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ABSTRACT VOLUME

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Sex and age-class acoustic variation of Pannonian red deer (*Cervus elaphus hippelaphus*) from South Hungary

Daria D. Yurlova[1*], Ilya A. Volodin[1,2], András Nahlik[3], Tamás Tari[3] and Volodina Elena[2]

[1]Department of Vertebrate Zoology, Faculty of Biology, Lomonosov Moscow State University, Moscow 119234, Russia
[2]Scientific Research Department, Moscow Zoo, Moscow 123242, Russia
[3]University of West Hungary, Sopron 9400, Hungary
yurlowa.darya@gmail.com

The Pannonian red deer represent the largest native population of *Cervus elaphus hippelaphus* in Central Europe, but their vocalization has not been studied so far. This study provides spectrographic investigation of the Pannonian red deer stag, hind and calf vocalizations. Using automated recording systems, we collected rutting roars of wild stags in South Hungary (46.07 N, 17.49 E) in September 2015, and contact calls of hinds and calves the farm of Pannonian red deer in South Hungary (46.23 N, 17.80 E) in May 2016. We analyzed spectrographically 71 stag longest roars within bouts, 58 hind contact calls and 55 calf contact calls. Because hinds and calves were kept separately from stags and field observations showed that only stags vocalized in the rut period, we could separate the vocalizations of the sexes from the automated recordings. We found that acoustics of stag rutting roars were practically undistinguishable from those of female contact calls by duration (stags: 1.62±0.53 s; hinds: 1.64±0.96 s, p=0.90), maximum fundamental frequency (stags: 162.8±65.3 Hz; hinds: 172.4±32.2 Hz, p=0.31) and peak frequency (stags: 610.0±596.3 Hz; hinds: 761.9±610.7 Hz, p=0.16). The values of maximum fundamental frequency of neonatal calf calls (827±54 Hz) suggested a descending ontogeny of fundamental frequency. We discuss that the descending ontogeny of fundamental frequency is typical for other studied European subspecies of red deer (*C. e. corsicanus* and *C. e. hispanicus*) and opposite to the non-descending ontogeny of fundamental frequency in Siberian wapiti *C. e. sibiricus* and North American wapiti *C. canadensis*. We also discuss that very similar or even undistinguishable acoustics of high-arousal vocalizations of stags and hinds within subspecies represent a common rule across subspecies of *Cervus elaphus*.