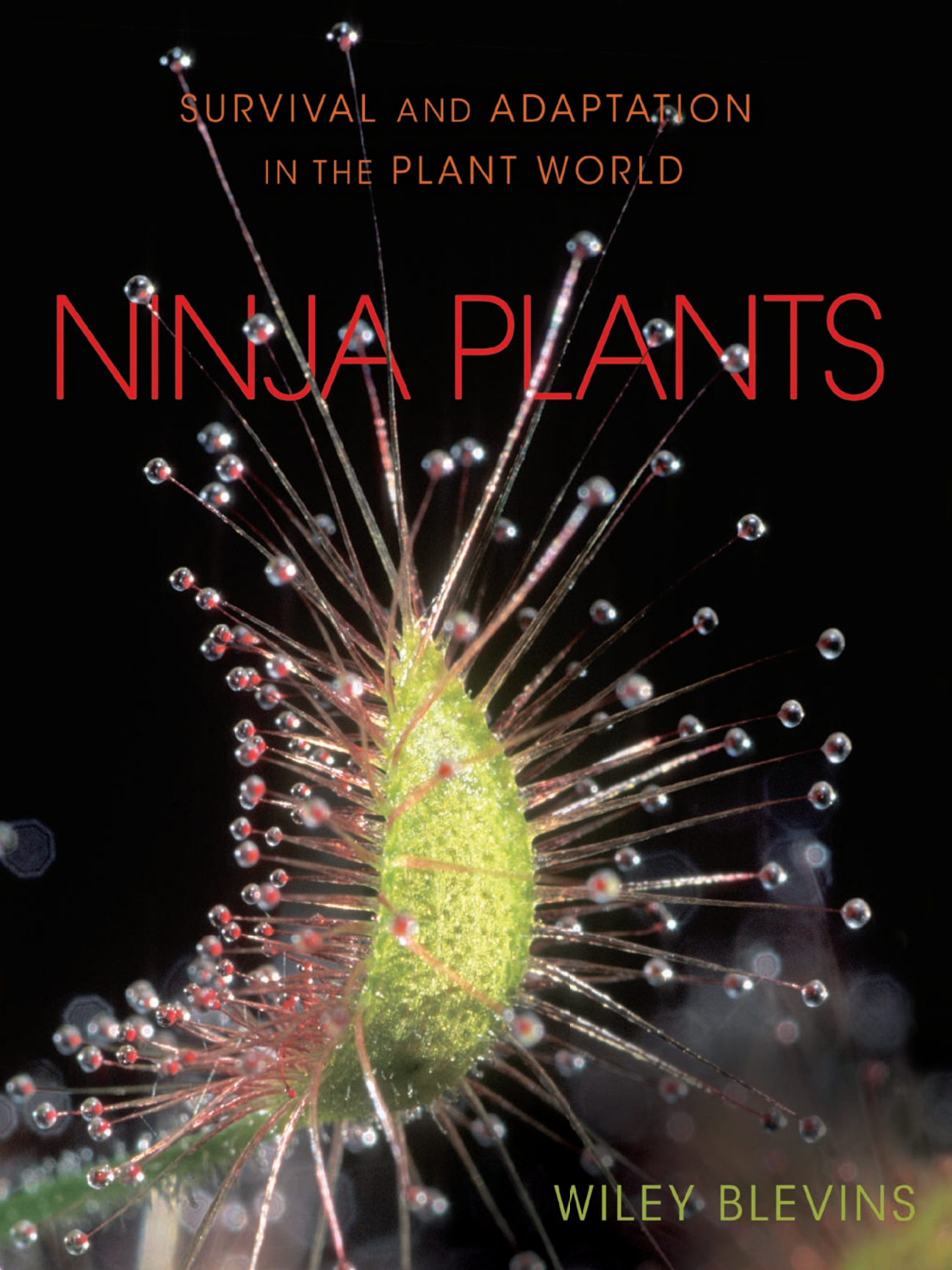
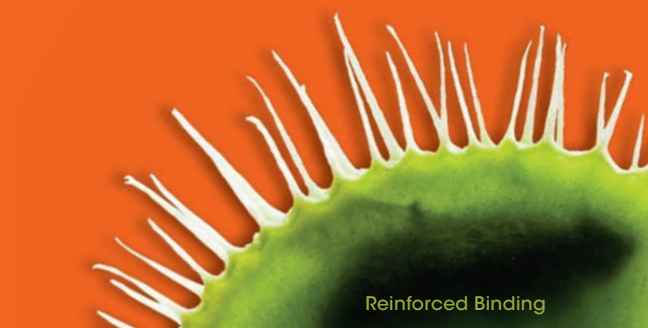

SURVIVAL AND ADAPTATION
IN THE PLANT WORLD
NINJA PLANTS
WILEY BLEVINS

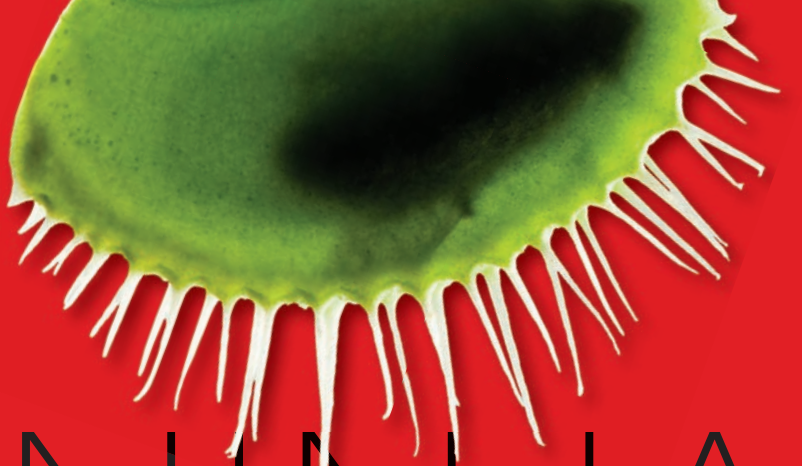
WHAT CAN COMMUNICATE BUT HAS NO MOUTH, CAN SMELL BUT HAS NO NOSE, AND CAN ATTACK BUT HAS NO HANDS? A PLANT!

You might love the beauty and fragrance of flowers or the taste of fresh fruits and vegetables. But plants are far more complex than meets the nose, mouth, and eyes.

Some plants have ways of luring insects for pollination, which allows the plants to reproduce. The stinking hellebore, for instance, emits strong odors to entice insects. Other plants, such as the bumblebee orchid, mimic the look of the female insects whose male counterparts they want to attract. The Venus flytrap is carnivorous—it eats insects and other small animals for extra nourishment. Parasitic plants, such as the strangler fig, extract nutrients from host plants. Many plants use tricks to disperse their seeds. For example, fruit of the squirting cucumber explodes, shooting seeds across a wide area.

You might see some of these ninja plants—with their sneaky, creepy, explosive, and deceitful ways—in your backyard or in nearby gardens and parks. These plants might even be sitting on a windowsill in your home. This fascinating world of plants, with bizarre stories to tell, is waiting to be discovered!





NINJA PLANTS

SURVIVAL AND ADAPTATION IN THE PLANT WORLD

WILEY BLEVINS

TWENTY-FIRST CENTURY BOOKS / MINNEAPOLIS

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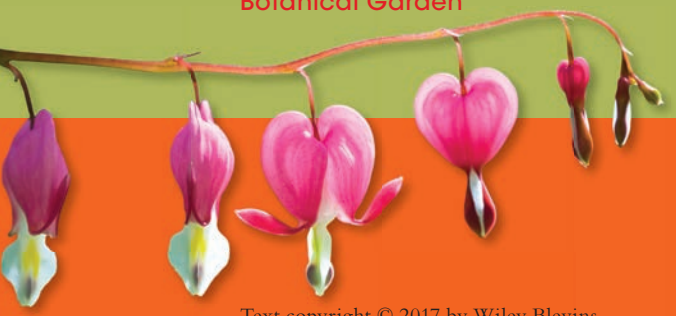

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CONTENTS

INTRODUCTION

A SECRET, REMARKABLE WORLD

WHAT CAN COMMUNICATE BUT HAS NO MOUTH, CAN SMELL BUT HAS NO NOSE, AND CAN ATTACK BUT HAS NO HANDS?

The answer: a plant! When you think about plants, you might admire the beauty and sweet fragrance of flowers, appreciate the taste of fruits and vegetables, or think about the many products we get from wood, such as furniture or paper. But you might not realize that plants are far more complex than their beauty, taste, and utility in everyday life and that many are in a constant struggle with one another for survival. Every day, plants wage a fierce battle—a struggle for the best soil, the most direct sunlight, and domination of the land's resources. Unless we observe plants carefully, humans mostly miss these struggles, because they occur at a slow pace and almost silently.

Skunk cabbages emit a strong odor that attracts insects such as flies, bees, and beetles. The insects carry pollen between male and female parts of skunk cabbage flowers, helping the plants reproduce.

The scientific study of plants is called botany. Botanists observe, research, and record plant behavior, and plants certainly have some surprises for us. From plants that act aggressively—almost like ancient ninja warriors—to those that behave like secret agents and tricksters, the world of plants is as diverse and action-packed as it is fascinating.

Some plants, such as the stinking hellebore and the skunk cabbage, emit odors that are offensive to humans. But the odors attract the insects and animals that pollinate these plants as part of reproduction. Without pollination, these plants would become extinct. Other plants, such as the laughing bumblebee orchid, have evolved over many generations to resemble the insects they need to lure their way for pollination. The Venus flytrap, which grows in mineral-deficient soil,

Plants use various methods to disperse their seeds over a wide area. Some plants rely on the wind to blow seeds to new spots. The seeds sprout and grow in the soil where they land.

survives by being a carnivore (flesh eater), specifically by eating insects. This plant draws nitrogen and other vital minerals from the bodies of the insects and other small animals it devours. Lithops take the shape of pebbles to trick their plant-eating predators into passing them by.

Other plants lie dormant (inactive), appearing dead for periods of time, to survive harsh climates or to deceive hungry animals that might want to munch on their leaves. Parasitic plants, such as the strangler fig, are far more aggressive. They suck host plants to get the nutrients they need to live. They might also hog all the sunlight and water in the area. This sometimes results in the host plant's death. Plants also use botanical tricks to disperse their seeds over a wide area. For example, the spiny seedpods of burdock burrs grab onto animal and human passersby, who unknowingly carry the seeds with them to new spots,

where they will sprout and grow. The seedpods of some fruit plants explode like mini bombs, shooting seeds over a wide area to ensure that new plants of the species will grow there.

You might have some of these sneaky, creepy, and sometimes violent plants in your own backyard. One or more of these plants might even be lurking in your home in a decorative pot. You might see some of these plants at a local park or community garden. They live in a world few people regularly notice, but this secret world of plants, with bizarre stories to tell, is waiting to be discovered.

EVOLUTION 101

Ukrainian American biologist Theodosius Dobzhansky once said, "Nothing in biology makes sense except in light of evolution." In evolution a species, or specific type of living thing, changes and adapts to its environment over many generations. Famed English naturalist Charles Darwin (1809–1882) was the first to describe the process of evolution, which he published in his landmark 1859 book *On the Origin of Species*.

A number of different processes can cause plant species to change. The most common is natural selection (living things pass on to their offspring beneficial traits that help them survive). With each successive generation, the favorable traits become more common, while plants with less favorable traits do not reproduce and therefore die out. Natural selection often begins with a mutation, or a random change, in a plant's genes. Genes are chemical structures made of deoxyribonucleic acid (DNA). They are in the cells of all living things, and they direct the growth, behavior, and reproduction of living organisms. Parents pass on their genes to the next generation. Suppose a mutation in a plant's genes results in a new flower color that is very appealing to pollinating insects. With more pollinators, the plant is more likely to reproduce than plants with a less attractive flower color. The plant will pass the appealing color to its offspring, which will later reproduce and continue to pass on the color. Eventually, more and more plants of the species will have the new flower color.

BINOMIAL NOMENCLATURE

Throughout history, numerous scientists have devised ways to classify and identify plants and animals. Some early classification systems included long descriptions of a plant's or animal's identifying characteristics, often resulting in long and cumbersome names. To streamline identification, eighteenth-century Swedish botanist Carolus Linnaeus (1707–1778) created a scientific naming system called binomial nomenclature. It consists of just a two-word name for each living thing. The system's name comes from the Greek words *bi* and *nomos* (two parts) and the Latin word *nomenclatura* (name calling).

In this system, each plant or animal is named by its genus (biological ranking) and its species (specific type within that ranking). For example, all roses belong to the genus *Rosa*. Within that group are dozens of different kinds of roses, distinguished by their species names. For instance, some scientific names for roses are *Rosa persica* (the barberry-leaved rose), *Rosa arkansana* (the prairie rose), and *Rosa rubiginosa* (the sweetbriar rose). In scientific writing, the genus in a plant's name is always capitalized, and both the genus and species names are italicized or underlined. The scientific name can be written out fully (for example, *Rosa arkansana*), or the genus name can be abbreviated using only the initial letter (*R. arkansana*).