Behavior and Serum Cortisol Concentrations of Three African Elephants

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Captive African elephants (*Loxodonta africana*) engage in a variety of complex behaviors, yet comprehensive research on these behaviors is limited. In addition, measures of cortisol have potential applications to elephant management practices that are currently understudied. The behavior of 0.3 African elephants managed in a free contact system was recorded using focal animal sampling. Proximity to other elephants and location in the exhibit were recorded, and all-occurrence data were collected on social behaviors. Data analyses indicated that the elephants spent much of the observed time feeding, primarily on provisioned hay. While in the outdoor habitat, the elephants were in areas visible to the zoo-visiting public a substantial amount of the observations. The elephants utilized all areas of the outdoor and indoor areas, with the exception of the pool. In addition, the elephants exhibited a variety of social behaviors, namely touching with the trunk the mouth or body of another elephant, and displacing of another elephant. Pushing, driving, and sparring also occurred. Weekly blood samples were collected from each elephant and serum cortisol concentrations were analyzed. The data provide important information about the behavioral repertoire and corresponding cortisol concentrations of captive African elephants. These baseline data will allow for meaningful comparisons when various management changes occur in the future.

Is Musth a Reproductive Event? An Examination of Arguments for and Against this View

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Musth is a complex behavioral and physiological phenomenon occurring in sexually mature bull elephants of both genera. It is known that musth involves a dramatic elevation in androgens. Musth bulls exhibit a number of behavioral and physical changes. While some of these changes may serve as signals for conspecifics, or increase the bull's likelihood of finding estrous females, they occur at considerable cost to the bull.

There are a number of advantages which bulls in musth enjoy. Musth bulls automatically attain a rank higher than any non-musth bull. Furthermore, there is evidence that musth bulls have more access to estrous females, and are in fact preferred by them as potential mates.

However, it is not clear that musth is purely a reproductive phenomenon. The evidence is unclear on whether or not the reproductive axis (hypothalamic-pituitary-gonadal) is entirely responsible for the events of musth. Preliminary data from a pilot study will be presented which indicate increased adrenal activity during musth.

Alternative explanations for musth will be explored, and an experimental design detailed to address some of the questions raised.

Oral Session - Rhinos

Long-Term Medical and Surgical Management of Chronic Pododermatitis in a Greater One-Horned Rhinoceros

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This report discusses the ongoing treatment of an advanced case of bilateral, chronic pododermatitis in a 23-year old male *Rhinoceros unicornis*. Chronic pododermatitis is a poorly understood but common medical condition, which affects up to 28% of adult male *R. unicornis* in captivity. It generally affects the hind feet and is characterized by non-healing fissures and ulcers located between the sole of the central toe and the adjacent pad and by pad overgrowth, bruising and chronic infection. Potential contributing factors include massive body size and weight, inappropriate housing conditions and husbandry techniques and possible genetic predisposition. The management plan for this animal includes changes in husbandry techniques and medical and surgical therapy. Medical intervention based on bacterial and fungal culture of lesions has included oral anti-microbial medication and topical application of copper sulfate/tetracycline by means of footbath. Surgical intervention involves regular debridement, aggressive trimming and paring of overgrown hoof tissue and the periodic application of collagen to stimulate granulation. To perform surgery on this animal, 24 chemical immobilizations have been performed during the past 55 months. Safe, repeated chemical restraint was achieved using combinations of etorphine, detomidine and ketamine injected intramuscularly. Intravenous ketamine supplementation following induction was utilized to improve immobilization and muscle relaxation and permit relatively invasive surgical procedures to be performed without significant or premature arousal. Changes in husbandry have included the addition of wood-mulch or cardboard substrate to the concrete flooring during winter holding, providing access to large areas of natural ground with free access to ponds and water and a diet that incorporates grass and natural browse. Regular assessment of hoof conformation and appearance is combined with thorough hoof trimming and nail care performed during anesthetic procedures. These changes in husbandry and the long-term therapeutic regimen have resulted in significant improvements in the appearance of lesions.

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