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Survival of a Laughing Kookaburra (*Dacelo novaeguineae)* after the predation of a Cane Toad (*Rhinella Marina)*

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ABSTRACT

Australian wildlife is highly susceptible to poisoning from bufotoxins in the tissues of the introduced Cane Toad *Rhinella marina* (Linnaeus 1758. Formerly *Bufo marinus*). While the outcomes of predation attempts are well documented in Australian mammals and reptiles, the susceptibility of birds is less well known. In a series of incidental observations, an adult Laughing Kookaburra *Dacelo novaeguineae* (Hermann 1783) was seen to survive the predation and ingestion of cane toads on two occasions with no ill effects. ❒ *survival, predation, Rhinella marina, Dacelo novaeguineae*

The Cane Toad *Rhinella marina*, was introduced to Australia in 1935 as a biological control against agricultural pests (Lever 2001; Shine, 2010). It now occupies much of the east coast and the tropical north, continuing to spread rapidly into Western Australia (Urban *et al.* 2007; Scott-Virtue 2012). The parotoid glands and ovaries of cane toads contain high concentrations of toxic bufadienalides which act as an antipredator defence mechanism (Lever 2001). As Australia has no naturally occurring bufonid species, bufadienalides are novel toxins to many of the predatory vertebrate species that occur there (Cogger 2000). While some predatory vertebrates that co-evolved with bufonids exhibit resistance to their toxins (Phillips *et al.,* 2003), many evolutionarily naive species are highly susceptible to their effects.

Attempts to prey on cane toads by frog-eating snakes, varanids, crocodiles and carnivorous marsupials often have fatal consequences for the predator (Burnett 1997). Hence, some predatory species have adapted behaviourally by avoiding tissues with the highest toxicity (Beckmann & Shine 2011). While the effects of Cane Toad predation by Australian reptiles and mammals is relatively well documented (Burnett 1997), much less is known about predation attempts by Australian birds (Beckmann & Shine 2009). Herein, I report an observation of successful Cane Toad predation by a Kookaburra. This observation is a response to the specific request from Beckmann and Shine (2009) to publish anecdotal observations of predation attempts on cane toads made by Australian birds.

PREDATION OBSERVATION

The observation commenced at approximately 1700 hrs on the 8th of October 2012 in suburbia in the Greater Brisbane region (-27.5464S, 153.1939E). An adult Laughing Kookaburra, was observed to have secured a prey item, identified as a Cane Toad. From photographs of the event, the toad was estimated to be approximately 75 mm s-v length and to be of poor condition.

The Kookaburra despatched the toad by repeated thrashing against a branch. At 1708 hrs the Kookaburra flew down to a clothes line (Fig 1A) and continued to beat the Toad against

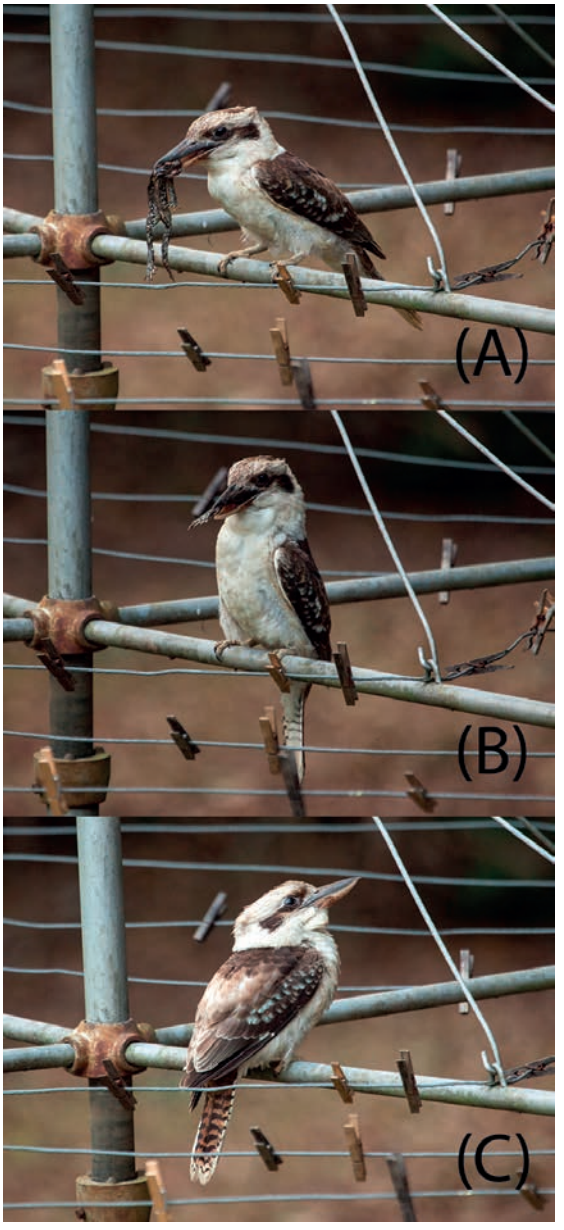

FIG. 1. A sequence of photographs documenting the predation of a cane toad *Rhinella marina* by a Laughing Kookaburra *Dacelo novaeguineae*.

its perch. This manipulation continued until 1711 hrs until the Cane Toad had become limp and pliable (Fig. 1A). The intact Cane Toad was then swallowed whole (Fig. 1B). At 1718 hrs, seven minutes after swallowing the Cane Toad, the Kookaburra flew away with no ill effects observed. This individual Kookaburra was a member of a resident family group, being identifiable from other members by an unusual patch of pale feathers on its back (Fig. 1C). The same bird was observed on the following two days having survived its encounter and exhibiting no ill effects. Furthermore, the same bird was observed on the 24th of December 2012 preying upon another cane toad under similar circumstances.

Unlike other predatory birds which have been reported to ingest only parts of cane toads (Beckmann & Shine 2011), this Kookaburra was observed to ingest the entire toad. It is likely that, given the bill morphology and feeding strategy of Laughing Kookaburras, partial consumption of non-toxic parts is not possible. I cannot rule out that the Kookaburra did not regurgitate the toad following the initial encounter. However, it is clear from this observation that the species is resilient enough to survive mouthing and ingesting a Cane Toad. Further, that the same Kookaburra was observed taking another Toad at a later date does strongly suggest that Toads are a feature of its diet. The emaciated condition of the Cane Toad on both occasions may have played some part in its predation and consumption, as well as the survival of the Kookaburra.

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