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CHROMOSOME ANALYSIS IN THE KRUGER NATIONAL PARK: THE MITOTIC AND MEIOTIC CHROMOSOMES OF THE AFRICAN BUFFALO *SYNCERUS CAFFER*

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The African buffalo *Syncerus caffer* is a member of the tribe Bovini, which includes cattle and other large species. The present report presents chromosome results from a male and female African buffalo. Even though the chromosomal preparations obtained were of rather poor technical quality, they are presented here because few studies on mitotic chromosomes have appeared. The meiotic studies here presented are the first in the species.

A male and female African buffalo from the Crocodile Bridge area of the Kruger National Park, Republic of South Africa, were immobilised by the drugged dart technique. Bone marrow was aspirated with great difficulty from the iliac crest of both animals. The bones of both animals (both of which were mature adults) were noted to be extremely hard, leading to difficulty in penetrating the marrow cavity.

Dividing cells in the marrow aspirate were processed according to the technique described by Wallace & Fairall (1965, *Koedoe* 5:97–103).

Testicular material for meiotic studies was obtained from a male which formed part of a culling operation. The material was processed according to the technique described for field work by Wallace & Fairall (1968, *S Afr. J. Med. Sci.* 33:113–118).

Mitotic Studies

The model diploid number in both animals was 52. A study of metaphases from the female buffalo revealed that eight of the 52 chromosomes were metacentric to submetacentric in morphology, and comprised the largest chromosomes of any given metaphase. The remaining chromo-

somes of any metaphase were all acrocentric, varying in size from large to small. A metaphase from the female is shown in Fig. 1.

Fig. 1 An example of a well-spread metaphase from the female African buffalo. The eight large metacentric to submetacentric chromosomes can be clearly seen.

Preparations obtained from the male buffalo also showed the presence of eight large metacentric to submetacentrics, similar in morphology to those seen in the female. All other chromosomes were acrocentric, and varied in size from large to small. On direct and critical visual examination, the largest acrocentric chromosome appeared to have no homologue in certain of the better quality metaphases. This chromosome was identified as the possible X. It was not possible to identify the Y chromosome, even tentatively, but it was apparent that it was one of the acrocentric chromosomes. Both animals had a chromosome arm number (N. F.) of 60.

Meiotic Studies

Many cells in a dividing state were seen. Numerous pachytene figures were present, all of which showed a prominent sex vesicle (Fig. 2). A number of figures in first meiotic metaphase were observed, but these were mostly of poor technical quality. The modal number of bivalents in 11 such figures in which the bivalents could be counted, was 26. In each of these 11 spreads a clear end-to-end X–Y bivalent was seen. the X–Y can normally be identified in mammals at first meiotic metaphase by the apparently end-to-end configuration of the bivalent when compared with the side-by-side configuration of the autosomes (Nadler 1969, *In* Bernischke:

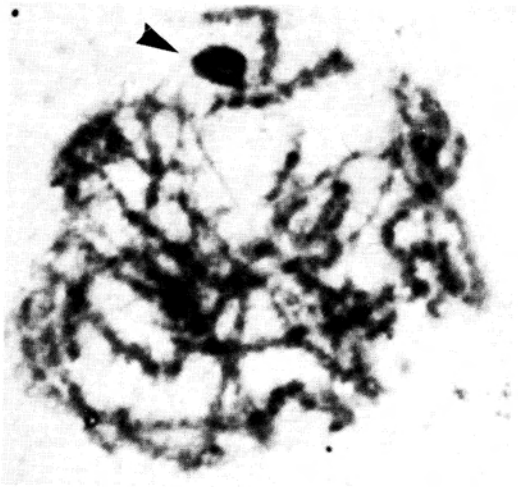

Fig. 2. Pachytene stage of first meiotic prophase of primary spermatocyte. Note the prominent sex vesicle (arrowed) and the poor fixation and staining of autosomal bivalents.

Comparative Mammalian Cytogenetics). The X–Y of the buffalo male consisted of a long component, the X, and a very short one, the Y (Fig. 3). No second meiotic metaphase or mitotic plates were seen.

The results of the study of meiotic preparations from the African buffalo male provide the first glimpse of the meiotic process in this species. The haploid number of 26 confirms the diploid number of 52 found in the present and other studies (Ulbrich & Fisher 1967, *Z. Tiers. Zuchtbiol.* 219–223;

Fig. 3. A portion of first meiotic metaphase plate. Note the end-to-end configuration of the presumed X–Y (arrowed).

Hsu & Benirschke 1969, *An atlas of mammalian chromosomes*). The structure of the X–Y seen at first meiotic metaphase, suggested a large X chromosome and a very small Y. A large X and a small Y were indeed observed (Ulbrich & Fisher (1967); Hsu & Benirschke (1969)), in mitotic figures.

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