
APPLICATION OF ELEPHANTTB STAT-PAK[®] ASSAY AND MAPIA[™] (MULTIPLE ANTIGEN PRINT IMMUNOASSAY) FOR TUBERCULOSIS TESTING OF BLACK RHINOCEROS (*Diceros bicornis*) IN MANAGED CARE

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Abstract

Mycobacterium tuberculosis (Mtb) and *Mycobacterium bovis* (Mbtb) have both been documented in rhinoceros species in captivity.^{1,5,7-9} Two culture confirmed cases of Mtb in black rhinoceros at two separate facilities had serum retrospectively analyzed with the ElephantTB STAT-PAK[®] Assay and MAPIA[™] 4 (both from Chembio Diagnostic Systems, Inc., Medford, NY) after death. Both animals were positive on both assays at the time of culture. A third black rhinoceros was housed with one of the above culture positive rhinoceros, and tested positively on two separate occasions with STAT-PAK and MAPIA. In addition, this rhinoceros had positive skin reaction to PPD Bovis and had a high ELISA titer from the National Veterinary Diagnostic Laboratory in Ames, Iowa. This rhinoceros was euthanized for debilitating arthritis. No evidence of mycobacterial disease was seen at the time of the post-mortem examination and no cultures were submitted. Frozen tissue samples are currently being cultured to help determine the status of this rhinoceros. The two culture positive rhinoceros had undergone anti-tuberculosis therapy prior to death.

Tuberculosis testing has proven to be problematic in a variety of species, and an assay to improve diagnostic confidence has been sought.^{2,8} Antemortem diagnosis that relies on culturing the organism is limited due to intermittent shedding of mycobacteria. Ancillary diagnostic tests such as the gamma interferon assay have limitations in application or in sensitivity and specificity for different species.

The use of the ElephantTB STAT-PAK[®] Assay and MAPIA[™] has already proven useful in species other than elephants³ and the initial results in these cases show promise for rhinoceros. The availability of serum samples in these cases may not allow a detailed investigation as to when the infection was contracted but at least in one case the animal was negative 4 yr prior to positive culture results. Response to therapy may also be evaluated but again is limited by available samples. With the re-emergence of tuberculosis in managed wildlife, the need for early detection is crucial. This assay holds great potential for diagnosis of this infection in free-ranging rhinoceros and may facilitate movement from areas where tuberculosis is endemic in other species such as the Kruger National Park.⁶

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