

BEHAVIOUR OF BATS

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Abstract

Bats possess a variety of communication systems such as auditory, visual, tactile and olfactory. Of all types of communication, olfactory signals seem to be highly successful during breeding season. Olfactory communication in bats varies greatly depending on ecological pressure, roosting environment and the nature of the social organization of the species. Communication is the essence of all behavior. In bats, there is a relation between behavior and scent glands. Marking or direct rubbing of specialized scent glands on objects in the organism, habitat and leaving the glandular secretions as mark is a common phenomenon. Behavior maintaining the social bond between the pair, group cohesion and reduces tension in bat species which brings reproductive success.

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Introduction

Behaviour is the overall activity of an animal in relation to its environment. Social behavior largely depends on the modes of communication that organisms have evolved. The co-ordination and integration of all social activities including reproduction depends upon effective exchange of information between individuals (Scully *et al.*, 2000). Scent marking is an ideal strategy for marking territories in the roosting sites, selection of mates and also facilitate individual and group recognition (Kamran and Kerth, 2003). In territorial mammals, they make specific territory marking with both glandular secretions and urine (Buesching and MacDonald, 2001). In bats, they settle in the marked territory to display courtship behavior for attracting female. In gray-headed flying fox (*Pteropus poliocephalus*) and the samoan fruit bat (*Pteropus samoensis*), males rub the secretions from this neck and shoulder glands on branches of tree roosts and on trees in their foraging areas to advertise social and reproductive status (Brooke and Decker, 1996). French and Lollar (1998) observed that make Mexican free-tailed bats, *Tadarida brasiliensis* scent mark their roost with secretions from the gular gland and defend the marked territory during the breeding season.

In bats, chemical cues play a role in maintenance and social structure of colony. Dominant males produce more odorous and voluminous secretions than females and roost together with groups of 'harem' females within the colony. Bouchard (1998) reported that the bat species *Mops condylurus*, *Chaerephon pumilus* and *Myotis lucifugus* can recognize their roost mates based on olfactory cues.

Materials and methods

Video recording was made to observe the mating behavior during breeding season. During video recording a single mating pair was observed to study the mating behavior.

Results and Discussion

Scent marking is the behavioural pattern of mammals to transmit the chemical signal to their immediate environment (Berner and Bower, 1988). Scent marking behavioural patterns of animals in their roosting sites is categorized as territory marking, settlement of pairs in the marked territory, grooming, fanning, body rubbing, sniffing and mating.

Territory marking

Territory marking includes the marking of territorial boundaries. In bats, the dominant males often make a confirmed territory in the roosting site and become very aggressive to defend their territories. Such aggressive behavior has been noticed in other mammals such as gerbils, voles, wolves and Eurasian beaver (Rosell, 2002).

Grooming to attract the mates

Self-anointment of glandular secretions is used not only to create odour to the environment but also to help the animal appear more attractive to their conspecifics (Blosset *et al.*, 2002). In bats, dominant males produce odorous secretions from glands and disperse secretions over the females (Brooke and Decker, 1993). Similarly the antelope makes small bites during grooming and the maxillary gland secretions are pressed and dispersed to the females body (Ralls, 1971).

Fanning Behaviour

Bats use a special way of dispersing body fragrance by way of using wing flapping and fanning behavior. The male flutter both their wings directed towards the hanging females in its marked territory and release the scent. The same type of behavior have been observed by Voigt and Helversen (1999) in *Saccopteryx bilineata*.

Body rubbing

Self-anointed male bats mark their responding females by body rubbing. In *Molossus molossus*, makes sit on the back of females and smear the liquid from their chest glands. Like bats, body rubbing behavior has been reported in ferret, moose and *Bison bison* (Bowyer *et al.*, 1998).

Sniffing

Bats recognize roost mates and the selected mates through sniffing. Males investigate the selected female through sniffing. Such sniffing behavior has been observed in *Myotis lucifugus* and *Phyllostomus discolor* (Esser and Schmidt, 1989).

Mating

Olfactory communication during mating is very important in bats. Males making and rubbing behavior leads to mating. This paper concludes that the scent marking behavior is well developed in bat species. Odours play a dominant role in mate attraction, identifies the reproductive status, males' dominance, male fitness, male-female communication and mate choice.

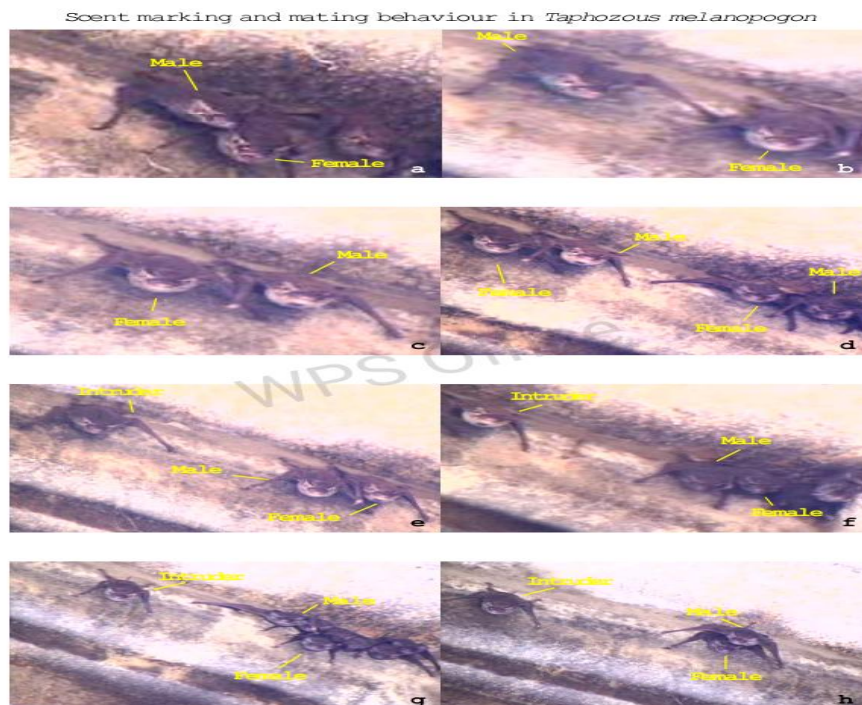


Figure: 1 showing the behaviour of bats

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