

LEVELED Book • V

Giant Insects



Written by Mary Reina

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Table of Contents

Insects Are Everywhere!.....	4
Giant Darner Dragonfly: The Speed Demon.....	6
Titan Beetle: The Pencil Breaker.....	8
Giant Water Bug: The Toe Biter.....	10
Goliath Beetle: The Heavyweight.....	12
African Driver Ant: The Ultimate Army.....	14
Madagascar Hissing Cockroach: The Noisy Pet.....	16
Wetapunga: The God of Ugly Things.....	18
Queen Alexandra's Birdwing Butterfly and Atlas Moth	20
Chan's Megastick: The Hidden Wonder.....	22
Glossary	24



Insects Are Everywhere!

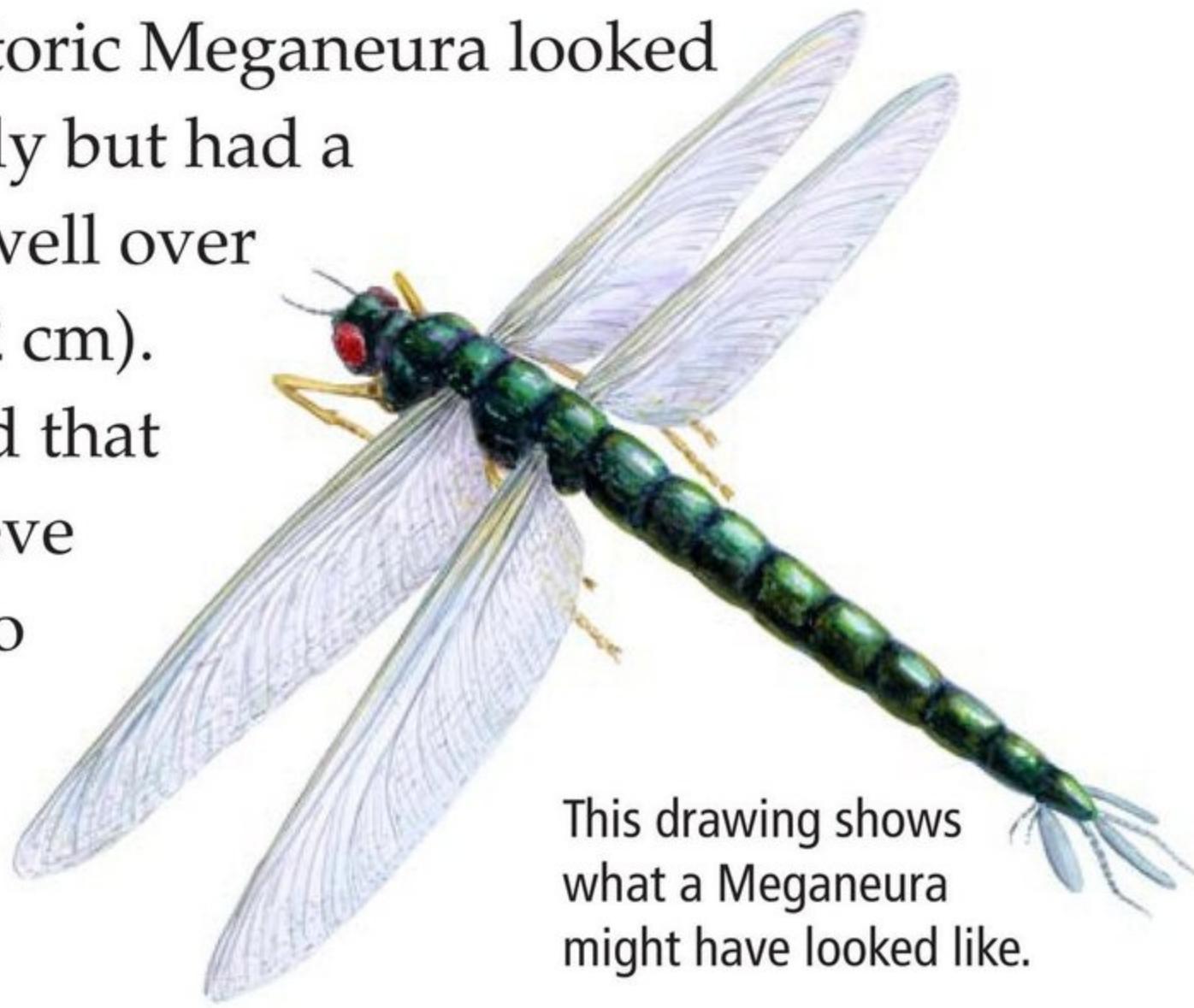
Every time you step outside your door, you marvel at the idea that you probably look right past hundreds—even thousands—of insects. You know that scientists estimate that there are around ten quintillion (10,000,000,000,000,000,000) insects alive on Earth at any given time. So far, scientists have identified over 900,000 different insect species—about 80 percent of all the world's species of animals. They think that two to thirty million more species remain undiscovered or unidentified.

When you think about this, you're glad most insects are small.

You know this wasn't always the case, though. Hundreds of millions of years ago, before dinosaurs walked on Earth, insects were already buzzing around. Using fossil evidence, you know that these insects were similar to modern insects—they each had three body sections, six legs, and often two sets of wings. They were a bit different in other ways, though—these guys were **titans**!

The prehistoric Meganeura looked like a dragonfly but had a **wingspan** of well over 30 inches (72.2 cm).

You've learned that scientists believe insects grew so huge partly because back then, Earth had a higher amount of oxygen in the air. Over hundreds of millions of years, as the amount of oxygen decreased from about 35 percent to today's 21 percent, the insects **adapted, evolved**, and became smaller.



This drawing shows what a Meganeura might have looked like.

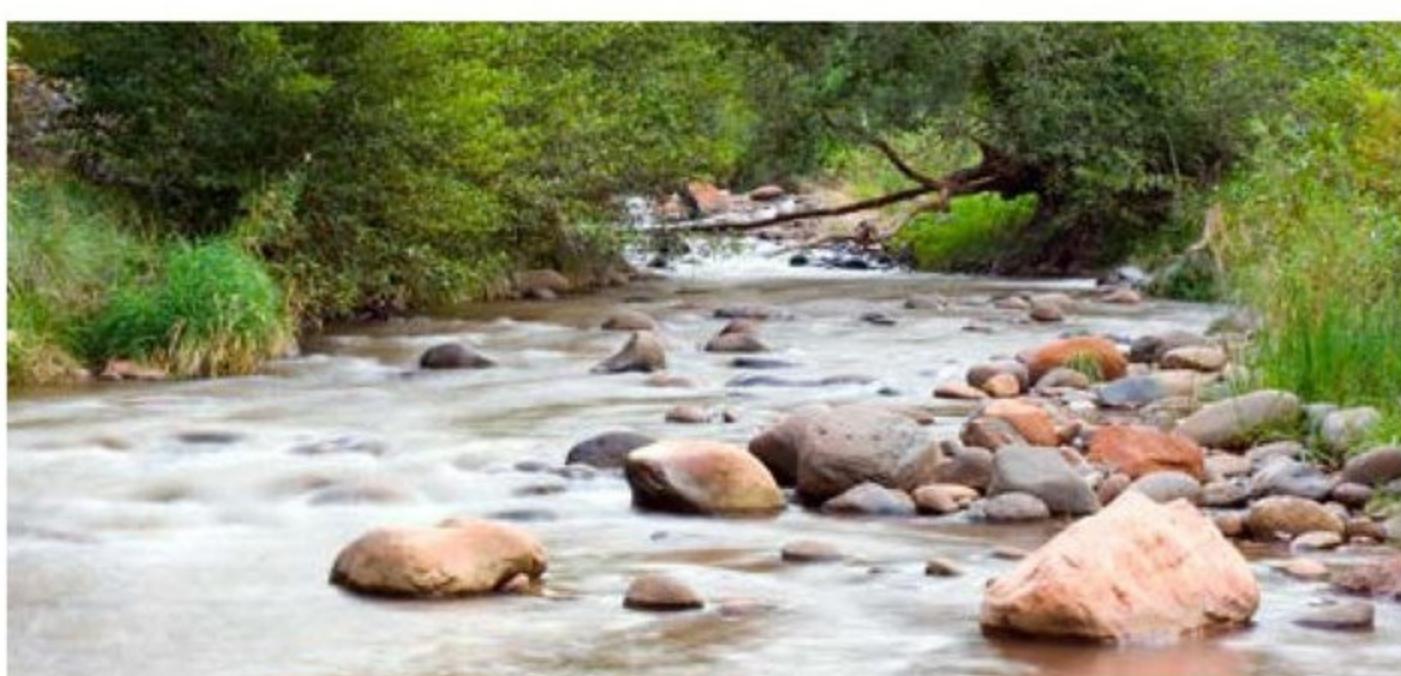
A few insects, however, have remained the giants of their world. These are the beasts you've really wanted to study—and you finally have your chance. You feel your excitement building because this time when you walk outside your door, you'll be taking your first step on a giant insect **safari**. You'll pass by billions of smaller insects on your hunt around the globe for these massive monsters. You'll finally have the chance to see them with your own eyes and find out if everything you've learned is really true. Prepare your pack, because you're about to head out.

Giant Darner Dragonfly: The Speed Demon

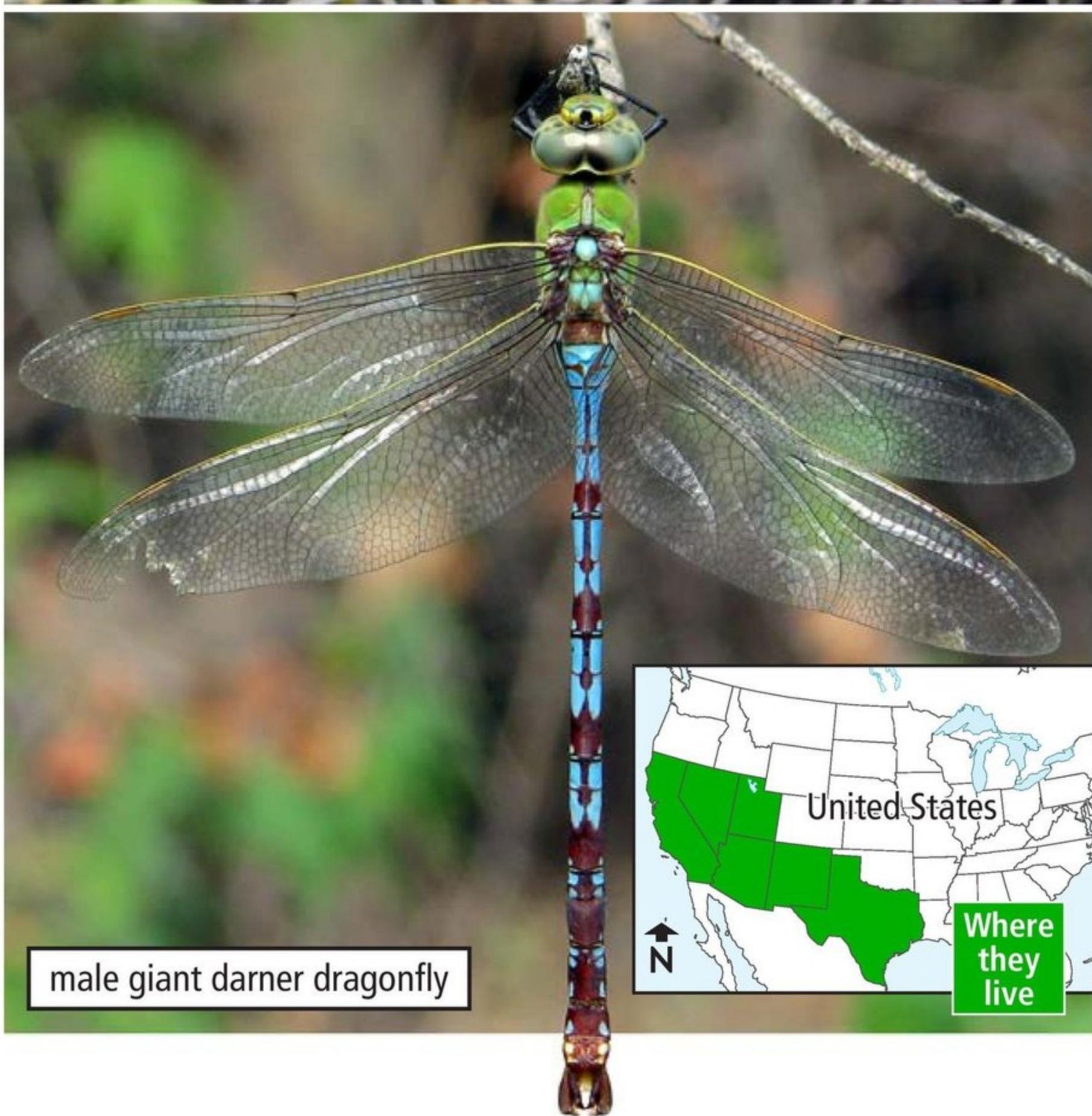
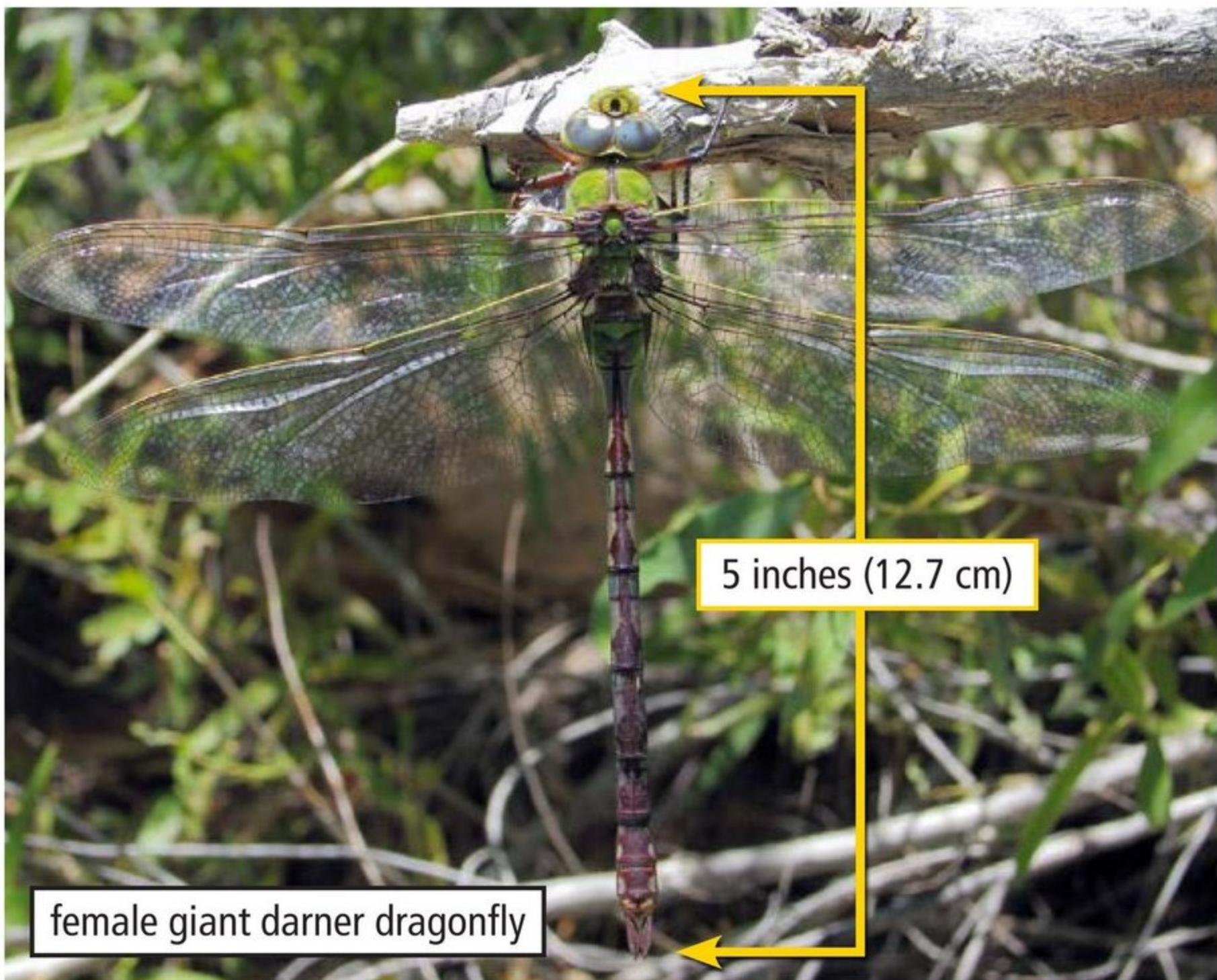
Your journey starts by a slow-running stream in the southwestern United States where you can hear the buzzing of a giant darner dragonfly. It uses its 5-inch (12.7 cm) wingspan to zip through the warm air at speeds of over 35 miles per hour (56.3 kph). These insects are so good at turning that they can completely shift direction in a split second, which is when you catch a glimpse of one. This insect's speed and ability to move come in handy as it hunts mosquitoes and other small insects.

The dragonfly lands on your arm, but you have nothing to worry about. The giant darner dragonfly is harmless. You look at it just long enough to see the shimmering wings and black, blue, and green 5-inch (12.7 cm) body before it takes off again.

As you walk through the tall grass on your way to your next destination, you see flashes of other dragonflies—giant darners and their smaller cousins—and wish them good hunting.



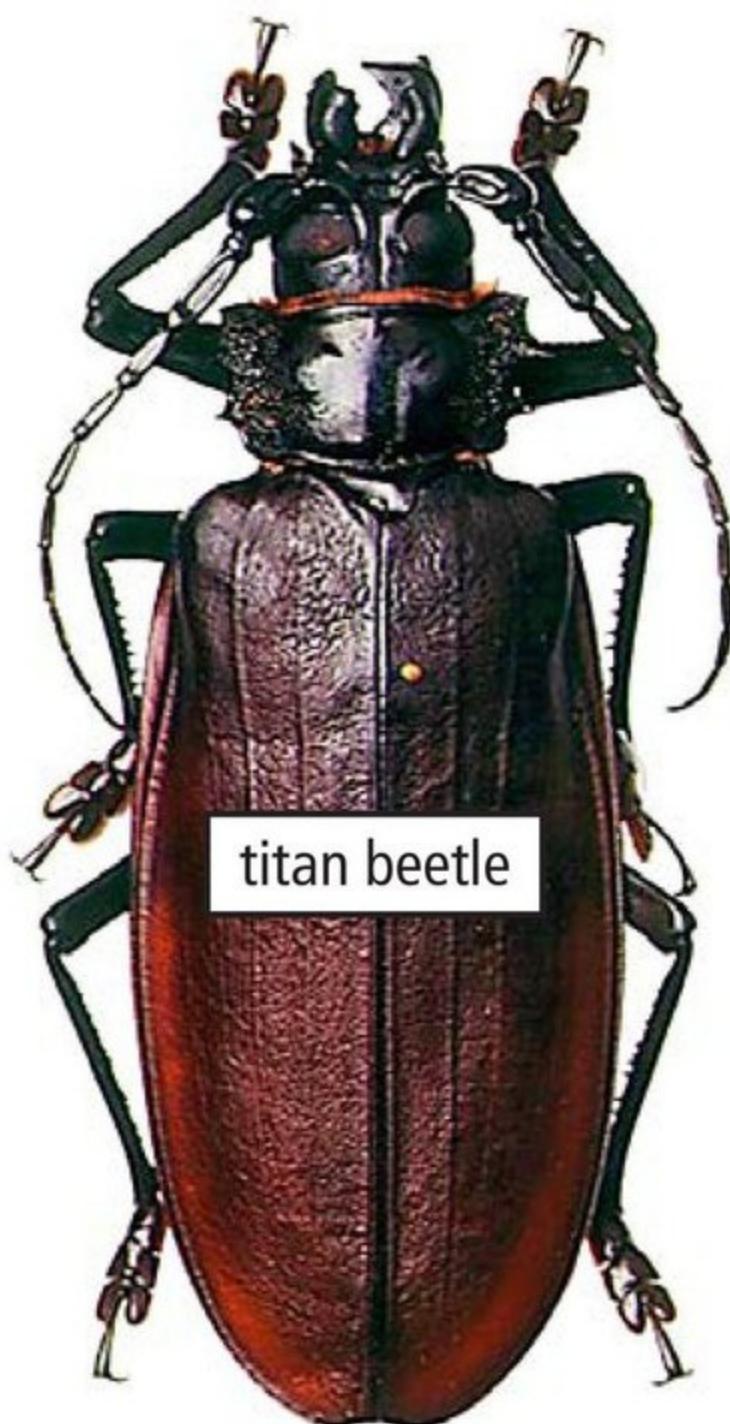
Giant darner dragonflies live near streams like this one in the southwestern United States.



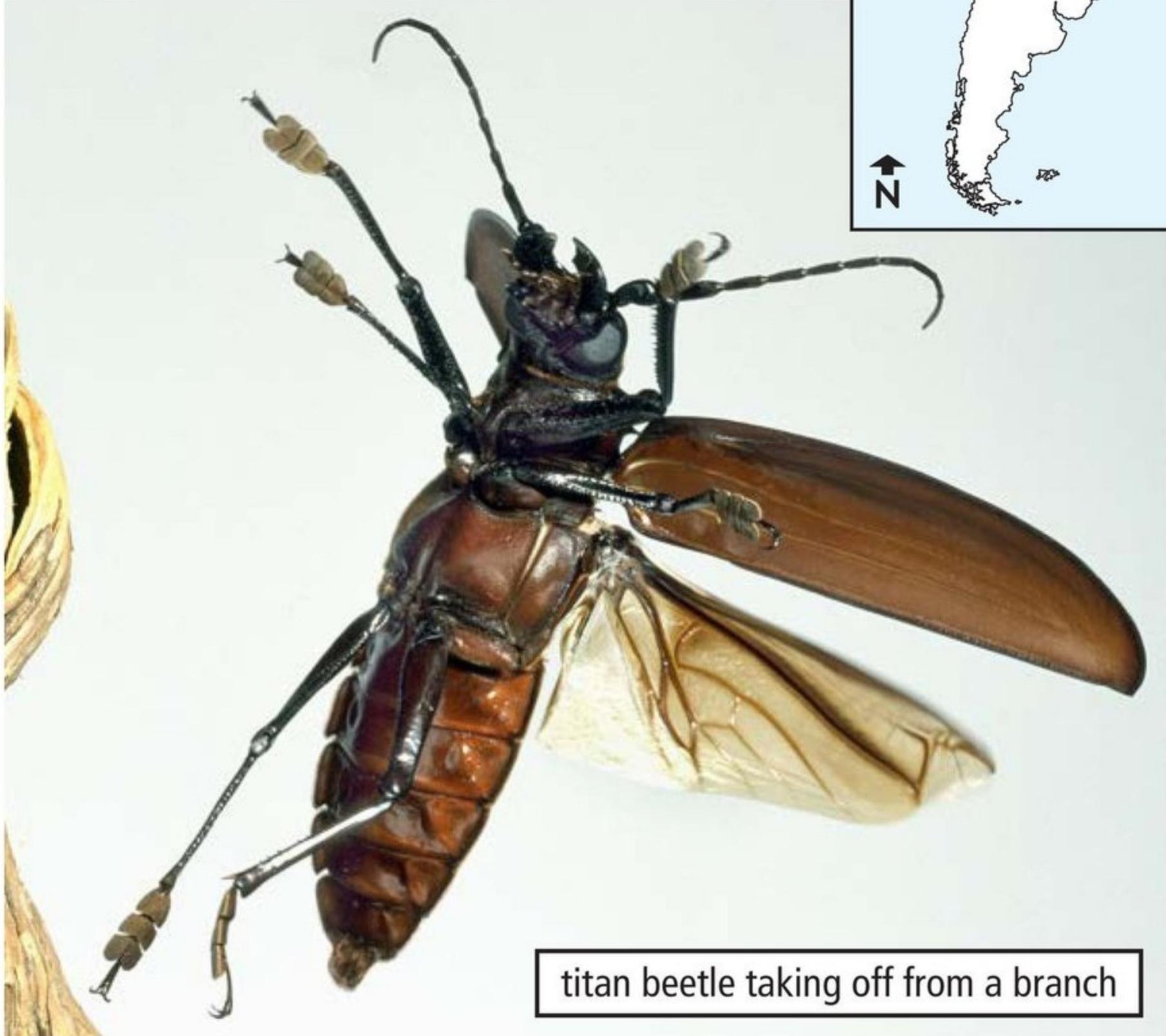
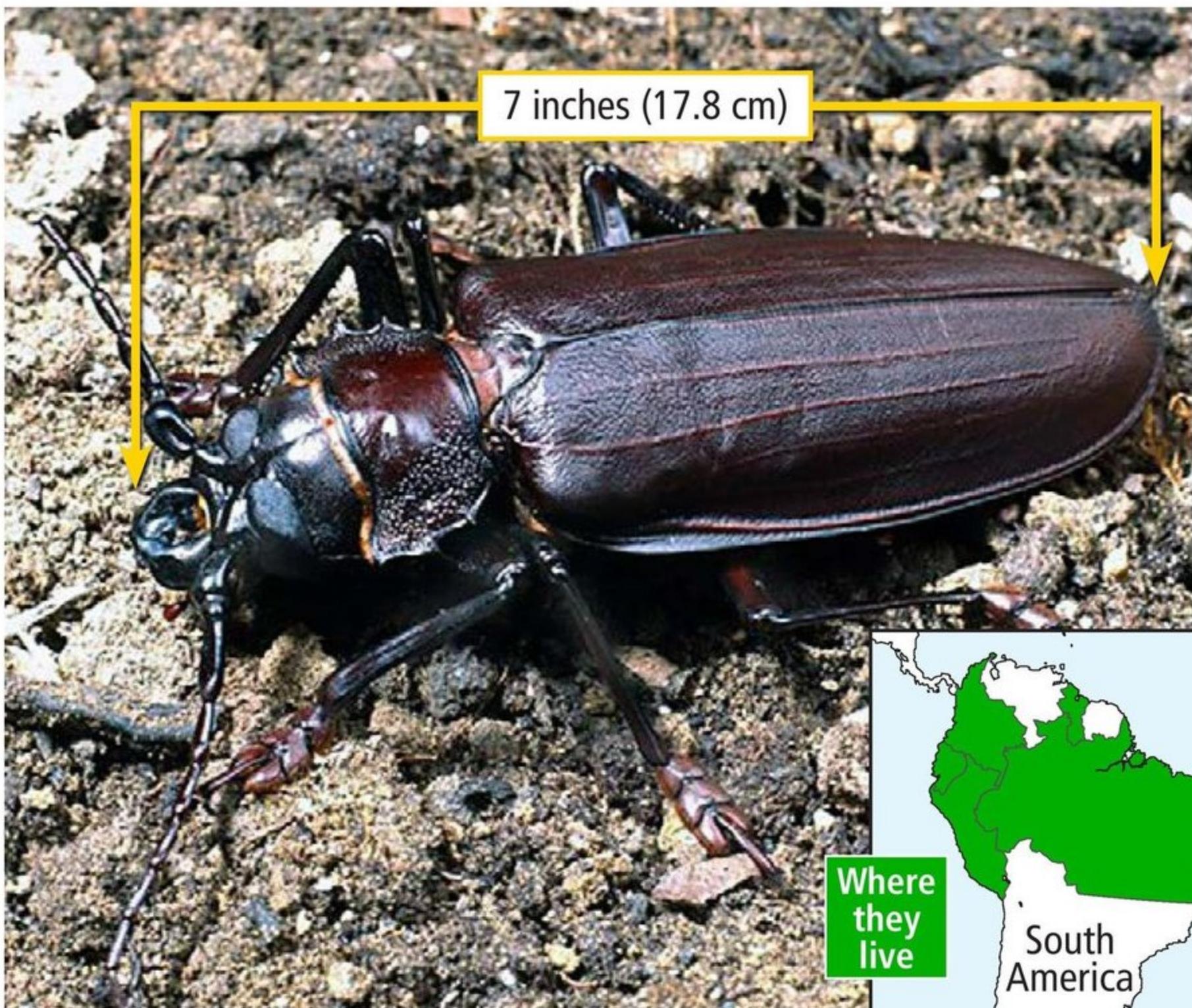
Titan Beetle: The Pencil Breaker

When you arrive in the steamy Amazon rainforest, it's dark, and you can hear the tapping of rain on the leaves overhead. Something flies through the beam of your flashlight, and at first you think it's a bird. You look closer and see it's a 7-inch (17.8 cm) titan beetle—the biggest beetle in the world.

This **nocturnal** creature was attracted to your light. As you watch it crawl its way through the dead leaves and dirt, you see the thick **mandibles** on its head. They're strong enough to snap through a pencil. You're tempted to find a stick to see if the titan beetle can break it. When you get near, though, it hisses and you back off.



Like many beetles, this one has only a few weeks to live as an adult. It doesn't have time to mess with you—it needs to find a mate. Though it can fly, it's too heavy to take off from the ground. It uses its powerful, spiny legs to climb a tree and launch itself from a branch. You duck as it flies toward your face. Laughing, you continue your journey.

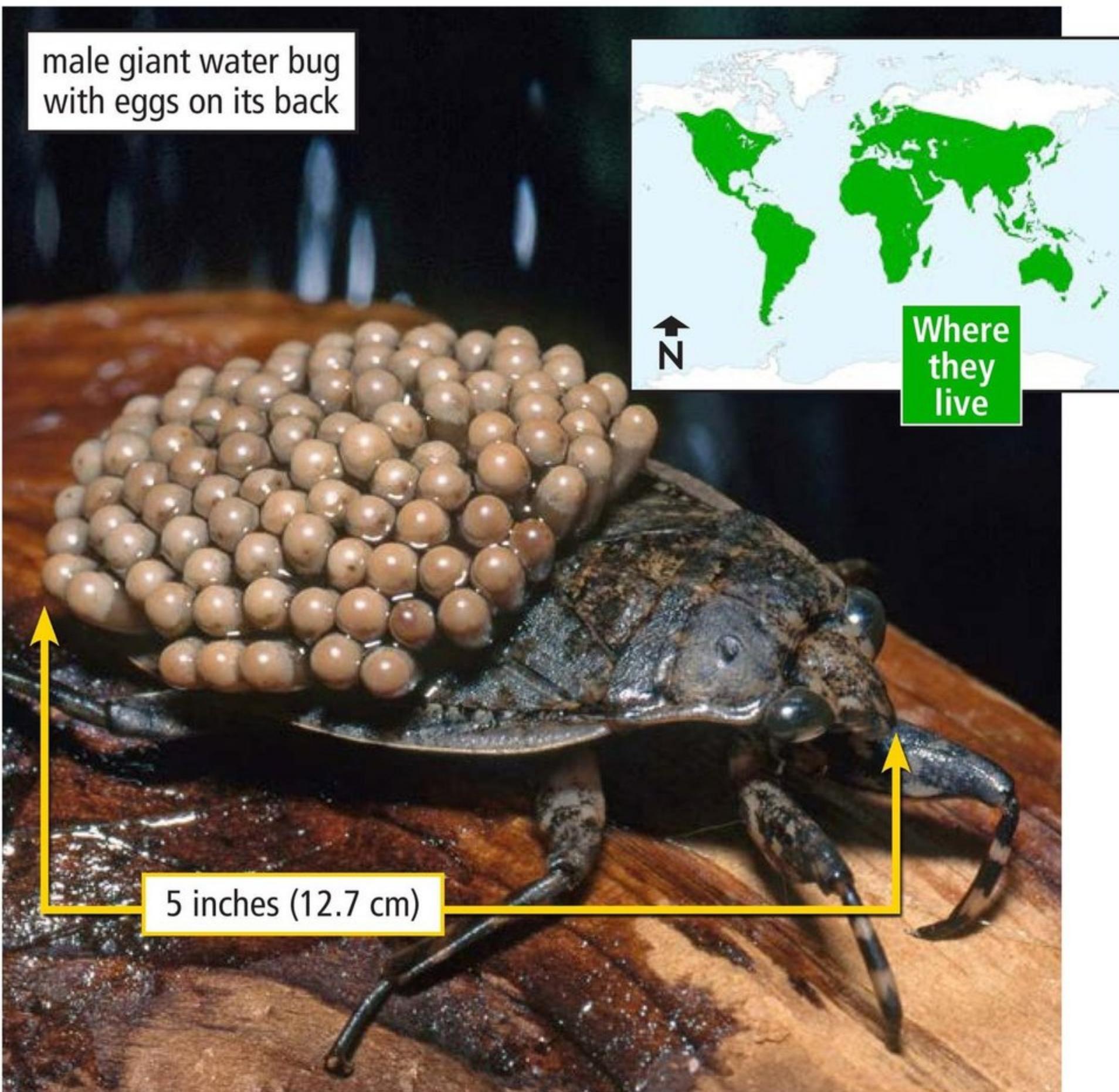


Giant Water Bug: The Toe Biter

The afternoon in Thailand is hot and humid. You stop to look into a clear, cool-looking freshwater pond. The idea of dangling your aching feet in the water is tempting, but then you see the giant water bug. You recognize it because this insect is found in bodies of fresh water all around the world. About 5 inches (12.7 cm) long, it clings to an underwater plant while holding a minnow in its powerful front legs. It eats by using its strong jaws to inject the struggling fish with digestive fluids and then sucking out the remains.

You see a few other giant water bugs. One must be a male, as it has round eggs stuck on its back. After mating, the female giant water bug glues the eggs there for safety until they hatch.

Another giant water bug tries to catch a tadpole and misses. These bugs will eat pretty much anything they can overpower, including frogs, snakes, and even baby turtles. While their bite isn't dangerous to people, you remember one of the local people saying that it has one of the most painful bites of all insects. She said this just before taking a big, crunchy bite out of a grilled giant water bug. The water may look perfect, but you decide not to stop.



Putting the Bite on Insects:

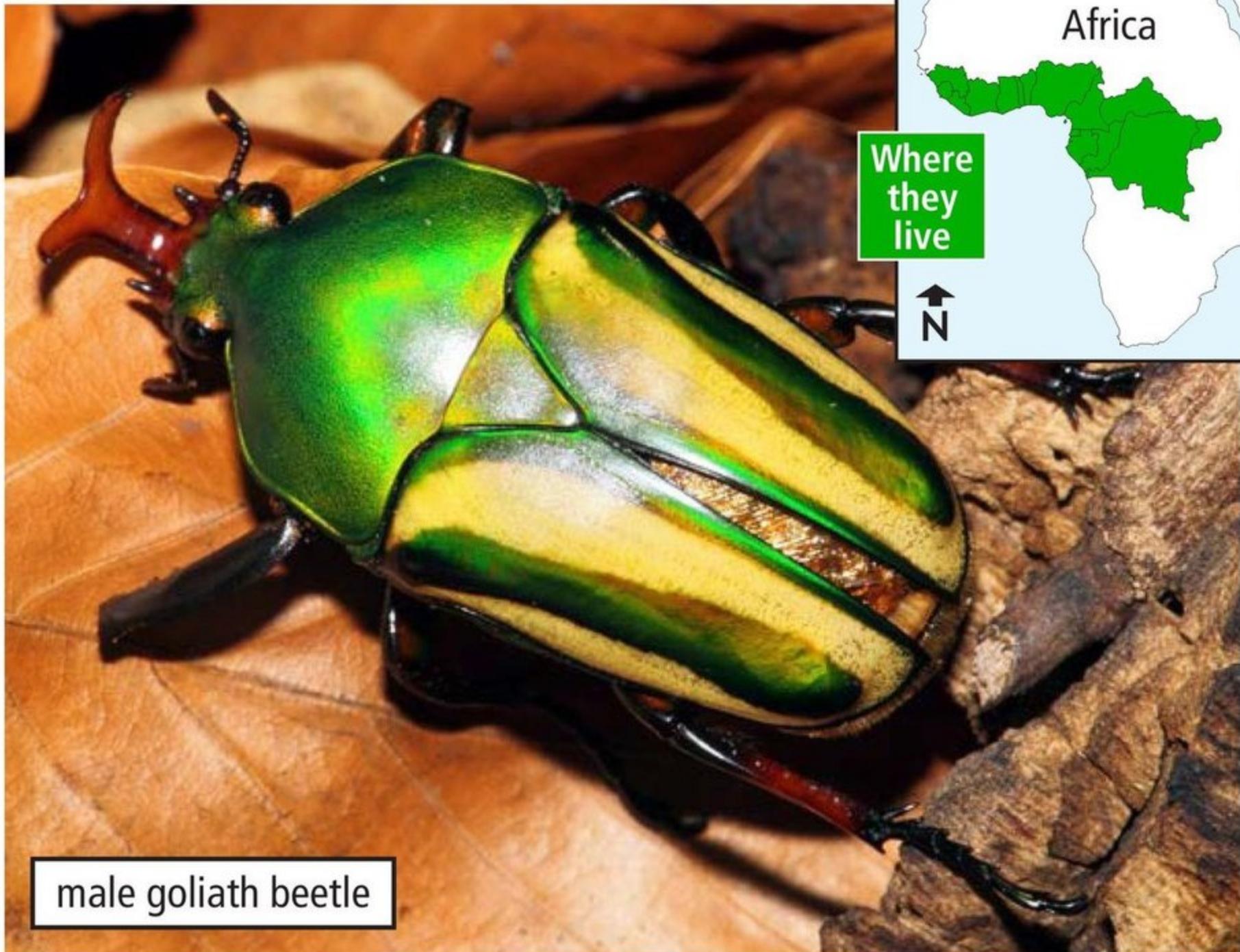
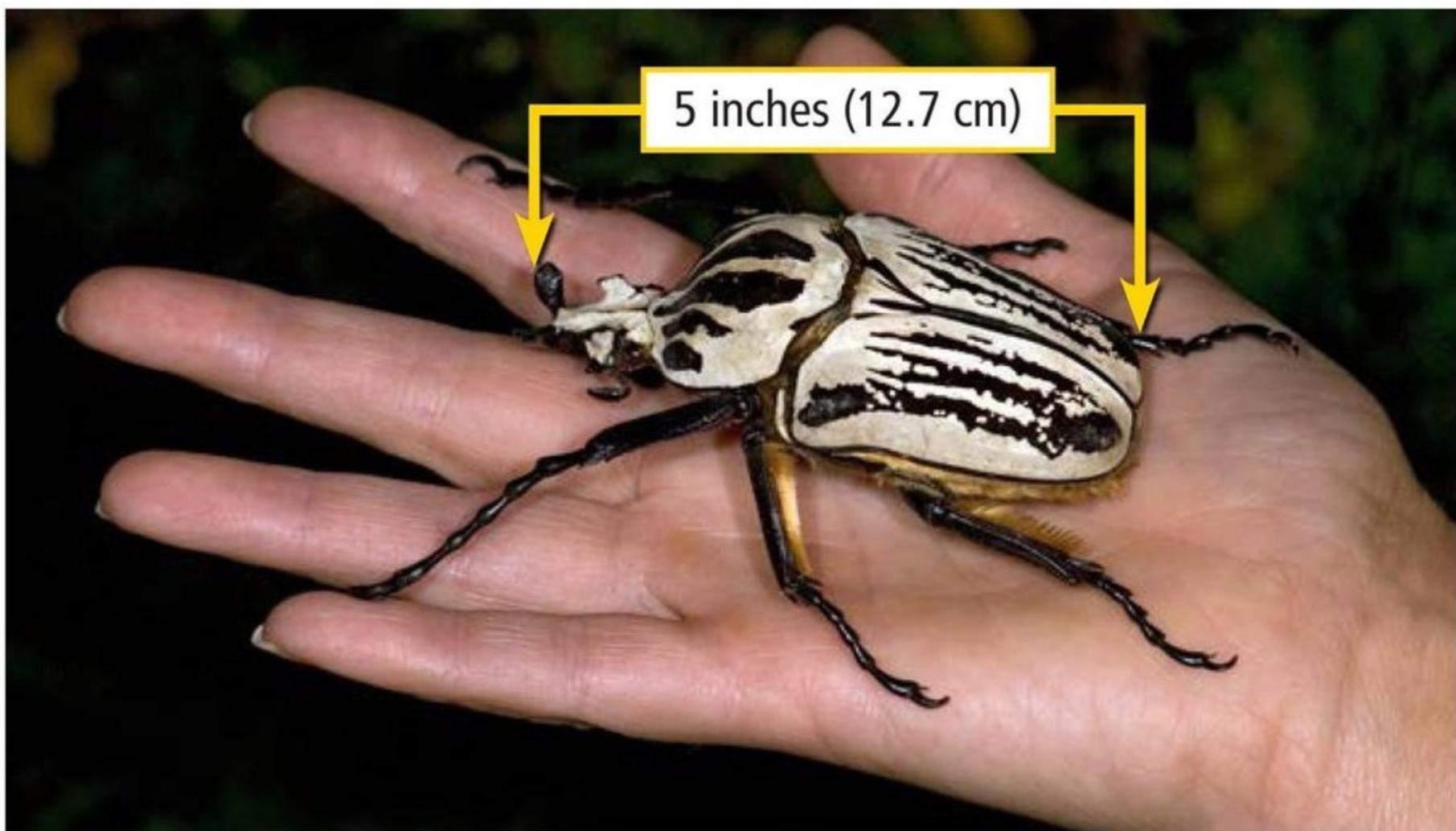
People have been eating insects since prehistoric times. Over 1,000 types are eaten in many parts of the world. They include water bugs, cockroaches, ants, dragonflies, and grasshoppers. The practice of eating insects is called *entomophagy*.

Goliath Beetle: The Heavyweight

You're back to walking through a rainforest, which doesn't surprise you since most of Earth's insects live in rainforests. This time you're in central Africa. The rainy season has made the air feel heavy and thick. You hear a shuffling sound and find a female goliath beetle using its wedge-shaped head to dig in the soil. It's making a safe place to lay her eggs. You take a moment to examine the patterns on her shell.

Another beetle buzzes by and lands on a tree. It's a male goliath beetle; you can tell by the Y-shaped horns on the front of its head. It's almost 5 inches (12.7 cm) long (the female is smaller). These beetles didn't get their name for their length; they earned it for being the heaviest insects in the world. This one looks as if it will weigh in near the top of the range at over 3.5 ounces (100 g).

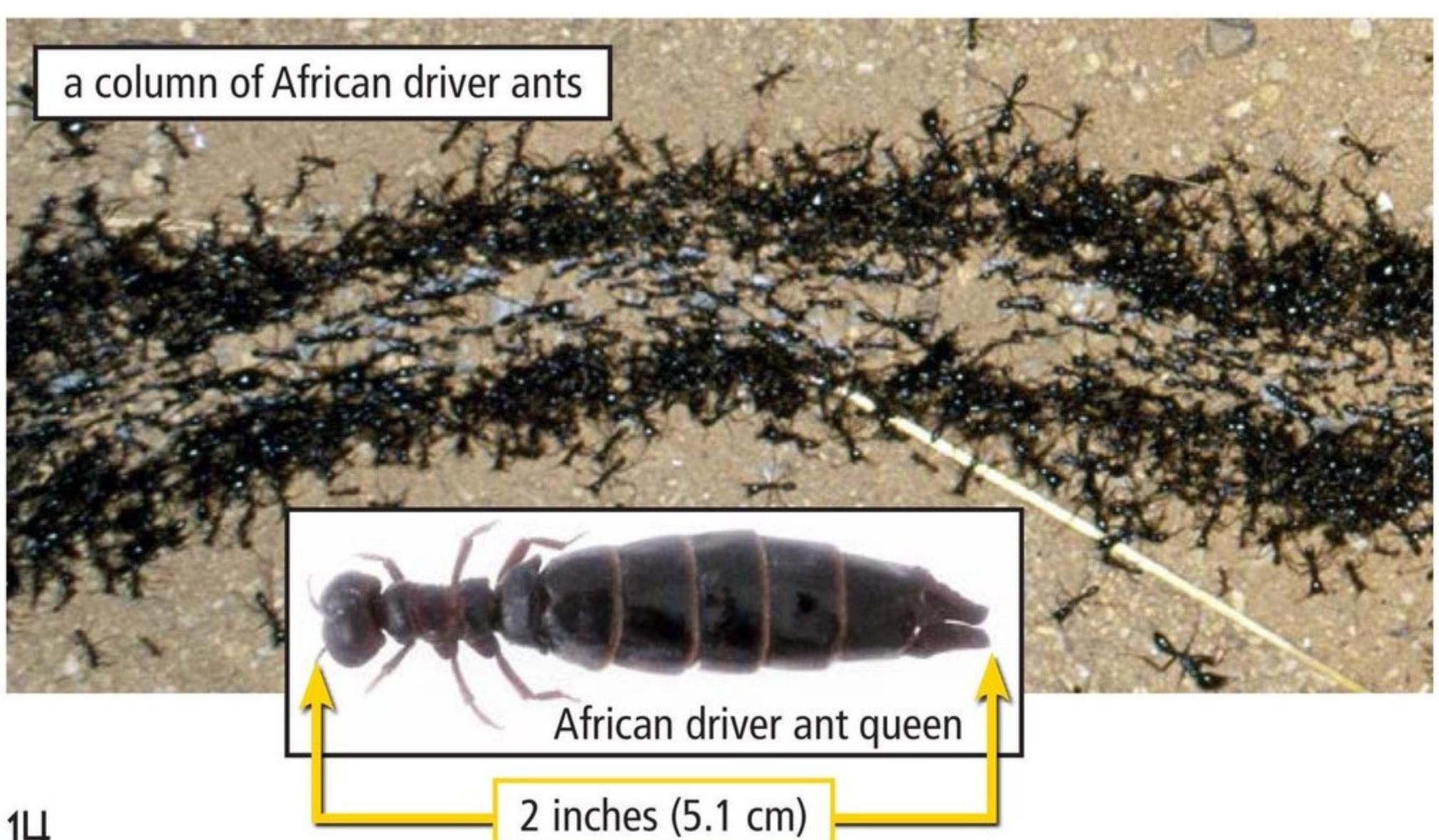
The goliath beetle is big but harmless, eating the waste that falls to the forest floor. You think about getting the male to climb on your arm, but you change your mind when another male shows up. If you wait, the two males might fight each other using their impressive strength and horns. The smaller male flies away quickly, though, which means it's time for you to move on, too.



African Driver Ant: The Ultimate Army

You're about to leave the African rainforest when you come upon what looks like a dark stream running across the ground. You move closer, but not too close. Millions of African driver ants march along the ground. In the center, you see the small worker ants, which aren't much bigger than the ants you see at home. Along the edges, the soldier ants, each almost 1 inch (2.5 cm) long, form a wall. Their large mandibles point outward to protect the ants within.

These insects are on the hunt, so they're very dangerous. Though blind, these ants find their way easily using touch, smell, and chemical signals. **Colonies** can have over twenty-two million ants (the largest colonies of any insect on Earth), and they're all hungry. Millions upon millions of ants **swarm** in search of food, which can include pretty much any animal they can overpower—including people.



You decide to follow the ant column to see if you can find the nest. Against a large rock, you see a dark wall of movement. The ants have formed a bivouac (BIH-vuh-wak)—a temporary nest made out of living ants. As you watch, the bivouac begins to break up. They must have exhausted the food supply of the area. The ant column carries away food, millions of eggs, and the queen. At over 2 inches (5.1 cm) long, she is the largest ant on Earth. She can lay up to two million eggs each month.

Despite the amazing sight, you start to notice a few ants crawling in your direction and decide it's probably best to get out of there.



larger soldier ants protecting the smaller worker ants



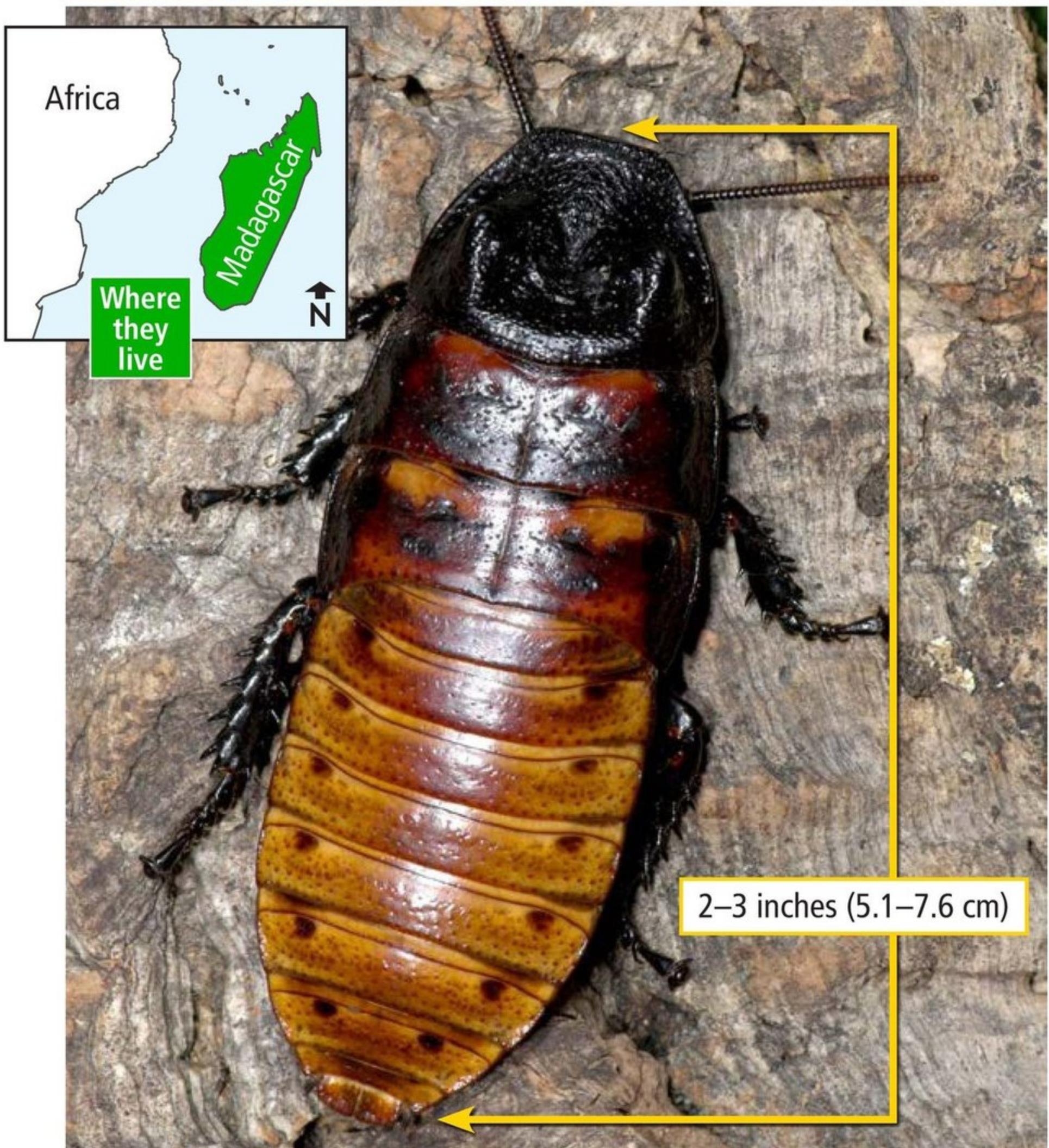
Madagascar Hissing Cockroach: The Noisy Pet

It's a lovely day in tropical Madagascar as you walk through the forest. You decide to sit down on a log beside a slow-moving stream. When you do, the log moves—and something hisses. You look down to see you've upset a colony of Madagascar hissing cockroaches. Each about 2 to 3 inches (5.1–7.6 cm) long with a shell of black and dark orange, they crawl back into the shade of the log. It's too early for them to be out. At night, this colony would be crawling along the forest floor, looking for fallen fruit and dead plants.

Unlike most species of cockroaches, the Madagascar hissing cockroach can't fly, and the females give birth to live young instead of laying eggs. You reach out and touch a cockroach—a male, by the look of the long horns on its head. It hisses, pushing air out through small holes along its body, and then spits. You laugh because these insects are gentle and harmless. In fact, you have a friend who keeps a number of them as pets. You'd like to stay and watch, but your friend is waiting—besides, you can watch your friend's cockroaches.



a pet Madagascar hissing cockroach



Wetapunga: The God of Ugly Things

On Little Barrier Island off the coast of New Zealand, you hunt through the trees in search of the endangered wetapunga, or giant weta. These strange cricketlike insects' name means "the god of ugly things" in the native Maori language. They have lived on these islands for millions of years. Over the last few hundred years, however, they have almost been wiped out due to the introduction of rats and mice, which eat the slow wetapunga.

As the Sun begins to set, you find a wetapunga hiding among the leaves of a tree. It looks like a cross between a cricket and a grasshopper—only much bigger. The largest ever found was about

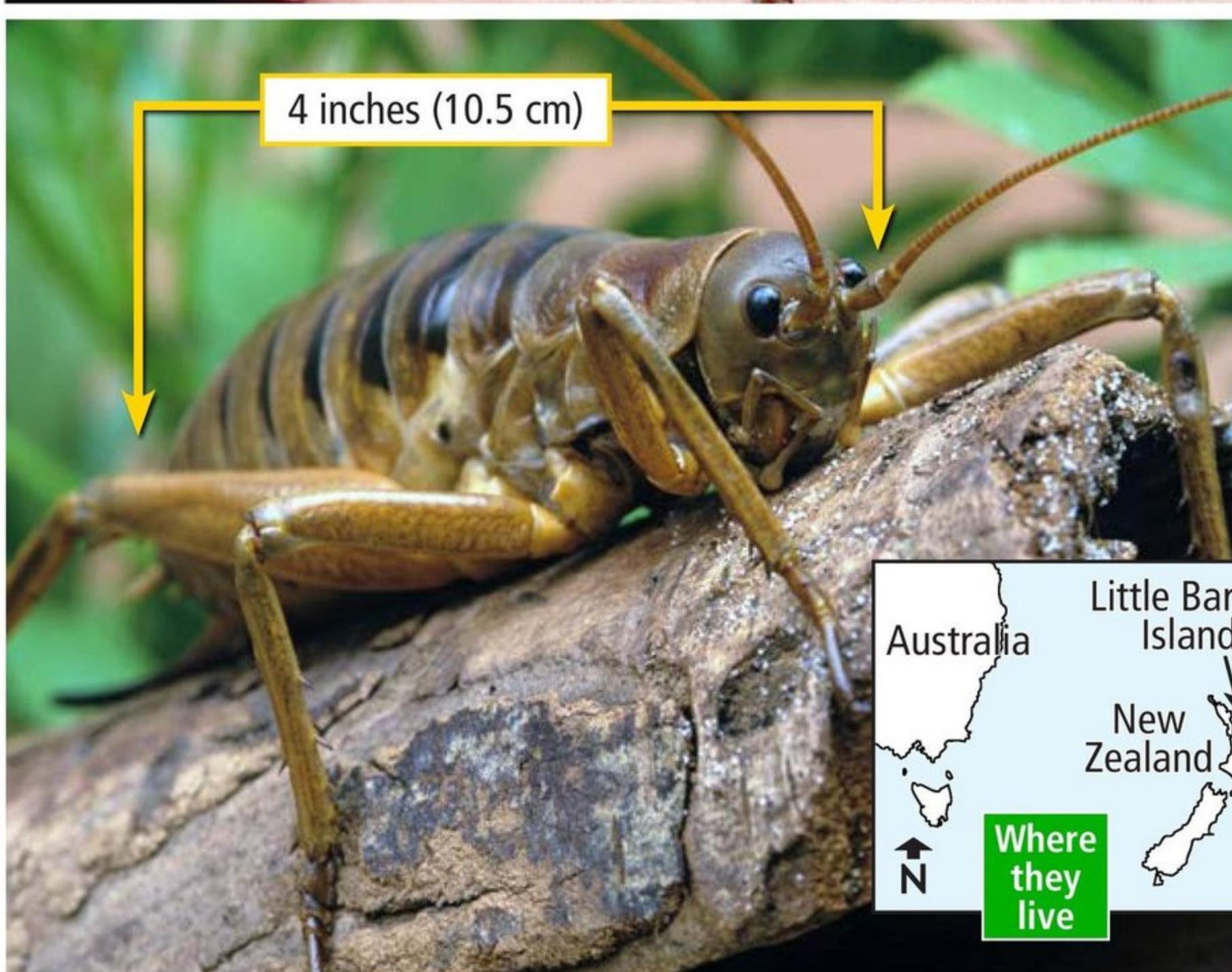


4 inches (10.5 cm) long and 2.5 ounces (70.9 g), and this one looks to be almost that big. It crawls slowly along the branch—it will spend almost its entire life in trees—nibbling on the leaves. You could catch it if you wanted, as these insects can't fly or jump,

nor do they kick or bite. You decide to leave it be as you have to run back to town. A group that is trying to bring back the wetapunga population plans to release a number of them into the wild, and you want to be there.



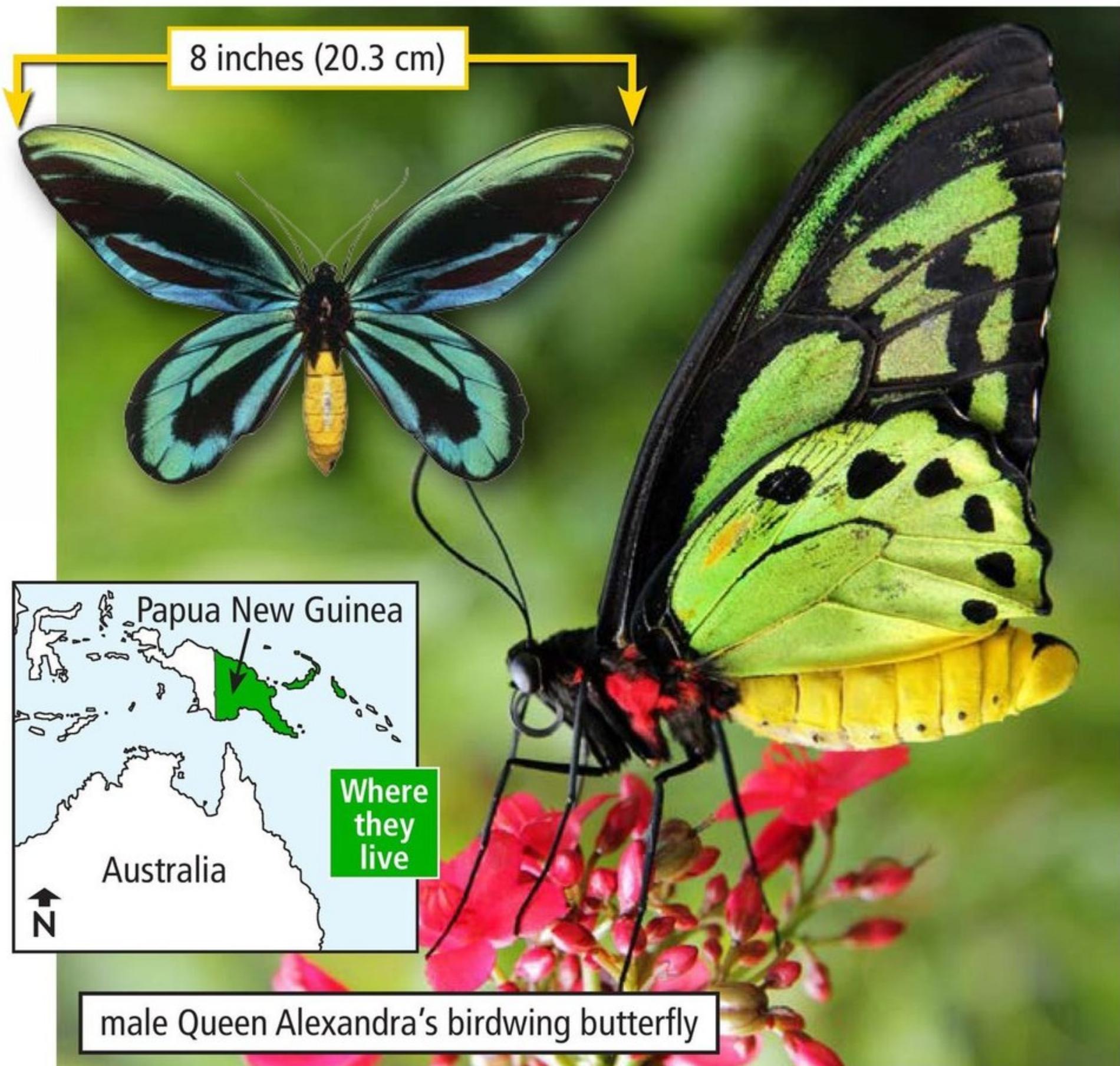
female giant wetapunga



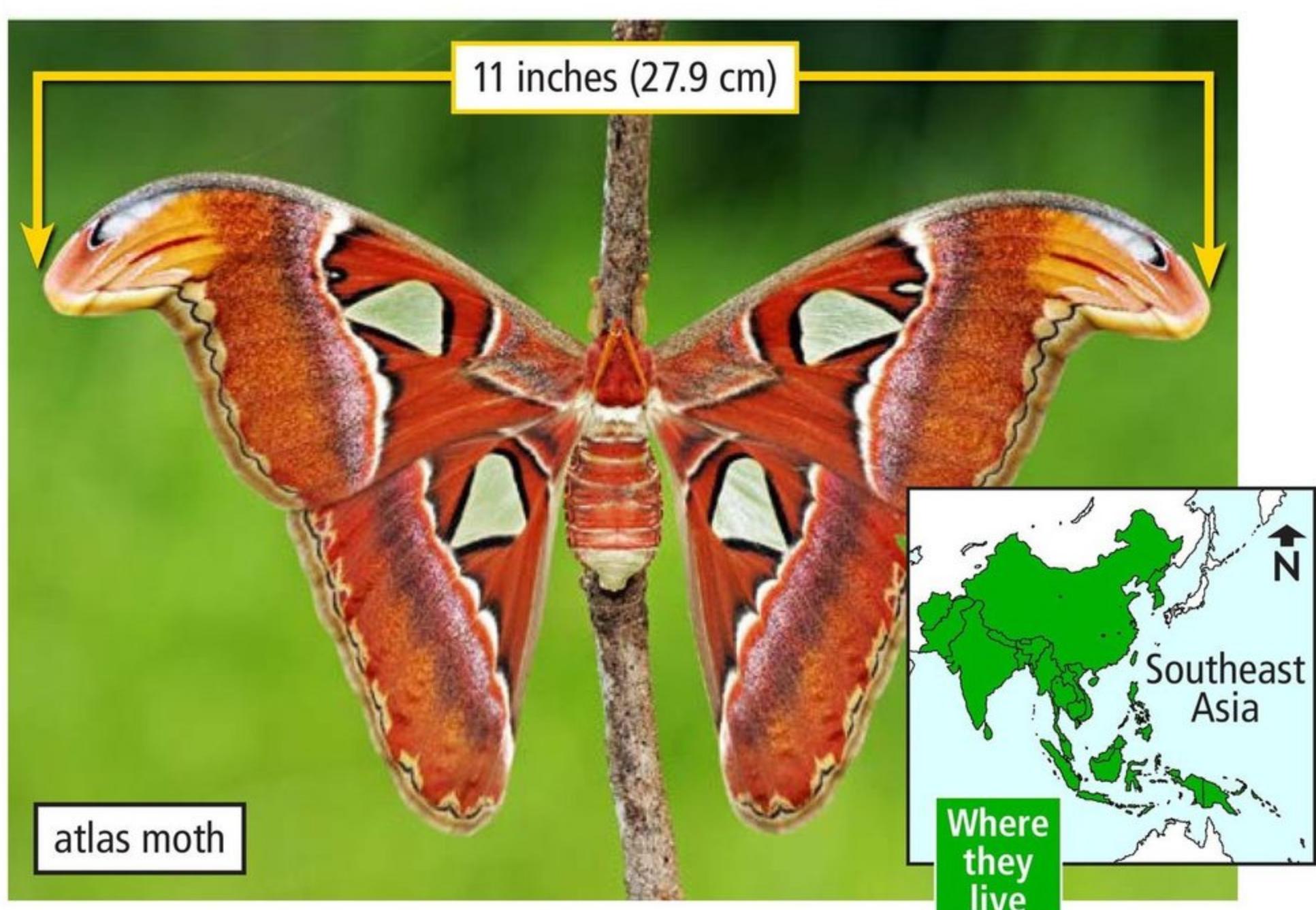
Queen Alexandra's Birdwing Butterfly and Atlas Moth

In a rope chair high above the ground, you look around at the forest **canopy** of Papua New Guinea. Lush green surrounds you for miles. Then you see a flash of blue rise up. It's a male Queen Alexandra's birdwing butterfly, flapping its shimmering blue-green and brown wings, which span almost 8 inches (20.3 cm). You look around for a female, which would be larger, with a 12-inch (30.5 cm) wingspan of a lighter shade of brown, but don't find one. Other than in zoos, this rare species can only be found in the wild in Papua New Guinea—and only in the forest canopy. You watch in awe as the male feeds on a flower and flutters away.

On your way down, something else catches your eye. You stop and pull yourself closer to a branch where an atlas moth sits, its wingspan 11 inches (27.9 cm) wide. The hooks on the ends of its wings remind you of this moth's other name: the snake head moth. Unlike the Queen Alexandra's butterfly, which lives up to three months or more and feeds regularly, the atlas moth lives only a few weeks and never feeds. You've seen this species before, as it's fairly common throughout Southeast Asia, but it's still an impressive sight.



male Queen Alexandra's birdwing butterfly



atlas moth

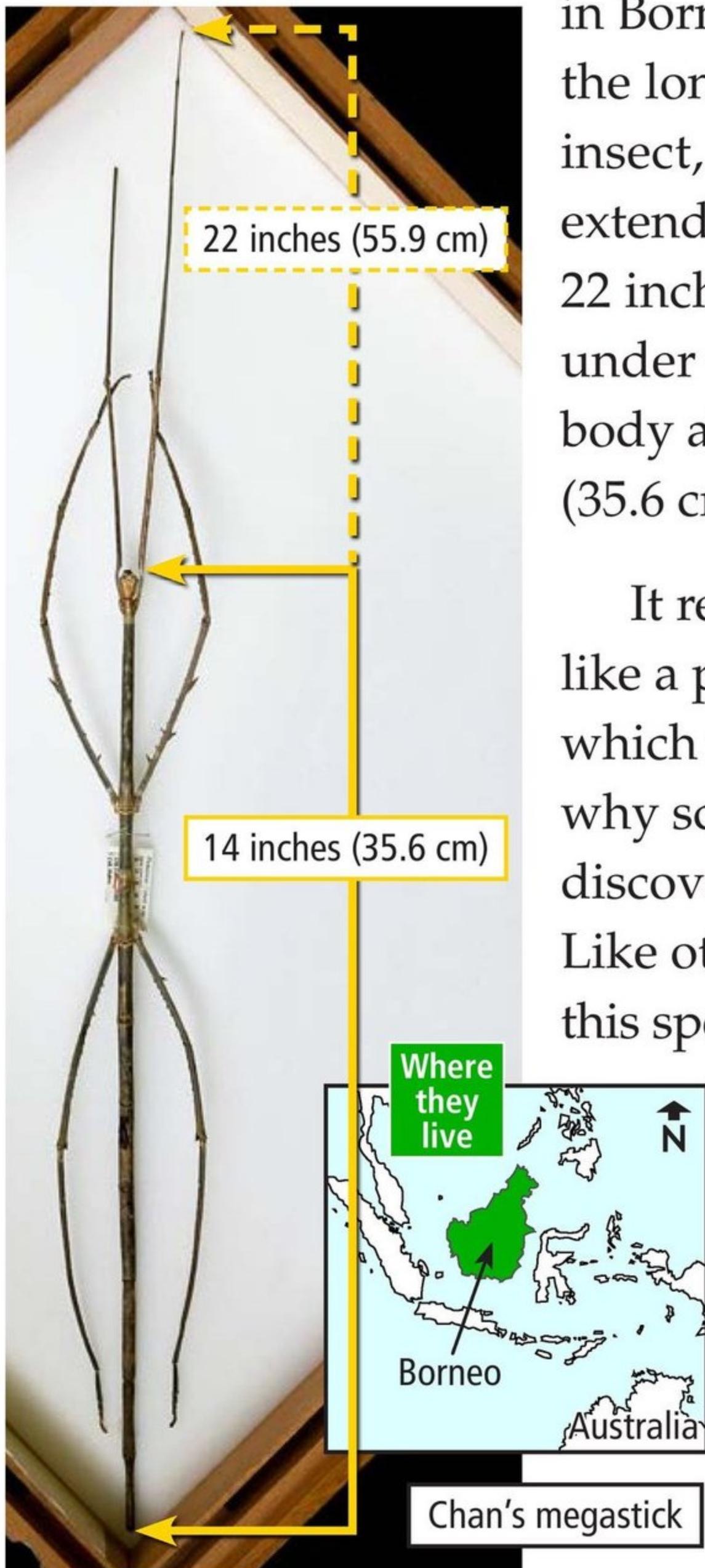
Chan's Megastick: The Hidden Wonder

Your final stop brings you to the London Natural History Museum. You have come to view the world's longest insect: Chan's megastick. One of only six found in the world so far (all of them

in Borneo), this one is the longest. The whole insect, with its legs extended, stretches 22 inches (55.9 cm) under the glass. The body alone is 14 inches (35.6 cm) long.

It really does look like a plain old stick, which might explain why scientists didn't discover it until 2008. Like other stick insects, this species is believed to

hide within the forest canopy while it feeds on leaves.





three-horned beetle



giant stag beetle



giant katydid with wings flared

As you leave the museum, you begin to wonder how many new species of insects you passed during your travels. They might be heavier than a goliath beetle, stronger than a titan beetle, or more dangerous than a colony of driver ants. The only way to know is to keep learning, keep exploring—and keep your eyes open.

Glossary

adapted (<i>v.</i>)	changed to fit a new or specific situation or environment (p. 5)
canopy (<i>n.</i>)	the part of a forest where the tops of trees form a dense layer of foliage (p. 20)
colonies (<i>n.</i>)	groups of animals that live together (p. 14)
evolved (<i>v.</i>)	changed or developed over time (p. 5)
fossil (<i>n.</i>)	the remains of a plant or animal that turned to stone over time (p. 4)
mandibles (<i>n.</i>)	body parts near an insect's mouth that are used for grabbing, cutting, or crushing food or enemies (p. 8)
nocturnal (<i>adj.</i>)	active at night rather than during the day (p. 8)
safari (<i>n.</i>)	a journey to search for animals in the wild (p. 5)
species (<i>n.</i>)	a group of living things that are physically similar and can reproduce (p. 4)
swarm (<i>v.</i>)	to move in great numbers (p. 14)
titans (<i>n.</i>)	very large or powerful individuals; giants (p. 4)
wingspan (<i>n.</i>)	the distance from tip to tip of a pair of wings (p. 5)

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