

I there but caught a glimpse... of a 410 million-year-old eye or two

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A University of Queensland researcher has uncovered the oldest known fossilised eye capsules from jawed fishes.

Palaeontologist Dr Carole Burrow, from UQ's School of Integrative Biology, discovered the 410 million-year-old specimens in central New South Wales, and her research is shedding new light on the evolution of eyes in early vertebrates.

“Even though they probably have no modern descendants, placoderms were the most primitive group of jawed fish, and their eyeballs give us an insight into what came before modern fish,” Dr Burrow said.

Dr Burrow's research was also the first to use x-ray microtomography to investigate 3-D structure of small vertebrate fossils.

Previous work on the few other fossil eye capsules known have been based on visual examinations or fractured sections.

She said the x-ray microtomography analysis allowed her and her colleagues to see amazing detail of the inner and outer structure.

“We were able to prove that these fish had an extra muscle attachment to the eye,” she said.

“It has been assumed that six muscles were the norm for all vertebrates (from lampreys to humans) and we can only speculate on the functional

'need' for seven muscles.

“I think that one possibility is that the extra eye muscle is related to these fish having an eye stalk attaching the eyeball to the braincase.”

Dr Burrow said even to find such intact fossils was exciting, as each eye is only about half-a-centimetre in diameter.

“Out in the field my collecting is highly speculative, basically picking up likely-looking lumps of limestone,” she said.

“It's only when I've gone back to the lab, dissolved the samples in acetic acid, and sifted through the dirt and residues under the microscope that I find these small bone fragments, so it was great to uncover such complete specimens.”

Dr Burrow's work was recently published in the scientific journal *Micron*.

Source: University of Queensland

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