

## **Behavioral dependence in calling parameters of the red-haired bark beetle *Hylurgus ligniperda* (Coleoptera: Curculionidae: Scolytinae)**

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Eligible for student prize

We performed an analysis of the behavioural dependence in the variation of the call parameters of the bark beetle *Hylurgus ligniperda*. To achieve this, recordings of 15 males and 15 females were acquired in six different behavioural contexts, namely, distress, normal (no stimulus applied), and both close and distant male-male and male-female interactions. Each chirp was automatically segmented with a threshold- and power-based algorithm in order to estimate two temporal (duration and inter-syllable interval) and three spectral (minimum, maximum, and centroid frequencies) parameters. An additional hierarchical clustering analysis (average linkage), in conjunction with a distance matrix, was used for the computation of the hierarchies of the calls in a dendrogram with the estimation of pairwise similarities in all behavioural contexts. Females produced no calls, but the calls of males consist of strings of simple (monosyllabic) chirps, whose spectro-temporal parameters vary in accordance with behavioural context. Differences in single male studies were found between the calls obtained with no stimulus applied (normal call) and the distress call. In dual interactions (i.e., male-male and male-female), calls from distant interactions were more similar to each other than to any other type of call. In close interactions, a similar case occurred, with male-male (close) and male-female (close) being more similar to each other. Consequently, direct stimulation by either external sources or other individuals was more relevant than acoustic stimuli *per se*. As bark beetles are frequent pest species, we hope that understanding the behavioural aspects of sound production can underpin the development of acoustic tools for their detection in import pathways.

