

Skunk cabbage blooms are a stinky herald of spring

April 6 2015, by J Peter Coppinger



Too bad this picture's not scratch n sniff. Credit: slack12, CC BY-NC-ND

I love the smell of skunk in early spring. That sulfur smell tells me that the snow is melting, the sun is rising higher into the sky, and soon a carpet of wildflowers will paint the forest floor in white, purple and pink.

But it's not the stink of an unfortunate nocturnal road-crosser. It's a

flower. In fact, it is the earliest flower to bloom in the first days of spring – if not the last weeks of winter.

I'm a professor of plant biology. Every spring I take my students on a walk through the woods. While they're off taking pictures of buttercups and lilies, I'm ankle deep in mud, looking for my favorite spring wildflower: [eastern skunk cabbage](#), *Symplocarpus foetidus*. Its species name, "fetid flower," is an understatement.

The philodendron, that beautiful sprawling houseplant, is a first cousin to skunk cabbage, as is the graceful and pleasantly scented peace lily. Here is the bad news: these plants are poisonous if you eat them. They're all members of the plant family [Araceae](#), colloquially known as the Arums. Attractive, yes. Poisonous? Yes. This family of plants is infamous for its production of noxious [calcium oxalate](#). When [ingested](#) in high doses, this toxin can cause permanent liver damage. This is one cabbage you definitely don't want to eat.

If you take a stroll through the late winter woods in the eastern half of North America from the midwest and mid-Atlantic states north, you might notice a few slushy spots where the snow has melted into circles. Look closer. In those circles you might see some thick leaves that only a botanist could love: cup-shaped, about the size of a softball, cresting above the snow.



Skunk cabbage flower, late winter in Michigan. Credit: Dembinsky Photo Associates

The smell will be unmistakable. The flower is mottled purple and green, with a dull-colored spike in the middle. You've found it. That is skunk cabbage.

While all the other spring wildflowers are still in winter dormancy, skunk cabbage is springing to life. Equipped with a remarkable evolutionary trait, skunk cabbage can generate its own heat. It can melt the snow around it. Some skunk cabbage have been observed to generate warmth greater than room temperature, even on a chilly, snowy, late winter day.

The [biochemical explanation](#) of skunk cabbage's ability to generate snow-melting heat is as elegant as it is simple. Within the skunk cabbages' cells are mitochondria, the energy-generating machinery of all cells. In these mitochondria exists an enzyme called alternative oxidase, or AOX. This enzyme alters the energy-making capability of a cell. Instead of generating power for growth, it generates heat. These [flowers](#) can melt snow.

That's how they can create those little snow clearings as they emerge in the spring. But why do they smell rotten? As the snow melts and flowers start to appear, there's competition for pollinators. Some of the very first insects to emerge are beetles and flies. These guys thrive on decay. They've spent the winter months frozen, and are the first to rummage for food.



Signs of spring. Cabbage-melted snow. Credit: Dembinsky Photo Associates

Many flowering plants, like skunk cabbage, [co-evolved](#) with animals, primarily insects. The flower provides nourishment and the insect carries pollen from flower to flower. (You know, the birds and the bees spiel.) But why would a flower smell like decay? What type of animal would visit a malodorous flower?

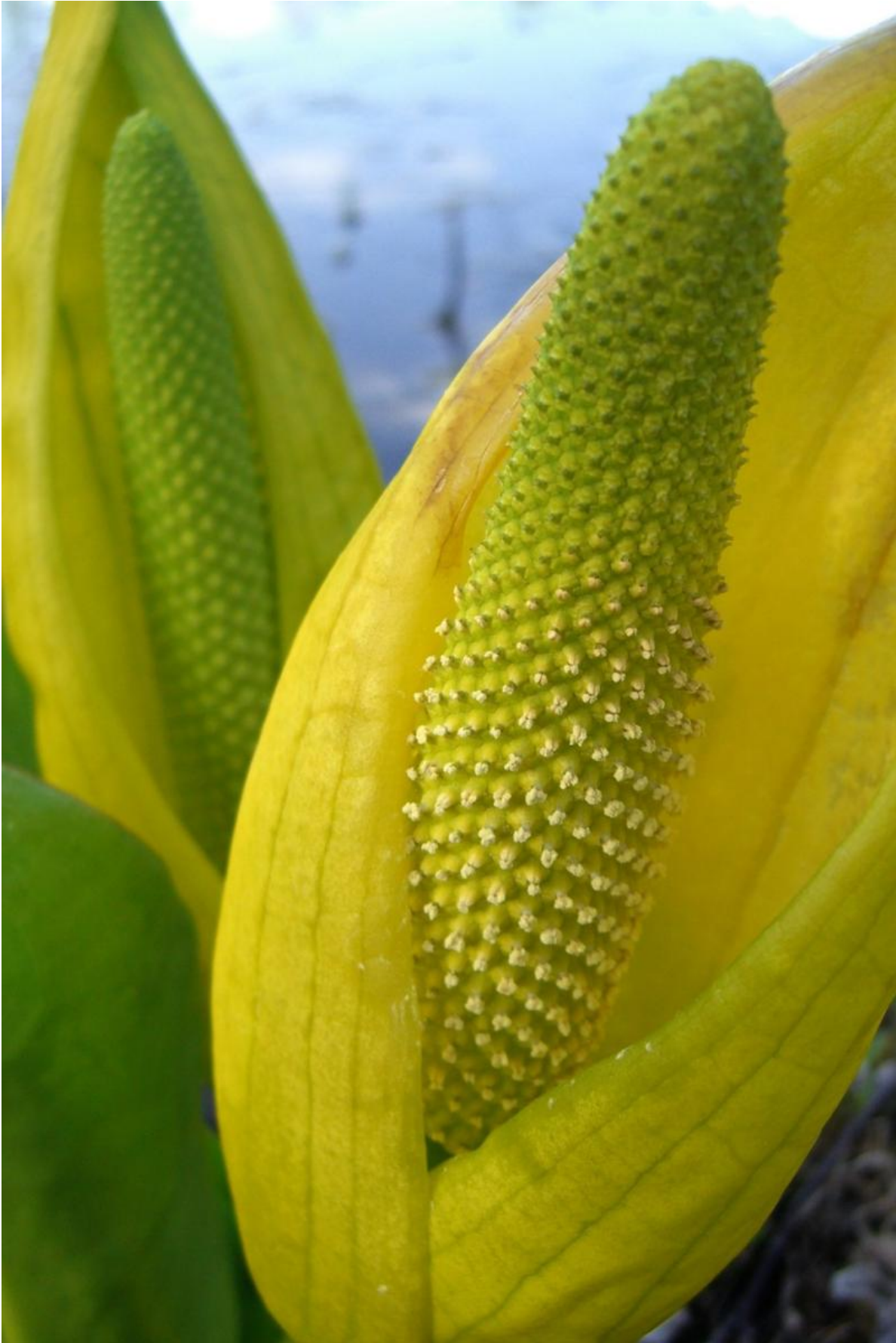
The skunk cabbage's smell is a magnificent example of mimicry and defense. The stink deceives beetles and flies, fooling them into thinking that food is available. Instead of a smelly decaying animal carcass—their spring meal of choice—they're tricked into visiting a flower filled with pollen, which they will then unintentionally carry to another flower. By mimicking the smell of decay, skunk cabbage has evolved the ability to exploit the first pollinators of the spring.



Skunk cabbage burning through the late winter ice. Credit: VasenkaPhotography, CC BY

At the same time, the bitter taste and stink deter herbivores like deer and rabbits who would otherwise be happy to feast on these first leaves of spring.

Skunk cabbage, by any other name, would smell as fetid. But to me, it smells like spring.



The alluring blossom, with its all important pollen. Credit: Jason Hollinger, CC BY

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