

INTISARI

ANALISIS FILOGENETIK KAMBING PERANAKAN ETAWA (PE) KEPALA HITAM DAN KEPALA COKLAT BERDASARKAN SEKUEN GEN PENYANDI *CYTOCHROME B* (Cyt-b) DNA MITOKONDIA (mtDNA)

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Kambing Peranakan Etawa (PE) merupakan salah satu ternak lokal Indonesia yang berpotensi sebagai penghasil daging dan susu. Penelitian ini bertujuan untuk menganalisis keragaman genetik dan hubungan filogenetik kambing PE kepala hitam dan kepala coklat berdasarkan gen penyandi Cytochrome b DNA mitokondria (mtDNA). Sampel darah kambing PE dianalisis menggunakan metode Polymerase Chain Reaction (PCR) dan sekuensing DNA, kemudian data hasil sekuensing dianalisis menggunakan perangkat lunak MEGA versi 12 melalui alignment Clustal W, analisis jarak genetik Kimura 2-parameter, dan analisis filogenetik metode Maximum Likelihood. Hasil penelitian menunjukkan bahwa panjang sekuens gen Cyt-b sebesar 1140 bp dengan dua situs polimorfik pada posisi 49 dan 495 berupa mutasi substitusi transisi. Persentase komposisi basa nukleotida A-T sebesar 58,66% dan G-C sebesar 41,41%. Analisis asam amino menunjukkan satu situs polimorfik berupa perubahan alanin menjadi treonin pada referensi kambing Etawa. Nilai jarak genetik antar sampel berkisar antara 0,00000–0,00706 yang menunjukkan hubungan kekerabatan genetik yang dekat. Hasil analisis filogenetik menunjukkan seluruh sampel kambing PE berada dalam haplogrup B bersama kambing lokal Indonesia lainnya. Berdasarkan hasil penelitian dapat disimpulkan bahwa kambing PE di Kabupaten Kulon Progo memiliki keragaman genetik yang relatif rendah dan hubungan filogenetik yang dekat dengan kambing lokal lainnya.

Kata kunci: *Cytochrome b*, DNA mitokondria, filogenetik, kambing Peranakan Etawa, keragaman genetik

ABSTRACT

PHYLOGENETIC ANALYSIS OF BLACK-HEADED AND BROWN-HEADED PERANAKAN ETAWA (PE) GOATS BASED ON THE *CYTOCHROME B* (Cyt-b) GENE SEQUENCE OF MITOCHONDRIAL DNA (mtDNA)

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The Peranakan Etawa Goat (PE) goat is one of Indonesia's local livestock breeds with potential as a source of meat and milk production. This study aimed to analyze the genetic diversity and phylogenetic relationships of black-headed and brown-headed PE goats based on the mitochondrial DNA (mtDNA) Cytochrome b gene. Blood samples from PE goats were analyzed using the Polymerase Chain Reaction (PCR) method and DNA sequencing. The sequencing data were subsequently analyzed using MEGA version 12 software through Clustal W alignment, Kimura 2-parameter genetic distance analysis, and phylogenetic analysis using the Maximum Likelihood method. The results showed that the Cyt-b gene sequence length was 1,140 bp with two polymorphic sites at positions 49 and 495, both representing transition substitution mutations. The nucleotide base composition consisted of 58.66% A-T and 41.41% G-C. Amino acid analysis revealed one polymorphic site involving an alanine-to-threonine substitution in the Ettawah goat reference sequence. Genetic distance values among samples ranged from 0.00000 to 0.00706, indicating close genetic relationships. Phylogenetic analysis showed that all PE goat samples belonged to haplogroup B together with other Indonesian local goats. The results indicate that PE goats in Kulon Progo Regency possess relatively low genetic diversity and close phylogenetic relationships with other local goat populations.

Keywords: *Cytochrome b*, genetic diversity, mitochondrial DNA, Peranakan Ettawah Goat, phylogenetics,