

IMPLICATIONS OF G-6PD ALLOZYMES FOR CAPTURE AND CARE OF BLACK RHINOCEROS

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The black rhinoceros *Diceros bicornis* has two alleles which code for the synthesis of glucose-6-phosphate dehydrogenase (G-6PD). The specific activity of the enzyme associated with one of these alleles is less than 50% of that of the other allozyme. The prevalence of the less active allele varies among the different populations of black rhino in southern Africa, with the Zimbabwean and Namibian populations having the highest allele frequencies for this allele. Moreover, these allele frequencies correspond to the prevalence of haemolytic shock during the handling of black rhinos from these different geographic areas. These results strongly suggest that a G-6PD deficiency is at least partly responsible for capture-related deaths of black rhinos. We review the different drugs used in the immobilization, tranquillization and management of black rhinos and analyze the effects of these chemicals on animals that are prone to haemolytic shock. We also suggest measures that may be taken to reduce the risk of haemolysis in G-6PD deficient animals.

IMMUNOCYTOCHEMICAL STAINING OF HYPOPHYSEAL HORMONES AS A POSSIBLE INDICATOR OF CHRONIC STRESS

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Stress has been shown to be of paramount importance in the handling of game and responses to stressors have been demonstrated by chemical methods employing fresh blood samples and other techniques such as body condition scoring and kidney fat indices. All the studies have been done on animals in acute stress and limited chronic stress situations.

The South African Defence Force, as the fourth largest land user in the Republic of South Africa, has various large areas where game has been introduced as part of the management of these areas. In the conservation programme of these areas, there remains a cardinal problem as to whether or not the extensive military activities evoke chronic stress in the animals.

In previous studies, hormone levels in blood together with other parameters such as body condition scoring and kidney fat indices, were used to determine indices for stress. As most of these parameters are influenced by the stress created by the capture and handling of the animals, they were unsuitable for studies on the long term effect of stress on animals.

Some prerequisites for a parameter to be used in chronic stress situations are:

- (a) The parameter must be stable and not be influenced or changed in the short term.
- (b) It must be repeatable.
- (c) It must be easy to use.

Immunocytochemistry was chosen due to the fact that this method acts at a cellular level and thus is not influenced by short-term factors. Immunocytochemical staining of ACTH, Somatostatin, Prolactin, Vasopressin, LH and FSH producing cells in the hypophyses were done on groups of impala *Aepyceros melampus* selected for specific hormones. Computer image analysis of:

- (i) the relative numbers of endocrine cells producing these specific hormones in the hypophysis;
- (ii) the relative area active in producing these hypophyseal hormones; and
- (iii) activity of these cells by scoring were done.

Statistical analyses of these parameters were correlated to RIA results of these hormones in the blood.