



Fruit consumption and seed dispersal of *Caryocar brasiliense* (Caryocaraceae) by *Caracara plancus* (Falconidae)

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The Southern Caracara (*Caracara plancus*) is a widely distributed species in South America, occurring from Bolivia to Northern Argentina (BirdLife International, 2016). Among the falconids, which include approximately 65 species of small-sized raptors (Clements et al., 2018), it is the species with the most diversified diet, feeding on arthropods, birds, mammals, reptiles and fruits (Johnson, 1996; Travaini et al., 2001; Tomazzoni et al., 2005; Sazima, 2007; Vargas et al., 2007; Villalobos and Bagno, 2012).

The pequi fruit (*Caryocar brasiliensis*, also known as souari nut) is used in many different ways (Ferreira et al., 2017), including consumption human food, as a component of commercial animal food, and in folk medicine (for a thorough review, see Almeida and Silva, 1994). The pequi also exhibits the potential to be used in biodiesel production, due to a large number of oil components in its fruits (Mujeeb et al., 2016; Vijayakumar et al., 2016). Despite of its importance, this species is affected by the low dispersal rates of their seeds.

Here, we report the first known case of dispersal of pequi seeds by the Southern Caracara spotted two animals in the ground, manipulating the fruit for a few minutes. After that, one of the birds retrieved the seed from the fruit and flew to a nearby tree (Figure 1). In the tree, we were able to observe the individual scraping the seed to retrieve the pulp fragments between the seed's spines (for approximately two minutes). Lastly, the animal flew away while carrying the seed on its bill, until it left the observers' line of sight (at approximately 300 m of distance). This record was made in Brasília, Brazil (coordinates: 15° 53' 2.25" S 47° 56' 44.56" W) on December 4, 2014.

Species dispersal across long distances is a key ecological process (Nathan, 2006), able to reduce spatial aggregation, increase gene flow among plant populations and even influence the accumulation of carbon (Galetti et al., 2018), but remains a poorly-understood issue. It is known that not all plant species have the ability to disperse its seeds due to size constraints. In the case of the pequi, for example, the fruit can reach up to 10 cm in length (Almeida and Silva, 1994). Its main dispersers were animals of the now-extinct megafauna (Guimarães et al., 2008), and now it is only dispersed by a few large-sized animals, mainly tapirs, large primates and rheas (Galetti et al., 2018). Because of this, pequi populations currently exhibit low genetic variability,

leading to concerns regarding this species' future existence (Galetti et al., 2018). Thus, reports of any species dispersing pequi seeds are relevant for its conservation.

Because they usually feed on animals that consume fruits rather than eating fruits themselves, raptors are typically regarded as secondary seed dispersers (Pérez-Méndez and Rodríguez, 2018). Contrastingly, their relevance as primary seed dispersers is mostly neglected, despite of the number of reports of direct fruit consumption by raptors (see Galetti and Guimarães, 2004; Jacomassa, 2011; Pérez-Méndez and Rodríguez, 2018). Furthermore, to this date, there were no previous records of raptors consuming pequi fruits, which are both economically and ecologically important. Even though we are aware that this is a single record, and that the pequi is not a frequent food item for the caracara, we nonetheless



Figure 1. Consumption and dispersal of pequi (*Caryocar brasiliensis*) by the Southern Caracara (*Caracara plancus*).

believe that the information brought here is important. If the main dispersers of these fruits are extinct (“megafauna seed dispersal syndrome”), these casual dispersers may play a key role in the future of certain plant species.

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