

Behaviour

Juvenile calls as indicators of sex and individuality in the red-crowned crane (*Grus japonensis*)

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Bioacoustical data on adult red-crowned cranes are scarce and almost lacking for juveniles. However, such data would be important both for understanding the early vocal ontogenesis in gruid species and for conservation purposes. The red-crowned crane is an endangered species; its population size in nature is as little as about 2000 birds. In Russia, the international programme for breeding and releasing red-crowned cranes into nature has started in 1994.

The focus of our research are the individual and sexual differences between calls of red-crowned crane chicks throughout the first 40 days of their lives. In brooders, sexing of chicks, based on DNA analysis, is not possible earlier than at three months of age. Among the drawbacks of this method are stress owing to capture and blood sampling, delay of getting results, with expense and unsuitability for application to free-ranging birds. Acoustical methods developed in the course of our studies may be considered as a good alternative or supplementation of the current practice.

In summer 2003, we analysed two tonal call types, recorded from 6 chicks (3 males and 3 females) from 0 to 40 day of life in the brooder of Oka's Natural Reserve (Russia). Sexes of these chicks were independently confirmed by two laboratories. We measured 3 frequency and 3 temporal parameters type 1-calls (n = 611), and 4 frequency and 6 temporal parameters for type 2-calls (n = 581). Despite a high interindividual variability, for limited time periods of 4 to 15 days (9 to 20 calls per individual) discriminant analysis showed up to 97 % of correct assignment to individuals (random value is 17 % for 6 individuals) and up to 93 % of correct assignment to sex (random value is 50 % for two sexes). Over the complete 40-days period, discrimination was lower (68 % for assignment to individuality and 71 % to sex), probably, because of voice alterations during growth.

These cues to individuality and to sex in juvenile bird voices may prepare the ground for the future development of individual and sex-related features in voices of adolescents. It might become important in monitoring autumn flocks, when the chicks of different parents mix up with each other, or during pairing of young cranes. These data have a practical application for the development of non-invasive bioacoustical sexing in red-crowned crane chicks or, taking into account long preservation of juvenile calls in crane repertoires, for monitoring young cranes released into the wild.