The Outside Story

Jack-in-the-Pulpit, or is that Jill?

By: Meghan McCarthy McPhaul

Jack-in-the-pulpits (*Arisaema triphyllum*) are not the most colorful spring flowers, but what they lack in beauty they make up for in interesting characteristics. These easily-identified plants are full of surprises, from their ability to change from male to female (and back) to the bite of their calcium oxalate crystals, which can make your tongue feel like it's full of burning splinters.

Jack-in-the-pulpit surfaces in wet, shaded woodland areas in mid-spring as a purpley-brown spike, all tucked up within itself. As the days meander toward summer, this spike unfolds into leaves and flower, with the plants growing as tall as two feet. The floral anatomy here includes a spadix of tiny flowers contained within a hooded spathe: Jack enclosed within his pulpit.

Of course, not all the flowers are "Jacks;" some of them are "Jills." And last year's Jill could very well be this year's Jack – and vice versa. Jack-in-the-pulpits change sex from year to year based on how much energy a plant contains in its corm, a bulbous underground stem that stores the plant's carbohydrates.

"Producing fruit takes a lot of energy, usually more than any one plant has stored in its corm," said Dan Jaffe, a botanist with the New England Wild Flower Society. "Most plants will produce male-only flowers while they are storing up additional energy. The male flowers produce pollen, which doesn't require much energy. As the plant matures it will continue to photosynthesize and store energy in the form of sugars in its root system. Once enough energy has been stored, the plant will produce female flowers, and if pollinated will then produce berries. After fruiting, the plant will revert back to being male, and the cycle will continue."

Male flowers are generally accompanied by a single leaf comprising three leaflets. Females, thanks to their additional energy stores, usually sprout two leaves. Beyond that, the plants look basically the same, unless you open the spathe to examine the flowers within. Male flowers appear in a loose cluster of tiny, pale yellow pollen blooms. The female flower resembles a cylindrical cluster of small green berries, which will mature and become the plant's crimson fruit in late summer.

Fungus gnats and flies, attracted by the plant's color and odor, are the main pollinators of Jack-in-the-pulpit, although they have a tough go of it. Because of the spathe's deep cylindrical lower structure and the location of the flowers at the base of the spadix, would-be pollinators often get stuck in the plant.

"The way the flower is arranged is similar to a fish trap – wide in one direction, narrow in the other," said Jaffe. "As [insects] bumble around in the spathe, trying to find a way out, they get coated in pollen in male flowers and transfer that pollen to the stigmas in female flowers."

While the spathes of the male flowers have a small opening at the base, by which lucky pollinators may eventually emerge – carrying their burden of pollen – there is no such escape hatch in the female plant. Any insect that finds its way into a female Jack-in-the-pulpit may spend the rest of its life within the spathe.

Although Native Americans found a variety of uses for the dried corm of Jack-in-the-pulpit (also called Indian turnip) – from grinding it into flour to relieving colds, fevers, and snakebites – all parts of the plant, in raw form, are quite poisonous to humans. The flowers, roots, and leaves of Jack-in-the-pulpit contain high concentrations of calcium oxalate crystals. These crystals, the major ingredient of painful kidney stones, cause severe burning and swelling.

That seems to only be a danger to humans, however, as many animals eat both the corms and berries of Jack-in-the-pulpit. The corms are a favorite late-spring snack for black bears, which neatly extract them from the ground. Deer eat the roots, while wood thrush, turkeys, and other wild birds eat the berries, which are a particular favorite of ring-neck pheasants.

None of these animals seems willing to snack on the Jack-in-the-pulpits growing beneath the wild rose hedge along our driveway; it seems the thick brambles keep them protected. Each spring we look eagerly for the plant's first spikes. As spring turns to summer, we watch them grow and develop tall green leaves and striped spathes, each one containing a little Jack – or Jill – within its hooded pulpit.

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