

Discovery: Some frogs eliminate foreign objects via their bladders

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Litoria caerulea. Image: Wikipedia.

(PhysOrg.com) -- Three species of Australian frogs have been found to be able to move transmitters implanted in them to their bladders for elimination. This process appears to be a unique way of eliminating foreign objects from the body, which has never been seen before.

Dr. Christopher Tracy of the School of Environmental and Life Sciences at [Charles Darwin](#) University in Darwin, Australia, and colleagues were doing telemetry studies of the Australian tree [frogs](#) Litoria caerulea, Litoria dahlia and Cyclorana australis, in which they surgically implanted 2-cm-long transmitters in the frogs' peritoneal cavities.

A few weeks after the frogs were released into the wild the researchers were surprised to find some transmitters on the ground, but there were

no signs the frogs had been eaten or died of other causes. When the remaining frogs were recaptured to recover their transmitters, in around three quarters of them the transmitters were found in their bladders.

The researchers followed the findings by implanting small inert beads into five frogs of the *L. caerulea* species, and found the beads were all expelled via the bladder in 10-23 days. Similar experiments were done on five cane toads (*Rhinella marina*), and in four cases the beads migrated to their bladders and remained there, while the fifth eliminated the bead.

To discover the route taken by the beads, the researchers implanted beads into 31 cane toads and then dissected them over successive days. They discovered a thin strip of tissue begins to grow out from the bladder within a couple of days and then wraps around the bead. The offshoot then develops into mature tissue and merges with the main cavity of the bladder, and the bead then floats free in the urine.

[Cane toads](#) were chosen because they are an introduced species in Australia, where they have become an invasive pest poisoning or out-competing many [native species](#). They are closely monitored by ecologists.

Dr. Tracy speculated that this remarkable ability of frogs may help them eliminate foreign objects lodged in their bodies such as insect body parts that break off and become lodged in the digestive system while they are being eaten (since the frogs do not chew the insects they eat), or foreign objects piercing the frogs' soft skins when they land clumsily.

Other amphibians, as well as fish and mammals, including humans, are known to enshroud and expel foreign objects via the digestive tract, but elimination via the bladder was previously unknown. Dr. Tracy said more research would be needed to find out if other amphibians use the

same mechanism. It is known that the bladder is particularly large in frogs because it is used to store water to prevent them becoming dehydrated, and this would mean most foreign objects would be in the vicinity of the [bladder](#).

In their paper, published in the Royal Society journal *Biology Letters*, the researchers warn that when telemetry is used in studying frogs a separation of the transmitter from the body should not necessarily be interpreted as meaning the frog is dead.

More information: Removing the rubbish: frogs eliminate foreign objects from the body cavity through the bladder, Christopher R. Tracy, et al., *Biology Letters*, [doi:10.1098/rsbl.2010.0877](https://doi.org/10.1098/rsbl.2010.0877)

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