
Do anal gland scent of Alpine marmots encode genetic relatedness?

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Abstract

Chemical signals are omnipresent in sexual communication in the vast majority of living organisms. To enhance their fitness benefits, choosy individuals should be able to obtain information about the genetic makeup of conspecifics. The use of chemical signals as indicators of genetic compatibility (relatedness) could facilitate inbreeding avoidance and help in identifying the best mate. This implies that choosy individuals are able to discriminate genetically compatible mates and orientate their mate choice towards them. We tested this prediction in the Alpine marmot, a cooperatively breeding species, which social and extra-pair mate choice were previously reported to be based on genetic characteristics. In Alpine marmots, the proportion of extrapair paternity has been shown to increase with both high similarity and dissimilarity between the social pair suggesting a choice for an optimal outbreeding variant. We predict that odour of anal gland should encode chemical information about pairwise genetic relatedness within and between the sexes which should use as cue in mate assessment. We sampled anal gland scent of 154 Alpine marmots and we couple gas chromatography and mass spectrometry data with genetic analyses to test whether the chemical composition of anal scent provides information on genetic compatibility. We expect that anal scent provide these genetic information and so that chemical signals have the potential to act as effective signals for mate assessment.

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