A COPROLOGICAL SURVEY OF PARASITES IN TWO ENDANGERED PRIMATES OF SILENT VALLEY NATIONAL PARK, KERALA

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Introduction

Silent Valley National Park, an undisturbed tropical rain forest in its true form in India, is a rectangular table land in the South-western corner of Nilgiris. The whole 90 km^2 extent of the National Park is regarded as the core area of Nilgiri Biosphere Reserve. This pristine forest of Kerala State lies between the latitudes of 10°15' and 11°25'N and the longitudes of 76°21'and 76°33' E. The elevation of the undulating terrain is ranging between 658 m to 2,383 m above msl having an average temperature of 23°C and an annual rainfall of 6,000 mm.

Out of the 60 species of mammalian fauna of the forest of Kerala, about 40 species are among the better known large and medium sized ones (Balakrishnan and Xavier, 1995). The ecological insulation of this National Park provide abode to many number of mammals that have become extinct elsewhere. Lion-tailed Macaque (*Macaca silenus*) is considered as one of the most endangered primates of India occurring only in the wet evergreen forest of the Western Ghats. However, a long standing viable population of this most arboreal Macaque is presently existing only in two areas namely, Silent Valley forests and Ashambu hills in Agasthya forests (Green and Minkowski, 1977; Kumar, 1987).

Nilgiri Langur (*Trachypithecus johnii*), is also an endangered primate found exclusively in the Southern-Western Ghats (Kurup, 1975). Silent Valley forests have been recently identified as a very good habitat for the species (Ramachandran and Joseph, 1997). Habitat destruction, poaching, habitat loss due to fire and diseases are considered to be the main causes for the endangerment of these primates. Data on the diseases and mortality of the wild stock are still meagre.

Material and Methods

Between January 1994 and February 1995 census-walks were conducted in Silent Valley National Park, Kerala. Population of Lion-tailed Macaque (*Macaca silenus*) and Nilgiri Langur (*Trachypithecus johnii*) troops were ascertained. Twenty samples of fresh faecal materials could be collected from randomly selected troops. A comparative evaluation of the parasitic load of Lion-tailed Macaque and Nilgiri Langur

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in captivity were also conducted during the same period. The samples were preserved in 10% formalin and preserved in labelled bottles. The faecal samples were sent to the Parasitology laboratory attached to the College of Veterinary and Animal Sciences for examination. The presence of eggs, oocyst or larvae and adult worms were determined by standard examination procedures. Sedimentation as well as salt floatation techniques were employed (Georgi and Georgi, 1990).

Results and Discussion

Analysis of the samples from these highly arboreal and endangered primates revealed that parasitism was highly prevalent among these animals (Table 1). Two types of nematodes viz., *Trichuris* sp. and *Oesophagostomum* sp. were identified in all samples collected from the wild. *Trichuris* or ship worm are hair like and embedded in the wall of the large intestine. The posterior end is stout and lying free in the lumen. The eggs are lemon shaped with a distinct plug at each pole. Oesophagostomines are parasites of the large intestine of ruminants, swine and primates. These worms are called nodular worms (Georgi and Georgi, 1990). In Lion-tailed Macaques, among the samples examined, 66.67% were *Trichuris* sp. and 33.33% were *Oesophagostomum* sp. In Nilgiri Langur, 25% *Trichuris* sp., 12.5% *Oesophagostomum* sp. and 62.5% a mixed infection of *Trichuris* and *Oesophagostomum* sp. A comparative evaluation of faecal samples from a captive population of Lion-tailed Macaques and Nilgiri Langurs revealed, *Strongyloides* sp. was present only in the former group. Whereas the samples from Nilgiri Langur, were positive for *Trichuris* sp. only.

No serious efforts have been taken up

Table 1

Coprological survey of parasites in two endangered primates in the wild and captivity.

Animal	Infested (%)	Parasitic species observed		
		Nematode	Cestode	Trematode
Wild stock				
Lion-tailed Macaque	100	1. *Trichuris* sp. 2. *Oesophagostomum* sp.	Nil	Nil
Nilgiri Langur	72.72	1. *Trichuris* sp. 2. *Oesophagostomum* sp.	*Nil*	*Nil*
Captive stock*				
Lion-tailed Macaque	100	1. *Strongyloides* sp.	Nil	Nil
Nilgiri Langur	100	1. *Trichuris* sp.		

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so far to study the impact of diseases in the depleting populations of the prized wildlife fauna of Silent Valley National Park. Even a documentation of the parasites of these fauna has not been done so far. This is the first study of its kind in this National Park. The difficulty in following and identifying a specific troop, in the undulating terrain may be one impasse for the above situation. Collection of fresh faecal samples from these arboreal primates in the highly closed and interlocking canopy conditions itself is a very difficult task. Less visibility and difficulty in tracking conditions in the thick evergreen forests may make the matters worse. With experience and a thorough knowledge of the behavioural peculiarity of these primates enabled us to collect the scattered scat samples from the forests. This accounts to the small sample size used in the present investigation.

Trichuris and *Oesophagostomum* were the two types of nematodes identified in the wild stock. Lion-tailed Macaques thrive mainly on the fruits and flowers of *Cullenia exarillata, Palaquium ellipticum, Syzygium cumini, Artocarpus heterophyllus* etc. The food habits of the Nilgiri Langur were also reported to be overlapping to some extent with the Lion-tailed Macaque. Even though, the latter is reported as a folivore, at times feeds moderately on the fruits and flowers of *Cullenia exarillata, Palaquium ellipticum Syzygium cumini* etc. (Ramachandran and Joseph, 1990). The mode of transmission of *Trichuris* and *Oesophagostomum* is by ingestion of larvated eggs (Soulsby, 1982). Larvated eggs voided from the infected animals contaminate the faecal material. In the process of excretion from an elevation plane, all the feeding materials utilised by these primates get contaminated with the infective material. The members of the troop which thrive on these materials in the home range get automatically infected.

Infections with nematode parasites can result in weak and unhealthy members in a troop. If their digestive tract is over-burdened with parasites, then only it causes a serious threat to the life of an individual. *Oesophagostomum* has been reported to cause acute and chronic disease syndromes in primates like Gorillas and Chimpanzees. *Conoweberia apiostomum, C. stephanostomum* and *Ternidens deminutus* assume pathogenic status especially in captured primates exposed to unaccustomed stresses of confinement and transporation (Rousselot and Pellissier, 1952). However, the chances of such a stress in the wild are meagre. Since the animal cats a variety of plant materials, periodic evacuation of parasites from the digestive tract will be a common feature. Only in old animals and siblings a heavy parasitic infestation may become fatal. Parasitism along with other stress factors of the wild may be a threat to the existing population of primates in Silent Valley National Park.

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SUMMARY

Information on the parasitic load of two endangered primates, Lion-tailed Macaque and Nilgiri Langur, inhabiting Silent Valley National Park were collected during the period 1994-95. Parasitic load within these primate species in captivity were also ascertained and compared with that of the wild. The major intestinal parasites identified from the wild samples were *Trechuris* sp. and *Oesophagostomum* sp. The mode of transmission and the factors affecting the transmission of these parasites in the closed canopy conditions in the wild were discussed. The infection with these parasites may result in weak and unhealthy members in the troop and the heavier parasitic infestation may be fatal to the juveniles. Thus parasitism is also a threat to the viability of the existing population of endangered primates in the National Park.

साइलैंट वैली राष्ट्रीय उपवन, केरल की दो विलुप्ति खतरे में पड़ी नरवानरगण जातियों के परजीवियों का शकृदविज्ञानी सर्वेक्षण

गिगि के० जौजेफ, के० माधवन पिल्लै, फ्रांसिस जेवियर, बिन्धु माइकेल व अमृत राज एम०

सारांश

साइलैंट वैली राष्ट्रीय उपवन में रहने वाली, विलुप्ति खतरे में पड़ी दो नरवानरगण जातियों, सिंह पुच्छ वानर और नीलगिरि लंगूर के परजीवी भार के विषय में 1994-95 के दौरान, इकट्ठा की गई जानकारी से बन्दी बनाकर रखी गई इन दो नरवानरगण जातियों में परजीवी भार की जानकारी ली गई और उसकी तुलना जंगली दशाओं में मिलते प्राणियों के साथ की गई । जंगली नमूनों की अंतड़ियों से मिले परजीवियों की पहचान *ट्राइचूरिस* की जाति और *ईसोफैगोस्टोमम* की जाति की गई । उनकी शरीर के अन्दर पँहुचने की रीति तथा जंगल के संवृत वितान वाली दशाओं में जो कारक प्राणियों के अन्दर परजीवियों का पहुँचना प्रभावित करते हैं उन्हें विवेचित किया गया है । इन परजीवियों से संदषित होने का प्रभाव दल के सदस्यों को कमजोर और अस्वस्थ बनाने वाला हो सकता है और यदि परजीवी संदूषण भारी माला में हो तो बच्चों के लिए वह सांघातिक हो सकता है । अत: परजीविता भी राष्ट्रीय उपवन के नरवानरगण के संकटापन्न प्राणियों की वर्तमान संख्या के लिए भारी खतरा है ।

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