

## Weaving Her Story: An Orb in the Yard

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One recent November morning I was returning from a sunrise walk. As I approached my front door, a large golden web seemed to appear out of nowhere across the yard. The rising sun had aimed a finger of light around my neighbor's tree and then there was the web, about eighteen inches high and glowing like a Klimt tapestry. Without the sun's help, I'm sure it would have been invisible.



Orb weaver spiderwebs can appear as a work of art.

This web was strung between two branches of my jacaranda tree, with an anchor down in the grass. A light yellow-tan spider with a three-quarter inch body sat in its crux.

I took a few photos of the web, although the windy conditions made the spider herself impossible to photograph. Back inside the house, I began to worry that our lawn crew would run into the web and kill our spider.

Not to worry! In another half hour I discovered that she and her web had decamped.

Consulting *iNaturalist*, using only one poor photo and my memory, I decided she was likely a Tropical Orb Weaver, *Eriophora ravilla*, or an *Eriophora edax*, one of some 2800-3000 species of orb weavers in 170 genera in the family Araneidae. "She," because it is the female who makes and stays in the web -- the smaller male just roams, looking for a mate. And as I suspected from my experience, *E. ravilla* is a nocturnal spider who makes a new web each night and removes it at dawn.



Tropical orb weaver *Eriophora ravilla* or *E. edax*

Sad to say, her web was *not* there the next morning when I left the house. That evening about nine p.m. I went out with a flashlight to look for her and sure enough she *was* there, spread out in the crux of the web. Indeed, the following day she was there at dawn with the whole glorious web, and she was gone when I returned thirty minutes later.

As I learned more about orb weavers, I became impressed with the sophistication of their webs. The web is made out of more than one type of protein-based silk. The anchors, outside circle, and radii are made of plain silk, while the inner circlets are of sticky silk, and there is some evidence that the silk may contain neurotoxins to paralyze prey. Some orb weaver species make up to eight different types of silk, each from a different silk gland, and the typical orb weaver has about three pairs of spinnerets for weaving, each with its own specific function.

Building the web involves floating a line on the wind from one anchor to another and then dropping another line from its center, forming a “Y”. The outside circle and radii are put in place before the inner circlets.

Thanks to the internet, you and I can watch the whole process of web-building. You will see the spider take a break during the process, likely so that she can switch to a different type of silk gland. This BBC Earth video shows and explains the entire construction process—normally one that takes thirty minutes to an hour—condensed to four minutes: “Beautiful Spider Web Build Time-lapse”:

<https://www.youtube.com/watch?v=zNtSAQHNONo>

During her time in the web the orb weaver responds to vibrations of the strands, rushing to whatever flying insect is caught, wrapping it in silk, biting it and waiting for it to die, and then taking it to the center of the web to eat. If prey is plentiful, she may not risk tussling with any unusually large insect or other animal that is caught. I found at least two reports of birds, a warbler and a bunting, who died, unconsumed, in orb weaver webs. In diurnal orb weaver webs, butterflies and diurnal moths will usually escape by shedding scales from their wings. Some new science shows that orb weavers even catch and eat pollen in their webs, so they are actually omnivores.

The web’s signaling power has also turned out to be much greater than expected, acting as a sound amplifier, magnifying acoustic vibrations that occur beyond the web, perhaps giving advance warning of predators. And communication via web isn’t limited to sound: males may have taste receptors on their legs which allow them to taste the silk and determine the female’s receptivity to mating.

We can also see a marvelous video showing an orb weaver quickly taking down a web, which she mostly consumes, in Jo Alwood’s “A Barn Spider Takes Down Her Web”:

<https://www.youtube.com/watch?v=Y-WxGikaaiM>

Once her web is down, our spider will rest in a hidden spot, usually under a leaf, with her legs drawn up for the rest of the day.

Some other species of orb weavers produce very different shapes and sizes of webs and deploy them differently. At the extreme, bolas orb weavers do not make webs at all but instead fish for moths using a sticky moth-pheromone-laden globule suspended from the legs. There are even some social species of orb weavers who cooperate in building very large webs.

Spiny backed orb weavers, often seen in RGV backyards, make smaller and less organized-looking webs which they inhabit throughout the day.



Spiny backed orb weaver is common in the RGV

Some nocturnal orb-weavers rank potential web-building spots according to whether they have the correct amount of light for attracting insects. Adams (2000) found that spiders would build smaller webs and take them down sooner in places with higher prey density, thereby conserving energy.

One of the most interesting web variations appears in the genus *Argiope*, which includes some of our familiar black and yellow garden spiders, who are diurnal. This is the addition of a stabilimentum, criss-crossing bands of silk in the center of the web where the spider sits. Biologists have proposed that it may function as a lure for insects by reflecting UV light, as a warning to birds, or as a way of camouflaging the spider. It may also have been the inspiration for E.B. White's *Charlotte's Web*.

But back to our own spider, *Eriophora*, she of the lovely web. Her species lives about twelve months, laying eggs inside a fluffy cocoon attached to foliage. Her hundreds of spiderlings hatch in autumn and balloon off into the breeze on small silk strands, building tiny webs in vegetation and waiting until spring to fully develop and build larger webs (if they are female). It is now November, suggesting that the web I saw was one of our spider's last creations.

I found it moving that her skillful effort created an experience of beauty for another animal (a large, literate ape!). However frivolous, I felt grateful to her and hope to see some of her tiny spiderlings in the spring.

To read more:

About pollen consumption by spiders:

<https://pubmed.ncbi.nlm.nih.gov/24312430/>

About orb weaver webs:

<https://insideecology.com/2018/06/21/a-closer-look-at-spider-webs/#:~:text=There%20are%20four%20main%20parts,the%20web%20to%20the%20substrate.>

About the acoustic properties of webs:

<https://news.cornell.edu/stories/2022/03/orb-weaver-spider-uses-web-capture-sounds>

Photos of a variety of stabilimenta: <https://en.wikipedia.org/wiki/Stabilimentum>

About bolas spiders: [https://en.wikipedia.org/wiki/Bolas\\_spider](https://en.wikipedia.org/wiki/Bolas_spider)

About choice of hunting sites:

Adams, M.R. *Choosing Hunting Sites: Web Site Preferences of the Orb Weaver Spider, Neoscona crucifera, Relative to Light Cues*. Journal of Insect Behavior, Vol. 13, No. 3, 2000