CHAPTER 16

ENVIRONMENTAL STUDIES

Doctoral Theses

01. SHARMA (Bharat Bhushan)
Genetic Analysis of a Painted Stork (Mycteria Leucocephala) Population from the Delhi Region, Using Molted Feathers as DAN Source.
Supervisors: Dr. A. J. Urfi and Prof. B. D. Banerjee
Th 23134

Abstract
(Not Verified)

The Painted Stork (PS) (Mycteria leucocephala) is listed as near threatened under IUCN criteria and one of its important nesting colonies is located within the premises of National Zoological Park in Delhi. No genetic application based studies have been undertaken on this species of which there is a definite need for conservation work. In my PhD research work, I used the molted feathers as DNA source and cross-amplified Wood Stork (Mycteria amaercana) microsatellites as molecular tool for the population genetic analysis of three temporally distributed PS populations of Delhi zoo. One hundred and forty-five feather samples (142 molted and 2 plucked from dead individuals) were collected over a three year period i.e. 2011-12 (N=47), 2012-13 (N=45) and 2013-14 (N=53). Both the calamus tip and the blood clot, located near the superior umbilicus, were included in DNA extraction by a standard manual isopropanol method. Eleven microsatellites, originally characterised for Wood Stork, were tested for cross-amplification in PS. Because of non-specific amplification with 2 loci, PCR experiments were carried out for 9 microsatellite markers. The DNA yield from large sized and good conditioned feathers was more than the yield from small sized and deteriorated samples. Of the 145 feather samples collected, data could be obtained for 109, with the others loci failed to amplify. For genetic diversity, only 3 loci (WSμ09, WSμ18 and WSμ23) could be used since others were monomorphic, poorly amplified and exhibited linkage disequilibrium. Probability of identity (0.034) was not low enough to develop a confidence that the similar genotypes originate from the same individual. Forty-two unique genotypes were identified. The mean observed and expected heterozygosities are 0.439 (± 0.075) and 0.435 (±0.066), respectively. Non-significant Fst (0.003, p=0.230), G'stH (0.005, P=0.247) and Dest (0.003, P=0.250) values indicate a lack of structuring in temporally distributed populations of Delhi Zoo.

Contents