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**Karakterisasi Genetik Ayam Gallus gallus domesticus (Linnaeus, 1758) Golden Kamper Berdasarkan Gen
COI dan ND6**
Avriena Lintang Aulia Riefa'i, Prof. Dr. Budi Setiadi Daryono, M.Agr.Sc.
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KARAKTERISASI GENETIK AYAM *Gallus gallus domesticus* (Linnaeus, 1758) GOLDEN KAMPER BERDASARKAN GEN *COI* DAN *ND6*

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INTISARI

Indonesia memiliki keragaman ayam lokal yang berpotensi sebagai sumber daya genetik, tetapi karakterisasi molekuler ayam Golden Kamper sebagai hasil persilangan ayam Pelung dan Layer masih terbatas. Penelitian ini bertujuan mengkaji karakterisasi genetik dan hubungan kekerabatan filogenetik ayam Golden Kamper berdasarkan gen mitokondria *cytochrome c oxidase subunit I* (*COI*) dan *NADH dehydrogenase subunit 6* (*ND6*). DNA total diisolasi dari sampel darah ayam Golden Kamper F_5 betina, kemudian dilakukan *Whole Genome Sequencing* (WGS) menggunakan platform Pacific Biosciences (PacBio) Revio dengan teknologi sekuensing *Single Molecule Real-Time* (SMRT). Data sekuensing dipetakan terhadap genom referensi ayam untuk memperoleh sekuens gen *COI* dan *ND6* yang selanjutnya dianalisis berdasarkan komposisi nukleotida, jarak genetik, polimorfisme (SNP), perubahan asam amino, dan rekonstruksi pohon filogenetik. Hasil analisis menunjukkan bahwa ayam Golden Kamper memiliki komposisi nukleotida yang identik dengan ayam Manokwari, ayam Maluku, ayam Kedu, dan *Red Jungle Fowl*. Variasi genetik yang ditemukan relatif rendah ditandai oleh sedikitnya situs polimorfik yang didominasi substitusi transisi dan mutasi sinonim. Analisis jarak genetik menunjukkan nilai divergensi yang sangat rendah (*COI*: 0,000–0,005; *ND6*: 0,000–0,010). Selain itu, analisis filogenetik mengelompokkan ayam Golden Kamper dalam satu klad bersama ayam Manokwari, ayam Maluku, ayam Kedu, dan *Red Jungle Fowl*. Dengan demikian, gen *COI* dan *ND6* efektif digunakan sebagai penanda molekuler untuk karakterisasi variasi genetik dan hubungan kekerabatan filogenetik ayam Golden Kamper.

KATA KUNCI: filogenetik, gen *COI*, gen *ND6*, Golden Kamper, karakterisasi genetik.

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GENETIC CHARACTERIZATION OF GOLDEN KAMPER CHICKEN *Gallus gallus domesticus* (Linnaeus, 1758) BASED ON *COI* AND *ND6* GENES

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ABSTRACT

Indonesia possesses a rich diversity of indigenous chicken breeds that represent valuable genetic resources. However, the molecular characterization of Golden Kamper chicken, a crossbreed between Pelung and Layer chickens, remains limited. This study aimed to investigate the genetic characterization and phylogenetic relationships of Golden Kamper chicken based on the mitochondrial cytochrome c oxidase subunit I (*COI*) and NADH dehydrogenase subunit 6 (*ND6*) genes. Total genomic DNA was isolated from the blood of a female F_5 Golden Kamper chicken and subjected to Whole Genome Sequencing (WGS) using the Pacific Biosciences (PacBio) Revio platform with Single Molecule Real-Time (SMRT) sequencing technology. Sequencing reads were mapped to the chicken reference genome to obtain the *COI* and *ND6* gene sequences, which were subsequently analyzed for nucleotide composition, genetic distance, single nucleotide polymorphisms (SNPs), amino acid substitutions, and phylogenetic relationships. The results showed that Golden Kamper chicken shared an identical nucleotide composition with Manokwari, Maluku, and Kedu chickens, as well as the Red Jungle Fowl. Genetic variation was relatively low, as indicated by the limited number of polymorphic sites, which were predominantly transition substitutions and synonymous mutations. Genetic distance analysis revealed very low sequence divergence (*COI*: 0.000–0.005; *ND6*: 0.000–0.010). Furthermore, phylogenetic analysis clustered Golden Kamper chicken within the same clade as Manokwari, Maluku, Kedu chickens, and the Red Jungle Fowl. These findings demonstrate that the *COI* and *ND6* genes are effective molecular markers for characterizing the genetic variation and phylogenetic relationships of Golden Kamper chicken.

KEYWORDS: *COI* gene, genetic characterization, Golden Kamper, *ND6* gene, phylogenetic.