



Curiosity Guide #704

Leafy Science

Accompanies Curious Crew, Season 7, Episode 4 (#704)

Repulsive Leaves

Investigation #6

Description

Some leaves repel water more than others. Find out how and why!

Materials

- Water lily leaf
- Variety of other leaves
- Eye dropper
- Container of water

Procedure

- 1) Fill the eyedropper with water.
- 2) Save the water lily for last. Drip the water onto the surface of different leaves.
- 3) What do you notice?

Results

Explanation

You may have noticed that water droplets bead up on the surface of the water lily, much more so than the other leaves, which seem to get saturated. Leaves have a layer on the top, referred to as the cuticle. The cuticle can reduce water loss. The cuticle also stops water from penetrating the leaf. The thickness of the cuticle layer determines how repellent the leaf will be. Because a water lily lives in the surface of the water, the lily leaf has adapted so that the waxy cuticle layer is thick and can shed away excess water. Getting rid of excess water helps the leaf to breathe and stay afloat. A tropical lotus leaf is extremely hydrophobic, or water repellent. Because the lotus is exposed to so much moisture, this plant adapted with a thick cuticle that resists water. Instead, the water will bead up and roll right off. The rain first collects in the center of the leaf until the weight of the water bends the leaf enough to shed the water off. In that way, the rain will wash bacteria or fungus away and off the leaf. Scientists have used this phenomenon to design waterproof clothing.

Let's not leaf anyone out: Every leaf is not the same. Leaves come in many different shapes and sizes. The primary function of leaves is to feed the plant through the process of photosynthesis. This is true even with pine needles! The slender pine needle can't catch as much light as a large leaf on a deciduous tree can, but the needle still does its job. The waxy cuticle surface of leaves differs, too, making some leaves more water-repellent than others. The tropical lotus leaf is so waxy that, just like the water lily, the lotus repels water off, perfect for a really wet environment!

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