

Cytoscreening of Indigenous Pigs for Numerical Chromosomal Abnormalities

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Abstract—The present study was designed to investigate the indigenous pigs for the various chromosomal abnormalities. For the present investigation thirty indigenous pigs 15 males and 15 females of same generation and age from the AICRP unit of Pigs, at IVRI Bareilly were selected. Apparently healthy animals and also those with the low litter size (<6) and failure to conceive were used for this study. These animals were screened for numerical chromosomal abnormalities if any, by karyotyping.

Preparations of chromosomes for cytoscreening of animals was done on the basis of short term whole blood lymphocyte culture technique as described by Moorhead *et al.* (1960) and then the karyotypes of animals were prepared using cells arrested at metaphase division. Ten metaphases were used for karyotyping per animal. So, in this study a total of 300 metaphase plates were used for screening 30 animals. As per cytoscreening, all the animals were found to be devoid of any numerical chromosomal abnormality (aneuploidy and euploidy).

Keywords: Chromosomal abnormalities, aneuploidy, blood lymphocyte culture, metaphase plate.

1. INTRODUCTION

The deviations from the standard chromosome number and morphology of a species are referred to as chromosomal abnormalities or chromosomal aberrations. The importance of cytogenetic screening for prevention of infertility caused by chromosomal anomalies in a modern breeding system has been established since 1980s. Modern pork production requires high levels of reproductive efficiency. Several reproductive traits such as ovulation rate, embryo survival, number born, number weaned and age at puberty in the female and testicular size and libido in the male are important for the productivity. For any country with an intensive pork industry, the cytogenetic screening programs to systematically test all breeding boars serve an essential tool for swine improvement as the sires with the chromosomal abnormalities have low or reduced reproductive performance. To minimize the risk of carriers of chromosome aberrations entering artificial insemination centres, systematic cytogenetic screening of potential breeding boars should be done.

2. MATERIAL AND METHODS

Thirty indigenous pigs 15 males and 15 females of same generation and age from the AICRP unit of Pigs, at IVRI Bareilly were selected. Apparently healthy animals and also those with the low litter size (<6) and failure to conceive were used for this study. These animals were screened for numerical chromosomal abnormalities if any, by karyotyping.

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3. RESULTS

In the present study, the standard protocols (Moorehead *et al.*, 1960) followed for short-term lymphocyte culture method with minor modifications gave satisfactory results in terms of the quantity and quality of metaphases obtained. Chromosomes of ten well spread metaphases from each animal with a total of 300 metaphases from 30 indigenous pigs were examined and found that all metaphases contained a diploid chromosome number (2n) of 38 with XY complement in males and XX complement in females, indicating absence of any numerical chromosomal abnormality.

4. CONCLUSIONS

As the various chromosomal aberrations directly affect the reproduction parameters and thereby causing loss to the various animal industries, removing the carriers from reproduction will prevent not only the dissemination of the chromosomal rearrangements in the off-spring but will also save the cost of raising the carrier animals.

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