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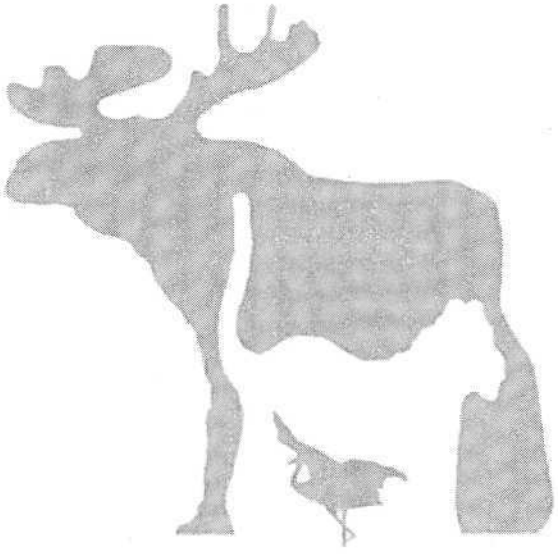

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D52 Acoustical cues to mother-calf communication in Iberian red deer *Cervus elaphus hispanicus*

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The acoustic communication channel is among the most important for establishing and supporting the relationship between mother and offspring in ungulates. Individual-specific call features that are based on variations of their acoustic structure enable mother-young recognition in a herd. While vocal variation is thoroughly investigated in Iberian red deer stags *(Cervus elaphus hispanicus),* the Iberian mother and young calls have been studied only on a limited sample of individually unidentified calls. This study was conducted during June 2011 and 2012 at the experimental farm of the University of Castilla-La Mancha (Albacete, Spain). We examined a sample of 1235 individually identified contact calls, recorded from 28 mothers and 31 calf Iberian red deer. Both hinds and calves produced calls through the mouth and through the nose. No significant effect of sex was revealed on the acoustic variables. For calves, a comparison of variables of oral and nasal calls with repeated-measure ANOVA revealed that the maximum fundamental frequency, peak frequency, and power quartiles of oral calls were significantly higher compared to those of nasal calls. Duration was longer in oral calls. For hinds, the maximum fundamental frequencies and durations were undistinguishable between oral and nasal calls. Previously we reported thatfor mother and young saiga antelope *(Saiga tatarica)* and calves of goitred gazelles *(Gazella subgutturosa)* the fundamental frequency of the oral calls is higher than those for the nasal calls, in contrasts with results obtained from the current data for hinds of Iberian red deer. Analysis of vocal individuality has been conducted with 5 to 10 oral and nasal calls per individual using discriminant function analysis (DFA). In calves,

individuality was moderately expressed in both oral and nasal calls. In contrast, in hinds individuality was significantly higher in the oral than in the nasal calls. Thus, in calves, the nasal and oral calls differed by their acoustic structure, but not by the degree of individualization; whereas, the hind nasal and oral calls did differ by the degree of individualization, but not by their acoustic structure. Previously, we reported more individualistic oral calls compared to nasal calls also in goitred gazelle calves. To estimate between-year stability of individual acoustic differences of June hind nasal calls, we made DFA crossvalidation of calls recorded in June 2012 with discriminant functions created with calls recorded in June 2011. The value of correct classification decreased twice, pointing to very poor between-year stability of individual characteristics of hind nasal calls. These results suggest that acoustic cues to communication to mother-calf communication in Iberian red deer arise anew each year.

Key words: call structure, farm deer, ontogenesis, social behaviour, vocalization

D54 Vocal variation from bass to soprano in red deer *Cervus elaphus*

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This talk integrates acoustic variation among subspecies of red deer, with involvement of own data on Iberian and Siberian subspecies. The red deer *{Cervuselaphus)* is the species with broad distribution over Eurasia and North America, displaying a strong variation in the structure of stag rutting calls. The species *Cervuselaphus* has originated from Tarim Basin in Middle Asia approximately 2 million years ago and then distributed in two opposite directions, to the East and to the West. The Eastern branch went over Tian-Shan and Altai to China, Siberia and North America. The Western branch went over Caucasus and Carpates to Western Europe. The Western stags produce low-frequency roars, ranging in their maximum fundamental frequency (f0) from 52 Hz to 223 Hz between subspecies. The Eastern stags produce high-frequency bugles, with the maximum f0 ranging from 1230 to 2080 Hz between subspecies, what is