



Acoustic variation in rutting calls of the Pannonian red deer *Cervus elaphus pannoniensis* (Banwell 1997)



Volodin Ilya^{1,2}, Nahlik András³, Tari Tamás³, Volodina Elena²

<http://www.bioacoustica.org>
volodinsvoc@gmail.com

¹Lomonosov Moscow State University, Russia;

²Moscow Zoo, Russia;

³University of West Hungary, Hungary



AIM

In red deer, rutting calls are good indicators of subspecies. The native population of the Pannonian red deer *Cervus elaphus pannoniensis* of the South Hungary and Croatia has not been studied bioacoustically to date. The aim is to compare the acoustics of Pannonian stag rutting calls with other European red deer subspecies.

METHODS

South Hungary (46.067 N, 17.492 E)

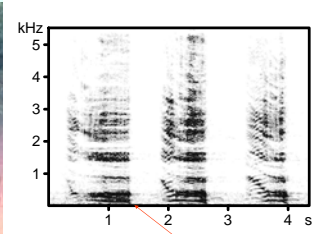
September 2015



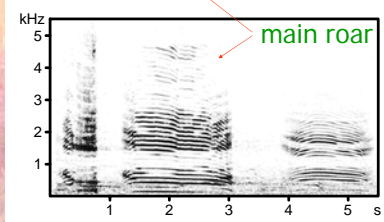
SongMeter2+



We analysed 673 bouts consisting 1-15 roars per bout, a total of 2360 roars



bout of harsh roars

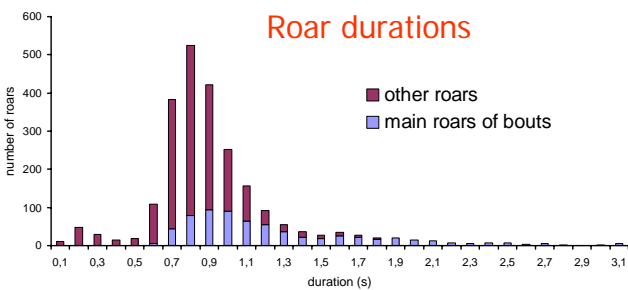


bout of common roars

main roar is the longest roar within bout

RESULTS

Roar durations



A distribution of roar durations in a pooled call sample (2360 roars) had two peaks, one at 0.1-0.2 s and a second at 0.7-0.8 s, separated by an intermediate depression at 0.4 s. This peak of pooled calls distribution coincided with the peak of main roars distribution (n=673) on 0.8-1.0 s.

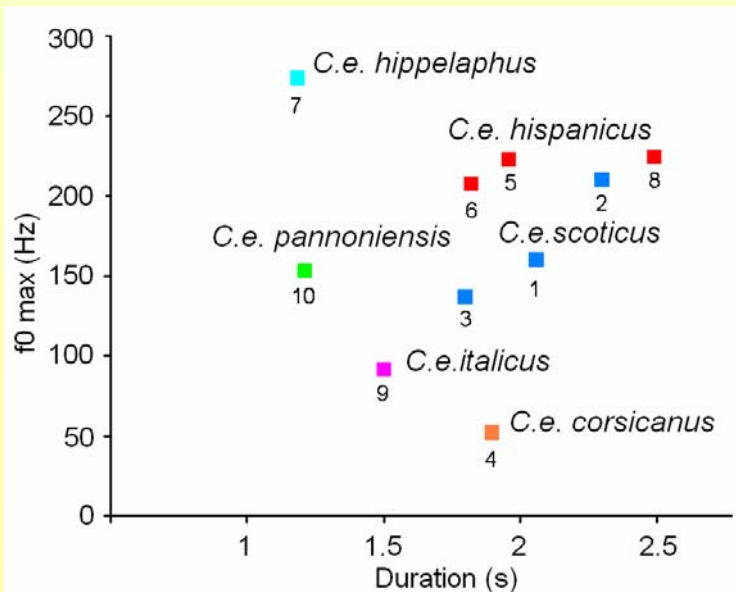
Rutting calls acoustics

	Pannonian deer	Iberian deer
Roars per bout	3.51±2.30	> 2.11±1.71
Main roar		
Duration	1.21±0.52 s	< 1.90±0.50 s
f0 max	153±56 Hz	< 223±35 Hz
Common main roar	63.6 %	< 89.1 %
Duration	1.38±0.55 s	< 1.88±0.50 s
f0 max	164±60 Hz	< 223±35 Hz
Harsh main roar	36.4 %	> 10.9 %
Duration	0.90±0.27 s	< 2.12±0.49 s
f0 max	133±41 Hz	< 236±29 Hz
Main roar = high frequency roar	52 %	< 94 %

Main roar acoustics across European subspecies of red deer

CONCLUSION

Rutting roars of the Pannonian red deer are distinctive from those of other European subspecies by their fundamental frequency and duration. Bout structure is different from the Iberian red deer (in which such data are available) by number of calls per bout and by ratio of harsh/common roars.



1. McComb 1988; 2. Long et al. 1998; 3. Reby and McComb 2003; 4. Kidjo et al. 2008; 5. Frey et al. 2012; 6. Passilongo et al. 2013; 7. Bocci et al. 2013; 8. Volodin et al. 2015; 9. Della Libera et al. 2015; 10. This study