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Structure and Variability of Alarm Calls of European Ground Squirrel *Spermophilus citellus* L. 1766 (Mammalia: Rodentia) from Western Bulgaria

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Abstract: The structure and variability of alarm call of European ground squirrel (*Spermophilus citellus* L. 1766) from two populations in West Bulgaria are studied. The registered alarm calls may consist of two separated phases: at 8 kHz and 12 kHz respectively. Both phases can be fused or emitted continuously with maximum interval of 32.90 ms between them: probably they are produced by two independent acoustic sources. A phenomenon of concentration of the maximum energy of the call in the second harmonic is observed. The durations of the phases have high degree of variation, but the total length of the call in the studied populations has similar values. The total duration of alarm call is more than 100 ms, while the maximum registered value can exceed twice the minimum. The frequency characteristics (highest, lowest frequency and frequency with most energy of both phases) have low degree of variability and they clearly and statistically significantly distinguish the studied populations.

Key words: alarm call, sound analysis, *Spermophilus citellus*, Bulgaria