

New sources of melanin pigment shake up ideas about fossil animals' colour

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10 million-year-old frog from Libros, Spain, showing dark internal melanosomes in the chest cavity and legs. Credit: Museo Nacional de Ciencias Naturales,

Madrid, Spain

A team of palaeontologists, led by University College Cork (UCC) and including the University of Bristol, have discovered new sources of the pigment melanin, calling for a rethink of how scientists reconstruct the colour of fossil birds, reptiles and dinosaurs.

Many recent studies of fossil [colour](#) have assumed that fossilized granules of melanin – melanosomes – come from the skin. But new evidence shows that other tissues – such as the liver, lungs, and spleen – can also contain melanosomes, suggesting that fossil melanosomes may not provide information on fossil colour.

The study, published today in the journal *Nature Communications*, is led by UCC's Dr. Maria McNamara in collaboration with her Ph.D. student Valentina Rossi, Dr. Paddy Orr from University College Dublin and an international team of palaeontologists from the UK and Japan.

The team studied [internal tissues](#) in modern frogs with powerful microscopes and chemical techniques to show that internal melanosomes are highly abundant.

Dr. McNamara said: "This means that these internal melanosomes could make up the majority of the melanosomes preserved in some fossils."

The team also used decay experiments and analysed fossils to show that the internal melanosomes can leak into other body parts during the fossilization process—like snowflakes inside a snow globe, according to Dr. Orr.

There is a way, however, to tell the difference between melanosomes

from internal organs and the skin.

Dr. McNamara added: "The size and shape of skin melanosomes is usually distinct from those in [internal organs](#).

"This will allow us to produce more accurate reconstructions of the original colours of ancient vertebrates."

More information: Maria E. McNamara et al. Non-integumentary melanosomes can bias reconstructions of the colours of fossil vertebrates, *Nature Communications* (2018). [DOI: 10.1038/s41467-018-05148-x](#)

Provided by University of Bristol

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