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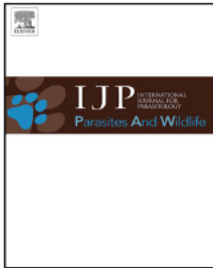
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The non-invasive measurement of faecal immunoglobulin in African equids

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ABSTRACT

Eco-immunological research is encumbered by a lack of basic research in a wild context and by the availability of few non-invasive tools to measure the internal state of wild animals. The recent development of an enzyme-linked immunosorbent assay for measuring immunoglobulins in faecal samples from Soay sheep prompted us to optimize such an assay to measure immunoglobulin A (IgA: an antibody associated with parasitic nematode fecundity) in faecal samples from equids. We measured total IgA in domestic donkeys, wild plains zebras, and wild Grevy's zebras sharing the same landscape in central Kenya over two field seasons. Attempts to measure anti-nematode IgA more specifically, using a homogenized extract from a mixture of excreted nematodes, failed to clear background. However, we found that total IgA positively correlated with strongyle nematode faecal egg counts (FECs) in donkeys sampled during the wetter field season - a time when the donkeys were in good condition. Further, this relationship appeared among donkeys with high body condition but not among those with low body condition. Time lags of 1–4 days introduced between IgA and FEC measurements in repeatedly sampled donkeys did not yield correlations, suggesting that IgA and FEC roughly tracked one another without much delay in the wet field season. Such a direct IgA-FEC relationship did not appear for zebras in either the wet or dry field season, possibly due to higher interindividual variation in body condition among the free-roaming zebras than in the donkeys. However, Grevy's zebras had higher overall levels of IgA than either plains zebras or donkeys, potentially associated with their reportedly lower FECs at the population level. Our results suggest that equids may mount an IgA response to nematode egg production when the host is in good condition and that

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