

## Somatic Chromosomes of the Bornean Sambar Deer and Rusa Deer Interspecific Hybrids

### ABSTRACT

Problem statement: Hybridization has potential benefits to the Malaysian farmed deer industries in terms of increased growth rate and increased proportion of muscle and an improved alignment of feed supply and annual energy requirement. Species or subspecies of different chromosome constitution could mate to produce healthy hybrid offspring in a normal ratio of males and females. If any of the hybrid offspring were sterile, the sterile offspring would be the heterogametic offspring. The study investigated the use of chromosome banding method to detect chromosomal variation and to define the chromosome homology and the possibility of the Bornean Sambar deer (*Cervus unicolor brookei*) and Rusa deer (*Cervus timorensis*) hybrids to reproduce. Approach: Samples were collected from the Livestock Breeding Station, Sabrang, Keningau, Sabah, East Malaysia. The animals studied consisted of two deer subspecies namely the Bornean Sambar deer, Rusa deer and their hybrids. The karyotypes of the Bornean Sambar deer, Rusa deer and their F1 hybrids have been investigated by solid giemsa staining, G-banding and Ag-NOR banding techniques. Results: Rusa and Bornean Sambar have different chromosome number; 60 and 62 respectively, but share the same fundamental number of chromosome arm, 70. The hybrids have  $2n = 61$ , consisting of 9 metacentric to submetacentric autosomes and 24 pairs of acrocentric autosomes with two acrocentrics and one submetacentric chromosome being unpaired. The morphology of the sex chromosomes in the F1 hybrids was similar to that of the parental species. The Ag-NOR pattern and the conventional Giemsa staining of chromosomes were effective as markers in the characterization of the karyotypes of the parental lines and hybrids because of the presence of active NORs on different chromosomes of different species. G-band, in contrast, showed complete homology in the presence of euchromatic bands and heterochromatin blocks respectively on each chromosome, suggesting that the two species have few genetic differences. Conclusion: In the present study, natural mating between Bornean Sambar deer and Rusa deer were conducted and the number and chromosomal location of the nucleolar organizer regions in their offsprings were analyzed by the silver staining method. Apart from that, the interspecific dissimilarities with regards to chromosome number and morphology are less extensive and the production of chromosomally balanced gametes could be expected.

**Keyword:** Hybridization, chromosomes, karyotype