

RESEARCH COMMUNICATION

Vaccination to control an outbreak of *Mycoplasma crocodyli* infection

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ABSTRACT

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Details of a severe outbreak of *M. crocodyli* infection in farmed crocodiles are reported. The outbreak was suspected to have been precipitated by translocation-related stress on the animals brought from a farm with a known history of *M. crocodyli* infection. Resorting to the use of an autogenous vaccine proved more effective in alleviating the disease manifestations than antibiotic therapy. Prospects of vaccination in the face of an outbreak are discussed.

Keywords: Crocodile, *Crocodylus niloticus*, *Mycoplasma crocodyli*, vaccination

Mycoplasmiasis in farmed crocodiles which manifested as polyarthritis was first reported in Zimbabwe (Mohan, Foggin, Muvavarirwa, Honywill & Pawan-diwa 1995). The strains of the organisms that were isolated were assigned to a new species, *Mycoplasma crocodyli* (Kirchhoff, Mohan, Schmidt, Runge, Brown, Brown, Foggin, Muvavarirwa, Lehmann & Flossdorf 1997). Currently, 35 commercial crocodile farms are operational in Zimbabwe, of which 12 farms, from various regions in the country, have been reporting cases of mycoplasmosis year after year. However, cases were not reported in a proportion to be called a severe outbreak until the current one. Despite the therapeutic use of antibiotics on most of the affected farms in an attempt to control the disease, outbreaks continue to occur. Consequently, an autogenous vaccine was developed which, in an experimental trial, afforded limited protection (Mohan, Foggin, Muvavarirwa & Honywill 1997). In an ongoing study, an identical vaccine was used to control the current severe outbreak of *M. crocodyli* infection.

Over 2500 crocodiles, 2–4 years old (1787 from farm A and 780 from farm B) were translocated to a new farm near Harare. Farm A had a history of *M. crocodyli* infection, but no confirmed case had ever been reported from farm B. The animals from both the farms were translocated in hessian sacs (2–3 crocodiles in each) on trucks with the open ends of the sacs tied with strings. During the journey of around 1 000 km from farm A and 800 km from farm B all the sacs were constantly kept wet by sprinkling water. The ambient day temperatures during those days were reported to be between 28 °C and 32 °C. Several animals from farm A, within a week following translocation, were noticed to be suffering from swollen joints (Fig. 1), respiratory distress and conjunctivitis.

Mycoplasmiasis was suspected. Control measures were mounted soon after, which included administration of injectable tetracyclines and topical treatment of conjunctivitis with chloramphenicol eye ointment together with hygienic measures which comprised segregation and disinfecting the premises. There was, however, no apparent respite. Within the next 4 weeks, 50% of animals from farm A and a few from farm B appeared to be affected, and in the following 8 weeks, 286 animals from farm A and five from farm B died of suspected mycoplasmosis. Six dead and

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eight moribund animals were referred for necropsy and microbial investigations. Joint aspirates, lung and heartblood specimens and conjunctival swabs were cultured for mycoplasmas and other aerobic pathogenic bacteria following standard techniques of isolation and identification (Koneman, Allen, Janda, Schreckenberger & Winn Jr 1997; Mohan, Obwolo & Hill 1992). Smears of conjunctival swabs, liver and intestinal mucosa were examined for chlamydia. The slides were stained modified Ziehl-Neelsen (MZN) and with fluorescein-conjugated monoclonal antibodies (FAT) (DAKO, Denmark). The technique recommended by the manufacturer of the conjugate was followed for FAT. An autogenous vaccine prepared from *M. crocodyli* strain MP 536/99 (exheartblood) was administered 0.5 ml intramuscularly followed by a booster one week apart to all the animals on the farm irrespective of their clinical status. The details of preparation of the vaccine, have been described by Mohan *et al.* (1997). Prior to administration of the vaccine injectable tetracycline was discontinued but the hygienic measures and topical treatment continued to be applied.

Mycoplasma crocodyli was consistently cultured from the joint aspirates and lung specimens of all the crocodiles and from conjunctival swabs of three and heartblood specimen of one. No other known pathogenic bacteria were isolated from the specimens; the swabs and the smears were also negative for chlamydiae. Within 4 weeks from the day of vaccination a further 113 originating from farm A and five from farm B died. In the following 10 weeks, however, no further mortality occurred and the clinical signs also apparently subsided.

Over the past 6 years we have investigated a number of *M. crocodyli*-related outbreaks, but the present one was the most severe of all. Despite the morbidity rate at 50% in some of the previous outbreaks, the mortality rate seldom exceeded 5% (K. Mohan, unpublished 1999). In the current outbreak, morbidity peaked at over 50% in animals from farm A and the mortality rate was more than 20%. The severity in the outbreak under review was unlike past outbreaks, exacerbated by lung infection in all the animals examined. In addition, *M. crocodyli* was, for the first time, cultured from the heartblood of a crocodile, but we were not able to determine whether this indicated the presence of a septicaemia or terminal bacteraemia. We suspect that translocation-related stress played a role in the prevalence and severity of the disease as it was more pronounced in animals from farm A which had a history of infection.

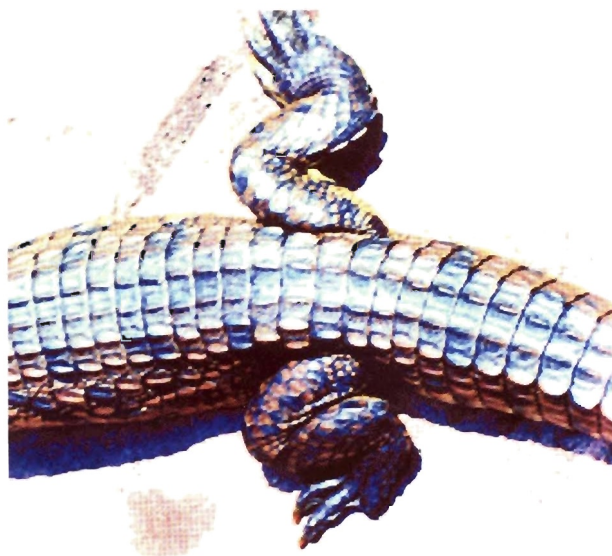


FIG. 1 Close-up view of the affected joints of right hind limb. Clear mucoid exudates could be aspirated from such cases from which *M. crocodyli* was always isolated in pure culture

Post-vaccination data confirmed that vaccination proved more effective in alleviating the problem than the parenteral administration of tetracyclines. More field trials are required, however, before it can conclusively be suggested that the vaccine affords a reasonable protection in the face of an outbreak.

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