Production, isolation, and purification of bioactive protein from red algae *Eucheuma spinosum* symbiont bacteria and anticancer activity test with BSLT method

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Abstract. *Eucheuma spinosum* is seaweed from the class Rhodophyceae (red algae) which contains bioactive protein. The purpose of this study is to determine the concentration of bioactive protein produced by red algae *Eucheuma spinosum* which can be potential as an anticancer. Red algae symbiotic bacterial cells are lysed to obtain protein isolates using certain buffers with a pH of 8.3. Protein isolates were carried out for initial purification using ammonium sulphate salts with saturation levels of 0-20%, 20-40%, 40-60%, and 60-80%. The results obtained were further purified using a cellophane bags soaked in buffer C. The results obtained were determined by the protein concentration using the Lowry method with Bovine Serum Albumin (BSA) as standard. Pre-testing of anticancer activity is carried out by examination at the level of toxicity against *Artemia salina* Leach. The results obtained showed that the symbionts bacteria of red algae *Eucheuma spinosum* had the highest protein concentration in the fraction of 40-60% with value of 20.67%, and the fraction that had the potential as an anticancer agent was in the 20-40% fraction which had an LC₅₀ with value <1000 μg/mL. Symbionts bacteria of red algae protein fraction has the potential to be developed as an anticancer agent in the future.

**Keywords:** *Eucheuma spinosum*, bioactive protein, anticancer, symbionts bacteria.