

# ABSTRACTS FROM ZEBRA FUND RECIPIENTS

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## CROSS MATCHING OF BLOOD IN CARCHARHINIFORM, LAMNIFORM, AND ORECTOLOBIFORM SHARKS

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### Abstract

The transfusion of whole blood in elasmobranchs could provide cardiovascular support following hemorrhage. Since donor and recipient compatibility is not known, a technique was established to allow cross matching of red blood cells and serum in sharks. Cross matching was carried out among 19 individuals from seven species: the nurse shark (*Ginglymostoma cirratum*), sandbar shark (*Carcharhinus plumbeus*), sandtiger shark (*Carcharias taurus*), white-spotted bamboo shark (*Chiloscyllium plagiosum*), brown-banded bamboo shark (*Chiloscyllium punctatum*), zebra shark (*Stegostoma fasciatum*), and spotted wobbegong (*Orectolobus maculatus*). Negative cross-matches showed no agglutination or hemolysis, suggesting that donor and recipient would be compatible. Cross-matches between conspecifics were all negative (sandbar, sandtiger, nurse, and white-spotted bamboo sharks). All cross-matches between sandbar and sandtiger sharks were also negative. Positive cross-matches consisted of agglutination or hemolysis of red blood cells, suggesting that the donor and recipient would be incompatible. Strong positive reactions occurred, for example, with red blood cells from sandtiger and sandbar sharks and serum from nurse sharks. Cross matching should be carried out in elasmobranchs prior to any blood transfusion.

*Key words*: Anticoagulant, blood transfusion, cross matching, elasmobranch, intestinal eversion, shark.

# VARIATION IN HELMINTHS OF AFRICAN ELEPHANTS IN AMBOSELI AND TSAVO EAST NATIONAL PARKS IN KENYA

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## **Abstract**

In natural populations of wild animals, parasite infections are common, their effects equivocal and their epidemiology, especially ecological factors that regulate their abundance, distribution and diversity, scantily studied.

Although helminths of African elephants have been investigated, few are comparative studies on different populations. This study aimed to evaluate prevalence, diversity, aggregation and infection intensity of helminths in two populations in habitats of apparently different ecological characteristics, Tsavo East and Amboseli National Parks, Kenya. Fresh faecal samples (N=80) were analysed based on sedimentation-floatation techniques. Nematodes and Trematodes were common but Amboseli elephants had higher prevalence. Worm load was also higher in Amboseli population, though the difference was not statistically significant ( $P>0.05$ ). In both populations, parasite aggregation was skewed with few hosts having high infections. Worm load was also inversely related to age. It is probable that ecological differences in the two sites did not influence the parasite infection patterns as the results were in agreement to previous studies in other wild hosts. These findings provide preliminary data on elephant helminths vital for future health monitoring. However, there is need for a comparative study on elephant parasites during wet season and molecular characterization to identify the parasites to species level.

# POPULATION STRUCTURE AND EFFECTIVE POPULATION SIZE OF THE STRAW-COLOURED FRUIT BAT (*Eidolon helvum*) AT KASANKA NATIONAL PARK, ZAMBIA

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## Abstract

*Eidolon helvum* (the straw-coloured fruit bat), a strong flyer and excellent disperser, can be found throughout sub-Saharan Africa. However, for such a common species, very little is known regarding its population structure, migration pathways, mating strategy, and actual or effective population sizes. Efforts to obtain information is important in its own right, but also since bats have recently attracted the attention of researchers due to their link with viral emerging diseases. We extracted DNA from wing punches taken from 92 individuals, and used microsatellite markers to determine presence of population structure within a large population from Kasanka National Park (Zambia) and infer its effective population size ( $N_e$ ). STRUCTURE was used to detect genetic substructure and found none. A comparison of results from several programs (LDNE, COLONY, MIGRATE) used to estimate  $N_e$  gave highly variable results (104 to infinite). These results provide baseline data where there was none. Further investigations and analysis are needed to improve accuracy and reproducibility.

*Keywords: Eidolon helvum, straw-coloured fruit bat, microsatellite, effective population size, population structure*

# AN EVALUATION OF THE EFFICIENCY OF FAECAL DNA EXTRACTION METHODS IN ASIAN ELEPHANT (*Elephas maximus*)

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## Abstract

Noninvasive samples are becoming widely used for genetic analysis. However, extracted DNA from these samples has often presented with either low quantity or poor quality, which resulted in an unpredictable genotyping outcome. This study aimed to evaluate the efficiency of DNA extraction methods, the effect of age on the faecal sample and whether these could improve the feasibility of using noninvasive samples as genetic tools. Three extraction methods which included modified phenol-chloroform method, QIAamp® DNA stool mini kit and Nucleospin® plant II kit were applied to faecal samples from Asian elephants, which were serially collected at 0, 24, 48, 72 hours and 7 days after defaecation. Amplification and genotyping were performed over five microsatellite loci. This study found that fresh faecal samples provided excellent results in both amplification and genotyping success in all three extraction methods. In addition, no significant difference of the efficiency was detected between fresh faecal sample and 24 hours sample but the efficiency of each method decreased with time. The modified phenol-chloroform and the Nucleospin® plant II kit produced similar and significantly better success rates of a DNA amplification and genotyping than the QIAamp® DNA stool mini kit. Therefore, we strongly recommend collecting the faeces as soon as possible or within 24 hours after defaecation. However, if collection of fresh samples is not possible, we suggest using either the modified phenol-chloroform or the Nucleospin® plant II kit to extract the DNA. For health and safety reasons, the Nucleospin® plant II kit is superior and could potentially be an excellent extraction method for use with faecal samples from herbivorous species.

*Keywords:* elephant, extraction, faeces, microsatellite DNA, noninvasive