

Biogeography

## Distribution of nonindigenous Basket clams (*Corbicula* spp.) in Mexico

### *Distribución de almejas canasta no nativas (Corbicula spp.) en México*

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#### Abstract

*Corbicula* spp. are one of the most prolific aquatic invasive species in the world and can have negative effects on aquatic ecosystems. We performed qualitative field surveys, examined literature accounts and natural history museum holdings, and accessed citizen science data sources to document the distribution of *Corbicula* in Mexico and shared drainages. Through 26 publications (N = 127 records), 312 museum holdings, and 446 iNaturalist records, we documented 885 records pertaining to *Corbicula* in Mexico and shared drainages with the USA. The first record of the species in Mexico was in 1969, and it has since been reported from 26 of the 32 Mexican states and most of the major river basins throughout the country. However, we suggest *Corbicula* are more prevalent in Mexico than we report in this work as it is often under sampled or under reported.

**Keywords:** Exotic species; Invasive species; Asian clams; Bivalvia; Freshwater systems

#### Resumen

Algunas especies de *Corbicula* son de las especies invasoras acuáticas más prolíficas del mundo y pueden tener efectos negativos en los ecosistemas acuáticos. En este trabajo, realizamos estudios de campo cualitativos, examinamos literatura y registros en museos de historia natural y, además, revisamos datos de ciencia ciudadana para documentar la distribución de *Corbicula* en México y cuencas compartidas con EUA. A través de 26 publicaciones (N = 127 registros), 312 registros de museos y 446 registros de iNaturalist, documentamos 885 registros pertenecientes a *Corbicula* en México. El primer registro en México de la especie en el país data de 1969 y, desde entonces, ha

sido reportada en 26 de los 32 estados mexicanos y en la mayoría de las principales cuencas hidrográficas del país. Sin embargo, creemos que *Corbicula* es más prevalente en México de lo que reportamos en este trabajo, ya que frecuentemente no se muestrea o no se reporta de manera suficiente.

*Palabras clave:* Especies exóticas; Especies invasoras; Almejas asiáticas; Bivalvia; Ambientes dulceacuícolas

## Introduction

Basket clams (Cyrenidae: *Corbicula* spp.), also commonly known as Asian clams, are moderately sized (to 50 mm) freshwater bivalves that have become one of the most successful aquatic invasive species to spread across the globe (Pigneur, Etoundi et al., 2014; Pigneur, Falisse et al., 2014). Native to the temperate/tropical regions of Asia, Africa, and Australia, *Corbicula* can be found on every continent except Antarctica (Bieler & Mikkelsen, 2019; Morton, 1986; Sousa et al., 2008). Species of the Genus *Corbicula* have been described as hyper-invasive aliens with great biofouling capabilities (Isom, 1986). Once established, *Corbicula* species can rapidly become extremely abundant and often affect water supply systems, alter nutrient regimes and food web dynamics, and potentially have deleterious effects to native freshwater mussel populations (Cohen et al., 1984; Counts, 1986; Haag, 2019; Isom, 1986; Sousa et al., 2008).

*Corbicula* taxonomy is in flux, as is the number of species that have become established outside of its native range (Hoagland, 1986). *Corbicula* were first recorded in North America in British Columbia, Canada, in 1924, and has since spread throughout the continent to areas in which winter water temperatures do not fall below 2 °C (Benson & Williams, 2021; McMahon, 1999). At least 3 *Corbicula* taxa have become established in North America (Haponski & Ó Foighil, 2019; Lee et al., 2005; Tiemann et al., 2017). *Corbicula* have been sporadically collected in Mexico, with the first occurrence reported in 1969 from an irrigation ditch just north of Cerro Prieto, south of Mexicali in Baja California (Fox, 1970). However, *Corbicula* were present in the Río Grande/ Río Bravo in the USA as early as 1964 (Benson & Williams, 2021). Since then, it has spread throughout Mexico (Counts, 1991; López et al., 2019; Naranjo-García & Castillo-Rodríguez, 2017). It can become the most prevalent mollusk in streams (Czaja et al., 2022; Tiemann et al., 2020), and threatens to alter biologically diverse aquatic ecosystems in Mexico (Czaja et al., 2023).

Once established, *Corbicula* often becomes the most abundant benthic bivalve in streams. Tiemann et al. (2020) reported densities > 200 individuals/m<sup>2</sup> in a small stream in the Río Conchos basin in northern Mexico. *Corbicula* life history characteristics (e.g., early sexual maturity,

high fecundity, and ability to be actively and passively dispersed) favor rapid colonization and persistence in disturbed and unstable habitats (McMahon, 2002; Minchin & Boelens, 2018; Smith et al., 1986; Thompson & Sparks, 1977; Voelz et al., 1998). We herein attempt to summarize the distribution of *Corbicula* species in Mexico, as was done in the USA by Benson and Williams (2021).

## Materials and methods

Data for *Corbicula* in Mexico and the shared drainages in the USA (i.e., Río Grande and Río Colorado) were compiled from 4 sources. First, we conducted qualitative freshwater mollusk surveys in the Grande, Pánuco, Papaloapan, and Usumacinta basins in the Mexican states of Chihuahua, San Luis Potosí, Veracruz, Tabasco, and Chiapas in 2017-2022 (see Inoue et al., 2020; Kiser et al., 2022; Tiemann et al., 2020). Second, we reviewed literature accounts of *Corbicula* in Mexico and shared drainages (Barba-Macías & Trinidad-Ocaña, 2017; Benson & Williams, 2021; Contreras-Arquieta & Contreras-Balderas, 1999; Counts, 1991; Counts et al., 2003; Czaja et al., 2022, 2023; Davis, 1980; Dinger et al., 2005; Fox 1970, 1971; Gutiérrez-Galindo et al., 1988; Hillis & Mayden, 1985; López-López et al., 2009, 2019; Naranjo-García & Castillo-Rodríguez, 2017; Naranjo-García & Meza-Meneses, 2000; Naranjo-García & Olivera-Carrasco, 2014; Ramírez et al., 2022; Ramírez-Herrera & Urbano, 2014; Rico-Sánchez et al., 2020; Ruelas-Inzunza et al., 2007, 2009; Tiemann et al., 2020; Torres-Orozco & Revueltas-Valle, 1996; Trinidad-Ocaña et al., 2018). Third, we gathered from the following natural history museums and collections: Colección Nacional de Moluscos, Instituto de Biología, Universidad Nacional Autónoma de México (CNMO); Carnegie Museum of Natural History, Pittsburgh (CM); Delaware Museum of Natural History, Wilmington (DMNH); Field Museum of Natural History, Chicago (FMNH); Florida Museum, University of Florida, Gainesville (UF); Illinois Natural History Survey, Champaign (INHS); Museum of Comparative Zoology, Harvard University (MCZ); National Museum of Natural History, Smithsonian Institution (USNM); New Mexico New Mexico Museum of Natural History and Science, Albuquerque (NMMNH); Ohio State University Museum of Biological Diversity, Columbus (OSUM); Santa Barbara Museum of Natural

History (SBMNH); Strecker Museum, Baylor University, Waco, Texas (SMBU); Facultad de Ciencias Biológicas de la Universidad Juárez del Estado de Durango, Colección de Moluscos (UJMC); University of Michigan Museum of Zoology, Ann Arbor (UMMZ); and the University of Texas - El Paso Biodiversity Collections (UTEP) (most museum codes follow Sabaj [2020]). Lastly, we used data from iNaturalist ([www.iNaturalist.org](http://www.iNaturalist.org); accessed on 1 November 2023), which is a citizen science sourced database.

We verified or re-identified each record to the species level, if possible, from the image(s) provided on-line, by curators, or those posted on iNaturalist. We excluded those records with missing or imprecise locality data, as well as those that could not be identified (e.g., poor quality photographs) from our database. The database is archived in the Illinois Data Bank ([https://doi.org/10.13012/B2IDB-9221608\\_V1](https://doi.org/10.13012/B2IDB-9221608_V1)) and is available for future studies.

## Results

We found 26 publications (N = 127 records), 312 museum lots, and 446 iNaturalist records, which totaled 885 records pertaining to *Corbicula* in Mexico and shared drainages (684 from Mexico and 201 from the USA; Table 1). *Corbicula* have been collected throughout Mexico from the Río Grande and Colorado at the U.S. border southward to the Río Usumacinta basin along the Guatemalan border (Fig. 1). *Corbicula* have been collected in a wide variety of waterbodies, including estuarine wetlands, irrigation ditches, manmade impoundments, large rivers, and headwater streams (e.g., < 2 m wide). *Corbicula* have been recorded from 26 of the 32 Mexican states (Table 1) and most of the major river basins (Table 2), but we feel it is highly probable that *Corbicula* are more prevalent in Mexico than we report as it is often under-sampled. The 6 Mexican states without verified records include: Aguascalientes, Baja California Sur, Campeche, Mexico City, Tlaxcala, and Yucatán. Citizen scientists provided 4 unique state records for *Corbicula* in Mexico not reported in the literature or represented in museums (Table 1). In addition, > 50% of the records were from citizen observations via iNaturalist, which demonstrates how citizen scientists can contribute important data, especially in understudied areas.

Most *Corbicula* accounts from Mexico are classified as either *Corbicula fluminea* (Müller, 1774) or simply *Corbicula*. However, there are at least 2 *Corbicula* taxa in Mexico —*Corbicula fluminea* (form A, white nacre) and *Corbicula largillierti* (Philippi, 1844) (form B, purple nacre)— as identified by Lee et al. (2005) and Tiemann et al. (2017) (Figs. 1, 2), and both can occur in the same

basin, often syntopically (e.g., Río San Juan and Río Soto la Marina basin, Hillis & Mayden, 1985; Río Conchos basin, Tiemann et al., 2020). The distinguishing characteristics are subtle but more pronounced in younger individuals that become less obvious as individuals mature and become large (Tiemann et al., 2017). In young / small (< 25 mm) individuals, *C. fluminea* has more pronounced external ridges, yellowish periostracum, and white nacre, whereas *C. largillierti* has less pronounced but tighter ridges, olive periostracum, and purple nacre (Fig. 2). Because most of the specimens examined were from photographs, we could not rule out additional taxa being present in Mexico and we could not verify all records to species, especially those from the historical literature and some iNaturalist photos. We speculate that some unvouchered specimens reported as *C. fluminea* are likely *C. largillierti*.

## Discussion

Determining the dispersal chronology of *Corbicula* in Mexico is difficult for a variety of reasons. Unlike freshwater mussels (Unionidae), which are transported within and between river systems via fishes as part of their reproductive cycle, these clams are not dependent on fishes for dispersal. The origins and ensuing dispersion pathways of *Corbicula* are still poorly known, but it is thought to be a combination of both human-mediated activities such as aquaria releases and bait bucket introductions, and natural dispersal such as passive drift or via intestinal passage through fishes (Gatlin et al., 2013; McMahon, 1999; Naranjo-García & Castillo-Rodríguez, 2017; Sousa et al., 2008). Another confounding factor in determining the chronology of invasion is that there are no regular systematic sampling programs in Mexico that would serve to document the arrival dates in select basins or areas of the country. The literature has also been sporadic and uneven in reporting *Corbicula* in Mexico. We have summarized the known records and dates of occurrence of *Corbicula* by major drainage basin (Table 2).

### *Río Colorado Basin*

*Corbicula* were first reported in the Colorado River at Yuma, Arizona, USA, on the California border in 1955 (Benson & Williams 2021; Counts, 1991). It was first reported from Mexico from an irrigation canal in the Colorado River basin in Baja California in 1969 (Fox 1970). However, there is a specimen (SBMNH 697249) from the Río Cihuatlán (also called the Río Chacala or Marabasco) along the Pacific Coast at Manzanillo, Colima collected in 1965. That locality is problematic, as the Río Cihuatlán does not run through Manzanillo. It does however pass through the city of Cihuatlán, Jalisco. Counts (1991) summarized the occurrences for *Corbicula*

Table 1

List of Mexican states where *Corbicula* has been found, the year in which the species was first reported, the water body where it was found, the source (citation or museum accession number; museum codes can be found in the methods section) of the first collection, and the number of records we found. These *Corbicula* records, including data sources, were archived in the Illinois Data Bank ([https://doi.org/10.13012/B2IDB-9221608\\_V1](https://doi.org/10.13012/B2IDB-9221608_V1)).

State	First year reported	Waterbody	Source	Number of lots/ records
Baja California	1969	Irrigation canal, Cerro Prieto	Fox, 1970	36
Chiapas	2009	Río Lacantún	CNMO 3284, Naranjo-García & Olivera-Carrasco, 2014	73
Chihuahua	1996	Río Conchos	UTEP 13683, Benson & Williams, 2021	107
Coahuila	1976	Irrigation canal, Municipio Juarez	UTEP 4836	15
Colima	2006	Río Armería	CNMO 1720, Naranjo-García & Olivera-Carrasco, 2014	6
Durango	2006	Presa La Vega, Teuchitlán	CNMO 1679, Naranjo-García & Olivera-Carrasco, 2014	53
Estado de México	2014	Pond, E of Laguna de Zumpango	iNaturalist, 2023	8
Guanajuato	2018	Arroyo Hondo	iNaturalist, 2023	4
Guerrero	2009	Trib. Pacific, W of Petacalco and Río Atoyac	CNMO 5542	5
Hidalgo	2014	Río Venados	iNaturalist, 2023	4
Jalisco	1981	Trib. Lago de Chapala	UF 34919, Hillis & Mayden, 1985	47
Michoacán	2008	Río Atoyac (Balsas)	CNMO 2827, Naranjo-García & Olivera-Carrasco, 2014	10
Morelos	2005	Río Amacuzac	CNMO 1599	9
Nayarit	1969	Playa Novillero	DMNH 92579, Hillis & Mayden, 1985	7
Nuevo León	1976	Ríos Salado and San Juan	UTEP 4860, UTEP 4828	33
Oaxaca	1998	Dominguillo (S San Juan Bautista Cuicatlán)	CNMO 771, Naranjo-García & Olivera-Carrasco, 2014	13
Puebla	2020	Río Pantapec	iNaturalist, 2023	1
Querétaro	2017	Río Jalpan	Rico-Sanchez et al., 2020	6
Quintana Roo	1972	Unknown	DMNH 237279	2
San Luis Potosí	1993	Río Huichihuayán	UF 211359, Benson & Williams, 2021	29
Sinaloa	1970	Río Fuerte	Fox, 1971; Counts, 1991	37
Sonora	1970	Río Colorado	Counts, 1991	28
Tabasco	2011	Multiple locations in the Grijalva basin	Barba-Macías & Trinidad-Ocaña, 2017	37
Tamaulipas	1969	Falcon Reservoir	OSUM 22683	41
Veracruz	1992	Laguna de Catemaco	Torres-Orozco & Revueltas-Valle, 1996	71
Zacatecas	2006	Río Juchipila	CNMO 1690, 1692, Naranjo-García & Olivera-Carrasco, 2014	2

Table 2

List of Mexican rivers/ lakes drainages (Dr.) from north to south where *Corbicula* spp. have been found and the year first reported. These *Corbicula* records, including data sources, were archived in the Illinois Data Bank ([https://doi.org/10.13012/B2IDB-9221608\\_V1](https://doi.org/10.13012/B2IDB-9221608_V1)).

Waterbody where it was first found	Year of first occurrence
Gulf of Mexico Basin	
Río Grande Dr. – Falcon Reservoir, Tamaulipas	1969
Río San Fernando, Tamaulipas	1974
Río Soto la Marina Dr – unnamed stream, Tamaulipas	1981
Río Pánuco Dr. – Río Comandante, Tamaulipas	1990
Río Tecolutla, Veracruz	2007
Río Papaloapan Dr. – Laguna de Catemaco, Veracruz	1992
Río Coatzacoalcos, Veracruz	2005
Río Usumacinta Dr. – Río Lacantún, Chiapas	2009
Colorado/Gulf of California Basin	
Irrigation canal, Baja California	1969
Río Yaqui, Sonora	1970
Río Fuerte, Sinaloa	1970
Pacific Coastal Basin	
Río San Pedro, Mezquital, Durango	2006
Playa Novillero, Nayarit	1969
Río Grande de Santiago Dr., Jalisco	1981
Río Ameca, Jalisco	1982
Río Cuitxmala, Jalisco	1993
Río Armería, Colima	1986
Río Atoyac (Balsas), Michoacán	2008
Río Amacuzac, Morelos	2005
Caribbean Basin	
Cozumel, Quintana Roo	1971

in Mexico and provided a new record for the Río Colorado basin from the Río Mayo (UF 247535), Sonora collected in 1972.

#### *Río Grande del Norte Basin*

*Corbicula* were first found in the Río Grande basin in 1969 in the Falcon Reservoir, Tamaulipas (OSUM 22683) and along the Pacific coast at Playa Novillero in Nayarit (DMNH 92579; Hillis & Mayden, 1985; Counts, 1991;

Table 2) —suggesting multiple invasions have occurred, as has been reported elsewhere (Benson & Williams, 2021). Based on collections made as early as 1975 in the upper Río Grande in Texas (Davis, 1980), Benson and Williams (2021) noted that *Corbicula* were likely present in the states of Chihuahua and Coahuila prior to 1996. This is borne out by museum specimens from the ríos Salado (UTEP 4860) and San Juan (UTEP 4828), Nuevo León collected by A.L. Metcalf in May 1976, an irrigation canal at Municipio Villa Juárez, Coahuila in 1976, and the Río Escondido, Coahuila in 1978 (UTEP 6810). Contreras-Arquieta and Contreras-Balderas (1999) reported *Corbicula* as common in Presa Rodrigo Gómez in the Río Grande basin, Nuevo León in 1984. Tiemann et al. (2020) found live individuals of *C. fluminea* and *C. largillierti* at 10 sites in the Río Conchos (Río Grande basin), Chihuahua in May 2018.

#### *Ríos Carrizal, Soto la Marina, etc. basins*

Hillis and Mayden (1985) summarized the data to date on the presence of *Corbicula* in Mexico and the neotropics. In January 1984, they investigated various river systems along the Gulf Coast in northeastern Mexico for evidence of *Corbicula* and found populations of both the “white and purple forms” in the San Juan River (Río Grande basin), at El Castillo, Nuevo León, and an unnamed tributary of the Río Corona (Soto la Marina basin), 3 km S of Mex. Hwy. 101, Tamaulipas (Hillis & Mayden, 1985). However, they failed to find either form in the Río San Fernando, which lies between the Río San Juan and Río Soto la Marina basins. There is an unpublished record from the Río San Fernando at Mexico Highway 101/180 collected by A.L. Metcalf in May 1974 (UTEP 15126). The authors also found no evidence of *Corbicula* in Río Purificación, despite the presence of both species of *Corbicula* in the Río Corona branch of the Soto la Marina basin. Further, Hillis and Mayden (1985) found no evidence of the purple form of *Corbicula* south of the Río Soto la Marina basin, or of either form south of the Río Carrizal basin, even though they sampled at several sites in the ríos Pánuco, Tuxpan (= Pantepec), Nautla, Blanco, and Balsas. There are numerous records post-1985 in the Río Soto la Marina basin from Presa Vicente Guerrero and Arroyo San Felipe, the Río San Fernando in Tamaulipas, and the Río Pantepec, Veracruz, which lies between the Pánuco and Papaloapan (López-López et al., 2009).

#### *Río Pánuco basin*

Continuing south along the Gulf of Mexico coast, *C. fluminea* began showing up in the Río Pánuco basin from the Río Comandante, Tamaulipas in January 1990 (UF 159751; Counts, 1991), the Río Huichihuayán, San Luis Potosí in July 1993 (UF 211359; Benson & Williams 2021), and the Río Tempoal, Veracruz in February 1994 (INHS



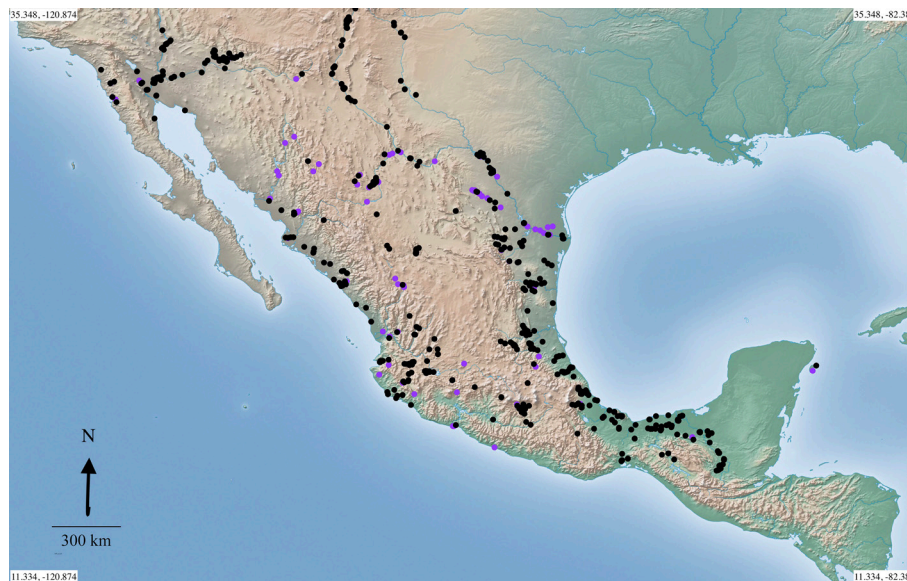


Figure 1. Distribution of *Corbicula* species —*Corbicula fluminea* (form A; black dots) and *Corbicula largillierti* (form B; purple dots)— in Mexico and the Colorado and Río Grande river basins in the southern USA based upon our compilation of records as described in the Materials and methods section. These *Corbicula* records, including data sources, were archived in the Illinois Data Bank ([https://doi.org/10.13012/B2IDB-9221608\\_V1](https://doi.org/10.13012/B2IDB-9221608_V1)).

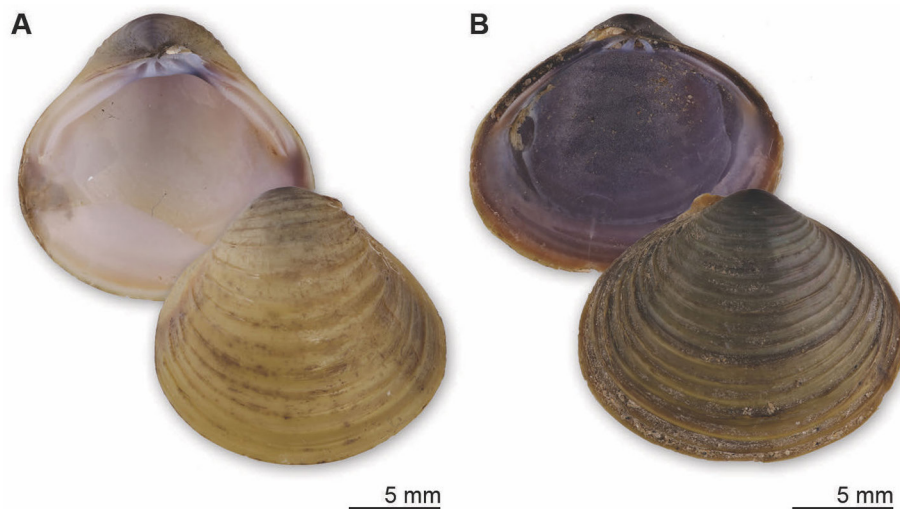


Figure 2. The 2 *Corbicula* species in Mexico —*Corbicula fluminea* (Müller, 1774) (form A, left) and *Corbicula largillierti* (Philippi, 1844) (form B, right). Images modified from Tiemann et al. (2017).

89423). Rico-Sánchez et al. (2020) reported *C. fluminea* from 6 sites in the Río Pánuco basin in the Biosphere Reserve Sierra Gorda, Querétaro between February and July 2017. We (JST & KSC) collected *Corbicula fluminea* from 16 sites in the Río Pánuco basin, San Luis Potosí in 2017-2018.

#### Río Papaloapan basin

Torres-Orozco and Revueltas-Valle (1996) found several empty valves of *C. fluminea* in Laguna de Catemaco, Veracruz in 1992. Later, they confirmed the presence of *C. fluminea* at several localities along the southeastern shore of the lake: Las Margaritas,

Ahuacapan, and Cuetzalapan in September 1994, which they attributed to dispersal by migratory birds (Torres-Orozco & Revueltas-Valle, 1996). Naranjo-García and Olivera-Carrasco (2014) reported *C. fluminea* from the Río Atoyac (Río Jamapa basin), ca. 16 km from Cordoba in August 1997 (CNMO 689). Ruelas-Inzunza et al. (2007) found *C. fluminea* further south in the Río Coatzacoalcos, Veracruz in 2005, and Naranjo-García and Olivera-Carrasco (2014) also reported it from the Río Coatzacoalcos in 2012 (CNMO 4009). Barba-Macias and Trinidad-Ocaña (2017) found *C. fluminea* at 7 sites in the Río Papaloapan basin in 2013.

#### *Río Usumacinta basin*

The first record of *C. fluminea* reported from the Río Usumacinta basin was from the Río Lacantún in Chiapas in 2007 and numerous other sites in or near the Reserva de la Biosfera Montes Azules in Chiapas and Tabasco from 2009–2022 (Barba-Macías & Trinidad-Ocaña, 2017; Naranjo-García & Olivera-Carrasco, 2014; Ramírez et al., 2022; CNMO Collection data). We also collected both *C. fluminea* and *C. largillierti* at 8 sites in the Río Usumacinta basin, Tabasco and Chiapas in 2019.

#### *Pacific: Mesa Central & Balsas basins*

Mesa Central and Balsas Region lies south of the Colorado and west of the Río Pánuco basins. There are numerous endorheic basins in this area (e.g., Llanos El Salado and Río Nazas). The area is largely drained by the Lerma-Santiago system. The Río Lerma mainstem is > 700 km long and empties into the Lago de Chapala, which is Mexico's largest lake, and then into the Río Grande de Santiago, which drains into the Pacific. Comparably, the Río Balsas (also locally known as the Río Mezcala or Río Atoyac) has its headwaters in the western slope of the Continental Divide, southeast of the city of Puebla, and flows southwest where it empties into the Pacific Ocean at the border of Guerrero and Michoacán. This area is highly mountainous with the Sierra Madre Occidental reaching its southern limit here and the Río Balsas cutting through the Sierra Madre del Sur and Eje Volcánico Transversal. *Corbicula fluminea* first appeared along the Pacific Coast at Playa Novillero in Nayarit in 1969 (DMNH 92579; Table 2) and the Río Fuerte in Sinaloa in May 1971 (USNM 892340 and USNM 903657; Ramírez-Herrera & Urbano, 2014). There are numerous records of both *C. fluminea* and *C. largillierti* in the Mesa Central in the endorheic Nazas System, Armería, Atoyac (Balsas), Elota, Fuerte, and Río Grande de Santiago basins in the states of Durango, Guanajuato, Guerrero, Jalisco Michoacán, Morelos, Nayarit, Sinaloa, and Zacatecas. States (i.e., Baja California Sur and Yucatán) or areas with few or no records of *Corbicula* may be attributed to a lack of collecting or suitable habitat in those places.

#### *Caribbean basin*

There are odd records of both *C. fluminea* (DMNH 237279) and *C. largillierti* (DMNH 249472) from Cozumel, Quintana Roo in 1972. Whether they got to the island via humans, fish, or another method is unknown.

The biodiversity of some countries, like Mexico (Inoue et al., 2020; Kiser et al., 2022), is understudied and citizen scientists play an integral role in collecting data and aid in documenting new occurrences of invasive species (Barbato et al., 2021; Di Decco et al., 2021; Tiemann et al., 2022). This collaboration is critical in advancing our knowledge and conservation of our natural environment. However, as scientists, we must train and encourage citizen scientists to collect useful and verifiable data, as we discovered a misidentification error rate of ~ 10% and could not verify all *Corbicula* records submitted to iNaturalist due to photo quality or specimen orientation. We encourage future observers to take close-ups of both the external and internal sides of the shells to better aid in proper identification (i.e., similar to Fig. 2).

Our study was an attempt to summarize the known records of *Corbicula* taxa in Mexico. Given that several areas in Mexico are under sampled, it seems likely that *Corbicula* are established in additional areas (e.g., Pacific slope drainages) not reported here. We encourage colleagues to voucher specimens in natural history museums, as well as citizen scientists to take high quality photographs and upload them to iNaturalist with precise locality data when *Corbicula* are encountered, to help continue to document the spread of this invasive species in Mexico and Central America.

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