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 (Schisostoma sp.), respectively. Among the nematodes Strongyle sp. eggs was found to be the predominant species (36.36%). A similar condition was reported by Sundaram et al. (1971). In cestodes, Anoplocephala sp. (9.00%) was encountered in one elephant, the same parasite was recorded in elephants by Chandrasekaran et al. (1979) in Kerala. Among trematodes, Bivitellicolubaria nazi was recorded in one (9.00%) Elephant which was reported earlier by Sundaram et al. (1972) and Islam (1994). The incidence of helmith recorded in the present study were also reported by Warte (1995) and Saseedharan et al. (2004). The low incidence of helmith 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 helmith infection among elephants in Theppakul, 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

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.

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

¹² Division of Veterinary Epidemiology and Preventive Medicine, Faculty of Veterinary Sciences and Animal Husbandry, SKUAST-J, R.S. Pura, Jammu, India Email: ¹rajesh.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 Betal 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, O9, O25, O32, O56, O61, O69, O108, and O147 serotypes of E. coli has also been isolated from diarrhoeic and non-diarrhoeic 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). Savoy (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
Table 1. Escherichia coli serotypes isolated from wild animals and their sensitivity to antibacterial agents

<table>
<thead>
<tr>
<th>Source</th>
<th>Sample examined</th>
<th>Serotypes isolated</th>
<th>Ac</th>
<th>C</th>
<th>G</th>
<th>Ex</th>
<th>Tr</th>
<th>K</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gaur (Bos gaurus)</td>
<td>01</td>
<td>UT, O8, O9</td>
<td>-</td>
<td>3</td>
<td>-</td>
<td>1 (UT)</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Asian elephant (Elephas maximus)</td>
<td>02</td>
<td>032, 069</td>
<td>2 (032)</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>1 (069)</td>
</tr>
<tr>
<td>Fruit Bat (Pteropus giganteus)</td>
<td>01</td>
<td>O61, O108</td>
<td>1 (061)</td>
<td>-</td>
<td>-</td>
<td>1 (0108)</td>
<td>1 (061)</td>
<td>1 (061)</td>
</tr>
<tr>
<td>Porcupine (Atherurus macrourus assamensis)</td>
<td>01</td>
<td>036, 0147</td>
<td>2 (036)</td>
<td>-</td>
<td>-</td>
<td>2 (0147)</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Palm Civet (Paradoxurus harrhaphroditus)</td>
<td>01</td>
<td>O25</td>
<td>1</td>
<td>-</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Krait (Bungarius caeruleus)</td>
<td>01</td>
<td>O1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>-</td>
<td>1</td>
<td>-</td>
</tr>
<tr>
<td>Total</td>
<td>07</td>
<td>11</td>
<td>05</td>
<td>10</td>
<td>11</td>
<td>03</td>
<td>03</td>
<td>10</td>
</tr>
</tbody>
</table>

Ax - Amoxicillin; C - Chloramphenicol; Cl - 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


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

VET BRIEF

ZOOS’ PRINT JOURNAL 22(11): 2900-2901

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

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 hypothesized 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 (apomazine) 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 toco-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 apomazine 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 foetal 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; oxytetracycline (5.0g) bolus was given intrarterine. 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.

*See Images in the web supplement at www.zoosprint.org*