

The Eyes Have It

Excerpts from an article by Rhys A. Brigida; ATS Forum magazine, Vol. 10.3

I recall my early days in the hobby, having just a few tarantulas in my collection. They were all burrowing species. My very first arboreal was a *Heteroscodra maculata*. It was a real surprise when I opened that mail package. A young spider with astonishing athletic abilities emerged! She didn't hesitate to show off her talents, either. There were several scary moments during some cage transfers. I have witnesses that can testify to this spider's leaping, gliding, and 'run for cover' tactics.

As time went on I acquired more tree dwelling tarantulas. Some various *Avicularia*, *Poecilotheria*, *Stromatopelma*, and *Psalmopoeus spp.* began to populate my spider room. Casual day-to-day observation of these critters revealed remarkable differences from the ground dwellers I had become so used to. Aside from the arboreals' obvious ability to scurry and dance on nearly any surface in just about any position, I noted they often reacted when I switched on the lights. My spider room is kept warm and dark. Only two night-lights illuminate the area. Upon entering the room I often spotted a few of the arboreals ducking behind their retreats, then peeking out when they felt safe.

I've also seen some of my burrowers react to light, but to a lesser degree. I brought a female *Haplopelma lividum* into the sunlight to photograph her and she immediately began digging into the potting soil of her container. It took several minutes of coaxing to get her to remain still and out in the open for the camera.

It would be unfair to generalize by saying that one type of tarantula can see better than another. We can only guess at how a tarantula views the world, or for that matter what kind of images are transposed on their brain from that complex, eye covered bump we call an ocular tubercle, or eye turret. I also didn't want to mislead anyone by implying that tarantulas rely upon their sense of vision more than their sense of touch.

Tarantulas are mostly nocturnal, and their awesome tactile sense is likely the one that dominates nearly all of their life's situations. I

noticed that some ground dwelling species have smaller eyes that seem to be grouped together in a tight pattern on their turret. This leads me to believe that their sight is adapted to looking above, to the side, and to the rear with less emphasis placed upon frontal vision. The arboreals tend to have larger eyes spread out and more deliberately aimed forward, to the rear, or to the side. One pair of large eyes is dedicated to looking straight up. These could help the spider elude an approaching enemy. The forward facing eyes are relatively large and their field of vision may overlap at a critical distance just beyond the spider's front legs.

This is a nice feature for any predator that stalks prey on the tree branches. We all know that when eye fields overlap it adds stereoscopic and depth of field perception elements that are essential tools for a skilled predator. Can arboreals see better than their earthbound relatives, or does their more elaborate eye pattern simply augment their already finely tuned tactile senses?

For both ground dwellers and arboreals I think that their eyes would at least allow them to see images or focus where the action is when they emerge from their favorite hiding place.

My close up vision is not so acute. To view a structure as small as a tarantula's eye turret I need some help. The 35mm SLR camera with special lenses was my first tool that unlocked some of the secrets that my naked eyes would've never uncovered. Lately, I've been using a scanner to capture digital images on the computer. The scanner is fairly good with adjustable resolution. It can 'see' objects that are well beyond my unaided vision. For example, the color scan that follows shows a close up of the molted carapace of adult sized *B. smithi* (left) and *P. regalis* (right). Notice the tarantula's eye arrangement. There are eight eyes, placed into two lines, anterior (front) and posterior (back). The eyes on the outer extreme are lateral, and the inner eyes are called median. Most tarantulas have an ocular arrangement that follows these simple rules.

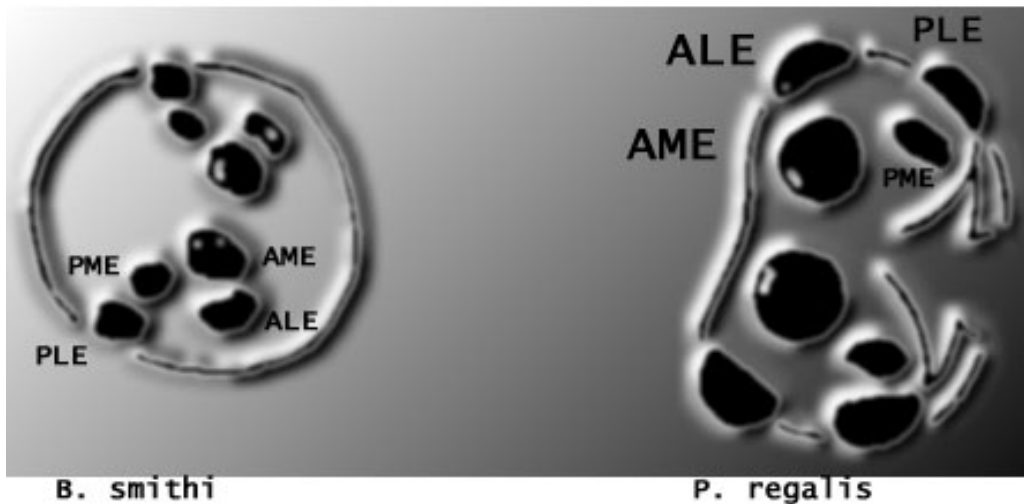


Mainly, I wanted to show you a comparison between a typical ground dwelling and arboreal tarantula. The scan is clear enough to show us the ocular arrangements and simple eye pattern rules that are common from spider to spider. From this scan I made a computer drawing that maps out the four pairs of eyes for *B. smithi* and *P. regalis*.

My first view ever of a living tarantula was in a pet shop from a distance of several feet. I kept my distance because I was afraid to look at it closely. Fear was eventually pushed away and replaced by wonder, which then prompted me to buy my first tarantula. Ever since, I've been striving to get closer and closer! Technology keeps getting better. We now have digital cameras with enough resolution, image quality and true macro capability to capture astounding images of our spiders.

KEY:

ALE = Anterior Lateral Eye Anterior = front
 AME = Anterior Median Eye Posterior = back
 PLE = Posterior Lateral Eye Lateral = side
 PME = Posterior Median Eye Median = middle



This drawing shows the eye arrangement of two typical tarantulas, one burrower, and one tree dweller.