
RETROSPECTIVE USE OF MULTIANTIAGEN PRINT IMMUNOASSAY (MAPIA) TO DOCUMENT SUCCESSFUL TREATMENT OF A BLACK RHINOCEROS (*Diceros bicornis*) FOR MYCOBACTERIOSIS

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Abstract

In late 1992 a 40-yr-old male black rhinoceros (*Diceros bicornis*) was found to be positive on tuberculin skin test using 0.1cc PPD and ELISA positive for mycobacteriosis. An attempt to collect a sample for culture via gastric lavage was not successful. This mycobacterial testing was performed after the rhinoceros's mate was found to be skin test positive, ELISA positive and culture positive for *Mycobacterium tuberculosis* via gastric lavage.

Both rhinoceros were treated for mycobacteriosis. The female was treated for 10 mo before she died suddenly and was found to be culture positive for *M. tuberculosis* on necropsy.² Treatment for the male rhinoceros initially utilized isoniazid (INH) alone at a dose of 8.0 mg/kg s.i.d. Five months later, rifampin was added at a dose of 12.5 mg/kg s.i.d. After serum rifampin levels were determined to be lower than therapeutic levels for the female, the dose of rifampin was increased to 37.6 mg/kg s.i.d.; both drugs were continued for a total treatment period of 41 mo. Drugs were purchased in raw form from CIBA, and were given daily by sprinkling them directly on pelleted diet. There was a 4-mo period (May 1994-September 1994) when treatment with rifampin was interrupted while waiting for drug delivery.

During treatment and for a 5-yr period afterward, a total of ten anesthetic procedures were performed to collect bronchoalveolar and gastric lavage samples for mycobacterial culture, acid-fast staining and PCR. Samples were sent to three different laboratories for culture. No samples were found to be positive for *M. tuberculosis* and the rhinoceros never demonstrated any clinical signs consistent with mycobacteriosis.

In 2001, the male black rhinoceros was euthanatized at the age of 49 due to discomfort caused by chronic arthritis. Necropsy confirmed that there was severe osteoarthritis. There were no gross or microscopic lesions consistent with mycobacteriosis.

In recent years the MAPIA (Multiple Antigen Print Immunoassay) has been developed to assist in the diagnosis of mycobacteriosis in elephants and other wildlife species.^{3,4} The same MAPIA antigen profile used in elephants was used to do a retrospective analysis of samples from both the

female and male rhinoceros. The results show a positive band for the ESAT 6 / CFP 10 antigen in both rhinoceros after diagnosis. In the case of the male this band faded after over a year of therapy. In elephants the ESAT 6 band has been the most useful indicator of both infection and therapeutic success.⁴ Overall, the results suggest that the male rhinoceros was infected with *M. tuberculosis* and was successfully treated and cleared of the infection. It is considered unlikely that the mycobacteriosis responsible for the positive test reactions were MOTT (Mycobacterium other than tuberculosis), as MOTT have been found not to evoke a response using either RT or MAPIA.¹

LITERATURE CITED

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