nematode infection. One elephant exhibited mixed infection consisting of cestode and strongyle eggs, while four, five and one elephant showed the presence of single infection of nematode, cestode and trematode (*Schistosome* sp.), respectively. Among the nematodes *Strongyle* sp. eggs was found to be the predominant species (36.36%). A similar condition has been reported by Sundaram *et al.*, (1971). In cestodes, *Anoplocephala* sp. (9.09%) was encountered in one elephant, the same parasite was recorded in elephants by Chandrasekaran *et al.*, (1979) in Kerala. Among trematodes, *Bivitellobilharzia nairi* was recorded in one (9.09%) Elephant which was reported earlier by Sundarm *et al.*, (1972) and Islam (1994). The incidence of helminth recorded in the present study were also reported by Watve (1995) and Saseedharan *et al.* (2004). The low incidence of helminth infection among wild elephants might be due to lesser number of availability of intermediate hosts especially snail, etc among river banks which may be flushed out during heavy rainy season in dense forest and also the adverse environment temperature in the forest makes it unsuitable for intermediate host. However, the role of intermediate host in the transmission of helminth infection among elephants in Theppakdu, Nilgiris have to be studied in detail. The findings in the present study makes a call for routine deworming of elephants of all age groups which are kept in captive, semicaptive and free ranging systems.

References

Chandrasekaran, K., K. Rajamohanan & R.K. Sundaram (1979). A case of cestode infection in an Indian elephant. *Kerala Journal of Veterinary Sciences* 10(2): 157-158.

Islam, S. (1994). Occurrence of *B. nairi* in captive Assam elephants (*Elephas maximus)* from Kaziranga National Park and Assam state Zoo, Guwahati. *Zoos' Print* 9(9): 10-11.

Saseedharan, P.C., S. Rajendran, H. Subramanian, M. Sasikumar, G. Vivek & K.S. Anil (2004). Incidence of helminth infection among annually dewormed captive elephants. *Zoos' Print Journal* 19(3): 1422

Sundarm, R.K., K. Chandrasekaran & K.M. Pillai (1971). Tetramisole (Nilverm) as an anthelmintic against gastrointestinal nematodes of elephants. *Kerala Journal of Veterinary Sciences* 2(1): 55-58.

Sundaram, R.K., R. Padmanabha Iyer, C.T. Peter & V.S. Alwar (1972). On *Bivitelobilharzia nairi* (Mudaliar & Ramanujachari, 1944). Dutt and Srivastava 1955 (Treamtoda: Schistosomatidae) parasitic in Indian elephants (*Elephas maximus*) with a rediscription of the species. *Indian Veterinary Journal* 49(1): 1-10.

Watve, M.G. (1995). Helminth Parasites of Elephants: Ecological Aspects. Proceedings of the International Seminar on Asian Elephants. Bombay, India, Bombay Natural History Society; Oxford University Press, 289-295pp.

Acknowledgement: The authors wish to express their gratitude to the Dean, Veterinary College and Research Institute, Namakkal for the facilities provided to conduct the study.

VET BRIEF **ZOOS' PRINT JOURNAL 22(11): 2899-2900**

Isolation, serogrouping and antibiogram of *Escherichia coli* of wild animals

Rajesh Agrawal [1], Abha Tikoo [2], Rajeeb K. Roy [2], Rajeev Singh [2] and Arshdeep Singh [2]

[1,2] Division of Veterinary Epidemiology and Preventive Medicine, Faculty of Veterinary Sciences and Animal Husbandry, SKUAST-J, R.S. Pura, Jammu, India
Email: [1] rajesh.agrawal76@gmail.com

Vast literature is available on *Escherichia coli* based enteric infection in domestic animals, but works on this line in wild animals, seems to be meager. The present communication deals with isolation and serotyping of *E.coli* from wild animals and their sensitivity to antibacterial agents.

A total of seven faecal samples, one each of Gaur (*Bos gaurus*), Indian Giant Fruit Bat (*Pteropus giganteus*), Porcupine (*Atherurus macrourus*), Palm Civet (*Paradoxurus hermaphroditus*), Krait (*Bungarus caeruleus*) and two of Asian Elephants (*Elephas maximus*) from Betla National Park, Jharkhand and Veterinary College, Jammu were collected. *E. coli* were isolated and identified as per Edward & Ewing (1972) and sent to Central Research Institute, Kasauli, Himachal Pradesh for serotyping. The identified serogroups were tested for their sensitivity to eight antibacterials, *viz.*, amoxicillin, chloramphenicol, ciprofloxacin, erythromycin, gentamicin, enrofloxacin, tetracycline and kanamycin by single disc-diffusion method (Ellner, 1978).

E. coli was recovered from all the faecal samples. The three serogroups (O8, O9 and UT) of *E. coli* were isolated from Gaur. Two serogroups were isolated each from Asian Elephant (O32, O69), Fruit Bat (O61, O108) and Porcupine (O56, O147). One serogroup each was isolated from Palm Civet (O25) and Krait (O1).

The O8, O9 and UT all three *E. coli* sero groups isolated from Gaur were sensitive to ciprofloxacin. O9 was also sensitive for enrofloxacin and UT to gentamicin and enrofloxacin. Both O32 and O69 isolates of Asian Elephants were sensitive to chloramphenicol, ciprofloxacin, and enrofloxacin. The O69 also showed sensitivity to tetracycline. The O61 isolate of Fruit Bat was sensitive to all the antibacterials except erythromycin. Whereas, O108 was sensitive to chloramphenicol, ciprofloxacin and enrofloxacin. Amongst O56 and O147 *E. coli* isolates of porcupine, the O56 was sensitive to amoxicillin, chloramphenicol, ciprofloxacin and enrofloxacin, whereas, O147 in addition to these was also sensitive to erythromycin. The O25 *E.coli* isolate of Palm Civet was sensitive to all the antibacterials except kanamycin. O1 isolate of Krait was sensitive to amoxicillin, chloramphenicol, ciprofloxacin and enrofloxacin only.

The *E. coli* strains were highly sensitive to ciprofloxacin (100%) followed by chloramphenicol (90.9%) and enrofloxacin (90.9%). The sensitivity for other antibacterials was amoxicillin (45.4%), erythromycin (27.3%), gentamicin (27.3%) and tetracycline (27.3%). Only serogroup (O61) of *E. coli* isolated from Fruit Bat was sensitive to kanamycin (Table 1).

The O1, O8, 09, O25, O32, O56, O61, O69, O108, and O147 serotypes of *E. coli* has also been isolated from diarrhaoeic and non-diarrhaoeic faecal samples of domestic animals (Sarma & Boro, 1984; Abha, 2006; Shuchismita & Kashyap, 2006). O1 serotype was also recorded from the stool of human patients suffering from gastrointestinal disorder (Shah *et al.*, 1980). Savou (1965) isolated and described this serotype as highly virulent and invasive to fowl. The occurrence of common serotype in domestic and wild animals could be related with their shared food, fodder and habitat (Dubey & Rao, 1997).

The present findings indicate the expansion of *E.coli* host range in wild and their possible role as reservoir in near future and *vice versa*.

References

Abha, T. (2006). Studies on bacterial diarrhoea in neonatal bovines. M.V.Sc Thesis, F.V.Sc. and A.H., SKUAST-J, Jammu (Unpublished).

Dubey, R.D. & K.N.P. Rao (1997). *Indian Veterinary Journal* 76: 677

Edwards, P.R. & W.H. Ewing (1972). *Identification of Entrobacteriaceae.* 3rd edition. Burgess, Minneapolis.

Ellner, P.D. (1978). *Current Procedure in Clinical Bacteriology.* Charles C. Thomas, Springfield, Illinois.

Sarma, D.K. & B.R. Boro (1982). Isolation of *Escherichia coli* from zoo animals. *Agricultural Science Digest* 2: 237

Savor, D. (1965). *Vet. Med. Nauki. Sof,* 2: 85 cited from Lakshmana Char, M., R.K. Rao, V.S. Shankar & V.D. Rao (1986). Prevalence of *Escherichia coli* serotypes in captive wild animals and birds. *Indian Veterinary Journal* 63: 611-615

Shah, R.R., M.A. Modi & R.L. Modi (1980). *Indian Journal of Microbiology,* 20:39 cited from Lakshmana Char, M., R.K. Rao, V.S. Shankar & V.D. Rao

Manuscript 1725a; © ZOO; Date of publication 21 October 2007; Received 22 February 2007; Finally accepted 15 September 2007

Table 1. **Escherichia coli *serotypes isolated from wild animals and their sensitivity to antibacterial agents***

Source	Sample examined	Serotypes isolated	No. of strains sensitive to Ax	C	Cf	E	G	Ex	Tr	K
Gaur (*Bos gaurus*)	01	UT, O8, O9	-	2 (UT,O9)	3	-	1 (UT)	2 (UT,O9)	-	-
Asian elephant (*Elephas maximus*),	02	O32, O69	1(O32)	2	2	-	-	2	1 O69)	-
Fruit Bat (*Pteropus giganteus*),	01	O61, O108	1(O61)	2	2	1(O108)	1(O61)	2	1 O61)	1 (O61)
Porcupine (*Atherurus mecrourus assamensis*),	01	O56, O147	1(O56)	2	2	1(O147)	-	2	-	-
Palm Civet (*Paradoxurus hermaphroditus*)	01	O25	1	1	1	1	1	1	1	-
Krait (*Bungarus caeruleus*)	01	O1	1	1	1	-	-	1	-	-
Total	**07**	**11**	**05 45.4%**	**10 90.9%**	**11 100%**	**03 27.3%**	**03 27.3%**	**10 90.9%**	**03 27.3%**	**01 09.1%**

Ax - Amoxicillin; C - Chloramphenicol; Cf - Ciprofloxacin; E - Erythromycin; G - Gentamicin; Ex - Enrofloxacin; Tr - Tetracycline; K - Kanamycin

(1986). Prevalence of *Escherichia coli* serotypes in captive wild animals and birds. *Indian Veterinary Journal* 63: 611-615

Shuchimita, C. & S.K. Kashyap (2006). Serogroups of *Escherichia coli* isolated from camel, cattle, sheep and poultry. *Indian Veterinary Journal* 83: 479-482

Acknowledgement: We thank the director, National Salmonella and Escherichia Center, Central Research Institute, Kasuli (Himachal Pardesh) for serotyping the *E. coli* strains.

Treatment of certain ailments in zoo animals

Ashwani Kumar [1] and V.K. Bhalla [2]

[1] Ex-veterinary Doctor, M.C. Zoological Park, Chhat Bir, Punjab, Chandigarh (Presently): Assistant Professor, Department of Surgery and Radiology, College of Veterinary Sciences, GADVASU, Ludhiana, Punjab 141004, India
[2] Veterinary Officer, Village Chhat, Punjab, India
Email: [1] drashwanikumar@rediffmail.com

plus web supplement of 1 page

Wild animals maintained in Zoo/Safari are affected with a number of infectious/non-infectious diseases. Diagnosis and management of these disease conditions pose a challenge to wildlife veterinarians. The present communication describes diagnosis and treatment/management of some disease conditions in zoo animals.

Photosensitization/dermatitis in Asian Elephant (*Elephas maximus*): A male Asian Elephant in musth was kept in a restrained position in an open shed for 3-4 months (December to April) and as a result it developed dermatitis and necrosis with sloughing of skin over back and left lateral side of abdomen. The animal was administered antihistamine (inj. Avil 30 ml, i/m) for five days and local dressing with himax lotion with coconut oil was carried out. It took about two months to recover. It is hypothecated that confinement of elephants and lack of soil and water bath can lead to such skin condition. The left lateral side of abdomen was more exposed to sunlight during captivity. Elephants have delicate epidermis, so it is recommended to bathe them daily and also provide protection from sunlight if they are in confinement. Phenothiazine (acepromazine) administration and prolonged exposure to sunlight during transport has been reported to cause photosensitization in elephants (Selvam *et al*., 1996).

Ketamine induced catalepsy in Himalayan Black Bear (*Selenarctos thibetanus*): An adult female Himalayan Black Bear weighing about 125kg was to be transferred from Chhat Bir zoo to another zoo in the country. Ketamine 6.0ml (600mg) was given, intramuscularly with a dart syringe. After 15-20 minutes, the animal started showing symptoms of maniacal excitement, head movements and paddling and became uncontrollable. As the animal was furious it was not possible to physically restrain it for intravenous administration of either diazepam or barbiturates, so alternatively xylazine (2.5ml, i/m), was administered. The animal calmed down and became unconscious within 15-20min. To reverse the anaesthetic effects of xylazine, yohimbine 60mg i/m was given. The animal recovered from anaesthesia and started showing symptoms of excitement again. It was bathed with fresh tap water at frequent intervals and complete recovery occurred within 4-5hr.

Perusal of literature revealed that use of ketamine (1000mg, i/m) alone for operating adult Bears (Pandey *et al*., 1994; Dutta *et al*., 1999) may produce mild tono-clonic spasms, lasting for 30-40 seconds, without any significant excitement. But in the present study an adult Himalayan Black Bear showed symptoms of maniacal excitement, head movements and paddling after administration of 600mg of ketamine. This difference in behaviour might be attributed to the difference in species of bear, or noisy environment, or individual susceptibility.

Ketamine is a poor muscle relaxant and causes catalepsy, hyperthermia and seizures in some species of animals. Ketamine alone or in combination with xylazine, has been indicated for chemical restraint of captive carnivores, non-human primates and reptiles (Arora, 2000). To control the side effects of ketamine, the premedication or concurrent use of xylazine (Amend *et al*., 1972; Yate, 1973), diazepam or acepromazine are advocated in dogs and cats. To control convulsions, barbiturates are advocated intravenously (Arora, 2000), which was not possible in the case of the excited bear. Ketamine and xylazine combination (1:1) has been reported successfully in bear (Dutta *et al*., 1999; Kumar *et al*., 2002). However, there is no cited literature on the use of xylazine to treat ketamine induced catalepsy. So xylazine may be indicated for the treatment of ketamine induced catalepsy in bear.

Dystocia in Nilgai (*Boselaphus tragocamelus*): A Nilgai was reported with dystocia for more than 12hr. The animal was administered with xylazine (200mg) and ketamine (200mg) mixture with pneumatic driven dart syringe to restrain the animal (Kumar, 2006) but it only produced sedation so additional 100mg each of xylazine and ketamine was repeated to anaesthetize the animal. During anaesthesia, 0.9% normal saline solution (4-5l) was given intravenously. Per vaginal examination revealed anterior presentation with head and neck extended over the foetus laterally and both the fore limbs of the foetus were present in the vaginal passage. Correction of the position of the neck was not possible. The foetus was delivered by traction. It was administered streptopenicillin 2.5g, analgin 250mg, and prednesolone 100mg intramuscularly; oxytetracyline (5.0g) bolus was given intrauterine. To reverse the anaesthetic effects yohimbine (30mg, i/v) was given. The animal recovered from anaesthesia and could stand and walk but it died a few hours later.

[W] See Images in the web supplement at www.zoosprint.org

Manuscript 1636; © ZOO; Date of publication 21 October 2007
Received 04 September 2006; Revised received 01 September 2007;
Finally accepted 14 September 2007