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Changes in the acoustic structure of fallow buck groans during the rut

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The acoustic structure of mammal vocalisations is affected by social and physiological factors and can therefore change over time. During the rut, fallow bucks feed little, invest time and energy in vocalising and fighting in order to gain matings, and lose on average one quarter of their body weight. Therefore, we investigated if the acoustic structure of fallow buck groans changed as a result of their mating effort. We found that F0-related parameters were lowest during the middle of the rut when most matings occurred, and highest at the beginning and at the end. The degree of F0 variation along the groan (Jitter) remains stable throughout the rut, whereas the number of pulses and duration of the groans decreased linearly. Although most of the minimum formant frequencies were lowest during the middle of the rut, and higher at the beginning and at the end, the overall minimum formant dispersion did not vary significantly. Finally, we found that changes in the acoustic structure of groans were associated with changes in the vocalisation rates, which were highest in the middle of the rut and lowest at the beginning and end. Changes in the acoustics structure of groans represent changes in the intensity of intrasexual competition and mating opportunities occurring over the course of the rut as well as the declining body condition of males.

The temporal instability of individual alarm calls in the speckled ground squirrels (*Spermophilus suslicus*)

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Apart from alerting function of alarm calls, the natural selection may favor cues to individual identity to distinguish between the reliable and unreliable callers. This mechanism for selective responding on real and false alarms may act however only if the calls can mark individual identity and are stable at least for some time. Here we test this implicit assumption for the caller's reliability hypothesis, studying the individuality of whistle alarm calls in the colony of free-living, individually marked speckled ground squirrels *Spermophilus suslicus*. We recorded the whistle alarm calls, produced toward a human from live-traps by 20 individuals, captured/recaptured four times with time spans of one day, two weeks and one year from the first capture. We analyzed ten whistle alarm call notes per animal per record (in two cases - only 3 and 7 notes), 790 notes in total. Within capture, the whistle alarm call notes were very similar in their structures. Between the captures however, the calls of the same individual did differ strongly. The potential to encode the individual identity decreased progressively with an increase of the time span between the captures. Both MANOVA and the discriminant function analysis were consistent in showing a considerable decrease in the ability to reveal the individual identity with time. These data, suggesting the unstable individuality of the whistle alarm call in the speckled ground squirrel, contradict the caller's reliability hypothesis.

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