

**REVIEW OF THE STATUS OF *RUPICAPRA PYRENAICA* BONAPARTE, 1845 ssp. *ORNATA* NEUMANN, 1899 IN THE PERIODIC REVIEW OF SPECIES INCLUDED IN THE CITES APPENDICES RESOLUTION CONF. 11.1 (REV. COP15) AND RESOLUTION CONF. 14.8**

## **INTRODUCTION**

At its 25<sup>th</sup> meeting (Geneva, 2011), the Animals Committee selected *Rupicapra pyrenaica ornata* for review under the Periodic Review of Appendices taking place between CoP15 (2010) and CoP17 (2016) (AC25 Doc. 15.6; AC26 Doc.13.3). The CITES Secretariat issued Notification to the Parties No. 2011/038 (*Periodic review of species included in the CITES Appendices*), inviting range States of the taxa concerned to comment within 90 days (by 20<sup>th</sup> of December 2011) on the selection and to put forward offers to review the species. The EU offered to undertake the review for this species, which was conducted by Italy, in collaboration with UNEP-WCMC.

The Animals Committee endorsed this proposal by postal procedure after AC26 as part of the Periodic Review of the Appendices (Resolution Conf. 14.8).

The sub-species *R. pyrenaica ornata* is the only member of the genus *Rupicapra* to be listed in the CITES appendices – the remainder of the species and genus are not listed in the CITES appendices

## **PROPOSAL**

To transfer *Rupicapra pyrenaica ornata* from CITES Appendix I to CITES Appendix II, in accordance with provisions of Resolution Conf. 9.24 (Rev. CoP15), Annex 4 precautionary measure A1 and A2 and to meet the guidance on split-listing (Resolution Conf. 9.24 [Rev. CoP15], Annex 3).

The subspecies *R. pyrenaica ornata* is endemic to Italy; it is protected both nationally and internationally; the population trend of the taxon is increasing; the subspecies does not appear to be in demand in international trade and the listing is contrary to the current advice on split-listings outlined in Resolution Conf. 9.24, Annex 3.

However, whilst *R. pyrenaica ornata* was listed prior to the adoption of any listing criteria, it does meet some of the biological criteria for inclusion in Appendix I as outlined in Resolution Conf. 9.24 (Rev. CoP15), Annex 1. The wild population is small (criterion A), although it is now increasing due to active management and protection. Similarly, the wild population has a restricted range (criterion B), although this range is now increasing due to the (re)introductions into protected areas which are expanding its geographic range and reducing genetic isolation.

Furthermore, the current listing of *R. pyrenaica ornata* is inconsistent with measures for split-listing, which advise that this should be on the basis of national or regional populations rather than subspecies; split-listings that place some populations of a species in the Appendices, and the rest outside the Appendices, should normally not be permitted (Annex 3 of Resolution Conf. 9.24. [Rev. CoP15]).

Considering the recommendation to avoid implementation and enforcement problem with the split-listing, it is considered that identification of hunting trophies would not lead to enforcement problem as the subspecies is easily recognizable and it is not actually legally hunted.

As per the precautionary measures outlined in Resolution Conf. 9.24 (Rev. CoP15) Annex 4, its management is such that the Conference of the Parties would be satisfied with: i) implementation by the range States of the requirements of the Convention, in particular Article IV; and ii) appropriate enforcement controls and compliance with the requirements of the Convention (criterion A2b).

The proponent does not consider necessarily the downlisting as a first step to delisting. If the species is downlisted consequences of this action should be carefully monitored to evaluate the opportunity to proceed with delisting within the suggested lapse of time.

## PROPONENT

Denmark on behalf of the European Union Member States acting in the interest of the European Union.

## SUPPORTING STATEMENT

### 1. Taxonomy

**1.1 Class:** Mammalia

**1.2 Order:** Artiodactyla

**1.3 Family:** Bovidae

**1.4 Genus, species or subspecies, including author and year:** *Rupicapra pyrenaica* Bonaparte, 1845 ssp. *ornata* Neumann, 1899

**1.5 Scientific Synonyms:** *Rupicapra ornata*, *Rupicapra rupicapra ornata*

**1.6 Common names:**

English: Abruzzo Chamois, Apennine Chamois

French: Chamois des Abruzzes

Italian: Camoscio appenninico, Camoscio d'Abruzzo

Spanish: Gamuza alpina, Gamuza de los Abruzzos, Rebeco de los Abruzzos/Apeninos

**1.7 Reference number in the CITES Identification Manual:** A-199.009.044.001

### 2. Overview

*Rupicapra pyrenaica ornata* was included in CITES Appendix I on 01/07/1975. At its 25<sup>th</sup> meeting (Geneva, 2011), the Animals Committee selected *R. pyrenaica ornata* for review in the process of the Periodic Review of Appendices, to be conducted between CoP15 (2010) and CoP17 (2016) (AC26 WG1 Doc. 1).

The subspecies *ornata* is endemic to Italy, where it occurs in four isolated populations. Three of these populations are part of re-introduction programmes, with one of them numbering only a few animals, as the introduction process is still under way. In a 2008 assessment, *Rupicapra pyrenaica ornata* was considered to be Vulnerable by the IUCN. The main threats include effects related to its small population size and competition for space and food with livestock. There has been virtually no reported international trade in recent years (2001-2010), according to both importers and exporters. The subspecies occurs in a number of protected areas and is protected nationally and internationally.

### 3. Species characteristics

#### 3.1 Distribution

*R. pyrenaica ornata* is endemic to Italy, with three subpopulations in the Apennines (Wilson and Mittermeier, 2011), where it occurs in the National Parks of Gran Sasso-Monti della Laga, Majella and Abruzzo, Lazio and Molise (Herrero *et al.*, 2008). Animals have also been introduced to the Sibillini Mountains National Park (G. Amori, CITES Scientific Authority of Italy, *in litt.* to UNEP-WCMC, 2012).

### 3.2 Habitat

*R. pyrenaica ornata* occurs at altitudes of 400-2800 m above sea level (asl) and undertakes seasonal altitudinal migrations (Wilson and Mittermeier, 2011). The species usually remains above 1800 m asl during the warmer months, while descending to areas below 1100 m asl in autumn and winter (Nowak, 1991). It prefers forested slopes during the cold season, inhabiting more open areas such as alpine meadows and cliff ledges in warmer months (Lovari *et al.*, 2010; Wilson and Mittermeier, 2011). Subadult and adult males, however, tend to live in woodland for most of the year (Lovari, 1977).

### 3.3 Biological characteristics

The knowledge of chamois taxonomy, systematics and biology was considered incomplete (Corlatti *et al.*, 2011). The life history of *Rupicapra* spp. was considered to show apparently contradictory relationships between survival, sexual dimorphism and mating system, indicating that their survival strategy may not yet be fully understood (Corlatti *et al.*, 2011).

The population of *R. pyrenaica ornata* exhibits extremely low microsatellite diversity (Rodriguez *et al.*, 2010) as a result of two population bottlenecks during the two World Wars due to poaching (Lovari *et al.*, 2010).

*Rupicapra* spp. usually produce one young born during May and June, after a gestation of 170 days (Nowak, 1991). Twins and triplets also occur (Nowak, 1991). If a mother is killed, her young are taken care of by other females (Nowak, 1991). *Rupicapra* spp. live up to 22 years (Nowak, 1991).

The relatively slow expansion of the range of *R. pyrenaica ornata* was thought to be linked to the localized distribution of the food plant *Festuco-Trifolietum thalii* association, on which the species is heavily dependent (Dupré *et al.*, 2001).

### 3.4 Morphological characteristics

The head and body length of *R. pyrenaica ornata* is 105-120 cm, the tail 3-4 cm, with a shoulder height of 76- 80 cm and a weight of 20-35 kg (Wilson and Mittermeier, 2011). Its pelage is stiff and coarse and in summer the hair is about 4 cm long and of a reddish colour (Nowak, 1991). The hair of the winter coat is 10-20 cm long and of blackish brown colour with white markings on the head, throat, neck, shoulder and flanks, and with pale underparts; the underfur is thick and woolly (Nowak, 1991). Slender black horns, which are set closely together and rise almost vertically before abruptly bending backward forming hooks, are borne by both sexes (Nowak, 1991).

### 3.5 Role of the species in its ecosystem

The species is preyed upon by wolves (*Canis lupus*), brown bears (*Ursus arctos*), golden eagles (*Aquila chrysaetos*) (Dupré *et al.*, 2001) and red foxes (Wilson and Mittermeier, 2011). Wolves in particular are considered well established in both in the Gran Sasso-Monti della Laga and Majella National Parks (Mari and Lovari, 2006). *Rupicapra* spp. was reported to be able to alter forested areas to grassland in the absence of predators (Miller *et al.* 1982 in Sinclair, 2003).

Competition between *R. pyrenaica ornata* and domestic and wild ungulates, mainly for diet and space, were considered likely (Dupré *et al.*, 2001).

## 4. Status and trends

### 4.1 Habitat trends

The habitat trend was considered to be stable (G. Amori, CITES Scientific Authority of Italy, *in litt.* to UNEP-WCMC, 2012).

## 4.2 Population size

*R. pyrenaica ornata* was considered to be very rare and the population was estimated at fewer than 1500 animals (Lovari *et al.*, 2010), with the largest population occurring in the Abruzzo National Park, estimated at 530 animals in 2011 (G. Amori, CITES Scientific Authority of Italy, *in litt.* to UNEP-WCMC, 2012).

Its population was thought to have been very small for some centuries (Lovari, 1989; in Herrero *et al.*, 2008), with numbers plummeting during World War I and II to less than 50 animals in one single population (Dupré *et al.*, 2001) and later increasing again, as a result of increased conservation efforts, re-introductions and the establishment of two new populations (Herrero *et al.*, 2008).

## 4.3 Population structure

Herd sizes are variable, depending on the population density (Wilson and Mittermeier, 2011). Females and young live in herds, while adult males (fully mature at eight to nine years) are solitary for most of the year, joining the herds only in the late summer (Nowak, 1991). Subadult males tend to disperse from herds at the age of two to three years (Nowak, 1991), although to a lesser degree in the presence of several mature females (Lovari *et al.*, 2010); they may also be driven away from the herds during the autumn rut (Nowak, 1991). Subadult males are nomadic, only becoming attached to a specific area as they mature (Lovari, 1984; in Nowak, 1991). There is seasonal variation in herd size, with herds being largest in summer but dispersing when moving to their winter ranges (Lovari, 1984; in Nowak, 1991). Home ranges may range from 113 ha for females to 168 ha for males (Dupré *et al.*, 2001).

Female rank is correlated with age, weight and horn size, with body weight thought to be the most important factor in determining dominance (Locati and Lovari, 1991).

## 4.4 Population trends

The population was reported to be increasing, as a result of strict protection and reintroductions (Herrero *et al.*, 2008; G. Amori, CITES Scientific Authority of Italy, *in litt.* to UNEP-WCMC, 2012). In the early 1970s, the population was estimated at 250-300 animals (Dupré *et al.*, 2001), in the late 1980s at 400 animals, with a growing population leading to estimates of 1100 in 2006 (Mari and Lovari, 2006; S. Lovari pers. comm. 2006, in Herrero *et al.*, 2008) and almost 1500 animals a few years later (Lovari *et al.*, 2010).

An annual increase of seven per cent was observed for the population in the Abruzzo National Park (Mari and Lovari, 2006).

## 4.5 Geographic trends

*R. pyrenaica ornata* was reported to have had a larger distribution in the Holocene, occurring throughout the central Apennines in Italy, with its range being restricted in historical times (Lovari *et al.*, 2010).

## 5. Threats

The small population size and low genetic variability of the subspecies *ornata* render it vulnerable to many factors (Shackleton and the IUCN/SSC Caprinae Specialist Group, 1997) and was considered the main threat to the species (Dupré *et al.*, 2001). Competition with domestic caprins was noted as a main limiting factor for *R. pyrenaica ornata* (Herrero *et al.*, 2008), with competition with wild ungulates, potential transmission of disease, slow dispersal and colonization of new areas, free-ranging dogs, poaching and disturbance by tourism also considered to be threats (Dupré *et al.*, 2001). The subspecies *ornata* was however reported not to be affected by disease (J. Herrero pers. comm. 2006 in Herrero *et al.*, 2008). Poaching was not considered to impair the viability of the population in Abruzzo National Park (Herrero *et al.*, 2008).

*R. pyrenaica ornata* was categorised as Vulnerable by the IUCN in 2008, due to its small population size and restricted distribution (Herrero *et al.*, 2008). Previous assessments in the 1990s had categorised the species as Endangered, but strict protection and reintroductions led to a population increase and consequent re-categorisation (Herrero *et al.*, 2008).

## 6. Utilization and trade

### 6.1 National utilization

The meat of *Rupicapra* spp. was reported to be prized by some, its skin used as 'shammy' leather for polishing and the hair from the back of the winter hide used for the brush on Tyrolen hats (Nowak, 1991). However, this refers to legal trade in *R. rupicapra* and no such tradition is present in Central Italy (M. Valentini, CITES Scientific Authority of Italy, pers. comm. to UNEP-WCMC, 2012).

### 6.2 Legal trade

Global trade in *R. pyrenaica ornata* over the period 1975-2010 consisted of 143 skins and 800 kg skins, 29 trophies, 10 live animals and four bodies, according to importers, with some hair, horn products and garments also traded (Table 1). However, the majority of this trade was reported in the 1980s, primarily by the United States as '*Rupicapra ornata*'; some of this trade had unknown origin or an unknown exporter and it is likely that imports originating in Austria, France and the former Yugoslavia may have been *R. rupicapra*, whereas imports from Spain may have been *R. pyrenaica pyrenaica* or *R. pyrenaica parva*. Furthermore, imports reported by the United States from New Zealand may have been *R. rupicapra*, as New Zealand has an introduced population of this species (Wilson and Mittermeier, 2011). There has been virtually no reported trade in recent years (2001-2010), according to both importers and exporters. Italy has never reported any exports of *R. pyrenaica ornata* and the CITES Scientific Authority of Italy confirmed that they have no record of the single trophy reported as an import by South Africa in 2010 (M. Valentini, pers. comm. to UNEP-WCMC, 2012).

**Table 1:** All trade in *Rupicapra pyrenaica ornata* since the species listing on CITES Appendix I.

Exporter	Importer	Origin	*Purpose	*Source	Term (Unit)	Reported by	1975	1983	1984	1985	1986	1988	1989	1992	1995	1996	2002	2003	2005	2010	Total	
Canada	United States of America	-	-	C	live	Importer								3							3	
						Exporter																
France	United States of America	-	-	-	bodies	Importer			2												2	
						Exporter																
FYR Macedonia	Serbia & Montenegro	-	Z	C	live	Importer												2			2	
						Exporter																
Hong Kong, SAR	United States of America	Unknown	-	-	horn products	Importer				1											1	
						Exporter																
Iran, Islamic Republic of	United States of America	-	P	W	skins	Importer																
						Exporter																
Italy	South Africa	-	H	W	trophies	Importer															1	
						Exporter																
	United States of America	-	T	-	garments	Importer			20												20	
						Exporter																
																					2	
New Zealand	Canada	-	-	-	trophies	Importer		1													1	
						Exporter																
	United States of America	-	T	-	bodies	Importer			2												2	
						Exporter																
																						5
																						5
																						1
																						1
																					9	
																					9	
Spain	United States of America	-	-	-	trophies	Importer		4	4	1											9	
						Exporter																

Exporter	Importer	Origin	*Purpose	*Source	Term (Unit)	Reported by	1975	1983	1984	1985	1986	1988	1989	1992	1995	1996	2002	2003	2005	2010	Total	
	Venezuela, Bolivarian Republic of	-	H	-	trophies	Importer				1											1	
						Exporter																
Switzerland	Austria	-	-	W	hair	Importer																
						Exporter												34				34
Turkey	United States of America	former Yugosl./ Serb&Mont	-	-	trophies	Importer							1									1
						Exporter																
		-	-	-	trophies	Importer							2									2
						Exporter																
United Kingdom	United States of America	Unknown	T	-	skins (kg)	Importer		800														800
						Exporter																
United States of America	United States of America	Austria	-	-	trophies	Importer				2												2
						Exporter																
Unknown	United States of America	-	T	-	skins	Importer		143														143
						Exporter																

Source: UNEP-WCMC CITES Trade Database, April 2012.

**\*Key:** Purpose codes: H= hunting trophy, P= personal, T= commercial, Z= zoos; Source codes: C= animals bred in captivity, I= confiscated or seized specimens, O= pre-Convention, W= specimens taken from the wild.

### 6.3 Parts and derivatives in trade

Trophies and skins were the main parts and derivatives reported in trade for this taxon, although there has been virtually no trade in recent years.

### 6.4 Illegal trade

Not known. There is little evidence of trade or offers for sale of *R. pyrenaica ornata* over the internet and internet trade is not considered a concern (M. Valentini, CITES Scientific Authority of Italy, pers. comm. to UNEP-WCMC, 2012).

### 6.5 Actual or potential effects of trade

The species is protected nationally and internationally. Although poaching was reported to occur, it was thought to not impair the viability of the population in Abruzzo National Park (Herrero *et al.*, 2008). The CITES Scientific Authority of Italy confirmed that if any poaching does occur, it is at low level and not linked with trade activities (M. Valentini, pers. comm. to UNEP-WCMC, 2012).

## 7. Legal instruments

### 7.1 National

Italian hunting law (157/1992) protects *R. pyrenaica* as an especially protected species (Italy, 1992). The subspecies is included in Annex B (requiring the designation of conservation zones), D (requiring strict protection) and E (requiring the establishment of management measures) of law No 357/97 (Ministero dell'Ambiente, 1997). Law No 357/97 prohibits the killing, take and disturbing of specimens or their habitats of species included in Annex D, as well as their possession or commercial use (unless legally acquired prior to the law being in force), with derogations for take or keeping only granted in the absence of satisfactory alternatives and on a selective basis only.

### 7.2 International

*R. pyrenaica ornata* has been listed in CITES Appendix I since 01/07/1975. It was included in Annex A of Commission Regulation (EU) No 338/97 and most recently, in Commission Regulation (EU) No 101/2012. It is also included in Annex II (species of community interest requiring the designation of special areas of conservation) and Annex IV (species of community interest requiring strict protection) of the EU Habitats Directive (92/43/EEC) and as strictly protected species in Appendix II of the Bern Convention.

## 8. Species management

### 8.1 Management measures

Specimens from the wild and from a captive breeding programme have been introduced and reintroduced into suitable habitat in the 1990s (Herrero *et al.*, 2008). All re-introductions and introductions, recent and planned, are into protected areas (Herrero *et al.*, 2008):

#### **Majella National Park (introduction)**

Between 1991 and 1997 a total of 27 animals were released in the Majella massif (13 wild specimens and 14 originating in park enclosures) and the population has since been observed to grow (Dupré *et al.*, 2001). In 2005, five more animals were released and the population was counted at 300 animals (Mari and Lovari, 2006), while in 2008, the population was estimated at 450-500 animals (G. Amori, CITES Scientific Authority of Italy, *in litt.* to UNEP-WCMC, 2012).

#### **Gran Sasso–Monti della Laga National Park (re-introduction)**

*R. pyrenaica ornata* became extinct in 1892, making this site the only real re-introduction site (Mari and Lovari, 2006). Following identification of a suitable area and assessment of

limiting factors, about 30 chamois (14 wild and 16 animals from park enclosures) were released (Dupré *et al.*, 2001; Lovari *et al.*, 2010). A consequent steady growth rate led to 340 animals in ten herds occupying most of the suitable area in 2008 (Lovari *et al.*, 2010), with the population being estimated at 460 animals in 2011 (G. Amori, CITES Scientific Authority of Italy, *in litt.* to UNEP-WCMC, 2012). Overall the programme was considered to be highly successful (Lovari *et al.*, 2010).

#### **Sibillini Mountains National Park (introduction)**

Eight animals (wild, originating in Abruzzo, Latium and Molise National Park) were released in SMNP in September 2008 (PNMS, 2009), followed by further releases, with the last one planned for 2014 (PNMS, 2011), with an overall goal of establishing a minimum viable population of 30 animals (PNMS, 2010). In 2011, the population numbered 25 animals and included offspring of released animals (PNMS, 2011).

#### **Sirente -Velino National Park (introduction)**

The Park was assessed as a potential site for introduction of the species (Dupré *et al.*, 2001) and in the mid 2000s, releases were reported to be planned 'for the near future' (Mari and Lovari, 2006).

#### **Pollino National Park (introduction)**

The Park was thought to potentially be able to maintain a small herd, however as regular releases of animals was expected to be required, the value of the operation was questioned (Dupré *et al.*, 2001).

A national action plan was established for *R. pyrenaica ornata* in the early 2000s, which recommended the further (re-)introduction of specimens into suitable habitats and to support the recently created populations with further releases (Dupré *et al.*, 2001). Herrero *et al.* (2008) recommended conservation actions to include further introductions, with captive breeding encouraged to consider the "alarming lack of genetic variability" in the Abruzzo National Park population highlighted by Nascetti *et al.* (1985; in Herrero *et al.*, 2008) and associated development of a studbook.

## **8.2 Population monitoring**

The national action plan for *R. pyrenaica ornata* recommended the development of a standardized monitoring protocol for all the national parks (Dupré *et al.*, 2001). Population monitoring measures were recommended for the species as a whole, with particular focus on the demography and impact of hunting (Herrero *et al.*, 2008). An Ungulates Database was reported to have been developed by INFS (Istituto Nazionale per la Fauna Selvatica) in 1990, aiming at the sustainability of hunting (Blasi *et al.*, 2007). Many surveys were confirmed to be focussing on this species (G. Amori, CITES Scientific Authority of Italy, *in litt.* to UNEP-WCMC, 2012).

## **8.3 Control measures**

### **8.3.1 International**

CITES, EU Commission Regulations implementing CITES, EU Habitats Directive, Bern Convention.

### **8.3.2 Domestic**

Italian hunting law (157/1992) and law No 357/97 (Ministero dell'Ambiente, 1997).

## **8.4 Captive breeding and artificial propagation**

A breeding population of the subspecies is kept in wildlife areas across four national parks, numbering 18 animals in 2006 (S. Lovari *in litt.* 2006, in Herrero *et al.*, 2008). However a studbook has not been kept, which was considered a major shortcoming of the breeding program (Shackleton and the IUCN/SSC Caprinae Specialist Group, 1997).

## 8.5 Habitat conservation

The species' distribution is concentrated in three protected areas, the Gran Sasso-Monti della Laga, Majella and Abruzzo, Lazio and Molise National Parks (Herrero *et al.*, 2008). Integrated grazing management plans are part of the habitat management (Wilson and Mittermeier, 2011) and livestock grazing is being restricted in an increasing number of alpine meadows within the subspecies range in order to reduce competition (Herrero *et al.*, 2008). The impact of tourism is being managed in the Abruzzo, Lazio and Molise National Park, (Dupré *et al.*, 2001) and after assessing the impact of various sources of disturbance, access to the release area in the Sibillini Mountains National Park was temporarily prohibited (PNMS, 2009).

## 8.6 Safeguards

A breeding population is being kept in semi-captivity for the subspecies (*S. Lovari in litt.* 2006, in Herrero *et al.*, 2008).

Any downlisting would not change protections status in the EU of the subspecies at national and EU level.

## 9. Information on similar species

*R. pyrenaica ornata* is similar to other chamois species, although it differs in coloration; it has 'a larger white throat patch and extensive white areas on the side and back of [its] neck that extend to the shoulder' (Wilson and Mittermeier, 2011).

*R. pyrenaica ornata* is the only member of the genus *Rupicapra* to be listed in the CITES appendices. Other subspecies of *R. pyrenaica* are being hunted; however, they were assessed as Least Concern by the IUCN in 2008, with their numbers and range increasing (Herrero *et al.*, 2008). In Spain, *Rupicapra* spp. are major game species and are an important source of rural livelihoods, with hunting well managed through a quota system (Herrero *et al.*, 2008) and considered sustainable (J. Herrero pers. comm. 2006 in Herrero *et al.*, 2008). In France, hunting is of more recreational nature, with annual quotas set at below 10% of the population (Herrero *et al.*, 2008) and is considered sustainable overall, with few local exceptions noted (C. Berducou pers. comm. 2006 in Herrero *et al.*, 2008).

## 10. Consultations

The proponent of this proposal is the only range State of the subspecies.

## 11. Additional remarks

*Rupicapra* ancestors may have originated in Asia, spreading to Europe prior to the Riss glaciations [middle Pleistocene], which led to isolation of populations and resulting in genetic differentiation, although later climatic oscillations also led to population expansions, contractions and hybridizations (Wilson and Mittermeier, 2011).

While *R. rupicapra* and *R. pyrenaica* are commonly recognized as two species (Wilson and Reeder, 2005; Crestanello *et al.*, 2009; Corlatti *et al.*, 2011), Rodríguez *et al.* (2009; 2010) suggested that they are polyphyletic and that there is only one chamois species.

*Rupicapra pyrenaica* was considered to include three subspecies, *parva*, *pyrenaica* and *ornata*, which are geographically isolated and occur in south-western Europe, including the Pyrenees, the Cantabrian Mountains, and the central Apennines (Dupré *et al.*, 2001; Mari and Lovari, 2006). The chamois of the Apennines of Central Italy was however considered as a distinct species, *Rupicapra ornata*, by some authors (Wilson and Mittermeier, 2011; Groves and Grubb, 2011), as were *parva* and *pyrenaica* (Wilson and Mittermeier, 2011). Crestanello *et al.* (2009) recommended a revision of the status of *ornata* and its re-elevation to species rank.

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