

Harpy Eagle *Harpia harpyja* preying on an Ursine Howler Monkey *Alouatta arctoidea* in northeastern Venezuela

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This study provides a detailed description of a rare predatory event concerning a juvenile Ursine Howler Monkey *Alouatta arctoidea* captured and consumed by a sub-adult Harpy Eagle *Harpia harpyja*. During ca. 30 min., we were able to observe the behaviour of the eagle from the moment in which the howler group began screaming until the raptor began to feed on its prey. The observation took place close to the northwestern limit of the Orinoco River Delta (Venezuela) and we were able to capture the first ever photographs of a harpy eagle consuming a howler monkey. This record contributes to our knowledge of how raptors process large-bodied arboreal mammals.

Key words: Harpy Eagle, *Harpia harpyia*, predatory attack, Raptor, Falconid, Platyrrhine, South America

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To date, few predatory events concerning primates have ever been recorded (Cheney & Wragham 1987). This might be due to the fact that they occur quickly and not very frequently (Isbell 1994, Urbani 2005, Ferrari 2009). Isbell (1994) has suggested that primates are only very rarely preyed upon by aerial and terrestrial predators due to the differences in habitat use by prey and predators. Nevertheless, the fact that potential arboreal prey items frequent the upper parts of trees and unfamiliar parts of the forest make them more vulnerable to predators. Harpy Eagles (*Harpia harpyja*) have been reported to be important predators of atelines in general and howlers in particular (Di Fiore 2002, Urbani 2005, Ferrari 2009). The aim of this report is to describe the process of predation of an ateline by a Harpy Eagle, to present a photographic account

of the event, and to explore how our information differs – or otherwise – from previously published reports of howler predation by raptors.

Material and methods

A Harpy Eagle was encountered, observed and photographed at a distance of ca. 40 m (visual estimation) as it preyed on an Ursine Howler Monkey *Alouatta arctoidea*. The observation took place on the Guarapiche River near Caño Colorado, approximately 35 km northeast of Maturín (state of Monagas, NE Venezuela, 9°54'58"N, 62°54'49"W) at 5 m a.s.l. The observation was recorded in an area with a matrix of tropical riverine lowland rainforest and a *varzea* secondary forest. Other raptors occur in the

area (e.g. *Spizaetus ornatus*, *Leptodon cayanensis*, and *Chondrohierax uncinatus*), as well as other primates such as the Wedge-capped Capuchin monkey *Cebus olivaceus*.

Swarovski 8x42 binoculars and a Swarovski 80-mm telescope were used during the observation. Behavioural data was collected *ad libitum* (Martin & Bateson 2007). In addition, a Kodak Z650 digital camera (6.1 Mp) was fitted to the telescope to photograph the event. A sequence of four frames was selected and is shown below (Figure 1; see the Supplementary material for a complete sequence of 24 frames: www.ornitologia.org/ca/queoferim/divulgacio/publicacions/rco/28_40_44.pdf).

Results

On 18 May 2007, a dry day, at 150 m from the river on a forested riverbank, we were surprised by a nearby and unusually powerful howler scream. At 09:15 h, we located a Harpy Eagle with a captured howler monkey, its presence causing approximately 10 other howlers to vocalize loudly at a distance of 15 m. Once the capture was successfully completed, the howlers stopped screaming and the group moved away, leaving the Harpy Eagle to begin consuming the corpse. The predatory event was observed for a period of around 30 min. The event took place at mid-storey level of a tangled tree around 8 m above ground level. The eagle did not respond to the presence of human observers. This is the first report of this raptor species from the Venezuelan state of Monagas (Redman 2008).

The Harpy Eagle was a sub-adult male, its age being based on the moult of its upper wing-coverts; sex was determined, above all, by the size of its talons and legs and its smaller body size (females are larger). The howler was aged as juvenile by its body size, which was intermediate between a full adult individual and an infant.

During feeding (Figure 1), the Harpy Eagle clasped the torso of the primate with its claws. At first, the eagle seemed to squeeze the monkey as it trampled on its body before beginning to feed. The bird often changed the position of its talons while manipulating the monkey and was first observed to bite the monkey near its neck. Whilst biting, portions of hair were observed in the Harpy Eagle's beak. When the eagle bit

the monkey, it balanced its body by placing its tail midway in relation to its body's horizontal plane. At times, the eagle stopped feeding and remained motionless on the corpse (Figure 1, Supplementary material).

Discussion

It has been known since the end of the nineteenth century that Harpy Eagles attack both sloths and monkeys in Venezuela (Goering 1893). Specific cases of predation on howlers have also been reported. M. Marquina (pers. comm.) observed a Harpy Eagle consuming an adult Ursine Howler Monkey in April 1986 in the rainforest of the Guatopo National Park, central Venezuela. Guyanan Howler Monkeys *Alouatta macconelli* in Venezuela have been reported apparently as prey for a jaguar on an island of Lake Guri, state of Bolívar (Peetz *et al.* 1992), and captured by a Harpy Eagle in the southeast of this state (A. Crease pers. comm.). In 1989, Álvarez-Cordero (1996) found postcranial elements of Guyanan Howlers in a Harpy Eagle nest in Venezuelan Guayana. In an account of the range of the Harpy Eagle in northeastern Venezuela, Redman (2008) reports on this observation whereby "the eagle was standing on a monkey that... had presumably been caught just moments before... [and was] tearing off chunks of flesh with its huge bill..." Our report provides novel information on these events in northern South America, and Venezuela.

Although anecdotal data must be interpreted with caution when attempting to explain behavioural and evolutionary phenomena, it nevertheless still is a way of understanding rarely recorded behaviour (Urbani & Garber 2002, Sarringhaus *et al.* 2005). Interestingly, some patterns do emerge from the few observed events of raptors preying on howlers (papers cited in Di Fiore 2002, Urbani 2005, Ferrari 2009). First, all such raptors were Harpy Eagles. These records are from field observations (Peres 1990, Sherman 1991, Touchton *et al.* 2002, Ferrari 2010, Marquina pers. comm., this study, and a capture attempt reported by Eason 1989) and from examinations of remains found in Harpy Eagle nests (Izor 1985, Retting 1991, Álvarez-Cordero 1996, Ford & Boinski 2007). Ferrari



Figure 1. Harpy Eagle preying upon an Ursine Howler Monkey.
Harpia depredant una Mona Udoladora.

(2009) suggests that the size of the talons and feet (approximately 10 cm width) of this raptor may in fact constrain the minimum size of their prey. Field data indicate that this raptor selects large-sized monkeys as prey (Di Fiore 2002, Urbani 2005, Ferrari 2009) and thus will often predate on howlers given that these monkeys are among the largest of all New World primates. Furthermore, it has been found that sub-adult and adult howlers, i.e. the largest individuals, are often the targets of attacks (Di Fiore, 2002, Urbani 2005, Ferrari 2009). Our record consists of a sub-adult Harpy Eagle capturing a juvenile howler monkey and there may be a correspondence between the relative small body size of both young individuals. In addition, sexual dimorphism in the Harpy Eagle (males are smaller than females) might also influence prey selection and size (R. Muñoz-López, pers. comm.).

A second issue is how Harpy Eagles feed on howlers. In the few available accounts, Harpy Eagles are reported to prefer the ventral area of the corpse (Sherman 1991, and inferred from Rettig 1978). Nevertheless, in our observation the area around the neck was first attacked. A description of how howlers are seized by Harpy Eagles has been given by Touchton *et al.* (2002). In a photographic study, Springer *et al.* (2011) provide information on the consumption of a Brown-throated Sloth *Bradypus variegatus* by a Harpy Eagle: the eagle tore off flesh and moved around on the corpse less and less as feeding progressed, a detail that we also observed. We too noted that once the prey had been seized, the Harpy Eagle seemed to squeeze its prey whilst it walked on top of it.

Previous reports have noted the howling reactions by monkeys before, during and/or after an aerial attack (e.g. *Alouatta palliata*: Touchton *et al.* 2002, *Alouatta puruensis*: Peres 1990) and, indeed, the observed group of Ursine Howler Monkey in our case did howl during the attack. Loud vocalization make howlers easier to detect and capture and we suggest that this vocal behavior, common resting behavior in this species, and the fact that howlers are both large-bodied and, in some species, conspicuously coloured (see Ferrari 2009), render these monkeys more noticeable and easier to capture.

Finally, according to Peres (1990) and Sherman (1991), predation by Harpy Eagles may act as a selective pressure on the structure of howler

populations. However, anecdotal reports cannot be used to fully support such evolutionary conclusions. Thus, more field data still need to be gathered and experimental field studies conducted if we are to study and test this contention.

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Resum

Depredació d'una Mona Udoladora *Alouatta arctoidea* per una Harpia *Harpia harpyja* al nord-est de Veneçuela

En aquest estudi es fa una descripció minuciosa d'un fenomen rar, com és la depredació d'un juvenil de Mona Udoladora *Alouatta arctoidea* per un mascle d'Harpia *Harpia harpyja* subadult. Durant aproximadament mitja hora, es va observar el comportament de l'àguila des que el grup de mones estava udolant fins que l'Harpia va ingerir la presa. A més, es van realitzar les primeres fotografies de tot el procés. Les observacions es van realitzar prop del límit nord-oest del delta del Orinoco, Veneçuela. Aquest estudi pretén esbrinar com els rapinyaires processen mamífers arboris grans.

Resumen

Depredación de un Mono Aullador *Alouatta arctoidea* por parte de una Arpia *Harpia harpyja* en el noreste de Venezuela

Este trabajo hace una descripción detallada de un evento raro de depredación de un juvenil de Mono Aullador *Alouatta arctoidea* capturado y consumido por parte de un macho de Arpia *Harpia harpyja* subadulto. Durante aproximadamente 30 minutos, se observó el comportamiento del águila desde que el grupo de monos estaba gritando hasta que el arpía ingería la presa.

Se realizó la primera serie fotográfica de una arpa consumiendo un mono aullador. El evento ocurrió cerca del límite noroeste del Delta del Orinoco, Venezuela. Este estudio contribuye a comprender mejor cómo un rapaz procesa un mamífero arbóreo de gran tamaño.

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Supplementary material / Material suplementari

Supplementary material may be found in the online version of this article. / Es pot trobar material suplementari a la versió en línia d'aquest article.

Figure S1. Complete sequence of 24 frames of an Ursine Howler monkey preyed upon by a Harpy Eagle. *Seqüència completa de 24 imatges d'una Mona Udoladora depredada per una Harpia.*

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