

*Nav)gators*



**RAINFOREST**

# ON THE FLOOR

Where the canopy is thickest, barely any light reaches the rainforest floor. Few plants grow, and in some places the ground is bare except for a thin layer of dead leaves and twigs that have dropped from above. Sometimes a tree falls, leaving a gap in the canopy. Sunlight streams through, and suddenly seeds burst into life. Saplings shoot upwards in a race to reach the canopy. The fastest wins, reaches its full height and soon blocks out the light again.

*The tailless whip scorpion has large pincers for grabbing prey.*



*The trapjaw ant has the fastest-shutting jaws of all animals.*



## Bustling with life

The forest floor provides food and shelter for a huge number of insects. Ants, beetles and other invertebrates live in the leaf litter or in the soil underneath. These in turn are eaten by spiders, scorpions and centipedes. Mammals find food here, too. Pigs and rats root among the litter, while deer eat leaves. They are hunted by other animals, such as snakes and big cats.



> Less than one per cent of the sunlight that shines on the top of the canopy makes it down to the forest floor.



### Tongue twister

The African okapi is one of the tallest rainforest animals. Not surprisingly, it is related to the giraffe. It stands nearly 2m tall, and can reach up to feed on the leaves of understorey trees. A long tongue also helps. The okapi's tongue is so long that it can lick its own eyelids.

Leafcutter ants chew up leaves and grow a special fungus on them for food.

The goliath bird-eating tarantula is the biggest spider in the world, reaching 30cm across.

### FANTASTIC FUNGUS

Fungi are some of the most important inhabitants of the forest floor. They feed on plant tissue, and help break down the leaf litter. Mostly they are invisible, sending out tiny threads under the leaves, but occasionally they send threads up a stem or form structures that come in many shapes and colours. One of the most dramatic structures is the maiden's veil fungus, whose tip gives off a disgusting smell.



The smell of the maiden's veil fungus attracts flies, which spread the fungus's spores.





## Feet that fly

All frogs have webs of skin between their toes, to help them swim. But some rainforest species, such as the Wallace's flying frog, use these membranes for gliding as far as 12m. This flying frog lives high in the jungle canopy of Thailand and Borneo in Southeast Asia. It has extra long toes, so its membranes are much bigger than ordinary frogs. It also has flaps of skin on its arms.



## Winged cradle

The colugo has a membrane that stretches from the shoulders to the tip of the tail. Spreading this out, it can glide for over 100m. When she is not flying, the female colugo uses the membrane as a cradle for her young.

## Tail steering

The female sugar glider of Australia glides through the air using membranes between the arms and legs, and steering with the tail. She has a pouch on her stomach in which her babies shelter.



# FLIERS AND GLIDERS

Many jungle animals appear mainly at night. Flying creatures patrol the canopy, looking for food. Bats set out to hunt, along with uncountable numbers of nocturnal insects. These, together with moths, owls and other birds, fly easily in the upper forest layers. But some animals have adapted to this environment. They cannot actually fly up, but they can glide from a high branch to a lower one. Some squirrels, colugos, lizards and even frogs grow extra flaps of skin that they use like wings.

> MEMBRANE - a thin layer of skin or tissue between two parts of the body



> The paradise tree snake is able to glide without a membrane at all. It spreads out its body by raising the ribs.



"We constantly find details of the marvellous adaptation of animals to their food, their habits, and the localities in which they are found."

Alfred Russel Wallace (1823–1913)

*British naturalist and explorer*



*When the flying frog jumps, it stretches out its toes, so the four feet act as wings.*

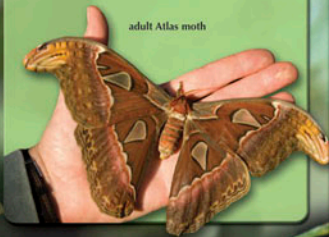
*The frog can change direction by extending or pulling back one of its limbs.*



## MONSTER MOTH

The Atlas moth of Southeast Asia has the largest wings of any moth in the world. This huge insect can reach nearly 30cm across. The moths lay eggs, which hatch into caterpillars. The caterpillars turn into pupae, spinning themselves cocoons made of silk. About four weeks later, they become adult moths and break out of the cocoons. But they only live for two weeks. The moths cannot eat as they have no mouths. They only have time to mate and lay eggs before they die.

adult Atlas moth



# WATER LIFE

Rivers create an extra kind of habitat in the rainforest. For a start, they make large openings in the forest canopy. The trees take advantage of the extra light and form a dense barrier at the river's edge. Water also provides a home for entirely different creatures. Specialized plants such as giant water-lilies live here, as well as huge numbers of beetles, flies and other insects. There are also several fearsome river animals, including piranhas and caimans.



Two rows of sharp, triangular teeth nip off chunks of flesh.

piranha

A transparent third eyelid helps to see under water.



caiman creeps up on capybara from below.

A caiman can grow to more than 4m long. It lies half-hidden in the water and ambushes its prey.

## TINY BUT DEADLY

There are many areas of still water in the rainforest and these places are perfect breeding grounds for mosquitoes, which lay their eggs in water. Female mosquitoes feed by sucking blood from mammals (including humans). When they do this, they may also pick up strains of deadly diseases such as malaria and yellow fever. They will then pass these on to their next victim.



mosquito on human skin



"Pirates, piranhas... a lot of mud. It's not polluted water but a lot of parasites were in my body."

Martin Strel (born 1954)

*Slovenian long-distance swimmer and the first person ever to swim the length of the Amazon river*

*Capybaras, the largest rodents, have webbed feet and live in groups of 20 or more.*

## River visitors

Many kinds of animals are attracted to rivers, because they are rich in food as well as water. Land animals come to drink, and swimmers visit to eat water plants or catch fish.

Mammals such as capybaras or peccaries make an easy meal for a crocodile, caiman or water snake. The giant anaconda of the Amazon kills by wrapping itself around its prey and strangling it.

## River grazers

Manatees are large water mammals that can weigh as much as half a tonne. They eat mostly plants in shallow water. Manatees spend much of the day sleeping under water, coming up to the surface to breathe every 20 minutes.

capybara



*Rows of special organs on each side of the eel's body release electric charges into the water.*

*Amazonian electric eels can produce electric shocks to stun prey or use as a defence.*

electric eel



# JUNGLE PARTNERS

All rainforest animals depend on plants for shelter or food. Even meat eaters rely on plant food because it attracts their plant-eating prey. Many plants also depend on animals to help fertilize them and spread their seeds. Sometimes, animals and plants form special partnerships that are good for both of them. Azteca ants make their homes inside the stems of cecropia trees. In return, they defend the tree against climbing plants and harmful insects.

➤ LARVA - a young animal that looks unlike its parents, and that changes shape as it grows up

mealy bugs feed on the sap of the plant, and produce a sweet juice



ants gather food that the cecropia plant produces



Azteca ants driving off tappaw and by pinning down its feet and feelers





### Sap Licker

This Males marmoset is a small South American monkey with claw-like nails and long, narrow teeth. It uses these to gnaw away the bark of some trees. This allows it to lick up the sugary sap or resin that comes out of the wood.



queens and slaves  
dig tunnels  
down and create  
the first chamber



the ant larvae are fed  
by the adult ants

### THE FIG WASP

The flowers of the fig tree grow inside the fruit and are pollinated by fig wasps. Lured by the sweet scent, a female fig wasp pushes her way into the fruit to lay eggs on the flowers. Male wasps hatch and develop first, and bore tunnels through the fig wall. After mating with the males, the females escape through these tunnels and fly away. The males have no wings and so die inside the fig.



fig wasp starts to push her way into the fruit

### Ant tree house

The Cecropia is a small tree with a hollow trunk and branches. A queen ant bites her way inside and sets up a colony. She seals herself into the stem and lays eggs, which hatch into larvae, then into adult ants that raise the next batch of young. To provide food for the larvae, the ants bring in mealy bugs, which give out a sugary liquid that is fed to the larvae. The ants attack other insects that might damage the Cecropia, and destroy climbing plants that may smother it.



> The biggest fig tree ever discovered in the rainforests had a crown that was 600m in circumference.

