

9. Ecological impacts on variance in male mating success in red deer

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Understanding the ecological factors that affect the intensity of competition for mates in a population is important for understanding the evolution of sexual traits and mating systems. Few empirical studies have addressed the interactions between multiple ecological variables, such as operational sex ratio, the spatio-temporal distribution of receptive females, and climate, on variance in male reproductive success, particularly in wild populations not under experimental manipulation. In this study we investigate the effects of several demographic factors, climate, and variance in the temporal availability of oestrous females on inter-annual variation in variance in male reproductive success over a 35 period in a wild population of red deer. We find that a significant interaction between the number of immigrant males rutting and variance in female oestrus timing predicts variance in male mating success at the population level. The same interaction also determines the likelihood of males gaining reproductive success at the individual level, suggesting that whilst increased numbers of immigrant males rutting increases the intensity of competition amongst males, the effects of such competition depend on the temporal availability of females. To our knowledge, this is the first study to demonstrate an interaction between male density and oestrus synchrony on variance in mating success in a wild mammal.