



EFFECTS OF CHROMIUM ON CHLOROPHYLL-a, CARBOHYDRATE AND PROTEIN CONTENTS IN *Tetraselmis* sp. (Butcher 1959)

Ernisa Maranatha Nainggolan, Rindra Aryandari, Haikal Prima Fadholi,
Andhika Puspito Nugroho, and Eko Agus Suyono

Faculty of Biology UniversitasGadjahMada Yogyakarta Indonesia
e-mail: aryandariirindra@gmail.com

ABSTRACT

Electroplating and paper industry activities contribute to pollution of chromium (Cr) in aquatic ecosystems. The presence of Cr can affect the activity of microalgae which play an important role as primary producers in the food chain of ocean ecosystem. Cr was tested on a species of green microalgae, *Tetraselmis* sp. This microalgae are very abundant in the sea and can accumulate heavy metals, including Cr. Changes in nutrient content in cells of *Tetraselmis* sp. can affect the productivity of the next trophic level organisms. This research aims to determine effect of Cr to Chlorophyll-a, carbohydrate and protein content in *Tetraselmis* sp. The methods of this study include several steps, cultivation with initial density of 40×10^4 cells ml^{-1} to log phase, then exposed by $\text{K}_2\text{Cr}_2\text{O}_7$ during 96 hours with concentrations 0; 3.2; 5.6, and 10 ppm. Cell density was calculated everyday using haemocytometer, observed with microscope and optilab. Chlorophyll-a, carbohydrate and protein were measured by a spectrophotometer on days 0, 4, 6 and 8. Data analysis with ANOVA, the real difference is determined by Dunnet and Duncan Test. The results showed that increasing Cr concentration causes higher growth inhibition rate of *Tetraselmis* sp. IC_{50} -96 hours was 2.63 ppm and NOEC value was <3.2 ppm. The content of Chlorophyll-a, showed decrease after Cr exposure for 96 hours. Carbohydrate content was increased after 72 hours, and then decreased after 96 hours exposure. Protein content increased significantly up to 96 hours.

Key words: *Tetraselmis* sp., Chromium, Toxicity test, Chlorophyll-a.