

INTISARI

Analisis Genetik Kuda (*Equus Caballus*) Sumba Berdasarkan Sekuen Gen Penyandi *NADH Dehydrogenase Subunit 2 (ND2)*

Fendy Fadillah Akbar
(NIM: 12/329623/KH/7365)

Kuda (*Equus caballus*) Sumba merupakan kuda lokal asli Indonesia yang memiliki nilai penting dalam kehidupan sosial ekonomi masyarakat di Sumba. Keberadaan kuda Sumba kian terancam dengan terdesaknya populasi kuda lokal akibat banyaknya kuda impor dan kuda hasil persilangan. Dalam rangka usaha konservasi terhadap kuda Sumba sebagai plasma nutfah Indonesia, maka diperlukan identifikasi secara molekuler. Tujuan dari penelitian ini adalah untuk mengidentifikasi secara molekuler kekerabatan antar kuda Sumba berdasarkan sekuen gen *NADH Dehydrogenase Subunit 2 (ND2)*.

Amplifikasi gen ND2 dengan metode *Polymerase Chain Reaction (PCR)* menggunakan hasil isolasi DNA sebagai cetakan, primer ND2 *Forward (ECND2F)* dan primer ND2 *Reverse (ECND2R)*. Kondisi PCR yaitu predenaturasi 94°C selama 5 menit, denaturasi 94°C selama 30 detik, *annealing* 52°C selama 45 detik, *elongasi* 72°C selama 1 menit 30 detik dan post-*elongasi* 72°C selama 5 menit sebanyak 35 siklus kemudian dilanjutkan dengan sekuensing. Hasil sekuensing ND2 dari sampel dibandingkan dengan kuda lain yaitu *Equus caballus* (AP013102.1), *Equus przewalskii* (AP0131095.1), *Equus caballus* breed Arab (HQ439488.1) dan *Equus caballus* breed Thoroughbred (HQ439462.1) yang diambil dari *Genbank* dan selanjutnya dianalisis dengan program MEGA versi 6.06.

Hasil analisis urutan nukleotida dan asam amino pada gen ND2, serta hubungan filogenetik menggunakan metode *Neighbor-Joining* dengan nilai *Bootstrap* 1000X antara sampel kuda Sumba dengan pembanding menunjukkan kedekatan yang erat dengan jarak genetik yang hanya berkisar antara 0 – 0,7%. Sekuen gen ND2 tidak dapat digunakan sebagai penanda genetik kuda Sumba.

Kata Kunci: *Equus caballus*, Kuda, Sumba, *NADH Dehydrogenase Subunit 2*, Molekuler

ABSTRACT

Genetic Analysis Of Sumba Horse (*Equus Caballus*) Based On *NADH Dehydrogenase Subunit 2 (ND2)* Gene Sequences

Fendy Fadillah Akbar

(Std. No: 12/329623/KH/7365)

The Sumba horse, *Equus caballus*, is a native Indonesian horse that plays a significant role in the lives of locals in the Sumba district. The Sumba horses are under constant threat of extinction, with a major recession in the local horse population, due to the increase in imported and crossbred horses. In order to conserve the Sumba horse race as an Indonesian germplasm, molecular identification of the horse DNA is required. The purpose of this study is to identify the kinship among Sumba horses at the molecular level based on NADH dehydrogenase subunit 2 (ND2) gene sequences.

Polymerase Chain reaction (PCR) method is used to amplify the ND2 gene using the isolated DNA as template and primers; ND2 Forward (ECND2F) and ND2 Reverse (ECND2R). The PCR program used was 35 cycles of predenaturation 94°C for 5 minutes, denaturation 94°C for 30 seconds, annealing 52°C for 45 seconds, elongation 72°C for 1 minute 30 seconds and post-elongation 72°C for 5 minutes, followed by sequencing. Results from the ND2 sequencing of the samples were compared to that of other horses which include *Equus caballus* (AP013102.1), *Equus przewalskii* (AP0131095.1), *Equus caballus* breed Arab (HQ439488.1) and *Equus caballus* breed Thoroughbred (HQ439462.1) taken from Genbank, and analyzed by MEGA version 6.06 program.

Matrix analysis results of the difference in nucleotides and amino acids sequences of the ND2 gene, as well as the phylogenic relationship results from the Neighbor-Joining method (with bootstrap 1000X values) between Sumba horses and the comparative showed a close relationship in genetic distance which range between 0 - 0.7%. In conclusion, the ND2 gene sequence cannot be used as a genetic marker for the Sumba horse.

Keywords: *Equus caballus*, Horse, Sumba, NADH *Dehydrogenase Subunit 2*, Molecular