SEXUAL BEHAVIOUR OF BANK VOLES (CLET*HRI*ONO*M*YS GLAREOLUS) IN NATURE AND IN EXPERIMENTAL GROUPS

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Mating behaviour of bank voles has been described in details in a number of experimental studies. However is poorly known so far how sexual interactions of the individuals simultaneously develop in natural social background in nature. It is still a question how the population density affects the sexual interactions of the animals, what the fundamental reason of the males' success during mating with female is. In this research we investigated the mating behaviour of bank voles in nature and the impact of population density on relationships between males and females. In experimental part of our study we designed the situation which could be found in wildlife in the years of middle or high population density: a female interacted with several males.

The main method we used in nature was direct visual observations of individually marked bank voles. The study was conducted in a study plot (9 ha in size) situated in a forest-steppe oak forest (Central Russia) in 1982-1997. Density of bank vole population over this period differed significantly (from 5 to 44 individuals per ha). To obtain more comparable data we analyzed here the interactions of the voles during the beginning of each year reproductive season, when the population consisted of the overwintered mature individuals only. Totally we examined relationships of 14 females and 47 males.

Observations of bank voles' behaviour in experimental groups were held in large enclosures (from 34 to 120 sq. m in size). Each group consisted of two females and four males. All animals were mature; they were trapped in nature or were the first generation of those animals. On the whole 12 cases of mating behaviour were analyzed. We recorded all patterns of activity and interactions of the voles during observations either in nature or in the experiment. Receptiveness of females was determined from the behaviour of conspecific males and the females' response. The duration of female's receptiveness was taken as the period of time between the first and the last mating recorded. In total we used 10 observations to estimate the duration of female's receptiveness.

Duration of receptiveness in bank voles varied within 40 min and 4 h 36 min. Not less than two males copulated with a female almost in all cases. The average mean in experimental groups was 2,4. It didn't always happen that the hierarchical status of the male determined his sequence of mating. Dominants were the first to mate only in 50% of occasions. It was found that the number of copulatory series during the period of female's receptiveness could vary from 2 to 27, the average mean was 7.2. One male could take part in several copulatory series (up to 10) running, but more often males matured by turns and made on average 1.9 series in a row.

In nature it was found that 2-3 days before the litter birth neighbouring males gathered within pregnant female home range. The number of males depended on the population density, 2-3 males in low and 6-8 males (up to 13) in high density. Males constantly pursued the pregnant female, tried to couple with her but she showed aggressiveness. After litter birth several males usually matured with the female during the period of her

postpartum receptiveness. However, the number of males matured with one female did not depend on population density. A large gathering of males in the neighbourhood of receptive female caused the increasing in the number of aggressive contacts between them. 1-3 males coupled with one female either in high or in low density. In the natural habitat those males who came into the home range of estral female earlier took priority in coupling with her. By the end of female's estrus period the centres of males' activity shifted to home ranges of another females and another male could take priority in mating. In the years of very low population density (up to 5 individuals per ha) the home range of a female usually overlapped with home ranges of 1-3 males. Decreasing in the number of aggressive interactions between them allowed every male mating with a female.

Thus either in nature or in experimental groups two – three males coupled with receptive female as a rule. So it would be quite probably that mutual paternity found in bank voles is a common occurrence.