



Bathing behavior and waterhole importance of white-rumped vulture conservation in the Sigur Plateau, Tamil Nadu, Southern India.

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ABSTRACT

Bathing is a unique and important character for vultures, it play a major role in maintaining vulture hygienic as well as their living. There are eight bathing sites that were recorded around the Sigur plateau, out of which six of them were streams and two of them were shallow water pools. Totally twenty bathing observations were recorded from 2012 to 2013 during White-rumped vulture ecological study. Out of twenty basking observations fourteen of them were top of the trees and six were on rock surfaces. This paper is an eye opener to bring out bathing and basking behaviors of White-rumped vultures and important of waterholes and their conservation in India.

Keywords: Bathing, Basking, waterhole, White-rumped vultures, Sigur plateau

INTRODUCTION

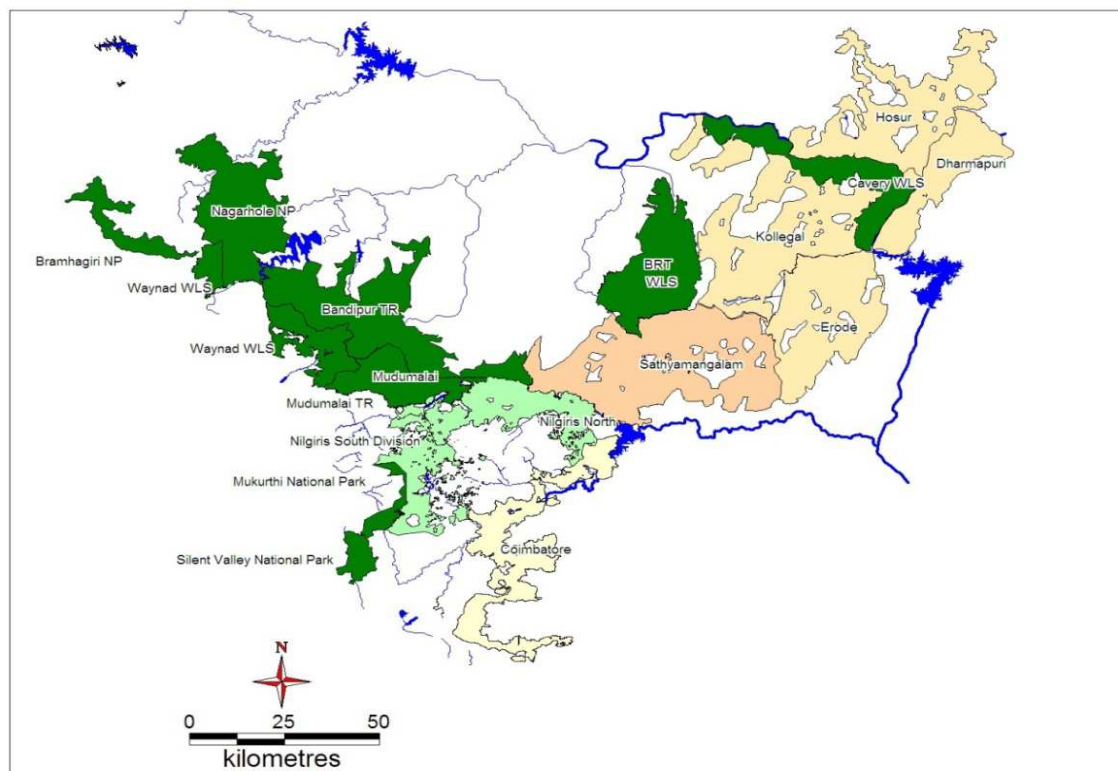
All vultures chiefly feed on the carcasses of small and large size mammals and also on the carcasses of domestic animals. Vultures as a flesh eater also need to find way to supplement their diet with As a scavenger, vulture plays a calcium which is very rare in soft tissue meat (Houston, 1978). vital role in maintaining the health of forest ecosystem. **Vultures** are, however, great ecologists, having a high sense of personal hygiene and are a manifestation of the adage of patience as a virtue. They clean the veld of carrion, thereby minimizing the impact of animal disease. Vultures have a unique pattern of digestive system that has a powerful acid inside the stomach using which it can digest any condition of food material including decaying food. Vultures are very clean in nature and they clean their body and bath regularly in rivers after gorging themselves at a kill, this is naturally a unique character of vultures. The behaviors such as drinking, bathing and basking information are not a high merit to takes place in a literature. However, these behaviors are very vital for maintaining the hygiene and health of the birds (Burton, 1985), and there are several aspects of behavior in vulture that remain unexplored. In this paper we observed and discussed the behaviors such as bathing, bathing site selection, basking and also drinking of White-rumped vulture (*Gyps*

bengalensis) and also related them to other vital physiological functions such as feather maintenance and thermoregulation.

Study area

The study was carried out in the Sigur plateau of the Nilgiris North Forest Division. The Sigur plateau is located in north eastern portion of the Nilgiris North Forest Division. The plateau is strategically located between the Western Ghats and Eastern Ghats. One end of this plateau is connected with Mudumalai Tiger Reserve (MTR), Waynad Wildlife Sanctuary and Bandipur Tiger Reserve of the Western Ghats and other end is connected with Biligiri Rangasamy Temple Tiger Reserve (BRT) and Sathyamangalam Tiger Reserve (STR) of Eastern Ghats (Map 1). The Sigur plateau is an excellent habitat that supports several endangered species and critically endangered *Gyps* vultures such as Long-billed (*Gyps indicus*) and White-rumped (*Gyps bengalensis*), Egyptian (*Neophron percnopterus*) and Red-headed (*Sacrogyps calvus*) vultures (Ramakrishnan *et al.*, 2010). There are five major rivers such as Moyar River, Sigur river, Avarahalla river, Kedarhalla river and Gundattihalla river drains in the Sigur plateau.

Map 1: Showing the study area location



MATERIALS AND METHOD

Bathing, drinking and also basking behaviors of White-rumped vultures was recorded from 2012 to 2013 in the Sigur plateau. Observation was recorded using scan and “Ad libitum” methods (Altman, 1974) and “behavior” sampling rules (Martin and Bateson, 1986), both of which are adequate for opportunistic records were used throughout the observations whenever vultures were sighted during field visits. The birds were spotted with naked eye and the behaviors were observed through 10 × 48 Bushnell binocular from a distance from 80 to 100 m. and photographs were captured using the

Fuji Film 24x optical zooming camera from the bathing sites. Google earth was used for measuring the distances from the nesting sites to bathing sites in the study area. Mapping was done by Quantum GIS version (1.7.4) Computer software.

RESULTS AND DISCUSSION

Bathing

There were eight bathing sites namely chemmanatham checkdam, Kalkarai, Anaikatti river, Jalliyaraipallam, Byson view point river side, Avaralla river, Narsalapari, Koolithoraipatti were recorded in the sigur plateau during the study period. Among the eight bathing sites, four of them were located within 10km (average distance between two nesting sites) radius and other four of them were located more than 10km radius from two nesting sites together (Table 1) (Map 2 & 3). Among the eight bating sites, six of them were located along the river side's (Semmanatham Dam, Anaikatti river, Byson view point river side, Narsalapari, Koolithoraipatti, Averallha river). Other two were shallow water pools (Kalkarai, Jalliyaraipallam). Bathing sites were classified for their water retaining as well as water running condition 7 of them was classified as seasonal and one was perennial type. White-rumped vulture was utilized these waterholes for their convenient. Mostly the seasonal waterholes were frequently used by the white-rumped rather than perennial waterhole. It was quite interesting to note that all eight bathing sites were surrounded by a rocky surface area. Totally twenty bathing observations were opportunistically recorded during our study period. We had observed that the numbers of vultures in the bathing sites ranging from 20 to 30. It was quite interesting to note that, when bathing in groups, hierarchy among the group members was displayed; dominant individuals displace the others from a given site in a pool or stream.

Table 1. Average distance between bathing sites and nesting sites

| Bathing site | Jagalikadavu Nesting Site | Siriyur Nesting Site | Average distance | Dimension Of Bathing Site | Seasonality |
|-----------------------------|---------------------------|----------------------|------------------|---------------------------|-------------|
| Chemmanatham check Dam | 1.77km | 13.91km | 7.84km | Stream | Seasonal |
| Kalkarai | 2.63km | 12.50km | 7.56km | Shallow water pool | Seasonal |
| Jalliyaraipallam | 5.61km | 10.18km | 7.89km | Shallow water pool | Seasonal |
| Anaikatti River | 6.04km | 6.75km | 6.38km | Stream | Seasonal |
| Avaralla river | 4.26km | 16.40km | 10.33km | Stream | Perennial |
| Byson view point River Side | 9.94km | 13.78km | 11.86km | Stream | Seasonal |
| Narsalaparai | 15.28km | 6.04km | 10.66km | Stream | Seasonal |
| Koolithoraipatti | 33.31km | 22.71km | 28.01km | Stream | Seasonal |

Note: Distance calculated through Google Earth map



Map 2 & 3. Location of Nesting sites and Bathing sites in the Sigur Plateau.

Bathing takes place on warm days (up to 34°C) as well as on cold days (down to 16°C). Vultures fly in a circular motion above the bathing site. The adults land first at the bathing site followed by immature. We found that our observations were showed that vultures followed by one by one to land at the bathing sites. Having reached to the bathing site, the vultures drunk some amount water followed by immersed their wings, then slowly submerged their head in to the water, and raised their head and wings, splashed itself with energetic sideways motions of the body while fluffing the feathers up. Its plumage, particularly on the breast and belly position soaked into the water. The vultures still in the water, stood straight and beaten their wings energetically soaking the body further, as the wings touch the water surface at times. After the bath, the bird came out of the water and rearranged their wings and ruffled so as to regain its original plumage. After completion of bathing, the next activity was basking in the sun light at a convenient place from the bathing sites. Once vultures came out of water, the bird often expanded their wings and showed its back to the sun.

Basking

Totally twenty occasions were observed the basking behavior during our field visits. Basking characters were very unique in vultures; they wildly expanded their wings against the sunlight for drying their wet wings. The feather maintenance was done using their bill and energetic fraction by changing their postures. We found that vultures used tall trees (n=14) for basking at the bathing sites, the average DBH (Diameter at Breast Height) of the basking trees were 453.5 cm and the average height was 24.5 m. Similarly, vultures also used rock surfaces for basking purposes (n=6). We found the vultures stood on the rock to dry the wetness from the body. 70% to 80% of wetness was dried by basking remaining 20% to 30% of wetness was dried by the effect of gliding sunlight in the air.

Discussion

Vultures are basically scavengers; they consume fresh as well as decaying carcasses from the forest areas. Bathing is a vital role for vultures to keep their body against any infection from external pathogens since it feeds on decaying carcasses as well to regulate their body temperature. The present paper described that there were totally eight bathing sites and twenty bathing observations recorded from one years of field study. Out of eight bathing sites six of them were rivers and two were shallow water pools. Generally the vultures use shallow water pools especially during rainy and winter when the pools were contain fresh water. On the contrary rivers were effectively used as long as their water running conditions. The vultures do bathing mainly to clean their body as well as to get thermoregulation.

Some of the previous studies were found that the vultures have a unique character to regulate their body temperature by urohydrolysis (Snyder and Snyder, 1991; Houston, 1994; Sick, 1997). Sometimes the vultures excrete on their legs, the excreta contains 80% of water content that cools appendages. This reaction also cools the appendages as well and also improves blood circulation which would help to cool the blood that would circulate through the body and thus radiate excessive heat (Sick, 1997; Snyder and Snyder, 1991; Houston, 1994). The bathing behavior is also helps in prevention of dangerous build-up of uric acid through urohydrolysis (Snyder and Snyder, 1991), which is a way to regulate body temperature as well. Drinking in vultures is roughly similar to that found in several other birds, although vultures do not throw head back as most birds do (Burton, 1985, de Juana *et al.*, 2004), but hold it horizontally (Buckley, 1999). Bathing is good for feather maintenance and is especially important in birds, most raptors bath regularly some of them do even daily if opportunity is given (Peeters and Peeters, 2005). As the lives of vultures depend on the efficiency of their wings, feather maintenance is of utmost importance to these birds (Houston, 1994). Vulture bath on streams, shallow water pools or under the rain that washes the feather and may help in their maintenance especially during rain, the birds carefully preen the feather in to shape (Fig.3) (Houston, 1994, *IS pers. obs.*). Raptors normally preen daily, not only after a bath and often interrupt a preening session by “Rousing” and raising and vigorous shaking of the entire plumage or by stretching legs and wings usually on one side and then the other (Peeteres and Peeteres, 2005).

This paper revealed that fourteen observations on top of the trees and six occasions on the rock surfaces for basking (Fig. 1) Ravi (*Pers.com.*) the basking behavior in vultures had been seen normally on top of the trees (Fig. 2) but some vulture do bask on the rock surface because it is more quicker than basking on top of the tree to dry their body, the reason being that rocks absorb the heat and reflect the sunlight. All raptors appear to enjoy sunning themselves not only for the warmth that it provides but also probably for additionally therapeutic effects. They usually turn their back to the sun and fan their tails partially or completely spread their wings (Peeteres and Peeteres, 2005).

Sunning, including bath, probably maintain the flight feathers in optimal conditions (Houston, 1994). Agonistic interactions among vultures are a common spectacle whenever these birds assemble (Houston 1994, Buckley, 1999), at the roosting places, feeding grounds near the carcasses and even at the bathing and drinking places (Sazima, 2010 and 2011). Adults are dominant over juveniles, and aggression is directed mostly towards non kin individuals (Buckley 1999). Bathing sites plays a vital role in maintaining the hygiene of the vultures as well as important for the breeding population, especially during the nesting in summer months (March-July) Chhangani (2010). He also added that the vultures feed more amount of food for feeding their chicks at the breeding seasons (January to May) so bathing is important aspect of vultures to maintain their sanitation in order to protect their body against the external pathogens. Similarly, Ali and Ripley (1987) stated that water sources are important criteria for selection of nesting habitats and it plays a crucial role in the survival of these birds. In a nutshell, although bathing and basking behaviors of vultures has been pointed sporadically by abroad studies (Sazima, 2010 and 2011), this paper is an eye opener to record bathing and basking behaviors of White-rumped vultures in India. These ecological characters would play vital role for the vultures for its long run conservation.

Management Recommendation

This short note is part of the long term studies on ecology of vultures in the Tamil Nadu part of the Nilgiri Biosphere Reserve. Twenty bathing observations were recorded from eight bathing sites. Of which two of them in shallow water pools and six of them in rivers. According to their water retaining capacity seven of them was holding water seasonally. White-rumped vultures utilized seasonally available water pools and rivers efficiently than the perennial river. Therefore this study recommends that the seasonal water pools are need to be filled by lorry water to ensure the water facility available even during dry seasons for vultures.

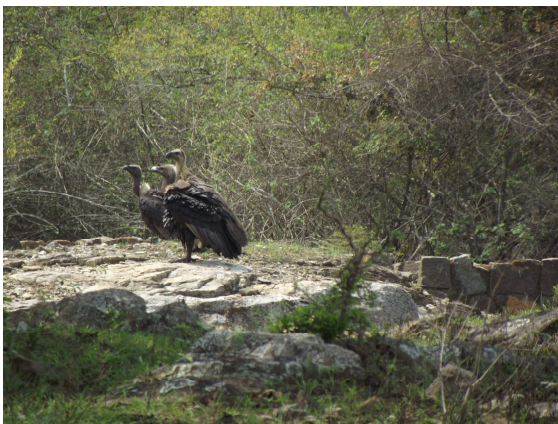


Fig.1.Bask on the rock surface



Fig.2.Bask on the top of the tree



Fig.3. Feather maintenance



Fig. 4. Bathing site (Anaikatti river)

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