

# An additional record of hematophagy by the Yellow-headed Caracara *Daptrius chimachima* on a domestic horse from Venezuela

## Abstract

Hematophagy is a practice in which animal organisms feed on blood. Among birds, few species are known to practice it, including rapacious birds such as Caracaras. Here, an hematophagy event by a Yellow-headed Caracara on a wounded domestic horse from northern Venezuela is described, taking notes about the visit frequency, number of visitors, the horse's interaction with the caracara, the blood consumption type (direct, indirect), and hematophagy tactics (active or passive). Over six continuous days, once a day, a Yellow-headed Caracara arrived on the back of a wounded domestic horse between 08:00–10:00 h and perched without any negative response from the quadruped. After arriving, the bird remained motionless for a few minutes and then approached the open wound. After sucking blood for about 4–7 minutes, the bird of prey inspected the rest of the animal for ectoparasites and then it left the area for the rest of the day. Once, an adult and a juvenile Yellow-headed Caracaras visited the horse to feed on blood together. This is the first report of hematophagy for the Yellow-headed Caracara in Venezuela. My observations suggest that the Yellow-crested Caracara is a passive hematophagous bird, and direct hematophagy in this species occurs because its opportunistic behavior is stimulated by wounds made accidentally or by other active hematophagous animals such as Vampire Bats.

**Keywords:** bird of prey, blood-sucking animal, cleaner bird, sanguivory, cleaning symbiosis, vampire bird

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## Introduction

Hematophagy or sanguivory is the practice by certain invertebrate or vertebrate organisms of feeding on blood.<sup>1</sup> Since blood is a fluid tissue rich in water, electrolytes, nutritious proteins, and lipids,<sup>2</sup> that can be taken without great effort, hematophagy is a preferred form of feeding for several small invertebrate animals. Nonetheless, several vertebrate organisms, including fishes (Petromyzonidae, Trichomycteridae),<sup>3</sup> mammals (Phyllostomidae: Desmodontinae)<sup>4,5</sup> and birds, also have hematophagous behavior. Among birds, few species are known for hematophagy, including non-passerine families, such as Cathartidae, Stercorariidae, Chionidae, Cuculidae, Falconidae,<sup>6–8</sup> as well as passerine birds from Buphagidae, Mimidae, Turdidae, and Furnariidae.<sup>7–12</sup> Bird hematophagy can be active, when the hematophagous bird causes a traumatic damage (wound) in a vertebrate animal to access its blood, such as the Vampire Finch *Geospiza septentrionalis* does. This species, from the Galapagos islands, uses its needle-sharp beak to pierce the skin of large seabirds (Sulidae: *Sula*) and then feed on its blood.<sup>10</sup> This behavior occurs because of a lack of fresh water on the islands.<sup>13</sup> Passive hematophagy, however, occurs when the hematophagous bird visits a wounded animal and, without effort, accesses its blood in an opportunistic way. For example, the Yellow-billed Oxpeckers *Buphagus africanus* and the Red-billed Oxpeckers *B. erythrorhynchus* (Buphagidae), exploit bleeding wounds of several African ungulates after removing their ticks.<sup>9,12</sup> The Snowy Sheathbills *Chionis albus* (Chionidae) drinks blood from the open wounds of seals.<sup>8</sup> A set of mockingbirds from Galapagos Islands, including the Galapagos Mockingbird *Mimus parvulus*, the Hood Mockingbird *M. macdonaldi*, and the Charles Mockingbird *Mimus trifasciatus* (Mimidae), feed on blood of wounded seabirds,<sup>7,8</sup> while the Tristan Thrush *Turdus eremita* (Turdidae) has been observed drinking blood from penguins.<sup>11</sup> Although all these examples constitute direct mechanisms of blood

feeding, bird species can also take advantage of blood indirectly, including some of the aforementioned species. Oxpeckers and the Smooth-billed Ani *Crotophaga ani* (Cuculidae) ingest blood when they feed on ticks filled with the nutritious liquid. Likewise, birds of prey consume blood while swallowing their prey.

Besides indirect blood consumption by birds of prey, direct hematophagy is also known from Falconidae species, including the Yellow-headed Caracara *Daptrius chimachima* Vieillot, 1816.<sup>7</sup> This is an opportunistic omnivore species that eats on almost any edible plant or animal matter,<sup>14</sup> from palm nuts and berries to arthropods (spiders, ticks, and insects, including caterpillars and maggots), small frogs, lizards, rodents, bird eggs and nestlings.<sup>6,14,15</sup> Carrion is an important part of its diet. It feeds on animals that were run over by cars or pushed by the tides on sandy beaches (fishes, crabs, turtles). As a cowbird species, the Yellow-headed Caracara has developed a deep symbiotic relationship with wild mammals, including the Capybara *Hydrochoerus hydrochaeris*, the South American Tapir *Tapirus terrestris*, and the White-tailed Deer *Odocoileus virginianus*, as well as domestic quadrupeds such as horses *Equus caballus*, goats *Capra hircus*, and cattle *Bos* spp., in order to keep them ectoparasite-free. It perches on these animals not only searching for ectoparasites but these mammals also orient it toward places where they need its services.<sup>6,16</sup> Although the Yellow-headed Caracara is known as a bird cleaner par excellence,<sup>6,7</sup> it has an isolated record of hematophagy on a Capybara from Brazil<sup>7</sup> without further details. Here, an additional record of hematophagy by the Yellow-headed Caracara on a domestic horse is described, with some notes associated with this behavior recorded in northern Venezuela.

The record area is located in the SE suburbs of Caracas, at Los Naranjos farm, El Hatillo County, Miranda state, northern Venezuela (10°26'14"N; 66°47'27"W), about 900 m a.s.l. This area was mostly covered by Guinea grass *Megathyrsus maximus* (Poaceae) and a few

fruit trees such as citrus and avocado.<sup>17</sup> In the area, a horse in a poor state of nutrition, with an open wound on its back, was spotted in an abandoned paddock full of Guinea grass. With limited access, I was located 50–60 m from the horse. From there, I recorded daily visits of a Yellow-headed Caracara from March 20 to March 25, 2018. On each visit, I took notes about the Caracara's visit frequency, number of visitors, the horse's interaction with the Caracara, the blood consumption type (direct, indirect), and hematophagy tactics (active or passive). The blood consumption was regarded as direct if the hematophagous bird imbibed blood as its main and unique resource; and indirect, if the blood came associated with other food as a secondary resource (e. g. ticks). Also, hematophagy was active if the hematophagous bird caused a traumatic damage (wound) on the animal host to access the blood; and passive, if the bird visited a previous wound on the animal host and accessed the blood without effort. The observations were made with the naked eye and/or with Swarovski (10X40) binoculars. Photographs were taken with a Nikon™ Coolpix P510 camera with electronic Zoom 42X.

Over six continuous days, once a day, a Yellow-headed Caracara

arrived between 08:00–10:00 h and perched on the animal's back without any negative response from the quadruped. After arriving, the bird of prey remained motionless for a few minutes and then approached the open wound (Figure 1). After sucking blood for about 4–7 minutes, the rapacious bird inspected the rest of the animal for ectoparasites. Without apparent success in its examination, the raptor left the area for the rest of the day. Therefore, only direct blood consumption was recorded. After three days, the wound was still bloody and I suspected the Yellow-headed Caracara may have removed the fresh scab to continue sucking on blood. But because of the distance, the Yellow-headed Caracara could only be recorded sucking from the wound. A few days later, however, I met with the horse's owner who told me the horse was a sick animal, and the wound on its back was made by a Vampire Bat *Desmodus rotundus* (Chiroptera: Phyllostomidae). Caracara falcons have a relatively weak and unhooked bill as compared with other falconids,<sup>6</sup> so they are unlikely to do mechanical damage. Thus, the Yellow-headed Caracara depends on wounds previously generated by accident to access blood, or caused by other active hematophagous animals such as Vampire Bats, as in this case.



**Figure 1** An hematophagy event sequence performed by the Yellow-headed Caracara *Daptrius chimachima* on a domestic horse *Equus caballus* in northern Venezuela: a, the caracara arrives on the animal's back and stay motionless for a few minutes; b, approaching the open wound; c, drinking blood; d, resting between each sip. Photos author: C. Verea.

In addition, Vampire Bat saliva contains an anticoagulant called draculin that keeps the blood flowing from a wound.<sup>18</sup> That explains, in part, why the wound was kept fresh daily and why the rapacious bird preferred to visit the host only in the morning hours. On day five, two Yellow-headed Caracaras landed on the animal's back to take advantage of the blood. One of the caracaras was an adult accompanied by a juvenile individual, a similar scenario reported by Sazima,<sup>6</sup> on capybaras from Brazil. Certainly, foraging congregations

of Caracaras species are often composed of adults and juveniles with the advantages for learning.<sup>6</sup> On day six, only one adult Yellow-headed Caracara landed on the horse. Observations stopped on day seven because the horse died.

This is the first report of hematophagy for the Yellow-headed Caracara in Venezuela. Besides the Yellow-headed Caracara, a related species, the Chimango Caracara *Daptrius chimango*, also had records

of direct hematophagy in the Neotropics.<sup>7</sup> My observations suggest that the Yellow-crested Caracara is a passive hematophagous bird, and direct hematophagy in this species occurs because its opportunistic behavior is stimulated by wounds made accidentally or caused by Vampire Bats. Although this record represents a case of direct hematophagy, indirect hematophagy is also known in the Yellow-headed Caracara,<sup>6,7</sup> in the same way that other Venezuelan cowbird species such as the Cattle Egret *Bubulcus ibis*, the Shiny Cowbird *Molothus bonariensis*, the Cattle Tyrant *Machetornis rixosa*, and the Tropical Mockingbird *Mimus gilvus* do on cattle.<sup>17</sup>

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## Conflicts of interest

The author declared that there are no conflicts of interest.

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