INTRODUCTION

Rats emit ultrasonic vocalizations in many contexts. For those interested in sexual behavior, the post ejaculatory 22 kHz vocalizations as well as the precopulatory 50 kHz vocalizations are of particular interest. Although the circumstances under which vocalizations are emitted have been rather well characterized, very little is known about their possible effects on other individuals. Playback of the 22 kHz vocalizations has given conflicting results. This is also the case for the 50 kHz vocalizations emitted during the initial stages of copulatory interactions. Thus, at present it is not known whether high frequency vocalizations have a communicative function or not.

The simultaneous recording of ultrasonic vocalizations from both members of a pair of rats could perhaps give some clue as to their possible communicative function. In earlier studies one member of the pair had to be devocalized or anesthetized in order to determine the emitter. Such procedures probably altered the interaction between the subjects, making results difficult to interpret.

We now report some data from a preliminary study in which a two member pair of rats was to be recorded simultaneously in both cages. In order to determine the emitter such procedures probably altered the interaction between the subjects, making results difficult to interpret.

We employ circular cages placed 2 cm apart with wire mesh openings in the lower part allowing the rat in one cage to hear, smell and see the subject in the other cage.

The inside cage walls are covered with sound absorbing material.

Tests show that ultrasound are transmitted from one cage to the lower part of the adjacent cage while normally not being recorded by the microphone located at the top of that cage.

With a light source producing a light intensity of 8 lux at the bottom of the cage, the video cameras are able to record the animal's behavior. Time synchronisation with ultrasound recordings allows for analysis of animal behavior during vocalizations.

METHODS

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Even when a sound is recorded simultaneously in both channels it is possible to identify the source by comparing the intensity and exact time of recording.

CONCLUSIONS

With the present procedure it turned out to be possible to simultaneously record two adjacent animals and to identify the vocalizing subject. Although the animals were physically separated by a wire mesh, they could see, hear and smell each other. Nine percent of vocalizations were recorded in both compartments, but it was always possible to determine the animal of origin.

In pairs of a male and a sexually receptive female, it was basically the female who vocalized.

The behavior of the vocalizing female as well as that of the silent male was not clearly different between periods of vocalization and during an equal number of randomly chosen periods of silence. Data are mean ± SEM.

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There were large interindividual differences, some females being silent and others emitting more than 100 vocalizations during a 10 min test.

The stimulus control of vocalization was clear-cut in the vocalizing females. An intact male was a most efficient stimulus while a castrated male evoked a modest amount of vocalizations. Another sexually receptive female was less efficient than a castrated male, and a non-receptive female was inefficient.

It seems that a potential sexual partner evokes far more vocalizations than any other stimulus.