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Ecology of two sympatric cervids from Spain: confronting data from stomach contents and dental microwear texture

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Abstract:

The red deer, *Cervus elaphus* is characterized by a plastic diet that varies depending on resource availability in its habitat (Gebert and Verheyden-Tixier, 2001). On the other hand, the fallow deer *Dama dama* is reported to predominantly eat grass – and acorns whenever available whether in cold and humid or warm and dry habitats (Jackson, 1977, Azorit et al., 2012). The Spanish locality Lugar Nuevo (Fig.1) is characterized by a dry summer which constitutes a constraint season for the two sympatric cervid populations (Azorit et al., 2012). In this study, we focus on diet to explore the ecological relationships between the two populations under these extreme conditions.

Dental microwear texture analysis (Scott et al., 2006), the study of the microscopic wear caused by food during mastication, has proven to be very efficient in deciphering both inter- and intra-specific variations in diet (Merceron et al., 2010). Efforts are focused on the shearing facet of the lower second molars (Fig.1). The results are compared with the rumen content analysis based on the very same specimens (Azorit et al., 2012).

We show that the red deer are highly grazer (high anisotropy, low complexity), while the fallow deer combine intermediate complexity and lower anisotropy suggesting a more browsing diet (Fig.1). Notably, at the peak of the grass consumption for the two species (from May to August, before the occurrence of fruit in their diet), we highlight significant differences in the dental microwear signal. These results lead to the conclusion that conversely to the rumen contents, DMTA supports a more abrasive and tough alimentation (possibly herbaceous

monocots) for the red deer compared with the fallow deer. In summary, the two species seem to occupy different micro-habitats with *Dama* in places where grasses are less abrasive and less tough than the place where *Cervus* grazes.

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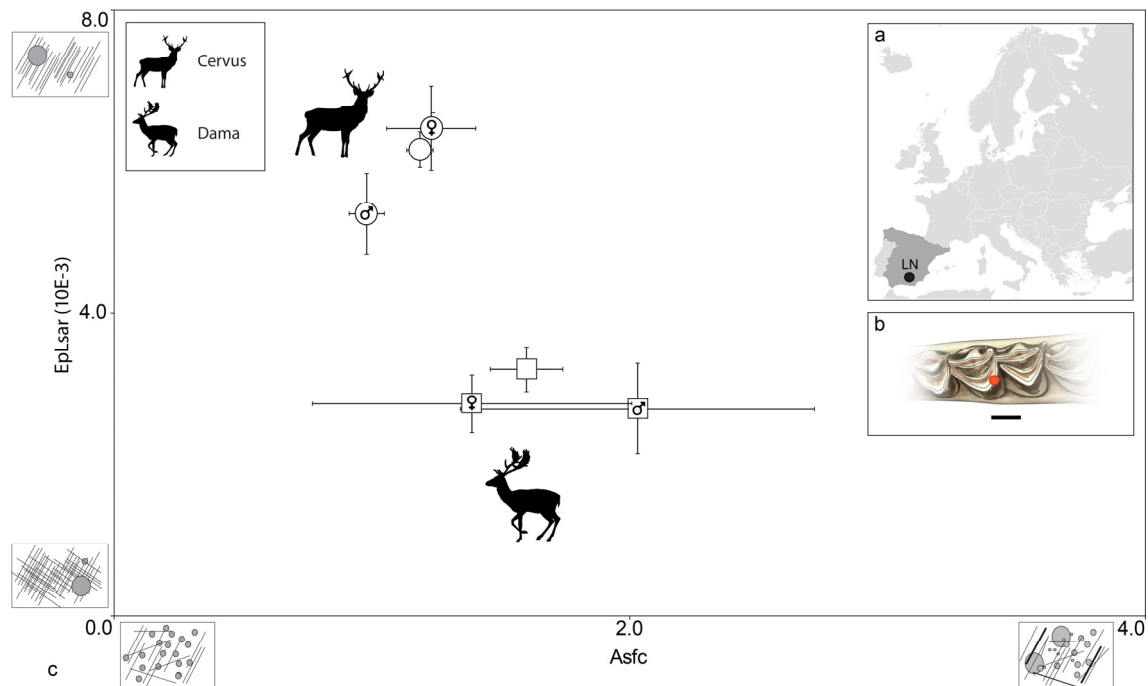


Fig. 1. Differences of dental microwear results between Red and Fallow deer from Jaen. a: Location of Luegar Nuevo in south of Spain; b: dental facet of interest on lower m2; c: The mean and standard error of mean for anisotropy and complexity are illustrated for both taxa on a year basis. Results for males and females of both taxa are illustrated for the constraint season (May to August)