

**SUMMARY RESEARCH REPORT:  
BRITISH VETERINARY ASSOCIATION**

**An investigation of the parasitic worm burden in a captive and a wild Asian Elephant (*Elephas maximus*) population and the effect of worming in the captive population in Sri Lanka.**



(Above) Myself collecting faecal samples with one of the ETH's bolder orphans

**Introduction**

The Asian elephant (*Elephas maximus*) is a key part of Sri Lanka's heritage; for centuries it has been a key cultural and religious symbol, as well as a focus for the tourism industry. It also acts as an 'umbrella species'; contributing to the protection of many smaller endangered species, such as the native amphibian population.<sup>1</sup>

Parasitism is a significant cause of Asian elephant morbidity<sup>2</sup> and affects juvenile populations in particular<sup>3</sup>. This, their endangered status and the release of rehabilitated elephants into the wild (such as the orphans from the ETH into the Uduwalawe

(Below) A member of the ETH staff bottle feeding the youngest orphans



reserve) makes it important to further our understanding of the worm burden and the differences between wild and captive populations.

### **Aims and Methodology**

This study aimed to compare the faecal worm egg counts (obtained using a modified McMaster's method) between a captive population (CP) and a wild population (WP), within a CP and to assess the efficacy of a worming protocol. The CP used were from the ETH, a small charity that rescues and rehabilitates orphan elephants before releasing them into the neighbouring reserve of Uduwalawe (the WP used were from the reserve) (Figures 1 and 2). For the worming study the CP was wormed with an Albendazole oral bolus at approximately 2500mg for every 300kg (8.3mg/kg). The egg counts were expressed as a total egg count and were also further divided into the number of strongyle and cestode type eggs identified (See Figures 3 and 4).

#### **The results of the study will be used to show:**

- The extent of endoparasitism in a large captive collection of juvenile elephants
- The effectiveness of a worming protocol for juvenile Asian elephants in Sri Lanka
- Possible future directions for research to establish the frequency of worming, dosage and category of worming compounds, based on the types of endoparasites
- A comparison of the worm burden between a wild and captive population living in the same area
- A comparison of the worm burden between the males and females of a captive population
- A comparison of the worm burden between the ages of a captive population



**(Above) Figure 1: Free ranging orphan elephants at the ETH**



**(Left) Figure 2: Wild elephants in Uduwalawe Nature Reserve**

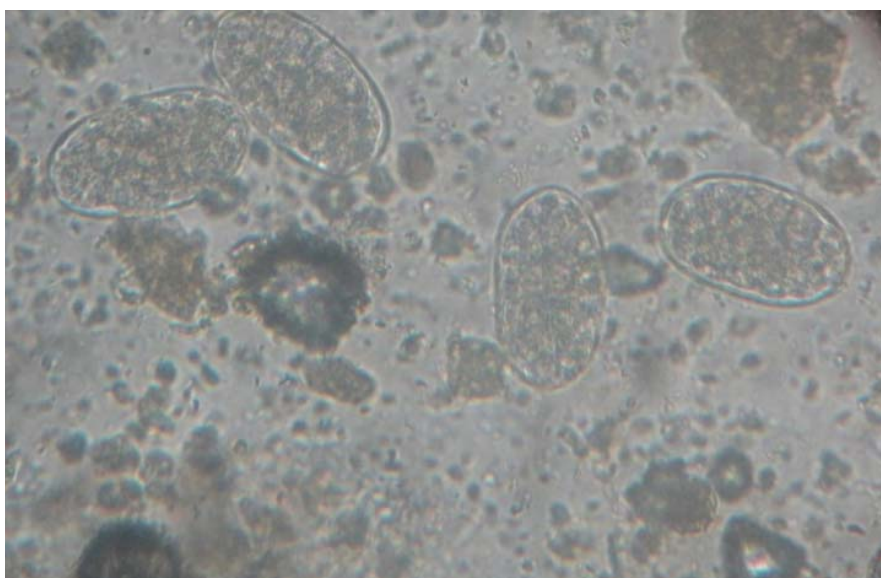
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## **Results and Discussion**

It was found there were significantly more strongyles in the WP compared to the CP and cestode eggs were only identified in the WP. This is most likely to be due to the worming of the CP. The difference may also be due to the restricted diet of the CP and the larger geographical range of the WP<sup>4</sup>.

However, unexpectedly no significant relationships between the presence of worm eggs and each of the 4 time periods (before worming and 10, 15 and 75 days post worming) in relation to worming were found. This could be due to a number of reasons related to the small sample size, accuracy of dosage (the weights of the ETH elephants had to be estimated so it is likely some individuals were under dosed), and possible resistance to the drug.<sup>5</sup>

It was found there was no significant difference in the total egg count between the sex and between the ages of the CP. This is likely to be due to the lack of hormonal difference between juvenile males and females and the lack of age range.<sup>6</sup>



**(Above) Figure 3: Strongyle eggs identified using modified Mc Master Method**



**(Above) Figure 4: Cestode Egg (This image was not taken from this study's samples but is a close likeness to the cestode eggs observed)**

## **Limitations and Future Studies**

This investigation has identified there is a substantially larger worm burden in the WP; this should be taken into consideration when introducing captive animals into the wild. Stopping the worming of CPs altogether could be considered to ensure they have a sufficient immune defence against endoparasites once released into a WP. The lack of efficacy found in

worming suggests more accurate dosing is required as well as further investigation of the worming protocol. Recommendations for improvements and future studies include collecting larger sample sets (including a larger age range), and collecting samples over many consecutive days to allow for intermittent egg shedding in order to detect prevalence.

Specific identification of the ova was not possible. A recommendation for future studies would be to use molecular cloning techniques to genetically identify each parasite species, in order to further investigate the variety of species present.



**(Left) Myself (centre) with the parasitology department at the University of Peradeniya Vet School (Professor Rajapakse in the foreground).**

## **Personal Experience**

This project allowed me a unique insight into the lives of Asian Elephants; whilst at the ETH I was able to walk alongside the herd every day and experience just how intelligent and unique a species they truly are. I feel hugely privileged to have been allowed this insight and to see first-hand the excellent work the ETH is achieving. Shortly after I left a large group of orphans was released successfully into the Uduwalawe reserve, it is very rewarding to know that some of the orphans I saw are now living wild and will hopefully further the endangered population. Not only did I get to spend time with elephants but during my stay I also saw a host of other endangered wildlife including leopards, jackals, crocodiles, turtles and a huge array of bird life.

The experience also allowed me to learn more about a fascinating culture; I thoroughly enjoyed investigating Buddhism and exploring some of the ancient temples. The people I

met were incredibly friendly and hospitable, in particular I will miss the students I befriended at the university, who made me feel so welcome and helped me so much.

## **Acknowledgements**

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