11 04 13 Plagio: los Ana Rosa Quintana de la investigación, pillados.

La revista "Behaviour" (comportamiento), acaba de retirar un artículo que había sido publicado en Diciembre del 2009 por investigadores españoles. **El motivo: ¡¡¡plagio!!!** Tanto el artículo retirado, como la explicación de la revista, se pueden encontrar al final de estas letras.

El título: Evidence of sexually selected infanticide in an endangered brown bear population .

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La verdad es que el asunto, gravísimo porque desprestigia a todos los que desarrollan su trabajo de forma honesta, sólo con la explicación de la propia revista ofrece pocas dudas. Para quienes no dominen el inglés, aquí va una traducción:

"Este artículo ha sido retirado: por favor, consulte la política de retirada de artículos de Elsevier (http://www.elsevier.com/locate/withdrawalpolicy). El artículo ha sido retirado a requerimiento de los editores. Los autores se han apropiado de

forma indebida de datos, plagiado y ocultado la autoría de un trabajo que ya había aparecido en Palomero et al. (2007) Osas, El comportamiento de las osas y sus crías en la Cordillera Cantábrica, Fundación Oso Pardo. Fundación Oso Pardo (FOP) and Fundación Biodiversidad (153 pp. +DVD. ISBN 978-84-612-1173-9). Una de las condiciones de remisión de un trabajo para publicación es que los autores declaran explícitamente que su trabajo es original y no ha aparecido en una publicación en otro lugar. La reutilización de cualesquiera datos debe ser citada de forma apropiada. Como tal, este artículo representa un abuso severo del sistema de publicación científica. La comunidad científica adopta un punto de vista muy duro sobre este asunto y piden disculpas a los lectores de la revista por el hecho de que no se detectara durante el proceso de remisión".

En las próximas semanas, comprobaremos las consecuencias. Podría ocurrir que, como en su día hizo la presentadora Ana Rosa al descubrirse que su siguiente *bestseller* había sido casualmente escrito por otra autora años atrás, se culpa a algún "negro" de haber escrito el trabajo con poco rigor (en este caso seguramente un pobre becario); o si se argumenta que en realidad es todo fruto de un lamentable malentendido, o de una persecución poco ética por parte de grupos de investigación rivales; o cualquier otra explicación imaginativa, ya que de alguno de los "investigadores" se conocen ya sobrados antecedentes en cuestión de excusas grotescas; incluso, es previsible que como en otras ocasiones se exhiban cartas de apoyo de ilustrísimos investigadores (preferentemente extranjeros, que luce más) avalando lo que sea. Sobre todo, habrá que comprobar si ese **comité de ética de la investigación científica** española que preside el Dr. Pere Puigdomenech actúa, lo que sería casi una primicia, dada la escasísima actividad demostrada en los años de existencia; o, por el contrario, todo este asunto se queda poco más que en un leve sonrojo de los "autores" del trabajo.

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Commentary

Evidence of sexually selected infanticide in an endangered brown bear population

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The behaviour of individual animals has often been studied from the perspective of the selective forces driving it, but independent of its conservation consequences (Sutherland 1998). However, behaviour and behavioural ecology have a relevant role in the conservation of biodiversity (e.g. Clemmons & Buchholz 1997; Caro 1999). Recently, several links between behaviour and conservation biology have been identified, including mating and breeding systems, specific habitat choice for various activities, ontogeny constraints, predator-avoidance behaviour, and movement ecology (Caro 2007). Our aim is to emphasize the relationship of another type of behaviour, the controversial sexually selected infanticide (SSI) in solitary carnivores, with the monitoring and conservation of endangered populations, using as a model the brown bear, *Ursus arctos*, in the Cantabrian Mountains (northern Spain).

Infanticide, the killing by conspecifics of (usually) unrelated offspring, has been documented in over a hundred species of mammals (Agrell et al. 1998; Ebensperger 1998). Initially, infanticide was considered to be a pathological behaviour, but now it is recognized as an adaptive behaviour that may increase the fitness of the perpetrator (Hrdy 1979; Hausfater & Hrdy 1984). Adults of both sexes can kill unrelated young to exploit them as a food resource (i.e. cannibalism or intraspecific predation). Infanticide by females has been widely documented in mammals (e.g. Wolff 1993; Agrell et al. 1998); females could benefit from killing conspecifics' offspring by reducing competition (present or future) for resources. The killing of unrelated young by males to obtain a mating opportunity with the victimized female, i.e. SSI, seems to be common in mammals when (a) the young are vulnerable and (b) the loss of offspring results in the mother returning to oestrus quickly (Van Noordwijk & van Schaik 2000). Together with primates, carnivores seem to be the most likely candidates among mammals to commit SSI (Packer & Pusey 1984). Despite some controversy (e.g. Miller 1990; Miller et al. 2003; McLellan 2005), the occurrence of SSI in brown bears seems well documented (Swenson et al. 1997, 2001a; Swenson 2003; Bellemain et al. 2006).

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However, no direct field observations of infanticide behaviour are available in the scientific literature, nor have the effects of SSI on endangered brown bear populations been considered. Here, we describe one complete observed infanticidal event and report on others in the highly endangered brown bear population of the Cantabrian Mountains (northern Spain). We consider the compatibility of these observations with SSI.

Previous discussions about the occurrence, frequency, and demographic effects of SSI in brown bears have been hampered by the absence of observations of infanticides or other events of cub mortality. As a consequence, factors influencing cub survival are poorly understood, despite much literature discussing the variables related with the topic. Adult sex ratio, bear density, adult male density, carrying capacity, food shortage, dispersion and social structure, and population management (hunted or not) are among such variables (McLellan 1994; Swenson et al. 1997, 2001a; Miller et al. 2003; Zedrosser et al. 2009). Also, adult female bear counterstrategies to avoid infanticide (e.g. home range reduction and habitat segregation) have been considered in the context of this discussion (Wielgus & Bunnell 1994, 1995; Miller et al. 1997; Haroldson et al. 2002; Dahle & Swenson 2003a, b). Further, promiscuity to confound paternity (Bellemain et al. 2006), which is apparently common in some Cantabrian areas (Fernández-Gil et al. 2006), has been argued.

In this study we present direct and indirect evidence of infanticide, examine it in the light of the requirements of sexual infanticide, and discuss its significance as a cub mortality factor in the Cantabrian range. We also discuss the effect of the loss of entire litters due to presumed sexual infanticide on the main index used for analyzing trends in the Cantabrian Mountains population, i.e. the annual count of females with cubs of the year (Wiegand et al. 1998; Palomero et al. 2007a). This highlights the importance of behavioural studies for population monitoring and conservation (Caro 2007; Angeloni et al. 2008).

The Cantabrian Bear Population and Data Sources

The Cantabrian brown bear population includes about 100 individuals (Servheen et al. 1999; Zedrosser et al. 2001) in two populations (western and eastern) and could be the last remnant of the oldest genetic brown bear maternal lineage in Eurasia (Taberlet & Bouvet 1994; Swenson et al. 2000). Detailed descriptions of the study area can be found in Naves et al. (2003) and Fernández-Gil et al. (2006). The Cantabrian Mountains offer opportunities for direct observations of bears because of the lowest proportion of forest among all the bear ranges in Europe (about 30%) in a rugged landscape, which allows long-distance visibility from suitable points on the opposite slopes (Fernández-Gil et al. 2006). In fact, direct observation of females with cubs of the year is a major monitoring method in this population (Wiegand et al. 1998; Ordiz et al. 2007; Palomero et al. 2007a). Close monitoring of family groups is a conservation goal of the Cantabrian Brown Bear Conservation Strategy (Ministry of the Environment of Spain 2001). Females with cubs of the year are counted through direct observation in the western subpopulation of the Cantabrian area, whereas looking for tracks of family groups is the most common method used in the more flat and forested eastern subpopulation (Palomero et al. 2007a). Bear locations and other data are detailed in forms and unpublished reports from the regional agencies with management responsibility for wildlife in Spain. Bear forms, filled out mainly by federal and regional rangers, include the name of observer, date and location of a bear record (direct observation, track sets, scats, other bear sign), details on behaviour (in the case of direct observation), number of individuals, whether they are females with cubs, and measurements of track prints.

To identify potential SSI events, we reviewed all available bear forms (several thousands), unpublished reports, and necropsy reports of dead cubs from the environmental agencies. Also, we interviewed at least one of the observers in each confirmed or suspected infanticidal event. In addition, one of the SSI events was observed and filmed by one of us (C.G.). When two adult bears and cubs were observed we assumed that the larger bear was the male, because adult male European brown bears are on average twice as big as females in the wild (Swenson et al. 2007).

Confirmed and Probable Cases of SSI

Nine infanticide events have been detected since 1996 (eight during 2000–2008). Four of them were considered 'confirmed' and five 'probable' (Table 1). We distinguished between confirmed or probable according to the following criteria.

(1) Confirmed when: (a) at least one cub was observed to be killed by a big bear (probably a male) in the presence of the mother, and dead cub remains were collected at the site (two cases); or (b) actual killing was not observed, but two adult bears were seen acting aggressively and dead cub remains with severe injuries were collected at the site (two cases).

(2) Probable when: (c) the remains of a killed cub(s) were collected and adult bears (at least one of them being the mother of the cubs) or their sign (tracks) were observed at the site (three cases); or (d) after being observed accompanied by young cubs, the adult female was seen acting aggressively towards another adult bear (probably a male) and the cubs were never seen again (two cases).

A description of the nine events is given in the Appendix.

One complete event (no. 2 in Table 1), lasting 48 min, was observed and filmed by one of us (C.G.). An adult female and three cubs of the year were chased by a big bear (probably an adult male) that killed all three cubs, despite vigorous defence by the mother. After the first cub was killed, the mother with the two remaining cubs outran the male briefly. A few minutes later, the male found the family again and sequentially killed the remaining cubs. Two

Table 1
Confirmed and probable cases of infanticide in Cantabrian brown bears, northwestern Spain

No.	Date	No. cubs with female	No. cubs lost	No. cubs retrieved	Criterion	Killer
1	10 June 1996	1	All	1	Confirmed (b)	Unknown adult
2	15 June 2000	3	All	3	Confirmed (a)	M ad
3	26 May 2001	2	All	None	Probable (d)	M ad
4	3 June 2004	2	All	None	Probable (d)	Unknown
5	1 June 2005	>1	>1	1	Confirmed (b)	M ad
6	3 June 2005	2	All	1	Confirmed (a)	M ad
7	25 May 2006	3	All	1	Probable (c)	Unknown
8	28 April 2007	>1	>1	1	Probable (c)	Unknown
9	8 June 2008	2	>1	1	Probable (c)	M ad

Cases 1–8: western population; case 9: eastern population. For criteria, see details in the text. M ad: known or judged to be an adult male.

days later, the carcasses of all three cubs were found in the area. A video of the killing of the second cub is available in the Supplementary Material (video clip copyright by C. Granda).

In case 6 (Table 1), the rangers who had observed the killing of one cub obtained samples at the infanticide site, including the dead cub and 11 bear faeces. Eighteen microsatellite loci and the sex marker SRY were amplified using the polymerase chain reaction as described in Pérez et al. (2009). The 18 loci allowed us to identify an individual unambiguously ($P_{ID} = 3.28 \times 10^{-9}$ and $P_{ID\text{-}sibs} = 1.16 \times 10^{-4}$). A set of 39 genotypes from the western subpopulation of the Cantabrian brown bear (Pérez et al. 2009), including the individuals identified at the site of the infanticide, was used to determine the relatedness between individuals. We determined parentage using PARENTE (Cercueil et al. 2002) and Kinship 1.3.1 (Goodnight & Queller 1999). Four individuals were identified, three females (including a dead cub) and one male. The probability that the only male detected, and the probable perpetrator, was the father of the victim was very low (<0.005), even if we did not know the mother; if the mother was any of the identified individuals, the probability was null (details can be obtained from T.P. and A.D.).

All the cases occurred between 28 April and 15 June, the mating period of Cantabrian brown bears (Clevenger et al. 1992; Fernández-Gil et al. 2006). Evidence to consider most or all of the observed infanticide events as SSI is strong. Despite many observations of females with cubs in other periods of the year, no infanticide was observed outside the mating season, thus supporting a basic premise of SSI, i.e. the perpetrator kills the cubs to mate with the female. Another basic premise, i.e. the perpetrator was not the father of the killed cubs, was documented in Case 6 with genetic samples. In at least two other cases (numbers 3 and 4), the victimized female (recognized by her natural markings) mated after the infanticide, as she produced cubs the following year, meeting another basic premise of SSI, although we were not able to investigate whether the infanticidal males fathered the female's next litters. To obtain sexual access to the female, the killing of the entire litter is essential. In four of nine cases (numbers 1, 2, 3, and 4) the entire litter was lost; in two cases (numbers 6 and 7) we suspected it, because the mothers were observed leaving the area alone, and in three other cases (numbers 5, 8, and 9) it could not be determined. The infanticide events spanned a period of 12 years and distances of up to 300 km. Although we cannot exclude the possibility that the reported events involved a single male, that seems unlikely taking into account the time length and distances, in two subpopulations with almost no contact between them (Pérez et al. 2009).

Cub Mortality Rates and Infanticide in Brown Bears

Cub mortality rates in brown bear populations range between 4 and 66% in North America and Europe (Table 2). Most studies (nine of 11 in North America and two of three in Europe) show mortality rates >20%. The rate in the Cantabrian population (0.40) is quite close to the mean (0.34), pooling the data from Table 2 ($N = 1353$ cubs).

Assuming that the current annual counts of females with cubs of the year (hereafter F_{cub}) are accurate (Wiegand et al. 1998; Palomero et al. 2007a; but see Fernández-Gil et al., In press), during 1996–2005 a minimum of 10–20% of the annual litters suffered infanticide (confirmed and probable) in the years with recorded cases. In that period, six litters suffered infanticide from a total of 75 F_{cub} estimated, and 11 cubs were lost because of infanticide from a total of 137 detected (so a minimum of 8% of cubs were lost by infanticide; F_{cub} data came from federal and regional agencies' bear databases and our unpublished data).

Table 2
Mean cub mortality rates from 11 brown bear populations (study areas) in North America and three populations in Europe

Study area	Mortality rate	Sample size (*N*)	Study period
North America			
Northern Continental Divide (Montana)*	0.10	62	1969–1991
Flathead (British Columbia–Montana)†	0.15	81	1978–2000
Banff National Park (Alberta)‡	0.21	53	1994–2002
Swan Mountains (Montana)§	0.23	28	1987–1996
Yellowknife (Northwest Territories)‖	0.26	57	1995–1999
McNeil Sanctuary (Alaska)¶	0.31	120	1978–1991
Yellowstone (Montana–Wyoming–Idaho)#	0.36	137	1983–2001
Southcentral Alaska**	0.37	167	1980–1996
Black Lake (Alaska)**	0.43	107	1988–1996
Denali National Park (Alaska)**	0.66	88	1991–1998
Katmai National Park (Alaska)**	0.66	99	1989–1996
Europe			
Northern Sweden††	0.04	78	1988–1998
Central Sweden–southeast Norway††	0.35	126	1988–1998
Cantabrian Mountains‡‡	0.40	150	1982–1991

Sample size (*N*) refers to cubs.
* Aune et al. (1994).
† McLellan (2005).
‡ Garshelis et al. (2005).
§ Mace & Waller (19[illegible]).
‖ McLoughlin et al. (20[illegible]).
¶ Sellers & Miller (1994).
# Schwartz et al. (2005).
** Miller et al. (20[illegible]).
Swenson et al. (2001a).
‡‡ Wiegand et al. (1998).

known mortality rate of cubs by infanticide in our study seems to be lower than that recorded in central Scandinavia, where the total mortality rate of cubs, most of which is presumed to be caused by infanticide, is about 40–50% (Swenson 2003; Zedrosser et al. 2009). However, our data are underestimates, because we do not know the fates of entire litters that could have been lost, as bears have not been radiotracked in the Cantabrian Mountains since 1998. Nevertheless, cubs are not usually radiotagged, so causes of mortality are particularly poorly known in most populations (Swenson et al. 2001a; Miller et al. 2003; Garshelis et al. 2005). However, we found that known and suspected infanticide was responsible for at least 20% of the total cub mortality in the Cantabrian Mountains (see Wiegand et al. 1998).

Infanticide of Bear Cubs: SSI or Predation?

Infanticide has been reported or suggested in many brown bear populations, but whether such infanticide is SSI or predation has caused controversy (Swenson et al. 1997; Miller et al. 2003; McLellan 2005). For some authors infanticide in brown bears is a foraging strategy rather than a mating one (Craighead et al. 1995). Among the published events of intraspecific killing in brown bear populations (Table 3), the killer was a male in a high proportion of cases when the sex was known (85% in North America and 96% in Europe). This proportion was 65 and 100%, respectively, considering only cubs as victims. Again, cubs have not usually been radiotagged so the sample for this age class could be underrepresented, whereas adult females could be overrepresented. In the Cantabrian range, all known intraspecific killing events were on cubs (Tables 1 and 3) and when the perpetrator was seen, it was confirmed or judged to be an adult male. We presented strong evidence that one infanticide event (Case 2 in Table 1) was SSI owing to the behaviour of the male and because the cubs were not consumed, so predation could be excluded. Other authors also found that killed cubs were not usually consumed (McLellan 2005).

Table 3
Documented age and sex classes of victims and perpetrators of intraspecific killing of brown bears from studies in North America and Europe

Victim	Killer						
	Adult female	Adult male	Unknown adult	Subadult male	Unknown male	Unknown	Total
North America*							
Adult female		16		1	2	7	26
Adult male		3				2	5
Subadult female		2				1	3
Subadult male		3				2	5
Unknown subadult		4					4
Yearling	1	4				3	8
Cubs	7	13	4			12	36
Total	8	45	4	1	2	27	87
Europe†,‡,§,‖							
Adult female		2					2
Adult male							
Subadult female							
Subadult male						4	4
Unknown subadult							
Yearling	1	2				7	10
Cubs		23	2			5	30
Total	1	27	3			15	46

All known victims in our study ($N = 16$) were cubs.
* McLellan (2005; $N = 87$).
† Swenson et al. (2001b; $N = 14$).
‡ Bellemain et al. (2006; $N = 15$).
§ This study ($N = 16$).
‖ Gârlea (1999; $N = 1$).

We have also investigated the sex of predatory bears killing roe deer, *Capreolus capreolus*; red deer, *Cervus elaphus*; and southern chamois, *Rupicapra pyrenaica*, in the Cantabrian range. Of 13 cases reported between April and September, seven were predation events carried out by adult female bears with cubs or yearlings, five by bears assumed to be males, and one by a bear of unknown sex (data from rangers' bear forms, Palomero et al. 2007a, and our unpublished data); nine cases involved fawns and four involved adults (two roe deer and two red deer). Thus the pattern was one of more female bears attacking and killing ungulates, but bears killing cubs were judged to be males. The literature also suggests that medium-size prey such as fawns of ungulates are often killed by females (Reynolds & Garner 1987), although other studies do not find differences among the sexes (Ballard et al. 1981; Boertje et al. 1988; Mattson 1997). Nevertheless, there may be some bias, e.g. because males might supplant females on a kill and the true perpetrator might be difficult to identify (Reynolds & Garner 1987; Boertje et al. 1988). This also suggests that the infanticidal events we documented were SSI.

SSI and Bear Conservation

SSI may have an important impact on the endangered brown bear population in the Cantabrian Mountains, because of its small size, its fragmented habitat, the influence of humans, and the relatively high mortality rates (Naves et al. 2001, 2003). These factors are common for most endangered bear populations (Zedrosser et al. 2001). It is possible that small and fragmented populations with a potentially high probability of unequal sex ratio are more prone to SSI (McLellan 2005). Our study population typically has five to 10 females breeding each year, based on the annual counts of females with cubs. Thus in a given year, there might be very few available oestrous females in some areas and competition for mating among males would probably be high. The proportion of forest in the Cantabrian Mountains is the lowest among the areas where bears exist in Europe; at the same time, human density (up to 12 inhabitants/km^2) is among the highest. The scarcity of suitable undisturbed habitat (Naves et al. 2003) and the high level of human disturbance could influence the ability of female bears to avoid SSI in the Cantabrian range by segregating from other bears during the mating season, a strategy observed elsewhere (see the introduction).

Also, SSI might be more common in populations with primiparity at younger ages, because young females are more prone to lose their offspring to SSI (Zedrosser et al. 2004, 2009), perhaps even more in a still endangered, but currently increasing population (Palomero et al. 2007a). In addition, high adult mortality rates in the Cantabrian Mountains, at least in the recent past (Naves et al. 1999), could lead to a high proportion of potentially infanticidal males moving into areas where they had not fathered young (Swenson et al. 1997, 2001a), thus increasing the vulnerability of females with cubs.

The occurrence of infanticide affects population dynamics (Swenson et al. 1997; Wielgus & Bunnell 2000; McLellan 2005), especially considering that SSI might be involved in brown bear population regulation mechanisms (Ordiz et al. 2008). For instance, the interval between consecutive litters is an essential reproductive parameter determining brown bear population growth rates (Eberhardt et al. 1994). So increased litter intervals between weaned litters (a more descriptive demographic parameter than interbirth interval, see Kovach et al. 2006) may influence population growth, for example if high rates of SSI occur (Swenson et al. 1997, 2001a). At the same time, SSI may confound managers relying on annual counts of F_{cub} to estimate the demographic population trends. The annual counts of F_{cub} are the main index for estimating population trends in Cantabrian bears (Wiegand et al. 1998; Palomero et al. 2007a). Using this index (F_{cub}), Palomero et al. (2007a) reported that the western bear population in the Cantabrian Mountains was recovering (F_{cub} increasing at 7.5% annually). However, when we removed infanticide events in Table 1 (four cases) from the annual counts of F_{cub} for the period 1994–2004 (Palomero et al. 2007a) and performed a generalized linear model

fit with the 'corrected' number of F_{cub} of the year as a response variable, with Poisson error distribution and a natural log link function, the observed F_{cub} trend of 0.069 (SE = 0.04) was not significant ($P = 0.59$). Thus, the occurrence of SSI may contribute to the false impression of a population increase while actually hiding a reduction in recruitment.

Concluding Remarks

We believe that SSI in brown bears should be considered proven in the Cantabrian range and that the described direct observation of this phenomenon exemplifies the interactions between animal behaviour and conservation. The endangered status of the Cantabrian bears, together with the conditions promoting it (low population size, reduced suitable habitat, high human density) may fuel SSI, which may affect population size negatively, but at the same time mask these effects when measured by observations of F_{cub}. These kinds of feedback are typical of a vortex of extinction (Lande 1993) and could apply to many other small and endangered populations, which deserves careful attention by corresponding scientists and managers.

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Supplementary Material

Supplementary material associated with this article can be found, in the online version, doi:10.1016/j.anbehav.2009.11.027.

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APPENDIX

Description of Infanticide Events (Confirmed and Probable) in the Cantabrian Mountains (Case Numbers as in Table 1)

Case 1

On 6 June 1996, at the Sil drainage (western population), a female with one cub was seen in the morning. In the afternoon, two adult bears were seen chasing each other. The actual killing of the cub was not observed, but fresh remains of a dead cub (killed only some minutes earlier) and the observation of a bear fleeing from the site (unknown adult, but probably a male) suggest it was an infanticide event. Source: Juanjo Rodríguez (observer of the case).

Case 2

On 15 June 2000, at the Ibias drainage (western population), the following event was filmed by one of the us (C.G.). The film is available as in the Supplementary Material. On 8 June 2000 several local people watched a female and three cubs as they crossed a river close to a village and ascended a slope covered by shrubs of broom, *Genista* spp., and heather, *Erica* spp., 3.2 km from the den site (which was known from previous observations in early May by C.G. and other rangers). From 8 to 15 June, rangers and NGO personnel monitored the family group intensively, obtaining observations on predatory behaviour of the female bear, which successfully killed at least four roe deer fawns. The female and the cubs remained in an area < 1 km^2 during that period, and no other bears were observed.

During the afternoon of 15 June, C.G. and L. Fernández were watching the family group when a big, dark bear (an adult male, as it was almost twice the size of the female) attacked the group and tried to capture a cub. The female intervened, moving between the cubs and the male and confronted him aggressively. A very rough fight followed, during which both adult bears fell down the steep slope while all three cubs moved to a rocky outcrop. However, the male managed to outrun the female and reached the cubs before her. He grabbed and immediately killed one cub, and the other two fell from the cliff. While the male was out of sight, the female joined the two cubs and they all climbed to the summit of the cliff and remained together there. The male tried to reach the spot and again both adults fought vigorously. When a cub fell again from the cliff, the male tried to reach it, but the female bit the male and both fell down the slope again. Finally, the male managed to reach the cub and killed it. The female ran from the spot and rejoined the remaining cub on the cliff and began to move along the slope. Four minutes later, the male came from the scrub and located the female and the cub, seemingly by scent, and reached them in a few seconds. Again both adults fought vigorously while the last cub was out of sight under the broom shrub. Finally the male found the cub, bit it in the neck and back, and shook it in his mouth until it died. The female left the area, crossing the river at the same spot she and her cubs had crossed it 7 days earlier, and walked up the slope until out of sight. No bears were observed until dusk, 2 h later. The complete incident lasted 48 min of the entire 99-min observation of the bears that afternoon. Two days later (17 June) the remains of three cubs were found in the area, only partially eaten. As the female was unmarked and had no distinctive physical features, we could not determine her subsequent movements or behaviour. Observer: C.G. Additional consulted sources: Luis Fernández and administration bear forms.

Case 3

This incident occurred on 26 May 2001, in the Somiedo drainage (western population). A well-known female, easily identifiable by conspicuous markings on the neck and from previous radiotracking of her family group (Naves et al. 2001), and her two cubs had been monitored closely from 8 to 23 May. On 26 May, the female was observed without cubs. She acted aggressively towards a bigger bear, probably an adult male. The cubs were never seen again. This female bred in 2001, because she was observed with cubs the following year. Sources: Jesús Sanchez (observer of the case) and administration bear forms.

Case 4

This event was observed on 3 June 2004, in the Somiedo drainage (western population). The same female as in case 3 was closely monitored with two cubs from 13 May to 2 June. On June 3 she was observed carrying a dead cub in her mouth, with another big bear (probably a male) in close proximity. She was not observed with cubs again in 2004. The female bred in 2004, as she was seen with cubs in 2005. Source: Jorge Martí (observer of the case) and administration bear forms.

Case 5

On 1 June 2005, in the Sil drainage (western population), a hunter stalking roe deer saw a very big, dark bear (probably an adult male) vigorously fighting with a small, blonde bear (probably a female). During the fight, the larger bear killed a cub and stood over the carcass while the blonde bear tried to get to it. A freshly killed cub carcass (male) was retrieved the following day by a forest ranger, but no other samples were gathered. Source: Manuel Pérez (observer of the case).

Case 6

This event occurred on 3 June 2005, in the Ibias drainage (western population), 1.5 km from case 5 but involved a different female with cubs. The female with two cubs was monitored on 26 and 27 May and on 1 and 3 June. On 3 June, while the female with two cubs was being monitored, a big dark bear (probably an adult male as judged by the rangers and shown by the video footage they took of all four bears on that date, although not of the attack) was seen approaching the family group and, after fighting with the adult female, was observed killing one of the cubs. The female left the area without cubs later that day. A female cub carcass and 11 scats were collected on 5 June, presumably from the observed bears during the 4 days of monitoring (results of genetic analyses reported in this study). The necropsy reported wounds on the neck, the right forelimb was severely mutilated, and most viscera and lungs were missing. Sources: Fernando Somoano (observer of the case), Miguel F. Otero, and administration bear forms.

Case 7

This case was recorded on 25 May 2006, in the Sil drainage (western population). A female with three cubs was seen on 23 May. The same female, alone and appearing to be anxious, was seen on 25 and 26 May. A carcass of a cub was retrieved from the site on 27 May, soon after the female had left the area alone. Sources: Luis Fernández and administration bear forms.

Case 8

On 28 April 2007, in the Somiedo drainage (western population), a large, dark bear (probably a male) was seen standing over a dead cub, whose carcass was retrieved on the following day. Another smaller bear (probably a female) was in the area. It did not show any apparent protective behaviour towards the dead cub. The necropsy reported sharp wounds in the thorax and abdomen, the right hindlimb severed from the hip, and most viscera and lungs missing. Cause of death was reported in the necropsy to be 'predation by a male bear', although the sex of the perpetrator had not been confirmed. Sources: Antonio González (observer of the case) and administration bear form and report.

Case 9

On 8 June 2008, in the Pisuerga drainage (eastern population), rangers from the Castilla y León region and personnel from the NGO Fundación Oso Pardo retrieved the remains of a freshly killed cub. Previously, during May, a female with two cubs had been observed in the area by rangers and NGO personnel. At the site, the rangers found large bear tracks, compatible with those of a male, and signs of intense activity, possibly fighting. Furthermore, the necropsy of the remains (skull, part of the vertebral chain, and both forelegs) reported a traumatic death compatible with wounds caused by an adult bear. Sources: Castilla y León ranger and administration report.

Abstract

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Commentary

RETRACTED: Evidence of sexually selected infanticide in an endangered brown bear population

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This article has been retracted: please see Elsevier Policy on Article Withdrawal (http://www.elsevier.com/locate/withdrawalpolicy).

This article has been retracted at the request of the Editors.

The authors have misappropriated data, plagiarized and concealed the authorship of work that had already appeared in Palomero et al. (2007) *Osas, El comportamiento de las osas y sus crías en la Cordillera Cantábrica, Fundación Oso Pardo. Fundación Oso Pardo (FOP) and Fundación Biodiversidad* (153 pp. +DVD. ISBN 978-84-612-1173-9). One of the conditions of submission of a paper for publication is that authors declare explicitly that their work is original and has not appeared in a publication elsewhere. Re-use of any data should be appropriately cited. As such this article represents a severe abuse of the scientific publishing system. The scientific community takes a very strong view on this matter and apologies are offered to readers of the journal that this was not detected during the submission process.

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