Winnebago (BAK).

*Somatogyrus tryoni* Pilsbry & F.C. Baker 1927  
Remarks: common name = coldwater pebblesnail.  
County records (6): Door (SOL), Jefferson & Milwaukee (BAK), Oneida & Vilas (M32), Waukesha (BAK).

Lymnaeidae

Shells spiral, dextral. No operculum.

*Acella haldemani* (W.G. Binney 1867)  
Remarks: common name = spindle lymnaea.  
County records (3): Milwaukee (BAK), Vilas (M32), Washington (MPM).

*Bulimnaea megasoma* (Say 1824)  
Remarks: common name = mammoth lymnaea.  
County records (11): Barron, Bayfield (BAK); Brown, Burnett (MPM); Door (SOL), Douglas (MPM); Jefferson, Manitowoc (CHA); Oconto, Oneida, Vilas (BAK).

*Fossaria exigua* (I. Lea 1841)  
Remarks: classification uncertain (Turgeon et al. 1998).  
County records (7): Door & Green Lake (BAK), Iron (M32), Milwaukee (BAK), Vilas (M32), Waukesha & Winnebago (BAK).

*Fossaria modicella* (Say 1825)  
Remarks: common name = rock fossaria.  
County records (10): Bayfield, Calumet (BAK); Door (SOL), Green Lake (BAK), Jefferson (MPM), Marinette, Milwaukee, Oneida, Price, Sauk (BAK).

*Fossaria obrussa* (Say 1825)  
Remarks: common name = golden fossaria.  
County records (13): Bayfield, Brown, Calumet, Columbia, Dane, Door, Green Lake, Jefferson, Manitowoc, Milwaukee, Oneida, Vilas, Waukesha (BAK).

*Fossaria parva* (I. Lea 1841)  
Remarks: common name = pygmy fossaria.  
County records (5): Green Lake (BAK), Jefferson (MPM), Milwaukee, Waukesha, Winnebago (BAK).

*Lymnaea stagnalis* Linnaeus 1758  
Remarks: common name = swamp lymnaea.  
County records (19): Brown (MPM), Calumet (BAK), Dane, Dodge (LAP); Door (SOL), Forest (M32), Green Lake (BAK), Iron (MPM), Jefferson (LAP), Kenosha (BAK), Langlade (MPM), Manitowoc (CHA), Marinette (MPM), Milwaukee (CHA), Oconto (MPM), Oneida & Vilas (BAK), Washington (MPM), Waukesha (LAP).

*Pseudosuccinea columella* (Say 1817)  
Remarks: common name = mimic lymnaea.  
County records (6): Marinette (MPM), Milwaukee & Oneida (BAK), Ozaukee (MPM), Vilas (M32), Waukesha (BAK).

*Stagnicola caperata* (Say 1829)

Remarks: Manitowoc River (LAP).

Common name = wrinkled marshsnail.

County records (4): Door (CHA), Kenosha & Milwaukee (MPM), Waukesha (LAP).

*Stagnicola catescopium* (Say 1867)

Remarks: common name = woodland pondsnail.

County records (8): Barron, Chippewa, Green Lake, Jefferson (BAK); Milwaukee (CHA), Polk (BAK), Vilas (M32), Washington (MPM).

*Stagnicola elodes* (Say 1821)

Remarks: Includes *S. lanceata*, *palustris*, *reflexa*, *umbrosa* & *winnebagoensis*. Common name = marsh pondsnail.

County records (23): Bayfield & Brown (BAK), Burnett (MPM), Dane (LAP), Dodge (MPM), Door (BAK), Douglas & Grant (MPM), Green Lake (BAK), Jefferson (LAP), Kenosha (BAK), Manitowoc & Marinette (MPM), Milwaukee (CHA), Oconto (LAP), Oneida & Price (BAK), Racine (LAP), Vilas & Walworth (BAK), Washington & Waukesha (LAP), Winnebago (BAK).

*Stagnicola emarginata* (Say 1821)

Remarks: Includes *S. nashotahensis*.

Common name = St. Lawrence pondsnail.

County records (8): Dane (LAP), Door, Green Lake, Kenosha, Marquette, Oneida, Vilas, Waukesha (BAK).

*Stagnicola exilis* (I. Lea 1834)

Remarks: common name = flat-whorled pondsnail.

County records (8): Brown & Burnett (BAK), Iron (M32), Juneau, Milwaukee, St. Croix (BAK); Vilas (M32), Waukesha (BAK).

*Stagnicola walkeriana* F.C. Baker 1926

Remarks: common name = calabash pondsnail.

County records (2): Bayfield, Door (BAK).

*Stagnicola woodruffi* (F.C. Baker 1901)

Remarks: common name = coldwater pondsnail.

County records (2): Kenosha, Milwaukee (BAK).

Physidae

Shells spiral, sinistral. No operculum.

*Aplexa elongata* (Say 1821)

Remarks: Milwaukee and Manitowoc Rivers (LAP).

Common name = lance aplexa.

County records (11): Dane (BAK), Grant (MPM), Green Lake, Kenosha, Marinette, Milwaukee, Oneida (BAK); Rock (MPM), Washburn (BAK), Washington (MPM), Winnebago (BAK).

*Physella ancillaria* (Say 1825)

Remarks: common name = pumpkin physa.  
County records (11): Barron & Chippewa (BAK), Door (MPM), Florence, Lafayette, Milwaukee, Price, Rusk, St. Croix, Sauk, Washburn (BAK).

*Physella gyrina* (Say 1821)

Remarks: Includes *P. chetekensis*, *elliptica*, *obrussoides*.  
Common name = tadpole physa.  
County records (31): Barron, Bayfield, Brown, Burnett, Calumet, Clark, Dane (BAK); Dodge, Door, Douglas (MPM); Grant, Green, Green Lake, Jefferson, Kenosha, Manitowoc, Marinette, Milwaukee (BAK); Oconto (MPM), Oneida (M32), Polk, Price, Racine (BAK); Rock (MPM), St. Croix & Taylor (BAK); Vilas (M32), Washington, Waukesha (MPM), Winnebago & Wood (BAK).

*Physella heterostropha* (Say 1817)

Remarks: Includes *P. sayii* & *warreniana*. Milwaukee, Sheboygan & Twin Rivers (LAP).  
Common name = pewter physa.  
County records (26): Adams, Barron, Brown, Burnett, Calumet, Columbia, Dane (BAK); Door & Douglas (MPM), Green Lake (BAK), Jefferson (LAP); Juneau, Kenosha, Marinette, Milwaukee (BAK); Oconto (MPM), Oneida (BAK), Pierce & Rock (MPM), St. Croix, Sauk, Vilas, Washburn (BAK); Washington (MPM), Waukesha, Winnebago (BAK).

*Physella integra* (Haldeman 1841)

Remarks: Includes *P. walkeri*. Common name = ashy physa.  
County records (11): Bayfield, Brown, Dane, Door, Kenosha (BAK); Marinette (BAK *Physa brevispira*), Milwaukee (CHA), Racine (BAK), Vilas (M32), Waukesha & Winnebago (BAK).

*Physella lordi* (Baird 1863)

Remarks: common name = twisted physa.  
County records (4): Iron, Oneida, Vilas (M32); Waushara (BAK *P. laphami* Hancock=type locality).

*Physella magnalacustris* (Walker 1901)

Remarks: common name = Great Lakes physa.  
County records (1): Door (BAK).

*Physella vinosa* (Gould 1847)

Remarks: common name = banded physa.  
County records (1): Bayfield (BAK).

Planorbidae

Shells discoidal or with low spiral. No operculum.

*Gyraulus circumstriatus* (Tryon 1866)

Remarks: common name = disc gyro.

County records (3): Oneida & Vilas (M32), Waukesha (BAK).

*Gyraulus deflectus* (Say 1824)

Remarks: Includes *G. hirsutus*. Common name = flexed gyro.

County records (10): Barron (BAK), Dane & Jefferson (LAP), Manitowoc & Milwaukee (CHA), Oneida (M32), Price (BAK), Vilas (M32), Washington (CHA), Waukesha (LAP).

*Gyraulus parvus* (Say 1817)

Remarks: Manitowoc River (LAP).

Common name = ash gyro.

County records (7): Door (SOL), Fond du Lac (MPM), Iron (M32), Milwaukee (CHA), Oneida & Vilas (M32), Waukesha (LAP).

*Helisoma anceps* (Menke 1830)

Remarks: Includes *H. antrosa*.

Common name = two-ridge rams-horn.

County records (14): Burnett (MPM), Calumet (CHA), Dodge, Door, Douglas (MPM), Forest & Iron (M32), Jefferson & La Crosse (MPM), Milwaukee (CHA), Oneida & Vilas (M32), Washington & Waukesha (CHA).

*Planorbella armigera* (Say 1821)

Remarks: common name = thicklip rams-horn.

County records (8): Door (SOL), Jefferson (MPM), Kenosha, Manitowoc, Milwaukee, Oneida (BAK); Waukesha (LAP), Winnebago (BAK).

*Planorbella campanulata* (Say 1821)

Remarks: common name = bellmouth rams-horn.

County records (26): Barron & Bayfield (BAK), Burnett (MPM), Calumet (BAK), Dane (LAP), Dodge (MPM), Door (SOL), Forest & Iron (M32), Jefferson & Kenosha (BAK), Langlade (MPM), Manitowoc (CHA), Marinette (MPM), Milwaukee (CHA), Oconto (MPM), Oneida (BAK), Racine (MPM), Sauk (BAK), Sheboygan (LAP), Vilas (BAK), Walworth (MPM), Washburn (BAK), Washington (MPM), Waukesha (LAP), Winnebago (BAK).

*Planorbella pilsbryi* (F.C. Baker 1926)

Remarks: common name = file rams-horn.

County records (7): Barron (BAK), Dodge, Milwaukee (MPM); Oneida, Price, Vilas (BAK); Waukesha (MPM).

*Planorbella trivolvis* (Say 1817)

Remarks: common name = marsh rams-horn.

County records (20): Brown (MPM), Calumet & Dane (BAK), Dodge (MPM), Door (SOL), Douglas, Forest, Iron (MPM); Kenosha (BAK), Langlade (MPM), Manitowoc & Milwaukee (CHA), Oconto (MPM), Oneida (M32), Polk & Sheboygan (MPM), Vilas (M32), Washington (MPM), Waukesha (LAP), Wood (MPM).

*Planorbella truncata* (M. Miles 1861)

Remarks: common name = druid rams-horn.

County records (3): Brown, Door, Winnebago (BAK).

*Promenetus exacuus* (Say 1821)

Remarks: Milwaukee River (LAP).

Common name = sharp sprite.

County records (8): Barron, Bayfield, Dane, Green Lake, Milwaukee (BAK), Oneida (M32), Vilas & Waukesha (BAK).

*Promenetus umbilicatellus* (Cockerell 1887)

Remarks: common name = umbilicate sprite.

County records (5): Dane (BAK), Jefferson (MPM), Marinette, Price, Winnebago (BAK).

Pleuroceridae

Shells more than 15 mm high. Operculum oval with spiral growth lines.

*Elimia livescens* (Menke 1830)

Remarks: common name = liver elimia.

County records (10): Barron, Brown, Dodge, Door, Jefferson, Kenosha (BAK); La Crosse (MPM), Marinette (BAK), Milwaukee (CHA), Waukesha (MPM).

*Lithasia obovata* (Say 1829)

Remarks: Milwaukee and Sheboygan Rivers (LAP *Melania depygis*). Common name = Shawnee rocksnail.

County records (0).

*Pleurocera acuta* Rafinesque 1831

Remarks: common name = sharp hornsnail.

County records (16): Bayfield (BAK), Brown (MPM), Buffalo (BAK), Burnett (MPM), Calumet, Columbia, Dane, Green Lake (BAK); Kenosha (MPM), Milwaukee & Pepin (BAK); Pierce, St. Croix, Walworth (MPM); Waukesha & Winnebago (BAK).

Pomatiopsidae

Shells up to 10 mm high, high spired. No operculum. Amphibious snails.

*Pomatiopsis lapidaria* (Say 1817)

Remarks: common name = slender walker.

County records (11): Brown (TES), Crawford (MOB), Dane

(BAK), Grant (HUB), Kenosha (BAK), Kewaunee & Marinette (HUB), Milwaukee (LAP), Pierce (HUB), Richland (BAK), Sauk (HUB).

Valvatidae

Shells less than 7 mm high. Operculum circular with spiral growth lines.

*Valvata bicarinata* I. Lea 1841

Remarks: common name = two-ridge valvata.  
County records (4): Dane (LAP "Four Lakes"), Door (SOL), Milwaukee (CHA), Sheboygan (LAP).

*Valvata lewisi* Currier 1868

Remarks: common name = fringed valvata.  
County records (4): Barron & Bayfield (BAK), Oneida & Vilas (M32).

*Valvata perdepressa* Walker 1906

Remarks: common name = purplecap valvata.  
County records (1): Door (BAK).

*Valvata sincera* Say 1824

Remarks: common name = mossy valvata.  
County records (10): Bayfield, Dane, Door, Green Lake, Milwaukee (BAK); Ozaukee (MPM), Vilas, Walworth, Waukesha, Winnebago (BAK).

*Valvata tricarinata* (Say 1817)

Remarks: common name = threeridge valvata.  
County records (17): Barron, Calumet, Dane, Door (BAK); Dodge & Fond du Lac (MPM), Green Lake, Jefferson, Milwaukee (BAK); Oneida (M32), Ozaukee & Racine (MPM), Sauk (BAK), Vilas (M32), Waukesha (BAK), Waupaca (MPM), Winnebago (BAK).

*Valvata winnebagoensis* F.C. Baker 1928

Remarks: Type locality = Miller Bay, Lake Winnebago.  
Common name = flanged valvata.  
County records (2): Calumet, Winnebago [type site] (BAK).

Viviparidae

Shells 15-35 mm high. Operculum with concentric growth lines.

*Bellamyia chinensis* (Reeve 1863)

Remarks: See Smith (2000) for taxonomic revision of this introduced species. Common name = Chinese mysterysnail.  
County records (3): Milwaukee, Shawano, Waukesha (MPM).

*Campeloma brevispirum* F.C. Baker 1928

Remarks: classification uncertain (Turgeon et al.1998).  
County records (1): Sauk (BAK).

*Campeloma crassulum* Rafinesque 1819

Remarks: common name = ponderous campeloma.  
County records (6): Burnett & Douglas (MPM), Manitowoc & Milwaukee (CHA), Pierce & St. Croix (MPM).

*Campeloma decisum* (Say 1817)

Remarks: Milwaukee, Sheboygan and Rock Rivers (LAP *Paludina decisum*). Common name = pointed campeloma.  
County records (20): Bayfield (BAK), Brown, Burnett (MPM); Columbia, Crawford (BAK); Door (MPM), Forest & Iron (M32), La Crosse (BAK), Manitowoc & Milwaukee (CHA), Oneida (BAK), Ozaukee (MPM), Pierce (BAK), Price (M32), Racine (MPM), Sauk (BAK), Sheboygan (MPM), Vilas (M32), Waukesha (MPM).

*Campeloma milesi* (I. Lea 1863)

Remarks: classification uncertain (Turgeon et al.1998).  
County records (6): Brown, Milwaukee (MPM); Oneida, Vilas, Washburn (BAK), Washington (MPM).

*Campeloma rufum* (Haldeman 1841)

Remarks: classification uncertain (Turgeon et al.1998).  
County records (11): Burnett (MPM), Calumet (CHA), Dane, Door, Manitowoc, Milwaukee, Racine, Sauk, Washington (BAK); Waukesha (CHA), Waupaca (BAK).

*Lioplax subcarinata* (Say 1816)

Remarks: common name = ridged lioplax.  
County records (6): Brown, Calumet (BAK); Dodge (MPM), Jefferson, Kenosha, Winnebago (BAK).

*Viviparus georgianus* (I. Lea 1834)

Remarks: Not a Wisconsin endemic.  
Common name = banded mysterysnail.  
County records (4): Milwaukee (BAK *V. contectoides*); Walworth, Waupaca, Waushara (MPM).

*Viviparus intertextus* (Say 1829)

Remarks: common name = rotund mysterysnail.  
County records (1): Grant (BAK).

*Viviparus subpurpureus* (Say 1829)

Remarks: common name = olive mysterysnail.  
County records (1): Crawford (BAK).

### Terrestrial Gastropoda (80)

Nineteen terrestrial gastropod families have been reported from Wisconsin. For a recent key to terrestrial families and genera, see the well-illustrated Burch and Pearce chapter in Dindal (1990). Mollusks as represented on land by slugs and snails are the second largest group of terrestrial animals, arthropods being the first in terms of numbers of species. In terms of abundance, their numbers may reach as high as 3-12 million per acre under favorable conditions. To survive the dryness of land, terrestrial mollusks are



most active at night because then they are less likely to face the low moisture and high temperatures which could cause them to desiccate and die. To survive a Wisconsin winter, they seek shelter under stones, logs and boards, or bury themselves underground. Some slugs may live as long as five years, and snails as long as ten.

#### Arionidae

Slugs with the mantle in anterior position, with anterior pore. Introduced from Europe.

*Arion fasciatus* (Nilsson 1823)

Remarks: common name = orange-banded arion.

County records (2): Milwaukee, Washington (MPM).

*Arion subfuscus* (Draparnaud 1805)

Remarks: common name = dusky arion.

County records (1): Milwaukee (MPM).

#### Carychiidae

Shells less than 3 mm long, translucent white; aperture with a reflected or expanded lip. No operculum. Animal with one pair of tentacles only.

*Carychium exiguum* (Say 1822)

Remarks: common name = obese thorn.

County records (8): Brown (TES), Dane (L&L), Iowa (HUB), Kenosha (L&L); Marquette, Milwaukee, Ozaukee (JAS); Richland (HUB).

*Carychium exile* I. Lea 1842

Remarks: common name = ice thorn.

County records (7): Crawford (HUB), Douglas (L&L), Fond du Lac (JAS), Grant (HUB), Lafayette, Milwaukee, Ozaukee (JAS).

#### Cionellidae

Shells less than 8 mm wide, very smooth and glossy.

*Cionella lubrica* (Muller 1774)

Remarks: common name = glossy pillar.

County records (9): Ashland (L&L), Brown (TES), Clark (L&L), Dane (LAP), Door & Douglas (L&L), Milwaukee & Sheboygan (LAP), Waukesha (JAS).

*Cionella lubricella* (Porro 1838)

Remarks: common name = thin pillar.

County records (6): Jefferson, Milwaukee, Sauk, Washington, Waupaca, Winnebago (JAS).

*Cionella morseana* Doherty 1878

Remarks: common name = Appalachian pillar.

County records (1): Grant (HUB).

*Cionella nitens* (Gallenstein 1848)

Remarks: common name = robust pillar.

County records (2): Milwaukee, Winnebago (JAS).

Discidae

Shells more or less disc-shaped and umbilicate; having open, toothless apertures and straight rather than reflected lips.

*Anguispira alternata* (Say 1816)

Remarks: common name = flamed tigersnail.

County records (34): Adams (L&L), Brown (TES); Chippewa, Dane (L&L); Dodge (JAS); Door, Douglas, Florence, Fond du Lac, Grant, Iowa, Jefferson, Juneau (L&L); Kenosha (JAS); Kewaunee, Langlade (L&L); Manitowoc (LAP), Marathon (L&L), Milwaukee (LAP); Monroe, Oconto, Oneida, Ozaukee, Pierce, Polk, Price (L&L); Richland, Rock (HUB); Sauk (L&L), Sheboygan (LAP); Trempealeau, Vernon, Walworth (L&L), Washington (JAS).

*Discus catskillensis* (Pilsbry 1896)

Remarks: common name = angular disc.

County records (18): Adams, Ashland, Chippewa, Door, Douglas, Florence, Fond du Lac (L&L); Kenosha (JAS); Kewaunee, Langlade (L&L); Manitowoc (JAS); Marinette (HUB), Menominee (L&L), Oconto (HUB); Polk, Price, Rusk (L&L); Waukesha (JAS).

*Discus patulus* (Deshayes 1830)

Remarks: common name = domed disc.

County records (7): Brown (TES); Dane, Milwaukee (LAP) *Helix perspectiva*; Monroe, Sauk (L&L); Sheboygan (LAP), Vernon (L&L).

*Discus whitneyi* (Newcomb 1864)

Remarks: common name = forest disc.

County records (9): Brown (TES); Clark, Dane (L&L); Douglas (HUB), Juneau (L&L), Milwaukee (JAS), Polk, Rock, St. Croix (HUB).

Haplotrematidae

The only representative of this family in the eastern U.S. has an opaque, light-colored, umbilicate shell.

*Haplotrema concavum* (Say 1821)

Remarks: common name = gray-foot lancetooth.

County records (1): Grant (L&L).

Helicarionidae

Shells small to minute, spire shape differs with the genus.

*Euconulus chersinus* (Say 1821)

Remarks: common name = wild hive.

County records (12): Brown (TES), Dane, Douglas, Florence, Fond du Lac, Grant, Kewaunee, Langlade, Marathon (L&L); Milwaukee (LAP); Oconto, Vernon (L&L).

*Euconulus fulvus* (Muller 1774)

Remarks: common name = brown hive.

County records (13): Ashland (L&L), Brown (TES), Dane, Door, Douglas, Florence (L&L); Grant (HUB), Manitowoc (L&L), Marinette (HUB), Marquette(L&L), Ozaukee (JAS), Price (L&L), Waupaca (JAS).

*Guppya sterkii* (Dall 1888)

Remarks: Classification uncertain (Turgeon et al.1998). Wisconsin at northwestern edge of range.

County records (1): Ozaukee (JAS).

#### Helicidae

Shells more than 25 mm wide. Introduced from Europe.

*Helix pomatia* Linnaeus 1758

Remarks: common name= escargot.

County records (1): Milwaukee (CHA).

#### Helicinidae

Shells wider than high and without ribbed surface sculpturing.

*Hendersonia occulta* (Say 1831)

Remarks: common name = cherrystone drop.

County records (9): Brown (MAR), Crawford (MOB), Dane (HUB); Door, Kewaunee (L&L); Milwaukee (CHA), Monroe (L&L), Sheboygan (LAP), Vernon (L&L).

#### Helicodiscidae

Shells disc-shaped, with whorls that slowly increase in width toward the periphery, and having a wide umbilicus.

*Helicodiscus inermis* H.B. Baker 1929

Remarks: common name = oldfield coil.

County records (2): Crawford (HUB), Ozaukee (JAS).

*Helicodiscus parallelus* (Say 1817)

Remarks: common name = compound coil.

County records (24): Brown (TES), Chippewa, Clark (L&L); Columbia (JAS); Crawford (HUB), Door, Douglas (L&L), Fond du Lac (HUB); Grant, Jackson (L&L); Juneau, Kenosha (JAS); Manitowoc (LAP *Helix lineata*), Marathon (L&L), Milwaukee (LAP); Monroe, Oneida, Ozaukee, Price (L&L); Rock (HUB), Rusk (L&L), Sheboygan (LAP), Walworth (JAS), Wood (L&L).

*Helicodiscus shimeki* Hubricht 1962

Remarks: common name = temperate coil.

County records (2): Milwaukee, Ozaukee (JAS).

*Helicodiscus singleyanus* (Pilsbry 1889)

Remarks: common name = smooth coil.

County records (1): Columbia (JAS).

Limacidae

Slugs with a keeled back and pointed tail. Mantle small and anterior, with posterior pore.

*Deroceras laeve* (Muller 1774)

Remarks: Wisconsin is at the northwestern edge of this species range. Common name = meadow slug.

County records (2): Crawford Ozaukee (JAS).

*Deroceras reticulatum* (Muller 1774)

Remarks: An introduced species.

Common name = gray fieldslug.

County records (4): Kenosha, Milwaukee, Ozaukee, Washington (MPM).

*Limax flavus* Linnaeus 1758

Remarks: An introduced species.

Common name = yellow gardenslug.

County records (1): Milwaukee (CHA).

*Limax maximus* Linnaeus 1758

Remarks: An introduced species.

Common name = giant gardenslug.

County records (1): Milwaukee (MPM).

Philomycidae

Slugs with a long mantle covering the entire back.

*Pallifera dorsalis* (A. Binney 1842)

Remarks: common name = pale mantleslug.

County records (6): Columbia, Dane, Iowa, Jefferson (HUB), Milwaukee (CHA), Waukesha (HUB).

*Philomycus carolinianus* (Bosc 1802)

Remarks: common name = Carolina mantleslug.

County records (1): Sheboygan (MPM).

Polygyridae

Shells 5-40 mm wide. Mature specimens have aperture with teeth and a reflected lip.

*Allogona profunda* (Say 1821)

Remarks: common name = broad-banded forestsnail.

County records (23): Brown (TES), Calumet (JAS), Dodge

(MPM), Door, Florence, Grant, Jefferson (L&L); Kenosha (ECW), Kewaunee (L&L), Manitowoc (LAP), Marinette (HUB), Menominee (L&L), Milwaukee (LAP), Monroe L&L, Oconto, Outagamie (HUB); Ozaukee, Sauk (L&L); Sawyer (HUB), Sheboygan (LAP), Taylor, Vernon (L&L); Waukesha (JAS).

*Euchemotrema fraternum* (Say 1824)

Remarks: common name = upland pillsnail.

County records (22): Brown (TES), Burnett (JAS); Chippewa, Clark (L&L); Crawford (MOB), Dane (MOA), Door (L&L), Douglas (HUB), Grant (L&L), Juneau (HUB), Kewaunee, Langlade (L&L); Manitowoc (LAP), Marathon (L&L), Marinette (HUB), Milwaukee (LAP), Oconto (HUB), Pierce, Polk, Vernon (L&L); Waukesha (JAS), Waupaca (HUB).

*Euchemotrema leai* (A. Binney 1841)

Remarks: common name = lowland pillsnail.

County records (7): Brown (TES), Dane, Door, Kenosha (L&L); Manitowoc, Milwaukee, Sheboygan (LAP *Helix monodon*).

*Mesodon clausus* (Say 1821)

Remarks: common name = yellow globelet.

County records (2): Grant (HUB), Milwaukee (LAP).

*Mesodon thyroideus* (Say 1816)

Remarks: common name = whitelip globe.

County records (13): Brown (TES), Clark (L&L), Dane (HUB), Door (SOL); Marinette, Menominee (HUB), Milwaukee (JAS), Monroe (L&L), Oconto (HUB), Ozaukee (JAS), Shawano (HUB), Vernon (L&L), Waukesha (JAS).

*Neohelix albolabris* (Say 1817)

Remarks: common name = whitelip.

County records (19): Burnett (JAS); Clark, Door, Fond du Lac (L&L); Manitowoc (LAP); Marathon (L&L), Marinette (HUB), Menominee (L&L), Milwaukee (LAP), Monroe, Oconto (L&L); Ozaukee (JAS), Price (L&L), Sheboygan (LAP); Trempealeau, Vernon (L&L); Vilas, Waukesha (JAS), Winnebago (LAP).

*Patera pennsylvanica* (Green 1827)

Remarks: Wisconsin is at the northwestern edge of this species range. Common name = proud globelet.

County records (2): Milwaukee, Oconto (JAS).

*Stenotrema hirsutum* (Say 1817)

Remarks: common name = hairy slitmouth.

County records (7): Crawford (MOB), Grant, Juneau (L&L); Manitowoc (HUB), Milwaukee (LAP), Sauk (LAP), Sheboygan (LAP).

*Triodopsis tridentata* (Say 1816)

Remarks: Wisconsin is at the western edge of range of this northeastern species. Common name = northern threetooth.  
County records (1): Waukesha (JAS).

*Triodopsis vulgata* Pilsbry 1940

Remarks: Wisconsin at northwestern edge of range.  
Common name = dished threetooth.  
County records (1): Waukesha (JAS).

*Webbhelix multilineata* (Say 1821)

Remarks: common name = striped whitelip.  
County records (12): Brown (TES), Calumet (JAS), Crawford (HUB), Dane (LAP), Door (MPM), Grant (L&L), Marinette, Menominee (HUB), Milwaukee (LAP), Oconto (HUB), Rock (L&L), Sauk (HUB).

Punctidae

Shells less than 2 mm wide with about 4 whorls and usually with ribbed sculpturing on the surface.

*Punctum minutissimum* (I. Lea 1841)

Remarks: common name = small spot.  
County records (9): Adams (L&L), Brown (TES); Iowa, Juneau, Kenosha, Lafayette, Milwaukee, Ozaukee, Waupaca (JAS).

Pupillidae

Shells less than 5 mm wide, usually pupa-shaped. Aperture usually with teeth.

*Columella edentula* (Draparnaud 1805)

Remarks: common name = toothless column.  
County records (8): Ashland, Clark, Door, Douglas, Forest, Rusk, Taylor, Vernon (L&L).

*Columella simplex* (Gould 1840)

Remarks: classification uncertain (Turgeon et al. 1998).  
County records (3): Adams, Milwaukee, Ozaukee (JAS).

*Gastrocopta armifera* (Say 1821)

Remarks: common name = armed snaggletooth.  
County records (6): Brown (TES), Dane(L&L), Dodge, Grant (HUB), Marquette (L&L), Milwaukee (LAP).

*Gastrocopta contracta* (Say 1822)

Remarks: common name = bottleneck snaggletooth.  
County records (13): Ashland (L&L), Brown (TES), Dane (MOA), Door, Douglas, Fond du Lac, Grant (L&L); Milwaukee (JAS), Monroe (L&L), Ozaukee (JAS); Pierce, Sauk (L&L); Waupaca (JAS).

*Gastrocopta corticaria* (Say 1816)

Remarks: common name = bark snaggletooth.

County records (1): Milwaukee (LAP).

*Gastrocopta holzingeri* (Sterki 1889)

Remarks: common name = lambda snaggletooth.

County records (3): Brown (TES), Ozaukee (JAS), Waupaca (HUB).

*Gastrocopta pentodon* (Say 1822)

Remarks: common name = comb snaggletooth.

County records (9): Brown (TES), Dane (MOA), Grant (HUB), Kenosha (JAS), Kewaunee, Manitowoc (HUB); Milwaukee, Ozaukee, Waupaca (JAS).

*Gastrocopta tappaniana* (C.B. Adams 1842)

Remarks: Wisconsin is at the northwestern edge of this species range. Common name = white snaggletooth.

County records (2): Dane (L&L), Milwaukee (JAS).

*Pupoides albilabris* (C.B. Adams 1841)

Remarks: common name = white-lip dagger

County records (1): Dane (MOA).

*Vertigo elatior* Sterki 1894

Remarks: common name = tapered vertigo.

County records (2): Menominee, Shawano (HUB).

*Vertigo gouldi* (A. Binney 1843)

Remarks: common name = variable vertigo.

County records (3): Douglas (L&L); Milwaukee, Washington (JAS).

*Vertigo milium* (Gould 1840)

Remarks: common name = blade vertigo.

County records (9): Brown (TES), Dane (MOA), Marinette, Menominee (HUB); Milwaukee (JAS), Outagamie (HUB), Ozaukee (JAS), Shawano, Washington (HUB).

*Vertigo nylanderii* Sterki 1909

Remarks: common name = deep-throat vertigo.

County records (1): Door (L&L).

*Vertigo ovata* Say 1822

Remarks: common name = ovate vertigo.

County records (10): Ashland (L&L), Brown (TES), Dane (MOA), Douglas, Florence (L&L); Marinette (HUB), Milwaukee (LAP), Oconto, Outagamie (HUB), Sheboygan (L&L).

*Vertigo tridentata* Wolf 1870

Remarks: common name = honey vertigo.

County records (1): Milwaukee (JAS).

*Vertigo ventricosa* (E.S. Morse 1865)

Remarks: common name = five-tooth vertigo.

County records (2): Milwaukee (JAS), Taylor (L&L).

#### Strobilopsidae

Shells less than 3 mm wide, dome-shaped, aperture with shell folds.

*Strobilops aeneus* Pilsbry 1926

Remarks: common name = bronze pinecone.

County records (2): Door, Grant (L&L).

*Strobilops affinis* Pilsbry 1893

Remarks: common name = eightfold pinecone.

County records (5): Brown (TES), Dane (MOA), Fond du Lac (L&L), Milwaukee (JAS), Outagamie (HUB).

*Strobilops labyrinthicus* (Say 1817)

Remarks: common name = maze pinecone.

County records (29): Adams, Ashland (L&L), Brown (TES), Crawford (HUB); Door, Douglas, Fond du Lac, Forest, Grant, Juneau, Kewaunee, Langlade, Lincoln (L&L); Manitowoc (LAP), Marinette (HUB), Menominee (L&L), Milwaukee (LAP); Monroe, Oconto, Oneida (L&L); Outagamie (HUB), Ozaukee (JAS); Pierce, Polk, Price, Rusk (L&L); Sheboygan (LAP); Vernon, Walworth (L&L).

#### Succineidae

Shell very thin, amber colored, aperture very large. Found near water.

*Catinella vermeta* (Say 1829)

Remarks: common name = suboval ambersnail.

County records (11): Brown (TES), Buffalo (L&L), Crawford (MOB), Dane, Door, Grant (L&L); Marinette (HUB), Milwaukee (LAP *Succinea avara*), Outagamie, Pierce, Richland (HUB).

*Novisuccinea ovalis* (Say 1817)

Remarks: common name = oval ambersnail.

County records (25): Bayfield (HUB), Brown (TES), Clark (L&L), Crawford (MOB), Dane, Door, Douglas, Grant, Iowa, Langlade (L&L); Manitowoc (LAP *Succinea obliqua*), Marathon, Marinette, Menominee (HUB), Milwaukee (LAP), Oconto (HUB), Ozaukee (JAS), Pierce, Rock, St. Croix (HUB), Sauk (JAS), Shawano (HUB), Vernon (L&L), Vilas (JAS), Washington (HUB).

*Oxyloma retusum* (I. Lea 1834)

Remarks: common name = blunt ambersnail.

County records (16): Brown (TES), Buffalo (L&L), Calumet (MPM), Crawford (MOB), Dane (L&L), Dodge (HUB), Door (SOL), Fond du Lac (L&L); Grant, Jefferson (HUB), Kenosha (JAS), Marinette (HUB), Milwaukee (JAS), Oconto, Outagamie (HUB), Washington (JAS).



Valloniidae

Shell less than 3 mm wide, flattened; aperture toothless.

*Planogyra asteriscus* (E.S. Morse 1857)

Remarks: common name = eastern flat-whorl.

County records (1): Sheboygan (HUB).

*Vallonia costata* (Muller 1774)

Remarks: common name = costate vallonina.

County records (10): Brown (TES), Dane, Marathon (L&L); Milwaukee, Ozaukee (JAS), Rock, St. Croix, Vilas (HUB), Washington, Waukesha (JAS).

*Vallonia excentrica* Sterki 1893

Remarks: common name = Iroquois vallonina.

County records (3): Brown (TES), Milwaukee, Washington (JAS).

*Vallonia pulchella* (Muller 1774)

Remarks: common name = lovely vallonina.

County records (17): Brown (TES), Crawford (MOB), Dane (L&L), Dodge (HUB), Kenosha (ECW); Langlade, Marathon (L&L); Marinette, Menominee (HUB), Milwaukee (CHA), Pierce, St. Croix, Shawano (HUB), Sheboygan (L&L); Washington, Waukesha, Winnebago (JAS).

Vitrinidae

Shell colorless or pale greenish, glossy, transparent, thin, fragile.

*Vitrina angelicae* Beck 1837

Remarks: Wisconsin at western edge of range.

Common name = eastern glass-snail.

County records (2): Milwaukee, Waukesha (JAS).

Zonitidae

Shell lip thin, not reflected. Foot margin with pedal groove.

*Glyphyalinia indentata* (Say 1823)

Remarks: common name = carved glyph.

County records (11): Brown (TES), Dane (MOA), Door, Douglas, Fond du Lac (L&L); Kenosha, Milwaukee (JAS); Monroe (L&L), Ozaukee (JAS), Vernon (L&L), Walworth (JAS).

*Hawaiiia minuscula* (A. Binney 1841)

Remarks: common name = minute gem

County records (6): Brown (TES), Dane (L&L), Milwaukee (JAS), Outagamie (HUB), Ozaukee (JAS); Vernon (L&L).

*Nesovitrea binneyana* (E.S. Morse 1864)

Remarks: common name = blue glass.

County records (12): Adams (JAS); Ashland, Clark, Door,

Douglas, Juneau (L&L); Kenosha (JAS); Marinette (HUB fossil), Oneida (L&L), Taylor, Vernon, Walworth (L&L).

*Nesovitrea electrina* (Gould 1841)

Remarks: common name = amber glass.

County records (4): Brown (TES), Dane, Langlade (L&L); Milwaukee (JAS).

*Oxychilus cellarius* (Muller 1774)

Remarks: An introduced species.

Common name = cellar glass-snail.

County records (2): Milwaukee, Waukesha (CHA).

*Oxychilus draparnaudi* (Beck 1837)

Remarks: An introduced species.

Common name = dark-bodied glass-snail.

County records (1): Milwaukee (CHA).

*Paravitrea multidentata* (A. Binney 1840)

Remarks: common name = dentate supercoil.

County records (1): Door (L&L).

*Striatura exigua* (Stimpson 1850)

Remarks: common name = ribbed striate.

County records (2): Douglas (L&L), Fond du Lac (HUB).

*Striatura ferrea* E.S. Morse 1864

Remarks: common name = black striate.

County records (1): Rusk (L&L).

*Striatura milium* (E.S. Morse 1859)

Remarks: common name = fine-ribbed striate.

County records (4): Brown (TES), Douglas (L&L), Fond du Lac (HUB), Walworth (JAS).

*Zonitoides arboreus* (Say 1816)

Remarks: common name = quick gloss.

County records (52): Adams, Ashland (L&L), Brown (TES); Buffalo, Chippewa, Clark (L&L); Crawford (MOB); Dane (LAP); Door, Douglas (L&L); Dunn (HUB); Florence, Fond du Lac, Forest, Grant, Iowa, Jackson, Juneau, Kenosha, Kewaunee, Langlade, Lincoln (L&L); Manitowoc (LAP), Marathon (L&L), Marinette (HUB), Marquette (L&L), Menominee (HUB), Milwaukee (LAP); Monroe, Oconto, Oneida (L&L), Outagamie (HUB); Ozaukee, Pierce, Polk, Price, Richland (L&L), Rock (HUB); Rusk, Sauk (L&L); Shawano (HUB); Sheboygan (LAP); Taylor, Trempealeau, Vernon, Vilas, Walworth (L&L), Washington (HUB), Waukesha (L&L), Waupaca (HUB), Waushara (JAS), Wood (L&L).

*Zonitoides limatulus* (A. Binney 1840)

Remarks: common name = dull gloss.

County records (3): Door, Monroe, Vernon (L&L).

*Zonitoides nitidus* (Muller 1774)

Remarks: common name = black gloss.

County records (7): Brown (TES), Dane (HUB), Door (SOL), Milwaukee (MPM), Racine (JAS), Richland (HUB), Waukesha (JAS).

### Discussion

For his maps summarizing known distributions, Hubricht (1985) chose the county as the basic distributional unit and at the same time noted that records ending abruptly at such political boundaries indicate the need for additional collecting efforts rather than true range delimitations. Using *Carychium exiguum*, *Discus cronkhitei* and *Zonitoides arboreus*, he showed that the absence of county records for these three widely distributed U.S. species provided a good indication of where collecting gaps occurred. This may also be used as a criterion to evaluate the records from Wisconsin. The best reported terrestrial gastropod for the state is *Zonitoides arboreus*, a species that ranges across the U.S. Its presence in 52 of Wisconsin's 72 counties represents only 72% of the possibilities. The best reported freshwater species for the state is *Physella gyrina* at 31 counties, only 43% of the total. These low figures for even the most widely distributed species support the supposition that, for Wisconsin, gaps due simply to lack of collecting play a significant role in obscuring any attempt to gain a clear picture of freshwater and terrestrial gastropod distributions in the state. The resulting high degree of uncertainty as to the presence and location of actual gaps in species distributions, especially in light of the fact that a mere 29 of the 148 species (19.6%) have been collected from a dozen counties or more, hampers considerably any efforts to realistically assess the current status of the fauna and plan for its future conservation.

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### Counties of Wisconsin

1. Adams
2. Ashland
3. Barron
4. Bayfield
5. Brown
6. Buffalo
7. Burnett
8. Calumet
9. Chippewa
10. Clark
11. Columbia
12. Crawford
13. Dane
14. Dodge
15. Door
16. Douglas
17. Dunn
18. Eau Claire
19. Florence
20. Fond du Lac
21. Forest
22. Grant
23. Green
24. Green Lake
25. Iowa
26. Iron
27. Jackson
28. Jefferson
29. Juneau
30. Kenosha
31. Kewaunee
32. La Crosse
33. Lafayette
34. Langlade
35. Lincoln
36. Manitowoc
37. Marathon
38. Marinette
39. Marquette
40. Menominee
41. Milwaukee
42. Monroe
43. Oconto
44. Oneida
45. Outagamie
46. Ozaukee
47. Pepin
48. Pierce
49. Polk
50. Portage
51. Price
52. Racine
53. Richland
54. Rock
55. Rusk
56. St. Croix
57. Sauk
58. Sawyer
59. Shawano
60. Sheboygan
61. Taylor
62. Trempealeau
63. Vernon
64. Vilas
65. Walworth
66. Washburn
67. Washington
68. Waukesha
69. Waupaca
70. Waushara
71. Winnebago
72. Wood



**FIGURE 1** Wisconsin counties.

**TABLE 2** Classification and summary of Wisconsin gastropod families.

- Phylum Mollusca,
  - Class Gastropoda
    - Order Neritopsina
      - Helicinidae — terrestrial (1)
    - Order Architaenioglossa
      - Viviparidae — freshwater (10)
    - Order Neotaenioglossa
      - Pleuroceridae — freshwater (3)
      - Bithyniidae — freshwater (1)
      - Hydrobiidae — freshwater (9)
      - Pomatiopsidae — amphibious, listed under freshwater (1)
    - Order Heterostropha
      - Valvatidae — freshwater (6)
    - Order Basommatophora
      - Lymnaeidae — freshwater (15)
      - Physidae — freshwater (8)
      - Planorbidae — freshwater (11)
      - Ancylidae — freshwater (4)
      - Carychiidae — terrestrial (2)
    - Order Stylommatophora
      - Cionellidae — terrestrial (4)
      - Pupillidae — terrestrial (16)
      - Valloniidae — terrestrial (4)
      - Strobilopsidae — terrestrial (3)
      - Haplotrematidae — terrestrial (1)
      - Punctidae — terrestrial (1)
      - Helicodiscidae — terrestrial (4)
      - Discidae — terrestrial (4)
      - Arionidae — terrestrial (2)
      - Philomycidae — terrestrial (2)
      - Succineidae — terrestrial (3)
      - Helicarionidae — terrestrial (3)
      - Zonitidae — terrestrial (13)
      - Vitrinidae — terrestrial (1)
      - Limacidae — terrestrial (4)
      - Polygyridae — terrestrial (11)
      - Helicidae — terrestrial (1)