Comparison of vocal anatomy and call structure in Asiatic wild dog and red fox for revealing potential sources of canid biphonation

Volodin Ilya1,2, Frey Roland3, Fritsch Guido3, Gogoleva Svetlana1, Volodina Elena2

1 Lomonosov Moscow State University, Russia
2 Moscow Zoo, Russia
3 IZW-Berlin, Germany
volodinsvoc@gmail.com
http://www.bioacoustica.org

Two-frequency calls (biphonic)

Single-frequency calls

What morphological structures are responsible for high-frequency calls of canids?

Asiatic wild dog
1 male, 3 females

Red fox
1 male, 1 female

Reconstruction of vocal apparatus

Larynx

Nasal vocal tract

Call frequency values

Conclusions:

1. Vocal anatomy (larynx and vocal tract) of Asiatic wild dog and red fox are very similar.

2. Differences in calls are related to physiology (functioning of the anatomical structures) rather than anatomy.

3. Frequency range of calls corresponds to a species hearing range. The peak of hearing sensitivity in domestic the dog is 8 kHz (Heffner 1983) whereas in red fox 2 kHz (Peterson et al. 1969).

4. Biphonic calls may function for individual recognition (Volodina et al. 2006) and for estimating orientation of the caller towards a listener (Volodin et al. 2006) by obligatory pack-living Asiatic wild dogs but not by solitary foxes.

Financial support: The Russian Scientific Foundation, grant No 14-14-00237

Volodin Ilya, Volodina (2002)
Domestic dog (Volodin et al. 2005)
African wild dog (Wilden et al. 1998)
Timber wolf (Nikolsky, Frommolt 1989)
Red wolf (Schneider, Anderson, 2011)

Red fox (Gogoleva et al. 2008)
Polar fox (Ovsyanikov et al. 1988; own data)
Bush dog (Brady, 1981; own data)

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