

INTISARI

KAJIAN KERAGAMAN GENETIK GEN *Cytochrome Oxidase Subunit 1 (COX1)* IKAN TENGGIRI (*Scomberomorus*) ASAL CILACAP, REMBANG, DAN AMBON

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Ikan tenggiri merupakan salah satu spesies ikan yang termasuk ke dalam golongan ikan pelagis terbesar yang tersebar di berbagai daerah Indonesia. Ikan ini merupakan bagian dari famili Scombridae yang memiliki 15 genus dan 51 spesies. Daerah persebaran ikan tenggiri di Indonesia meliputi seluruh perairan Sumatera, perairan Jawa, Nusa Tenggara, Kalimantan, Sulawesi, Ambon, dan Papua. Keberadaan ikan tenggiri di beberapa perairan Indonesia tersebut tentunya menimbulkan pertanyaan apakah terdapat perbedaan di antara ikan-ikan tersebut. Oleh karena itu, perlu dilakukan kajian genetik menggunakan analisis DNA untuk mengetahui keragaman genetiknya.

Terdapat sembilan sampel ikan tenggiri yang berasal dari Cilacap (C1, C2, dan C3), Rembang (R1, R2, dan R3), Ambon (M1, M2, dan M3). Sampel isolasi yang digunakan sebagai *template* untuk proses amplifikasi gen *Cytochrome Oxidase I* menggunakan primer forward (COISCOMAF) dan primer reverse (COISCOMAR). Hasil produk PCR sebesar 1673 bp selanjutnya dilakukan sekuensing DNA. Hasil sekuensing gen COX1 selanjutnya dianalisis keragaman genetik dan filogenetiknya bersama spesies lain dari *Genbank* menggunakan program MEGA XI.

Hasil analisis menunjukkan bahwa gen COX1 terdiri dari 1252 nukleotida yang menyandi 417 asam amino. Analisis filogram berdasarkan sekuen nukleotida dan sekuen asam amino gen COX1 menunjukkan bahwa sampel ikan tenggiri asal Rembang dan Ambon berkerabat dekat dengan jarak genetik 0% - 0,8%. Ikan tenggiri asal Cilacap dan Rembang berkerabat dekat dengan ikan *Scomberomorus niphonius* didukung dengan jarak genetik 11,1% - 11,9%. Gen COX1 dapat dijadikan penanda genetik pada sampel ikan tenggiri asal Cilacap dengan ikan tenggiri asal Rembang dan Ambon.

ABSTRACT

STUDY OF GENETIC DIVERSITY BASED ON Cytochrome Oxidase Subunit 1 (COX1) OF TENGIRI FISH (Scomberomorus) FROM CILACAP, REMBANG, AND AMBON

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Mackerel fish is one of the fish species that belongs to the largest pelagic fish group which is spread in various regions of Indonesia. This fish is part of the Scombridae family which has 15 genera and 51 species. The distribution area of mackerel in Indonesia covers the waters region of Sumatra, Java, Nusa Tenggara, Kalimantan, Sulawesi, Ambon and Papua. The existence of mackerel in several Indonesian waters certainly raises the question, whether there any differences between these fish. Therefore, it is necessary to carry out genetic studies using DNA analysis to determine genetic diversity.

There were nine samples of mackerel from Cilacap (C1, C2, and C3), Rembang (R1, R2, and R3), Ambon (M1, M2, and M3). The isolation sample obtained was then used as a template for the amplification process using the PCR method. The isolation results will be amplified for Cytochrome Oxidase I gene using a forward and a reverse primer. The results of the PCR product were 1673 bp, then DNA sequencing was carried out. The results of the COX1 gene sequencing were then analyzed for the genetic and phylogenetic diversity together with eight (8) species from Genbank using the MEGA XI program.

The results of data analysis showed that the COX1 gene consists of 1252 nucleotides which encode 417 amino acids. Phylogram analysis based on nucleotide sequences and amino acid sequences of the COX1 gene described that mackerel samples from Rembang and Ambon were closely related with a genetic distance of 0% - 0.8%. Mackerel fish from Cilacap, Rembang and Ambon closely related to *Scomberomorus niphonius* supported by a genetic distance of 11.1% - 11.9%. The COX1 gene can be used as a genetic marker in samples of mackerel from Cilacap and mackerel from Rembang and Ambon with a total difference of nine amino acids.