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STATUS AND BEHAVIOUR OF WHITE-BACKED AND LONG-BILLED VULTURES IN RAJAJI NATIONAL PARK, UTTARAKHAND, INDIA

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Abstract. The collapse of three species of vultures namely *Gyps bengalensis*, *G. indicus* and *G. tenuirostris* has recently been observed in India. In the present study an attempt has been made to monitor the status of two most critical endangered species. During 2001–2002, 38 individuals of White-backed Vultures and 28 Long-billed Vultures were sighted in two ranges of Rajaji National Park. In 2002–2003 their populations were reduced to 6 and 0 respectively. During 2005–2006 while population of White-backed Vulture was found same but Long-billed Vulture could not be sighted. Though the real factor-causing decline in vulture populations in the study area is currently unknown but the availability of food and nesting sites does not seems to cause decline in vulture populations.

Key words: *Gyps bengalensis*, *Gyps indicus*, number, conservation.

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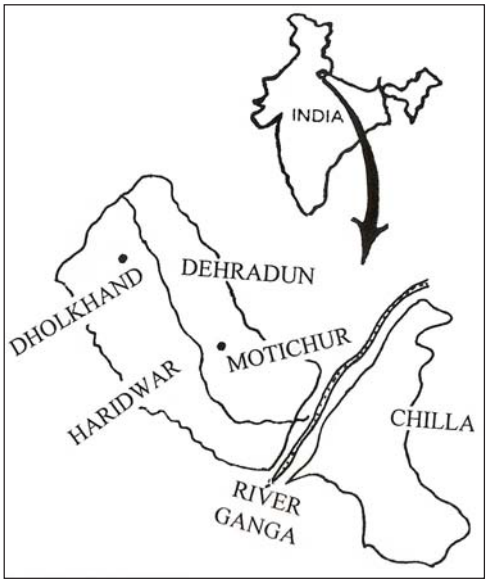
Статус и поведение бенгальского и индийского грифов в национальном парке Раджаджи, Уттараханд, Индия. - Р.К. Шарма, Д. Бхатт, В.К. Сети, В.Д. Джоши. - Беркут. 16 (1). 2007. - В Индии происходит коллапс популяций трех видов грифов: *Gyps bengalensis*, *G. indicus* и *G. tenuirostris*. Предпринята попытка мониторинга двух видов, находящихся под наибольшей угрозой. В 2001–2002 гг. 38 бенгальских и 28 индийских грифов обнаружены на двух участках парка. В 2002–2003 гг. численность этих видов уменьшилась соответственно до 6 и 0. В 2005–2006 гг. группировка бенгальского грифа оставалась такой же, индийских грифов обнаружить не удалось. Причины катастрофического сокращения численности грифов пока не ясны. Во всяком случае оно не связано с наличием пищи и мест гнездования.

Introduction

Recently it has been observed that out of eight species of vultures in India (Ali, Ripley 1983), White-backed (*Gyps bengalensis*), Long-billed (*G. indicus*) and Slender-billed Vultures (*G. tenuirostris*) have declined sharply in numbers (Prakash, 1999; Risebrough, 2002, in press; Virani et al., 2002). These species were found all over the country, often in groups, close to villages and towns, hovering around the carcass or doing its scavenging business few years ago.

The collapse of vulture populations has been sharpest since 1996. According to a study conducted in Keoladeo National Park (Rajasthan, India) between 1985 and 1999 a decline of 96 % was recorded in the population of White-backed Vulture and 97 % in Long-billed Vulture (Prakash, 1999). Insecticides and pesticides have been shown to cause shell thinning, egg breakage as well as embryo death in intact egg of birds (Newton, 1979). It has been suspected that population decline in vulture in Keoladeo National Park could be due to intake of pesticide through food (Prakash, 1999). However recent studies conducted in Pakistan, India and Lowland Nepal indicated the possibility of vulture death due to avian visceral gout, presumably caused by renal failure (Virani et al., 2002). An infectious disease that appeared by mutation or was transmitted from another species appears to be the most possible cause of the mortalities (Risebrough, 2002, in press). In a recent study on White-backed Vulture though diclofenac has been shown to be the main factor for the decline of vulture population (Oaks et al., 2004) but no study on diclofenac poisoning has been undertaken on any of the three *Gyps* vulture found in India. According to Arun and Azeez (2004) it would be premature to conclude that diclofenac was the main factor for the decline of vultures.



Study area. Район исследований.

Therefore, studies to identify the disease factor and to regular monitoring of the population status of the above species are highly needed. In the present study an attempt has been made to monitor the status of two most globally critical endangered vulture species in a few ranges of Rajaji National Park (Himalayan foothills) during 2001–2006.

Study Area and Methods

Fieldwork was undertaken between October 2001 and January 2003, and September 2006 in Motichur and Dholkhand ranges of Rajaji National Park (lat 29° 52' to 30°15'N; long 77° 57' to 78° 23'E) and adjacent villages and towns (Fig.). The forest of Rajaji National Park is moist (deciduous) with lot of vegetation. The main species of the plants in the Park is Sal (*Shorea robusta*), covering about 60–65 % of the total vegetation cover. The temperature varies from 3 °C in winter to 40 °C in summer and the annual rainfall is around 1150 mm, with most of it occurring during southwest monsoon from July to September.

The standard methods as suggested by Fuller and Mosher (1981) were followed for estimating the population of vulture in the Park. Nest searches and counting were conducted from November 2001 to February 2002 and November 2002 to January 2003 once in a fortnight. Behavioural observations were recorded in 20–40 meters distance from the nest of the vulture, using binocular (7 x 50) and photography was done with Pentax camera using telelens (500 mm). Because the species shows no obvious sexual dimorphism (Ali, Ripley, 1983), identification of partners was based on their position during copulations.

Results and Discussion

White-backed Vulture

During 2001–2002, 38 individuals were sighted (Photo). Out of these, only two pairs entered into breeding (attended the nest during incubation and rearing period) in *Ficus bengalensis* tree. In 2002–2003 only six White-backed Vultures were observed in the study site, indicating a drastic decline in the population (15.8 %) from the preceding year (2001–2002). One speculation may be that observed decline in the population is due to migration of vultures to other ranges of the Rajaji National Park in search for food. But food does not seem to be a cause of migration and/or decline as it is still available in abundance. In every visit 1–2 carcasses were seen in the study area with vulture feeding on them. The other proximate factor-causing decline in population may be the reduction in the availability of suitable nesting sites as suggested by Newton (1979) and Prakash (1999) also. During this study discussions were held with villagers and Park/Range Officers. They showed a number of tall trees (9–12 meter) of *Bombax ceiba, Ficus bengalensis* etc. still existing in their areas often used by vultures for their roosting and nesting few years ago. Obviously, availability of nesting sites is not a problem in two ranges of park, therefore the reason of decline in vulture population is currently unknown, though infectious/unidentified disease appears to be the most likely factor.

In November and December 2002 three

nesting sites (A, B & C) with presence of adults were observed in the study area on *Ficus bengalensis, Melia azadirecta*, and *Bombax ceiba* trees. At site A adults were seen in copulating posture. After copulation the male was found sitting on a branch of the same tree while female remained in the nest. In January 2003 only one pair was found attending the chick (nesting site A). In other nest (site B) one of the sexes was found dead and entangled in the branch of a *Melia azadirecta* tree. In nesting site C, the vulture pair was absconding and no vulture carcass was seen near the nesting site.

A flock of Long-billed and White-backed Vultures in the National Park.
Стая индийских и бенгальских грифов в национальном парке.

In January 2003, during field studies a dead vulture (almost fleshless) was found on the ground about 7 km away from the nesting sites, probably eaten up by some scavengers. This dead vulture may be one of the partners of the nesting sites B or C. We did not find any individual dead in September 2006 and no increase in the population.

In the present study, on one occasion one individual of the pair was seen bringing food items in its talons as generally observed in Bearded Vulture (*Gypaetus barbatus*) (Margalida, Bertron 2000) and giving it to its partner. The other partner then transferred the food to chick. To the best of our knowledge *Gyps* species of vultures have not been reported to bring food in talons. Therefore, a constant monitoring of such behaviour in the field would be helpful to understand the shift in the behaviour, if any. Concerning its breeding behaviour also, no information exists on the relative contribution of the sexes during the breeding with the exception of data given by Houston (1976) for the African White-backed Vulture (*G. africanus*). An in-depth study of the breeding behaviour of the species in India/ Asia is urgently needed to develop actions based on objective criteria for the recovery and /or conservation of the presently endangered Indian populations.

As generally observed in avian species, in the present study also, one of the sexes of the White-backed Vulture was found attending nest throughout the day (night data not available). The possibility of predation would seem to condition the permanent presence of one or other of adults at the nest. In a nest, one of the parents was observed providing shade to the chick by stretching wings in the afternoon (when nesting site was visited by the authors).

As mentioned earlier it is interesting to note that after having transferred the food item to the chick, the bird attending the nest did not allow the other partner (which brought the food) to stay in the nest. The bird gave a threat display. As a result of which the other partner went away from the nest and sat on the branch of an adjacent tree. After a brief stay of 10 minutes this bird traveled a large distance and

disappeared probably in search of food. Why one partner exhibited threat posture to other in the nest is not clear. But it may be assumed that at each feed the bird attending the nest to obtain adequate food for the growing chick as well as the normal daily requirement for itself. Whenever there is delay in food supply and/or shortage of food, the nest attending bird may force its partner to leave the nest and bring more food by exhibiting such threat display. From the nesting site vulture may travel large distances in search for a spatially and temporally unpredictable food. The frequency with which birds are able to feed and return to the nest presumably depends upon the distance and speed with which they are able to travel to the carcass, as well as the abundance of food and the feeding competition at the feeding site.

Long-billed Vulture

In 2001 (November) 28 vultures were present in the study area. Out of these, 12 were in Motichur range near water body while 16 were found feeding on the carcass in Dholkhand range. But their nesting sites could not be located. In the survey conducted in 2002–2003 not even a single individual was found in the study area. It is not clear whether their population has really declined or they have migrated to others sites of the park and/or restricted to their unknown nesting site. In March 2003 and then in September 2006, in the search of their nesting site we visited *Garur Chatti*, a place within Rajaji National Park where these vultures were known to breed in large numbers (hence the name *Garur Chatti*, i. e. place of vulture). But surprisingly no vulture was found in that well-known place also. The absence of vulture in the famous location of *Garur Chatti* indicated that this species has really declined sharply, but the cause of their decline is not yet clear in the study area. It may be mentioned that since vultures have the lowest reproduction rate compared to any bird species (Lack, 1968) and even a slight disturbance during breeding phase of this species would lead to decline in its population.

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