



# NATURE'S TRICKS

HOW ANIMALS AND PLANTS USE DISGUISES AND DECEPTION

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Photos by Chien Lee



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This page: Moyer's Pygmy Chameleon (*Rhampholeon moyeri*). Udzungwa Mountains, Tanzania.

Opposite page: Leaf-legged Katydid (*Eulophophyllum lobulatum*). Sabah, Malaysia.



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**One copy of this book has been donated to each of 4,000 primary schools  
across Australia.**

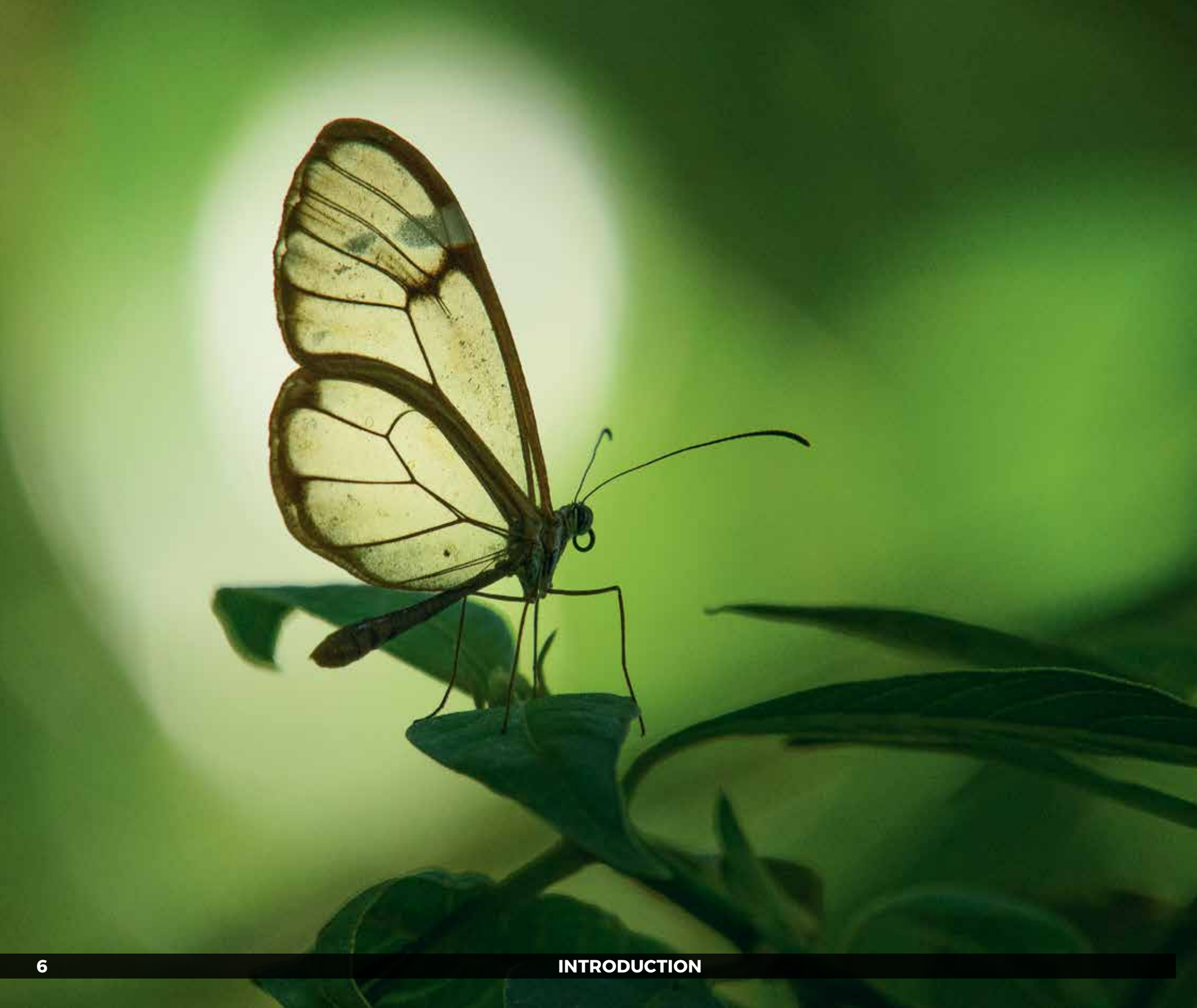


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# INTRODUCTION

Seeing may be believing, but in nature not everything you see is always what it seems.

From cryptic concealments to masquerades and flashy warnings, countless organisms utilise disguises to gain an advantage in their never-ending bid for survival. These remarkable adaptations, crafted by the uncompromising paintbrush of natural selection, have resulted in some of the most extravagantly detailed outfits, some designed to deceive and others to dazzle.

In *Nature's Tricks*, we journey through the amazing strategies of animals and plants around the world to discover how disguises and deception are used in the natural world. The book is divided into four main chapters: Defensive Camouflage, Hunting Camouflage, Mimicry, and Warning Displays.

Many species presented in this book face threats to their continuing survival in the wild, and each description is accompanied by a generalised conservation indicator as follows:



**Not Evaluated**



**Vulnerable**



**Least Concern (not threatened)**



**Endangered**



**Near Threatened**



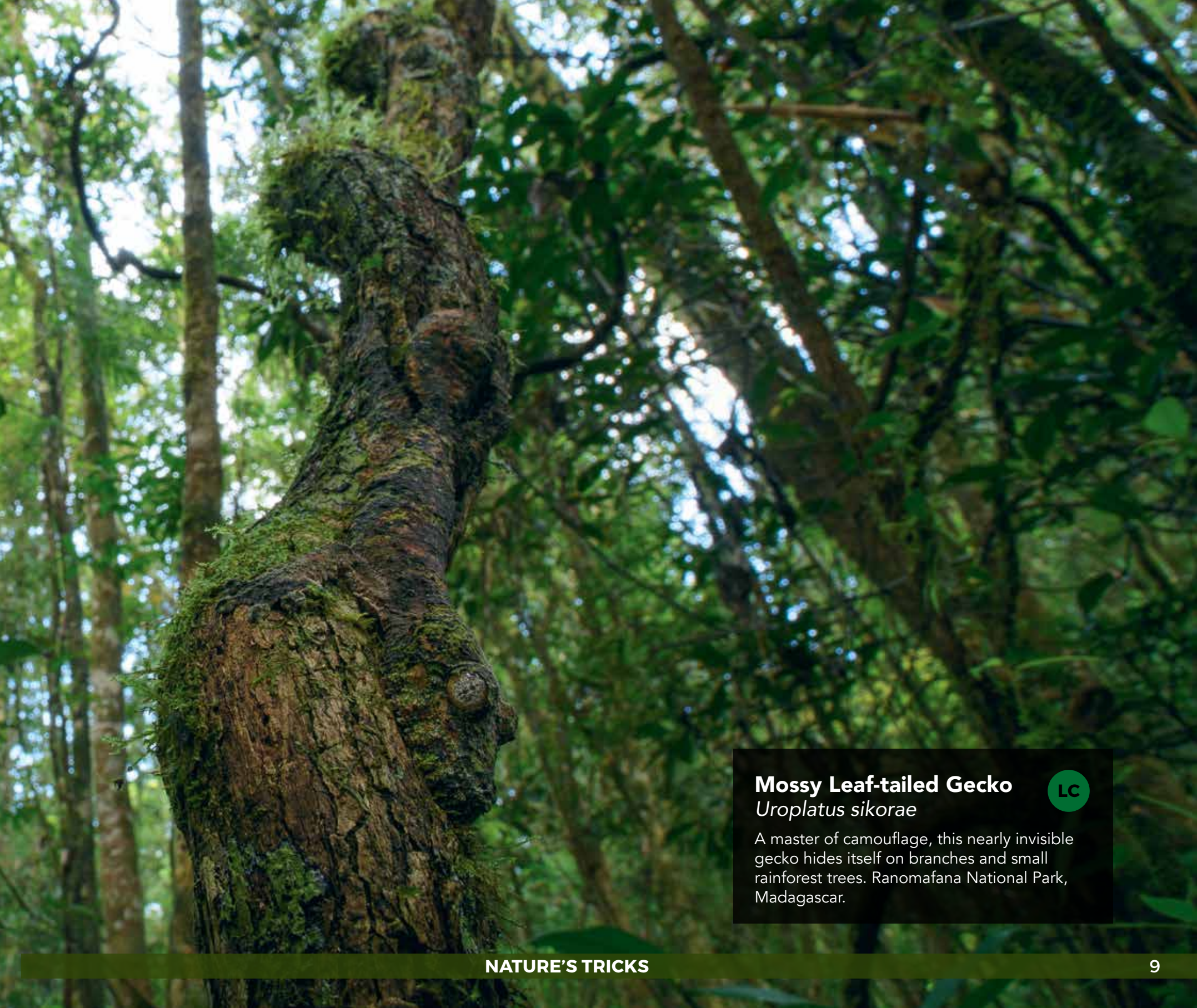
**Critically Endangered**

# DEFENSIVE CAMOUFLAGE

## Hiding for Survival

In a jungle full of perils, the value of remaining unseen is never overrated and it is no wonder that camouflage is the most frequently used defensive adaptation throughout the animal kingdom. Many creatures maximise their odds of survival by blending in with their surroundings, be it a leaf, tree bark, or just about anything in the forest that is less palatable than themselves. Such disguises can be used by predators as well, enabling them to stalk their prey or lie in ambush completely undetected. To be most effective, camouflage must be tailored to match an organism's specific environment and behavior; sometimes it is perfected to such a degree that it renders virtual invisibility. Many plants have also evolved forms of camouflage to hide or trick hungry herbivores.

A number of different camouflage strategies are employed by animals and plants; these are usually categorised by the method in which they function to deceive the viewer. Those that prevent the detection of the animal outright are called 'crypsis', whereas other disguises may cause it to be mistaken for something else. Not all camouflage can be readily perceived in photos – some designs are tailored to fool only certain predators which are colour-blind, and still others may involve movement, sound, or even smell. Researchers are still engaged in trying to unravel the many complex mechanisms behind camouflage and what drives some organisms to have the most extravagant designs.



**Mossy Leaf-tailed Gecko**  
*Uroplatus sikorae*

LC

A master of camouflage, this nearly invisible gecko hides itself on branches and small rainforest trees. Ranomafana National Park, Madagascar.

# CRYPISIS

## Background Matching

Reducing the chance of detection by bearing a resemblance to the background is the most straightforward and abundant form of defensive camouflage.

This is achieved by matching the colouration, lightness, patterns, and sometimes texture of a specific environment. Background matching works best on a particular substrate and is less effective when the organism moves to different surroundings. As such, many species that rely on crypsis as their primary method of evading predators are specialised to a particular habitat or environment.

The morphological adaptations that organisms undergo to achieve various forms of background matching camouflage are often astonishing, and the result of countless thousands of generations undergoing selective processes to slowly perfect and enhance the organism's morphology and colouration.

### Amazonian Horned Frog *Ceratophrys cornuta*



Hidden in the dense leaf litter of the rainforest floor, an Amazonian Horned Frog lies in wait for its next meal. With a mouth wider than the length of its body, and a voracious appetite to boot, these frogs can consume prey as large as small reptiles and rodents. Yasuní National Park, Ecuador.



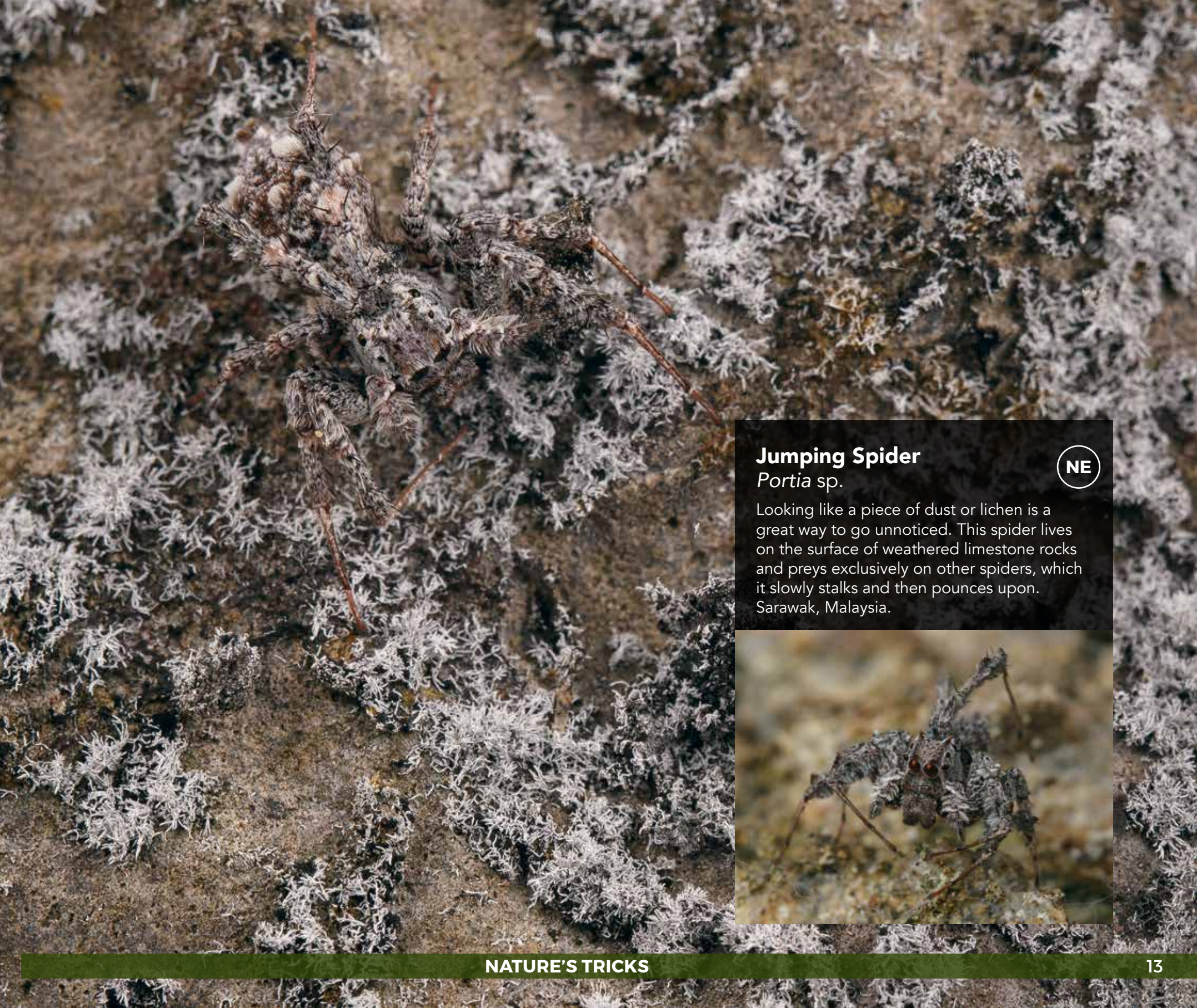


**Sand Grasshopper**  
*Cibolacris* sp.

NE

This sand grasshopper has evolved the same colouration as the substrate in which it is often found. Note the presence of black markings that add to the deception. Baja California, Mexico.





## Jumping Spider

*Portia* sp.

NE

Looking like a piece of dust or lichen is a great way to go unnoticed. This spider lives on the surface of weathered limestone rocks and preys exclusively on other spiders, which it slowly stalks and then pounces upon. Sarawak, Malaysia.



## Tree Bark Camouflage

With its rough texture and varied colours, the bark of trees is a great place to hide. However, animals hiding here must keep their body flat against the surface to avoid being seen. Many species that rely on tree bark camouflage have also evolved highly specific colouration patterns, which in some cases match a single species of tree.

### **Bark Katydid** *Olcinia dentata*

NE

Usually active only at night, this katydid conceals itself while it sleeps by day on the side of a rainforest tree. The greenish colouration on its wings matches the moss on the tree bark. Sabah, Malaysia.



**Bornean Bark Mantis**  
*Theopompa borneana*

NE

Concealed from both predator and prey alike, this praying mantis (left) hides itself against the bark of a tree. Sabah, Malaysia.



**Geometrid Moth**  
*Pingasa ruginaria*

NE

Despite having a broken wing, this moth is still perfectly hidden on tree bark (right). Sarawak, Malaysia.



**Fulgorid Planthopper**  
*Episcius* sp.

NE

Looking like tree bark is convenient if you also feed on tree sap. This planthopper spends its entire life on the side of trees – its straw-like proboscis enables it to suck sap from the tree while it remains unseen (left). Esmeraldas, Ecuador.



**Lichen Huntsman Spider**  
*Pander cetes gracilis*

NE

Superbly camouflaged, this huntsman spider lies in wait for prey on the trunk of a tree in the Arfak Mountains of New Guinea, Indonesia (right).



## Mossy Leaf-tailed Gecko

*Uroplatus sikorae*

LC

Found only in Madagascar, this species of gecko has mastered the art of camouflage.

Friiled scales on the sides of the gecko help to conceal its outline. Moreover, no two individual Mossy Leaf-tailed Geckos look identical; each has their own unique camouflage pattern even though they are the same species (opposite page). This makes it difficult for predatory birds to learn a familiar search pattern.

Birds have keen eyesight and thus these geckos need to remain completely still while tightly hugging the branch that they sleep on to avoid being detected.

## Moss Camouflage

When hiding yourself among green moss, you not only need to be green, but it also helps to have moss-like protrusions on your body to perfect your disguise. The greatest number of species using forms of moss camouflage occur in the world's tropical rainforests.

### Moss Mantis

*Haania* sp.

NE

Still a juvenile, this tiny mantis will eventually mature and shed most of its moss-like camouflage in favour of fully-developed wings. Sarawak, Malaysia.



**Mossy Bush Frog**  
*Philautus macroscelis*

LC

The green bumps and tubercles on the back of this small frog almost make it look as though moss is growing on it. Sarawak, Malaysia.



**Mossy Stick Insect**  
*Trychopeplus laciniatus*

NE

The green filamentous growths of this stick insect are almost indistinguishable from real moss. It lives in the cloud forest of Central America where it feeds exclusively on the foliage of several epiphytic orchids. Cartago, Costa Rica.





**Borneo Rainbow Toad** EN  
*Ansonia latidisca*

Looking like moss suits this small toad very well because it lives in trees. This secretive species eluded biologists for nearly 90 years and was once thought to be possibly extinct. Sarawak, Malaysia.



**Mossy Stick Insect** NE  
*Neoclides laceratus*

The impeccable camouflage of this stick insect makes it difficult to tell where moss ends and insect begins. Note how the shape and colour of the projections along its body matches the moss. Sarawak, Malaysia.



**Moss Katydid** NE  
*Championica montana*

When faced with a potential threat, this juvenile katydid will lay flat against the mossy leaf surface on which it perches. It has evolved colouration that matches the moss perfectly. Limón, Costa Rica.



### Mossy Rain Frog

*Scaphiophryne spinosa*



This frog is unique to Madagascar. It inhabits pristine rainforests, swampy forests, forest edges, and degraded forests, where it relies upon blending in with moss to avoid predators. Ranomafana National Park, Madagascar.



## Leaf Camouflage

Given the abundance of vegetation across most temperate and tropical parts of the world, it is hardly surprising that thousands of animals have evolved ways of blending in with leaves. This often involves highly specialised colouration and body-morphology that may resemble the shape and structure of foliage with astounding precision. The greatest number of species that utilise forms of leaf camouflage occur at tropical latitudes.



**Perinet Chameleon**  
*Calumma gastrotaenia*

LC

This chameleon grows up to 20 cm in length and has a stripe along its sides. It lives and hunts amongst undergrowth and blends in with the foliage. Ranomafana National Park, Madagascar.