



**von Hardenberg A., Bassano B., Arranz M.P.Z. & Bogliani G. (2004). Horn growth but not asymmetry heralds the onset of senescence in male Alpine ibex (*Capra ibex*). *Journal of Zoology*, 263, 425-432.**

Senescence can be defined as accelerating phenotypic deterioration with old age. For traits that grow throughout life, such as the horns of some ungulates, senescence may be expressed as a decrease in annual growth rates, or an increase in asymmetry, in the years preceding death. Age-specific yearly horn-growth segments of 378 male Alpine ibex *Capra ibex* L. that died from natural causes were analysed in the Gran Paradiso National Park (Italian Alps). Horn annuli displayed fluctuating asymmetry. The hypothesis that asymmetry and size of the annuli of the horns could predict annual survival probability was tested. It was found that between 5 and 11 years of age, male ibex that grew shorter annuli than the average for the population had a greater probability of mortality over the following years than those with greater rates of horn growth. Horn asymmetry and mortality rates were not significantly correlated. Annulus size, reflecting the onset of senescence, seemed to be a better indicator of individual quality than annulus asymmetry.

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