Diet and foraging strategies of the Jacky Lizard *Amphibolurus muricatus*

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ABSTRACT

Despite its widespread range overlapping with urban centres and agricultural areas of Australia, there are few published studies on many aspects of the ecology of the Jacky Lizard *Amphibolurus muricatus* in the wild, including its diet. We describe an instance of a Jacky Lizard foraging on abundant mating bibionid flies *Bibio imitator* amongst remnant vegetation in an urban environment. Small black ants, which were also present, were not consumed. Foraging techniques were similar to those observed by another study in laboratory conditions, but potential prey was not pursued beyond 30 cm.

Key words: Dragons, bibionid flies, *Bibio imitator*, blitz-feeding, foraging techniques, prey selection, ants

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Introduction

Australian agamid lizards are generally 'sit-and-wait', or ambush, predators and although some species will change position regularly, they generally do not actively seek prey from within cover (Witten 1993). The typical foraging strategy for agamid lizards is to sit motionless, often from an elevated position, and once potential prey is detected (through mostly visual and sometimes auditory cues), move rapidly to catch it (Thompson and Thompson 2001; Wilson and Swan 2017). Although, the smaller species of agamids are mainly insectivorous, at least some of the larger species are omnivorous (Witten 1993).

The Jacky Lizard *Amphibolurus muricatus*, also known as Jacky Dragon or Tree Dragon, is a common agamid lizard of southeastern Australia, inhabiting areas of dry sclerophyll forests, rocky ridges and coastal heathlands along the east coast of Australia (Cogger 2014). Despite its widespread range overlapping with urban centres and agricultural areas of Australia, there are surprisingly few published studies on many aspects of the ecology of the Jacky Lizard in the wild (Hitchen *et al.* 2011a), including its diet (Kubiak 2011). The Jacky Lizard is considered to be an opportunistic predator with a generalist diet (Cogger 2000). Their diet is described variously as insects and other small arthropods (Cogger 2000), grasshoppers and beetles (Michael and Lindenmayer 2010), or insects and spiders (Colbourne *et al.* 2004). In addition, crickets and cockroaches have been consumed in laboratory experiments (Harlow and Taylor 2000; Hoese *et al.* 2008), and banded bees *Amegilla* sp. have been caught in the wild (Kubiak 2011). [Although Bustard (1968) described *Amphibolurus muricatus* as taking large insects, small black ants and beetles in the Pilliga region of New South Wales, Murphy and Murphy (2015) suggest the species Bustard most likely observed was the Nobbi *Diporiphora nobbi*, while noting there is a single unconfirmed recent report of *A. muricatus* from Pilliga forest (NPWS 2010)].

The Jacky Lizard, like other dragons, employs a sit-and-wait foraging strategy (Michael and Lindenmayer 2010). It is commonly seen perched on a tree stump or rock, however they are also semi-arboreal and are known to forage in shrubs (e.g. Cogger 2014).

Here, we describe foraging on abundant mating bibionid flies *Bibio imitator* amongst remnant bushland in an urban environment.

Observations

Observations took place on 23 November 2011, ~1.30pm in a heathy woodland section of the Royal Botanic Gardens, Cranbourne in south-eastern Melbourne, Victoria (38.1309° S, 145.2692° E). The

weather was fine (max 17°C) and the observation lasted for approximately seven minutes.

A single Jacky Lizard was observed in the middle of a 4-m-wide gravel path (Figure 1). Numerous mating *Bibio imitator* flies (identified from Hardy 1982; Patterson and Grey 2012) were dropping to the ground attached to each other in copulation (Figure 2). The bodies of the orange females were approximately 1 cm long, while the black male was somewhat smaller. Although moving on the ground, the flies were not agile, with male and female facing opposite directions during copulation, and did not fly off when approached. When the flies landed within about 30 cm of the Jacky Lizard, the lizard would pursue, capture and consume them once they were seen. Beyond this distance, the Jacky Lizard did not pursue the flies, even though they were present and moving. Small black ants within this 30 cm range were not pursued by the Jacky Lizard. The flies were falling consistently and approximately 10 pairs of flies were taken by the Jacky Lizard in the 7-min period before the observers left the site.

Discussion

Detailed descriptions of foraging techniques for Jacky Lizards are rare, particularly for abundant prey in the field. Hoese *et al.* (2008) conducted a laboratory experiment of behavioural responses to crickets introduced into a Jacky Lizard's enclosure as prey. The following general response was described: Feeding sessions began with the lizard scanning their enclosure; Upon delivery of the cricket, either the head or the eye orients in a direction towards the prey item; Lizards then moved toward the cricket; striking with mouth open; and finally consumption. Our observations from the field generally concurred with those of Hoese *et al.* (2008).

Interestingly, Hoese *et al.* (2008) did not indicate there was a distance by which Jacky Lizards did either not detect or pursue prey in their 64-75 cm enclosure. Whether the Jacky Lizard during our observations either 1) did not detect or 2) chose not to pursue Bibionid flies further than 30 cm away due to the regularity of prey within 30 cm, could not be determined.

Bibionid flies *Bibio imitator* are known to swarm in Spring (Farrow 2016), but were in unusually high numbers in parts of Melbourne (northeast suburbs, Patterson and Grey 2012; east and southeast suburbs, J. Fitzsimons per obs.) in the Summer (December-February) of 2011-12. This, combined with their reduced mobility while mating, provided an abundant and easy food source for the Jacky Lizard.

Small black ants have been recorded as part of the diet of similar dragon species (e.g. Bustard 1968). Despite being present within 30 cm of the Jacky Lizard in our observations at Cranbourne, small ants were not pursued or consumed. This suggests larger prey was deliberately selected in this instance.

Unlike the observations of Hitchen *et al.* (2011b) who found Jacky Lizards on a Sydney golf course preferred areas where they were afforded most cover, the individual at Cranbourne foraged in an exposed area close to human observers.

Rapid feeding on abundant prey has been observed for other Australian dragons (Webb and Shine 1994; Thompson and Thompson 2003) and frogs (Mo 2015, described in that instance as 'blitz-feeding'). The observation presented here supports Kubiak's (2011) suggestion that more remains to be learnt about the diet of *A. muricatus* in the wild.

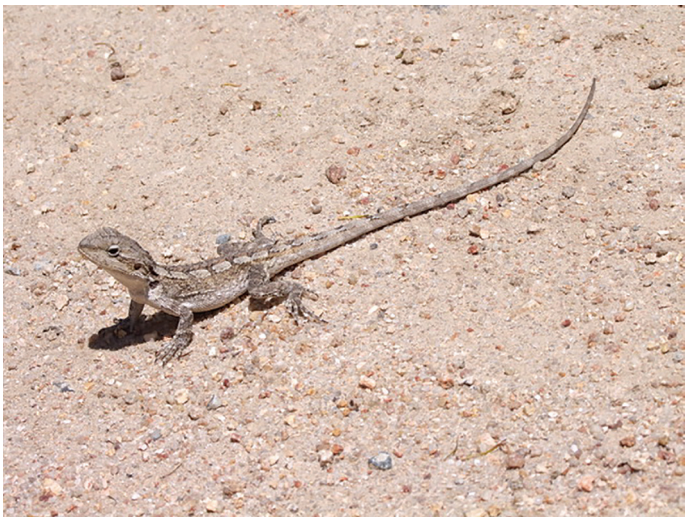

Figure 1. Jacky Lizard in a sit-and-wait hunting position at Royal Botanic Gardens, Cranbourne. Photo: James Fitzsimons.

Figure 2. Mating bibionid flies *Bibio imitator* at Cranbourne Botanic Gardens were easy prey for the Jacky Lizard *Amphibolurus muricatus*. Photo: James Fitzsimons.

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