

A decorative graphic consisting of several overlapping, semi-transparent wave shapes in shades of green, yellow, and blue, positioned above the main text area.

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ABSTRACT The pervasiveness of animal sounds in musical activity gives plenty of space for investigation of the relevance of animal sounds in musical practice. If music has any parallel to other representational arts, namely painting and sculpture, then animal sounds must have been a constant presence in early stages of human development. It is not possible to listen to these songs today, but by looking into the archaeology of musical instruments and to the recorded practice of musicians, it is possible to get some insights into the music of the time. As soon as a fully fledged music notation system was developed in 13th century, with melodic and rhythmic components, music was represented with a relatively precise method and from the beginning we can observe human interpretations of animal sound. A direct reference can be heard in the original work of the 13th century „Sumer Is Icumen In“, where the cuckoo song is developed as a canon. Examples of this practice can be found in the works of numerous composers to this day, with a special mention to Olivier Messiaen who exhaustively notated the sounds of birdsong. This work explores and analyses the representation and fixed media examples of music that have drawn influence from animal vocalization. Examples of musical works that have explicit connections to animal vocalisations, whether imitative or symbolic, will be shown in connection to their original animal correlates. The rhythmic features in both vocalisations and musical representations are analysed.

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What affects alarm call structure in speckled ground squirrels: multifactor analysis

ABSTRACT Processes, responsible for vocal variation in mammals are poorly understood so far. This 10-years-long study focuses on factors

affecting evolution of alarm communication in speckled ground squirrels *Spermophilus suslicus*. In individually chip-marked animals from natural colonies, we investigated effects on the alarm call structure of 1) caller identity, 2) sex, 3) age, 4) time-span between recordings, 5) population membership and 6) genetics. In total, we examined 171 individuals, 10 calls per animal, 8 acoustic variables per call. Caller identity had strong effects on all acoustic variables. Age effects were significant on call duration and fundamental frequency bandwidth. Age-class differences in the maximum and dominant fundamental frequencies of alarm calls lacked despite prominent age differences in body weight ($222 \pm 50g$ vs. $88 \pm 34g$). No sex effect on call variables was found. Twenty individuals were recorded 4 times with time-spans of 1 day, 2 weeks, and 1 year. Calls from individual callers were highly similar within recordings, but vocal individuality decreased drastically with increase of time span between recordings. However, calls remained individualistic, allowing distinguishing individual callers higher than was expected by chance. We compared alarm calls and polymorphism of mtDNA control region for 90 individuals from 6 scattered populations, 15 animals per population. Population membership and individual identities affected strongly the acoustic variables, especially the mean fundamental frequency and duration of the calls. Comparison among populations by acoustic, genetic and geographic distances with Mantel test revealed a highly significant positive correlation between the genetic and geographical distances ($r=0.97$, $p<0.001$) as well as significant correlations between acoustic and genetic ($r=0.66$, $p<0.01$) and between acoustic and geographical distances ($r=0.74$, $p<0.01$). Genetic differences among populations gradually increased with the increase of the geographical distance. Acoustic differences followed the same pattern, in support of gene drift hypothesis. Financial Support: RFBR grant 15-34-20589.

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Defining quietness in urban green areas