

EVALUATION OF LEPTOSPIROSIS IN BLACK RHINOCEROSSES
(DICEROS BICORNIS) BY MICROSCOPIC AGGLUTINATION AND FLUORESCENT
ANTIBODY TESTING

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Infection with the spirochaete bacterium Leptospira interrogans produces well-recognized disease in domestic animals. In several species, clinical signs of infection may include hemolytic anemia with subsequent hemoglobinuria. Due to the high incidence of hemolytic anemia of unknown origin in captive black rhinoceroses (Diceros bicornis) (3,4), leptospirosis has been considered as a possible etiology for this condition (1,3). Possible leptospiral infections have been described in wild (6) and captive black rhinoceroses (1,2,5). However, in the cases reported by Douglass (1980), as in many other black rhinoceroses with hemolytic anemia, paired titers are impossible to collect due to the acute and often fatal nature of the syndrome. Difficulties in culturing leptospiral organisms also compounds the definitive diagnosis of this disease.

This report describes the serological survey by microscopic agglutination testing for antibodies to leptospirosis in 15 black, two white (Ceratotherium simum) and one Indian (Rhinoceros unicornis) rhinoceroses in North America. Responses varied from negative to 1:3200 for L. interrogans serovar pomona. The highest titer was in a vaccinated adult. In all animals with titer responses, exposure to L. interrogans serovar icterohemorrhagica was indicated (1:25 - 1:200). Titers in two black rhinoceroses previously vaccinated with a 5-way leptospiral bacterin (a) indicated an appropriate immunological response. Fluorescent antibody (FA) conjugates were applied to frozen liver and/or renal tissue from five black rhinoceroses which died including four from hemolytic anemia. Of the four animals which died during anemic crises, one was positive for leptospiral infection, two were suspicious and one was negative, as was the fifth nonhemolytic animal. It is of interest to note that in the positive case on FA, the titers had been negative. This may indicate an animal that died of infection before it had time to mount an immunological response. It emphasizes the importance of saving frozen tissue from all black rhinoceros necropsies.

In summary, although leptospirosis does not appear to be the cause of all the cases of hemolytic anemia, this and previous reports (1,2,5) indicate that it is associated with at least nine of the 21 known fatalities. The fluorescent antibody test offers a new and more definitive evaluation for this disease. Extrapolating from domestic animals, vaccination would appear to be a safe and effective method of reducing the incidence of disease by this organism in the captive population. Further

studies are ongoing to determine the most effective vaccination schedule. Studies are also continuing to determine if leptospirosis is the sole cause of hemolysis in these cases, or if it simply serves as a "trigger" that activates a more deep-seated defect in the rhinoceros red blood cell.

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