

## New record of the green vine snake *Oxybelis fulgidus* in the Cerrado of Mato Grosso, central Brazil: A significant shift from forest to savannah?

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The Cerrado of Brazil is considered to be one of the world's biodiversity hotspot and one of the largest and most threatened tropical savannah in the world (Klink & Machado, 2005; Colli et al., 2020). Regarding snake species, owing to the fact that the Cerrado has contact with four other biomes (the Amazon Rain Forest, Atlantic Forest, Caatinga and Pantanal) it is the richest ecoregion in South America with 222 species of snakes (Guedes et al., 2017). Likewise, the Amazon is known as the world's largest tropical rainforest. It harbours approximately 150 species of snakes, with endemic and widespread species co-occurring (Fraga et al., 2013). The transition zone between the Cerrado and the Amazon forest ecoregions (CAT) extends over more than 6,000 km, crossing from the central-west to north-eastern Brazil, and is the largest savannah-forest transition on Earth (Torello-Raventos et al., 2013). There have been relatively few studies on snake assemblages in the CAT but these have found either a predominance of Amazonian species (Carvalho, 2006) or balanced number of species from Cerrado and Amazonia (Pinheiro et al., 2015). Snake species composition and distribution in savannah-forest zones have been explained as a matter of species-specific habitat preferences determining savannah species penetration within degraded forests (Freedman et al., 2009).

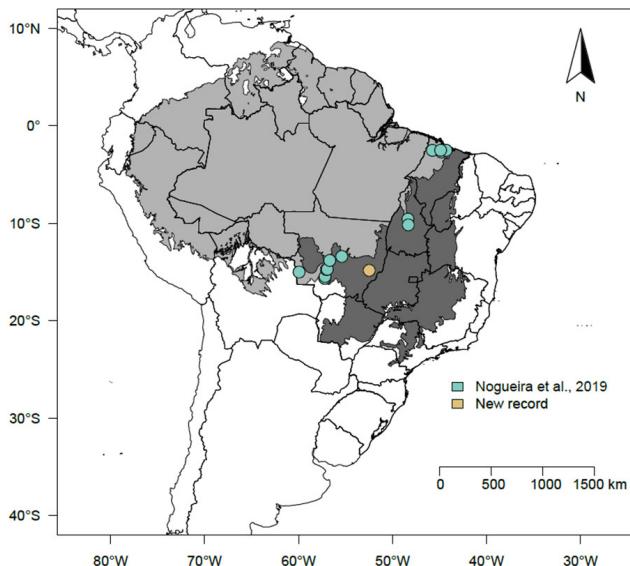
Herein we present a new record of the arboreal colubrid snake *Oxybelis fulgidus* (Daudin, 1803) at the limit of its distribution in Brazil. We collected a specimen (field tag AS018) (Fig. 1) on 2 October 2021 in Nova Xavantina municipality, Mato Grosso state, Brazil ( $14^{\circ} 50'7.39''$  S,  $52^{\circ} 29'57.36''$  W, 420 m a.s.l.) (Fig. 2). It was a large female (SVL 1345 mm, TL 680 mm) found during an incidental encounter at 15:28 h inside a gallery forest and it was stretched out, without moving, on a tree branch approximately 1 m from the ground. We made a video at that moment of the find and this has been deposited at Fonoteca Neotropical Jacques Vielliard (see FONTECA, 2021). The species shows a broad distribution from Mexico to South American in forest habitats (Peters & Orejas-Miranda, 1970) and is considered as an opportunistic predator of birds and lizards, using both active hunting and sit-and-wait ambush behaviour (Scartozzoni et al., 2009). In South America, the species has been recorded in tropical forests, within fewer marginal records in the "dry diagonal" (Nogueira et al., 2019).



**Figure 1.** *Oxybelis fulgidus* (field tag AS0018) from Nova Xavantina municipality, Mato Grosso state, Brazil

The area under study is situated close to the north-west border of the Cerrado with presence of Cerrado sensu stricto (savannah woodland), Campo (grasslands), Cerradão (dense savannah woodland) and gallery forest (Marimon et al., 1998; Marimon-Junior & Haridasan, 2005; Marimon et al., 2010). The climate is Aw of the Köppen classification, with annual precipitation from 1300 to 1500 mm and a mean monthly temperature of 25 °C. The gallery forests at the boundaries of the CAT harbour several plant species in common with Amazon Forest (Marimon et al., 2010). The new locality is about 420 km north-west of the closest previous record site (Diamantino, Mato Grosso state) and 660 km from the closest north-east record site (Palmas, Tocantins state) (Nogueira et al., 2019). Most of the records in the South American "dry diagonal" lie in the CAT located in the central and north-east areas of Brazil (Marques et al., 2019). This ecosystem is situated in the transition area of southern Amazonia and comprises a mixture of savannahs and forests with an approximated area of 152,180 km<sup>2</sup> in central and northern of Brazil (Marques et al., 2019).

The occurrence of *Oxybelis fulgidus* in this ecosystem could be related to the natural expansion of the Amazon Rain Forest into the savannahs of the Cerrado during the Holocene



**Figure 2.** Previous records of *Oxybelis fulgidus* inside the limits of Cerrado within the range of Cerrado-Amazon ecotone (Marques et al., 2019; Nogueira et al., 2019) and the new record reported in this paper. Light grey is the limit of the Amazon Rain Forest and dark grey is the limit of Cerrado.

(Marques et al., 2019). Other forest snake species show similar patterns of distribution in the CAT, such as coral snake *Micrurus surinamensis* (Cuvier, 1817), which occurs mainly in the Amazon Rain Forest but has also been recorded in areas of the Cerrado (Morais et al., 2011). This suggests that the CAT seems to be a suitable area for occupation by species from both savannahs and forests habitats.

It should be noted that in the past the boundaries of CAT area were wrongly interpreted by the Brazilian Institute of Geography and Statistics (IBGE), being larger than expected (Marques et al., 2019). Currently, the region is suffering from extensive deforestation and is referred to as the “Arc of deforestation” (Marques et al., 2019). The current rate of deforestation is preventing the natural expansion of forests into the Cerrado savannahs due the convergence of forests habitats into large areas for cattle raising, logging and agriculture (Marques et al., 2019). Yet, the snake recorded herein was found in a fragment of gallery forest surrounded by large agricultural fields. Our record highlights the importance of CAT as a domain which supports species from both savannahs and forests habitats.

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