

Some short notes on Research and Veterinary articles

Endoparasitism in Wild Animals in Captivity

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Zoo animals harbour a large number of parasites. These parasites adversely affect animal health, occasionally causing mortality, morbidity or both. Incidence of parasitism in wild animals has been reported from a number of places (Chauhan *et al.*, 1973; Sengupta 1974; Maske *et al.*, 1990). This communication deals with incidence of endoparasitism in zoo animals of National Park, Bhopal (M.P.). The study was conducted on 30 animals (6 Tigers, 7 Lions, 17 Leopards) maintained at Van Vihar National Park, Bhopal (M.P.) during the month of January, 2008. Freshly collected faecal sample of all the animals were processed and examined grossly and microscopically for qualitative examination adopting standard procedure. The identification of parasitic eggs was done by morphological criteria as described by Soulsby (1968). Out of 30 animals examined, 17 were found positive for helminthic infection as shown in the Table.

The result shows that the incidence rate of occurrence of helminth parasites is 50%, 57.14% and 58.82% in tiger, lion and leopard, respectively. reported infection of *Ancylostoma* sp., *Toxocara* sp., *Paragonimus* sp. and *Diphylobothrium* sp. in both tiger and leopard; *Capillaria* sp. in lion in Kha Wildlife Sanctuary, Thailand. The park animals are of national importance, regular faecal examination and specific individual examination should be done. Most of helminthic infections are through food and water contamination. Proper and regular check-up helps to reduce the incidence of helminths in park animals. Regular deworming and supplementation with vitamins and minerals are also helpful health measures.

Table: Incidence of helminth parasites among captive animals.

Sr. No.	Parasites	Tiger (6)	Lion (7)	Leopard (17)	Total (30)	% infection
1.	<i>Toxocara</i> sp.	2	-	2	2	13.30
2.	<i>Capillaria</i> sp.	-	1	-	1	3.33
3.	<i>Strongyle</i> sp.	-	3	-	3	10.00
4.	<i>Ancylostoma</i> sp.	-	-	3	3	10.00
5.	<i>Diphylobothrium</i> sp.	-	-	4	4	13.30
6.	<i>Alaria</i> sp.	-	-	3	3	10.00
7.	<i>Paragonimus</i> sp.	1	-	-	1	3.33
	Total	3	4	10	17	63.26

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References

Chauhan P.P.S., B.B. Bhatia, G.S. Arora, R.D. Agrawal and S.S. Ahuwalia (1973). A preliminary survey of parasitic infection among mammals and birds

at Lucknow and Delhi Zoos. *Indian Journal Animal Science* 43, 163-168.

Maske, D. K., N. G Bhilegaonkar and M. R Sardey (1990). Studies of Helminth parasites in captive animals and birds of deer park zoo, Nagpur, Maharashtra State. *Indian Journal of Animal Science* 5, 277-278.

Sengupta M.R., (1974). A preliminary report on disease and parasites of zoo animals, birds and reptiles. *Indian Journal of Animal Health* 13, 15-24.

Soulsby E.J.L. (1968). *Helminths, Arthropods and Protozoa of domesticated Animals*. 7th edition Baillier Tindall, London.

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A short note on rescue of a Hispid Hare (*Caprolagus hispidus*) at Manas National Park

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On 10 Feb 2009 a female Hispid Hare (*Caprolagus hispidus*) was rescued by forest guards in Uchilla Beat under Basbari range of Manas Tiger Reserve. Hispid hare is categorised as Critically Endangered CR under IUCN Red List and Schedule (I) of the Indian Wildlife (Protection) Act 1972. The hare was injured during a predation attempt of a Large Indian Civet (*Viverra zibetha*) and saved by forest guards posted on Uchilla beat out of anthropogenic response and biological ignorance. This short communication describes the event.

On 11th February, 2009 the female hare was examined and found to have severe claw marks between the right ear and the right eye, bite marks over the medial and lateral aspect of the left thigh and over the neck region. The bite marks were about 3-4 mm deep. The hare was kept in a dark concrete room inside the camp. Physical restraint was achieved by throwing a towel over the hare and securing head and legs. Once the hare was controlled, the hind legs were secured with the left hand putting the index finger between the hind legs and the ears and the head were secured with the left hand. Using this restraint method, the hare was easy to examine. Secure handling helps to ensure that the animal does not struggle and injure its legs or heavy muscles. It was put inside a small gunny bag and weighed with a non-standardised spring balance at 1.850 gms. Injuries were not treated and the hare was released from where it was found.



Hispid hare close up before release



After release in the wild

The Hispid Hare is confined to Terai grassland of Himalayas. Presence is reported only from Dudhwa Tiger reserve (U.P.) and Manas Tiger Reserve in India. It's coarse bristly fur and shorter tail (less than one inch) is the distinctive feature. Capturing the hare also reconfirms the animal's presence after the rough period of ethnic violence in Manas since late 80's till early 2000.

(*See Web supplement for images at www.zoosprint.org)

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Parasitic Infection among captive birds at Shri Sayaji Baugh, Baroda, Gujarat

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In spite of providing all the possible care and facilities, birds kept in the zoo are in an unnatural environment. Being under constant stress of captivity they are prone to parasitic infection. Parasitic infection causes considerable losses to wildlife in this country (Karamchand, 1969). A number of parasites are responsible for illness and death of captive birds, and exercise great influence on the success of bird management in the zoo. In Gujarat there are about 450 species of birds. Shri Sayaji Baugh, Baroda has 12 families of 63 species of 851 birds. Although so many birds are being kept no systematic study of parasitic infections in captive or wild birds is being conducted. Presently such a study is reported in this article.

A fresh group faecal samples of birds were collected cage-wise in clean sterile containers from Shri Sayaji Baugh, Baroda. A sample was fixed in 10% formaline and brought for laboratory examination for direct, concentration and centrifugation in saturated salt solution revealed a variety of helminthic eggs (Thienpont, 1979 and Georgi, 1985). A part of each sample was also mixed with 2.5% potassium dichromate solution and kept at room temperature for

sporulation of coccidian oocyst (Sprent *et al.*, 1967). Gross helminth passed in faeces were identified after staining with borax carmine in case of trematodes and cestodes. Nematodes were studied after clearing them in lactophenol (Soulsby, 1982).

The faecal examination of 63 samples revealed 73.01% parasitic infection with the highest prevalence of nematode eggs (69.56%) and coccidian oocysts (47.82%). The infection of trematodes was 8.69% in carnivorous birds and cestode infection was 10.86% in columbid birds. Mites infection was 6.52% in psittacidae and phasianidae family. (See web supplement for Table 1). Earlier workers have reported parasitic infection varying from 25 to 99 % in zoo birds from - Baranga zoo. Orissa (Patnaik and Acharjyo, 1970); Lucknow Zoo, Uttarpradesh, (Pande *et al.*, 1970); Lucknow and Delhi Zoo (Chauhan, *et al.*, 1973); Mysore Zoo (Muraleedharan *et al.*, 1990) Bennerghatta National Park, Bangalore (Reddy *et al.*, 1992) and Ahmedabad and Baroda Zoo, Gujarat (Patel *et al.*, 1998). Species-wise nematode infection was consisted of *Ascaridia* species (46.82%), *Capillaria* species (29.78%), *Strongyloid* species (10.63%), *Heterakis* species (8.5%), *Trichostrongylus* species (2.12%) and *Dyspharynx* species (2.12%) was observed. Among coccidian infection single coccidian infection was observed in 45.45% birds, where 54.55% having mixed infection with nematode. Patnaik and Acharjyo (1970); Chauhan *et al.*, (1973); Islam (1991); Reddy *et al.*, (1992) and Patel *et al.*, (1998) reported nematode infection mainly with *Ascaridia* species and *Capillaria* species in galliformes and columbiformes birds. In this study also nematode infection mainly with *Ascaridia* species (65.62%) and *Capillaria* species (43.75%) in Columbiformes and galliformes birds was recorded. It seems that nematode infection was 69.56% among all parasitic infections, which is high due to their direct life cycle.

Panaik and Acharjyo (1970), Islam (1991), and Reddy *et al.*, (1992) reported that cestode infection is mostly found in galliformes and columbiformes. In this study 10.86% cestode infection was observed

Table-1 Prevalence of Parasitic Infection in Captive Birds of Shri Sayaji Baugh, Baroda

Sr.No	Order	Family	Name of Bird	No. of Bird	Cestode	Nematode	Type of Infection Trematode	Emerian oocyst	Mite and mite
ova									
1	Galliformes	Phasianidae	White peacock (Pavo cristatus)	28	-	Capillaria spp	-	-	-
2			Peacock (Pavo cristatus)	7	-	Capillaria spp Heterakis spp	-	-	-
3			Grey Peacock pheasant(Polypectron thibetaneue)	3	-	Capillaria spp Heterakis spp	-	-	-
4			Golden Pheasant (Chrysolophus pictus)	3	-	Capillaria spp.	-	1	-
5			Silver Pheasant (Lophura nymthemera)	10	-	-	-	1	1
6			Lady amhesier's Pheasant. (Chrysolophus amherstiae)	2	-	-	-	-	-
7			Common Japanese pheasant (Polyplectron spp)	2	-	Ascaridia sppStrongylus spp	-	1	-
8			Gunia fowl (Numidia meleagridis)	2	-	Capillaria spp. Ascaridia spp	-	-	-
9			Mint cochin	20	-	Ascaridia spp	-	1	-
10	Psittaciformes	Psittacidae	Red or Molucan lory (Eos bornea bornea)	2	-	-	-	-	-
11			Black capped lory (Chalcopsitta atra atra)	5	-	-	-	1	-
12			Black lory (Eos cyanogenia)	2	-	-	-	-	-
13			Rainbow lory (Chalcopsitta spp)	4	-	Capillaria spp	-	-	-
14			Dusky lory (Chalcopsitta spp)	3	-	-	-	-	-
15			Chattering lory (Domicella garula garula)	2	-	-	-	1	-
16			Rosset cockatoo (Kakatoa senguinea golfini)	1	-	-	-	1	-
17			White Cockatoo (Kakatoa alba)	2	-	-	-	-	-
18			Red crested cockatoo (Kakatoa moluccesis)	9	-	Ascaridia spp.	-	-	-
19			Cockatiel (Lutino) (Nymphicus hollandicus)	9	-	-	-	-	1
20			Western Rossella (Platyconis spp)	2	-	-	-	-	-
21			African grey parrot (Psittacus erithacus)	1	-	-	-	-	-
22			Golden fronted conure (Aratinga spp)	3	-	Ascaridia spp.	-	-	-
23			Brown eared conure(Aratinga spp)	8	-	Ascaridia spp.	-	1	-
24			Pantagonian conure(Cyanoliseus pantagonus)	2	-	-	-	-	-
25			Jendaya conure (Artinga jendaya)	7	-	Capillaria spp	-	-	-
26			Illiger's macaw (Ara maracana)	2	-	Strongyloid spp	-	-	-
27			Alexandrine parakeet (Psittacula eupatria)	6	-	-	-	-	-
28			Blossom headed parakeet (Psittacula cyanocephala)	7	-	-	-	-	1
29			Rose ringed parakeet (Psittacula krameri)	12	-	-	-	1	-
30			Red breasted parakeet (Psittacula krameri)	8	-	Capillaria spp	-	-	-
31	Anseriformes	Anatidae	Duck Brahmini(Tadoma ferruginea)	2	-	-	-	-	-
32			Mandrine duck (Aix gelerulatus)	6	-	-	-	-	-
33			Duck common (Anas sp.)	20	-	Ascaridia spp.Strongylus spp	-	-	-
34	Ciconiiformes	Ciconidae	Painted stork (Ibis leucocephalus)	4	-	-	2	-	-
35	Phoenicopteridae	Phoenicopteridae	Flamingos(Phoenicopterus roseus)	3	-	Ascaridia spp.	2	-	-
36	Casuariiformes	Casuariidae	Cassowary (Casuarius casuarius)	1	-	Ascaridia spp	-	-	-
37			Emu (Dromaius novaehollandicus)	1	-	-	-	-	-
38	Bucerotiformes	Bucerotidae	Horn bill common Grey(Tockus birostris)	5	-	-	-	-	-
39	Cuculiformes	Cuculidae	Turaco white cheeked(Turaco leucotis)	2	-	Ascaridia sppDispharynx spp	-	1	-
40	Columbiformes	Columbidae	Diamond dove (Geopelia cuneata)	79	-	Ascaridia spp.	-	1	-
41			Pigeon crowned(Goura grislata)	12	-	Ascaridia spp.	-	-	-
42			Pigeon Green Imperial(Ducula aenea)	3	-	-	-	1	-
43			Pigeon Pied Imperial(Ducula bicolor)	2	-	Ascaridia spp	-	1	-
44			Red Jacobin pigeon	35	1	Ascaridia sppHeterakis spp	-	-	-
45			Shiraji pigeon	28	1	Ascaridia sppCapillaria spp	-	1	-
46			Black fan tail pigeon	20	1	Ascaridia sppCapillaria sppHeterakis spp	-	-	1
47			Black Jacobin pigeon	35	1	Ascaridia sppCapillaria sppTrichostrongylus spp	-	-	-
48			White Jacobin Pigeon (Columba sp)	38	1	Capillaria spp.	-	-	-
49			Phouter pigeon	32	1	Ascaridia spp. Capillaria spp.	-	-	-
50	Passeriformes	Passeridae	Yellow musk love bird (Agapornis roseicollis)	52	-	-	-	-	-
51			Golden cherry love bird(Agapornis roseicollis)	40	-	-	-	1	-
52			Blue Peach faced love bird(Agapornis roseicollis)	35	-	Capillaria spp	-	-	-
53			Budgerigers (Melopsittacus undulantes)	88	-	-	-	1	-
54			Grey java (Padda oryzivora)	48	-	-	-	1	-
55			White java (Padda oryzivora)	12	-	Ascaridia spp	-	-	-
56			Fawn java sparrow	15	-	-	-	-	-
57			Zebra finch white	11	-	Ascaridia spp	-	-	-
58			Zebra finch brown	22	-	-	-	-	-
59			White throated munia (Lonchura alabarica)	18	-	-	-	1	-
60			Cut throat	1	-	-	-	1	-
61	Silvidae		White spotted laughing thrusk (Garulax albogularis)	1	-	Ascaridia sppStrongyloid spp	-	-	-
62	Sturnidae		Myna. (Acridotheres tristis)	3	-	Ascaridia sppStrongyloid spp	-	-	-
63			Blue jai koel (Eudynamys scolopacea)	2	-	-	-	-	-
TOTAL :-				850	05	32	04	22	04

only in columbiformes birds reported by Patel *et al.*, (1998). Panaik and Acharjyo (1970) reported trematode infection in ciconiformes and falconiformes birds. During present study 8.69% trematode infection was observed in ciconiformes and falconiformes birds. Both trematode and cestode infection were found in low numbers, which might be due to their indirect life cycle. Trematode infection in ciconiformes and falconiformes may be due to fish, which may act as intermediate host.

In present findings it seems that nematode and coccidian infection were most commonly observed which might be due to their direct life cycle, whereas the trematode and cestode infection was low due to their indirect life cycle. Trematode infection was mainly due to fish given to ciconiformes and falconiformes birds, which act as intermediate host for trematode infection. Infected birds did not show any alarming clinical signs because of regular deworming at three months interval for three days in drinking water. However, some birds were not taking drug due to change of water taste. This may be the reason that infection is remaining in cage and reinfect the birds.

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References

- Ali S (1996).** *The book of Indian Birds* 12th edition. Oxford University Press Oxford, New York, 187pp.
- Chauhan P.P.S., B.B. Bhatia, G.S Arora, R.D. Agarwal and S.S. Ahluwalia (1973).** A preliminary survey of parasitic infection among mammals and birds at Lucknow and Delhi Zoo. *Indian Journal of Animal Science* 43: 163-168.
- Georgi, J.R. (1985).** *Parasitology for Veterinarians*. 4th Ed. W.B. Saunders, London p.344.
- Islam A.M. W. (1991).** Incidence of helminth parasites of guinea fowl in Zambia. (Abstract) *International Seminar on Veterinary Medicine in wild and captive animals, Bangalore* p.28 (unpublished)
- Karam chand (1969).** Studies on the biology, host-parasite relationship and control of some common tapeworm of poultry. Ph.D. Thesis submitted to Agra University, Agra.
- Muraleedharan .K., V. Iswariah., S.K. Ziauddin and K.Srinivasan (1990).** A survey of gastro intestinal parasites of mammals of Zoological garden at Mysore. *Mysore Journal of Agricultural Science* 24:250-256.
- Pande B.P., B.B. Bhatia, P.P.S. Chauhan., and R.K. Garg (1970).** Species composition of coccidia of some of the mammals and birds at the zoological garden, Lucknow. *Indian Journal of Animal Science* 40: 154- 163.
- Patel P. V .,A.I. Patel., R.K.Sahu, and R. Vyas (1998).** Helminthic infection in captive wild birds of Gujarat. (Abstract) *Xth National Congress of Veterinary Parasitology, Jabalpur*, 72pp (unpublished)
- Patnaik M.M. and L.N. Acharjyo (1970).** Notes on the helminth parasites of vertebrates in Baranga Zoo (Orissa). *Indian Veterinary Journal* 47: 723—730.

Reddy J.N.R. M.S Jagannath , P.E.D'souza., and A.S. Rahman (1992). Prevalence of gastrointestinal parasites in wild mammals and captive birds at Bennerghatta National Park, Bangalore, India. *Indian Journal of Animal Science* 62: 1 046-1 048.

Soulsby, E.J.L. (1982). *Helminths Arthropods and Protozoa of Domesticated animals*. 7th Ed. Elbs and Bailliere tindal, London.

Sprent, J.F.A.; Hoyte, H.M.D.; Pearson, J.C. and Waddell, A.H.(1967). Notes on methods used in parasitology. 2nd Ed. Dept. of Parasitology, Queensland.

Thienpont, D.(1979). Diagnosing helminthiasis through coprological examination. Beerse Jansen research Foundation.

***See web supplement for a Table on "Prevalence of Parasitic Infection in Captive Birds of Shri Sayaji Baugh, Baroda".**

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Record Longevity of Wild Ass (*Equus hemionus khur*) at Nehru Zoological Park, Hyderabad, India

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A pair of Wild Ass was procured by purchase from Sakkarbagh Zoo, Junagadh, and received on 1-3-1980. The female was born on 15-11-77. The pair were kept in fairly big moated enclosure. Feeding schedule of the animal included Lucerne - 5kgs, Kadvi - 10-15kgs, Peepul leaves 10kgs, cattle feed 2kgs, Green grass ad-lib. The first mating was observed on 31-3-1982 and again on 27-5-1982. Conception took place but caesarian had to be performed due to Dystokia on 2-5-1983 when the male foetus was removed dead. The operation was performed by Veterinarians from teaching faculty from college of Veterinary Sciences Dept. of Gynecology and Surgery, Andhra Pradesh Agricultural University. The life of the female Ass was saved by timely intervention and performance. The Wild Ass had completely recovered and ever since there was no breeding as the male had died and only the female remained in the enclosure. The female never developed any health problem except an ear infection for which it was physically treated. Despite treatment, she developed atrophied ears and also had colic once which was relieved by treatment. Now she is normal but as the age is advancing the weight of the animal has been observed to decrease; otherwise intake of food and water is normal. At this age of 32 years in May 2009, the female may be the longest surviving Wild Ass in captivity.

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Record of *Heteropneustes microps* (Gunther) like fish specimen from Tamil Nadu, Southern India

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A fish specimen resembling *Heteropneustes fossilis* Bloch was collected from Putheri wetland, a freshwater wetland, which is located approximately 3 km north of the Nagercoil town of Kanyakumari District, Tamil Nadu (8°10' - 8°15' N and 77°25' - 77°30' E), southern India on 10 March 2004, as a part of the wetland fish survey in the region. Detailed morphological examination and the literary review confirmed that the specimen is closely identical to *Heteropneustes microps* Gunther. The fish was a male having a length of 17cm (Total length) and 14.6 cm (Standard length); and weight, 45.5 g. The caudal and anal fins in the specimen were not separated as in the case of *H. fossilis* in which both these fins are clearly separated. Normally, *H. fossilis* has an arch at the posterior edge of the anal fin and a clear gap occurs between the anal and caudal fins (Talwar & Jhingran 1991; Jayaram 1999). The rays of anal and caudal fins could not be counted separately in the specimen; as they were joined together. The total number of rays in both fins of the specimen was of 66. However, the occipital process that extends until the base of the dorsal fin in the case of *H. microps*, as quoted by Jayaram (1999) is not clear in this specimen. Meristic counts - D 6; A+C 66, P 16; V 5

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References

- Jayaram, K.C. (1999). *The fresh water fishes of the Indian region*. Narendra Publishing House, Delhi, 304 – 306 pp.
Talwar, P.K. and A.G. Jhingran (1991). *Inland fishes of India and adjacent countries*. Oxford & IBH, New Delhi, 690 & 691pp.

*See web supplement for a Table on “Morphometric measurements recorded for the specimen” and Plates showing the study specimen with *H. fossilis*.

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Ascaridia galli infection in Guinea Fowl (*Numida meleagris*) of Mansar Area of Jammu

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Parasites exert their harmful effects in various ways viz., they may compete with the host for food thereby decrease food utilization and protein synthesis (Clapham, 1937; Holmes and Coop, 1994). Ascarid infection in domestic and wild birds was reported earlier by many workers in India (Bali and Kalra (1975); Joshi and Kamalapur (1972). The present study reports the incidence of *ascariasis* in guinea fowl in deer park Mansar, Jammu.

Four, 4-month old guinea fowl (two males and two females) were found dead in the pen. On external examination, no gross lesions were observed. Post mortem examination revealed the small intestine completely occluded with adult and young worms. Rupture of small intestine was observed in all birds. Examination of intestinal scrapings of the birds revealed characteristic *Ascaridia* eggs as per the morphology described by Soulsby (1982). On culture examination of heart blood and intestinal contents, no pathogenic organisms could be isolated.

Mortality in birds was thought to be due to Ascarid infection which causes rupture of intestine followed by peritonitis. Mortality in chickens due to helminth infections was reported by Ikeme (1971) and Ramadan and Znada (1991). The pathological lesions recorded in the present investigation are highly consistent with the findings of previous researchers (Clapham, 1937; Tugwell and Ackert, 1952). The high prevalence observed in free range birds might be due to the type of production system, where the birds are in constant contact with soil and intermediate hosts due to their scavenging habits (Magwisha *et al.*, 2002).

Though the total eradication of helminths from a geographical area is very difficult, the helminth infections can be controlled by simultaneous implementation of management practice and treatment strategies. The management practice includes all in – all out principle, regular cleaning and use of disinfectants proper disposal of the used litter and farm garbage, alternate use of pens etc. The helminths involving intermediate hosts in their life cycle can easily be controlled by destroying the intermediate hosts or preventing contact with the intermediate hosts. With the improvement in management practice, routine treatment with anthelmintic there is efficient prevention and control of helminth infections especially in the free-range systems. By performing direct post-mortem examination and detecting the worms diagnosis of helminth infections can also be done (Soulsby, 1982; Permin *et al.*, 1998).

Table 1. Morphometric measurements recorded for the specimen

Table 1	Actual length measures (cm)	In % Std. length (cm)
Head length	2.86	19.6
Head width	2.34	16
Head depth	1.57	10.7
Pre-dorsal length	5.12	35.1
Pre-anal length	6.76	46.3
Pre-pelvic length	5.35	36.6
Pre-pectoral length	2.54	17.4
Body depth at anus	2.51	17.2
Depth of caudal peduncle	2.06	14.1
Length of pectoral fin	1.96	13.4
Length of pectoral spine	1.88	12.9
Length of dorsal fin base	0.86	5.9
Pelvic fin length	1.63	11.2
Length of caudal fin	2.15	14.7
		In % head length
Snout length	0.84	29.4
Inter orbital distance	1.77	61.9
Eye diameter	0.35	12.2
Nasal barbel length	3.89	136
Maxillary barbel length	5.75	201
Inner mandibular length	4.09	143
Outer mandibular length	5.31	185.7

Plates showing the study specimen with *H. fossilis*.

Plate1



Plate 2



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References

- Bali H.S. & Kalra I.S. (1975).** Studies on the incidence of helminths in domestic and wild birds in Punjab State. 1. Nematoda. *Journal for Research in Punjab Agricultural University* 12(3): 313-316.
- Clapham P.A. (1937).** On some lesions associated with helminths in birds of economic importance. *Journal of Helminthology* 15(1): 49-52.
- Holmes P.H. & Coop R.L. (1994).** Workshop summary: Pathophysiology of gastrointestinal parasites. *Veterinary Parasitology* 54: 299-303.
- Ikeme M.M. (1971).** Observations on the pathogenicity and pathology of *Ascaridia galli*. *Parasitology* 63: 169-179.
- Joshi S.C. & Kamalapur S.K. (1972).** New records of helminth parasites of domestic fowls from Madhya Pradesh. *Indian Poultry Gazette* 55(1): 119-124
- Magwisha H.B., Kassuka A.A., Kyvsgaard N.C. & Permin A. (2002).** A comparison of the prevalence and burdens of helminth infections in growers and adult free-range chickens. *Tropical Animal Health and Production* 34(3): 205-214.
- Permin A., Nansen P., Bisgaard M. & Frandsen F. (1998).** *Ascaridia galli* infections in free-range layers fed on diets with different protein contents. *British Poultry Science* 39: 441-445.
- Ramadan H.H. & Znada A.N.Y. (1991).** Some pathological and biochemical studies on experimental ascaridiasis in chickens. *Die Nahrung* 1: 71-84.
- Soulsby E.J.L. (1982).** *Helminths, arthropods and protozoa of domesticated animals*. 7th edition Bailliere Tindall, London
- Tugwell R.L. & Ackert J.E. (1952).** On the tissue phase of the life cycle of fowl nematode *Ascaridia galli* (Schrunk). *The Journal of Parasitology* 4: 277-288.

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Sightings of breeding mallards (*Anas platyrhynchos*) in Dachigam National Park, Kashmir, India

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In the course of research work carried out for Department of Science and Technology (DST), Govt. of India, sponsored research project "Bio-ecology of Hangul deer (*Cervus elaphus hanglu*, Wagner) and its relationship with predators at Dachigam National Park, Kashmir, India" observations were carried out on Mallards (*Anas platyrhynchos*) occurring in the waterbodies of Dachigam National Park (Table1). In Kashmir, mallard usually breeds in wetlands where it nests in the vicinity of water mostly in the patches

Table 1: Sightings of breeding mallards (*Anas platyrhynchos*) in Dachigam National Park

Day	Time	Sighting	Location	Activity
15-04-2005	11:15	A mallard pair	Near oak patch	Fled upon our approach
21-05-2005	7:25	A duck with 8 ducklings	On the road about 1km above hatchery	The duck was crossing the road and ducklings followed
12-06-2005	10:00	A duck with 10 ducklings	Pehlipora	The duck was moving ahead and ducklings followed
25-04-2006	12:40	A duck with 6 ducklings	Reshiwadar	The duck was moving ahead and ducklings followed
09-05-2006	9:30	A duck with 8 ducklings	Pehlipora	The duck was moving ahead and ducklings followed

of tall and dense macrophytic vegetation and also in willow (*Salix* sp.) bushes and hollows of old willows (Bates and Lowther, 1952; Ali, 2002 and Shah, et. al. 2008). Before this study, in Kashmir, this bird has neither been sighted in forest areas nor in Dachigam National Park which is also a forest area. However, several sightings of mallard ducks along with their brood in the Dachigam National Park were made during the present study. In one sighting, a pair of mallard were disturbed and were seen flying away from the park upon our approach while in the remaining four sightings, ducks with their brood were seen.

This gives an indication that mallards use the dense habitats in lower part of Dachigam National Park as nesting sites. There however exists a reservoir outside the Dachigam National Park in Harwan, Srinagar. Hundreds of ducks of different species including mallards are seen to visit this reservoir in early spring (March and April). As no vegetation cover exists in the reservoir, mallards (only wild duck that breeds in Kashmir) which prefers highly concealed nesting sites where dense cover is available (Hill, 1984), finds it difficult to nest in the open reservoir. The presence of a dense habitat in the vicinity in the form of Dachigam National Park solves this problem for mallard where they find suitable nesting sites.

Although no nest was recorded from Dachigam it seems quite probable that hens with broods occurred there only because they had nested there as the park could not provide any other advantage to the bird except offering suitable nesting sites. Studies on mallards across the world have concluded that it is a highly adaptable species and adapts itself comfortably to various habitats (Drilling, et. al., 2002). In Minnesota it usually prefers to nest in upland habitats including forests (Gilmer, et. al., 1975). In Vermont, 28% of mallard nests were found in low dead herbaceous plants and 19% in live conifers (Coulter and Miller, 1968).

References

- Ali, S. 2002.** *The book of Indian birds*. 13th (Revised) ed. Daniel, J. C.(ed.) Mumbai: Bombay Natural History Society & Oxford University Press.
- Bates, R. S. P. & Lowther, E. H. N. 1952.** Breeding birds of Kashmir. London: Oxford University Press.
- Coulter, M.W., and Miller, W.R. 1968. Nesting biology of black ducks and mallards in northern New England. *Vt. Fish Game Bull.* 38(2):1-73.

Drilling, N., Titman, R and McKinney, F. 2002.

Mallard (*Anas platyrhynchos*). In The birds of North America, No. 658 (A. Poole and F. Gill, eds.). *The birds of North America*, Inc. Philadelphia, PA.

Gilmer, D.S., Ball, I.J., Cowardin, L.M., Riechmann, J. H., and Tester, J.R. 1975. Habitat use and home range of mallards breeding in Minnesota. *J. Wildl. Manage.* 39:781-789.

Hill, D. A. 1984. Clutch predation in relation to nest density in mallard and tufted duck. *Wildfowl*, 35: 151-156

Shah, G. M., Jan, U., Ahangar, F. A., Wani, J. A and Bhat, B. A. 2008. Nesting of Mallard (*Anas platyrhynchos*) at Anchar. *Science for Better Tomorrow*, 2008: 531-536 (Editors: M. Z. Chishti and Fayaz Ahmad). *The proceedings of 2nd J&K Science Congress*. July 2006.

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Field Report - Duration of Copulation Knot in Indian Fox (*Vulpes bengalensis*)

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This note describes the duration of copulation knot in the Indian Fox (*Vulpes bengalensis*) and activities of the pair before and after copulation. It is supposed to be the first documentation of duration of 'copulation knot' in Indian Fox in the wild.

The Indian Fox (*Vulpes bengalensis*), one of the smallest canids that is endemic to the Indian Subcontinent is categorized as "Data Deficient" by the IUCN's Canid Specialist Group. This species is considered to be widespread and it seems to occur at highest densities in semi-arid short grasslands (Vanyak *et al.* 2004). Nowhere in its range, the Indian Fox is abundant. Densities seem to fluctuate widely between years in the prime habitat of the species and follow the pattern of rodent densities in Bhal area of Gujarat (Prakash, 1975, Tripathi, *et al.* 1992). The density of breeding pairs range from 0.15 – 0.1 /Km² during peak rodent abundance to 0.01 /Km² during periods of low rodent abundance, whereas in more diverse and stable prey system of Kutch, the fox densities seem to be more constant (0.04 – 0.06 /Km²) (Johnsingh and Jhala, 2004). In Protected grassland plots of Rollapadu Wildlife Sanctuary, Andhra Pradesh, the density ranges from 1.62/ Km² to 0.37/ Km² in unprotected areas respectively (Manakadan and Rahmani, 2000). In Nannaj area of the Great Indian Bustard Sanctuary, the density of breeding pairs is 1.57/ Km² within the protected area and 0.33/ Km² in unprotected areas.

Canid Genital Anatomy and Knot

In case of Canids the male genitalia consist of a fur covered scrotum, composed of thin, dark coloured skin. The scrotum surrounds the testicles and is designed to keep the testicles several degrees

cooler than the canid's internal body temperature so that the sperms are not damaged by excessive warmth. From the scrotum extending along the lower belly is the prepuce, often called the sheath. The prepuce is a flap of fur-covered flesh that sheaths and protects the penis. The penis is a soft fleshy organ, which extends from the sheath as it pumps blood when the canids become sexually aroused. The penis contains a bone, which aids in penetrating the vulva of the female during copulation (Kennelly, 1978). In canids, erection in males is achieved after penetration. Towards the base of the penis is the *bulbus glandis*, also called the knot, which swells inside the female's vagina to keep the male and female together during coitus. The knot prevents the mating pair to separate until insemination has taken place. The duration of knot varies from few minutes, hours or some times entire day depending upon species (Bekoff and Diamond, 1976).

On 1st October 2004 the first author during the usual field routine at Great Indian Bustard Sanctuary, Nannaj, Solapur, Maharashtra, India spotted a pair of Indian fox playing with each other around 0710 Hrs at about 200 metres from a watch tower. The male was seen licking the vulva of the female for few seconds and after one minute, i.e., 0711 Hrs, the male mounted the female. The male remained mounted for another two minutes after which both oriented themselves in opposite directions and started dragging each other in the opposite directions. They continued to drag each other here and there till 0740 Hrs. After this they separated and entered a plantation area and remained out of sight. The duration of knot was approximately for 29 minutes. All the observations were made with 20x40x60mm spotting scope. There are no records about the duration of copulation knot in foxes from the wild. This is supposed to be the first record of duration of a copulation knot in Indian Fox (*Vulpes bengalensis*). The knot is believed to stimulate the penis for achieving erection. Erection expands the *bulbus glandis* and ties the pair together. Once the knot is attained the female pulls forward, triggering ejaculation of semen into the uterus, thus accomplishing insemination. After knot, both individuals continue to drag each other in opposite directions until the pair is unlocked. The evolutionary significance of the copulation knot in canids is successful mating and ensuring insemination. The duration of the copulation knot may vary among species until successful insemination is achieved.

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References

- Bekoff, M. and Diamond, J. 1976.** Precopulatory and copulatory behaviour in coyotes. *Journal of Mammalogy* 57: 372-375.
- Kennelly, J. J. 1978.** Coyote reproduction. Pp. 73-93 in M. Bekoff, ed. *Coyotes: biology, behavior and management*. Academic Press, New York, USA.
- Manakadan, R. and Rahmani, A.R. 2000.** Population and ecology of the Indian fox *Vulpes bengalensis* at Rollapadu Wildlife Sanctuary, Andhra Pradesh, India. *J. Bomb. Nat. Hist. Soc.* 97: 3-14.
- Johnsingh, A.J.T. and Jhala, Y. V. 2004.** Indian Fox *Vulpes bengalensis* (Shaw, 1800) pp. 219-222. In: Sillero-Zubiri, C., Hoffmann, M. and Macdonald, D. W. (eds). 2004. *Canids: Foxes, Wolves, Jackals and Dogs. Status Survey and Conservation Action Plan*. IUCN/SSC Canid Specialist Group, Gland, Switzerland and Cambridge, UK. + 430 pp.
- Tripathi, R.S., Jain, A.P., Kashyap, N., Rana, B.D. and Prakash, I. 1992.** North Western India. Pp. 357-395. In: I. Prakash and P.K. Ghosh, eds. *Rodents in Indian agriculture*. Vol. 1. Scientific Publishers, Jodhpur, India.
- Prakash, I. 1975.** The population ecology of the rodents of the Rajasthan desert, India. Pp. 78-116 In: I. Prakash and P.K. Ghosh, eds. *Rodents in desert environments*. Dr. W. Junk b.v. Publishers, the Hague, Switzerland.
- Vanyak, A. T. and Ullah, M. I. 2004.** Predicting distribution of the Indian Fox using Ecological Niche Modelling. Abstract *CARNIVORES 2004*.

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