

## **Fantastica Animalia. 1: rainbow spiders**

I remember years ago learning that, weight for weight, the silk a spider spins its web with has greater tensile strength than steel. Recently this got me thinking, what if you could make spider silk thick enough to hold up suspension bridges? The silk would have lots of other uses as well. Spider-silk cables would be thinner and lighter than normal steel cables because of their greater tensile strength. Just like rope, and many steel cables, thinner silk cables could be woven together to make a stronger, flexible cable. (Whether a spider-silk cable would last as long as a steel cable is another question.)

How would we get silk thick enough to make such cables? Imagine a combination of genetically engineering and breeding techniques to produce giant spiders. Instead of seeing cows in a field you might see a 'herd' of giant spiders. Over the years cows have been bred to be docile, and we could do the same with the spiders. Then it would be easy to keep them in a field. As well as breeding for docile behaviour perhaps we could breed into them the need to be 'milked' for silk every day. Otherwise they might build giant webs around the field every day! The farmer would bring them into the barn once a day and hitch them up to a silk gathering machine. The farmer would coax a bit of silk from the spider and then attach the end of it to a cylinder and, as the cylinder rotates, the silk would gently leave the spider and gather on the cylinder.

Obviously many people don't like normal sized spiders --- let alone giant ones! Having bred them to be docile maybe people would get used to them. But to make them more appealing we could also breed the spiders for colour. Instead of seeing black spiders in the fields we could have brightly coloured ones. Some species of tarantula already have wonderful red and yellow patterns. There are even spiders (and other creepy crawlies) that have iridescent colours that shine and glisten in the sun. Imagine driving passed a field of bright, rainbow-coloured giant spiders glistening in the sun! Maybe we could go further. Some creatures glow in the dark. Perhaps we could breed our spiders to lightly glow in the dark. That way, if they wandered off, it would be easy to find them in the dark. Perhaps this would be a step too far as our fields would constantly glow in the dark because of our giant rainbow spiders --- too much light pollution!

Unfortunately such giant spiders would collapse under the weight of their own skeletons (which are on the outside of their bodies). But if they were on a planet with much weaker gravity they would be much lighter, and might be OK. A bigger problem would be, how would they 'breathe'? Normal spiders don't have lungs. They are small enough to use air tubes running through their bodies to get oxygen to their different parts. This wouldn't work for giant spiders. Even so, I still like the idea --- giant iridescent spiders shining in the sun. For some people --- a nightmare. For me, a field of giant iridescent (tame) spiders shining in the sun --- a beautiful dream.