

JAPANESE SPIDER CRAB

The Longest Legs in the Sea



FUN FACT

Even though they're called "spider" crabs, they are more closely related to lobsters than to actual spiders!

MARVEL FROM THE DEEP

What if there was a creature with legs so long they could stretch across your entire classroom? Deep in the cold, dark waters around Japan lives one of the ocean's most amazing animals, the Japanese spider crab. This incredible sea monster isn't scary at all, but it sure is spectacular.

The Japanese spider crab is the largest crab in the world, measuring up to 12 feet (3.8 m) from tip to tip when it spreads out its legs. Its body is covered in a bumpy, spiky exoskeleton that is bright orange. The crab has eight super-long, skinny legs that look like giant spider legs, plus two powerful claws for catching food.

WHERE THEY LIVE

Japanese spider crabs live in the deep, cold waters off the coast of Japan, mostly in the Pacific Ocean. They are usually found between 150 to 300 meters (500 to 1,000 feet) deep —that's deeper than a 100-story building is tall!



SUPER SURVIVAL SKILLS

The Japanese spider crab has amazing features that help it survive in the deep ocean. Its long legs help it walk carefully across rocky sea floors, while its hard shell protects its soft body like armor. These crabs are camouflage masters who cover their shells with sea sponges and algae to hide from enemies! As night hunters, they look for food when it's dark and rest during the day. Even though they look scary, they are actually very shy. One of their coolest abilities is that when a spider crab loses a leg, it can grow a new one during its next molt!

Why do you think the ability to regrow a leg is a helpful survival skill in the deep ocean?

PARTS OF A CRAB

Antennae: Long feelers used to move and find food in the water

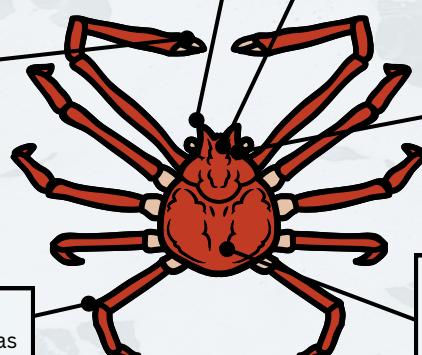
Claws: The crab's front legs with strong claws used for grabbing food and defending itself

Walking Legs: Long, jointed legs (the crab has 8) that help it walk across the ocean floor

Mouthparts: The crab has a mouth on the underside of its body. It uses its claws to bring food to its mouth and rip it up

Eyes: crabs' special eyes help them see in many directions at once

Body: the main part of the crab where the organs are. It is covered by a hard shell called a carapace.



What's for Dinner?

Japanese spider crabs are scavengers. This means they eat dead animals, rotting plants, shellfish, and small fish from the ocean floor. But eating isn't always safe! Big octopuses are their biggest enemies. Some sharks and other large sea animals try to eat them too, especially when the crabs are molting. Molting is when they grow a new shell, and their old shell is soft. Even though Japanese spider crabs are huge, they can be in danger when they are growing!



These crabs are thought to live 50 to 100 years!

Water Strider



Water striders can move very, very fast! They can go 50 times their body length in one second!

WALKING ON WATER

What looks like magic but is actually science? A water strider walking on water! Water striders are bugs that walk on top of ponds and streams. They look like they are doing magic. But it's really science!

Water striders have long, skinny legs. Their legs have lots of tiny hairs. These hairs keep water away. The hairs trap air bubbles. This helps the bugs float on top of the water.

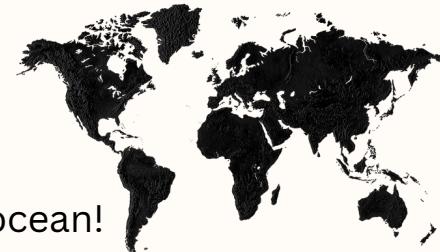
These cool bugs live by ponds and streams. They hunt other small bugs that fall in the water. When a fly hits the water, it makes tiny waves. Water striders feel these waves with their legs. Then they race over to catch the fly!

Where They Live

Water striders live almost everywhere in the world...except Antarctica! You can find them on:

- Ponds
- Lakes
- Streams
- Rivers

Some even live on the ocean!



Parts of a Water Strider

Head

Eyes and antennae attach to the head: the eyes detect movement and locate prey, while the antennae sense vibrations and smells

Abdomen

Long and slim abdomen: holds the insect's organs and has tiny breathing holes

Thorax

6 jointed legs connect to the middle part of the body: two short front legs used to grab and hold prey, two long middle legs used like oars to row across the water, and two hind legs used for steering and balancing

A hard exoskeleton protects that water strider's body.

Each of the water strider's legs are covered in water repelling hairs!

HOW THEY STAY AFLOAT

Water molecules stick together with an invisible force called **surface tension**. It's like the water has a stretchy "skin" on top. Water striders weigh so little and spread their weight across a large area so they don't break through this skin. Their special hairs make it even easier!

COOL WATER STRIDER FACTS

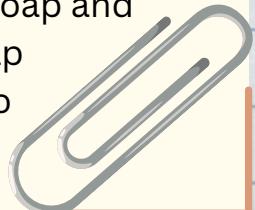
Super Senses: Water striders can feel bugs moving from far away. They can sense waves from 6 inches away!

Talking With Waves: Male water striders make special waves to talk. They drum their legs on the water. This tells other males to stay away. It tells females where to find them.

Winter Sleep: When winter comes, water striders hide under logs and rocks. They can freeze solid and still be okay! In spring, they wake up and go back to the water.

Walking Paperclip Experiment

Fill a bowl with water. Use a fork to gently place a paperclip on top of the water. The paperclip will float! Just like a water strider, it sits on the water's invisible "skin." Now add one drop of soap and watch the paperclip sink. Soap breaks the surface tension, so the "skin" disappears!



GLOWING MILLIPEDE

A Real Life Glow Stick



Even though “millipede” means “1,000 legs,” most only have 200 to 400 legs!

©“Glowing millipede” by Eden_Janine_and_Jim is licensed under CC BY 2.0.

A Body Built to Glow

Glowing millipedes are long, round animals with segmented bodies and jointed legs. They have a hard outer covering called an exoskeleton, which helps protect them. Their bodies glow a bright green color when disturbed or under ultraviolet light.

Millipedes have symmetrical bodies, which means the left and right sides look the same. Most of their body segments have two pairs of legs, and they can grow up to 9 centimeters (3.5 inches) long. They move slowly and crawl close to the ground.

Glow Means “No”!

Glowing millipedes have two clever tricks to survive:

- They curl into a ball to protect their soft underside.
- They glow green to scare off hungry predators!

Their glow says, “Back off! I’m poisonous.” Predators like birds and lizards quickly learn to stay away from glowing bugs. Glowing millipedes are nocturnal. They come out at night when their green glow is easiest to see.



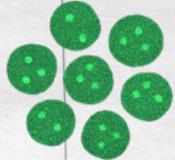
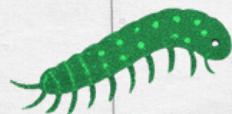
A tough exoskeleton protects the millipede

“Motyxia tularae olliae” by Alex Heyman is marked with CC0 1.0

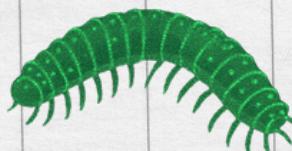
Bit by Bit, Molt by Molt

Glowing millipedes begin as eggs hidden in the soil. When they hatch, they only have a few legs. Each time they molt (shed their skin), they grow more body parts and legs. They molt several times before they're full-grown and can live up to 10 years!

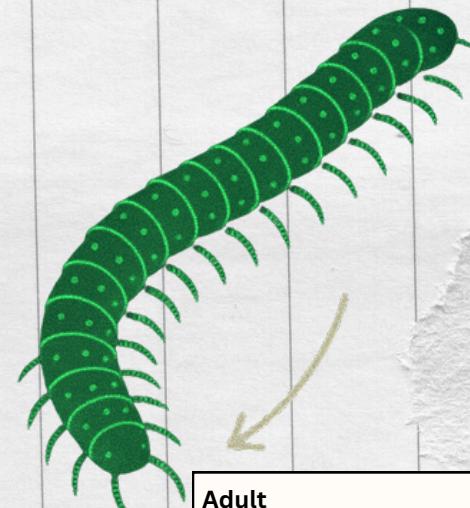
Larva
When the egg hatches, a tiny larva with few legs comes out. As it grows, it molts and gains more body segments and legs.



Egg
A glowing millipede's life begins as an egg laid in moist, hidden soil or under leaves.



Juvenile
The juvenile millipede looks like a smaller adult. It continues to molt, adding more legs and body segments each time



Adult
After several molts, it becomes a fully grown adult with all its body parts. Adult millipedes find mates and the cycle begins again when the female lays eggs.



This bright glow tells predators, "Do not eat me!!"

WHERE THEY LIVE



Glowing millipede habitat

Glowing millipedes live in coastal forests and mountain woodlands in California. They like cool, damp places and are often found under logs or fallen leaves in areas like the Sierra Nevada forest. These millipedes help clean up the forest floor by eating dead leaves and rotting plants.

GOLIATH BEETLE

Nature's Heavyweight Champion



**DID YOU
KNOW?**

These amazing beetles are so strong they can lift 850 times their own body weight. That would be like you lifting 10 elephants at once!

A GENTLE GIANT

What weighs as much as a small mouse but could sit in your hand? Meet the Goliath beetle, the heavyweight champion of the insect world! Don't let its enormous size fool you. This gentle giant is completely harmless to humans

The Goliath beetle's body is like a shiny suit of armor. Males can grow up to 11 centimeters (4.3 inches) long and weigh up to 100 grams (3.5 ounces). That's heavier than most songbirds! Their bodies have bold black and white stripes that look like racing stripes on a race car.

Male Goliath beetles have a special Y-shaped horn on their head. They use this horn like a tiny forklift to flip rival males off tree branches during fights over the best feeding spots. Like all insects, they have six powerful legs that end in sharp claws - perfect for gripping smooth tree bark.

WHERE THEY LIVE

Goliath beetles live in the tropical rainforests of Africa, especially in Ghana, Kenya, and Tanzania. They love warm, humid forests where they can find plenty of rotting fruit and tree sap.



BEETLE BATTLE ARMOR

Goliath beetles are like nature's ultimate warriors, equipped with amazing survival gear! Their armor-like body provides hard shell protection from predators and rough tree bark. Strong claws work perfectly for gripping bark and climbing even the smoothest tree trunks. Male beetles use their Y-shaped horn as a fighting weapon to battle rivals for the best food spots. Despite their heavy weight, powerful wings allow them to fly through the forest canopy. When all else fails, they can make a loud hissing sound by rubbing their legs together to scare away predators.

LIFE CYCLE

Goliath beetles go through complete metamorphosis, which means they totally change their body shape as they grow:



Adult Stage (3-6 months): The adult beetle breaks free and lives for several months, eating fruit and looking for a mate

Egg Stage (2-3 weeks): Females lay large, white eggs in rotting wood or compost



Larva Stage (3-4 months): The babies look like huge, fat white grubs and can weigh even more than the adults! They eat rotting plants and grow bigger and bigger



Pupa Stage (1 month): The larva creates a hard case around itself and transforms into an adult beetle



PREDATORS AND FOOD

What eats Goliath beetles:

- Birds (especially hornbills)
- Monkeys and other primates
- Spiders and mantises
- Ants (attack eggs and larvae)

What they eat:

- Tree sap and nectar
- Overripe fruit
- Flower pollen



"Goliath beetle (Goliathus goliatus), Entomica" by Fungus.Guy is licensed under CC BY-SA 4.0.

This big guy may look scary, but Goliath beetles are harmless plant-eaters that are surprisingly calm around humans!

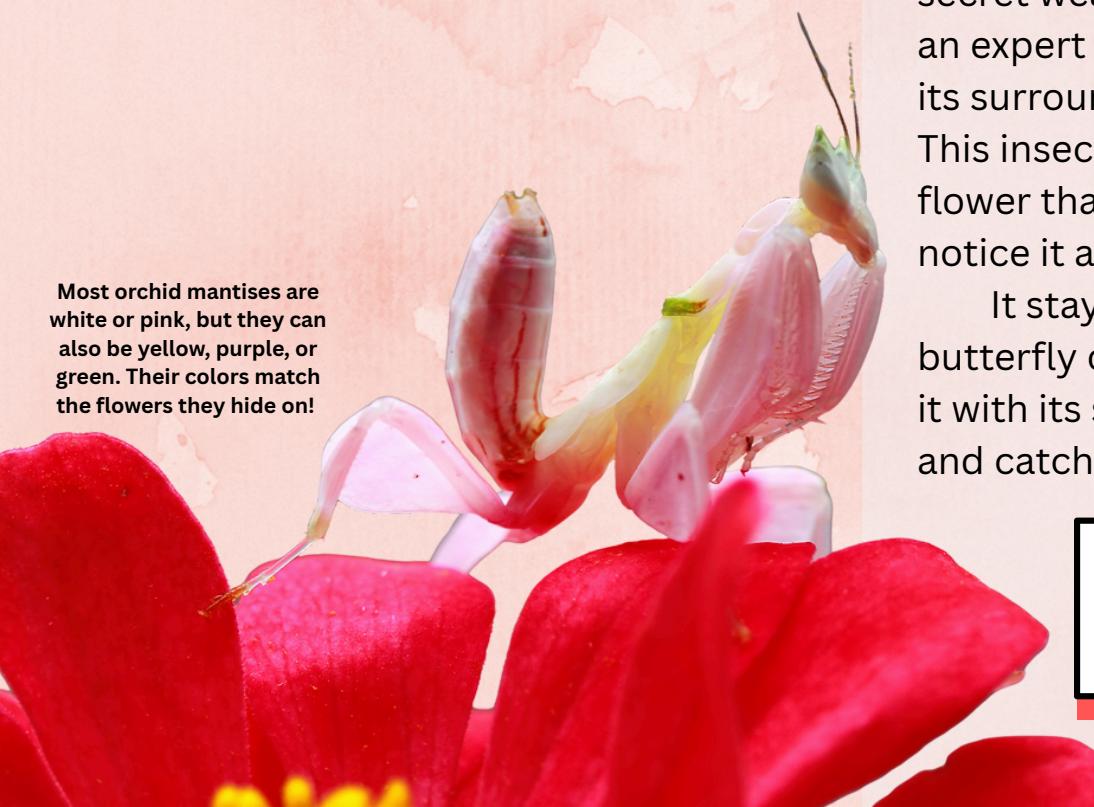
AMAZING!

A Goliath beetle is 8,000 times heavier than a house fly!

Orchid Mantis

Petal Power!

Most orchid mantises are white or pink, but they can also be yellow, purple, or green. Their colors match the flowers they hide on!



A Flower that Bites?

Imagine you're looking at a beautiful flower, but it's actually a deadly predator waiting to strike! That pretty pink petal? It's part of an orchid mantis, not a bloom. This amazing insect is a master of disguise. Its body looks just like an orchid flower, with soft colors and delicate, petal-shaped legs. But don't be fooled—this "flower" is just waiting for the perfect moment to grab its prey!

Camouflage is the orchid mantis' secret weapon. That means it is an expert at blending in with its surroundings to stay hidden. This insect looks so much like a flower that other animals don't notice it at all!

It stays still, pretending to be a petal. When a butterfly or fly gets close...SNAP! The mantis grabs it with its spiky legs. Camouflage helps it stay safe and catch its next meal.

Can you spot the mantis? It's hiding in plain sight!



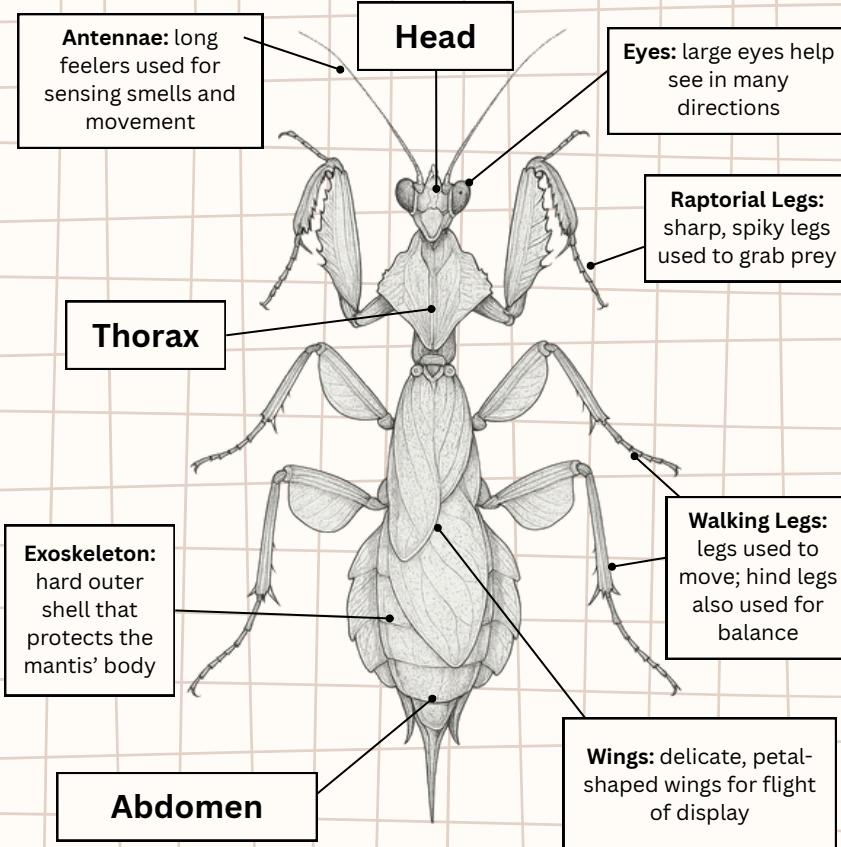
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Did You Know?

Some scientists think pollinators, like bees, are more attracted to orchid mantises than real flowers!

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Build a Bug



Math Connection

The orchid mantis uses its symmetrical body, where both sides are the same, to look just like a flower. This helps it hide from predators and sneak up on prey. But did you know symmetry can also help animals move more easily? When both sides of the mantis's body are the same, it can balance better as it sways like a petal in the wind. Its matching legs and wings help it stay steady and sneak around without being seen.

WHERE THEY LIVE

Orchid mantises live in the rainforests of Southeast Asia, including Malaysia and Indonesia. These warm, humid places are full of flowering plants that are perfect places for a mantis to hide!



Orchid mantises live where orchids bloom!

Other Flower Fakers

The orchid mantis isn't the only animal that pretends to be a flower! Some creatures use mimicry, a survival trick where one thing looks like something else. By copying flowers, they can sneak up on prey or hide from predators.

Flower crab spider: This spider hides inside blossoms and changes color to match the petals. It waits for bees or butterflies to land...then strikes!



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Dead leaf butterfly: When its wings are closed, it looks just like a dry leaf. But when it opens them, the bright patterns can look like flower petals or scare predators away.

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DIVING BELL SPIDER

Underwater Weavers



"european waterspider" by insect ID is licensed under CC BY 4.0.

LIFE UNDERWATER

Most spiders live on land, but one amazing spider has made its home underwater! The diving bell spider is the only spider in the world that spends nearly its whole life underwater.

This spider doesn't have gills like a fish. So how does it breathe? It brings air down from the surface! Using hairs on its body, it traps a bubble of air and carries it under the water like a little scuba tank. Then it releases the bubble into its special web, which it builds underwater.

What is a diving bell?

They are called "diving bell spiders" because the spider's silk bubble works like an old-fashioned diving bell used by humans. In the past, people used large metal chambers filled with trapped air to explore underwater. The spider's web holds air the same way, letting it "dive" and live below the surface while still being able to breathe.



Where They Live

Diving bell spiders are found in freshwater ponds, lakes, and slow-moving streams across Europe and parts of northern Asia. They choose calm, still waters with lots of underwater plants. These plants give the spider places to anchor its silk diving bell and stay hidden from predators. The quiet water also helps the air bubble inside the bell stay in place.



The diving bell spider shows just how amazing and adaptable spiders can be. It uses its silk not just to catch food, but to survive in a world where most spiders would drown.

A Bubble Home

The diving bell spider spins a silky web between underwater plants. This web acts like a tiny diving bell or air tent. The spider keeps adding fresh bubbles to the bell so it always has air to breathe. It hides in the bell to rest, eat, or wait for prey.

When the spider needs food, it swims out to hunt. It catches insects and tiny water animals, then brings them back to its air bubble to eat.

Living Inside the Bell

The spider uses the bell as a home. It hides there to rest, eat, or wait for prey. It also lays its eggs inside the bell. Even though it's underwater, the spider can breathe just like it's on land.

Bringing the Air

The spider swims up to the surface, traps a bubble of air against the hairs on its body and legs, and then dives back down.

Staying Fresh

The diving bell acts like a filter. Oxygen from the water slowly moves into the air bubble, and carbon dioxide escapes out. This helps the air inside stay fresh longer.

Building the Bell

The spider spins a web between plants underwater. This web is shaped like a tiny dome or bubble—almost like a tent made of silk. That's why it's called a "diving bell."

Filling the Bell

It releases the air bubble into the web. The silk dome holds the bubble in place. The spider repeats this trip many times until the bell is full of air.



DID YOU KNOW?

- The diving bell spider is the only spider that lives underwater full time.
- Its web acts like a diving bell, filled with air.
- It hunts underwater but eats inside its air bubble.
- Its hairy body helps trap and carry air.
- Males are larger and spend more time outside the web than females.



Can you spot the air bubble around the diving bell spider's abdomen?