Interspecies heterologous chicken microsatellite loci with their wide spectrum of applicability in different bird taxon

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Chicken microsatellite markers were tested for developing heterologous microsatellite markers for birds with their wide spectrum of applicability and use in studying genetic variation and relationship. We transferred and studied 15 chicken microsatellites to Himalayan monal (Lophophorus impejanus), 17 to mallard ducks (Anas platyrhynchos) and 18 to domestic pigeon (Columba livia var. domestica) for which previous genetic information was limited. Eight loci were commonly investigated in all the three species. Number of alleles per locus (Na) ranged from 8 (MCW0078) to 14 (MCW0067) in ducks, 3 (ADL0268) to 12 (MCW0078) with exception of one monomorphic marker in pigeon and 2 (MCW0078, MCW0016) to 6 (MCW0295) in monal. Mean observed heterozygosity (± SE) was found 0.6318 (±0.2192), 0.7004 (±0.278) and 0.4997 (±0.1256) in ducks, pigeon and monal, respectively. Expected heterozygosity was higher than the observed heterozygosity in all three species. Using allelic frequencies, polymorphic information content (PIC), a measure of marker's informativeness and predicted null allele frequencies was calculated. PIC values ranged between 0.432 to 0.777, 0.01 to 0.837 and 0.346 to 0.605 in ducks, pigeon and monal, respectively. The mean PIC values was 0.6855 in ducks, 0.6399 in pigeon and 0.5249 in monal which was informative (PIC>0.5). Hardy-Weinberg equilibrium test (P>0.05), describes the expected frequencies of genotypes in a population under random mating was conducted for all 8 loci in these bird species. In conclusion, we have successfully transferred chicken microsatellites in other bird species and also done an exhaustive attempt for assessing the existing genetic variability within and among species. Interspecies heterologous microsatellite primers for birds could play a major role in studies on bird evolution, phylogeny and genetic divergence of birds of different taxa.