ENTOMOTROPICA
*Vol. 29(3): 183-186. Diciembre 2014.*

ISSN 1317-5262

# *Tetracha brasiliensis brasiliensis* (Kirky, 1818) (Coleoptera: Cicindelidae) as a predator of newly-metamorphosed anurans

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## Abstract

Oda FH, Vieira L, Guerra Batista VG. 2014. *Tetracha brasiliensis brasiliensis* (Kirky, 1818) (Coleoptera: Cicindelidae) as a predator of newly-metamorphosed anurans. Entomotropica 29(3): 183-186.

Here we report two cases of predation on newly-metamorphosed frogs by the tiger beetle, *Tetracha brasiliensis brasiliensis*, in southern Brazil.

**Additional key words:** Leptodactylidae, opportunistic predation, tiger beetle.

## Resumo

Oda FH, Vieira L, Guerra Batista VG. 2014. *Tetracha brasiliensis brasiliensis* (Kirky, 1818) (Coleoptera: Cicindelidae) como um predador de anuros recém-metamorfoseados . Entomotropica 29(3): 183-186.

Registramos dois casos de predação de rãs recém-metamorfoseadas pelo besouro tigre, *Tetracha brasiliensis brasiliensis* no Sul do Brasil.

**Palavras chave adicionais:** Besouro-tigre, Leptodactylidae, predação oportunista.

## Introduction

Many aquatic and terrestrial invertebrates are known predators of juvenile and adult amphibians (Mccormick and Polis 1982, Toledo 2005). Among the most important terrestrial predators are spiders (Moura and Azevedo 2011), ants (Ward-Fear et al. 2009) and adult beetles (Mccormick and Polis 1982). The tiger beetles genus *Tetracha* Hope, 1838 (Coleoptera: Cicindelidae) has its greatest diversity in the southern Amazonian region, Bolivia and Brazil. Most species of this genus occur in muddy areas or wet sand near water, and some are found in moist upland and grassland areas (Pearson and Vogler 2001).

*Tetracha brasiliensis brasiliensis* (Kirby, 1818) belongs to the *T. brasiliensis* group, together with three more species (Naviaux 2007). This species has a broad distribution in South America, being recorded in south-central Brazil, northern

Argentina, Bolivia and eastern Paraguay (Naviaux 2007). There is little information about *T. brasiliensis* physiology or its occurrence in a community (Cassola and Pearson 2001, Pearson and Vogler 2001, Naviaux 2007, Martins et al. 2012).

Tiger beetles are known as predators of a variety of live arthropods (Pearson and Vogler 2001). They usually pursue the live prey visually, using the memory of its shape and location (Pearson 1988). Some strategies of predation used by these beetles are active running alternating with pause-and-look behavior, or they can also wait in a shaded area and ambush the prey.

*Physalaemus cuvieri* Fitzinger 1826 is a small-sized (males 2.8 cm and females 3.0 cm) leptodactylid frog belonging to the *P. cuvieri* group (Nascimento et al. 2005, Frost 2014), widely distributed in northeastern, central, and southern Brazil; Misiones and Entre Rios provinces of Argentina; eastern Paraguay; Departments of Beni and Santa Cruz in Bolivia; and possibly lowlands of southern Venezuela (Frost 2014). The species is found in open areas, mainly in recently flooded habitats, calling under clumps of grass or small shrubs, and also inside footprints of animals filled with water (Uetanabaro et al. 2008). This paper relates two observations of predation on newly-metamorphosed frogs by the tiger beetle, *Tetracha brasiliensis brasiliensis*, in southern Brazil.

## Material and Methods

The observations were realized in the municipality of Diamante do Norte, Paraná, Brazil. The region is inserted in the Semi-deciduous Atlantic Rain Forest. Local climate is classified as type Cfa in Köppen's system, temperate without dry season (Peel et al. 2007). On November 26, 2012, field observations were carried out at a permanent pond (603 $m^2$) within pasture area after heavy rains (22º 38' 51" S, 52º 49' 02" W). Observations were based on two predation events (two individuals of *Tetracha brasiliensis*).

## Results and Discussion

We observed adults of *Tetracha brasiliensis* (10 specimens) in active running alternating with pause-and-look behavior, searching for potential prey on the margin of the water body. Two of them were observed preying newly-metamorphosed *Physalaemus cuvieri* (Figure 1).

In both observations, the tiger beetles (1.45 to 1.8 cm length) were observed consuming the fleshy parts (viscera) of the juveniles (Figure 2).

The individuals consumed the prey for about five minutes. In both cases, when the beetles were disturbed by our presence, they released the carcass and run to seek shelter into footprint of cattle at the margin of the pond. The beetle specimens were manually collected and identified following the revision of the genera (Naviaux 2007).

Our record probably represents an opportunistic predation of *T. brasiliensis* on *P. cuvieri*. It is known that tiger beetles are predators on invertebrates (Pearson 1988) and frogs are considered non-typical food sources under special circumstances (Pearson and Vogler 2001). In North America, hundreds of adult *Cicindela sedecimpunctata* attacked tadpoles of Spadefoot toads (*Scaphiopus* spp.) at shallow drying-out desert ponds (Pearson and Vogler 2001). Another record of predation on tadpoles was observed in a semiarid environment of Australia, where about 20 adults of *Cicindela semicincta* fed on aggregated tadpoles in small and rapidly drying pool after rain (Hawkeswood 2011).

There is a lack of quantitative data evaluating the impact of arthropod predators upon vertebrates (Mccormick and Polis 1982), including the predation of newly-metamorphic anurans. According to Wells (2007) predation

**Figure 1.** Newly-metamorphosed specimen of *Physalaemus cuvieri* in life. Photo credit: Fabrício H. Oda.

**Figure 2.** Adult tiger beetles (*Tetracha brasiliensis brasiliensis*) consuming the fleshy parts (viscera) of newly-metamorphosed *Physalaemus cuvieri*. Photo credit: Fabrício H. Oda.

is one of the principal causes of mortality in natural populations of anurans, and may occur throughout their ontogenetic cycle. Toledo (2005) pointed out that there are two crucial periods of the anuran life cycles in which the risk of predation by invertebrates is greater: during the breeding season (Santos-Silva and Ferrari 2012, Batista et al. 2013) and when the newly-metamorphosed frogs are leaving the water (Hirai and Hidaka 2002, Toledo 2003).

## Conclusion

Our observations demonstrate that newly-metamorphosed frogs are subject to predation by invertebrate predators such as *T. brasiliensis*, which contributes to the mortality of amphibians. In this context, it is important to emphasize the necessity of future studies, which are fundamental to the understanding of the impact of predatory behavior of tiger beetles on newly-metamorphosed frogs.

## Acknowledgements

We are grateful to Roger Naviaux for the identification of the beetle species, to Priscilla, Valdir, José Cândido, Valdenir, Celso, Fagner, Fábio, and Rodrigo for field assistance. Mariana F. Felismino reviewed the English manuscript. The Estação Ecológica do Caiuá and Nupélia provided logistical support during fieldwork. Coordenação de Aperfeiçoamento de Pessoal de Nível Superior (CAPES)/Programa de Excelência Acadêmica (PROEX) provided financial support. Instituto Chico Mendes de Conservação da Biodiversidade (ICMBIO) and Instituto Ambiental do Paraná (IAP) for the collecting permits (ICMBIO/SISBIO nº 25916-1 and IAP nº 278/10). FHO and VGB received Doctoral and Master fellowships from CAPES.

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