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STATUS AND FEEDING ECOLOGY OF THE CHINKARA IN PANNA FOREST, PANNA (M.P.)

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ABSTRACT : The Chinkara or the Indian *Gazelle* is one of the most graceful animals. The forest compartments of Ajaygarh and Vishramganj range of North forest division have been visited for present observations, which were made on seasonal basis throughout the year. The present paper deals with the food habits of Chinkara they used 34 plant species as their food in Panna forest. During rains the most preferred food is variety of grasses, where as in winter when forage conditions becomes worst they become browser and in summer they feed on dry grasses along with fallen dry leaves. During two years study tenur 47 animals were indentified and reported into various age and sex groups.

Key words : *Chinkara, Population structure, Food habits, Panna forest.*

INTRODUCTION

The *Gazella bennettii* (Chinkara) was included in *G.gazelle* (Pallas) and later in *G.dorcas* (Linnaeus), now it is treated as a distinct species with only nominate subspecies (*Gazella bennettii bennetti*) Skyes,1931 found in India (Alfred *et al.*,2001). It is one of the common Antilopinae of India, with a distribution extending from the plains, low hills of the North-Western, Central India, to the open lands of the Deccan and little towards the Krishna river (Prater,1971).

The Chinkara is a species of *Gazelle* which is found in South Asia, in grasslands and desert areas of India, parts of Iran and Pakistan. The Indian gazelle or Chinkara (*Gazella bennettii*) is widely distributed in India, being present in nine states (Haryana, Rajasthan, Uttar Pradesh Bihar, Madhya Pradesh, Andhra Pradesh, Karnataka, Maharashtra and Gujarat), it is seen in 80 wildlife Sanctuaries and National Parks of these states. Chinkara is totally protected under the Indian Wildlife Protection Act (1972) and its hunting is banned. Rahmani (1990a,b&1997), Kankane (2000), Dookia (2007) and Dookia *et al.* (2009) dealt with distribution, density, group size and conservation issues of the Chinkara in Rajasthan.

After Rajasthan, Madhya Pradesh possibly has the highest number of Chinkara in India and the animal can be seen in all the dry deciduous forests (Rahmani,1990a,b). Mostly all of the Sanctuaries of Madhya Pradesh is having good population of Chinkara. Out of the 43 Sanctuaries and National parks of Madhya Pradesh, Chinkara is found in 16 existing and six proposed sanctuaries. A comparative study of Chinkara in protected areas of Madhya Pradesh revealed that Madhav National Park of Shivpuri district has maximum number of Chinkara, where as in Kanha National park Chinkara was not reported. In addition to this, scattered populations are also present in many districts of Madhya Pradesh *i.e.* Guna, Gwalior, Shivpuri, Bhind, Datia, Morena, Tikamgarh, Chhatarpur, Satna, Rewa, Sidhi, Shahdol, Bhopal, Khandwa, Raisen, Hoshangabad, Narsingpur, Jabalpur, Betul, Chhindwara, Indore and Dewas Ambikapur, Jagadalpur, Durg, Bilaspur, Raigarh (now in Chhatisgarh). The detailed study on the feeding ecology and population status of Chinkara will not only help in understanding the ecological requirement of the species but will also enhance our understanding of its relationship with the tiger. Such ecological information on the prey species are urgently needed for good management and conservation of top carnivores *i.e.* tigers and its environment in dry forest habitat.

MATERIAL AND METHODS

There are two forest divisions in Panna district *i.e.* North Panna forest division and South forest division. The forests of the North Panna division are confined to northern part of the revenue district. It is situated between 24°28' to 25°12' North Latitude and 79°45' to 80°40' East Longitude. The area is surrounded by Banda district of U.P. in North, Satna district in East, boundary of South Panna division in South and Panna Tiger Reserve, Gangau and Ken Ghadiyal Sanctuary boundary of Chhatarpur in the West.

The total geographical area of the division is 2155.76 sq.km. Out of which the forest area is 974.27 sq.km, which is 45.19% of total geographical area. The area is distributed over two sub-division (*i.e.* Vishramganj and Panna) and five ranges namely Dharampur, Devendranagar, Ajaygarh, Vishramganj and Panna. These ranges consists of 8 reserved forest blocks, 8 reserve forest compartments,

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85 protected forest blocks and 383 protected forest compartments. One range of social forestry has been also established for plantation in Panna forest division.

The forest of the North forest division consists of dense teak and mixed forest. The vast area is blank and degraded forest. The main tree species are Teak, Saja, Kullu, Dhaora, Seja, Tendu, Achar, Awanla, Haldu, Kusam, Bahera, Palash, Papada etc. Lantana, Karounda, Jharberi, Gokhro, Ber etc are the shrubs. Makor, Gurar, Palasbel, Mahulbel etc. are climbers and Lampa, Phulera, Sen, Bhurbhuse etc. variety of grasses are also found. A regular survey after every seasons was carried out to study the population trends of Chinkara in selected compartments of North Panna forest during January,2008 to December,2009. Each field day comprised of two visits, once in the morning (6 to 10 am) and one in the evening (4 to 7 pm), as ungulate activity is known to be maximum in these periods of the day. Observations were made along established forest roads using binoculars. Accurate classification of individuals was not possible because the Chinkara in Panna forest are generally very shy of humans and can not be approached easily. Animals more than 100 m away and those not seen clearly, were not classified. The troops were counted twice or thrice enabling correct sex identification of young animals.

The food habits of Chinkara and other ungulates are often recorded by observing the plants eaten as the animal graze or noting the locations where animals grazed and later inspecting the site to see what plants were eaten (Wallmo *et al.*,1973). The selected study areas were covered for feeding observations on foot and motorcycle in North Panna forest from January,2008 to December,2009. When a feeding animal was located, it was observed from a distance varying from 30 to 50 m and recorded the food plants eaten. The food plants species, types of the foods, which were being eaten partly or completely were also recorded and listed in tabular form. The activity of visible animals was recorded at regular intervals throughout the day, from dawn to dusk. To keep a permanent record of all those plant species, which were seen exploited by Chinkara was collected and carried for identification. The herbarium sheets were prepared for the species that could not be identified in the field.

The radius of 5 m around the freshly eaten plant, the availability of shrub and tree species was recorded. No attempt was made to quantify the grasses, herbs and fallen leaves, flowers and fruits. Irrespective of the species of all grasses, herbs and fallen leaves, flowers and fruits, they were considered as a separate category as ‘grass’, ‘herbs’ and ‘fallen leaves, flowers and fruits’.

RESULTS AND DISCUSSION

Chinkara are generally shy and avoid open agricultural areas, they are less gregarious than Blackbuck and are able to go without water for long periods deriving moisture from herbage and dew. Chinkara are hence able to disperse wider in the summer periods but are generally found in wastelands, scattered bush and forests along nallahs and ravines.

During present investigation numbers of visited forest compartment were 17 of forest beats of Dhuraha, Saliya and Jhinna but Chinkara was reported only in 7 compartment of the Ajaygarh forest range. Similarly Vishramganj range of North Forest Division showed Chinkara population in 15 compartments, out of 22 visited compartments of Kuawaseha (East and West), Chapper (East and West), Vishramganj and Patha forest beats. Chinkara, were seen either as solitary animal or in small groups, they do not exhibit significant changes in their group sizes across seasons, however we observed that the average size of Chinkara herds at Panna forest varied considerably with the seasons. The average for most of the year was between 2-5 animals per herd. During the monsoon months the size of herds increased greatly. Herd size was to some extent influenced by the availability of food and water. In Panna forest Nilgai and Chinkara do not show distinct changes in their group sizes across seasons which can be accredited to their breeding and foraging behaviour which is mostly independent of seasonal availability of resources. Chinkara are known to breed almost throughout the year.

During two year survey total of 47 animals were seen in 8 groups in North Forest Division, of which 23 animals could be identified and classified into various age and sex groups. Chinkara prefers using open habitats, where visibility is high. Since their antipredatory strategies require them to stay in open area and forest take evasive action from a greater distance, they tend to aggregate around the roads. On many occasions, Chinkara were observed resting either on the forest road or on the clearing on either side. considering that direct sightings were used for these estimations.

The foods of Indian gazelle consist of grass, leaves and succulent fruits. Chinkara is almost nocturnal in foraging habit. They can also raid in night at the nearby crop fields for foraging. It is better browser than grazer. It browses mainly on leaves of many plants such as *Acacia catechu, Cleome viscosa, Abutilon indicum, Sida cordifolia* etc. Leaves of grasses *Cyprus, Cyanodon, Dendrocalamus, Steria* and *Sorghum*. Fruits and pods constituting a major protein of its staple diet. Fruits of *Acacia nilotica, Butea monosperma, Zizyphus xylopyra* and *Zizyphus jujube* were very much liked by Chinkara, where as flowers of *Madhuca indica* were its one of the

favourite food. It can survive for many days without water. It is able to meet its water requirement from sap of vegetation or even from dew. The population of Chinkara used 34 plant species as their food in Panna forest. Out of them 7 were trees, 13 herbs and 14 grasses. Out of 46 feeding observations obtained on Chinkara, grass formed 41.1%, Herbs 36.8%, whereas trees form only 22.1% of the diet of Chinkara (Table.1).

Table. 1 Food plants of Chinkara available in Panna forest.

S.	Botanical name	Family	Chinkara
Trees :			
1.	*Acacia catechu*	Mimosaceae	L
2.	*Acacia leucophloea*	Mimosaceae	L
3.	*Acacia nilotica*	Mimosaceae	L, Fr
4.	*Butea monosperma*	Papilionaceae	L, Fr
5.	*Madhuca indica*	Sapotaceae	Fl.
6.	*Zizyphus xylopyra*	Rhamnaceae	L, Fr
7.	*Zizyphus jujuba*	Rhamnaceae	L, Fr
Herbs :			
8.	*Cleome viscosa*	Capparidaceae	L
9.	*Abutilon indicum*	Malvaceae	L
10.	*Sida acuta*	Malvaceae	L
11.	*Sida cordifolia*	Malvaceae	
12.	*Corchorus aestuns*	Tiliaceae	L
13.	*Tribulus terrestris*	Zygophyllaceae	L
14.	*Oxalis corniculata*	Oxalidaceae	
15.	*Cassia tora*	Casalpiniaceae	L
16.	*Ageratum conyzoides*	Asteraceae	L
17.	*Tridax procumbens*	Asteraceae	L
18.	*Vernonia cinerea*	Asteraceae	L
19.	*Achyranthes aspera*	Amaranthaceae	L
20.	*Commelina benghalensis*	Commelinaceae	L
Grasses :			
21.	*Cyprus iria*	Gramineae	L
22.	*Aphluda mutica*	,,	L
23.	*Aristida adscenscinois*	,,	L
24.	*Bothriochloa odorata*	,,	L
25.	*Chloris dolichostachya*	,,	L
26.	*Cyanodon dactylon*	,,	L
27.	*Dendrocalamous strictus*	,,	L
28.	*Dichanthium annlatum*	,,	L
29.	*Digitaria granularis*	,,	L
30.	*Heteropogon contortus*	,,	L
31.	*Seteria glauca*	,,	L
32.	*Sorghum halepense*	,,	L
33.	*Sporobolus coromandelianus*	,,	L
34.	*Themeda triandra*	,,	L

(L - Leaf, Fl - Flower and Fr - Fruit).

The Chinkara plays an important role in spreading the seeds and helping in regeneration of many plants. Some forest area of Panna forest have no fruits and seed available for birds and animals and the regeneration cycle of vegetation gets hampered as well. Like most other ungulates it is also known to regulate seeds and pile them at a place where it ruminates.

The Chinkara though seen roaming and feeding during daytime in this area, the animals have also been observed feeding as late as 0100 hrs. in the cultivated fields (Kankane,2000). Bohra *et al.* (1992) have listed about 13 species of plants, parts of which (containing 61 to 86% moisture) are consumed by Chinkara. This ensures reasonably large contribution of the preformed water of the feeds to their overall water balance. Sterndale (1984) had also pointed out that the Chinkara may not need any free water for drinking purposes, its food habit and physiological efficiency of water use is good enough to keep its water balance.

Nothing is known about their predation from Jackal and Wolves. However, Kankane (2000) reported an important aspect of predation in the cultivated areas of Ganganagar and Bikaner districts. The land-owners in these areas keep good breed pet dogs to keep the Chinkara and Black bucks away from their crop fields.

Thus Panna forest provides an ideal habitat of dry deciduous forest with high flora diversity, to the Chinkara. Habitat suitability and other factors like proportion of other species in the overall ungulate community possibly support its high density of Chinkara in Panna forest.

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