

WISSENSCHAFTLICHE KURZMITTEILUNGEN

Observations on the directional differences in homing ability of the rat-tailed bat, *Rhinopoma microphyllum* (Brunnich)

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WASON (1978) studied the homing ability in four species of insectivorous bats in Jodhpur and found that the rat-tailed bat, *Rhinopoma microphyllum* (Brunnich) was endowed with the best homing efficiency; it was also observed that the homing ability in bats dissipated as the distance from the home site increased. It was of interest to investigate the effect of the direction of release on the homing efficiency in bats. In the present study an attempt has been made to understand the directional differences in the homing ability of *R. microphyllum*. The data collected are summarised and discussed in this report.

The experiments were carried out in August and September, 1980 at Jodhpur, located on the eastern fringe of the Great Indian Desert between 26°18'N latitude and 73°8'E longitude and 241 m above the sea level. The bats were collected from an old ruin situated about 14 km west of Jodhpur near a place called Bhimbharak and they were marked with luminous enamel paint. The bats released from each cardinal direction were marked with a different colour so as to recognise them easily after return. Thus, the bats released from the north were marked with yellow, while that from south, east and west were marked with blue, white and red colours respectively. Bats of the release series A were marked with a single straight line on the dorsal side of the neck, while those of the release series B and C were marked with two and three lines respectively. No banding was done. The bats were usually captured 2–3 hours prior to the sun set, and were transported to the point of release in closed tin containers with a provision for the circulation of fresh air. Evenings on which experiments were performed were carefully selected for the calm weather conditions. All the bats of a given experiment were released simultaneously within a span of 3–4 minutes by tossing them up into air. All releases were made between 20.00–21.00 hours. The home-site of the released bats was searched in the following mornings for three consecutive days to record the return of the marked bats.

The results summarised in the Table, indicate that homing performance in *Rhinopoma microphyllum* from four cardinal directions varied considerably. It was observed that at a release distance of 15 km (release series A), homing was poorest from the west and best from the south and the east. From a release distance of 30 km (release series B) homing was poorest from the north and best from the east, and from a release distance of 45 km (release series C), homing was poorest from the north and west, and best from the east. Thus, considering all the three releases, east was the most favourable direction of release from where maximum bat returns were recorded. KRAMER et al. (1956, 1958) have given comparable information on pigeon, *Columba livia*, and reported that pigeons home better from some directions than from others. This supports our observations on *R. microphyllum*.

MUELLER (1965) carried out homing experiments on bat *Myotis lucifugus* in Wisconsin and reported that although homing in *M. lucifugus* from four cardinal directions varied considerably, these directional differences were not statistically significant. MUELLER performed his experiments from a distance of 8 km. We too observed that the directional differences in homing in *R. microphyllum* from a release distance of 15 km were statisti-

Homing efficiency in *Rhinopoma microphyllum* from four cardinal directions

Release series	Release of Bats			Recovery of Bats			Total	Total homing %
	Direction	Date	Number	1st day after release	2nd day after release	3rd day after release		
Distance of release 15 km from the home site								
A	N	5th Aug. 80	16	9	2	—	11	68.8
	S	5th Aug. 80	16	11	1	—	12	75.0
	E	7th Aug. 80	20	14	1	—	15	75.0
	W	7th Aug. 80	20	12	—	—	12	60.0
Distance of release 30 km from the home site								
B	N	25th Sep. 80	25	5	1	—	6	24.0
	S	25th Sep. 80	25	6	2	—	8	32.0
	E	26th Sep. 80	18	7	1	1	9	50.0
	W	26th Sep. 80	18	3	2	—	5	27.8
Distance of release 45 km from the home site								
C	N	28th Sep. 80	12	—	—	—	—	0.0
	S	28th Sep. 80	12	—	1	—	1	8.3
	E	29th Sep. 80	12	—	2	1	3	25.0
	W	29th Sep. 80	12	—	—	—	—	0.0

cally nonsignificant, which is, thus, in agreement with the finding of MUELLER (1965), but, that from the release distances of 30 and 45 km were found to be statistically significant ($P < 0.05$).

The foregoing, thus, demonstrates that release from relatively shorter distances leads to more or less equal success in homing irrespective of the direction, but, as the release distance increases success in homing varies for the directions i.e., directional differences in homing become more pronounced and marked with the increase in the release distance. In our experiments, better homing from east in *R. microphyllum* might, perhaps, be due to the fact that the wintering site of *R. microphyllum* is located in this direction, where this species migrates circannually in October–November.

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