

FRUSTRATED FROGS IN QUACKING FRENZY

Frog researcher Dr Dale Roberts from the University of Western Australia took this astounding photograph of these quacking frogs, which sometimes engage in bizarre and spectacular mating behaviour.

The quacking frog (*Crinia georgiana*) is a familiar species on the coastal plains and in the forests of south-western Australia. The species has a prolonged breeding season, with most breeding activity occurring between July and October. Males congregate where there is ample shallow water, and call to attract females. Particularly favourable sites are found around granite outcrops in the Darling Range. The call is a short and remarkably loud 'quack ... quack... quack', hence the common name of this species. Females are

attracted to a chorus of calling males and select a mate. On an average night a mating pair enter into a sexual embrace termed 'amplexus', where the male lies on the back of the female and clasps her firmly around the back legs. Eggs are released, then fertilised externally by the male releasing sperm over them.

This form of mating behaviour is common among most frog species. On certain nights, however, when large numbers of males appear at the breeding sites and competition for females is intense, males desperate to mate may attempt to join already amplexed pairs. Amplexed males attempt to discourage interlopers by lashing out with their powerful hind legs, however this evasive action is often to no avail and several males

may also gain hold of the female. It is not uncommon for four or five males to join a mating pair and in extreme instances up to nine males have been observed to mate with a single female. The outcome is a writhing ball of frogs desperately struggling to fertilise the female's eggs.

Genetic analyses reveal that a male placed in the normal, upper position, and a male amplexed underneath on the lower abdomen can both fertilise eggs, but other males may not do so well. Multiple male matings may be the best that they can do if females are scarce. For females there may be real costs: lower fertilisation success, because males are squabbling rather than concentrating on the job, or even death, probably from asphyxiation, if the males are too vigorous. Male

quacking frogs have massive forearms but females are slender and delicate. This gender difference suggests that wrestling for a position, or holding on in the ventral position, has had a long history in this species.

Multiple paternity is rare in frogs. Quacking frogs offer some unique opportunities to understand costs and benefits to both males and females of having several fathers for a single clutch.

For Dr Roberts and Phil Byrne of the University of Western Australia's Zoology Department, this is a continuing study.

Quacking frogs mate. Note the released eggs below, waiting for the male to fertilise them.

Photo - JD Roberts



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The waters off Western Australia's south coast are home to a rich diversity of marine plants and animals. Read about them on page 28.



Burnerbinmah Station, in WA's Murchison Region, fills an important gap in the State's flora and fauna reserve system. See page 42.



Was it created by a meteorite crashing to Earth, or more slowly over time? Find about Curiosity Swamp on page 50.



Imagine a commercially-owned and managed sanctuary in the hills east of Perth and you have 'Karakamia Sanctuary'. Find out how it was created on page 17.



The Western Blue Gum, a commercial variety of the Tasmanian bluegum, was developed for WA conditions, but tree breeders continue to improve the strain. See page 36.

COVER

Is the forest red-tailed black-cockatoo rare or just rarely seen? Find out the answer to these questions on page 10.



Illustration by Philippa Nikulinsky

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