

ABSTRACT

Zubair Ahdan Natadireja, 24020120140054. **DNA Barcoding and Phylogenetic Analysis of Sponges from Tulamben Village, Karangasem, Bali by Targeting COI and 28S Loci.** Under the guidance of Lilih Khotimperwati dan Ni Kadek Dita Cahyani.

Sponges are primitive invertebrate animals with porous bodies, whose morphology is difficult to identify due to their adaptation to the environment so molecular identification is necessary. This research aims to identify molecular, analyze phylogenetic trees and kinship relationships of sponges collected from marine waters of Tulamben village, Karangasem, Bali with COI markers and 28S C region. Research methods include sampling, morphological and molecular identification, phylogenetic analysis with maximum likelihood and bayesian inference approaches and genetic distance analysis. The results showed that molecular identification using DNA barcoding with both markers is effective to identify sponge species in the waters of Tulamben village, Karangasem, Bali. Five sponge samples can be identified using both markers COI and 28S C region, namely DBP012406, DBP012408, DBP012419 and DBP012421 as *Aaptos* sp. and DBP012410 as Haplosclerida sp. Two other samples can only be identified using COI markers, namely sample DBP012409 as *Ptilocaulis* sp. and DBP01214 as *Ptilocaulis* sp. and DBP012414 as *Clathria* sp. Phylogenetic trees formed from COI, 28S and concatenated markers produce the same tree topology, namely the formation of four clades, which represent the order Suberitida, Axinellida, Poecilosclerida and Haplosclerida as outgroups. The closest kinship between the seven sponge samples with COI markers is between samples identified as the genus *Aaptos*, namely DBP012406, DBP012408, DBP012419 and DBP012421 with a genetic distance of 0.000, while the farthest is between DBP012409 which is identified as the genus *Ptilocaulis* and DBP012410 which is identified at the level of the order Haplosclerida, with a genetic distance of 0.612. The closest kinship in the five sponge samples with 28S C region markers is between samples identified as the genus *Aaptos*, namely DBP012406, DBP012408, DBP012419 and DBP012421 which have a genetic distance of 0.000, while the farthest is between DBP012406 as the genus *Aaptos* and DBP012410 which is identified at the level of the order Haplosclerida, with a genetic distance of around 2.312.

Keywords: DNA barcoding, Sponge, COI marker, 28S C region marker, Phylogenetic tree, Genetic distance, Tulamben village, Bali