MAMMALS · BIOFLUORESCENCE

# Glowing Springhares

*Shine a UV torch on a springhare and its fur lights up in patches of orange to red. Here is what scientists found, and what is still unknown.*

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> The springhare is a familiar sight on a night drive, a pair of eyes bouncing across the short grass. In 2021 researchers reported that under ultraviolet light its fur glows a vivid orange to red. It was the first well-documented case of this in an Old World placental mammal.

Based on **Olson et al. (2021)**, "Vivid biofluorescence discovered in the nocturnal Springhare (Pedetidae)", *Scientific Reports* 11: 4125. Summarised in our own words; full citation in the sources.

## 01 Meet the springhare

There are two species of springhare, and both are found only in Africa. The **South African springhare** (*Pedetes capensis*) is the one we see in Zimbabwe. It also occurs across much of South Africa, Namibia, Botswana, Angola and Zambia. The **East African springhare** (*P. surdaster*) lives in parts of Kenya and Tanzania.

LIFESTYLE

### Nocturnal burrower

Springhares spend the day in their own burrows and come out at night. They mostly feed alone.

HABITAT

### Sand and short grass

They need sandy soil to dig in and open, short grassland to graze. Densities are highest on floodplains and pans.

ESCAPE

### Explosive leaps

Open ground offers little cover, but it gives a clear view of approaching predators and room to escape with powerful bipedal leaps.

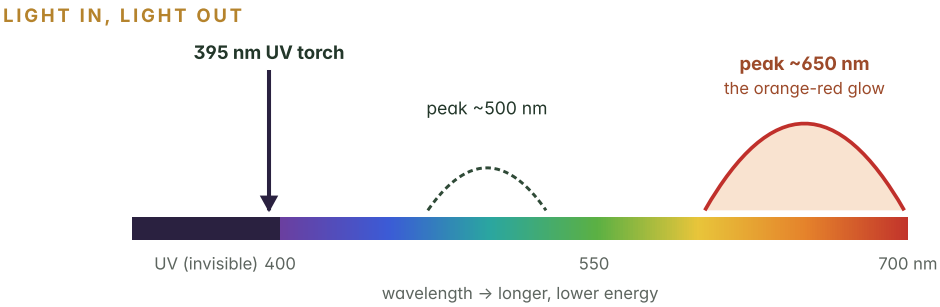
STATUS

### Least Concern

Widespread and abundant. They are easy to hunt at night with a spotlight and breed slowly, so heavy hunting could still affect local numbers.

## 02 What is biofluorescence?

**Biofluorescence** happens when a living thing absorbs short-wavelength light, such as ultraviolet, and gives it off again at a longer wavelength we can see. It is **not** the same as bioluminescence. A firefly makes its own light through a chemical reaction. A fluorescent animal only glows while light is shining on it.




*Schematic only. The researchers photographed specimens under 395 nm UV. Spectroscopy of a strongly glowing patch of belly fur found peaks at about 500 nm and 650 nm.*

## 03 How the discovery happened

The team was studying fluorescence in New World flying squirrels and in Anomaluromorpha (the rodent group that includes springhares) at the **Field Museum of Natural History in Chicago**. They noticed the glow on springhare specimens there by chance, and then set out to document it properly.

### 14
**MUSEUM SPECIMENS**

Both species, from Angola, Botswana, Kenya and Tanzania, collected between 1905 and 1963.

### 6
**CAPTIVE ANIMALS**

Five live springhares at Omaha's Henry Doorly Zoo and one that had died of natural causes at Mesker Park Zoo.

### 100%
**GLOWED**

Every individual showed orange-to-red fluorescence, though how strongly varied from animal to animal.

### 58 yrs
**STILL GLOWING**

Specimens collected over a 58-year period still fluoresced, though live animals glowed more vividly than museum skins.

## 04 What the glow looks like

- **Patchy, not even.** The glow appeared in irregular patches on both the back and the belly. The researchers found this pattern unusual compared with other fluorescent mammals.
- **Brightest areas.** On the back it was often strongest on the **head and rear**. Underneath it was mostly on the **inner thighs and tail**.
- **Same in males and females.** Both sexes glowed in the same areas with similar intensity.
- **Stable over time.** One live springhare photographed 14 months apart showed much the same pattern both times.

## 05 Where does the glow come from?

Under the microscope, the fluorescence appeared to sit within the **outer layer (cuticle) of each hair**, and seemed absent from the core and the tips. Washing the fur with dish soap neither removed the glow nor transferred it to anything else, which suggests it is part of the hair itself rather than something on the surface.

Chemical analysis of the hair found several **porphyrins**, including uroporphyrin and coproporphyrin, plus one unidentified molecule. Porphyrins are by-products of the pathway the body uses to make **haem**, the iron-carrying part of haemoglobin. Uroporphyrin and coproporphyrin are known to fluoresce in the red part of the spectrum, which fits the colour seen.

BIGGER PICTURE SINCE 2021

Fluorescence has since turned out to be far more common in mammals than once thought. A 2023 study at the Western Australian Museum recorded it in **125 mammal species** across all 27 living orders. What makes the springhare stand out is the **striking, patchy, intense** orange-red display.

## 06 Why do they glow? Nobody knows yet

The authors are clear that the purpose, if there is one, is **unknown**. They suggest a few possibilities to test:

IDEA 1

### Camouflage

The patchy pattern might help break up the animal's outline. This would only work if their predators can see UV, which hasn't been tested.

IDEA 2

### Linked to night life

All the mammals first found to fluoresce are active at night or dusk, which hints that UV light could matter in low light. This is a hypothesis, not a finding.

IDEA 3

### A side effect

It may have no function at all. The authors note that porphyrin build-up can also be linked to disease (porphyria), as in fox squirrels and people, and call for more research.

WHAT SEEMS LIKELY

### Probably not from the environment

It showed up in captive and wild-collected animals, across countries and decades, which suggests it isn't picked up from the surroundings.

USING A UV TORCH ON A NIGHT DRIVE

Keep it brief and at a distance. Don't chase or corner the animal for a photo, and don't shine UV into anyone's eyes, people or animals.

ON THE NIGHT DRIVE — HOW TO SAY IT

*"That's a springhare — not a hare at all, but a rodent that hops on its back legs like a little kangaroo. Here's something most people don't know: under ultraviolet light its fur glows orange to red in patches. Scientists only described it properly in 2021. The glow comes at least partly from natural pigments called porphyrins in the hair, and nobody yet knows whether it does anything useful for the springhare."*

## 07 Key terms

| | |
|---|---|
| **Biofluorescence** | Absorbing short-wavelength light (e.g. UV) and re-emitting it at a longer, visible wavelength. |
| **Bioluminescence** | Producing light through a chemical reaction, as fireflies do. Different from fluorescence. |
| **Porphyrins** | Ring-shaped molecules formed as by-products of making haem. Several fluoresce red under UV. |
| **Hair cuticle** | The thin outer layer of a hair, where the springhare's glow was found. |
| **Nocturnal / crepuscular** | Active at night / active at dawn and dusk. |

## In summary

- Springhares are nocturnal, burrowing African rodents, found in Zimbabwe where there is sandy soil and short grass.
- Their fur fluoresces **orange to red** under UV, in an unusual **patchy** pattern.
- The glow sits in the **hair cuticle** and comes at least partly from **porphyrins**.
- All 20 animals examined glowed, and the trait does not appear to come from the environment.
- Its purpose, if any, is **still unknown**.

SOURCES


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