

Habitat conservation of Chinkara (*Gazelle gazelle*) in protected areas of Maharashtra and Gujarat

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ABSTRACT

Chinkara is a wild animal present in 11 states of India. The Chinkara (*Gazella gazelle*) can be seen in various protected areas across India. This animal was recorded in IUCN category as L Rnt (lower risk near threatened) in 2000. Maharashtra and Gujarat states have declared wildlife sanctuaries namely Mayureshwar wildlife Sanctuary (MWLS) and Narayan Sarovar Wildlife Sanctuary (NSWLS) respectively for conservation of Chinkara. Habitat conservation in MWLS and NSWLS was carried out by planting suitable fodder species. Natural regeneration of other species reported from survey and floristic composition was 185 species, 155 genera belonging to 55 families of flowering plants, two Pteridophytes and one Gymnosperm. Gujarat Ecological Education and Research (GEER) Foundation, Gandhinagar has carried out ecological status of NSWLS and reported floristic composition of 254 species, 179 genera and 59 families of flowering plants and one Gymnosperm. The comparative floristic analyses of these two wildlife sanctuaries from two states will focus on common and uncommon plant resources useful for ecological diversity in two different environment.

Key words: Chinkara, Habitat conservation, MWLS, NSWLS

INTRODUCTION

Gujarat and Rajasthan are major states protecting wildlife with special reference to Chinkara and blackbuck. The Wala Rajputs and the Wala Kathis from Saurashtra worship blackbuck and consider them sacred. The Bishnoi communities from Rajasthan are protecting Chinkara as sacred. 'Jivdaya' a concept (a compassion for all forms of life) is the major consideration behind the protection of harmless creatures. Kathi and Patel communities protect blackbuck and blue bull zealously on religious grounds. Saurashtra and Kutch where majority of people are vegetarian, results into protection of wildlife throughout the region. About 7000 blackbuck live in agricultural fields and waste lands. They protect blackbuck in the area and provide fodder and water during scarcity. Blackbuck, blue bull, langur and peacock cause considerable damage to agricultural crops and cause resentment among people but they enjoy full protection from the society. In spite of their habitat degradation number of these species is growing consistently through out the state. The main reason behind is

the past history of villagers and religious practice (Singh, 2001).

As per our old heritage of nature conservation, Government of India has given emphasis mainly on comparatively large areas set aside in the form of national parks or wildlife sanctuaries with the primary aim of conserving tigers, lions, birds, animals etc.

In January 1935 Government of India organized a national conference for the preservation of wildlife and reviewed the existing position of flora and fauna as well as the general problem of protection of the animals peculiar to India. The conference further laid stress on the establishment of wildlife sanctuaries and their protection assigned to the Forest Department in the areas under their charge with the help of necessary co-operation of police and magistracy was also urged (Khullar. 1992).

Chinkara is a wild animal present in 11 states of India. The Chinkara gazelle can be seen in various parks across India but the best wildlife parks in which to look out for this animal are Gir, Panna, Ranthambore and The Desert National Park.

This animal was recorded in IUCN category as LRnt (lower risk near threatened) in 2000 (Dookia *et al.*, 2009). These animals are very shy and most of the time they are sighted from a long distance. This is the smallest Asiatic antelope. It grows to a height of 65 cm and weighs up to a mere 25 kg. Most males have very short horns, although some grow to a length of 25 - 30 cm. These gazelles are found mostly in open woodlands and scrublands. They have a special characteristic which helps them survive trying times. They can go without water for long periods and can even get sufficient fluids from plants and dew drops. Although mostly seen as solitary animals, they can sometimes be spotted in small groups numbering up to 3 - 4 individuals. They don't have any specific breeding period although it is mostly concentrated around autumn and spring. They have a gestation period of 5 and half months. Their numbers have dwindled to a large extent and they feature on the endangered list. They have a life expectancy of 12 - 15 years, which too is shorter than that of most of its cousins. Their diet consists of all kinds of vegetation. Their favorite food is lush grass and many types of fruit. They portray a very hyper and nervous appearance due to the constant wagging of their tail or very frequent glances around to check for approaching danger. Chinkara has been given due attention by Forest Department of Maharashtra and Gujarat for conservation of natural forest and plantation of fodder species for survival of this wild animal. Ecological of Chinkara animal was carried out from MWLS (Ben *et al* 2011). The study incorporates food habits, habitat preferences and herd conditions. Indian Gazelle was recorded in P1, P2, P3 and P4 seasonal identified habitats in the area. Attempts are also made to evaluate dung samples of Chinkara for microbiology. The droppings of Chinkara harbored cellulolytic organisms suggesting their role in the Carbon cycle and increasing the fertility of soil. Cellulose is hydrolyzed to cellobiose and glucose which is utilized by many other microbes in soil. The mycological study revealed that 15 fungi from the dung sample which are *Alternaria alternata* (Fr.) Keissler, *Aspergillus niger* var Tieghem, *Chaetomium globosum* Kunze, *Cladosporium oxysporum* Schlecht. *Curvularia lunata* (Wakker) Boedijn, *Fusarium moniliforme* J. Sheld, *Rhizopus oryzae* Went & Prinsen Geerligs, *Rhizopus stolonifer* (Ehrenb.), etc. They play an important role in the ecosystem, responsible for recycling the

nutrients in animal faces. Special observations are made on the health conditions of Chinkara in the sanctuary. Present attempt is documentation of floristic diversity in MWLS since 2004- 2007 and compare with NSWLS. Present paper deals with food habits of Chinkara and status of plant resources.

MATERIALS AND METHODS

Area under study

Narayan Sarovar Wildlife Sanctuary was declared as a wildlife sanctuary in Lakhpat Taluka by the State government of Gujarat through a notification in April 1981. An area of 444.23 sq km of reserved forest in 16 villages which constituted a part of the original sanctuary was notified as Chinkara wildlife Sanctuary in July 1993. Floristic data available from the GEER (Gujarath Ecological Education and Research Foundation. Gandhinagar, 2001).

Mayureshwar Wildlife Sanctuary (18° 10' N and 74° 34'E) falls in the biogeographic province 6B in the Baramati taluka of Pune District. The Mayureshwar Wildlife Sanctuary was declared vide Govt Resolution NO. WLP 1094/cr-510/F-1 dated 19th August, 1997. This sanctuary has 5.14 sq km area and studied for Ph.D. work from 2004 to 2007 and recorded ecological aspects with standard techniques.

Mayureshwar Wildlife Sanctuary and Narayan Sarovar Wildlife sanctuary are specially developed for Chinkara. Comparative floristic elements from both sanctuaries are reported.

Food habit of Chinkara

This wild animal generally preferred habitat of *Acacia* dominated species to feed on different food items. Ghosh *et al.* (1987) observed that Chinkara feed on *Acacia torta* leaves and pods in Jodhpur region. Other species like *Balanites aegyptiaca* (L) Del, *Capparis decidua* (Forsk) Edgew, *Prosopis cineraria* (L.) Druce, *Salvadora persica* L. and *Ziziphus nummularia* (Burm.f.) W. & A. and with few grasses (Sharma 1977). Based on a study conducted in desert, Chinkara generally preferred the leaves of *Capparis burhia* and *Zizyphus nummularia* (Burm.f.) W. & A. and also fed on the leaves of *Acacia torta* (Roxb) Ctsib. and on the standing crop of *bajra* (*Pennisetum typhoides* (Burm.f.) Stapf. & Hubb.) and *moth* (*Vigna acontifolia* (Jacq.) Marechal) during the post-monsoon and winter seasons.

Ochthochloa compressa (Forssk.) Hilu appeared to be the most preferred grass of the Chinkara. The chinkara have been noticed to pick up the highly nutritious green or dried pods shed by *Prosopis cineraria* (L.) Druce plants (crude proteins 11.5%, gross energy value 6.5 kcal/g) (Dookia, 2002).

The major forest types in NSWL sanctuary are dry deciduous scrub, *Salvadora* scrub, desert thorn forest, *Acacia* species forest, tropical *Euphorbia* scrub, dry savanna type vegetation. *Acacia nilotica* (L.) Willd. Ex Del. (Babul) and *Acacia Senegal* Willd. (Goradio Baval) are predominant species in the sanctuary. Some patches were planted with *Prosopis juliflora* (Sw.) DC. which has started spreading in the area. A total of 254 species of flowering plants belonging to 179 genera and 59 families and one gymnosperm were reported by GEER (Gujarath Ecological Education and Research Foundation (Gandhinagar, 2001). Population of Chinkara in the sanctuary is estimated to be 1200 to 1500.

In MWLS forest department planted species of *Acacia torta* (Roxb) Ctsib., *Gliricidia sepium* (Jacq.) Kunth. ex Walp., *Azadirachta indica* A. Juss. and *Prosopis cineraria* (L.) Druce., *P. juliflora* (Sw.) DC. since 1983. Due to protection natural floristic elements are well established. The documentation of such floristic account reveals total 185 species belong to 155 genera and 55 families. Two pteridophytes namely *Actiniopteris dichotoma* Bedd, *Ophioglossum gramineum* Willd. and gymnosperm *Thuja occidentalis* L. are recorded here. Some algae and bryophytes are *Chara*, *Hydrodictyon*, *Chlorella* and *Riccia* respectively. Population of Chinkara in the sanctuary is estimated to be 120 to 200.

It is observed that the Chinkara, which mainly browsers are, selectively consume leaves having low fibre and high crude protein contents. The soft branches and leaves of *Capparis burhia* are much relished by these animals; when these plants dry up in summer, the chinkara readjust their feeding habit and feed on the green leaves of *Maytenus emarginata* and to some extent on the energy and moisture-rich pods of *P. cineraria* (Bohera et al. 1992). In the saline desert tract of Israel, the pods of *Acacia* species reportedly form a considerable part of diet of *Gazella dorcas* (Baharav 1981, 1982). Roberts (1977) observed that the gazelles in the Cholistan desert region of Pakistan browse on *Leptadina spartium* and *Acacia jacquemonti* during

the early part of summer. When nothing else is available, the animals browse on *Calligonum polygonoides*. During monsoon, the young and sprouting shoots of grasses *Aristida mutabilis* Trin. & Rupr. *A. funiculata* Trin. & Rupr and *Cenchrus pennisetiformis* Steud. Provide sustenance to the Chinkara. A changeover from browsing to grazing in Chinkara was noticed only in this season and for a very short time. The selection of food plants of low fibre and high protein content by the Chinkara may be a reflection of their poor fibre digestibility. The light-weight stomach of these animals may be considered as an aid to fast leaping, a very effective means of escaping from poachers and predators (Sharma, 1977).

The Indian gazelle are mainly graminivorous. The Mayureshwar Wildlife Sanctuary has scrub type of vegetation which is composed of fodder species. It consists of grasses, seeds, and herbs along with agricultural crops. They also browse on the leaves of *Leucaena latisiliqua* (L.) Gills (Subabul), *Acacia leucophloea* (Roxb.) Willd (Hiwar) and *Acacia nilotica* (L.) Willd. Ex Del (Babul). They feed on berries of *Ziziphus mauritiana* Lam. Bor and pods of *Acacia nilotica* (L.) Willd. Ex Del (Babul), *Acacia leucophloea* (Roxb.) Willd (Hiwar) and *Dalbergia sissoo* Roxb (Sisoo). Tender shoots of *Agave americana* L too form part of food of Chinkara especially in summer months. The latex bearing leaves of *Calotropis gigantea* (L.) R.Br. are generally shunned during summer.

RESULTS AND DISCUSSION

Floristic account of NSWLS is 254 species split into 59 families and one Gymnosperm, *Ephedra foliata* Boiss. In this sanctuary Tamaricaceae, Elatinaceae, Sterculiaceae, Oxalidaceae, Burseraceae, Celastraceae, Moringaceae, Lythraceae, Aizoaceae, Sapotaceae, Salvadoraceae, Periplocaceae, Gentianaceae, Ehretiaceae, Avicenniaceae, Casuarinaceae, Hydrocharitaceae, Typhaceae are represented. This indicates that major elements in this sanctuary are naturally established. It is a mixed type of forest due to some saline species like *Avicennia marina* (Forsk.) Vierh. *Salvadora oleoides* Decne and *S. persica* L.. The other members like *Helicteres isora* L, *Tamarix ericoides* Roul. *Maytenus emarginata* (Willd) D. Hou. and *Cordia dichotoma* Forst.f. are deciduous forest elements. Floristic composition consists of 25 trees, 58 shrubs, 109 herbs, 16 climbers, 35 grasses and 11 crop plants.

In MWLS total 185 plants species divided into 55 families and two members of Pterodophytes and one Gymnosperm. This sanctuary has 17 trees, 8 shrubs, 123 herbs, 12 climbers and cultivated plants. Annonaceae, Agavaceae, Simaroubaceae, Passifloraceae, Papaveraceae, Aristolochiaceae, Urticaceae, Molluginaceae, Geraniaceae, etc. are found in the sanctuary. This forest is scrub thorny type and developed by forest department for protection of Chinkara. During monsoon season ample food material and water is available (Ben *et al.*, 2006).

There are 61 plants common in both sanctuaries. While 98 plants only reported in MWLS. NSWLS established in July 1993 and MWLS

in August 1997 for conservation of Chinkara wild animal. The area of NSWLS is 444.23 sq km and MWLS is only 5.14 sq km and forest types are different in both sanctuaries hence diversity of plants is higher in NSWLS (Ben *et al.* 2007).

Due to threat observed in protected areas by outside agencies. Forest department of both the states has developed a model for habitat conservation by way of ecosystem development in dry land areas.

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