

First record of death-feigning in Black Vultures (*Coragyps atratus*) (Cathartidae)

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ABSTRACT: Death-feigning is a behavior ability with the purpose of allowing prey to evade from predators. Despite death-feigning is recorded on a wide variety of bird species, it has been recorded only once in vultures, more specifically on a Turkey Vulture (*Cathartes aura*) nest. In addition to this record, we report this behavior while manipulating an individual of Black Vulture (*Coragyps atratus*) in Brazil. This behavior is not usual in Cathartidae since adult vultures do not have a known natural predator.

KEY-WORDS: anti-predator behavior, Brazil, physical contact, thanatosis.

Although Black Vultures (*Coragyps atratus*) are considered gregarious and group-forming species that can reach hundreds of individuals that feed, soar and roost together, they do not breed in colonies. They are not territorialists and fly large areas in search of food and shelter, considered rapid colonists, mainly in newly-opened anthropic-formed areas. Since individuals fly widely, they are considered as partially migratory birds, keeping longer periods of time in areas where a higher amount of resources is available (Mundy 1985, Souto 2008, Ribeiro *et al.* 2010). On the other hand, they have a strong agonistic behavior when it comes to a resource dispute, due to food competition. Among age-groups there are different behavioral features, such as juveniles being more submissive to the elders, as reported by Kruuk (1967), Houston (1975) and Ribeiro *et al.* (2010).

Aggregation in American Black Vultures brings about advantages, such as increased social interactions. Individuals may also benefit by being close to one another, mainly through thermoregulation mechanisms by using communal perches in trees, rocks or urban infrastructure (Campbell 2015, Ballejo 2016).

Thanatosis (or death-feigning) frequently occurs in response to the presence of predators, generating a state of immobility by the prey (Miyatake *et al.* 2004, Humphreys & Ruxton 2018). Although thanatosis has been described in many groups, such as mammals, birds, fish, reptiles, amphibians, arachnids and insects (Miyatake *et al.* 2004, Humphreys & Ruxton 2018), it is more frequently found in prey than predators, like vultures. Few studies have

reported thanatosis in predators, for example, Vogel-Jr. (1950) recorded thanatosis in a wild adult Turkey Vulture (*Cathartes aura*) in Indiana, USA, when the vulture was nesting in a Sycamore Tree, with two white downy chicks. Due to the human presence looking at the nest, the adult remained completely motionless, remaining in a prone position with its wings opened and its head down. Although it had been prodded with a stick and lifted off the ground, one could only notice eye movements (Vogel-Jr. 1950). On another occasion, Martin-Jurado *et al.* (2011) reported thanatosis in an adult individual of Red Kite (*Milvus milvus*) after anesthesia for a surgical procedure aiming for sex determination. This behavior was confirmed through the bispectral index, which evaluates the electrical activity of the brain of the bird. After finishing the surgery, followed by extubation, the Red Kite remained immobile and unresponsive, despite the bispectral index corresponded to a full awake bird.

In this report, we characterized thanatosis in one Black Vulture individual, recorded in 2018 during the removal from a handling-net (Fig. 1).

The individual was captured at the *Fundação Parque Zoológico de São Paulo*. The survey comprised biological sample collections such as feces, regurgitates as well as any ectoparasite encountered during the procedure. This individual was captured, quickly pulled out of the trap with a handling net and immediately released afterward. However, when released, the Black Vulture remained lying in the dorsal position. We could even lift the individual off the ground by holding it only by its legs.



Figure 1. Picture description showing thanatosis in a Black Vulture captured at the *Fundação Parque Zoológico de São Paulo*. (1) Individual lying down in dorsal decubitus; (2) touched without showing any response; (3) pushed out of the handling net without showing any response; (4) sideways-fallen Black Vulture seconds before rising.

After realizing that either it was expressing thanatosis or having a health issue, we placed the individual back on the handling net, in which it remained for a few seconds and it stood and flew away.

Thanatosis is an anti-predatory strategy frequently adopted by prey after physical contact by predator (Humphreys & Ruxton 2018). However, such behavior is uncertain in this particular situation described here. Even though vultures are vulnerable to predation by terrestrial carnivores when they are fledglings and juveniles, few reports of adults being predated are known (Houston 1994, Teixeira *et al.* 2019). In spite of being quite common in several taxa, the adaptive significance of thanatosis is still uncertain. Lack of studies may be attributed to the fact that the usual consequence of thanatosis may be predation, being less likely to be seen or tested in the field and laboratory due to ethical reasons. Besides that, the success or failure of death feigning depends largely on the foraging techniques adopted by the predator. More studies are needed with regards to the predator-prey dynamics of vultures, in order to fully understand the predator-avoidance tactics involved within this species (Honma *et al.* 2006, Humphreys & Ruxton 2018).

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