Local Nature

by Eric Dinerstein

The Advantages of Smelling Like a Skunk (or a Dead Monkey)

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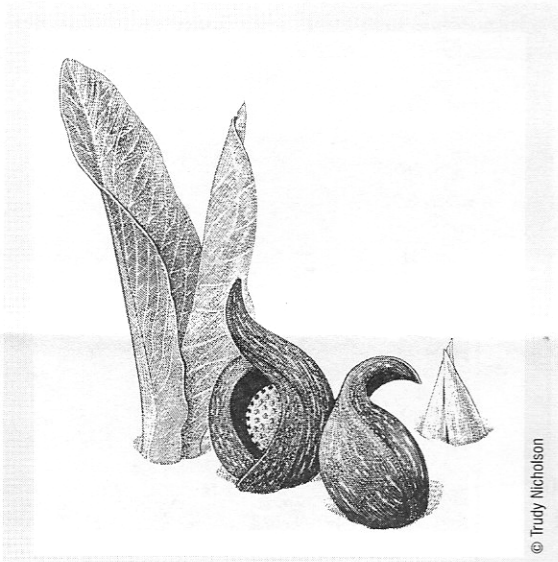
Geneticists tell us that the split between animals and plants occurred more than 1.5 billion years ago. That qualifies as eons, so it may come as a shock to all but cynics in the tradition of Mark Twain and H.L. Mencken that we humans still share about 75% of our genetic constitution with pumpkins. Even more remarkable is that 57% of our make-up remains genetically identical to cabbages. As I paused before another famous local plant on a cold, mid-February morning, known to naturalists as the eastern Skunk Cabbage—its bright purple and yellow flowering parts erupting from a crust of snow and frozen mud—I marveled at its unseasonal flowering effort and wondered how close kin I was to it. Scientists have yet to map the genome of eastern Skunk Cabbage, but let's put the genetic overlap at somewhere between 57-75%.



Several stages of an Eastern Skunk Cabbage plant, showing the flowers that can be seen by removing part of the hooded structure that protects them.

There were two remarkable features on display before me on the forest floor, where the similarities between Skunk Cabbage and humans are striking: our ability to generate heat and, at times, to emit a foul-smelling odor (and sometimes both at the same time).

Eastern Skunk Cabbage (Symplocarpus foetidus) is the first native plant to flower in the calendar year. It does so in part through a fascinating behavior called thermogenesis. Skunk cabbage, like a number of other plants in the philodendron family, generates its own heat. By a kind of cellular respiration a Skunk Cabbage is able to raise its internal temperature more than 60 degrees Fahrenheit above ambient and melt the snow around the emerging flower. The flower itself, actually an inflorescence, looks like it would be a popular choice of the landscaper assigned to plan the garden gates to Hell. There is a thick covering of the flowering part called a spathe and, in the case of the eastern Skunk Cabbage, it's a shocking shade of purple. The inner stalk, shielded by the spathe, is called a spadix and is bright yellow. Clustered on the stem are numerous small flowers, thus making the spadix what botanists call an inflorescence, a mass of lots of tiny flowers on the same structure. The sharp contrast of the spadix's bright yellow against the spathe's encompassing purple makes the eastern Skunk Cabbage one of the most striking still-life portraits in our local nature.

After the snow has melted, you'll find the tall, broad leaves of Skunk Cabbage shooting up like a wild head of romaine lettuce along streams, seeps, and wetland areas in April and May. Leafing out occurs long after the flowering part has withered away, its early work done. The flowering part of the Skunk Cabbage will be familiar to anyone who has grown a Philodendron, Monstera, Caladium, Anthurium, or Dieffenbachia indoors.

Some studies have shown that the eastern Skunk Cabbage's release of heat both offers a cozy, warm landing spot for the plant's pollinators—cold-hardy scavenger flies and bees—and helps to spread the rather foul aroma of its flowers more effectively. Just as warm breezes can accentuate the fragrance of clumps of sweet smelling herbs like lavender and bee balm, the warm air inside the inflorescence spreads the skunk-like aroma far and wide for pollinators to find the plant more easily.

The western U.S. version of the Skunk Cabbage doesn't smell foul, but in the tropics, where every

adaption seems magnified, there are plenty of wild arums, or aroids, as the family is known, that both produce heat and stink worse than old socks. In fact, there are a whole suite of tropical plants that emit the aroma of dead monkeys or other mammals, the better to attract carrion flies, a large group of flying insects that also serve as pollinators of stinky flowers.

Easily the best and largest example of this evolutionary path, is the Titan, or King Arum (Amorphophallus titanum). About every five or ten years or so, which is how frequently they flower, the National Botanic Garden trots out one of its magnificent specimens, arguably the world's tallest or largest inflorescence found in nature, reaching up to 12 feet tall and several feet wide. Many tropical plants are pollinated by carrion flies and beetles, and competition is fierce, so the Titan Arum is more clever than we may think, using its unique odor in an attempt to reliably attract pollen carriers in a dense rainforest.

Even without the tell-tale aroma, the Titan Arum's blossom is a spectacular feat of evolution, like the fronds of a leafy sea dragon or the feathers of a peacock, and almost as ephemeral as a firefly's glow. It is also one of the rarest of nature's spectacles—not just because of the long intervals between flowering events—but because the Titan Arum's natural habitat has been greatly reduced on the Indonesian island of Sumatra and could be completely converted to oil palm and pulp and paper plantations within a decade. How tragic to think that the Titan Arum may disappear in the wild before the next individual, one of the last in its lineage, flowers again. I imagine what it would be like, not to just stand in front of the eastern Skunk Cabbage, but to discover the Titan Arum in full flower in the lowland rainforests of Sumatra: after sweat-soaked hours of trudging through the mud and flicking off leeches, to smell something odd—a dead leaf monkey, a rotting tapir?—and then to stumble upon the biological reward of a lifetime. Even a short audience with an eastern Skunk Cabbage in flower in winter, a local marvel, is a reminder of why we have to save wild habitats around the world, home to such spectacular species as the Titan Arum, the King of Sumatra. The precise function of all the genes we share with the Titan Arum, the Skunk Cabbage, and the pumpkin remain unknown but let us hope that several of them code for enhanced persistence for all of us facing an uncertain ecological future. —❧