

Foraging for Dung Beetles: A Tasty Treat

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Within the thorny scrub, deciduous jungles of the state of Karnataka, in southern India, a visitor may occasionally notice within a disturbed forest floor a broken dark object; dung balls, roughly the size of a baseball, lying cracked open in the recently dug dirt. But who, or what, is doing the cracking, and why?

Wildlife SOS (WSOS) has been working to preserve sloth bear habitat that borders the Benekal Reserve Forest. This land is not far from the first sanctuary to have been declared for sloth bears in India, the Daroji Sloth Bear Sanctuary, founded on July 10, 1994. The area is also near the famous ruins of the Vijayanagar Kingdom, where the scars of historical battles

that took place on the Deccan plateau can still be seen.

The forests in and around the Benekal Reserve are interspersed by huge rocky granite outcrops, with pockets of schist and gneiss and bands of dolorite and quartzite. The geographical features of the area, specifically the boulders and caves, are used by many wildlife species found in the area, including sloth bears (*Melursus ursinus*), leopards (*Panthera pardus*), peninsular Indian wolves (*Canis lupus pallipes*), jackals (*Canis aureos*), stripped hyenas (*Hyaena hyaena*), Indian pangolins (*Manis crassicaudata*), and Indian porcupines (*Hystrix indica*), as well as a large variety of bird life, including the red-listed, yellow-throated bulbul (*Pycnonotus xantholaemus*). It is within these relatively dry, scrubby areas that an interesting foraging behavior by sloth bears upon dung beetle larva has been noticed.

Sloth bears have a greatly varied diet, and although they are myrmecophagous (specifically adapted to feed on insects, especially termites and ants) they also feed on fruits, other

plant matter and groundnuts (Joshi et. al. 1997, Bargali et. al. 2004). They will also eat carrion, and occasionally small mammals, amphibians or reptiles. Like other bear species but unlike other myrmecophagous mammals, they can adapt their diet to changing food conditions (Joshi et al. 1997). This ability to adapt their diet to the surrounding area may be exaggerated in sloth bears as they are found in a large variety of habitat types which includes everything from scrub jungle to rainforest to wet evergreen forest to open prairie. Previous studies have documented that sloth bears eat longicorn beetles and dung beetles (Bargali et al. 2004; Baskaran et al. 1997), but none have documented specific foraging behavior associated with these beetles or their larva.

Dung beetles are present throughout the sub-continent of India and can be split into two basic groups based on their breeding behaviors: the "Tunnelers" and the "Rollers." The Tunnelers make tunnels directly under a dung pat. The Rollers gather dung into a ball, roll it to a new location, and lay an egg in it. Some species of Rollers prop up the dung balls in vegetation, while other species bury them in the ground, roughly 10 cm deep. The species that bury the dung balls in the ground seem to be of particular interest to sloth bears.

It turns out that these buried, larva-filled dung balls are quite the delicacy to sloth bears, who will actively forage for them. Throughout the scrub forests of Karnataka, the unmistakable sloth bear sign --- the long, trailed dirt diggings and sloth bear prints --- will often contain a cracked-open dung ball (see photo). Exactly how the bears locate the dung balls under the earth is not known, though their keen sense of smell likely plays a role. Once the dung balls are located, the bears use their long, powerful claws to dig up them up. The ball is then cracked open and the contents eaten.

How important dung beetle larvae are to the sloth bear's diet is unknown. It would be particularly difficult to



Sloth Bear Sign: long, trailed dirt diggings and sloth bear prints

Eurasia

quantify in a formal study because the soft tissue of these larva likely would not be recognizable in bear scat. It is also not known if the importance of this food source varies with the seasons or other ecological cycles. Further research on this type of foraging behavior could provide additional important information on sloth bear ecology in these rocky deciduous scrub jungles.

Literature Cited

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Asiatic Black Bear in Dachigam National Park, Kashmir – A New Research Initiative by the Wildlife Institute of India

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Asiatic black bears are distributed through much of southern Asia and India, in the forested mountain habitats of northern India and in the hills of northeastern India. The potential black bear habitat in India is estimated to be approximately 270,000 km² with an estimated population of about 6,000 individuals. Apart from a few short investigations and status surveys, the information on Asiatic black bears in India is scarce. Poaching for bear parts, black human-bear conflicts and habitat loss are increasing in most parts of the black bears' range in India. The Kashmir Valley in the Jammu and Kashmir State of India has become a hot spot for human-bear conflicts. The persistence of the conflicts can be a major problem for the local people and may undermine conservation efforts of Asiatic black bears in this region. In light of that, the Wildlife Institute of India (WII), Dehradun has recently initiated a research project on Asiatic black bears to understand the ecology, behavior and sources of conflict. The study is being carried out at Dachigam National Park (141 km²) located in the Zanskar range of the Indian Himalayas.

Historically, Dachigam was the



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Asiatic Black Bear: Dachigam National Park



Bear Rake or Claw Mark on Tree

hunting reserve of Maharaja Harisingh – the ruler of Kashmir. Dachigam is now well known for its good population of black bears and is also home of the last surviving population of Hangul or Kashmir Stag – the only sub species of Red deer in India. Three short studies on black bears have been carried out in the past in Dachigam National Park (NP), two on food habits (Schaller, 1969; Manjeraker, 1989) and one on the distribution and density (Saberwal, 1989). The objectives of the current study are: (i) to assess the human-bear conflicts and threats to black bears and their habitat in Dachigam NP; (ii) to evaluate whether the distribution and relative abundance of Asiatic black bears is influenced by the availability of major plants found in Dachigam NP; and (iii) to evaluate whether the daily, seasonal and annual activity, habitat use, movement and ranging patterns of Asiatic black bears in Dachigam NP is influenced by the availability and distribution of plants used by black bears.

The survey of the study area was carried out in May 2007 and an appropriate study design has been developed. The study area has been divided into 25 grids (2 km² each) and each grid has permanent vegetation plots and transects that are sampled twice a month for bear signs and food availability. Based on intensive field-work from June to September 2007, 83 bears were sighted and 136 bear signs recorded. The bear signs included scats (n=67), trails (n=4), feeding signs (n=34) including stone turns, digging, bedding signs (n=31) and other signs (rake marks, rub signs). Bears and their signs were mostly found in the lower part of Dachigam NP during June and July; signs were patch during August and September when the bears were mostly in riparian and oak habitats.

Based on the information collected, we have identified six black bear habitats: riparian, low temperate, low temperate pine mixed, oak forest, mid temperate and grasslands. The availability of fruits of Prunus cerasifera,