Serological survey of sera from lions in Etosha National Park

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Blood samples (n = 66) collected from free-ranging lions *Panthera leo* in Etosha National Park were examined for the presence of Feline Immunodeficiency Virus (FIV). None of the lions tested was positive. Furthermore, these animals were also tested for the presence of antibodies to feline corona, herpes, calici, panleukopenia viruses and toxoplasma. Only 67% were positive for herpes virus antibodies and 98% were positive for the presence of antibodies to toxoplasma.

Bloedmonsters (n = 66) van vrylewende leeus *Panthera leo* in Etosha Nasionale Park is vir die teenwoordigheid van kat immuniteitsgebrek virus (Feline Immunodeficiency Virus) getoets. Al die leeus was negatief vir teenliggaampies teen die virus. Verder is die diere ook vir die teenwoordigheid van teenliggaampies teen kat corona, herpes, calici, panleukopenievirusse en toksoplasma getoets. Net 67% was positief vir herpesvirus teenliggaampies en 98% was positief vir die teenwoordigheid van teenliggaampies teen toksoplasma.

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Feline Immunodeficiency Virus (FIV) was first described by Pedersen, Ho, Brown & Yamamoto (1987). The virus was shown to belong to the Lentivirinae subfamily of the family Retroviridae (Yamamoto, Sparger, Andersen, O'Connor, Mandell, Lowenstine, Munn & Pedersen 1988). The infection is somewhat analogous to the human-acquired immunodeficiency syndrome (AIDS).

FIV has been shown to cause an AIDS in cats after months to years of clinical inapparent infection (Pedersen *et al.* 1987). Several viruses of domestic cats are known to infect non-domestic felids (Spencer 1991) and FIV is one of these (Spencer, Van Dijk, Horzinek, Egberink, Bengis, Keet, Morikawa & Bishop 1992).

This article reports on the incidence of antibodies to feline viruses, including FIV, and toxoplasma in a geographically isolated population of free-ranging lions in Etosha National Park, Namibia.

Free-ranging lions (n = 66) were bled during the period 1989 to 1991. Blood samples were collected into plain glass tubes, allowed to clot, the serum removed, and then stored frozen until used.

Antibodies to FIV were detected by means of either a commercial kit or an in-house Enzyme Linked Immunosorbent Assay (ELISA). The commercial kit used was the CITE Combo FeLV Ag/FIV Ab kit (IDEXX, Maine, U.S.A.). This test is designed for the simultaneous detection of the feline leukaemia virus (FeLV) group specific antigen (p27) and the antibody to whole FIV. All 66 animals were tested using this method. The in-house ELISA test was based on detecting antibodies to the cloned FIV p24 antigen. The p24 was expressed in bacteria, partially purified and fused with GST protein, and served as the antigen source (Spencer *et al.* 1992). Twenty-eight animals were tested using this method.

Antibodies to feline panleukopenia (FPLV), herpes (FHV), calici (FCV) and coronaviruses were measured by using an indirect immunofluorescence assay as described previously (Spencer 1991). Antibodies to toxoplasma were detected by using the above technique, but, the substrate slides were commercially purchased (Bio Mérieux, France).

Of the 66 animals tested, all were negative for antibodies to FIV, FELV, FPLV and FCV. Three per cent were positive for antibodies to feline coronavirus, 67% were positive to feline herpesvirus and 98% were positive for antibodies to toxoplasma. All sera were screened at a 1:10 dilution.

The most important finding is the evidence that a group of free-ranging lions in southern Africa is free of FIV. This contrasts strongly with the situation in the Kruger National Park where 83% of the lion population is positive for FIV (Spencer *et al.* 1992). This has important implications for this species. At this stage it does not appear that FIV induces an AIDS in lions as it does in domestic cats. If, however, in the future, the virus should mutate in some way that enables it to cause disease, uninfected populations could be in danger of decimation. The fact that the Etosha population is negative also has management implications; any new felids being introduced to this area would have to be carefully screened to exclude the possibility of the spread of FIV into Etosha.

Another noticeable difference between the two lion populations (Etosha National Park and Kruger National Park), is the absence of antibodies to FPLV in Etosha. It has been speculated that the source of infection in the Kruger Park was domestic cats introduced some years back (Spencer 1991). The maximum number of domestic cats found in camps in Etosha is ten, significantly fewer than the couple of hundred animals found in the Kruger National Park. This might further support the idea of the domestic cat being the source of infection in the Kruger Park.

Feline herpesvirus has been found in free-ranging felid populations throughout the world (Thompson, Sabine & Hyne 1971). It is therefore not surprising to find evidence of this virus in the Etosha population. However, the original source of the infection is unknown. As it is not a lethal virus, its presence does not pose any threat to this lion population.

Toxoplasmosis has been found to occur wherever felids are found (Povey 1985). Clinical disease from infection is very rare and so the presence of this parasite in the lions does not constitute a health risk to the animals.

In conclusion, it was shown that lions of the Etosha Park are free of feline panleukopenia virus, feline immunodeficiency virus and feline leukaemia virus. The organisms found in these lions, feline herpesvirus and toxoplasma as evidenced by the presence of antibodies, are not a threat to the health of these animals.

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