

# The Bosque Serengeti

-- Jean Mason

**AFRICA:** *The lion crouches low, exploiting camouflage provided by tall savanna grass that mirrors her tawny coat. She slinks forward slowly, noiselessly, keen eyes locked on a live one: A healthy young antelope isolated from the pack. With a shot of speed, the great cat runs and then jumps twelve feet forward. Outstretched claws sink in and long canines bite deep to the bone for a kill.*

**RIO GRANDE BOSQUE:** *Hiding his one-third inch self in a night web built inside the flower of a rabbitbush, an Apache jumping spider peers out at a new day. He spots a bluebottle fly buzz-flitting through vegetation blooming along the riverside drain. He scans and analyzes details of his prey image: Is it his enemy, a parasitic wasp? A juicy mosquito? A nothing leaf in the breeze? Yes, it's a live one! Tethering a silk fail-safe dragline to the edge of his home flower, he moves slowly, crawling forward, then backward and now sideways, always strategizing. Suddenly, he explodes in a jump 50 times the length of his body, snugging up the dragline to alter its pitch for a dead-on catch. Venom fangs open, spearing the fly in mid-air. Struggling in the vise of the spider's four legs and metallic green pedipalps, the fly vanishes, liquefied tissues gone in nine minutes.*



Antarctica; the Himalayan jumping spider *Euophrys omnisuperstes* (its name means standing above everything) makes a living feeding on insects blown up by high winds atop Mt. Everest at 22,000 feet. Tropical regions boast the most in number of species while North America north of Mexico has just 300.

When it comes to creative camouflage, the salticid spiders have raised the morphology bar. One species has tufts of hair that look like dust, allowing them to creep unseen into the nest of another jumper group that will become their prey. Another is an ant mimic, complete with a fake ant eyespot and antennae, cleverly fooling other ant predators who avoid

the toxic, nasty-tasting ant original. Many are brightly colored, and arrayed in striking iridescent patterns while others have evolved to look like tree bark, beetle shapes, grass, and stones.

And our Apache jumper? He's a mimic of the western velvet ant - a crawler that's not actually an ant but a hairy, brightly patterned wasp with a painful sting that most predators avoid. Both arthropods have red backs and black legs, though velvet ants are much larger than the Apache jumper. Behavior is the mimic key: Velvet ants run on the ground with their heads down, square bodies pointing forward. That shape matches the rectangular, front-facing shape of the spider's thorax, and at the same time, makes the ant look more spider-sized.

## Stopping for a morning meander

through the Nature Center's garden, you stoop to read a low sign identifying a handsome tall shrub with yellow flowers, the golden currant. But something is strange: You have a distinct sensation that the sign is reading *you*. It's an eight-eyed Apache

## Meet

### *Phidippus apacheanus*,

the Apache jumping spider of the Middle Rio Grande Valley. His sharp-eyed, deliberate hunting style, marked by camouflage, great target accuracy, and trap/stalk adaptability, make him a lion stand-in, a spider simile of Africa's Serengeti lion in the Rio Grande bosque.

Along with two other species in the *Phidippus* genus, the Californian and the eight-pointed jumping spider, the Apache is a Southwestern native, part of the dryland sagebrush community of the Great Basin.

Our Apache jumper is one species of the *Salticidae*, largest spider family in the world with at least 6,000 species in habitats ranging from low-down leaf litter to high in the forest canopy; jumpers are even found on insect-friendly windowsills in private homes. Members of the jumping spider family *Salticidae* fly through the air on every continent except

jumping spider on the ground, fearlessly giving you the onceover, in octuplicate. He's deployed the sharpest vision of all the world's spiders to the job of identifying *you*.

Shaped like telescopic tubes, the jumping spider's large, central, long focal-length, three-dimensional eyes provide its owner with narrow but high resolution images. Each eye can move independently around its optical axis like a scanner. Double front and back lenses focus the scene on a four-tiered retina with photoreceptors color-sensitive into the UV range. In addition, each retina has a crucial pit at the center that bends light to magnify the image. The jumpers' six remaining fixed eyes fill in the picture by providing good peripheral perception and a broad field of view along with motion detection capability from the side and even behind. If you move to the side, the spider will follow you, moving head and eyes.

### **Other Senses, Other Talents**

Excellent vision makes for a capable hunter; learning, remembering, and adapting behavior make for a super scout lookout.

Colorful jumping spiders have been shown capable of remembering the colors of their friends and enemies; they also can recall an unhappy encounter with certain animals, identifying and avoiding them at a later time. With experience, jumpers learn to discriminate about what prey to attack, and how - taking a round-about route, for instance, rather than a straight line, to reach an agitated beetle or to attack an unaware dragonfly from the rear. A jumper's detour can be complex: Starting from one bush, the spider climbs down to the ground; though the prey may be out of sight, he's then up the stem of another leafy bush, to finally capture the remembered prey on a particular leaf. It's a puzzlement: All this memory is inside a brain the size of a poppy seed, most of it devoted to anatomy required for topnotch vision.

**M**emory and planning: They're great as survival assets. Do jumping spiders also have a developed auditory sense?

By inserting hair-size tungsten microelectrodes into a jumping spider's brain, scientists have shown that auditory brain neurons can sense far-off (for a tiny spider) sounds of up to ten feet away. Also found was an area of the spider's brain that integrates visual and audio signals. Further research tested hairs on the spider's legs and body, stimulating them and generating a similar response in the same neurons. Different studies show that males give off auditory signals during courtship resembling buzzes and drum rolls when dancing before a female. She, in turn, will vibrate her pedipalps.

Jumping spiders, scientists have found, are sensitive to high frequencies, as well as to very specific low ones, in particular, to the same 90 Hz frequency made by the wingbeats of parasitic wasps, the jumpers' major enemy (it captures spiders for its wasp young to feed on). Researchers noted that spiders froze



when hearing the low sound, a well-known startle response of animals that can hear. Remaining stock-still allows a spider to assess the situation and avoid being grabbed by a wasp adapted to looking for movement in its prey.

### **A Let up, and Over**

Ask any Olympian high-jumper: You need leg power and strength to make it up and over. Does a jumping spider have large, muscular legs and jump like a grasshopper?

Instead of muscles providing strength, jumping spiders have a well-developed internal hydraulic system that allows the spider to extend his legs by forcing the pressure of his body fluid (hemolymph) into them. He's off, pumped up and pushing off with his four back legs.

### **Getting Together**

Like others of his salticed family, the Apache jumper generally uses his spider silk to build a thick white nest under stones, in crevices, and under bushes - for night shelters and winter retreats. When spring and summer come, a far larger nest will be created by the female spider before she begins laying successive batches of eggs, about 70 eggs overall. But before that, she must court, and be courted.

A male in the mood to mate will signal his interest by sending out a line of silk impregnated with pheromones. Finding a female, he will begin an elaborate dance. Carapace held high, abdomen shifting from side to side, and forelegs flicking up and down, he displays his colorful, iridescent nerve-active body hairs. Dancing and prancing, he zig-zags forward and reaches out to touch the female. She turns, stops, and - unusual among jumpers - may also perform an acceptance dance before being touched. He turns her and inserts his palpus.

Spiderlings hatch in three weeks and remain in the nest after their first molt for two more weeks, all the while, guarded by the female. She soon dies; her young are on their own, facing two more molts and great mortality till adulthood.

**"Cute," "friendly little creatures," and "charming"** are some of the descriptions applied to jumping spiders. Their venom? Of no concern to humans. If you find a jumper take a closer look.

Sources: [en.wikipedia.org/wiki/Jumping\\_spider](http://en.wikipedia.org/wiki/Jumping_spider);  
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