Occurrence of Desert Wheatear *Oenanthe deserti* in ICRISAT Campus, Medak District, Andhra Pradesh, India

R. Sreekar[1*], Ashwin Naidu[1] and C. Srinivasulu[2]

On 2nd December 2007 at around 1030 hrs, RS and AN (**R. Sreekar and Ashwin Naidu**) sighted and photographed (Fig. 1) a chat-sized bird near ICRISAT Lake in ICRISAT Campus (17°53' N & 78°27' E), Medak district, Andhra Pradesh, India. The said bird was sighted perching on *Phoenix acaulis* and had distinctive sandy-brown plumage with pale white supercilium, white rump and black tail with white tips and edges. The bird landed on a nearby pathway, where it was observed for a total of *c.* 15 minutes before it returned to the perch. The bird flew from its perch to an open ground and then returned to the perch. We had an opportunity to observe the bird for about 15 minutes. The bird perched in an upright stance and had long legs.

The bird was identified as Desert Wheatear *Oenanthe deserti* following Kazmierczak, (2000) and Grimmett *et al.* (1998). The identification was also independently confirmed from the photograph by more experienced members of the Birdwatchers' Society of Andhra Pradesh. The senior author (CS) has observed this species and Isabelline Wheatear *Oenanthe isabellina* in Haryana, Rajasthan and Delhi environs between 2005 and 2007. The bird is presumed to be a non-breeding adult female as its throat is white with pale whitish fringes and has broad whitish to buffish fringes and blackish centre on wing coverts.

The present report constitutes recent sighting of this species in Andhra Pradesh. This bird had been purportedly "observed along the route from Nirmal to Utnoor (via Talamdiri village) between 12 and 15 [1925]", Adilabad district by the late Dr. Salim Ali (Ali and Whistler, 1933) and Palmakole Tank (17°9' N, 78°19'E), Mehboobnagar in January, 2003 (Pittie and Shaffat Ulla, 2005). Referring to the unpublished notes of Dr. Salim Ali (photocopy of manuscript held by Aasheesh Pittie), Pittie and Shaffat Ulla (2005) opined that Dr. Ali's observation of this species in Adilabad district may be doubtful. Thus, this constitutes the second record of this species in Andhra Pradesh after Pittie and Shaffat Ulla (2005). This species is vagrant to Andhra Pradesh.

REFERENCES

Ali, S. and H. Whistler (1933). The Hyderabad State Ornithological Survey. Part 1. *Journal of the Bombay Natural History Society*, 26(**2**): 356-390.

Grimmett, R., C. Inskipp and T. Inskipp (1998). *Birds of the Indian Subcontinent*. Oxford University Press, New Delhi. 888p.

Kazmierczak, K. (2000). *A Field Guide to the Birds of the India, Sri Lanka, Pakistan, Nepal, Bhutan Bangladesh and the Maldives. 1st Edition.* OM Book Service, New Delhi. 352p.

Pittie, A. and M. Shafaat Ulla (2005). Occurrence of Desert Wheatear *Oenanthe deserti* and Isabelline Wheatear *Oenanthe isabellina* in Mahbubnagar District, Andhra Pradesh. *Journal of the Bombay Natural History Society*, 102 (**2**): 234-235.

ACKNOWLEDGEMENTS

We express our heartfelt thanks to Mr. Rajeev Mathew for helping in identification; Dr. Tom C. Hash of ICRISAT for permission to conduct bird surveys. CS is thankful to Head, Department of Zoology, Osmania University for permission and encouragements.

Desert Wheatear Oenanthe deserti in ICRISAT Campus, Medak District, Andhra Pradesh

[1] Biodiversity Research and Conservation Society, G4, MRK Towers, Swarnadhamanagar, Old Bowenpally, Secunderabad, Andhra Pradesh 500 011

[2] Wildlife Biology Section, Department of Zoology, University College of Science, Osmania University, Hyderabad, Andhra Pradesh 500 007

[*]Email: sreekar1988@gmail.com

Ehrlichiosis in Wild Dog Pups

Dr. K. Senthilkumar [1], Dr. S. Sathasivam [2], and Dr. Pathan Nasurallah Khan [3]

Canine ehrlichiosis is a well-documented clinical entity throughout the world, since its first record in India during 1944 (Mudaliar, 1944). The *Ehrlichiae* are a group of small, gram-negative, pleiomorphic, obligate intracellular cocci that infect mononuclear blood cells of various animal species. Canine ehrlichiosis is primarily transmitted by *Rhipicephalus sanguineus*, the brown dog ticks. *Ehrlichia canis* is commonly detected in cytoplasm of circulating monocytes and generally can be examined in peripheral blood smears. It is characterized by high fever, generalized enlargement of lymph nodes, depression, loss of body conditions, anaemia and some other abberant signs (Chakrabarti, 1997). Canine ehrlichiosis has been reported in the Wolf, Wolf-dog crosses, African wild dog, Jackal, Coyote, Red fox and Gray fox (Wallach and Boever, 1983). The present paper puts on record an unusual case of ehrlichiosis in a wild dog pup (*Cuon alpinus*).

Case History and clinical examination

Two wild dogs pups aged four-month-old (*cuon alpinus*) reared at Arignar Anna Zoological Park Vandalur were exhibited clinical signs like posterior paresis, cutaneous petechiae in the ventral abdomen, erythematous pustular erruption of the fore and rear flank areas, mucopurulent ocular and nasal discharge, convulsions, ulceration of the skin, gastroenteritis, partial anorexia, ascites, weight loss, weakness and dullness since two days. The wild dog pups were treated symptomatically antibiotics, analgesics and antihistaminic, but did not respond to the treatment. Blood samples were obtained for clinico pathological examination.

Results

Examination of preipheral blood smear by Giemsa satining revealed *Ehrlichia canis* organisms in the monocytes. Examination of feacal sample did not reveal, any parasitic ova. From the clinical signs and microscopic examination of the blood smear, the case was diagnosed as *Ehrlihcia canis* infection.

The wild dog pups were treated with Doxycycline at the dose rate of 5 mg per kg body weight twice per day orally for a period of 7 days together with parental administration of B- complex vitamins and antiinflammatory drugs for 3 days. The pustules were treated with external application of povidone iodine solution on alternate days. The pups respond well to the treatment. Paresis, anorexia were reduced from the 3rd day and there was gradual improvement in their appetite and general condition of the pups. Blood smear collected on 10th day was found to be negative for *Ehrlichia canis* organisms in the monocytes. They were monitored upto 2 weeks after treatment and appeared normal. Doxycycline is observed to be one of the successful drugs for the treatment of Ehrlichiosis in canine, both wild and domestic as reported by Ettinger and Feldman (2000).

Discussion

The clinical findings such as gastro intestinal disturbances, ocular discharge, ascites, weight loss and weakness reported in the present case correlates with those observed by Thirunavukkarasu et al, (1994); Troy et al, (1980) and Waddle and Littman, (1988) in domestic dogs. Wallach and Boever (1983) reported that presence of erythematous pustular erruption of the fore and rear flank areas which coincides with clinical findings of this case.

Summary

A case of *Ehrlichia canis* infection in wild dog pups and its successful treatment with Doxycycline and anti-inflammatory drugs was reported.

Acknowledgement

The authors are thankful to the Chief Conservator of Forests and Director, Arignar Anna Zoological Park, Chennai.

References

Chakrabarti, A. (1997). A textbook of preventive vetrinary medicine 1st EdnKalyani Publ New Delhi

Ettinger SJ, EC Feldman (2000): *Textbook of Veterinary Internal Medicine: Diseases of the Dog and Cat, vol. 1, 5th ed*. W.B. Saunders Co., Philadelphia, pp. 402-406.

Mudaliar, S.V. (1944). Canine Rickettsioses in south India-A preliminary note. Indian Veterinary Journal. 20: 163-164.

Thirunavukkarasu, P.S., A.P. Nambi, T.S.S. Rajan, and V. Gnanaprakasam (1994). Clinical and haematological finding in canine ehrlichiosis in Madras city. Indian veterinary Journal. 71: 825-828.

Troy, G.C, J.C. Vulgamott and G.H. Turnwald (1980). Canine ehrlichiosis: a retrospective study of 30 naturally occurring cases. *Journal of American Animal Hospital Association*. 16:181-187.

Waddle, J.R. and M.P. Littman (1988). A retrospective study of 27 cases of naturally occurring Canine ehrlichiosis. *Journal of American Animal Hospital Association*. 24: 615-620.

Wallach, J.D. and W.J. Boever (1983). *Diseases of exotic animals. Medical and surgical management.* W.B. Saunders Co., Philadelphia, pp. 426.

[1] Veterinary Assistant Surgeon,
[2] Zoo Veterinarian,
[3] Veterinary Officer,
Arignar Anna Zoological Park, Chennai

A new distributional record of *Euthalia lubentina* (Cramer, 1777) (Lepidoptera: Nymphalidae) from Kalesar National Park, Haryana

Parmod Kumar*

Kalesar National Park, a protected area located in eastern Haryana, India, 150 km from Chandigarh, is a Sal (*Shorea robusta*) forest in the Shivalik Hills spread across 11000 acres. The Shivalik range runs parallel to the Himalayan system from Haridwar on the Ganges to the banks of the Beas, with a length of 200 miles (320 km) and an average width of 10 miles (16 km). The elevation varies from 2000 to 3,500 ft (1,100 m). It is an intermediate valley lying between the outer hills and the Mussoorie. The Shiwaliks formed by debris from the older Himalayan ranges, are composed of sedimentary rocks such as sand stone, clays & conglomerates & is a highly fragile system.

Euthalia lubentina (Cramer 1777), commonly known as **Gaudy Baron** is a Nymphalid butterfly found in South Asia and South East Asia (Bingham, 1907; Evans, 1932; Blyth, 1957; Varshney, 1994; Meena, 1992; and Kehimkar, 2008).

Material Examined: India**:** Haryana: Distt. Yamuna Nagar, Kalesar National Park, Chandkhol, Kali mandir Road, (Long. N 30° 12. 308; Lat. E 77° 33. 804), 2 males, 21.11.2008, Collector: Parmod Kumar. The material has been deposited in the National Zoological Collection (NZC), ZSI, Dehra Dun and registered (Reg. No. A-9916, NRS).

Euthalia lubentina is a strong flier that prefers mainly deciduous and semi-evergreen forests. It is distributed in India along the foot hills of Himalaya up to 3050 m ASL) from Kangra (Himachal Pradesh) eastwards through Nepal and Bhutan to Assam, Myanmar, Thailand to the Malay Peninsula and Sumatra, and also in peninsular India southwards from Mumbai (Maharashtra).

The three known subspecies of *Euthalia lubentina* are *E. l. psittacus* Fruhstorfer from Sri Lanka, *E. l. arasada* Fruhstorfer from S. India and *E. l. indica* Fabricius from Mumbai to Bengal and from Kangra (Himachal Pradesh) to Myanmar (Evans, 1932).

During a recent series of surveys in Kalesar National Park, Haryana the author came across 2 specimens (both males) of *Euthalia lubentina indica* from Chandkhol (362 m above MSL), Kali mandir Road, Distt. Yamuna Nagar on 21st November 2008. This is the first record of the species from the foot hills of the Himalayan range in the state of Haryana, India. The larval food plant of the species reported in the literature is *Scurrula parasitica* (Wynter-Blyth, (1957**,** whose occurrence in KNP could not be confirmed.

However, the species has been recorded recently by a team of scientists of Zoological Survey of India, Solan, (ZSI *E News*, March 2009, Vol .**1** (3): 9) from Simbhalwara Wildlife Sanctuary, Himachal Pradesh, which is a hill forest contiguous with Kalesar National Park, further north-west. This record suggests that the species is widespread in the Sal Forest belt of Haryana & Himachal Pradesh.

It is also worthy of note that the present record of *Euthalia lubentina indica* is from a comparatively lower elevation (362m) than its earlier known records.

References

Bingham, C.T. (1907). *Fauna of British India, Ceylon and Burma (Butterflies*). Taylor and Francis Ltd., London. Vol. **1**: 1- 537+15 pls.

Evans, W.H. (1932) *The Identification of Indian Butterflies.* (2nd Ed*),* Bombay Natural History Society, Mumbai, India. 454 pp., 32 pls.

Haribal, M. (1992)**)** *Butterflies of Sikkim Himalaya and their Natural History.*Published by *Sikkim natural Conservation Foundation,* Gangtok, Sikkim, 216pp + 60 Plates

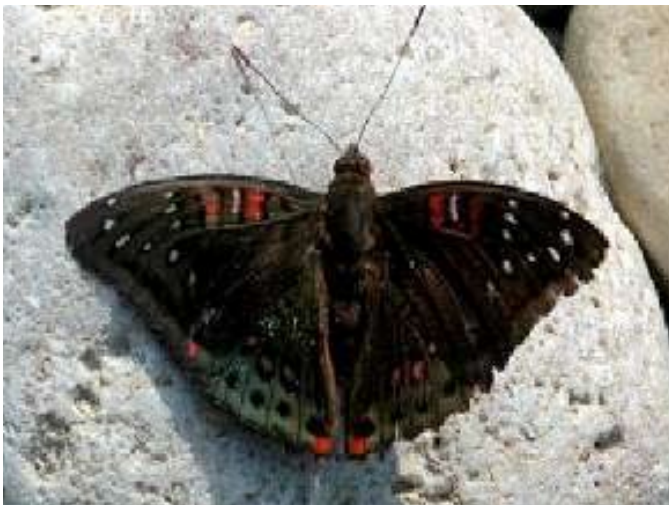
Isaac, K. (2008) *The Book of Indian Butterflies*, Bombay Natural History Society, Mumbai, India Oxford University: 1-487.

Varshney, R.K. (1994) *Index Rhopalocera Indica* Pt. III Genera of Butterflies from India and neighboring countries. *Oriental Insects* 28: 184.

Wynter-Blyth, M.A. (1957) *Butterflies of the Indian Region*, Bombay Natural History Society, Mumbai, India. xx + 523 pp., 72 pls.

Acknowledgement

The author is thankful to the Director, ZSI, Kolkata and to Sh. P.T. Bhutia, Officer in Charge, NRS, ZSI, Dehra Dun for the facilities. He is also thankful to Dr. Vinod Khanna, Scientist NRS, ZSI, Dehra Dun for critically reviewing the mss before submission.



***Zoological Survey of India, Northern Regional Station, 218 Kaulagarh Road, Dehra Dun 248195**

A REPORT ON INCIDENCE OF BLUE TONGUE IN FREE RANGING SPOTTED DEER (*Axis axis*)

K.S. Subramanian and V. Purushothaman

Abstract
Blue tongue is an infectious, non-contagious disease of sheep and other domestic, wild ruminants caused by an orbi virus and transmitted by insect vectors *(Culicoides sp)* to ruminant vertebrate reservoirs. Blue tongue has also been recorded in white tailed deer, camel and other wild ruminants (Jessup, 1984). This paper reports the incidence of bluetongue in free ranging spotted deer *(Axis axis*).
Key words : Spotted deer, Blue tongue

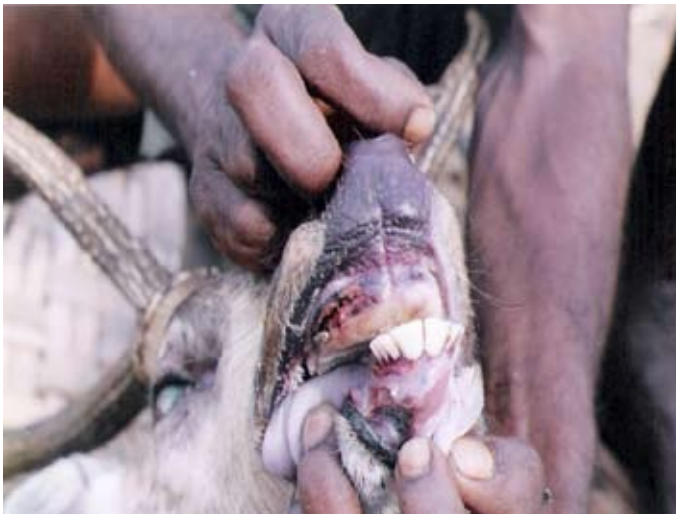
History
Post-mortem examination conducted on three carcasses of male spotted deer in the age group of 1 to 3 years belonging to Grizzled Giant Squirrel Sanctuary, Srivilliputhur in a span of four months (February to June 2001) were taken as materials for this study.

Post-mortem Observations
All three carcasses showed necrotic ulcers and erosion on the lateral aspects of the tongue with lingual swelling. Edema of lips, gums, dental pad and excoriation of buccal mucosa was observed (Fig: 1). Blood tinged froth in the nasal cavity and mouth, cyanosis of tongue, buccal mucosa and muco-purulent nasal discharge were also noted. In two cases, severe congestion of lungs with grey and red hepatisation, and echymotic hemorrhages in the mucosa of larynx, trachea and bronchi, hepatomegaly with rounded edges and congestion of spleen were also noticed. Specimens such as spleen, liver, heart, lungs, bone-marrow were collected in 50 % glycerol saline and serum samples were collected and sent to central university laboratory, TANUVAS, Madhavaram for histopathological and serological examination.

Results and Discussion
Laboratory examination of the specimens and serum samples revealed the presence of bluetongue virus specific antigen by Agar gel immuno-diffusion (AGID) test. Thomas & Trainer (1970) have opined that the disease is most prevalent in wet seasons and reported the incidence of blue tongue in White tailed deer, Elk and Pronghorn antelope. Fowler (1993) has reported that bighorn sheep inhabiting isolate desert ranges and at high altitudes were least exposed to blue tongue infection, since these habitats were unsuitable for vector population. But bighorn sheep at lower elevations in close association with livestock were more frequently exposed to bluetongue disease. This might the reason for the incidence of blue tongue in this free ranging spotted deer which were in close association with the local sheep population during grazing. However wild animals suffer from clinical illness due to exposure to increased solar radiation with other environmental stress and can act as carriers (Blood & Radostits 1989) which might be the reason for the sporadic nature of this episode during summer.

References
Blood, D.C. and O.M. Radostits (1989). Veterinary medicine, Seventh edn., ELBS, London. 873 - 877p.
Fowler, M.E. (1993). Zoo and wild animal medicine, Current therapy: III, W.B.Saunders co, London. 558 p.
Jessup, D.A. (1994). Report on blue tongue. *Proceedings of United States Animal Health Association,* 88: 616.
Thomas, F.C and D.O. Trainer (1970). Blue tongue virus in white tailed deer. *Journal of wildlife diseases* 6 : 383-338.

Acknowledgement
The authors thank TANUVAS for the facilities provided and the Wildlife Warden, Grizzled Squirrel Sanctuary, Srivilliputhur, Tamil Nadu for the co-operation.



Blue tongue in a spotted deer

Department of Wildlife Science, Madras Veterinary College, Chennai 7, Tamil Nadu
Email: drkswildlifevet@gmail.com

Survey Of Gastrointestinal Helminths In Captive Mammals and Birds At Maharajbagh Zoo, Nagpur

Priya Gawande*[1], Bahar Baviskar[2], Nikhil Umale[3], Anjali Gandhe[4], Pradyuamna Baviskar[5], Sunil Bawaskar[6] and D. K. Maske[7]

Abstract
Survey of gastrointestinal helminth parasites in captive mammals and birds at Maharajbagh zoo in Nagpur was carried out throughout winter 2006. A total of 132 samples were collected from all zoo mammals and birds. The tests revealed parasites such as *Toxocara* sp. in Leopards, *Diphyllobothrium* sp. in Jackals, *Haemonchus* sp. in Nilgai, *Heterakis* sp*., Capillaria* sp*., and Prosthogonimus* sp. (in Pigeons) and *Heterakis* sp*., Davaiea* sp., and *Strongyle* sp. (in Peacocks). All other mammals and birds including bears, macaques, rabbits, parakeets, geese, budgerigars and turkeys were tested negative for helminthic infection

Keywords: Occurrence, Gastrointestinal helminths, captive mammals and birds, Maharajbagh zoo, Nagpur**.**

Introduction
The wild animals and birds are generally infected with numerous parasites. Parasitic infections have caused considerable losses to wildlife in the country. A number of parasites are responsible for illness in zoo animals (Parasani *et al.,* 2003). Helminthic infestations have greater ramification and significant impact on these animals. When present in sufficient number it can cause high morbidity and mortality.

This may cause death in all age groups especially in young ones and weakness and unthreftiness in survivors who may, as a result, have lower body resistance and reproduction capabilities (Acharjyo, 2004). In order to understand the rate of helminthic infection in captive wild animals and birds, a survey on helminth parasites at Maharajbagh zoo was carried out throughout winter 2006. This paper attempts to provide some more information regarding parasitic infection of zoo animals based on the survey.

Materials and Methods
A total number of 132 samples were collected from all captive mammals and birds. Amongst them 72 samples were collected from six species of mammals, 12 samples from each species *viz.* Leopard (*Panthera pardus*), Bear (*Melurus ursinus*), Jackal (*Canis aureus*), Nilgai (*Boselaphus tragocamelus*), Macaque *(Macaca mulata*) and Rabbit (*Oryctolagus cuniculus*). Remaining 60 samples were collected from six species of birds, 10 samples from each species *viz.* Pigeon (*Columba elphinstonii / C.livia*), Parakeet (*Psittacula krameri / P.cyanocephala*), Peacock (*Pavo cristatus*), Geese (*Anser cygnoides*), Budgerigar (*Melopsittacus undulates*) and Turkey (*Meleagris gallopava*).

Faecal samples were collected in sterilized glass bottles for helminthic examination. They were processed by sedimentation technique. A drop of the sediment was examined under low power objective of light microscope. The ova were identified based on morphological characters described by Soulsby (1982).

Results and Discussion
All of the twelve samples collected from leopards were found positive for *Toxocara* sp., similar observations were made by Easwaran *et al.* (2002), who found *Toxocara canis* in leopard cat (*Felis bengalensis*) in Kerala and Chandranaik *et al.* (2005), who found *Toxocara leonine* ascarid eggs in leopards at Bannerghatta biological Park. All of the twelve samples collected from jackals revealed *Diphyllobothrium* sp. which is in agreement with Acharjyo (2003), who reported *Diphyllobothrium* sp. in jackals. Patel *et al.* (2003) have also reported *Diphyllobothrium* sp. in golden jackals. Similar findings were reported by Custer and Pence in 1981 in Texas. 50% samples collected from Nilgai were found positive for *Haemonchus* sp.

Among birds, 90% faecal samples collected from pigeons were positive for *Heterakis* sp*., Capillaria* sp. and *Prosthogonimus* sp., while 60% samples collected from peacock were positive for *Heterakis* sp., *Davaiea* sp. and *Strongyle* sp**.** Parsani *et al.* (2003) have reported similar observations of *Capillaria* and *strongyle* infection in captive birds in Kamala Nehru Zoological Garden, Gujarat. In an earlier survey of helminthic infection at Maharajbagh zoo, Kashid *et al.* (2003) found helminthic infection in all the spotted deers and lions, 83.33% of peacocks and 16.60% of other captive animals at Maharajbagh zoo. Similar observations of helminthic infestations were recorded by Maske *et al*. (1990) in the same zoo. All other animals and birds including bears, macaques, rabbits, parakeets, budgerigars, geese and turkeys were found negative for helminthic infection as shown in Table no.1.

[1, 3, 4, 7]Corresponding author*, Department of Parasitology, Nagpur Veterinary College, M. A. F. S. U., Seminary Hills, Nagpur- 440 006 (M. S.) E-mail: drpriyawande@gmail.com
[2,5]C/o Shrikrishna V. Baviskar, Retired Judge, Hanuman Galli, Post – Sakali, Tahsil –Yawal, Dist. - Jalgaon, 425 302 (M. S.) E-mail: drbaharbaviskar@rediffmail.com
[6]Zoo incharge, Maharajbagh zoo Nagpur, Agricultural College, Nagpur.

Table No. 1: Parasites identified during the study at Maharajbagh Zoo, Nagpur

Sr. No.	Host	Samples collected	Positive samples	Parasites
1.	Leopard (*P. pardus)*	12	12	*Toxocara* sp.
2.	Bear (*U. melursus*)	12	00	---------
3.	Nilgai (*B. tragocamelus)*	12	06	*Haemonchus* sp.
4.	Jackal (*C. aureus)*	12	12	*Diphyllobothrium* sp.
5.	Macaque *(M. mulata*)	12	00	---------
6.	Rabbit (*O .cuniculus)*	12	00	---------
7.	Pigeon *(C.ephinstoii / C.livia)*	10	09	*Heterakis* sp., *Capillaria* sp., *Prosthogonimus* sp.
8.	Parakeet(*P.krameri/ P.cyaenocephala*)	10	00	---------
9.	Peacock (*P.cristatus)*	10	06	*Heterakis* sp., *Strongyle* sp.
10.	Geese (*A. cygnoides*)	10	00	---------
11.	Budgerigar (*M.undulatus)*	10	00	---------
12.	Turkey (*M. gallopava*)	10	00	---------

References

Acharjyo, L. N. (2004). Helminthiasis in captive wild carnivores and its control in India. *Zoos' Print Journal* 19(7): 1540-1543.

Chandranaik, B. M., S. Murthy, D. Das, G. S. Mamatha, C. Renukaprasad and G. Krishnappa (2005). Helminthiasis in leopards (*Panthera pardus*) at Bannerghatta Biological Park. *Zoos' Print Journal* 20(7): 1934.

Custer, J. and D. B. Pence (1981). Ecological analysis of helminths population of wild canids from the gulf coast of Texas. *Journal of Parasitology* 67(3): 289-307.

Easwaran, K. R., R. Ravindran and K. M. Pillai (2003). Parasitic infection of some wild animals at thekkady in Kerala. *Zoos' Print Journal* 18(2): 1030.

Kashid, K. P., G. B. Shrikhande and G. R. Bhojne (2003). Incidence of gastro- intestinal helminths in captive wild animals at different locations. *Zoos' Print Journal* 18(3): 1053-1054.

Maske, D. K., M. R. Sardey and N. G. Bhilegaonkar (1990). Helminth parasites in zoo animals of Maharajbagh, Nagpur, Maharashtra state. *Indian Journal of Animal Science* 60: 952.

Parsani, H. R., P. R. Momin, R. K. Sahu and B. G. Patel (2003). Prevalence of gastro- intestinal parasites in captive birds at Kamla Nehru Zoological Garden, Kankaria Zoo, Ahmedabad, Gujarat. *Zoos' Print Journal* 18(1): 987-992.

Patel, P. V., A. I. Patel, R. H. Sabapara, R. K. Sahu and R. Vyas (2003). Helminthic infection in wild canids in zoological gardens of Gujarat. *Zoos' Print Journal* 18(4): 1084.

Soulsby, E. J. L. (1982). *Helminths, Arthropods and Protozoans of Domesticated Animals*. 7th edition. Baillier Tindall, London : 152,769.

ACKNOWLEDGEMENT

The authors are thankful to the Associate Dean, Nagpur Veterinary College, Nagpur for providing the necessary facilities.

Sacred groves-Unique traditional landscapes for conservation in Kodagu, Central Western Ghats

S. Raghavendra[1], C.G. Kushalappa[2], Smitha Krishnan[3] and Shonil .A. Bhagwat[4]

Protected areas have been the most common conservation approach approved world wide in general by ecologists and conservation biologists. The efforts in recognition of these landscapes in conservation biology and also betterment of management of these formally protected landscapes are well known facts. But, in many parts of the world, the landscapes, which have not been better considered for recognizing the high conservation values are of informally managed forests, managed through traditional approach. Constant pressure due to population explosion in addition to modernization and urbanization has led to a high pressure on the protected areas. Under such circumstances, the survivability and sustenance of these protected areas has to be given serious thought and identification and highlighting the conservation values of informally protected landscapes such as sacred groves needs to be given some importance.

The concept of sacred groves/sacred forests is ancient which is basically nature worship. India is not exceptional where such orthodox and conventional way of nature conservation has been rooted very strongly. These traditionally managed forests are inevitably small fragments of forests which are interspersed in a matrix of agricultural landscapes and human settlements. Though, many baseline principles and conceptual have been proposed about ecological concepts in general and autecology, patterns and trends in species association and species loss in the fragmented landscapes in specific, these traditionally managed landscapes could not be fit by or abide by them. That is the uniqueness of these landscapes because of the strong reason that many traditional beliefs and cultural values bound with. Expectation is high from cultural landscapes in conservation of biodiversity.

Rather general description about these traditionally managed landscapes, analyzing or accounting of physical condition, their distribution, changes in the area and their potential in conservation with the help of review of the past and ongoing research has much meaning. Ideal case study from Kodagu sacred groves would be supportive to talk of cultural landscape in conservation of biological diversity.

Kodagu is one of the smallest districts located in one of the biodiversity hot spots of the world, the Central Western Ghats region of Karnataka state in Southern India with low dense human population. Though, it is small in geographical area, it has very high tree cover (73%) represented by different major vegetation types. The sacred groves are dispersed all over the district in all these vegetation types. Each village in Kodagu district has atleast one sacred grove and is managed by the local community. Unlike in other parts of the country, the diversity of dieties is the uniqueness of Kodagu sacred groves. Also, the various traditional dances and songs associated with them made different or unique from other sacred groves. More importantly, a large number of sacred groves (1214 covering about 2550 ha of geographical area) have been documented or recorded which makes the district a 'hotspot of sacred grove tradition'.

The history of sacred groves in Kodagu can be traced back to the date when the concept of 'nature' or 'vegetation' has been evolved and when man started worshipping the nature. There has been a drastic reduction in the area of the sacred groves and an increase in the number due to fragmentation. However, the conservation potential or conservation values of these traditionally managed landscapes are comparable with or even better than protected areas. Such efforts in highlighting the high relevance of cultural landscapes by research team from within the country and outside the country is thought to be an endeavour in placing Kodagu sacred groves in the world map.

Studies have revealed that sacred groves support higher floristic diversity and a much more complex forest structure than protected forests. Trees species that are not found in protected forests can be found in some of the sacred forests that are in undisturbed condition. Seedling mortality and regeneration in these forests is affected due to fragmentation. A new species of fungal morphotype has been reported (If necessary mention the species which could be *Xylaria*) in the sacred groves. The need for protection of these forests can be further strengthened by additional studies like the important ecosystem services that are being provided by these sacred groves to the adjoining landscapes mainly the coffee agroforestry system. Proof that the sacred groves are indeed providing intangible benefits and long term food security might instigate the local community to take further initiative in maintaining the wholesomeness of these groves. Efforts to help recognize the conservation value of these landscapes is being made, in addition to which ecosystem services provided by these cultural landscapes are being assessed.

[1] Research Fellow, [2] Prof. & Head, Dept. of Forest Biology &Tree Improvement, College of Forestry, Ponnampet (Univ. of Agri. Sciences, Bangalore)
[3] Ph.D. Scholar, ETH, Zürich, Institute for Terrestrial Ecosystems, Switzerland
[4] Biodiversity Research Group, Centre for the Environment, Univ. of Oxford, Oxford OX1 3QY, UK