Evidence of communal nesting in *Kentropyx calcarata* (Squamata: Teiidae) on canopy bromeliads in the Atlantic Forest of southern Bahia, Brazil

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Colonial (or communal) nesting is a term used to describe the aggregation behavior during oviposition by amphibians or reptiles (Graves & Duvall 1995). This behavior is a standout factor that elects amphibians and reptiles as good organisms to investigate the causes, costs, and benefits of communal egg-laying (Doody et al. 2009). The phylogenetic inheritance of this characteristic suggests multiple evolutionary changes, both in the occurrence and in the relative frequency of colonial oviposition (Graves & Duvall 1995).

Kentropyx calcarata occurs mainly in the forests of the Amazon Basin, including forest edges, clearings caused by fallen trees, secondary forest areas, riverbanks, and plantations; some isolated populations can be found in the Atlantic Forest of Brazil (Gallagher et al. 1986; Avila-Pires 1995). Females usually lay their eggs in nests buried in the sand (Vitt 1991), rotten trunks (Mag-

nusson & Lima 1984), or in bromeliads (Lantyer-Silva et al. 2012). Clutch size ranges from 3–10 eggs (average: 5.63 ± 1.23 eggs) (Vitt 1991; Werneck et al. 2009). Only three records of communal nests have been reported for this species. Magnusson & Lima (1984) found more than 800 eggs, including intact eggs and hatched eggshells, in a tree trunk in Amazonia. In the Atlantic Forest, Lantyer-Silva et al. (2012) found 26 eggs, 19 of them not fertilized, in three terrestrial bromeliads on sandy soil in the city of Ilhéus, Brazil (15°04′35.1″ S, 39°03′01.5″ W). Another colonial nest, with 20 eggs, 11 intact and nine empty, was found in a stump cavity, close to the ground, in a fragment of Atlantic Forest near the city of Maragojipe, Bahia, Brazil (12°55′16″ S, 38°52′10″ W (Filadelfo et al. 2013). In this study, we present the first record of a communal nest in a canopy bromeliad and the fourth report of communal nest of *Kentropyx calcarata*, the third report for the Atlantic Forest populations. The nest was found during a fauna rescue during civil construction in the southern coastal area of Ilhéus, Bahia (14°51′28.85″ S, 39°01′30.48″ W).

During the clearing, a tree was carefully felled due to the presence of a large bromeliad of the genus *Aechmea*, located near the forest canopy (approximately 10 meters high) (Fig. 1). After the tree was felled, between 30 and 40 individuals of the gecko *Phyllopezus lutzae* (Loveridge, 1941) were observed inside the bromeliad. When handling the bromeliad, 28 clustered eggs were found in the central cup, stuck together in small groups of 4 to 6 eggs by a gelatinous substance (Fig. 2A-B). The eggs were carefully collected and taken to the laboratory in the belief that they could be *P. lutzae* eggs, not recorded in the literature yet.

We measured the eggs (Tab. 1) and maintained them in vermiculite substrate at controlled temperature (25°C). The mean length of eggs (18.11 mm) is larger than that observed for *P. pollicaris* (Ávila & Cunha-Avellar 2005; Gomides & Garcia 2014) and smaller than that observed for *Phyllopezus periosus* (20.2 mm) (Lima et al. 2011), but similar to that observed for *K. calcarata* (18.7 mm) (Filadelfo et al. 2013). After 10 days, four eggs hatched and neonates of *K. calcarata* emerged (CRC = 30.46 ± 0.95 mm; range: 29.17–31.69 mm; Fig. 2C). The neonates were euthanized with 5% xylocaine, fixed in formalin, and preserved in 70% ethanol at the Museu de Zoologia da Universidade Estadual de Santa Cruz (MZUESC 22137-22140). The remaining eggs lost the rigidity of their shell quickly, withered and did not hatch. We opened the remaining eggs and found that they were not fertilized or that the embryos did not develop to the point where the species could be determined. Unfertilized eggs and/or disruption of develop-

ment may have been caused by stress associated with displacement, changes in optimal environmental conditions, or even inappropriate diet, factors that can cause hormonal changes in the reproductive cycle of the species (Judah & Nuttal 2008).

We do not exclude the occurrence of an interspecific composition in the clutch, not only because of the abundance of *P. lutzae*, but also due to the occurrence of interspecific nest formation in lizards (see Radder & Shine 2007). There are no literature records about eggs of *P. lutzae*, but are expected to have similar egg characteristics of the other species in the genus, such as the slightly rounded shape (e.g. Lima et al., 2011; Domingos et al., 2017). However, it was not possible to identify most eggs and so we can't reject the hypothesis of an interspecific communal nest.

This is the first record of a communal nest of *Kentropyx calcarata* observed in a canopy bromeliad. The other records were observed in terrestrial bromeliads and fallen trees (Magnusson & Lima 1984; Lantyer-Silva et al. 2012; Filadelfo et al. 2013), as expected for a predominantly terrestrial species (Vitt 1991). Our observation highlights gaps in knowledge about the natural history of some lizards, especially those that can forage in the forest canopy.

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Table 1. Communal nest records of the species *Kentropyx calcarata* and morphometric variables. SD = standard deviation; N = number of eggs measured.

Kentropyx calcarata nest records			
Length ± SD; (N)	**Volume ± SD; (N)**	**Total number of eggs in the nest**	**References**
-	-	> 800	Magnusson & Lima 1984
-	1592.61 ± 671.12 mm^3; (26)	26	Lantyer-Silva et al. 2012
18.7±0.6 mm; (20)	-	20	Filadelfo et al. 2013
18.11 ± 1.20 mm; (28)	-	28	Present Study



Figure 1. Bromeliad in which the colonial nest of *Kenntropyx calcarata* was found in the municipality of Ilhéus, Bahia State, Brazil.

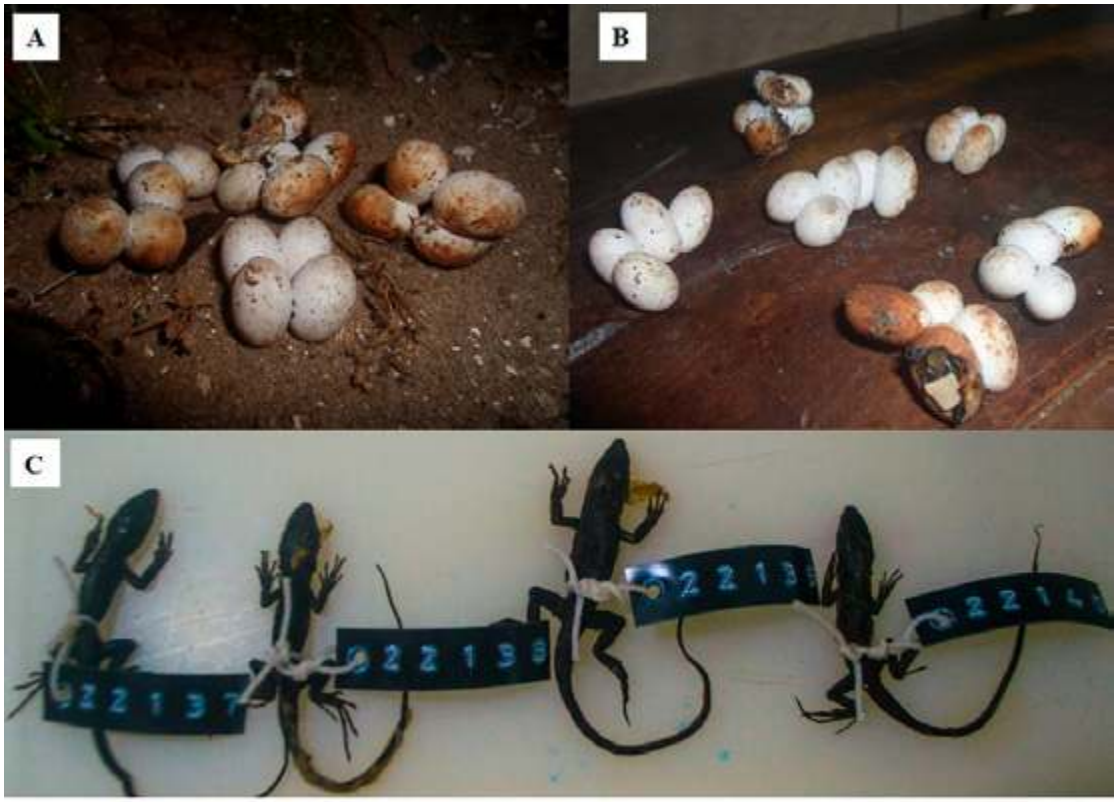

Figure 1. Eggs from *Kentropyx calcarata* found at a communal nest on a canopy bromeliad: (A, B) detail of the small subgroups and (C) neonates.



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