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Field observations of potential cannibalism among tadpoles of the Trinidad stream frog *Mannophryne trinitatis* (Anura: Aromobatidae)

Cannibalistic behaviour has been reported among tadpoles and is potentially influenced by food availability and conspecific density (Jefferson *et al.* 2014). Cannibalism involves killing and feeding on an individual of the same species (Fox 1975), not to be confused with scavenging, which involves feeding on already dead individuals. Cannibalism offers direct benefits to tadpoles in the form of a meal, and also provides other direct and indirect benefits such as shortened development time (Crump 1990) and reduced competition in some populations (Jefferson *et al.* 2014). Conversely cannibalism may pose selective disadvantages. For example, it may increase the risk of contracting chytridomycosis (Altig *et al.* 2007), or there may be inclusive fitness costs of killing close relatives. Observation and investigation across more species is required to further understand how common cannibalism is among tadpoles (Fox 1975, Altig *et al.* 2007).

Mannophryne trinitatis (Garman 1887) of the family Aromobatidae (formerly Dendrobatidae) are small frogs (males 29mm, females 30mm snout to vent length) which are distributed across the Northern Range and Central Range of Trinidad (Murphy *et al.* 2018). Cannibalism among large *M. trinitatis* tadpoles has been reported by Downie *et al.* (2001) mainly under laboratory conditions

and briefly in the field. We report on a field observation of potential cannibalistic behaviour in tadpoles of *M. trinitatis* in Trinidad and suggest further research.

On 6 August 2018 at 1810h, RJA and NFA observed seven to eight tadpoles of *M. trinitatis* consuming a single conspecific individual. We were unable to determine if the individuals were scavenging on an already dead conspecific, or whether this was a case of intraspecific predation, or cannibalism as defined by Fox (1975). Most tadpoles detached from the dead tadpole when we moved leaves and shone our LED torches to gain a better view. But one of the larger tadpoles appeared more aggressive than the others and stayed feeding, finally moving the dead tadpole into an overhanging rock crevice apart from the others (Figure 1). The site was along the Lopinot Rd., Trinidad just south of Lopinot Village (UTM 20N 682925, 1181345). The microhabitat consisted of an isolated pool of water, within a rock gully, less than 10m from the roadside. The ephemeral pool was on a slightly inclined rock surface surrounded by dense canopy cover with an almost dried up stream flowing nearby. The pool had leaves in it covering more than 50% of the surface of the water, and macrofauna consisted solely of *M. trinitatis* tadpoles. The tadpoles were visually identified using the

local field guide (Murphy *et al.* 2018) and we also observed *M. trinitatis* adults near the pool with no other amphibian species observed nearby.

Similar observations have been made before. Downie *et al.* (2001) reported on larger *M. trinitatis* tadpoles attacking and sometimes eating smaller conspecific tadpoles which were introduced to their pool. This behaviour was observed in the laboratory, and under natural conditions at a location similar to that of the present observation. Jowers and Downie (2005) also reported *M. trinitatis* tadpoles killing and feeding on their conspecifics under laboratory settings. Our additional observation of *M. trinitatis* tadpoles eating conspecifics under natural conditions is therefore not surprising. However it does highlight an area for further study.

Do tadpoles of *M. trinitatis* regularly kill and eat other tadpoles of their own species or are they usually only scavenging on individuals who have died for other reasons? If they are just feeding on dead individuals, then does this help keep the water clean? Alternatively, if individuals do regularly kill conspecifics, what are the factors that influence this behaviour? Cannibalism may provide a source of nutrition or reduce competition in resource-poor environments (Crump 1990), and the small isolated pools where the *M. trinitatis* tadpoles were observed were heavily shaded and likely to have low primary productivity. Alternatively do plentiful food sources modulate individual aggressiveness and boldness and lead to reduced cannibalism? Ultimately does cannibalism in the species offer any fitness benefits and do they cannibalise related individuals?



Fig. 1. *Mannophryne trinitatis* tadpole feeding on a conspecific individual.

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