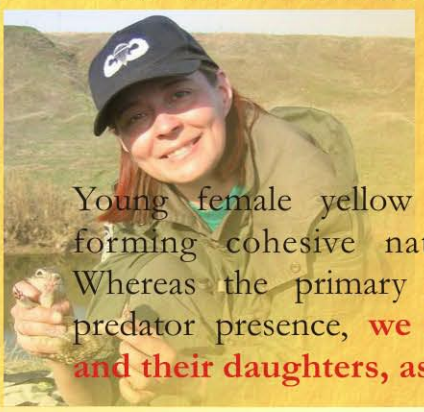
ALARM CALLS ARE NOT SIMILAR WITHIN MOTHER-DAUGHTER DYADS OF THE YELLOW GROUND SQUIRREL SPERMOPHILUS FULVUS



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INTRODUCTION

Young female yellow ground squirrels remain at close vicinity to their mother burrow, forming cohesive natal groups of breeding females with matriarchal social relations. Whereas the primary function of alarm call is to warning closely related kin about the predator presence, **we expected to find some similar features in alarm calls of mothers and their daughters, as signs of matrilineal groups, allowing the parent-offspring recognition.**

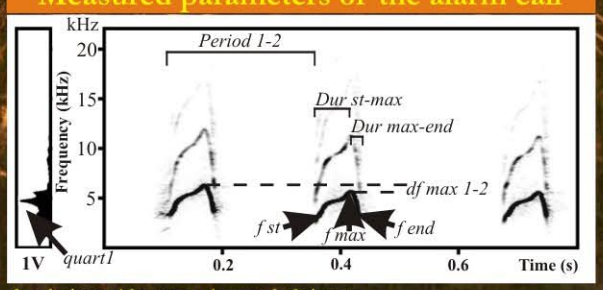
ANIMALS AND METHODS

Alarm calls were recorded from **30 individually marked animals**, representing **15 mother-daughter dyads**, in natural colony in May-June 2005-2006 in Saratov region, Russia. The adult mothers and their juvenile daughters were recorded when captured singly in live-traps and calling toward a human. We analyzed 10 alarm calls per animal (five individuals provided only 5-8 calls), **285 calls** in total. The individual call samples were subdivided half-and-half and the halves (143 calls and 142 calls correspondingly) were used to compare the calls of **related** (15 dyads mother-daughter) and **nonrelated** (15 dyads mother-nondaughter) females. To avoid pseudoreplication, each call was used in the analysis only once.

RESULTS

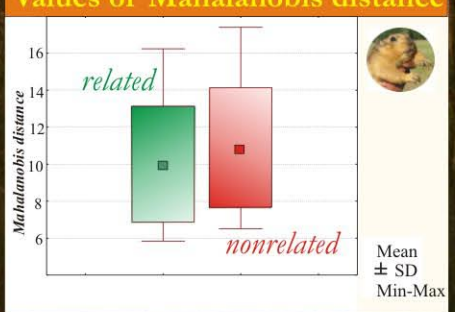
With 8 measured call parameters included into discriminant function analysis, we calculated Mahalanobis distances for each of the 30 dyads. Mahalanobis distances have been used as measures of similarity in structure of alarm calls between adult and juvenile yellow ground squirrels. Comparison between samples of the Mahalanobis distances for calls of the **related** (**mother-daughter**) and the **nonrelated** (**mother-nondaughter**) dyads did not reveal significant differences between them (Mann-Whitney test, $U = 96$, $P = 0.49$).

Measured parameters of the alarm call



f st - fundamental frequency at the start of a 2nd note,
f max - maximum fundamental frequency of a 2nd note,
f end - fundamental frequency at the end of a 2nd note,
period 1-2 - period from the beginning of a 1 note to the beginning of a 2 note in a cluster,
quart1 - the value of a first energy quartile,
dur st-max - time from the beginning of a note to the point of maximum fundamental frequency,
dur max-end - time from the point of maximum frequency to the end of a note,
df max 1-2 - difference between f max of a first and of a second note.

Values of Mahalanobis distance



15 Adult + 15 Juvenile females = 15 dyads in each box

CONCLUSION

The alarm call structure did not show within-family similarity, suggesting the irrelevance of vocal keys to kinship in the yellow ground squirrel.

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