

Cane toads have a salty secret to protect themselves when shedding skin

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Asian common toad (*Duttaphrynus melanostictus*) sloughing. Credit: Jasmine Vink

What happens to a cane toad's internal chemistry when it has to shed its skin to replace worn out skin cells?

A new University of Queensland study has revealed that these tough and poisonous amphibians have developed a secret technique to protect their vital internal balances of salt and water when they are moulting.

PhD student in UQ's School of Biological Sciences' ECO-Lab, Nicholas Wu said frogs and toads were able to exchange gas, water and salt through their permeable (porous) skins.

"Our study showed that the [skin](#) becomes slightly leaky during the shedding process, allowing salts to leak out of the skin and water to flow in.

"To make sure their internal salt level is balanced, toads increase their active re-uptake of salts through the skin, and increase the number of transport proteins responsible for the uptake of the salts."

The Cane toad (*Rhinella marina*) is a native of South and Central America introduced to Australia in 1935 to control the cane beetle.

However, the toads have since multiplied rapidly, and with a current estimated population of 200 million, have caused large environmental detriment, including the death of quolls, snakes and lizards.

Mr Wu said over time the cane toad's skin wore out, so to maintain its health and functionality, it was regularly removed, and replenished.

The process of removing the superficial dead skin layer occurred in all animals and was known as shedding, moulting or sloughing.

Physiological changes of the skin function had been observed during sloughing.

However, the role of sloughing on these changes in association with regulating the animals' salt and water balances had been little studied.

The research team, including co-authors UQ researchers Professor Craig Franklin and Dr Rebecca Cramp, examined [cane toads](#) from the University's St Lucia campus and measured salt loss across their skin and how the [salt](#)-transporting properties of the skin changed when the toad replaced old skin with new.

The study also considered the role of the deadly skin-attacking chytrid fungus, which is affecting amphibian populations world-wide.

The researchers said that other skin-sloughing amphibians might suffer if they begin sloughing their skins more frequently while trying to rid themselves of such infections.

The research is published in the *Journal of Experimental Biology*.

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