

# Geophagy by three species of crows near carcass dumping ground at Jodhpur, Rajasthan

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Survival and reproduction of each species depend on its ability to locate and eat sufficient food to meet their nutritional needs. Timings and selection of food synchronized to meet the requirements of proteins, carbohydrates, fats, vitamins, water and minerals, etc (Chhangani, 2000). The feeding behaviour of some birds is extremely complex. The complexity further increased by the type of food, feeding site, inter and intra-specific relationship and reproductive status of particular species. Birds in general consume a wide variety of food items that are very specific. The choice of particular food item depends on the nutrients value, energy value, which helps in digestion or balancing toxins in the diet, etc.

Geophagy, the deliberate act of eating soil, is widespread in vertebrates (Beyer, et. al., 1994). Many birds have been reported eating soil (Izawa, 1993; Diamond, et. al., 1999). Geophagy has also been reported in mammals and reptiles (Weir, 1969; Kreuten & Jager, 1984; Kreuten, 1985; Chhangani, 2000).

The present observations of sand eating by House crow (*Corvus splendens*), Large-billed crow (*Corvus macrorhynchos*) and Common raven (*Corvus corax*) were made at Municipal Corporation Dumping Ground (MCDG) at Jodhpur. All the species of crows were observed feeding with the seven species of vultures along with other birds at (MCDG) Jodhpur (Chhangani, 2002b). Jodhpur is situated on the eastern fringe of the Great Indian Desert (26°19'N, 73°08'E). There are about 158 species of birds belonging to 44 families were recorded in and around Jodhpur (Chhangani, 2002a). During the regular feeding and demographic observations and annual censuses of vultures from 1996 to 2002, sand eating by all the crow's species was observed 43 times. Of which 6% of observations were made on House crow, 35% were made on Jungle crow and 59% were made on ravens. All the species were observed eating sand after a regular feeding of 8 to 25 minutes on the dead carcasses. Sand eating was observed two times in a day in the morning it was observed between 10.00 to 12.00 am and in the evening between 3.00 to 5.00 pm. In most of the observations the sand was eating from the surface of the ground and some time from the opening of the dogs den. House crow used to eat small particles of sand where as Large-billed crow and ravens observed pickup larger pieces of sand then of House crow (about 1.5 cm). Timing of sand eating varies from .5 minute to 1.5 minutes.

The information presented here will form the basis for future studies, looking at the significance and use of geophagy in birds. The function of geophagy may vary from species to species, and within one species may serve different functions at different times (Davies & Baillie, 1988; Kreuten, 1985).

The simple explanation for geophagy in birds is to grind food in the gizzards because birds lack teeth (Diamond, 1999). But crows here preferred very fine soil so it is not useful in the grit and crows have no need for grit because they have large, strong and sharp bills.

This geophagy behaviour might have played a role in the neutralization or adsorption of toxins. Or this solid is a source of important supplement nutrients of the diet or the geophagy

improves the food intake through modification of conditions in the digestive track, such as PH, buffering capacity, osmotic pressure and dilution rate of food. Other potential benefits related to the protective effects of soil consumption against poisoning; the cation exchange capacity of clay minerals is associated with adsorption of dietary toxins (Kreuten, 1985).

A regular diet of routine and infected carcasses might contain alkaloids and other toxins, which are harmful or lethal for the crows, and the chemical elements present in sand are an extremely diverse group of nutrients that have many essential functions. Minerals present in the sand could play its role in the detoxification of toxic or poisonous elements (Chhangani, 2000). Deficiencies and imbalance of minerals are well recognized as important determinants of animal's physiology, fertility, productivity and mortality (Robbins, 1983). So, the "Soil Adsorption of Toxins" might be the reasonable explanation for the consumption of sand in birds. It is also important to investigate that is the soil eaten by crows are effective against the toxins in the diet or pathogens because it contains important ingredients which are effective and allow other chemicals to bond with them or lose their reactivity. More specific and further investigations and detail chemical study of sand eaten by crows of different species and other birds is needed. It is also possible that this soil is an important component of the diet for supplement nutrients like calcium, sodium, potassium, zinc, manganese, copper magnesium, etc.. All these possibilities need to be studied further to understand the geophagy in avian species.

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## Berwala Bird Safari

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The name of this wildlife sanctuary is perhaps unusual. But then it came to be created in rather unusual circumstances. In May 2001, Haryana's Chief Minister announced that he wanted to make the Morni area in the Shivalik Hills the finest tourist destination in north India; a Lion Safari laid over 1,000ha was to be the centre-piece of this utility. I was horrified as Morni is one of the few areas in the Shivaliks, which will qualify as a nature heritage site. I reasoned with the C. M. that he should instead create a Bird Safari that will require next to no infrastructure, no disturbance to the existing rich floral and faunal diversity and absolutely no relocation of villages. I learnt later that bureaucrats, without exception, were not happy with the idea of a Lion Safari but they did not wish to voice their opinion. So everyone backed my letter to the C.M. and the idea of a Bird Safari was accepted! For all intents and purposes it is a bird sanctuary but the word "Safari" has come to stay, for the present any way.

Berwala (30°41'N, 76°41'E; 300m a.s.l.) is a mere 16km from Chandigarh on the road to Morni. Situated at the junction of Shivaliks with the plains it is a bustling transit area in the back-and-forth movement of birds, butterflies and some mammals between the Himalaya and the plains, synchronous with the cycles of seasons the year long. It comprises the 260ha space in-between and over the last two major ridges of the Shivalik Hills range before they tumble down and eventually flatten out at the Ghagar River, merging with the plains of north India. At the widest the valley is about 2km and a mere 800m at the narrowest. There are three active springs that cater to the needs of birds and animals adequately. The valley, the numerous ravines and the slopes of the ridges are densely wooded with the dry deciduous flora typical of the Shivaliks. The predominant tree species are *Chaal* (*Anogeissus latifolia*), *Jhingan* (*Lannea grandis*), *Dhakk* (*Butea monosperma*), *Khair* (*Acacia catechu*), *Gular* (*Ficus glomerata*), *Ber* (*Zizyphus nummlaria*), and the climber *Bauhinia vahlii*. Some slopes support rich growth of *Bhabbar* grass (*Eulaliopsis binata*).

In keeping with the geology of the Shivaliks, Berwala has several bare and near vertical mud cliffs. The largest is almost in the centre of the sanctuary. It is approximately 40m at the base and narrows to about 30m as it rises dramatically for nearly 50m from the floor of the valley. In the month of May I found the Green Bee-eaters *Merops orientalis* covering the face of this cliff like a swarm of bees. About 20m above there were over 180 nest-tunnels so well placed that Shikras *Accipiter badius* and Common Kestrels *Falco tinnunculus* could not even get a toe-hold let alone prey upon the nestlings. And on 16.xi.2003, two Wallcreepers *Tichodroma muraria*

were sighted on this cliff face; I mention the date because this bird is a very rare vagrant from the Himalaya and it may well be the first record for this area.

So far 83 species of birds (resident, passage, vagrants and local migrants) have been sighted. Over a period of time, this list will surely cross the 200 mark. Occasionally encountered are the Great Barbet *Megalaima virens*, Blue-bearded Bee-eater *Nyctornis athertoni*, Yellow-billed Blue Magpie *Urocissa flavirostris*, Grey Treepie *Dendrocitta formosae*, Crested Bunting *Melophus lathamii*, Verditer Flycatcher *Eumyias thalassina*, Asian Paradise-Flycatcher *Terpsiphone paradisi*, Blue Whistling-Thrush *Myophonus caeruleus*, White-throated Fantail-Flycatcher *Rhipidura albicollis* and, Black Bulbul *Hypsipetes leucocephalus*. In the month of May, I sighted two male Crimson Sunbirds *Aethopya siparaja*. Surely they could not be nesting at such a low altitude? Those that delight your heart always and every time are the Red-vented Bulbul *Pycnonotus cafer*, Himalayan Bulbul *Pycnonotus leucogenys*, Oriental White-eye *Zosterops palpebrosus*, Great Tit *Parus major*, Rufous Treepie *Dendrocitta vagabunda*, Scarlet Minivet *Pericrocotus flammeus*, Oriental Magpie-Robin *Copsychus saularis*, Grey Bushchat *Saxicola ferrea*, Black Drongo *Dicrurus leucophaeus*, Jungle Babbler *Turdoides striatus*, Indian Peafowl *Pavo cristatus*, Red Junglefowl *Gallus gallus* and, Red-wattled Lapwing *Vanellus indicus*.

When summer is at its hottest and driest, the magic of this little sanctuary is hard to rival. The narrow valley reverberates with the incessant calls of the Lesser Cuckoo *Cuculus poliocephalus*, the Indian Cuckoo *Cuculus micropterus* and the Koel *Eudynamis scolopacea*. When rains are in sight, the Pied Crested Cuckoo *Clamator jacobinus* joins the chorus. Once the rains are well established, the Indian Pittas *Pitta brachyura* arrive in good numbers both to add colour and enliven the bird song. There is strong vocal evidence of the presence of Laughingthrushes (*Garrulax* spp.) as well but none have been seen nor identified from their calls so far.

There is one game trail in the sanctuary, which from the floor of the valley ascends to the top of the ridge and after a long traverse over the entire crest line again descends to the valley floor. The crest provides a total view of the entire sanctuary and a grand panorama of the Shivalik Range as far and wide as eyes can reach out. My first walk on the trail on 23.xi.2003 was very memorable. There were the tracks of a big Sambar *Cervus unicolor* with a fawn in tow, several heaps of droppings of the Barking Deer *Muntiacus muntjak*, spent quills of Indian Porcupines *Hystrix indica* and