

## Genetic Diversity and Relationship of Indonesian Indigenous Chickens Inferred from Microsatellite DNA Markers

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**ABSTRACT:** A total of 1178 individuals of nearly complete sampling of 49 populations belonging to 14 most popular Indonesian indigenous chicken breeds, geographically localized in different major islands, were genotyped using 20 microsatellite DNA markers to investigate their molecular diversity and genetic relationship. In total, 259 alleles were observed among 49 populations of Indonesian indigenous chickens across 20 loci. The mean number of alleles (MNA) per locus ranged from 4.20 to 7.60. The observed ( $H_O$ ) and expected heterozygosity ( $H_E$ ) values averaged over loci varied from 0.50 to 0.67 and from 0.55 to 0.72, respectively, and they displayed a similar distribution pattern to that observed for MNA across these populations. The results indicated that there was rich and unique genetic diversity among most of these populations. The presence of significantly positive  $F_{IS}$  values ( $P < 0.05$  and above), suggested genetic inbreeding within most of these populations, leading to partitioned genetic diversity among the major islands. Some localized chicken populations in particular islands have developed a distinct genetic background due to historical trading and large geographic isolation. On the other hand, a few populations kept in urban areas may have been genetically introgressed by commercial chicken breeds/lines at limited level, leading to different genetic structure. These findings will serve as scientific basis for the development of rational policies to sustainably conserve and utilize these unique Indonesian indigenous chicken genetic resources.

**Keywords:** Genetic diversity, relationship, Indonesian indigenous chicken, microsatellite marker

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