

STUDIES ON SOME ASPECTS OF FASCIOLIASIS IN ASIAN ELEPHANTS (*Elephas maximus*)

Saidul Islam*

ABSTRACT

Epidemiology of fascioliasis in free living and captive Asian elephant (*Elephas maximus*) of Kaziranga National Park, Rajiv Gandhi Wildlife Sanctuary and Assam State Zoo-cum-Botanical Garden was studied. A vegetation cover type-cum-wetland map of the Kaziranga National Park was prepared through visual interpretation of LANDSAT 5TM (FCC) remote sensing satellite data. Altogether four main land cover classes could be identified in addition to sandy and agricultural lands. The moist deciduous forest, grassland, waterlogged (perennial)/beels, swampy/marshy areas, sandy areas and agricultural lands occupied 29.13, 51.91, 7.62, 6.67, 3.95 and 0.60 percent of the total park area (430 sq. km) respectively. Limnological studies conducted during the month of December, 1993 at 3 selected wetland sites of the park revealed water temperature to be 25°C; the range of pH, total alkalinity, dissolved oxygen, total hardness and free carbondioxide varied from 7.4-8.0, 70.90 mg/l, 7.6-8.9 mg/l, 28-35 mg/l and 0-3 ppm respectively. Malacological studies conducted at 3 wetland sites of the park showed prevalence of 7 different aquatic snail species viz. *Bithynia* sps. (6%), *Gyraulus convexiusculus* (16%), *Indoplanorbis exustus* (20%), *Lymnaea luteola* (8%), *L. auricularia* var *rufescens* (22%), *Thiara (Melanoides) tuberculata* (8%) and *Vivipara* sps. (20%). A total of 14 different aquatic weed species under 11 families could be identified in three ranges of the park. Free living Asian elephant in the park showed 33.78 percent infection rate with *Fasciola jacksoni*. Highest infection (50.00%) was found at the Kohora range of the park. Captive elephants reared at the Kaziranga National Park, Rajiv Gandhi Wildlife Sanctuary and Assam State Zoo-cum-Botanical Garden showed highest infection with *F. jacksoni* which was 42.50, 62.28 and 18.18 percent during the year 1994, 1994 and 1993-94 respectively.

Studies conducted with LM and SEM showed the size of *F. jacksoni* eggs to be $127.14 \pm 5.26 \mu$ ($116.10 - 147.20 \mu$) $\times$ $65.36 \pm 0.86 \mu$ ($64.50 - 68.80 \mu$) and $145.06 \pm 9.49 \mu$ ($105.87 - 166.50 \mu$) $\times$ $75.43 \pm 5.12 \mu$ ($54.11 - 88.24$) respectively. The egg shape was elliptically oval with deep yellow coloured shell.

Complete miracidial development of *F. jacksoni* eggs was attained at 28 - 33°C on 12th day in wet cultures. Developed miracidia remained alive for 7 months in permanently moist faeces at a temperature of 21 - 35°C.

The dimension of *F. jacksoni* miracidia measured under SEM was $103.75 \times 26.00 \mu$. Tegument showed numerous cilia, an apical protrusible papilla and a pair of lateral papillae at the juncture of first and second tier of epithelial cells.

The adult parasites were 14.94-15.12 mm $\times$ 9.95 - 10.42 mm. Numerous sharp edged spines covered the entire tegument of the parasites which varied in size and density along the different parts of the body. Oral sucker showed numerous radially oriented papillae. Intestinal caeca were highly branched in the middle and posterior third than in the anterior third.

Average diurnal fluctuation of *F. jacksoni* egg count in naturally infected *E. maximus* was 4.89, 2.47 and 2.76 during the morning, noon and evening hours of the day respectively. Highly aged animals had less daily average egg output than the younger animals.

Younger animals with *F. jacksoni* infection showed the clinical signs of anorexia, constipation, often passed out odorous stool, dehydration, anaemia and icterus. They took black earth while grazing. There were deaths in progressive stage of the disease with distinct clinical manifestations. Many aged animals survived the disease without apparent clinical signs.

In liver of elephant, *F. jacksoni* produced well defined necrotic cavities which contained dark red coloured homogeneous masses, dead parasites and trapped eggs. There were periportal necrosis, hepatic fibrosis, individualization of hepatocytes, syncytia formation with enlarged hepatic nuclei, hydropic changes, leukocytic infiltration and tracts of hemosiderin deposits. Adult *F. jacksoni* produced emboli in a superficial epicardial vessel. In a pericardial vessel immature *F. jacksoni* could be observed at different stages of immune attack from host.

Triclabendazole @ 9 mg/kg (not exceeding a total dose of 7200 mg/animal) and oxclozanide @ 7.5 mg/kg (total dose not exceeding 6.8 gm/animal) was found to be 100 and 72.16 percent effective respectively till 21st day post-treatment in clinical fascioliasis in elephant based on faecal egg count. Post-treatment hematologic and serum biochemical values did not reveal any significant difference statistically. No signs of toxicity could be noticed in the treated elephants till 21st day post-treatment.

* Ph.D. Thesis Abstract. Department of Parasitology, College of Veterinary Sciences, Assam Agricultural University, Guwahati, Assam