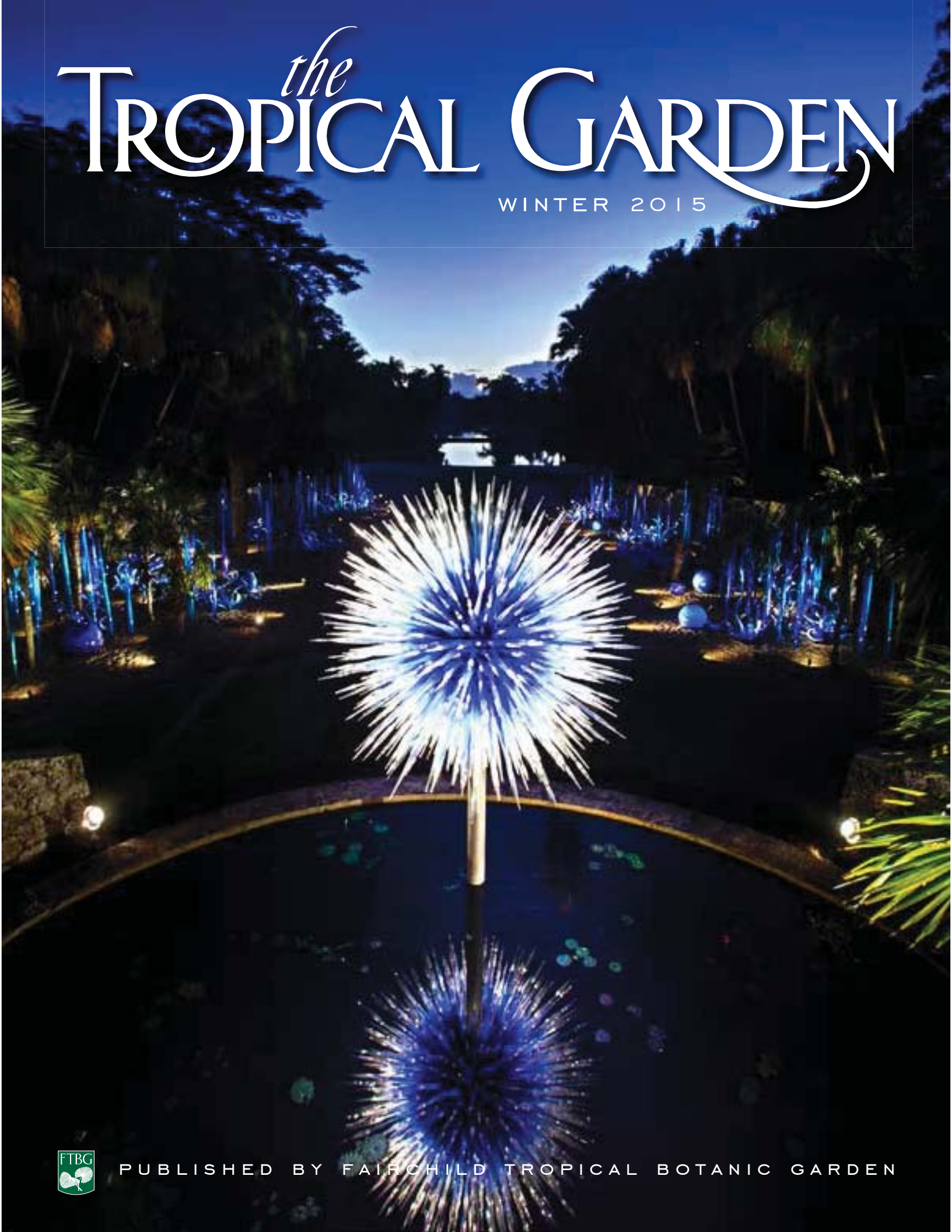
the Tropical Garden

WINTER 2015



PUBLISHED BY FAIRCHILD TROPICAL BOTANIC GARDEN

A GREATER APPRECIATION FOR FUNGI

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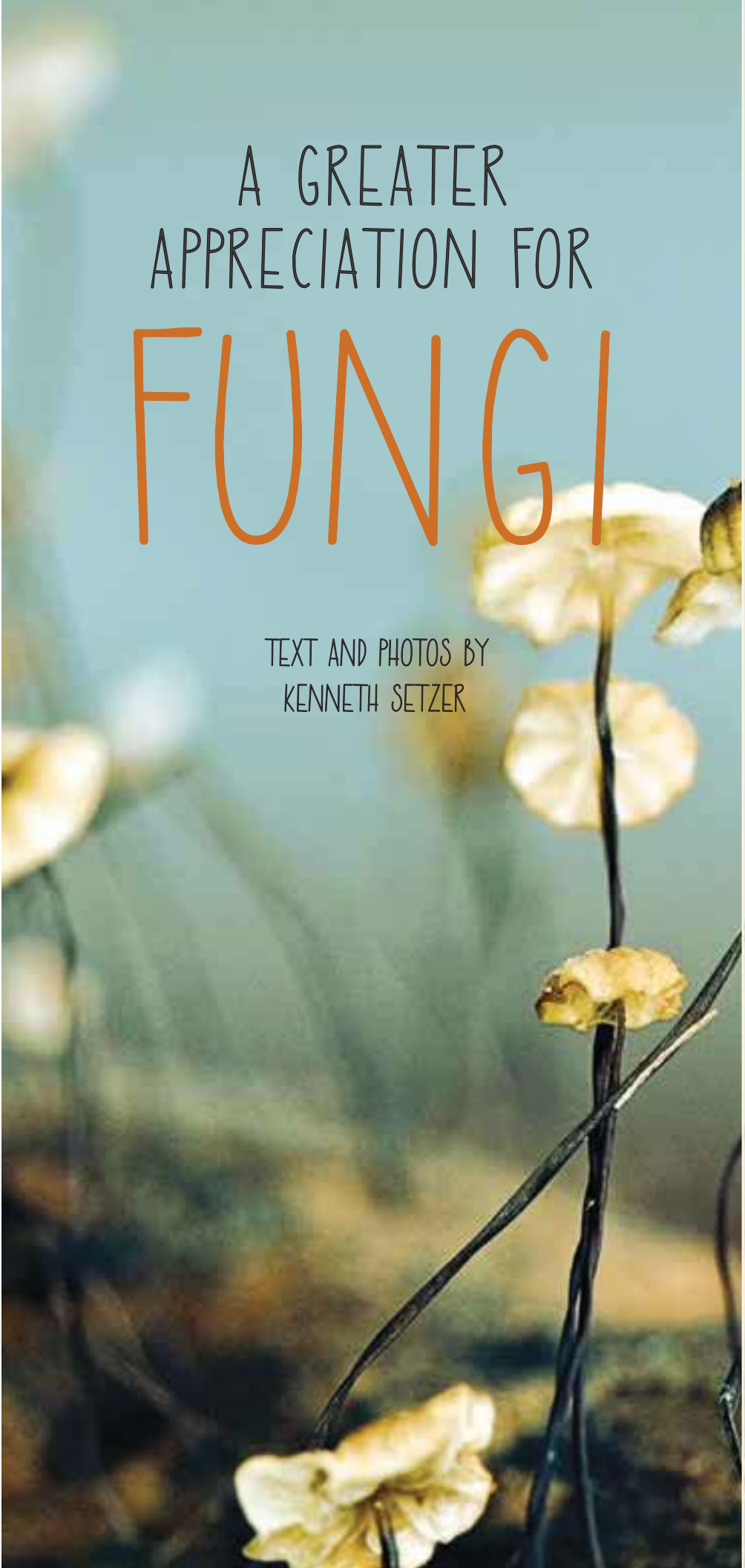

USUALLY OVERLOOKED, OFTEN MALIGNED, THE HUMBLE FUNGUS NEVERTHELESS CONTINUES MAKING LIFE ON EARTH POSSIBLE.

Have I gone too far in my assessment of fungi? I don't believe so, and I hope I can convince you of the same. Fungal phylogeny—their evolutionary history—shows that they are actually more closely related to animals than to plants. While the cell walls of plants are made of cellulose, the cell walls of fungi are composed of chitin, the same substance that makes up insect exoskeletons. Odd indeed, but the roles fungi play in nature are more than just unusual, they are intrinsic to life and its renewal.

While some fungi are pathogenic to plants and animals, many play a supporting, if largely unseen, role. This is evident in a mycorrhiza (myco="mushroom;" rhizo="root"). This is a symbiotic relationship between a plant and a fungus, or very possibly many plants, trees and fungi. Just imagine the woods with transparent soil, revealing a network of connections among the plants and fungi. Basically, a fungus will associate with the roots of a plant, in some cases infiltrating its very cells. They exchange nutrients, with the fungus gaining carbohydrates manufactured by the plant, and the plant receiving minerals, nutrients and higher rates of water absorption. Studies have shown plants grown in sterile soils lacking mycorrhizal fungi will suffer, wither and often die prematurely.

Another unappreciated fungal role is that of decomposition. We'd be knee-deep in waste were it not for saprotrophic fungi—those that feed on dead or decaying matter, recycling its nutrients back into the soil.

This is why so many mushrooms are found on mulch. This brings us to an important fact: the mushrooms you see are actually the reproductive structures of the fungus—the fruit. The body of the fungus is often completely underground, or entwined within a piece of rotten wood. The body of the fungus is called the mycelium, and is composed of masses of string-like filaments called hyphae. When conditions are right, the fungus will produce a mushroom; its purpose is to spread the fungal spores involved in reproduction. Let's take a closer look at some fungi you may encounter.

Clathrus crispus, two individuals of the latticed stinkhorn mushroom.

STINKHORN MUSHROOMS

These fungi (mostly within the Phallaceae family) live up to their common name by emitting a smell similar to decaying meat. The strategy is to attract flies, which then spread the fungal spores, thus playing a role like seed dispersers do for plants. Most stinkhorns are saprotrophic on wood, and are usually found on mulch. I think you'll agree, their forms are fantastic!

Pseudocolus schellenbergiae, the stinky squid—yes, this is a mushroom.

Mutinus species.

Candlesnuff fungus (*Xylaria hypoxylon*). At slightly taller than one inch, these look like little Halloween zombie hands.

Dead man's fingers fungus (*Xylaria polymorpha*). Nearly black, these are tough to spot, but they mature to grayish white. They contribute to spalting in wood—a discoloration prized by woodworkers.

DEAD MAN'S FINGERS

You need to get close to the ground to find these *Xylaria* species, but once you do, they are easily noticed. These creepy-looking fungi are also saprotrophs.

Cyathus striatus, sometimes called splash cups, are common throughout North America.

BIRD'S NEST FUNGI

These very tiny gregarious fungi are abundant on mulch. They start out looking like tiny, scaly white elongated spheres, but open to form a cup that holds the "eggs," called peridioles, which themselves contain spores. Raindrops displace the peridioles, ejecting the eggs from the nest and spreading the spores. Depending on species, the peridioles can range from silver to black.

Pisolithus arhizus (formerly *Pisolithus tinctorius*) eventually dries and crumbles, thus spreading its rusty brown spores.

DYE MAKER'S FALSE PUFFBALL

The common name reveals that *Pisolithus* species have been used as a source of fabric dye. While not particularly beautiful (reflected in their less polite common names) they form vital mycorrhizal relationships with many plants, including pine, spruce and oaks. I found this one on my lawn at the base of a live oak; I hope they've joined forces underground.

Leucocoprinus birnbaumii, the beautiful, but poisonous, flowerpot mushroom.

FLOWERPOT PARASOL MUSHROOM

This intensely sulfur-colored mushroom with a scaly cap feeds off very decayed matter like humus and compost, explaining its distribution in nurseries—and flowerpots—throughout the world. However, here in the sub-tropics, it can also be found outdoors in gardens. As the cap (called the "pileus" from Greek and Latin words for cap) flattens, the intense yellow fades.

Tremella fuciformis, aka the snow fungus.

SNOW JELLY FUNGUS

The closest we'll get to snow in South Florida, this gelatinous fungus (*Tremella fuciformis*) produces frond-like, nearly transparent mushrooms on hardwood after lots of rain. A humble fungus, it is nevertheless an important part of Asian cuisine, and is used extensively in traditional Chinese medicine.

Tremella species are mycoparasites, and are known to parasitize *Hypoxylon* fungi, though there may be some mutual benefits involved in this mysterious relationship.

Orange jelly on pine (*Dacrymyces palmatus*)—probably.

I wanted to include the common fungus witches' butter here (*Tremella mesenterica*), since it's a congener to snow jelly. However, as is so often the case in nature, what I thought was witches' butter is more likely orange jelly (*Dacrymyces palmatus*). But this is a good lesson learned: Fungi are often nearly impossible to accurately identify! I *think* this pretty orange fungus is orange jelly, purely because orange jelly prefers conifers and this example is growing on pine. To know for certain would require microscopic analysis of the spores.

The poisonous false parasol (*Chlorophyllum molybdites*).

FALSE PARASOL

These rather large mushrooms (my outstretched hand barely spanned the cap at top right) could be mistaken for the parasol mushroom (*Lepiota procera*), a choice edible. However, as these specimens matured, they developed a sordid greenish tinge to their gills, where the spores are located. This is characteristic of the false parasol (*Chlorophyllum molybdites*), possibly the cause of most mushroom poisoning cases in North America. My field guide notes that it causes "days of violent purging." Both species are pretty similar to the destroying angel mushroom (*Amanita virosa*), which can be found throughout North America on grass or in woods. And indeed, without intensive medical treatment, the destroying angel mushroom is deadly. The point: do not eat wild mushrooms unless you are an expert mushroom hunter/mycologist.

Poisonous or edible, ordinary or outstanding, the mysterious, fascinating fungi provide services we have yet to discover, as well as food, medicine, the kick-start to orchid germination and, lest we forget, the yeast for our bread, beer and wine.