

Attack behavior and disposal of cattle carcass by the andean bear *Tremarctos ornatus* in Colombia

Comportamiento de ataque y disposición de carcasas de ganado vacuno por parte de oso andino *Tremarctos ornatus* en Colombia

Adriana Reyes ^{1,2}, Daniela Pulido-Osorio ³, Fredy Saray ⁴, Héctor Restrepo ¹, Orlando Feliciano⁵, Deisy Beltran ⁶, Nicolás Reyes-Amaya ⁷, Daniel Rodríguez ^{1*}

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ABSTRACT

Seventy-eight reports of Andean bear (*Tremarctos ornatus*) attack to cattle between 2005 and 2021 were analyzed, to know the prey-dragging behavior; this behavior was described eleven times. These attacks occurred in meadows located 1.28 km (maximum 6.43; minimum 0.41 km), and 79 minutes (maximum 240, minimum 30 minutes) away from houses in the middle of Andean and High Andean forests and paramo environments. The mean distance to which the carcass was disposed was 157.44 m (minimum 45, maximum 884 m), and 80.1 m downward (even to 397 m), although the prey was dragged 55 m upward in three cases. The carcasses were found in the middle of dense forest cover and near watercourses, not within them, to a mean distance of 1.24 km (minimum 0.31, maximum 6.42 Km) from a humane house. The surviving animals showed attack evidence on their backs. *Tremarctos ornatus* also moves the carcass to continue feeding, as seen in black (*Ursus americanus*) and brown (*Ursus arctos*) bears, and frequently uses tree nests to put carcasses, and can change their places repeatedly. Guidelines and indications are provided to facilitate the correct identification of Andean bear attacks, as a basic tool for the management of this phenomenon.

Keywords: diet, extensive stockbreeding, scavenger

¹ Wii Foundation, Calle 161 # 12B 30, Int. 1 Apartment 404 C. P. 110131; email: shreyesp@unal.edu.co, restrepof@gmail.com, danielosito.wii@gmail.com*

² National University of Colombia, Cra. 30 #45-3, Bogotá, Colombia. Faculty of Sciences, Department of Biology, Master of Science. C. P. 111321; email: shreyesp@unal.edu.co

³ Merenberg Foundation, Km 12 Vía Puracé-La Plata, Huila, Cauca, Colombia, C. P. 415060; email: maria.pulidoosorio8@gmail.com

⁴ Chingaza National Natural Park, Calle 74 # 11 - 81 Bogotá, Colombia. C. P. 110221, Colombia, C. P. 251648; email: freddysaray@hotmail.com

⁵ Bioandina Colombia Foundation, Guasca (Vereda La Concepción), Cundinamarca, Colombia. C. P. 251218; email: orfelvet@hotmail.com

⁶ Guavio Regional Autonomous Corporation, CORPOGUAVIO, Carrera 7a #1A-52, Gachalá Cundinamarca, Colombia, C. P. 251257; email: deissyb@corpoguavio.gov.co

⁷ Alexander von Humboldt Biological Research Institute, Claustro de San Agustín, Cra 8 # 15 - 08, Villa de Leyva, Boyacá, Colombia, C. P. 154001; email: nreyes@humboldt.org.co

* Corresponding author



RESUMEN

Se analizaron 78 informes de ataque de osos andino (*Tremarctos ornatus*) a ganado vacuno desde 2005 hasta 2021, con el fin de conocer el comportamiento de arrastre de la presa; en once se describe este tipo de comportamiento. Los ataques se dieron en potreros alejados de las casas unos 1,28 km (máximo 6,43; mínimo 0,41), más de 79 minutos caminando (máximo 240, mínimo 30) y en medio de ambientes de bosque andino, altoandino y páramo. La distancia promedio a la cual se desplazó la carcasa fue de 157,44 m (mínimo 45, máximo 884) y la variación en altura de 80,1 m, hacia abajo (hasta 397). En tres casos (27,27 %) la presa se arrastró unos 55 m. hacia arriba. Los restos se encontraron en medio de coberturas boscosas densas y en cercanía de fuentes de agua corriente, pero no dentro, a una distancia promedio de 1,24 km (mínimo 0,31, máximo 6,42) de una casa de habitación humana. Los animales sobrevivientes mostraron evidencias de ataque sobre sus lomos y al igual que osos negros (*Ursus americanus*) y pardos (*Ursus arctos*), también mueve la carcasa para continuar alimentándose. El uso de nidos en árboles para ubicar la carcasa es frecuente, y puede ser cambiada de lugar varias veces. Los resultados aportan directrices e indicios que facilitan la correcta identificación de ataques por parte del oso andino, como una herramienta básica para el manejo de este fenómeno.

Palabras clave: carroñeo, dieta, ganadería extensiva

INTRODUCTION

The ursids belong to the order Carnivora. Nonetheless, seven of the eight species are omnivorous, feeding largely on plant material, insects, fish and mammals, except for polar bears whose diet is mainly carnivorous (Fowler *et al.* 2021). It is not unusual for large, robust, and powerful animals to attack livestock and crops (Braña *et al.* 1987, Charoo *et al.* 2011).

Cattle attacked by the different bear species show paw marks and bruises (Černe *et al.* 2019). The bears try to take down the cattle by force, and they bite them above the withers along the spine, once they can grasp them firmly, leaving very strong signs of mutilation and continuing the attack as long as the prey moves or struggles (Murie 1948, Márquez y Goldstein 2014, Laguna 2018, Rojas-VeraPinto *et al.* 2020).

Since bears are reluctant to pursue their prey over long distances (Acorn and Dorrance 1990, Green *et al.* 1997, McDougall 2004), it is possible to find animals that survive the attack, exhibiting claw marks on their shoulders, back and rump, as well as teeth marks on the back and neck (Stonehouse *et al.* 2016). Once the prey is captured, the bears often drag the carcass and protect it from other scavengers, hiding it until they consume all the prey,

even moving the same carcass several times to continue consuming it, more than 100 m from the place of attack (Acorn and Dorrance 1990, Allen *et al.* 2021). In this behavior the prey can be covered with surrounding material (dust, stones, leaves, etc.); for instance, ten to 15 % of the American black bear (*Ursus americanus* Pallas, 1780) individuals carry or drag their prey, to cover them or semi-bury them (Smith and Reichman 1984), as grizzly bears (*U. arctos* Linnaeus, 1758) do (Allen *et al.* 2021), consuming almost the entire carcass if they are not chased away nor they feel threatened (Acorn and Dorrance 1990). A grizzly bear can eat up to 10 kg of flesh a day (Černe *et al.* 2019) and will protect its prey or will move it to a place where the bear feels safe (Cristescu *et al.* 2014), until consumes most of it, discarding the largest bones and the skin (Acorn and Dorrance 1990). However, some bears prefer to leave the carcass until it rots and return to feed on maggots and debris, or they may consume 90 % of the carcass, as black bears do if they have the opportunity, or kleptoparasitize the prey of other predators, such as in certain cases of black bears and grizzlies (Cristescu *et al.* 2014).

Concerning the Andean bear (*Tremarctos ornatus* F. Cuvier, 1825), livestock consumption has been reported throughout its distribution, including attacks (Peyton 1980, Torres 2010, Laguna 2018, Rojas-VeraPinto 2019), as well as scavenging records (Castellanos 2002, Márquez

and Goldstein 2014, Rodríguez *et al.* 2019, Parra-Romero *et al.* 2019, Rojas-VeraPinto *et al.* 2020), including anecdotal documentation of prey dragging behavior during consumption (Goldstein *et al.* 2006, Figueroa 2015). In Colombia, during the last decade, conservation measures demonstrate attempts to better articulate environmental governance agendas with the knowledge and needs of local farmers, pointing out that the bear is an integral part, and a product of multiple historical assemblages that include wildlife, humans, their sciences, knowledge and policies, and that it is necessary to open conservation efforts to local communities knowledge, which allows progress towards more historically informed, pluralistic and effective conservation strategies (Garrido-Corredor *et al.* 2021). In this paper, we provide information on the attack behavior and final spatial disposal of the prey attacked by *T. ornatus*, aiming to provide safe guidelines and clues that facilitate the correct identification of attacks on livestock.

METHODS

Information on 78 livestock depredation events by Andean bears, was gathered from reports by ranchers from the jurisdiction of various environmental authorities at the municipal level municipal (Municipal Environmental Secretariats of Junín, Guasca, Calera, Fómeque, Choachí, Gachetá, San Juanito, Gachalá, La Paz, Santa Barbara, Piedecuesta, Gigante), regional (Environmental Corporations CORPO-CESAR, CDMB, CAS, CORPOGUAVIO), and national (National Natural Parks of Colombia), between 2005 and 2021.

Of the 78 reports obtained, only eleven were analyzed on-site within the first ten days of the incident. These reports provided valuable information and evidence regarding the attack location, as well as any indications of dragging and the ultimate disposal site of the carcass. The data collected was recorded in the visit reports. Once the location of the attack was determined, investigators searched for evidence of the animal altercation on the ground (such as trampled, dirty, or missing plant material), as well as forensic evidence of the attack (including blood and bovine fur on leaves and bark of the surrounding vegetation), fecal samples, and other traces left by the bear. Subsequently, the surrounding foliage was searched for evidence of carcass dragging, following the traces until the final location of the attacked animal, checking its final disposition, and verifying the altitude variation (m above sea level) between the attack location and the final location for consumption.

At each of the eleven sites, we captured GPS coordinates and took photos of the attack and carcass disposal locations. We gathered evidence of the attack on the dead animal remains. We measured the distance and travel time from the dwellings to the attack sites. Additionally, we recorded the distance of the final carcass disposal site from the closest water source. All measurements were conducted using QGIS 3.22 software (QGIS.org c2024).

The study recorded the attack sites and the treatment of the carcass, including whether the prey was moved intact or in pieces and if there were multiple attacks. Age characteristics of the attacked individual were also noted, along with details of any previous bear attacks on the livestock of the affected parties. Furthermore, a diagram was created to show the spatial arrangement of the attack site and the prey.

RESULTS

Andean bear attacks occurred in grazing meadows within Andean forests, paramo and sub-paramo, between 310 and 6420 m in a straight line to the nearest house (Table 1, Fig. 1). The final places for the prey disposal were always located within forests, between 3 and 40 m to the nearest water source (mean: 13.91 m) and between 50 and 450 m to the attack place (mean: 157.44 m), the mean altitudinal variation being around 80.18 m (Table 2).

The place where the carcasses were found furthest from the attack scene was located in the municipality of Santa Bárbara (Santander), four hundred and fifty meters away in a straight line, and an altitudinal difference of 397 m (ID = 11, Table 1; Fig. 2); whereas the nearest one was in the Perijá Serranía, municipality of La Paz (Cesar): there, the carcass was found 45 m away in a straight line, the altitudinal variation being 17 m (ID = 1, Table 1).

The time necessary to reach the attack sites from the nearest house along trails and rural roads varied between 30 minutes and four hours on foot (average 76.82 min), or between fifteen minutes and three hours riding on a beast's back. All the attack sites were difficult to access, even those six located less than 0.5 km from the house, because of the highly stepped topography. The attacks occurred in grazing areas near forests where multiple spectacled bear tracks could be seen.

Table 1. Livestock attack sites by Andean bears at different Colombian localities, based on site visits during the first 5 days after the attack. Andean Forest (BA), High Andean Forest (BAA), Subpáramo (SBP), Páramo (PA).

ID	Department			Municipality	Rural Division	Farm	Livestock age	Attack site coordinates and altitude			Carcass disposition coordinates and altitude			Altitudinal variation (m)	Dragging distance (m)	Water source distance (m)	Access time (min)	Distance to the nearest inhabited settlement (km)	Associated ecosystem (attack / final disposition)
								N	W	Altitude (m)	N	E	Altitude (m)						
1	Cesar	La Paz	Brisas del Chirialmo	Junin	Rancho Que-mao	16-month-old heifer		10°16'25.60"	72°55'10.41"	3 003	10°16'27.10"	72°55'10.57"	2 986	17	45	8	120	1.5	SBP/SBP
2	Cundinamarca	Junin	San Antonio	Primavera		2-year-old calf		4°42'54.93"	73°39'39.92"	2 950	4°42'54.2"	73°39'41.4"	2 911	39	50	10	35	0.48	BA/BA
3	Santander	Piedecuesta	Llano adentro	Potreros		16-month-old calf		7°4'22.6"	72°56'41.0"	3 391	7°04'22.5"	72°56'39.9"	3 299	92	59	15	150	1.81	BA/BA
4	Cundinamarca	Gachalá	Tendidos	Caño negro		5-year-old young bull		4°34'57.38"	73°36'25.81"	2 382	4°34'56.07"	73°36'28.10"	2 310	72	60	12	30	0.33	BA/BA
5	Cundinamarca	Fómeque	Quebrada blanca	El Zapato		16-month-old heifer		4°31'30.5"	73°47'32.2"	3 196	4°31'31.2"	73°47'30.2"	3 120	76	65	13	30	0.46	BA/BA
6	Cundinamarca	Fómeque	Quebrada blanca	El Carmen		3-year-old heifer		4°31'22.9"	73°47'3.6"	3 203	4°31'23.1"	73°47'8.0"	3 216	13*	87	9	65	0.77	BAA/ SBP
7	Cundinamarca	Fómeque	Quebrada blanca	El Carmen		7-month-old calf		4°31'30.0"	73°47'19.3"	3 180	4°31'33.9"	73°47'18.5"	3 195	15*	99	40	80	1.06	BAA/BAA
8	Huila	Gigante	La Umbria	Cerro Páramo Miraflores Regional Park		3-year-old cow		2°15'03.42"	75°27'06.51"	2 311	2°15'04.82"	75°27'04.51"	2 263	48	110	10	45	0.44	BA/BA
9	Cundinamarca	Gachalá	Guacamayas	El Romeral		5-year-old cow		4°37'03.78"	73°33'59.47"	2 400	4°37'5.99"	73°33'58.64"	2 342	58	120	15	45	0.52	BA/BA
10	Cundinamarca	Fómeque	Quebrada blanca	El Parejo		9-month-old calf		4°31'33.8"	73°47'49.1"	3 012	4°31'36.1"	73°47'44.8"	3 067	55*	153	18	30	0.31	BA/BA
11	Santander	Santa Barbara	Volcanes	Corralitos		14-month-old heifer		7°03'26.13"	72°52'48.26"	3 829	7°03'17.10"	72°53'11.84"	3 432	397	884	3	240	6.42	PA/BA

* Upward motion from attack site

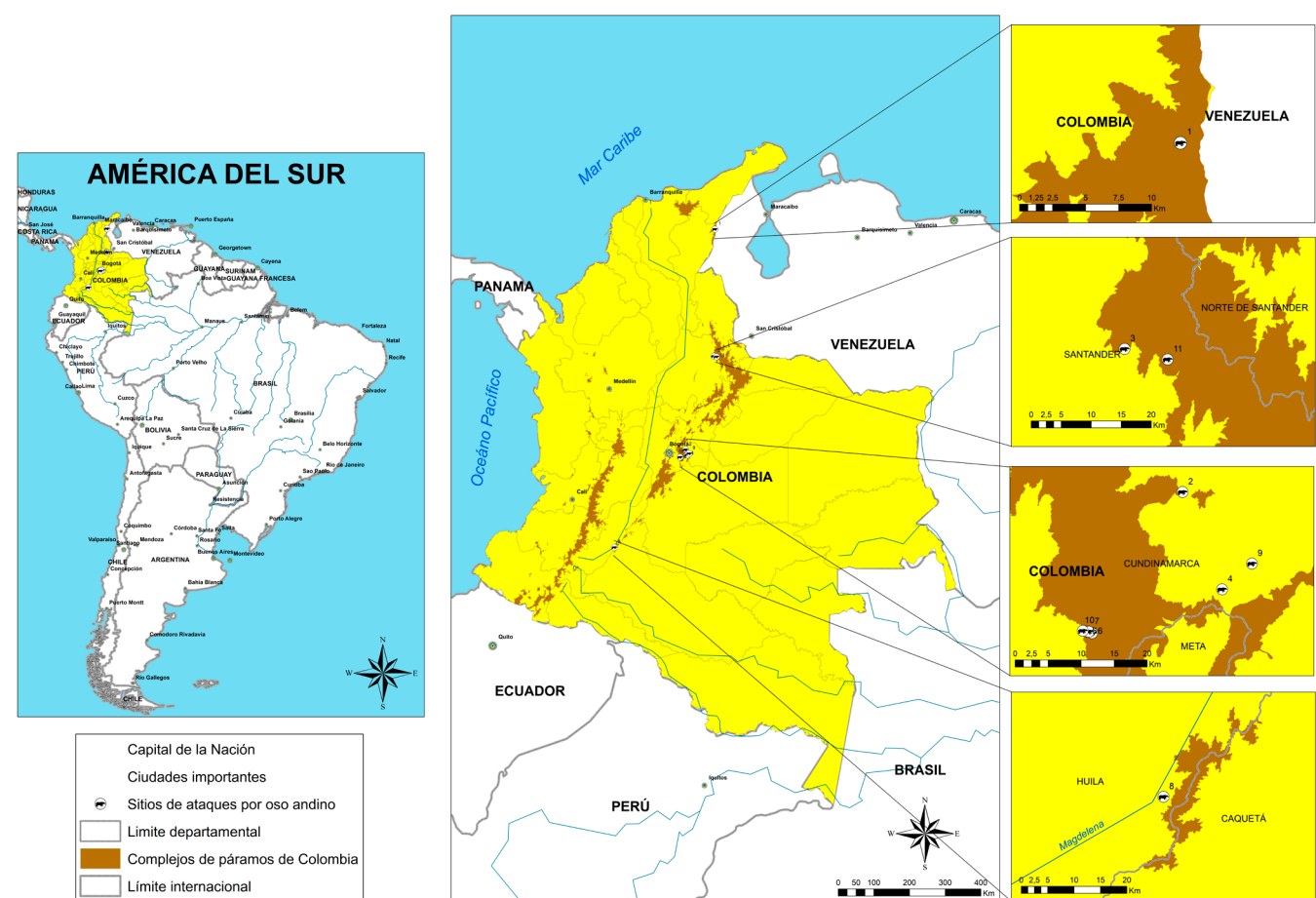


Figure 1. Location of the cow attack sites analyzed in this research project. Detailed information about each location can be found in Table 1.

The eleven studied sites showed fighting signs between animals: trampled soil, broken twigs, blood stains, and tissues of the attacked animal on the trees' barks. Three of the attacked animals, two cows and one bull, were older than three years, whereas the remaining eight individuals, four males, and four females, were between seven and 24 months old.

All bear attacks were performed directly on the hind-quarters and back of the cattle (presumably with the bear standing up on the animal), with claws and bites, which are marked on the skin in the form of obvious scratches and deep wounds, which generate large bruises. Scars like these were seen in calves that survived in the Municipality of La Paz, Cesar, and in Fómeque, Cundinamarca (Fig. 3a and 3b respectively), as well as in wild specimens of mountain tapir in the Puracé National Natural Park (Pisso-Florez *et al.* 2021; Fig. 3h). Once the bovine is subdued, the bear takes it to the floor (Fig. 3c), where it is killed by

bites and claws. In many cases, the bear can begin to consume the animal without it having perished.

Once the bovine is dead, it is dragged into the forest. This procedure of dragging the prey, in most cases complete, can include distances that vary between 45 to 450 m, up or down and always ends near a ravine with running water and between dense stubble or even within the water source (Fig. 3d). In some cases, the cattle's carcass is butchered into different portions and distributed in different places, which may include booths at the top of trees, between heights of 2 to 8 m above the ground (Fig. 3e), coinciding with what the Andean human communities that share the habitat with the Andean bear say, pointing that the bear kills, drags its prey, buries it or distributes it in different tree nests or ground beds. Generally, the bear returns to the site where the carcass is located, to consume the remains until the end (Supplementary video 1). Carcasses, livestock bones, and bear feces are found whenever the nests or cabins have been used to dispose of animal remains.

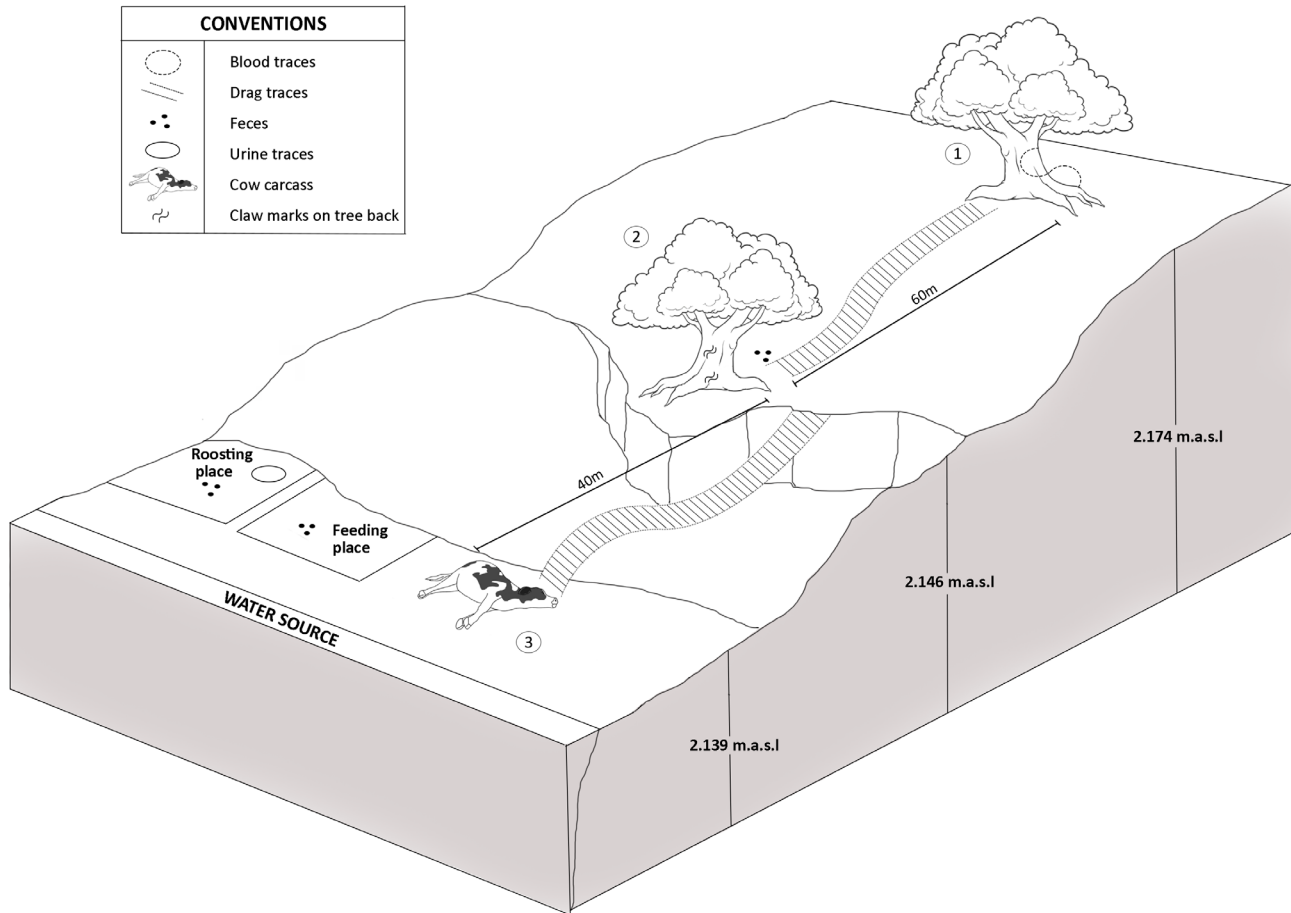


Figure 2. Diagram of a predation event on cattle in the municipality of Gigante (department of Huila) at the Cerro Páramo Miraflores Regional Park (02°15'03.42" North, 75°7'06.51" West, 2311 m above sea level).

DISCUSSION

Attack reports provided here agree with what has been described in this regard (Peyton 1980, Goldstein 1991, Poveda 1999, Castellanos 2002, Goldstein *et al.* 2006, Torres 2008, Figueroa 2015, Zukowski and Ormsby 2016; Albarracín and Aliaga-Rossel 2018, Bazantes-Chamorro *et al.* 2018, Laguna, 2018, Rojas-VeraPinto *et al.* 2020). However, very few authors mention the dragging behavior and final disposal of the carcass as happens with black bears and grizzlies (Acorn and Dorrance 1990, Cristescu *et al.* 2014, Allen *et al.* 2015, Stonehouse *et al.* 2016, Allen

et al. 2021). In the case of the Andean bear, it is common to find carcasses on the ground and tree nests located up to 8 m high or more (Fig. 3e). This strengthens the common view that the Andean bear places remains of the attacked carcass in their resting places and out of the reach of other possible scavengers such as dogs or vultures (Fig. 3f), as noted for grizzly bears (Green *et al.* 1997). We found Andean bears to drag their prey between 3 and 40 m away to the nearest water source, always in an area with a lot of vegetation cover and in quite rugged terrain, similar to the behavior reported for Grizzly bears and Black bears, that drag their prey into areas of dense vegetation before

Table 2. Average values between attack sites and carcass final disposition sites by Andean bears in the researched zones.

	Altitude (m above sea level)	Altitudinal variation (m)	Dragging distance (m)	Water source distance (m)	Access time (min)	Distance to the nearest inhabited settlement (km)
Average	2 921.91	80.18	157.44	13.91	79.09	1.28
Minimum	2 263.00	13.00	45.00	3.00	30.00	0.31
Maximum	3 432.00	397.00	884.00	40.00	240.00	6.42
Distance	421.05	108.26	243.29	9.55	66.55	1.77

feeding, sometimes covering it with leaves, grass and other debris (Acorn and Dorrance 1990, Allen *et al.* 2021). Generally, the Andean bear returns to the site where the carcass is located to consume the remains until the end (Supplementary video 1), as reported for other ursid species (Allen *et al.* 2021).

Andean communities that share the habitat with the Andean bear point out that the bear kills, drags its prey, buries it, or distributes it in different nests or beds (Fig. 3d and 3f), it can even move the carcass more than once, and the consumption of the prey is complete, as observed in black bears and grizzlies (Acorn and Dorrance 1990, Cristescu *et al.* 2014, Allen *et al.* 2015, Stonehouse *et al.* 2016, Seryodkin, 2016), but unlike these, the Andean bear consumes both the apophyses of the largest bones and the skin (Fig. 3f), and sometimes leaves the corpse until the degree of decomposition increases and returns to feed even on larvae (Fig. 3g, Gómez, pers. comm.), as the American black bear does (Acorn and Dorrance 1990). Similarly, we observed that the Andean bear may move carcasses at different times to finish eating them. The Andean bear can share cow carcasses found in pastures, just like polar bears with whales (Laidre *et al.* 2018), and up to seven Andean bears have been observed feeding on the same carcass at the same time (Orlando Suarez pers. comm., Parra-Romero *et al.* 2019). However, other aspects of the ethology of prey consumption by Andean bears are still unknown, such as whether they can claim prey captured by other predators such as pumas or jaguars.

The Andean bear is reluctant to pursue its prey over long distances, as other bear species are too, so it is possible to find animals that survived the attack, exhibiting claw marks on their shoulders, back and rump (Figs. 3a and 3b) (Acorn and Dorrance 1990, McDougall 2004), as well as teeth marks on the back and neck, since bear claws do not pierce or cut cleanly through the skin of prey like sharp, retractable claws of felines (Acorn and Dorrance 1990, Stonehouse *et al.* 2016). The information obtained from the carcasses found in the sites studied agrees with what has been described for black bears and grizzlies (Acorn and Dorrance 1990): bears usually capture their prey with a bite to the back near the withers or upper neck, in order to cause extensive damage to the spine and surrounding tissues (Fig. 3c) and attacked cattle may have claw marks on the head, neck, shoulders and other parts of the body, as in an individual of Mountain Tapir, *Tapirus pinchaque* (Roulin, 1829) attacked by an Andean bear (Fig. 3h) (Pisso-Florez *et al.* 2021).

The consumption behavior of prey attacked by bears has been documented by different authors (Murie 1948, Acorn and Dorrance 1990, Márquez and Goldstein 2014, Laguna 2018, Černe *et al.* 2019, Rojas-VeraPinto *et al.* 2020), but there is still no consensus on it. Acorn and Dorrance (1990) and Černe *et al.* (2019), point out that the brown bear begins to eat in the abdominal cavity, ingesting the internal organs first and then the muscles, but they also point out that the bear sometimes prefers to start eating the meat first then the viscera. Our results suggest that Andean bears prefer to consume the internal organs first and then the muscle (Fig. 4a).

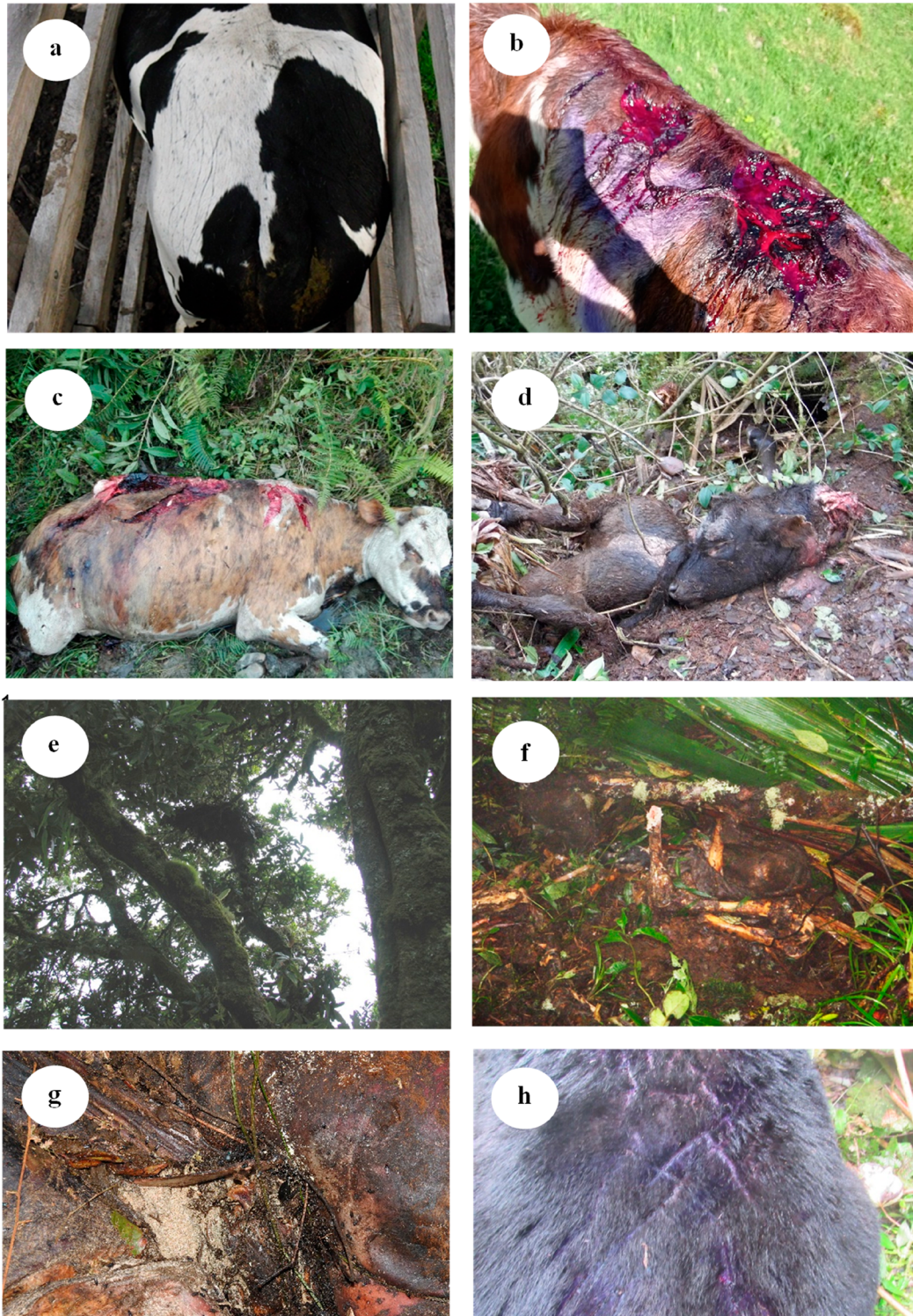


Figure 3: **a)** Bear claw scars on a calf attacked at Perijá mountain range, Colombia, Chiriamo rural division, La Paz municipality. **b)** Bear attack evidence on the back of a heifer in the municipality of Fómeque, Cundinamarca. **c)** Livestock carcass attacked by a bear in the municipality of Choachí, Cundinamarca. **d)** Calf remains dragged onto a bear den in the municipality of Fómeque, Cundinamarca (notice the forest soil in the background). **e)** Andean bear platform in the municipality of Piedecuesta over 12 m high in the forest surrounding the final carcass disposition site. **f)** Remains of a cow attacked in the municipality of Santa Bárbara, dragged 450 m from the attack site (notice the status of the femur and how its apophysis has been completely consumed). **g)** Remains of a cow attacked in the municipality of Gigante, Huila, dragged 110 m from the attack site (notice the number of larvae on the carcass). **h)** Bear claw scars on the back of a mountain tapir (*Tapirus pinchaque*) in the municipality of San Agustín, Huila.



Figure 4. **a)** Male Andean bear specimen that was found eating bleeding livestock in the Mina Palacio zone, Chingaza National Natural Park, municipality of La Calera (photo by Milton Julián Zamora Vargas). In this case, the livestock specimen had been giving birth, and the bear had already consumed the whole fetus and was eating the entrails at the time of human encounter. **b)** Male Andean bear specimen eating carrion in an extensive livestock paddock in the municipality of Gachetá, Cundinamarca. Notice the presence of black vultures (*Coragyps atratus*) (Photo by Javier Rodríguez, Wii Foundation).

Taking into account that the animal diet of the Andean bear varies from very small prey, such as insects or small rodents and birds (Gonzales *et al.* 2016), to prey of almost the same size (Figuerola 2015), it can be inferred that the consumption of livestock is not a new behavior, but, as Rodríguez (1991) proposes, it is the connection with resources that were not available before and that ensure their survival, due to the versatility in habits and exploitation of tropical diversity, which allows food supply in the combination of factors and resources such as the combination of events (fruiting) and resources (animal and plant species) and the anticipation of change to these events (migration and movements), characteristics of an opportunistic species (Peyton 1980, Sandoval-Guillén and Yáñez-Moreta 2019).

In the case of black bears attacking domestic livestock in British Columbia, these are presumed to be learned behaviors (COS-BC 2016). According to these authors, black bears can become efficient predators and can attack prey of all sizes, although they prefer small animals such as young cattle, sheep, goats, and pigs, which agrees with what was found during the present research. Like what is found for black bears, Andean bears are usually opportunistic and if prey is available, they will try to hunt it, being mainly mutilators when it comes to attacking and killing. The fatal injuries will occur in the upper part of the neck,

where serious damage to the spinal column is evident. We do not know if all Andean bears that kill cows drag the prey for later use.

The conditions of low-care livestock farming in the reports studied here, agree with what has been reported in the literature (Poveda 1999, Jorgenson and Sandoval 2005, Gaitán 2010, Parra-Romero 2011, Restrepo 2012, Márquez and Goldstein 2014, Laguna 2018, Rodríguez *et al.* 2019), with a great remoteness of the grazing areas with long distances between houses and pastures, long walks to reach the livestock, and an evident abandonment of animals with no recurrent visits to verify its health (Parra-Romero 2011), favoring attacks by wildlife. The sites visited in this study were located between 30 and 240 min (between 0.31 and 5.56 km) from the nearest houses of human habitation.

Most Andean bear attacks on livestock are reported late to regional environmental authorities, given that affected ranchers sometimes visit their cattle infrequently (up to fifteen days between visits; Parra-Romero 2011), making it difficult to notice an attack early. This means that the corresponding field verifications are also carried out long after the attack occurs, when most of the information required for verification has already been lost, making it difficult to determine with any degree of certainty if the cause

of death of the animal was a bear attack, or if the bear was just scavenging. When the carcasses are available, it is presumed that the Andean bear takes advantage of the carrion (Fig. 4b). In most cases, when farmers find the bear feeding on the dead carcass, they blame it for killing it.

Although there is not enough information on the percentage of animals killed on attacks by either Andean bears, pumas, or feral dogs, based on the information collected so far, it can be stated that the bear attacks do not represent more than 10 % of the deaths or injuries. All attack cases studied for this article included the dragging of the prey and a final disposal of the carcass in a place different from the initial site of the attack. All the cattle attacked by an Andean bear showed (1) dragging of more than 45 m from the place of attack, (2) trampled earth, (3) marked trees in the vicinity and (4) fecal samples.

The loss of forests for the creation of pastures in the middle of them is what generates this type of encounter between wild and domestic fauna. Laguna (2018) infers that, due to the loss of native forests and the increase in grasslands, agriculture, and livestock, a loss of wild food for large mammals is generated, reducing the quality of the habitats occupied by the species and increasing the areas of potential interaction, which are the main cause of bear-human conflicts. However, it is possible that attacks on domestic fauna are also due to learned behaviors, facultative conditions of this bear species to explore potential elements in the diet (Rodríguez 1991), or the phylogenetic information inherited from the short-faced bears group, to which the species belongs (Soibelzon and Schubert 2011).

Andean bear attacks on high-mountain livestock represent a challenge for their conservation, as retaliatory hunting against bears constitutes one of the main threats to the survival of this species. However, most Andean bear attacks on livestock are related to poor livestock management, and some of these suspected cases may be due to misidentification, corresponding to attacks by other species of wild or domestic animals, or scavenging by the Andean bear. We provide information on the attack behavior and final spatial disposal of the prey attacked by *T. ornatus*, aiming to provide safe guidelines and clues that facilitate the correct identification of attacks on livestock.

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This is the first posthumous scientific article published by our colleague Adriana Reyes, so we would like to make her a gratitude tribute: “Adriana, your perseverance, greatness, dedication, and commitment left lasting marks on the bear forests and in the hearts of the people... Thank you, Mona”.

AUTHORS' CONTRIBUTIONS

AR, DR, DPO, NRA conception, design, data collection, analysis and writing of the document; FS data collection and analysis; HR data collection, analysis and writing of the document; OF data collection and analysis; DB conception, data collection and analysis.

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