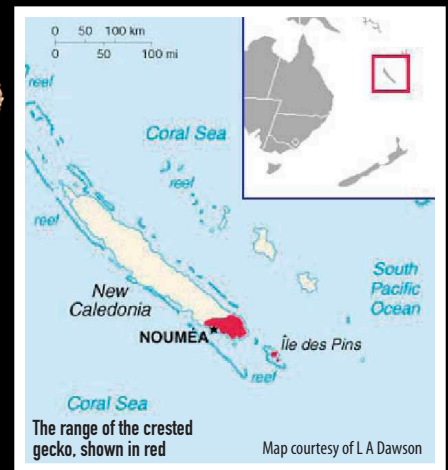


# Crested geckos & vivarium lighting

There is so much contradicting advice about keeping the popular crested geckos with ultra-violet (UV) light. So what is the truth? Do they need it or not? John Courteney-Smith, Arcadia reptile products manager, goes wild to provide an answer.



The skin on the underside of the crested gecko's body is very thin, and serves to absorb UV light

The crested gecko (*Rhacodactylus ciliatus*) is a remarkable animal that can make the perfect pet reptile. What is particularly amazing is that this lizard with a permanent smile was once thought to be extinct in the wild, until its unexpected re-discovery after a tropical storm in 1994. The species originates from the beautiful Pacific island of New Caledonia.

There is only one way to be sure if these geckos will use UV or not; the answer as always lies in returning to their natural habitat and seeking out the environment in which they live.

## Their native environment

New Caledonia is a lush and ecologically diverse island in the southwest Pacific Ocean. Thick jungle forests and rare high humidity cloud forests, pine and scrubland make up this magical ecosystem.

There are mountains and hills, jungle plants and in the case of the "Ile des pins" or "island of pines", huge swaths of tall pine trees, as well as waterways and grassland, sand banks and the surrounding ocean. There are only two real seasons on New Caledonia - a hot and dry season and a hot, very wet season.

The group of geckos that we know as *Rhacodactylus* mainly inhabit the rich pine forests of New Caledonia and some of the surrounding smaller islands where there is similar terrain. This is a very hot and humid place with a UV index of 6-8 at the height of summer, dropping back to 3-6 in the rainy season. We can also assume that even in a dense forest, around 10-20% of all available light would - either directly or by reflection - still be able to penetrate into the typical understory where most of the creatures live and feed.

The fact that crested geckos have a thin and reactive skin, coupled with the amount of light filtering through the canopy from the sun means they are efficient at absorbing UV directly through the back and sides of the body. Even the delicate underbelly of this gecko could be used in nature to obtain some of the solar energy needed to complete the D<sub>3</sub> cycle, as it will be exposed to reflected light and UV from the ground.

## The impact of leaf scatter

The direct power of the sun would be available through leaf scatter illumination. These little fragments of direct and heavily reflected light would be seen by the animal which would then be able to change its elevation and/or position to obtain a stronger or weaker dose of natural light as and when required. Reflected light contains the same relative percentage of UV as light measured from the original source, but it decreases in potency as it travels downwards.

Low light levels from typical leaf scatter illumination would enable these geckos to photo-regulate and see tetrachromatically, detecting sources of UV, even in these darker, lower reaches of their habitat. There would still be enough light and UV down on the forest floor for the animals to benefit from it. These are true omnivores and they will seek out and pursue invertebrates, as well as feeding on soft fruits here.

Crested geckos will actively bask as well, confirming that they have evolved to live further up into the understory and first reaches of the true canopy. Although they seem to seek out shady spots as they lie flat against a tree trunk, they will and do bask in hot spots and UV-rich areas.



◀The slit-shaped pupil reveals the nocturnal habits of these geckos





Being able to climb well helps these geckos to adjust their UV exposure in their native forest

These geckos will change colour quickly if they are exposed to sunlight or a synthetic source of full spectrum light containing UV. They have a very light-absorbent skin and would naturally be exposed to quite a high UV index in the wild, although they are known to be more active at dusk and into the night.

This may be the safest time of the day for them to hunt and feed, but they would have spent the day getting up to temperature wedged in-between bark and branches prior to their normal active period. Just as with crepuscular tree-dwelling snakes, even when they are asleep during the day therefore, so by being exposed to natural sunlight, crested geckos will be benefiting from the UV that is present here.

Reptiles change and adapt to the surroundings where they live. *Rhacodactylus*, like many of New Caledonia's animals, have adapted over time to

live in low but still quite powerful dappled light levels. They flourish in conditions of high humidity and use the earth's changing seasons to set their breeding cycles. This is natural selection at its very finest. If we can use these principles in vivarium surroundings, so the lives of captive animals can only be improved.

Every part of the local ecosystem, weather reports and the locations where these geckos are seen by local rangers all suggest that crested geckos can and do use leaf scatter illumination to see tetrachromatically in low light and for their vitamin D<sub>3</sub> cycle.

### Seeking a vivarium balance

The provision of a UV index of 0.5-2 as a gradient through a vivarium would replicate the average exposure that a crested gecko would receive in the wild, as long as it can regulate its exposure. The use of broad barks and dense foliage as décor will enable the gecko to decide where it wants to be and for how long.

We can see from their natural environment



Crested geckos can even benefit from UV in the wild when they are walking across the forest floor. Note the distinctive way in which their toe pads are raised when covering the ground in this way.

how the understory of the forest flourishes even with the relatively small amount of natural sunlight that the lower reaches receive.

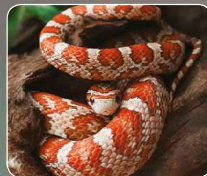
Crested geckos will sit under the correct UV lamp for long periods. This illumination could just be provided for three hours a day once in the morning and once in the evening if required.

One issue to be aware of that could cause problems, however, is over-supplementation. Some of the pre-mixed proprietary feeds for these geckos have high levels of Vitamin D<sub>3</sub> added. This vitamin, as a member of the fat-soluble group, can accumulate to excess in the liver, leading to potential health issues.

You should always ensure that you know exactly how much D<sub>3</sub> is being provided through your gecko's diet, and how to administer it properly. Vitamin D<sub>3</sub> manufactured by exposure to UVB cannot be over-provided though, as the lizard will bypass it naturally, but this could happen with dietary sources of the vitamin, which build up in the body. ❖

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