

## Behaviour

### Is it possible to recognise breed, individuality and sex by barks of indigenous windhounds of Russia?

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Barking is the most often emitted and most important communication call in domestic dogs. Individual barks are very complex in their spectral structures, varying from purely tonal to noisy and involving diverse nonlinear phenomena (biphonation, subharmonics, deterministic chaos) which may entirely mask fundamental frequency. We investigated if such complex and variable calls provide cues for the recognition of individuals, of sex and of breed in two indigenous breeds of Borzoi dogs: Chortaj Windhound from South Russia and Russian Borzoi from Middle Russia. During 2002 - 2004 we recorded barks from 18 Chortaj and 8 Borzoi dogs in the kennel "Collection of indigenous borzoi breeds" of A.N. Severtsov Institute of Ecology and Evolution, RAS. The barks were recorded in the standard situation, representing the approaching of a known person.

Discriminant analysis of 1329 barks from 11 Chortaj and 8 Borzoi dogs (69 - 70 calls per individual) showed 63.5 % of correct assignment to individuals. Separate values of correct assignment to individuals were 66.2 % for Chortaj and 75.0 % for Borzoi dogs. The average value of correct assignment to sex achieved for a mixed sample of the two breeds was 67.9 % (358 barks from 12 females and 375 barks from 15 males). Separate values of correct assignment to sex were 70.3 % for Chortaj and 85.3 % for Borzoi dogs. The total value of correct assignment to breed, irrespective of sex, was 71.6 % (630 barks from 16 Chortaj and 638 from 8 Borzoi). When considering males and females separately, the correct assignment to breed was 79.7 % for Chortaj and 83.4 % for Borzoi dogs. Thus, barking provides information concerning the individuality of a dog, and in less extent its sex or breed, at least in breeds of similar size and weight.

To estimate stability of acoustic features, responsible for the recognition of individuality, we tested barks of 3 female and 2 male Chortaj dogs which were recorded twice, with a more than one-year interval in between. Discriminant analysis of 55 - 60 barks per dog from a sample of 2002 provided 89.1 % of correct assignment to individuals (n = 294). Similar analysis of 280 calls (50 - 60 calls per dog) from a sample taken 2003 - 2004 showed 87.8 % of correct assignment. However, cross-validation analysis of barks recorded in 2003 - 2004 using functions of 2002 showed values as low as 38.9 % of correct assignment to individuals (86.6 %, 41.7 %, 41.7 %, 20.0 % and 0 % for different dogs). Consequently, future studies of stability of barks of individual dogs over years on the basis of a larger sample size are necessary.

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