

Paleobotany

A plant's ancient relationship with a beetle

Cycads have relied on beetles for pollination since before the dinosaurs



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CYCADS look the part of foliage on a “Jurassic Park” film set for a reason. The plants are indeed very ancient. They evolved during the Permian period, millions of years before the first dinosaurs existed. Although classified in the same group as conifers, cycads do not release their pollen into the wind like the rest of their kin. Instead, each species of cycad that remains today relies on a specific type of beetle for pollination. This is unusual for a non-flowering plant like the cycad, and has left palaeobotanists curious about how long the plants have relied upon this method. The answer, it seems, is just about for ever.

According to a study by Chenyang Cai of the University of Bristol, in Britain, reported in *Current Biology* this week, cycads have been luring beetles to do their bidding for nearly 100 million years. Dr Cai has found the evidence in a fossil. Seeing two organisms interacting with one another in a fossil is remarkably rare; it usually

involves finding the teeth of a predator lodged in the bones of prey. So it was particularly exciting for Dr Cai when he spotted cycad pollen fossilised alongside a 2mm-long beetle found in northern Myanmar (pictured).

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The beetle died 99m years ago, when it got trapped inside sticky tree sap. This sap eventually hardened into amber around the insect and preserved its corpse in pristine condition. Since the amber is clear, Dr Cai and his colleagues have been able to study the beetle and the other material that got lodged in the sap. Their analysis revealed not just the cycad pollen but also that the bug belongs to the family *Boganiidae*, of

which cycad-pollinating beetles are a part.

Crucially, the beetle has cavities just below its jaw filled with tiny hardened hairs that are used by these insects today to feed upon and transport cycad pollen. In the face of the fierce competition brought about by the evolution of flowering plants, the asteroid impact that did in the dinosaurs, the rise of mammals and numerous ice ages, cycads seem to have come up with a reproductive plan and stuck to it steadfastly.

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