Cipangopaludina chinensis
(Chinese mysterysnail)
Mollusks-Gastropods
Exotic

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Cipangopaludina chinensis (Gray, 1834)

Common name: Chinese mysterysnail

Synonyms and Other Names: Chinese mysterysnail, Oriental mysterysnail, Asian applesnail, Chinese applesnail, *C. chinensis malleatus, Viviparus malleatus, V. chinensis malleatus, Bellamya chinensis, B. chinensis malleatus*

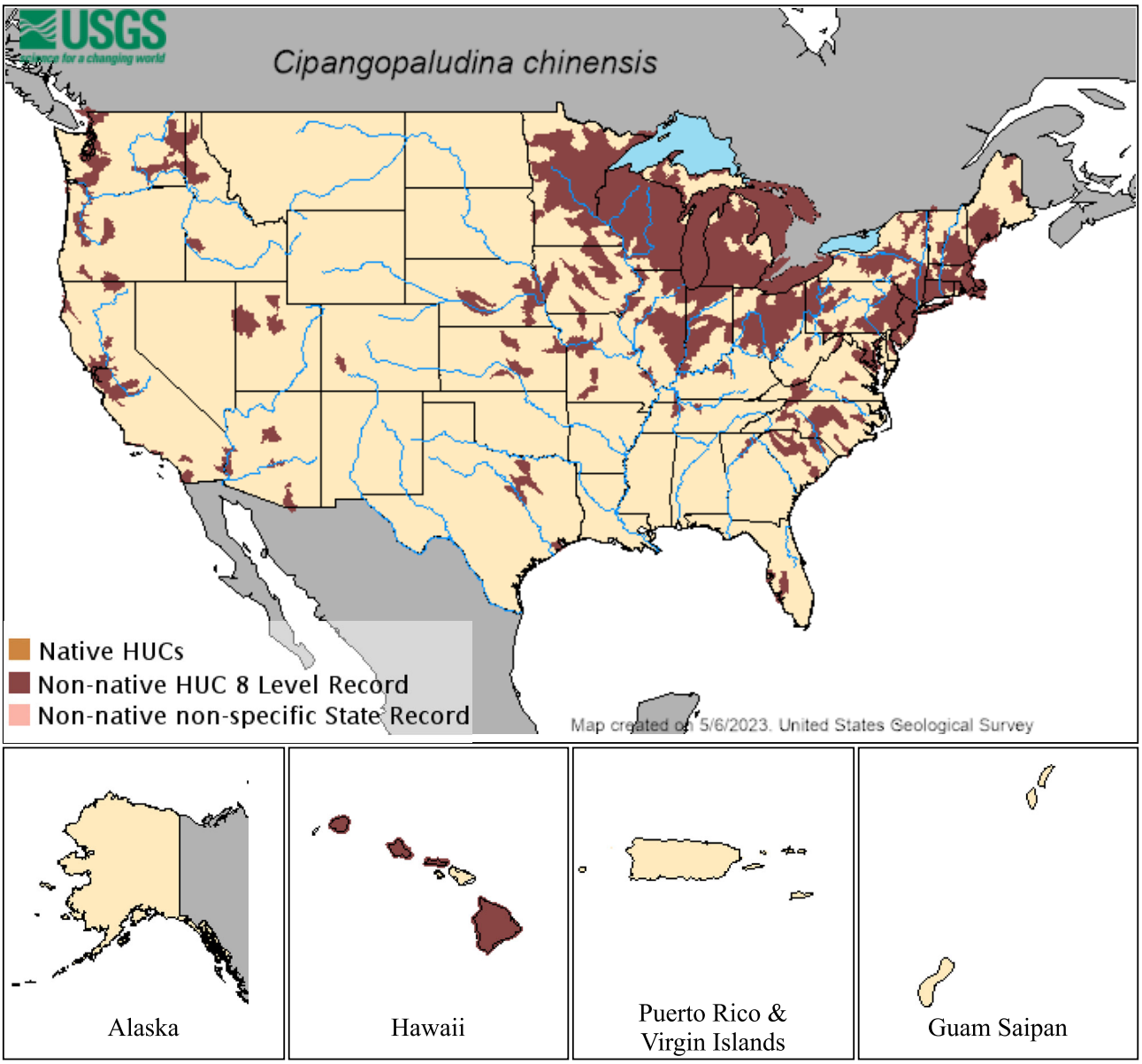
Taxonomy: available through www.itis.gov

Identification: Species of the genus *Cipangopaludina* can be identified by their relatively large globose shells and concentrically marked opercula (Burch 1980). *Cipangopaludina chinensis* has a width to height ratio of 0.74–0.82, the shell has 6.0–7.0 whorls, and the inner coloration is white to pale blue (Clarke 1981, Jokinen 1992). This species has a small and round umbilicus and the spire is produced at an angle of 65–80º (Jokinen 1992). *Cipangopaludina chinensis* exhibits light coloration as a juvenile and olive green, greenish brown, brown or reddish brown pigmentation as an adult (Clarke 1981, Jokinen 1992). In juveniles, the last shell whorl displays a distinct carina, and the shell contains grooves with 20 striae/mm between each groove (Clarke 1981, Smith 2000). Juveniles also have a detailed pattern on their periostracum consisting of 2 apical and 3 body whorl rows of hairs with long hooks on the ends, distinct ridges and many other hairs with short hooks (Jokinen 1984).

The shell of *C. chinensis* grows allometrically (the height increasing faster than the width) and does so at a decreased rate in comparison with *C. japonica*, such that the adult shell is less elongate than that of its congener (Jokinen 1982). The radula (feeding structure) also may differ between *C. japonica* and *C. chinensis*, but there is so much variation even within

one species that it is not a good diagnostic characteristic (Smith 2000). However, as a general guide, in one North American population, the radula of *C. chinensis* had seven small cusps on the marginal tooth and a large central cusp with four small cusps on either side (Jokinen 1982).
Size: can reach 64 mm (Johnsons et al., 2009)

Native Range: From Southeast Asia to Japan and eastern Russia.



Nonindigenous Occurrences:

Table 1. States with nonindigenous occurrences, the earliest and latest observations in each state, and the tally and names of HUCs with observations†. Names and dates are hyperlinked to their relevant specimen records. The list of references for all nonindigenous occurrences of *Cipangopaludina chinensis* are found here.

State	First Observed	Last Observed	Total HUCs with observations†	HUCs with observations†
AZ	1965	2020	4	Imperial Reservoir; Lower Salt; Upper Santa Cruz; Upper Verde
CA	1911	2021	14	Coyote; Honcut Headwaters-Lower Feather; Lower Sacramento; Mad-Redwood; Middle San Joaquin-Lower Chowchilla; Pajaro; San Diego;

State	First Observed	Last Observed	Total HUCs with observations†	HUCs with observations†
				San Francisco Bay; San Jacinto; San Joaquin Delta; San Pablo Bay; Santa Barbara Coastal; Santa Monica Bay; Suisun Bay
CO	1965	1965	1	Uncompahgre
CT	1983	2022	7	Farmington River; Housatonic; Outlet Connecticut River; Quinebaug River; Quinnipiac; Saugatuck; Shetucket River
DE	1965	1965	1	Broadkill-Smyrna
DC	2021	2021	1	Middle Potomac-Anacostia-Occoquan
FL	1965	2018	3	Charlotte Harbor; Peace; Tampa Bay
GA	2013	2013	1	Upper Chattahoochee
HI	1800	1997	4	Hawaii; Kauai; Molokai; Oahu
ID	2008	2022	5	Clearwater; Lower Boise; Palouse; Pend Oreille Lake; Upper Spokane
IL	1940	2022	19	Apple-Plum; Chicago; Copperas-Duck; Des Plaines; Embarras; Flint-Henderson; Kankakee; Kishwaukee; Little Wabash; Lower Fox; Lower Illinois-Lake Chautauqua; Mackinaw; Pike-Root; Salt; Upper Fox; Upper Kaskaskia; Upper Mississippi-Cape Girardeau; Upper Sangamon; Vermilion
IN	1965	2022	14	Eel; Highland-Pigeon; Kankakee; Little Calumet-Galien; Lower Wabash; Lower White; Middle Wabash-Busseron; Middle Wabash-Little Vermilion; Ohio Region; St. Joseph; Tippecanoe; Upper White; Whitewater; Wildcat
IA	1943	2022	9	Blackbird-Soldier; Boyer; Flint-Henderson; Maple; Middle Cedar; Middle Des Moines; South Skunk; Upper Wapsipinicon; Winnebago
KS	2001	2021	6	Little Arkansas; Lower Kansas, Kansas; Lower Missouri-Crooked; North Fork Ninnescah; Solomon; Upper Walnut River
KY	2009	2017	2	Kentucky Lake; Salt
ME	1965	2021	7	Fish River; Lower Androscoggin River; Lower Kennebec River; Mattawamkeag River; Piscataqua-Salmon Falls; Presumpscot; St. George-Sheepscot
MD	1974	2021	4	Middle Potomac-Anacostia-Occoquan; Patuxent; Upper Chesapeake Bay; Youghiogheny
MA	1914	2022	10	Ashuelot River-Connecticut River; Blackstone River; Cape Cod; Charles; Chicopee River; Deerfield River; Merrimack River; Narragansett; Nashua River; Outlet Connecticut River
MI	1947	2022	33	Au Gres-Rifle; Au Sable; Betsy-Chocolay; Black; Black-Macatawa; Boardman-Charlevoix; Clinton; Detroit; Flint; Great Lakes Region; Huron; Kalamazoo; Keweenaw Peninsula; Lake Huron; Lake St. Clair; Lower Grand; Manistee; Maple; Menominee; Michigamme; Muskegon; Ontonagon; Ottawa-Stony; Pere Marquette-White; Raisin; Shiawassee; St. Joseph; Thornapple; Thunder Bay; Tiffin; Tittabawassee; Upper Grand; Upper Wisconsin
MN	1944	2022	37	Baptism-Brule; Beartrap-Nemadji; Beaver-Lester; Buffalo; Buffalo-Whitewater; Cannon; Chippewa; Clearwater; Clearwater-Elk; Cloquet; Crow; Crow Wing; Elk-Nokasippi; Kettle; Lac Qui Parle; Leech Lake; Little Fork; Long Prairie; Lower Minnesota; Lower St. Croix;

State	First Observed	Last Observed	Total HUCs with observations†	HUCs with observations†
				Mississippi Headwaters; Otter Tail; Pine; Platte-Spunk; Prairie-Willow; Red Lake; Red Lakes; Redeye; Rum; Rush-Vermillion; Sauk; Shell Rock; Snake; St. Louis; Twin Cities; Upper Cedar; Vermilion
MO	2002	2019	8	Blackwater; James; Little Chariton; Lower Kansas, Kansas; Lower Missouri-Crooked; Niangua; Peruque-Piasa; Thompson
NE	1974	2020	7	Big Papillion-Mosquito; Lower Elkhorn; Lower Platte; Middle Big Blue; Middle Platte-Buffalo; Salt; South Loup
NH	1973	2022	8	Ashuelot River-Connecticut River; Black River-Connecticut River; Contoocook River; Merrimack River; Pemigewasset River; Piscataqua-Salmon Falls; Waits River-Connecticut River; Winnipesaukee River
NJ	1965	2022	8	Cohansey-Maurice; Crosswicks-Neshaminy; Hackensack-Passaic; Lower Delaware; Middle Delaware-Musconetcong; Mullica-Toms; Raritan; Sandy Hook-Staten Island
NY	1920	2022	14	Chenango; Hudson-Wappinger; Lake Champlain; Lower Hudson; Middle Delaware-Mongaup-Brodhead; Middle Hudson; Mohawk; Niagara River; Oneida; Raquette; Rondout; Saranac River; Seneca; Southern Long Island
NC	1965	2022	10	Deep; Haw; Lower Cape Fear; Lower Pee Dee; Lower Tar; Lower Yadkin; Roanoke Rapids; Upper Catawba; Upper Neuse; Upper Pee Dee
OH	1965	2022	21	Ashtabula-Chagrin; Black-Rocky; Cuyahoga; Hocking; Lake Erie; Licking; Little Miami; Lower Scioto; Mahoning; Mohican; Muskingum; Paint; Raccoon-Symmes; Sandusky; Shenango; Tuscarawas; Upper Great Miami, Indiana, Ohio; Upper Ohio; Upper Scioto; Walhonding; Wills
OR	2008	2022	8	Coast Fork Willamette; Lost; Lower Willamette; Middle Rogue; Middle Willamette; Necanicum; Upper Deschutes; Upper Willamette
PA	1957	2022	20	Beaver; Connoquenessing; Crosswicks-Neshaminy; French; Lackawaxen; Lake Erie; Lehigh; Lower Allegheny; Lower Delaware; Lower Susquehanna; Lower Susquehanna-Swatara; Middle Allegheny-Redbank; Middle Allegheny-Tionesta; Middle Delaware-Musconetcong; Raystown; Schuylkill; Shenango; Sinnemahoning; Upper Delaware; Upper Susquehanna-Lackawanna
RI	1965	2018	1	Narragansett
SC	2017	2022	6	Cooper; Lake Marion; Lower Broad; Saluda; Tyger; Wateree
TN	2018	2022	1	Lower Cumberland-Sycamore
TX	1965	2020	6	Elm Fork Trinity; Lower West Fork Trinity; Middle Brazos-Lake Whitney; Trinity; Upper Trinity; West Galveston Bay
UT	1965	2022	4	Lower Weber; Southern Great Salt Lake Desert; Spanish Fork; Utah Lake
VT	1965	2022	2	Black River-Connecticut River; Waits River-Connecticut River
VA	1993	2022	4	Lower Potomac; Middle James-Willis; Middle Potomac-Anacostia-Occoquan; Upper New

State	First Observed	Last Observed	Total HUCs with observations†	HUCs with observations†
WA	1965	2022	15	Colville; Deschutes; Hangman; Lake Washington; Little Spokane; Lower Columbia-Clatskanie; Lower Cowlitz; Lower Spokane; Nisqually; Nooksack; Palouse; Puget Sound; Puyallup; Strait of Georgia; Upper Columbia-Priest Rapids
WV	2011	2020	3	Cacapon-Town; Middle New; West Fork
WI	1974	2022	41	Bad-Montreal; Baraboo; Beartrap-Nemadji; Black; Brule; Buffalo-Whitewater; Castle Rock; Coon-Yellow; Des Plaines; Duck-Pensaukee; Eau Claire; Flambeau; Jump; La Crosse-Pine; Lake Dubay; Lake Michigan; Lake Winnebago; Lower Chippewa; Lower Fox; Lower St. Croix; Lower Wisconsin; Manitowoc-Sheboygan; Menominee; Middle Rock; Milwaukee; Namekagon; Oconto; Ontonagon; Peshtigo; Pike-Root; Red Cedar; South Fork Flambeau; Sugar; Trempealeau; Upper Chippewa; Upper Fox; Upper Fox; Upper Rock; Upper St. Croix; Upper Wisconsin; Wolf

Table last updated 2/27/2023
† Populations may not be currently present.

Ecology: *Cipangopaludina chinensis* feeds non-selectively on organic and inorganic bottom material as well as benthic and epiphytic algae, mostly by scraping, but diatoms are probably the most nutritious food it ingests at sites in eastern North America (Jokinen 1982).

It prefers lentic water bodies with silt, sand, and mud substrate in eastern North America, although it can survive in slower regions of streams as well (Jokinen 1982, Stanczykowska et al. 1971). This species has been found in waters in eastern North America with pH 6.5–8.4, calcium concentration of 5–97 ppm, magnesium concentration of 13–31 ppm, oxygen concentration of 7–11 ppm, depths of 0.2–3 m, conductivity of 63–400 µmhos/cm, and sodium concentration of 2–49 ppm (Jokinen 1982, Jokinen 1992, Stanczykowska et al. 1971). It can tolerate conditions in stagnant waters near septic tanks (Perron and Probert 1973). Prefers slow-moving freshwater rivers, streams, and lakes with soft, muddy or silty bottoms.

This species is ovoviviparous (Jokinen 1992). Females live up to 5 years, while males live up to 3, occasionally 4 years (Jokinen 1982; Jokinen 1992). Female fecundity is very high, with brood pouches found to contain up to 133 embroys at once; larger females have larger broods, rather than larger embryos, increasing cluch sizes overall (Stephen et al. 2013). All females generally contain embryos from May to August and young are born from June through October in eastern North America in shallow water, then females begin migrating to deeper water for the winter in the fall (Jokinen 1982; Jokinen 1992; Stanczykowska et al. 1971). Females bear more young in their 4th and 5th years than in other years (Jokinen 1992).

Johnson et al. (2009) showed that *C. chinensis* often co-occurs with the rusty crayfish (*Faxonius rusticus*), another species that has invaded the midwest; this co-occurrence is likey due to the resistance of *C. chinensis* to crayfish predation, which is attributed to their thick shell.

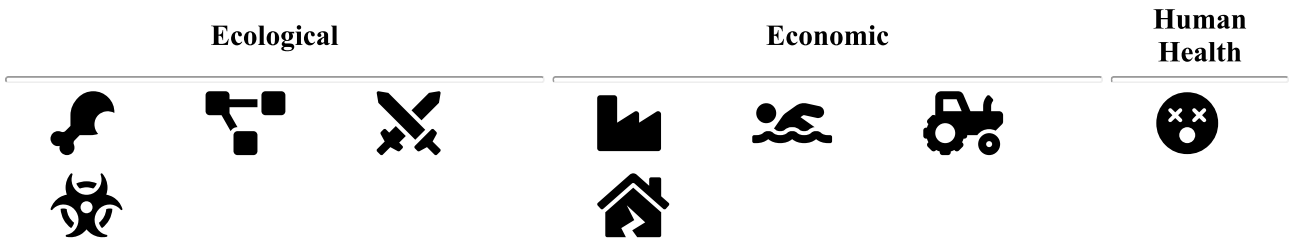
This species is a host to many parasites (see 'Impacts' section below; Chang et al 1968; Michelson 1970; Otsuru 1979; Chao et al. 1993; Chung and Jung, 1999; Sohn et al. 2013).

Means of Introduction: This species was sold in Chinese food market in San Francisco in the late 1800s; collected as early as 1914 in Boston. Probably released from an aquarium into the Niagara River between 1931 and 1942 (Mills et al. 1993).

Status: *Cipangopaludina chinensis* is established in Lake Ontario and Lake Michigan drainages.

Impact of Introduction:

Summary of species impacts derived from literature review. Click on an icon to find out more...



Human Health, Parasites

This species host to many parasties: the common native parasite *Aspidogaster conchicola* (Michelson 1970), the human-intestinal trematide *Echinostoma cinetorchis* (Chung and Jung, 1999) and Echinostoma macrorchis (Sohn et al. 2013), and the rat lungworm (*Angiostrongylus cantonensis*) (Chang et al 1968; Otsuru 1979). This It is also a common host to larvae of echinostomes in the Kinmen islands (Chao et al. 1993).

Additionally, the parasite *Aspidogaster conchicola*, which this species hosts, can be spread to native Unionid mussels (Huehner and Etges, 1977).

Competition

This species has been shown to alter feeding behavior in the native snail *Helisoma trivolvis* (marsh rams-horn) when present in high densities (Sura and Mahon, 2011).

During mesocosm experiments, *C. chinesis* reduced the abundance of the native snail *Lymnaea stagnalis*; when *Faxonius rusticus* (the rusty crayfish) co-occured with *Cipangopaludina chinensis, Lymnaea stagnalis* was extipated from the mesocosm (Johnson et al., 2009).

Habitat Alteration, Recreation

Since this species reaches such high densities where it occurs, large die-offs often occur with the species as well, which result in shell accumulations and wrack line on the lake beaches, often to the dismay of recreational users (Bury et al. 2007).

Human Health, Agriculture

Cipangopaludina chinensis is capable of ingesting, and therefore removing, the heavy metals from sewage fertilizer on rice fields; this has implications for human health and food safety (Kurihara et al. 1987).
Remarks: Prefers slow-moving freshwater rivers, streams, and lakes with soft, muddy or silty bottoms. Can have up to 7 whorls; females are livebearers giving birth to crawling young. This species was sold in Chinese food market in San Francisco in the late 1800s; collected as early as 1914 in Boston.

Taxonomy of the introduced populations of mysterysnails from Asia is confusing and there are many scientific names in use. There has also been debate regarding whether or not *C. chinensis* and *C. japonica* in North America are synonymous and simply different phenotypes of the same species. This database considers the two as separate species. Smith (2000) argues that *Cipangopaludina* is a subgenus of *Bellamya*; however, because most North American literature does not use the genus *Bellamya* to refer to these introduced snails, the mysterysnails discussed here are referred to by the name *Cipangopaludina*. David and Cote (2019) did a genetic and morphological analysis on North American populations of both C. *japonica* and *C. chinensis*, finding them genetically distinct, morphologically indistinguishable, and co-occuring in multiple lakes of New York; the authors go on to discuss literature which also supports the idea that these two species have no shell characters that can be used to distinguish them morphologically.

Literature cited in this database regarding the Chinese mysterysnail may employ the following names: *C. chinensis, C. chinensis malleatus, C. chinensis malleata, Viviparus malleatus, V. chinensis malleatus, B. chinensis* and *B. chinensis malleatus*.

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Other Resources:
GLIFWC-Maps

Great Lakes Water Life

Wisconsin DNR - Chinese mystery snail presence by county

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