

Similarly low-frequency stag rutting calls and hind contact calls develop from the high-frequency newborns calls in Pannonian red deer

Cervus elaphus hippelaphus

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AIM

Vocal ontogenetic pathways across subspecies of red deer highlight evolution of vocal communication. This study investigated stag, hind and newborn calls in Central European Pannonian red deer.



METHODS



South Hungary (46.07 N, 17.49 E)

September 2015 (free-ranging stags)
May 2016 (farm hinds & calves)

We analysed:

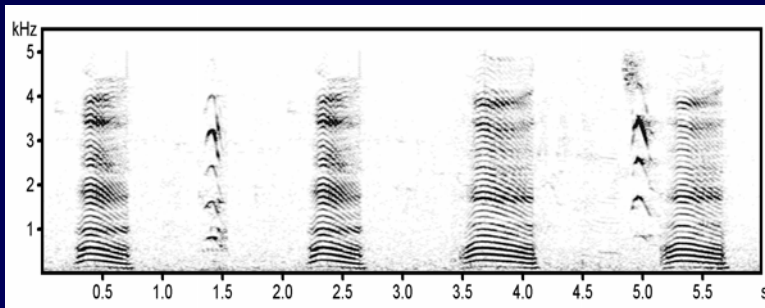
- 172 stag longest roars within bouts
- 165 hind contact calls
- 226 calf contact calls



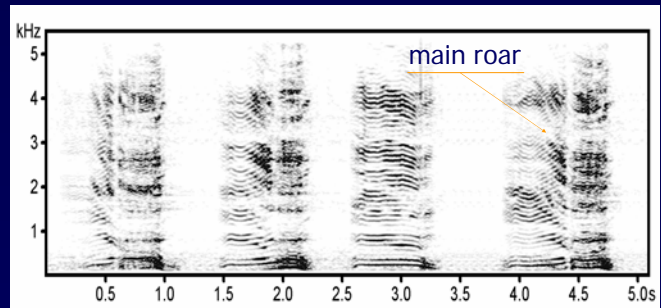
CALL ACOUSTICS

| | Calves; n=226 | Hinds; n=165 | Stags; n=172 | Hinds-Stags (t test) |
|--------------|---------------|--------------|--------------|----------------------|
| duration (s) | 0.30±0.11 | 1.23±0.71 | 1.44±0.54 | p=0.002 |
| f0 max (Hz) | 699±132 | 159±26 | 171±51 | p=0.01 |
| fpeak (Hz) | 1904±1022 | 1048±869 | 642±635 | p<0.001 |

Calf and mother call-over

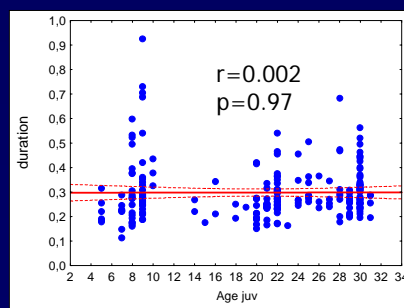
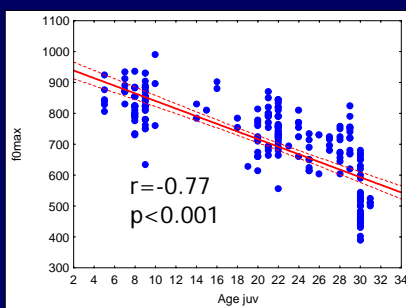


Stag bout of common roars



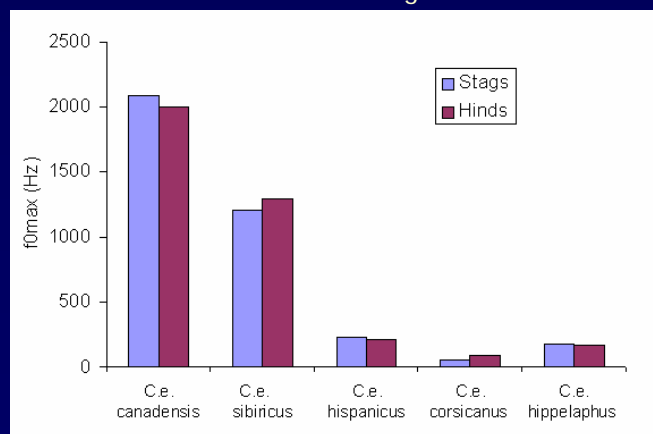
f0 DESCENDING ONTOGENY

Descending ontogeny of fundamental frequency of Pannonian calves, as in other studied European red deer subspecies and opposite to the non-descending ontogeny in Asian and American wapiti.



Pannonian calves show decreasing fundamental frequency and constancy of duration during ontogeny

main roar is the longest roar within bout



NO SEX DIFFERENCES

Pannonian stag roars and hind contact calls slightly differ in fundamental frequency between sexes, as in other European and American red deer subspecies.

