



NOT QUITE CRIMSON ROSELLA: WHY ANIMALS EVOLVE IN A RANGE OF COLOURS

They are known as crimson rosellas, but when it comes to the colour of these birds, don't take it as read. These parrots, which are found throughout Australia's south-east, have a remarkable level of colour diversity beyond their namesake hue.

In higher rainfall areas, such as Gippsland and along the Great Divide, the rosellas' colour remains true to their name, with a plumage of crimson red. But those in lower rainfall parts of south-east Australia, including along the Murray and Murrumbidgee rivers, are predominantly pale yellow, and are known as the yellow rosella. In the Adelaide Hills of South Australia, the bird is a splotchy orange yellow colour and also goes by the name of the Adelaide rosella. The amazing colour range of this parrot is a focus of a long-term study by Deakin researchers to work out how, and why, animals can vary so much in their colour scheme.

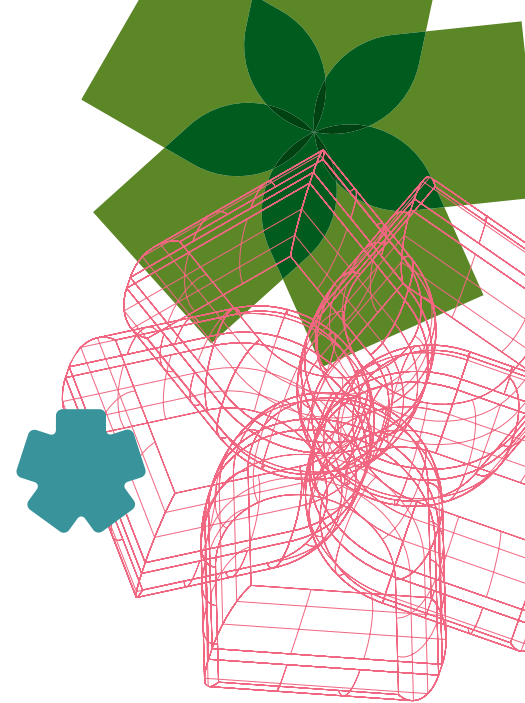
Project leader at the School of Life and Environmental Sciences, Professor Andy Bennett, says explaining the diversity of animal colours was a fundamental question in biology that had long intrigued scientists, as well as the public. He recalls his own curiosity, as a youngster growing up in the Adelaide Hills, about why the Adelaide rosellas he saw from his backyard had such a range of colour.

"I was always intrigued by why individuals varied so much and why they were so colourful."

An animal's colour is generally a balance between the need for camouflage, as protection against predators, and conspicuousness for use in mating displays.



'An animal's body, if you like, is a trade-off between conspicuousness for sexual selection, and camouflage for natural selection.'



Professor Andy Bennett

To learn more about colour variation, Andy's research team at the School of Life and Environmental Sciences will investigate if diet or differences in habitat may have an impact.

The research team will also test if birds prefer mates of their own or a different colour, as well as whether there is any link between colour and climate.

Andy says it is possible that climate change could lead to more yellow forms of the crimson rosella appearing in Victoria as the state becomes drier.

It is hoped that finding out more about the colouration of rosellas will help inform studies of colour variation in other animals.

"We're interested in rosellas, but we're really trying to understand general principles of evolution that underlie what causes and maintains colour variability in animals."

The rosella project, which has been running for five years, is led by Andy and his Deakin colleague Dr Mathew Berg, in collaboration with scientists from the CSIRO, the Netherlands and Britain.

Research so far has revealed that around Albury-Wodonga, where yellow versions of the parrot meet red versions, surprisingly, they are genetically the same. Further west along the Murray River, the rosellas are genetically different, but all pale yellow.

The study of bird colours also involves an examination of the nanobiology, or nanostructure, of one of the most characteristic features of birds: their feathers.

"Feathers are pretty amazing structures, they're some of the lightest materials known, they have very good insulating properties, they're aerodynamic, they can allow the bird to be waterproof and they can be extraordinary colours," Andy explains.

"Understanding how feathers develop and what controls the amazing form and diversity in colouration produced by feathers is an interesting area of study in its own right."

A further area being explored by Andy's team is the question of how and why birds see more colours than humans.

In particular, the team is interested in what colours birds see when they are looking at flowers, to help understand what influences the pollination of plants by birds.

Andy says one of the things he enjoys most about the work is that it's not reflecting the stereotype of an ornithologist standing around peering through binoculars all day.

Instead, his work spans a range of scientific disciplines, from molecular biology and nanobiology, to animal behaviour, ecology and evolution.

"We're working at the boundary of many different areas. It's actually multidisciplinary evolutionary biology of animal colouration and colour vision."

FURTHER INFORMATION:

Professor Andy Bennett,
Head of School, School of Life and Environmental Sciences
E: andy.bennett@deakin.edu.au
www.deakin.edu.au/scitech