

Short Communication

Alpine chamois *Rupicapra rupicapra* (L. 1758) and European roe deer *Capreolus capreolus* (L. 1758) close together at a salt lick

Tiziano Londei*, Giuliana Marzi

Abstract - Three sub-adult chamois and two adult male roe deer were sighted in the Western Italian Alps while staying close to each other, without any interspecific interaction, near rocky outcrops with the characteristics of salt licks, likely of natural origin. This is apparently the first report of chamois and roe deer seen together at salt licks and suggests spatial overlap of two ungulates usually observed in different habitats. Their interspecific tolerance might be due to differences in their diets, which might, in turn, depend on overlooked local adaptations to coexist in the same habitat.

Key words: ungulates, habitat overlapping, interspecific tolerance, salt licks.

Riassunto - Vicinanza tra camosci alpini *Rupicapra rupicapra* (L. 1758) e caprioli *Capreolus capreolus* (L. 1758) presso una salina.

Tre subadulti di camoscio e due maschi adulti di capriolo sono stati avvistati nelle Alpi Occidentali italiane mentre stavano vicini gli uni agli altri, senza alcuna interazione interspecifica, presso rocce con caratteristiche di salina, probabilmente di origine naturale. Questo è molto probabilmente il primo resoconto di camosci e caprioli visti insieme presso saline e suggerisce una sovrapposizione di spazi tra due ungulati che di solito sono osservati in habitat diversi. La loro tolleranza interspecifica potrebbe essere dovuta a differenze nella dieta, che a loro volta, secondo una possibilità finora trascurata, potrebbero dipendere da adattamenti locali a coesistere nello stesso habitat.

Parole chiave: ungulati, sovrapposizione di habitat, tolleranza interspecifica, saline.

In the Alps, the ongoing increase of the red deer *Cervus elaphus* L. 1758 and European roe deer *Capreolus capreolus*, the two native cervids, contrasts with the status of the Alpine chamois *Rupicapra rupicapra* and Alpine ibex *Capra ibex* L. 1758, two native bovid species which are not as abundant outside protected areas. Conservation concern has resulted in the assessment of their interspecific competition for resources. Adverse effects of red deer

abundance over chamois populations are now well supported (e.g., Donini *et al.*, 2021). Mainly indirect competition has been considered, e.g., through diet analysis: while the occurrence of red deer likely affected both chamois (Bertolino *et al.*, 2009; Anderwald *et al.*, 2015; Andreoli *et al.*, 2016) and ibex (Anderwald *et al.*, 2015), competition between roe deer and chamois seemed unlikely because of their different diets (Bertolino *et al.*, 2009, Andreoli *et al.*, 2016). However, no diet-related information exists about areas where roe deer and chamois coexist. Direct interspecific competition through behavioural interference has received less attention. Chamois tolerate proximity (<50 m) to ibex (Ryser-Degiorgis *et al.*, 2002), although not to non-native Mouflon *Ovis aries musimon* (Pallas 1811) (e.g. Chirichella *et al.*, 2013). Outside the Alps, displacement of roe deer by non-native European fallow deer *Dama dama* (L. 1758) is well known and may be habitat-independent (Ferretti *et al.*, 2011; Ferretti *et al.*, 2012). Encounters between chamois and roe deer have rarely been reported in scientific literature before Mori *et al.* (2017), who attempted the first, and still only, quantitative study of the occurrences. According to these authors, only an anecdotal report was previously available, of chamois apparently giving way to male roe deer at waterholes (Perco *et al.*, 1997). Mori *et al.* (2017) found out that, on a total of 67 observations, mainly at feeding sites, no interspecific interaction occurred in 45 cases, roe deer was displaced in 19, and chamois was displaced in three. Displacement only occurred at 5-30 m distance, which means that most of the observations did not concern very close encounters. Here, we report on a sighting of chamois and roe deer at a salt lick, where they were remarkably close to each other and seemingly oblivious of the presence of the other species.

On 1 July 2020, 9:50 solar time, we were climbing up a disused tract of the pasture zone above Aceglio (CN), Western Italian Alps, when an ungulate indistinctly appeared from a shallow depression in the ground, only to disappear few seconds later in the long grass. At first sight, it looked like a chamois, but later a roe deer showed up virtually in the same location. Our subsequent quiet approach revealed that both species were present near a flat outcrop, two chamois standing on it or rummaging around. Although we had only intermittent views of the roe deer, no sudden movement suggested any interaction.

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Received for publication: 26 August 2022

Accepted for publication: 17 February 2023

Online publication: 6 October 2023

Unfortunately, as soon as we got a full view of all the animals in the area (Fig. 1), three sub-adult chamois and two male roe deer, they went on the run and soon disappeared over the hilltop. We reached a vantage point uphill, at suitable distance from that outcrop to keep a large area under observation. The place might attract wild ungulates not only for what we assumed being a salt lick, but also for unexploited pasture (cattle found kept at lower elevations), a drinking trough with running water (presumably attractive in that hot day) and no other human presence during our stay there. However, four hours of observations did not produce any further sighting. We wanted confirmation of what that outcrop meant for these ungulates. Salt licks are exposures of specific rocks actively searched for and consumed by animals, mainly herbivores, to compensate for mineral deficiencies in their diets by ingesting mineral nutrients, usually with a prevalence of sodium, although different explanations for geophagy exist (see Panichev *et al.*, 2014). Thus, we first found the precise position of the outcrop, 44°29'55"N, 6°59'43"E, 2096 m a.s.l., on the satellite map provided by Google Earth, the shape of the

rock being recognizable there. Afterward, using a detailed geological map (GeoPiemonte Map, 2021) we found this position within an area containing prasinite, and a comparison of the debris we had collected around the outcrop with photographs of prasinite on internet confirmed it was this kind of rock. A component of prasinite is albite, a sodium-rich mineral which occurs in natural salt licks (Tab. 1 in Panichev *et al.*, 2014). Various animal tracks were evident around the outcrop (Fig. 2): we assume that the trampled ground indicated where ungulates obtained mineral nutrients by licking the rock, while ravaged ground revealed where they ate soil. As confirmation of a use of that rock by ungulates, the only unexploited ground close to the outcrop featured a conspicuous clump of the false helleborine *Veratrum album* L. 1753, a perennial forb that escapes not only being eaten, but also trampled, by large herbivores because of its strong toxicity (Kleijn & Steinger, 2002). A close examination of the satellite image of the area revealed similar bare ground around several outcrops, including the rock near which we found the roe deer less close to the chamois (see Fig. 1). As it would



Fig. 1 - The positions of the three chamois (C), two roe deer (R), and two observers (O) at the first full sighting of the animals, when the shortest distance between chamois and roe deer was four metres, 27 metres the longest. / Le posizioni dei tre camosci (C), dei due caprioli (R) e dei due osservatori (O) nel momento del primo avvistamento completo degli animali, quando tra camosci e caprioli la minima distanza era 4 metri, la massima 27 metri.



Fig. 2 - The roe deer and two chamois at the shortest interspecific distance (see Fig. 1) and the trampled and ravaged ground around their rock, suggesting the salt lick. / Il capriolo e i due camosci alla minima distanza interspecifica (vedi Fig. 1) e il terreno calpestato e rivoltato intorno alla loro roccia, indicativo di una salina.

be unlikely that people had added salt to several, sparse, rocks, this was a further suggestion of the natural origin of those salt licks, which might thus be a stable attraction for these animals. Salt licks are well known as an attraction for many species of ungulates and interspecific encounters have been observed at such sites in the Alps (Ryser-Degiorgis *et al.*, 2002). However, to the best of our knowledge this is the first report of chamois and roe deer together at salt licks. At first glance, their interspecific tolerance at a close distance might be understood as an unusual occurrence, as male roe deer were previously observed displacing chamois even when the latter were in numerical superiority (Mori *et al.*, 2017). Displacement should have been even easier with the sub-adult chamois we observed; in turn, the adult male roe deer closest to these chamois might have had a health condition, as his defective antlers (Fig. 2) would suggest. However, the raw numbers in Mori *et al.* (2017) would rather suggest a prevailing absence of (clear) interspecific interactions. The alternating outcomes of the less frequent aggression might mean that animals of similar physical power (as individuals, or groups) preferred to avoid such encounters. The authors did not attempt to infer any sort of interspecific competition from their heterogeneous data and admitted that interviewees would be more likely to recall the details of the observations if there were interactions than if there were not. Among ungulates, resource exploitation rather than behavioural interference seems to be the main mechanism for interspecific competition, while behavioural interference may increase when non-coevolved species come into contact (Ferretti & Mori, 2020). Accordingly, we propose the following explanation for tolerance between chamois and roe deer. Their difference in diet is usually ascribed to difference in habitat, below the tree line for roe deer and above for chamois. However, the roe deer may have evolved as an ungulate of forest glades, rather than dense forests, and in fact it requires only a minimum quantity of woodland in its home range (Lovari *et al.*, 2017). On the other side, some chamois populations spend the entire year in forested areas, apparently less affected by competition with red deer (Kavčić *et al.*, 2021). Therefore, chamois and roe deer may have adapted to coexist in (partially) forested habitats: differences in foraging niche may make them tolerate each other and comparable physical power may contribute to avoid interspecific aggression.

Acknowledgments

Sandro Lovari provided valuable suggestions to the first draft of the manuscript. Criticisms and suggestions from Luca Corlatti and another reviewer have also been very useful.

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