

Howells
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Undeniably those vulnerable and fascinating mollusks we variously call freshwater or pearly mussels, naiads, unios, or river clams are becoming scarcer by the day due to agricultural, residential and industrial pollution, habitat destruction, dams, poaching and over-fishing. But those of you who just got interested or thought freshwater musseling opportunities were going the way of the typewriter and boy-calls-girl just haven't checked out Texas. Bob Howells of the Texas Parks and Wildlife Department, Heart of the Hills Research Station in Ingram, Texas, actually approached us about interesting collectors in his unique mussels.

The Tampico Pearlymussel (*Cyrtonaias tampicoensis*): SHADES OF THE OLD WEST

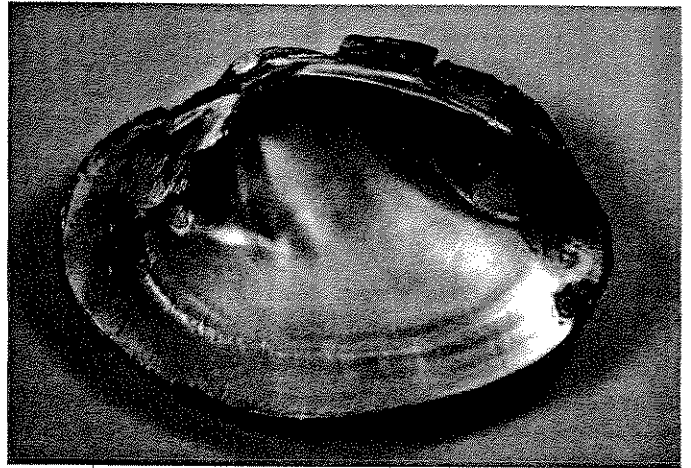
Robert G. Howells

Shell collectors often venture far and wide in pursuit of unique mollusks. Yet travelers to the other side of the planet after that special shell may be overlooking an especially unique species right at home. Long before Lyndon Johnson carried his dog around by its ears, before Davy Crockett ever fired Old Betsy at the Alamo, and before the Yellow Rose of Texas first rolled in the hay with Santa Ana, early Spanish explorers ventured into western Texas in search of the Tampico pearlymussel (*Cyrtonaias tampicoensis*; family Unionidae) and the gem-quality freshwater pearls it frequently produces. Clemmens (1981) reported how Hernan Martin and Diego del Castillo arrived in 1650 near what is now the city of San Angelo on the Concho River (river of shells) in western Texas. Pearls they obtained there were sent back to Sante Fe and caused enough excitement that in 1654, Diego de Guadalupe was also sent into the area to locate as many pearls as possible. Some reports suggest excessive harvest of mussels and others mention enlisting the local Indians in the pearl-harvest efforts. Most agree the number of pearls obtained were apparently well below Spanish expectations.

At least in part because of the Tampico pearlymussel and its pearls, Spanish attention was drawn to this area. Missions were constructed and ultimately the present city of San Angelo developed. Although Spanish colonial days have long ended, San Angelo, the Concho River and Tampico pearlymussels endure. A fishery for the mussels and the pearls they produce also continues.

Tampico pearlymussel occurs from northeastern Mexico into the Colorado and Brazos Rivers of central Texas. Although many, if not most, members of the family have declined dramatically in recent years, Tampico pearlymussel numbers have held up rather well. It evolved as a riverine mussel (there were no natural lakes within its range in Texas); however, it has adapted well to man-made impoundments. While riverine populations have been subjected to dewatering during droughts and severe scouring during floods, some reservoir populations have flourished. Today, reservoirs from the Rio Grande to Abilene and Waco still support significant populations of Tampico pearlymussels, as do some rivers and streams.

This unique unionid reaches over 130mm in shell length and has a general shape reminiscent of *Mercenaria* or *Spisula*. There is no significant external shell sculpturing. Coloration varies from yellowish-brown with faint green rays to dark brown and black. Internally, nacre is typically purple, but may be lavender, pink, orange, salmon, white or multicolored. Boldly-colored nacles are comparable to anything grown on a tropical coral reef. Tampico pearlymussel pearls are the same colors as the nacre (imagine a deep purple pearl). Pearls occur freely in the soft tissues of about 3-4% of individuals, with



Tampico pearlymussel (*Cyrtonaias tampicoensis*) Twin Buttes Reservoir, Tom Green County, Texas, August 1994, 122mm shell length. Many specimens display a bright purple nacre (usually poorly represented in color photographs) and produce a pearl of the same color. This specimen shows an indentation near the posterior margin of the shell where a pearl was once positioned. Because of their tendency to have pearls in this position, many musselers who have attempted to open a specimen while standing in the water have watched while an impressive pearl tumbled free and sank out of sight.

about that same percentage having pearls or other imperfections attached to the shell. Although some individuals have taken pearls over 10mm in diameter and valued at thousands of dollars, true gem-quality pearls are very rare . . . perhaps one in 500 to 1,000. Realistically, if pearls were common, their value would be far less.

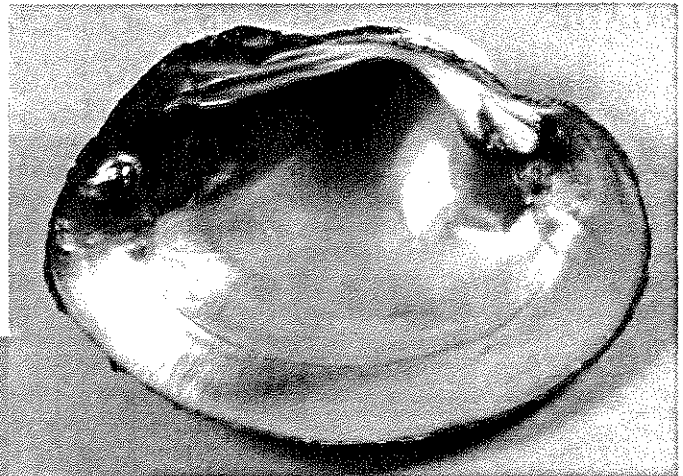
Habitat of Tampico pearlymussel ranges from relatively small streams to large reservoirs. Although they sometimes occur at substantial depths, most usually inhabit waters less than 20' deep. They seek out substrates of sand, mud and fine-

CAUTION

Many species of freshwater mussels fall under a variety of federal and state regulations, and regulations can sometimes change rather quickly. Species which can be legally harvested in one state may be considered endangered in another. Always check with local authorities before collecting any freshwater mussel or transporting it into another state. Also remember, collecting freshwater mussels can be extremely hazardous. Broken glass and rusty cans can cause cuts; branches and trotlines may cause entangling problems. Both scientific and commercial divers have been lost while collecting mussels. Always use caution.

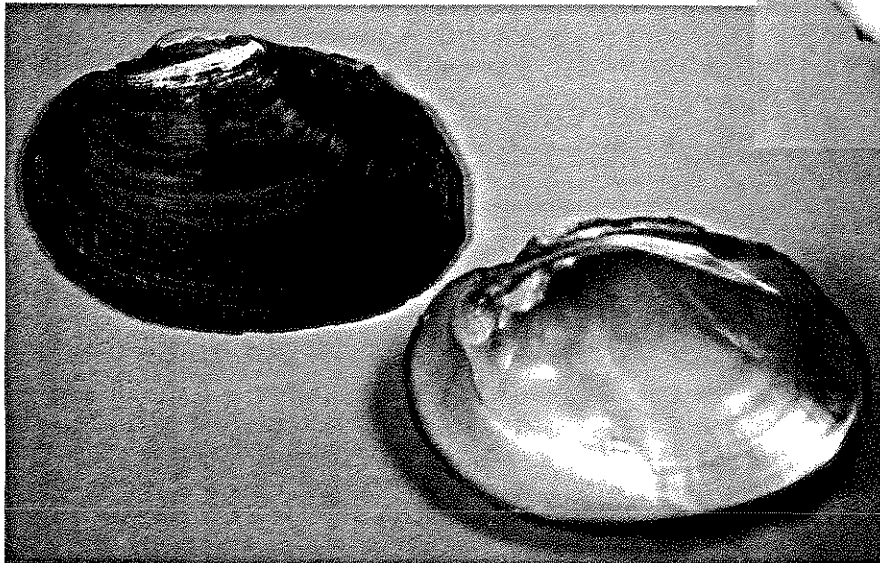
to moderate-sized gravel and avoid deep-shifting sands, very soft silts, and hard cobble and bedrock. Many musselers locate Tampico pearlymussels by wading shallow waters and feeling for specimens with their feet. Still others snorkel or dive with SCUBA or hookah pumps. It is important to remember most reservoirs which harbor Tampico pearlymussels lack the clarity of coral reefs of the South Pacific. Visibility is usually near zero and collection is almost completely by touch (not a harvest method for the claustrophobic).

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Tampico pearlymussel (*Cyrtoneias tampicoensis*), Nasworthy Reservoir, Tom Green County, Texas, September, 1992, 67mm shell length. This specimen has a pearl embedded in the shell at the posterior margin.

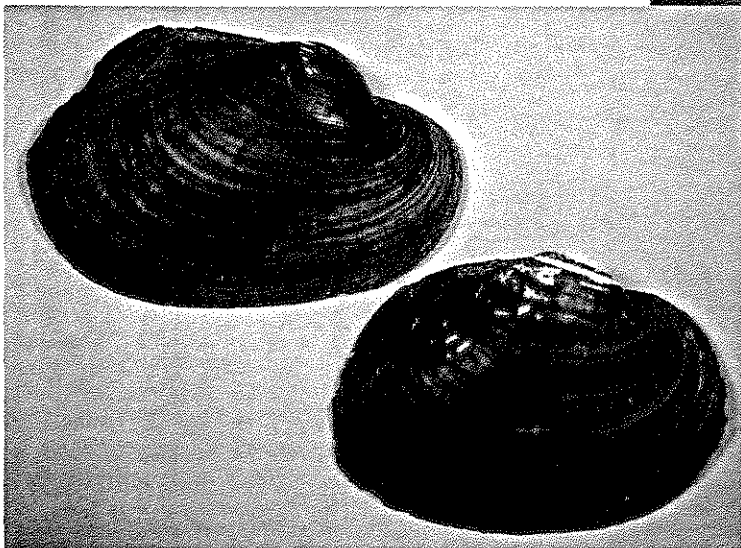
Tampico pearlymussel (*Cyrtoneias tampicoensis*), Twin Buttes Reservoir, Tom Green County, Texas, August 1994, 108mm shell length. Although most specimens have purple nacre, color may be lavender, pink, orange, salmon, white or multicolored and range from dark to pastel. Pearls produced may also occur in these same colors.



Below: Bleufer (*Potamilus purpuratus*), 132mm shell length male. Below: Tampico pearlymussel (*Cyrtoneias tampicoensis*), 122mm shell length, sex undetermined. Bleufers often occur with Tampico pearlymussels and they are sometimes confused. Externally, bleufers are less deep-bodied anteriorly and deeper, often alate, posteriorly. Bleufers also produce pearls, but do so much less frequently than Tampico pearlymussels.



Above: Tampico pearlymussel (*Cyrtoneias tampicoensis*), 122mm shell length, sex undetermined. Below: Bleufer (*Potamilus purpuratus*), 132mm shell length, male. Both from Twin Buttes Reservoir, Tom Green County, Texas, August 1994. Lateral teeth in bleufers typically angle upward or are nearly horizontal, but in Tampico pearlymussels, lateral teeth usually angle downward. Additionally, within the range of Tampico pearlymussel, bleufers usually show a more rosy nacre, and that of Tampico pearlymussels is often closer to purple. In more eastern bleufer populations, nacre is often much more purple than in central and western Texas specimens.



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Another similar unionid called bleufer (*Potamilus purpuratus*), somewhat similar in appearance, occurs in most of the same areas as Tampico pearlymussels. It typically ranges throughout much of the Mississippi River Valley west into western and southern Texas. Bleufer has purple nacre which often appears slightly more rosy in western populations. Sexually dimorphic, the males are more elongate and females more posteriorly truncated and inflated. Much deeper bodied posteriorly than the Tampico pearlymussel, some bleufers are rather alate (winglike). Even some past experts have confused these two species.

Current mussel-harvest regulations in Texas allow collection of up to 25 pounds of whole mussels per day with a standard fishing license. Harvest of greater amounts requires a commercial mussel license. Additionally, there is a 2.75-inch minimum shell height requirement; smaller specimens must be released unharmed. Most musselers determine legal size by passing the mussel through a ring of PVC pipe with a 2.75" inside diameter. Harvest in Texas is also restricted to hand collection; dredges, brails and other harvest devices are prohibited. Lastly, there are 28 no-harvest mussel sanctuaries around the state which hopefully provide protection to brood stocks which will distribute offspring up- and down-stream from the sanctuary sites to perpetuate the fishery.

Although some individuals have expressed disdain over the continued harvest of Tampico pearlymussels for pearls, this harvest may actually serve a purpose. Freshwater mussels of the family Unionidae are among the most rapidly declining faunas in North America. Roughly half are extinct, endangered, threatened or in line to be listed. Continued harvest of the Tampico helps draw attention to a largely unnoticed but seriously troubled group of animals. Were it not for sport and commercial harvest, freshwater mussels in Texas would likely still remain largely unstudied and unprotected.

A number of reservoirs in Texas support relatively easily collectible Tampico pearlymussel populations. Falcon and Armistad Reservoirs on the Rio Grande are currently at very low levels which have left many mussels stranded on dry lake beds or in shallows. Lake Corpus Christi on the Nueces River, Nasworthy Reservoir on the Concho River and Lake Buchanan

on the Colorado River can be noteworthy collection sites. Ease of collection, however, often reflects recent hydrological conditions. For example, Lake Buchanan experienced a decline in water level for a period of years, but in 1992, it abruptly caught 30' of water during a very wet spring. No living mussels could be found at shallower depths, and it took nearly a year for them to crawl slowly back into shorezone areas. If water levels rise suddenly, collection may be difficult for an extended period of time.

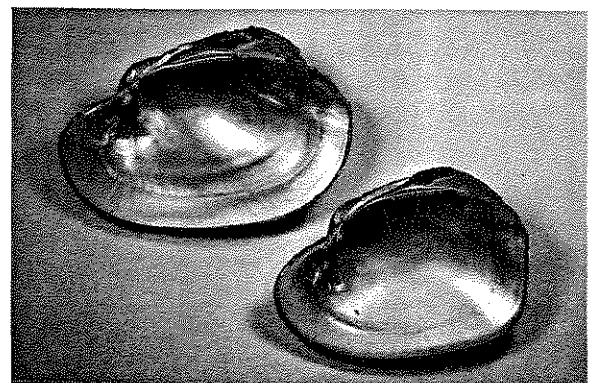
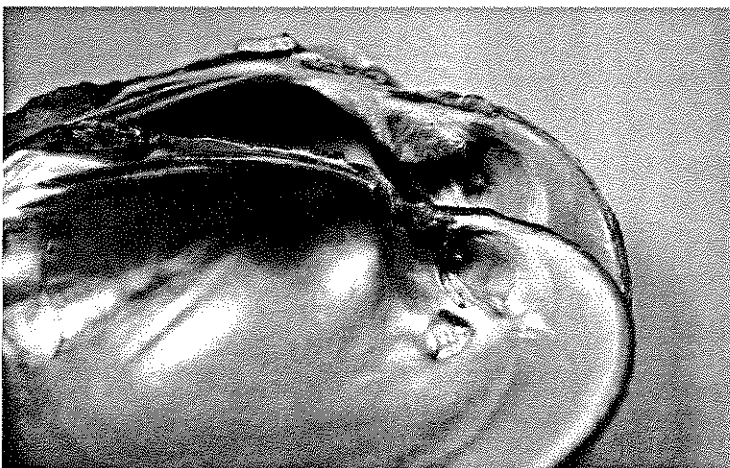
Next time the lure of far-away, expensive collection sites calls, without the time and funding to satisfy the urge, consider overlooked species at home. Although it is true that waters harboring the Tampico pearlymussels do not have attractive island women in grass skirts dancing on the shoreline, when was the last time anyone collected a Golden Cowrie under the scrutiny of a herd of longhorns? While the threat of man-eating sharks and poisonous sea snakes is also lacking, the occasional giant alligator gar or ill-tempered water moccasin can still prove interesting. Following tracks of the early conquistadors in central and western Texas can be an experience in itself.

Latest information from Bob Howells indicates that his book, *Freshwater Mussels of Texas*, written with Raymond Neck and Harold Murray will be ready about the end of August or early September. We hope to have a few order forms at the convention in July at the COA table.

And a rather rewarding development in the study of these remarkably sturdy mussels is the discovery this spring of the host fish for their reproductive cycle: the Longnose gar. Continued health of the Tampico pearlymussel species depends on the continued presence of this fish.

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Bleufer (*Potamilus purpuratus*), 132mm male above and 114mm female below. Both from Twin Buttes Reservoir, Tom Green County, Texas, August, 1994. Bleufers are sexually dimorphic: males are more elongate and less inflated, while females are posteriorly truncated and more inflated.

Above: Tampico pearlymussel (*Cyrtornaias tampicoensis*), 122mm shell length, sex undetermined. Below: Bleufer (*Potamilus purpuratus*), 132mm shell length, male. Both from Twin Buttes reservoir, Tom Green County, Texas, August 1994. Pseudocardinal teeth among equal-sized specimens are usually more massive and molar-like in Tampico pearlymussel, but are smaller and more compressed in bleufers.