

# If you're a vole, beware white owls when it's full moon

Light-reflecting plumage tricks their prey. Natalie Parletta reports.



Nestling barn owls with varying colourations  
CREDIT: ALEXANDRE ROULIN

The plumage of white barn owls (*Tyto alba*) appears to be a unique evolutionary quirk that helps them catch common voles (*Microtus arvalis*), their key prey.

Although the nocturnal owls can't camouflage themselves under bright moonlight like their brown counterparts, their white feathers reflect the light, exploiting the rodents' aversion to "flash" lights and causing them to freeze for longer.

The research, **published [1]** in the journal *Nature Evolution & Ecology* by Luis San-Jose and Alexandre Roulin from the University of Lausanne, Switzerland, and collaborators, was drawn from 20 years of

data and follow-up studies.

But it wasn't what they initially were looking for.

"One day we realised something we had in front of eyes for decades," says Roulin. It dawned on them that the barn owl is the only white nocturnal predator, which is "totally counter-intuitive", he adds.

"This appeared weird at first sight. And we thought, during full moon nights white barn owls are like stars flying in the sky, very visible."

When rummaging through the data, they found that barn owl plumage colouration, reproduction success and foraging activities corresponded with the cycles of the moon.

To explore reproductive biology, they analysed data on brood size, nestling body condition and survival and parental feeding rate, along with online information on moon cycles.

Results showed that the full moon impacted negatively on red owls but positively on white owls.

"From new- to full-moon nights," Roulin explains, "nestlings survived better when the parents were white but survived less well when the parents were red."

To investigate hunting behaviour, they attached GPS tags to the back of adult barn owls. Downloaded data from the recaptured birds revealed that the full moon thwarted red owls' foraging behaviour but helped the hunting success of white owls.

Finally, to illuminate prey behaviour, the researchers captured common voles and took them to the lab where they could mimic light conditions of a new versus full moon.

To test the rodents' startle response, they succumbed the clueless mammals to red and white stuffed barn owls flying on a zip wire.

This was most revealing.

“We found that voles ‘panic’ much more when they are attacked by a white than a red owl,” says Roulin, “but only under full moon conditions, not under new moon conditions.

“We could demonstrate that plumage of white owls reflects light which triggers fearful reactions in the prey.” Because the voles froze, they were easier to catch.

The findings were strong and consistent across all analyses, and although this surprised the researchers, it could explain why white barn owls, that predominate around the world, have an evolutionary advantage.

“Our results can help explain the evolution and maintenance of colour polymorphism, that is, the presence of differently coloured individuals in a single population,” says Roulin.

This suggests the moon influences the evolution of nocturnal animals’ colour patterns while the sun shapes that of diurnal creatures, he adds.

Bird ecology and evolution expert Jesús Avilés, from **EEZA-CSIC [2]** in Spain, **writes [3]** in an accompanying paper that the findings are “exciting”.

Although the moon is known to shape many animal behaviours, until now their colouration had not been examined in relation to their fitness, Avilés explains.

He suggests that predator and prey response to moonlight variations be observed simultaneously – and under natural conditions – to fully grasp the adaptive significance of owl plumage patterns.

***The Royal Institution of Australia has an education resource based on this article.***

***You can access it [here \[4\]](#).***