

# The Hunting Blind

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## MORE ABOUT CTENIZIDS, THEIR HUNTING BEHAVIOR AND OTHER SURPRISES

Out of the clear blue, Luc Ross forwarded an article to me entitled "Hunting behavior in the Ctenizidae" (pronounced ten - izz - i - dee) written by the late Harro H. R. Buchli, published in American Zool. in 1969. Thanks to Luc, I can share parts of this wonderful article with everyone.

I offer this as a follow up to my previous article about trapdoor spiders in Forum Magazine 8(2). Buchli cleverly breaks down hunting techniques of mygalomorph spiders into a few basic categories. These are listed in order from simple, to those that seem more evolved or specialized.

1) Those that seem to roam freely, capture prey that they encounter, or seek. Free hunting vagabonds are found among the Theraphosidae such as Aviculariinae in the treetops and Grammostolinae creeping on the forest floor. These patient hunters can remain motionless, springing with great speed upon unsuspecting prey that flounders within their reach.

2) Those that remain sedentary, such as trapdoor spiders or other spiders whom rely on their hunting blind exclusively to ambush their prey.

Trapdoor spiders, including members of the families Ctenizidae, Actinopodidae (mouse spiders), and Barychelidae (brushfooted trapdoor spiders), fit nicely into the group that tends to remain sedentary, safely hidden most of their lives in a burrow or tube of silk that can be capped with a fully functional door or other structure.

The specific hunting tactics of the ctenizids, or trapdoor spiders is broken

down further by Buchli. The typical mode of hunting expression is a spider lying in wait, peeking from behind the slightly opened trapdoor. The door is flung open at lightening speed and the spider tackles its prey.

Usually, the prey is within reach, and the spider does not have to leave the burrow. These type of hunters tend to keep a firm foothold on the rim of their burrow with their rear legs. As soon as the prey is grasped, the spider withdraws back inside, all within a split second.

Another variation that Buchli describes as more "cunning" is accomplished by a species who assemble an array of trip wires radiating from the center of the burrow entrance. Again, the lurking spider peers through a partially opened door, waiting to sense a vibration emanating from the length of one of those sensors. Those vibrations are probably like a dinner bell to the spider.

Some that fashion a tube of silk adorned with sand and other ground litter are called Atypidae, or purseweb spiders. Very peculiar animals, they catch their prey without leaving home at all. They have extra large fangs, and employ them to impale their prey right through the wall of their tube. The unlucky bug gets dragged inside, eaten and disposed of at the bottom of the burrow. The purseweb spider then carefully mends the slit it created.

If you see a purseweb burrow with multiple mends, it's safe to assume that the spider inside is content and well fed. Others may or may not build a trapdoor, but crown their burrow with a funnel

shaped web, or build an entire web structure above the ground in the shape of a sheet, tube, or hammock.

The extraordinary behavior of a ctenizid observed on the Greek island of Tinos in 1868, portrayed a spider that at dusk, held her trapdoor open by a strand of silk. The occupant left the burrow and built a 10-20 cm rectangular shaped web connected to the entrance. The spider returned to the safety of the burrow dashed out to dispatch its prey. The remarkable part was that before sunrise, the spider destroyed the sheetweb and dragged it into the burrow. A brand new web was made every night!

There are still more sophisticated techniques used by a North African species. The burrow is open, and extends from the ground upward into a silken funnel, which is anchored to surrounding plants. The spider stays safely near the lower level, charging out to capture any insect foolish enough to betray its own presence. Variations on this hunting theme exist in abundance. Sheet webs with burrows, without burrows, trip wires made of silk and plant matter, camouflage, and any combination of the above can be found, if we search carefully. Most spider homes of this type are well hidden by design, so watch where you step!

Of these methods, is it fair to say one is more successful than the other? Probably not, because all have endured and survived in their own way.

I read through Buchli's writings with great interest, because he entered the secret world of trapdoor spiders and revealed some startling details. As I turned the pages I sensed this work must have been documented over a very long period of time. Buchli didn't merely observe the creatures, but recorded their activities in an ingenious way using some

quite elaborate mechanical devices. I won't go into the elaborate elements here, but try to imagine a fine copper filament attached to the spider's trapdoor, which was then attached to a recording arm on a pivot. Movement of this pivoting arm triggered a pen that etched a complete story and rhythm of the spider's nocturnal activities on a rotating actograph cylinder covered with smoke paper. This is just one highlight of the article that proved to be a real eye opener. The study revealed that trapdoor spiders are completely nocturnal. They open their trapdoor at intervals to remove trash, food pellets, stones and their shed exoskeletons. Different levels of activity were recorded during the night. There are rest periods, where the creature is lying in wait. There are spurts of activity where the spider leaps without motivation. These practice drills occur frequently and could be a spontaneous release of built up energy, or may serve a partial role in keeping their hunting skills up to snuff!

Ctenizids most often burrow on steep embankments, facing north. The reason for this may be the need to live in moist soil, protected from direct sunlight. Spiders living on steep banks never leave their burrows entirely, likely because of the risk of falling and not being able to return. Some spiders living on flatter terrain can be coaxed from their burrow to capture prey if they are hungry.

The hunting period normally begins right after sunset, and terminates just prior to dawn. In between, there are intervals of lurking and resting, with the trapdoor half opened, then closed. There are usually about six intervals per night, often with practice leaps put in for good measure at various times.

If prey is taken, it will be consumed immediately and the remains removed as soon as possible. Some ctenizids leave the

remains at the bottom of their burrow and cover it with layers of silk. They have also been observed stocking food items for later consumption if prey is abundant.

Over the period of one year, Buchli collected sufficient data to show that the spider's biological clock adjusted accordingly to the seasons as the daylight hours and length of night changed. Light plays an important role in determining the spider's hunting schedule. Trapdoor spiders seemed to be active only when the light intensity dropped below 100 lux. Experimental (artificial) inversion of the day and night showed the spider's remarkable ability to adapt to the change within a few days. Their eyesight may be poor, at best, but their ability to detect light is all they need to stay on schedule!

To remain in top form, ctenizids need higher humidity levels. If the relative humidity drops below 50%, the animal will close shop and stay inactive. Windy conditions may stop all hunting activity for two reasons. First, a dry wind can lead to quick desiccation. Secondly, in moist conditions, high winds may inhibit the spider's senses by confusing their ability to detect prey movement.

Buchli revealed that some species of trapdoor spiders mature over a period of five years. They remain in their maternal burrows up to three years feeding upon prey their mother has caught. The young never capture their own prey while living in the mother's burrow. At some point, the urge to leave home becomes a priority, and each of the young go out into the world to fend for themselves. Both males and females disperse and dig their own burrows. Males reach adulthood in the eleventh or twelfth instar, females in or after the thirteenth instar. Females continue to molt through their estimated lifespan of 15-20 years. Males, upon reaching sexual maturity wander from the

safety of their nest to search for a mate, or many mates, if they are lucky. Females of some species tend to attack the males after copulation, probably to take advantage of a good meal. After sex, some females were observed kicking the male out the door, dead or alive! Females who are not in mating condition may treat any passing male as a prey item. It's a tough world out there for the boys.

The female's eggs begin to develop in early spring, and mating season is in autumn, from September to October. Females who successfully mate in the fall, will produce an eggsac containing about 40 eggs the following spring, usually in May. Mated females suspend their eggsac within their burrow, and seal the trapdoor entrance tightly with silk. Some plug the entrance with dirt. Once the eggs hatch, with some variation in time among species the young can remain with their mother in her burrow for a few years. The family that stays together longer, usually feeds together as well. Some species of the genus *Nemesia* act a little differently. The young do not accept food from the mother. They live on yolk sack nutrients stored within the abdomen until the third instar. When dispersing, they dig tiny trapdoor burrows of their own, just 2 mm in diameter! It is thought that the digging of its own burrow also triggers the hunting and eating instincts. Spiderlings this tiny must selectively hunt equally tiny prey.

I guess to wrap things up, I have to say that it is an incredible feat for a spider to detect its prey, locate it, and judge its size, all the while totally concealed behind a trap door! Hunting senses are mostly centered around vibration detection. Not visually acute animals, trapdoor spiders rely almost entirely on locating the prey by feel. A couple of species within the genus *Ummidia* leap upon their prey with great precision from behind a closed door.

Specially developed, spoon shaped sense hairs located on the tarsi are attributed in helping the spider zero in on the kill. The spoon, or racket-shaped hair transmit the nearly imperceptible vibrations to the hunter's nerve center. The information is gathered, channeled, and processed at deadly speed and accuracy. Unfortunately, the passing bug doesn't stand a chance in hell against such a finely tuned system.

Over the summer, I received some positive feedback and helpful tips from one of my readers that I'd like to share.

Below is from Wade Harrell.

Thanks for the great article in the Forum Magazine about trapdoor spiders! As luck would have it, I had just recently purchased one and have been looking for information. I wanted to share with you a method for housing them that I came up with. I started with a round container (ten inches tall by eight inches wide container from Pioneer Plastics, but a large jar should work just as well).

Inside of that, I inserted a upside-down 32 ounce deli cup. This left a one and a half to two inch space between the inside of the container and the outside of the cup, all the way around. This space I filled with peat moss which I packed somewhat tightly. I then cut a piece of opaque poster board (black is best) as wide as the peat moss section and long enough to wrap the whole container, and, using tape, attached it a fashion that would allow me to easily unwrap and rewrap it. I made a hole with my finger (just as you described) near the edge. Less than twenty-four hours later, the spider had dug its burrow, complete with trapdoor. Because of the narrow space, one side of the burrow is on the side of the container and I can look in at her if I need to see her (to check on her health, or just because I forgot what she looked like!). I keep the window covered at all other times for her privacy; besides,

she would probably web it over if it was left exposed too much. I have used this method for immature burrowing tarantulas as well.

As for being boring, a friend of mine who keeps a lot of reptiles, but until recently had never kept any arachnids, became so intrigued by mine that he's gotten one for himself! Another convert! Thanks Wade, that was great!

Thanks to everyone until next time.