

Playa Lake Jar

By Tishia Stewart

Materials List

Large clean pickle jar

Clay from playa basin, not edge

(3 – 4 inches deep/dry)

Water

Sunny window



Week 1: January 17th, 2011

I attended a Conservation Education training program at Clovis Municipal Schools sponsored by Ogallala Commons. The purpose for the training: prepare 5th grade teachers and administrators with a wealth of information regarding the biological functions of playa lakes/wetlands and how to plan and host a Playa Lake Festival at their school(s).

Dr. Birkenfeld; Dr. Haukos; Julie (Boatright) Hodges; and Robert Martin, from the New Mexico Nature Conservancy, each presented topics that ranged from what is a playa and what is its function, such as: the nutrient and hydrologic cycles; to the life cycles of the invertebrates (tadpole shrimp, snails, water skimmers, etc) and the flora and fauna. All are important to the overall health of playas as a community. What happens to one playa affects all other playas.



What is a Playa Lake Festival:

Sometimes the best way to learn about Playa Lakes is to get actively involved, i.e., boots to the ground and dirt on the hands.

The group of students pictured here (I won't mention their school nor district) were a part of a larger group of elementary school students that were participating in a Playa Lakes Festival. Five days of hands-on learning centers, field trips, discussions, and plenty of time away from their indoor classroom. Up until this day I took the picture, I have not ever met a class full of students where each and every child was engaged in learning. I had tears of joy when I watched children get excited about finding invertebrates in the dry Randall clay or when they pointed out birds and made every attempt to identify them. I learned more from watching the students than I did listening to the guest speakers. After all, if you're going to work with children you need to know what motivates them to learn.



At the conclusion of the training, Julie presented each of us a gift: a playa lake in a jar. Each pickle jar consisted of three to four inches of clay that Dr. Birkenfeld collected from his playa in Nazareth, Texas. Hidden in the dark, clumpy clay were seeds, macro-invertebrate eggs, snail shells, other surprises. The only way to find out was for me to hurry home and add the water into the mix.

The hardest thing for people to realize is *what is a playa*. The playa is brown and devoid of life (perceived). Therefore, most people do not see how a playa can have any value at all. However, when a playa is wet, it is very productive thus valued. Playas have to be visited over and over again to understand them.

So, how will a playa lake jar help you see the value of playas? First, allow me to share with you a few things about playa wetlands.

What makes a *playa* a playa?

- 1) The above picture is the playa soil. It consists mostly of clay and some sediment and other detritus. The soil is what defines the playa location. If the playa soil is covered or removed the playa is gone as an ecologically functioning unit. Also, a playa is a close watershed. Playas are downhill from everything. When there is substantial rainfall water will flow downhill into the playa carrying with it sediments, agricultural chemicals, and debris.
- 2) Playas hydrological isolation does not mean they are ecologically isolated. Playas connect us to the rest of the world through migrating birds because playa wetlands provide wintering grounds for birds. Healthy playas increase survival rates. Therefore, what we do here on the Southern High Plains affects everyone in North America. In other words, the ecological web begins to crumble affecting wildlife and water quality.
- 3) Playas have a dynamic environment. They change when wet or dry; hot or cold; windy or not. Flora and fauna rely on the wet-dry cycles for survival. We do not want playas to remain static. The diversity of a playa creates the diversity of life.

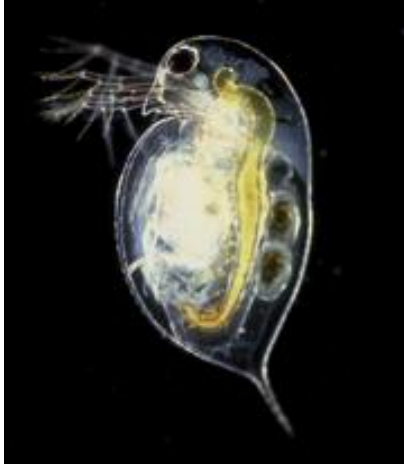
- 4) Playas also function as flood control because on the Southern High Plains we do not have rivers or streams to capture flood water. With the loss of over 20% of our playas, the water has to go somewhere.
- 5) Aquifer recharge occurs through playas. Water flows between the cracks in the clay and percolates through the layers of soil until it eventually reaches the aquifer. As the clay absorbs the moisture it begins to swell and seals the cracks, therefore additional water fills the playa basin.



The Playa in a Jar

When I got home my daughter asked what I was doing with a *stinky* jar. I told her about the playa jar and she immediately wanted to pour water into the jar with the hope the snails would *come back to life*.

The above picture is not what the jar first looked like. Instead, the water was murky and the glass was clear. But we watched for a few minutes to make certain there were not any fish inside.



Day 3:

My daughter and I observed tiny invertebrates using my hand lens. She asked me what the little specks were called and I told her they looked like *fleas*. Though the water fleas were not as large as the one pictured above, my daughter's eyeballs were as she lost count after twenty-five because "they moved around too much."



Day 5:

By the fifth day we found several Fairy Shrimp (Anostraca) swimming upside down. We watched, taking turns with the hand lens, as the fairy shrimps' undulating appendages moved them around the enclosed environment.

At night I used the flashlight to see if Fairy shrimp slept or rested. Nope. They were still moving about the water.



Day 7:

To our surprise the snails were alive! Prior to adding water all we thought we had were snail shells but that was certainly not the case. Do the snails hunker down deep inside their shells producing a mucus that slows down the drying out process? How long can they live without any water or moisture? How big do they get? Do we have snail eggs? Will there be more snails? Are we going to ever let the water dry up? So many questions.





Week 2:

“Mom! I see tiny swimming things that look like stingrays!”

I knew exactly what my daughter found but how could I have missed the Tadpole shrimp? When I looked into the jar my daughter had to point out the *stingrays* to me because they were so small that I had to use my hand lens to verify her observations. HOW EXCITING! We have Tadpole shrimp.

For the next few weeks neighbors would stop by to see “what interesting things” were in the jar.



I remember when I was a fifteen-years-old my brother and I were playing in the storm water that flooded an entire field near our house in Clovis, New Mexico. We were wrestling in the mud when my eyes fell on some strange creature flittering about on the wet ground. At first I thought it was a tadpole. But the more I stared at it the more I thought back to the pages of my favorite dinosaur book that had pictures of fossilized *trilobites*. I probably sat there for a few minutes poking at the living fossils not understanding how something like this could still be alive today!

I now know what they are, 20 + years later!



Tadpole Shrimp

Order: Notostraca.

Family: Triopsidae

Genera: Triops

Triops are considered living fossils having not changed in outward appearance since the Triassic period. They have a broad, flat carapace and head with a simple pair of compound eyes. The abdomen is long and segmented. Underneath are numerous legs that undulate and made the water in the jar very murky from kicking up the soil. Two reduced antennae and mouthparts that are uniramous mandibles used for grinding up plant materials. The telson, or tail, is split into long caudal rami.

Their lifespan is 20-40 days, though the record is 100 days. Triops are omnivorous and are found living on the bottom of playa lakes on the Llano Estacado. They will grow to about 3 inches in length.



*The triops we had in our jar grew to about 2 inches in length.

Most populations of triops are hermaphroditic through some are males. They can fertilize their own eggs or will mate with a male. The eggs, also called *cysts*, will lay dormant for many years, or decades, until the right amount of water rehydrates them. The eggs can survive extreme hot or cold and dry conditions.



Week 4:

The triops grew quickly. Thankfully my daughter took this picture of the triops completing the molting process. Crustaceans will shed their exoskeletons as they grow. Are tadpole shrimp more vulnerable at this particular time like lobsters?



Week 5 and 6:

The fairy shrimp were gone. I assumed the tadpole shrimp ate them.

Meanwhile, we noticed the triops were growing quickly and molting about once a week until they reached 2 inches in length.

As the triops grew, we observed them digging tunnels in the wet clay. I used my hand lens and observed the triops carrying their eggs about halfway down the length of their body. In the dug-outs, the triops released their eggs which were either pink or white in color.

Week 7:

Air bubbles were trapped in spaces between layers of soil and algae.

The water was unusually because, I'm sad to say, the three triops had died. I could see them laying at the bottom with their legs up in the air. When my daughter got home I told her about the triops and she was saddened by the news.

I contemplated letting the clay dry completely and re-fill with water for more tadpole shrimp fun. However, I remembered all the plant seeds that must have germinated by now and decided to wait until late fall.



Weeks 8-12

I wonder what kind of plants my playa jar will be inundated with? Every playa jar is different just as every playa wetland is different from another. To appreciate playa wetlands, you need to visit several at various times of the year. As Forrest Gump would say, "Life is like a box of chocolates you never know what you're gonna get."



In the end it is the creative minds of our children who will grow up and, hopefully, have a positive impact on the playa wetlands of the Southern High Plains.