

**PEST STATUS OF THE INDIAN CRESTED PORCUPINE,
*Hystrix indica***

Chakravarthy, A.K., A.C. Girish and Shakunthala Sridhara*

Department of Entomology,
University of Agricultural Sciences
G.K.V.K., Bangalore – 560 065

*AINP on Rodent Control

ABSTRACT

The Indian crested porcupine, *Hystrix indica* because of degradation and fragmentation of its scrub, rocky, hilly and forest habitat is being frequently reported as a pest on crops. Data on its feeding behaviour and pest status in India is scarce. Comprehensive studies to evolve management strategies on its foraging activity using radio collared animals and evaluation of ecofriendly crop protection methods have been carried out only in the hilly and coastal zones of Karnataka. Based on this investigation, burrows were categorized into big and small depending on number of openings and animal/s living inside. Density was 8.8 to 12.9 animals per square km. Thirty six plant species, both cultivated and wild were consumed by porcupines. Debarking was the major damage in forest nurseries of Rajasthan and coconut palms in Karnataka. Palms in the vicinity of forests were damaged more than the distant ones. Active feeding was limited to seedlings of coconut. Encasing coconut and areca nut seedlings with porcelain pipes of suitable diameter and thatches of bamboo protected them from porcupines. Smearing seedlings and adult palms with coal tar prevented porcupine debarking. Telemetry has proved to be a good tool to understand the population dynamics, behaviour and feeding ecology of porcupines for both conservation and for developing crop protection measures.

INTRODUCTION

The name 'Porcupine' is derived from the Latin word "porous" meaning swine and the French 'epine' derived from the Latin word "Spina" meaning thorn. Literally it means "the irritable back". *Hystrix indica* is called the Indian crested porcupine because of the presence of very long stiff bristle-like hairs along the neck and upper back region. The species is characterized by relatively short tail the tip of which bears specially modified quills which are hollow tubes. When threatened the tail is shaken making a hissing noise.

SCIENTIFIC STATUS

Class : Mammalia
 Order : Rodentia
 Sub order : Hystriognath
 Family : Hystriacidae
 Genus : *Hystrix*
 Specific name : *Indica*
 Binomial name: *Hystrix indica*

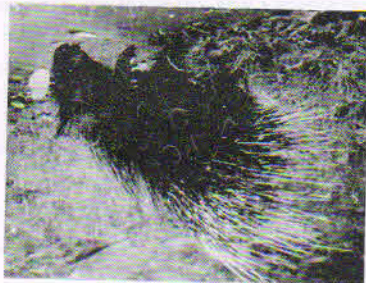


Fig. 1. *Hystrix indica*

DISTRIBUTION: The porcupine, a fossorial and nocturnal animal is distributed from sea level to 2800m msl throughout India. In India, two genera and three species of porcupines are found. The species are: The Indian crested porcupine, *Hystrix indica*, the crested Himalayan porcupine, *Hystrix hodgsoni grey* and the Asiatic brush tailed porcupine, *Atherurus macrourus assamensis*. The latter two species are restricted in geographical distribution to Himalayas and North east India. The place of origin of the genus *Hystrix* is still unknown.

MORPHOLOGY: Porcupine is a thickset rodent with short powerful limbs. Forefeet have four digits and a vestigial thumb. There are five digits on the hind limb. The animal is plantigrade in gait and sole of the hind foot is naked. The head terminates in a broad blunt muzzle with the upper lip being divided. The area around the nose appears fleshy due to inflation of the nasal area by pneumatic cavities. The eyes and ears are comparatively short. The vibrissae are black and the longest measures 20cm in length. The

lower part of the body is thinly covered with dark brown and black, short glossy brown bristle-like hairs. The face is also covered with similar but smaller hairs. There is an indistinct crescent of grey and white quills on the back. These are frequently shed during their lifetime. Tail is short, covered with short white quills mixed with hollow rattling quills.

BIOLOGY AND BEHAVIOUR: Published information on Indian crested porcupine is meagre. The animal is nocturnal. Day times are spent in deep subterranean retreats which usually have more than one exit hole. It also rests under the cover of tall grass and digs burrows close to its foraging site. Diurnal activity of the animal is rare and is restricted to the vicinity of their burrows. Burrows can be quite deep, sometimes extending up to 18.5m in rocky hillsides (Prater, 1993). Two to eight animals live in the burrow. They come out after sunset. They have a keen sense of smell and display high intelligence in evading traps. Grain, vegetables, fruit and roots are their main food. When irritated or alarmed, porcupines erect their spines, grunt, puff and rattle their quills.

Porcupines breed throughout the year with females littering from March to December (Prakash, 1971). The gestation period ranges from 109-112 days. Females excavate a separate burrow in which two or four young ones are born with their eyes open and soft quills covering the body. Both parents are reported to occupy the same burrow along with their young, usually two or three (Prater, 1993). Life span ranges from eight to twenty years (Roberts, 1977).

BURROWS: Porcupines dig extensive and deep burrows with several side entrances. Burrows are excavated in the embankment of river channels, under walls and hedges so as to gain easy entry into a garden or cultivated fields (Agarwal & Chakravarthy, 1992). In the Thar desert, porcupines dig burrows in the intertidal plains, far away from crop fields. The burrow had two side openings with the main entrance slightly arched. The burrow sloped down steeply four meters downwards expanding into a round chamber. The width of the burrow opening was 15x20cm² and 20x30cm². Being nocturnal, porcupines in the desert were seen spending the day inside the burrows, venturing out during the night to raid crops like wheat and other food grain (Bhargava *et al.*, 2004).

Table 1. Food range of Porcupine in hill and coastal regions of Karnataka

Common name	Scientific name	Damage (%)
Sweet potato	<i>Ipomoea batatas</i> Lamk.	20 (10 tubers)
Bamboo	<i>Bambusa arundinacin</i> (Retz.)	12 (15 tillers)
Tapioca	<i>Manihot esculenta</i> Crantz.	50 (68 tubers)
Alocasia	<i>Alocasia indica</i> Schott.	2 (5 tubers)
Cane	<i>Calamus tenuis</i> Redt.	25 (45 tillers)
Dioscorea	<i>Dioscorea esculenta</i> Burm.	7 (42 tubers)
Ananus	<i>Ananas comosus</i> (L.) Merr	10 (250 plants)
Banana	<i>Musa</i> spp.	25 (1500 suckers)
Cactus	<i>Agave americana</i> L.	35 (850 plants)
Wild turmeric	<i>Zingiber zerumbet</i> Rose ex.Sm	15 (250 plants)
Colocasia	<i>Colocasia esculenta</i>	10 (150 plants)
Gauri gedde	<i>Gloriosa superba</i> L.	5 (100 plants)
Byne palm	<i>Caryota urens</i> L.	20 (45 seedlings)
Acacia	<i>Acacia catechu</i> Wild	35 (45 fruits)
Ridge gourd	<i>Luffa acutangula</i> (L.) Roxb.	2 (75 plants)
Bottle gourd	<i>Lagenaria vulgaris</i>	20 (10 plants)
Muskmelon	<i>Cucumis melo</i>	25 (5 plants)
Mango	<i>Mangifera indica</i> L.	1 (108 fruits)
Groundnut	<i>Arachis hypogea</i> L.	1 (one acre)
Pumpkin	<i>Cucurbita moschata</i> L.	2 (one acre)
Beans	<i>Dolichos lablab</i> L.	1 (one acre)
Rubber kai.	<i>Ficus elastica</i>	5 (10 plants)
Thare mara nuts.	<i>Terminalia bellerica</i>	2 (20 plants)
Elachi mara fruits.	<i>Ziziphus zizuba</i>	1 (5 plants)
Kakke mara roots.	<i>Cassia fistula</i>	5 (45 plants)
Kare mara roots.	<i>Kanthonium</i> sps	2 (4 plants)
Thavere gedde	<i>Nelumbo nucifera</i> Gaertn.	10 (45 plants)
Kadu irulli	<i>Crinum defixum</i> ker-Gawl.	5 (10 plants)
Bhela fruits	<i>Ferronia elephantum</i>	2 (3 plants)
Coconut	<i>Cocos nucifera</i> L.	15 (seedlings)
Areca nut	<i>Areca catechu</i> L.	3 (seedlings)
Ragi (finger millet)	<i>Eleusine coracana</i> L.	1 (one acre)
Paddy	<i>Oryza sativa</i> L.	2 (one acre)
	<i>Garcenia xanthochymus</i>	10 (45 plants)
	<i>Dioscorea oppositifolia</i>	5 (10 plants)
	<i>D.bulbifolia</i>	2 (3 plants)
Hard metallic substances		

BEHAVIOURAL ECOLOGY

Using radio collars for the first time in India, Girish (2005) observed porcupines leaving their burrows around 6 to 7pm, spending 10 to 11 h in the night foraging, scanning for food, walking, running, etc. They were found foraging in pairs and sometimes alone but always in the vicinity of another animal. Rain deterred activities in the flatlands of Mysore zoo but not in the heavy rainfall, hilly areas of Nagarhole, Subramanya and Bhadra reserve area. Similarly moonlight affected foraging in the open area but not in the forest habitat where moon light seldom penetrates the thick canopy of trees. Porcupines were found adapted to living in a wide range of temperatures. Radio collared animals exhibited inter and intra individual variations of activity in relation to ambient temperature and precipitation. Generally activity of porcupines decreased in cooler habitats and environments (Chakravarthy, 2004).

The faecal pellet size varied from 1x0.5cm to 2.5x0.75 cm and colour from grey to dark brown. Undigested cellulose content was the major component of faecal pellet of porcupines indicating the herbivorous nature of feeding.

CROP PROTECTION

Schemnitz (1994) suggests several methods to reduce or prevent porcupine damage. Principally these include removal, repelling and excluding.

Animal removal or translocation from problem areas can stop plant damage completely. This can be accomplished by live trapping porcupines using cage trap or wooden trap with a minimum dimension of 30cm height, 25cm width and 80cm length. Preferably traps should be set at the base of a large tree or leaning against a damaged tree. Salt soaked pieces of leather or wood, salt mixed with edible oil or pieces of carrot, turnip, etc are the suggested baits (Schemnitz, 1994).

A stockade trap, which is a mini wooden fortress, usually of jungle wood is effective in capturing porcupines alive. When the animal steps on

Covering of the base of palm with bamboo thatch was found to be economical and ecofriendly in preventing porcupine damage to coconut (Chakravarty & Girish, 2001).

Lethal Methods: Since the animal is a protected species, lethal approach to manage porcupines should be the last option and should be resorted only when damage levels are extreme and other methods of damage prevention fail.

Chemical control: A prerequisite for all methods of porcupine control is to have a map with location of porcupine dens well marked. Fumigation and baiting with rodenticides are effective in killing porcupines, the details of which are as under.

Fumigation can be by cyanogas or aluminium phosphide tablets preferably during day time. After locating porcupine dens, all openings, except one are to be closed and cyanogas pumped through the single, open tunnel and then sealed. Alternatively 10-15 tablets of aluminium phosphide can be inserted into the active den using a long-handled shovel and sealed afterwards.

A two ingredient pyrotechnic has been fabricated and used successfully in Pakistan (Khan, 1990). This is a gas cartridge containing 65% sodium nitrate and 35% ground charcoal. The ignited device is kept inside the burrow and sealed. The burning chemical releases carbon monoxide which is lethal to the porcupines.

Poison baiting: In Pakistan sodium monofluoroacetate (1080) is smeared on cut potatoes or apples and then introduced inside porcupine burrows. The method was very effective. Permanent bait stations with strychnine treated salt blocks were also successful in forest areas (Khan, 1990). Wheat flour mixed with either 0.0375% coumatetralyl or 0.005% brodifacoum, when baited for 5-7 and 3 days respectively gave considerable reduction of porcupines (Khan, 1990).

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