COMPARISON OF TRUNK WASH RESULTS MATCHED TO MULTIANTIGEN PRINT IMMUNOASSAY (MAPIA) IN A GROUP OF CAPTIVE ASIAN ELEPHANTS (Elephas maximus).

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Introduction

Between 1994 and June 2005, there were 34 confirmed cases of tuberculosis in elephants in the U.S. population. Thirty-one Asian (Elephas maximus) and three African (Loxodonta africana) elephants were affected. Mycobacterium tuberculosis was the etiologic agent in 33 cases and M. bovis in one case. Cases of tuberculosis caused by an unusual nontuberculous mycobacteria, M. szulgai have recently occurred as well.[1] The sensitivity of trunk wash culture, the currently recommended test for diagnosis, is unknown. False negatives have been documented (trunk wash negative elephants that were subsequently found to be culture positive at necropsy). Other non-culture techniques for TB diagnosis include ELISA,[2] and PCR. A novel technology, MultiAntigen Print ImmunoAssay (MAPIA) and lateral-flow technology (Rapid Test)[3] has been evaluated and used to diagnose tuberculosis in captive elephants with encouraging results.[4] One concern with this serological testing is the possibility of Mycobacterium other than tuberculosis (MOTT) cross-reacting with the antigen used in the Rapid Test or the MAPIA and leading to a false positive. With numerous MOTT routinely cultured from trunk washes, this is a valid concern.

Methods and Materials

A retrospective analysis was done at Busch Gardens Tampa Bay and Chembio, Inc. that matched trunk wash results to serum samples. All serum was collected within 7 days of the trunk wash and analyzed with the Rapid Test and MAPIA. Four Asian elephants with a total of 18 samples met this criteria and had serum submitted for testing.

Results and Discussion

Table 1 lists the results and the organisms cultured. While the sampling is limited in this pilot project, it appears that MOTT does not evoke a response when assayed with the Rapid Test or MAPIA. The recent cases of M. szulgai do demonstrate the potential usefulness for this test when a disease develops from MOTT. The usefulness of this new technology, taken in conjunction with other clinical data including trunk washes when indicated, is a valuable tool in the healthcare of captive elephants

Table 1. Trunk wash mycobacterial culture with matched Rapid Test (RT) and Multiantigen print immunoassay (MAPIA) results.

Elephant	Serum Date	Trunk wash date	Mycobacterium cultured	RT	MAPIA
1	15-Jul-2004	15-Jul-2001	M. avium complex	-	-
	21-Jun-2001	22-Jun-2001	M.asiaticum	-	-
2	1-Sep-2001	21-Aug-2001	M fortuitum	-	-
	9-Apr-2001	10-Apr-2001	M terrae	-	-
3	24-Feb-2003	6-Mar-2003	M abscessus	-	-
	20-Oct-2001	23-Oct-2001	M avium complex	-	-
	16-Aug-2001	21-Aug-2001	M flavenscens	-	-
	21-Jun-2001	20-Jun-2001	M mucogenicum	-	-
	9-Apr-2001	9-Apr-2001	M avium complex	-	-
	5-Apr-2001	9-Apr-2001	M nonchromogenicum	-	-
	8-Aug-2000	10-Aug-2000	M gordonae	-	-
4	17-Feb-2003	19-Feb-2003	M fortuitum	-	-
	17-Feb-2003	18-Feb-2003	M intracellulare	-	-
	21-Jan-2002	18-Jan-2002	M avium complex	-	-
	23-Aug-2001	21-Aug-2001	M chelonae	-	-
	27-Jun-2001	20-Jun-2001	M avium complex	-	-
	27-Jun-2001	20-Jun-2001	M gordonae	-	-
	3-Apr-2001	5-Apr-2001	M simiae	-	-

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