

ABSTRAK

Juandi Ikhwan, NIM. 8236148002 (2025). Antikolesterol Alami Berbahan Kitosan Dari Cangkang Kepiting Rajungan (*Portunus pelagicus*)

Kolesterol merupakan zat lemak penting bagi tubuh yang terdapat dalam aliran darah. Namun, jumlah yang berlebihan dapat menyebabkan masalah kesehatan yang serius seperti penyakit jantung koroner dan stroke. Penelitian ini bertujuan untuk mengukur karakteristik kitin, kitosan dan aktivitas kitosan kepiting rajungan dan sinerginya dengan kitin udang windu terhadap kadar kolesterol secara *in vitro*. Penelitian diawali dari proses isolasi kitin dari cangkang kepiting rajungan (*P. pelagicus*) meliputi tahap demineralisasi dan deproteinasi, proses sintesis kitosan dari kitin melalui tahapan deasetilasi. Dilakukan pengukuran kadar abu, kadar air dan persen derajat deasetilasi. Tahap selanjutnya dilakukan uji aktivitas kitosan dan sinerginya dengan kitin udang windu (*P. monodon*) terhadap kadar kolesterol. Kadar kolesterol yang diukur meliputi kolesterol, trigliserida, HDL dan LDL. Hasil isolasi kitin menunjukkan bahwa serbuk kitin berwarna putih kekuningan dengan rendemen sebesar 53,49% yang mengandung gugus fungsi pada spektrum FTIR diantaranya N-H ulur (3255 cm^{-1}), C=O ulur (1621 cm^{-1}), dan N-H tekuk (1552 cm^{-1}). Sintesis kitosan menunjukkan serbuk kitosan berwarna putih keruh dengan rendemen sebesar 71,05%, kadar abu kitosan diperoleh nilai sebesar 1,68%, kadar air sebesar 6,78% dan derajat deasetilasi sebesar 84,96%. Spektrum FTIR yang diperoleh menunjukkan hasil yang sama dengan kitin namun gugus asetil pada kitin tergantikan dengan gugus fungsi -NH_2 tekuk dengan bilangan gelombang 1653 cm^{-1} . Hasil uji aktivitas kitosan sebagai antikolesterol menunjukkan bahwa kitosan berpengaruh terhadap kadar kolesterol, trigliserida, HDL dan LDL dengan taraf signifikansi $P < 0,05$. Kitosan kepiting yang disinergikan dengan kitin udang memiliki pengaruh yang lebih kuat terhadap kadar kolesterol, trigliserida, HDL dan LDL. Dengan demikian kitosan kepiting yang disinergikan dengan kitin udang memiliki potensi sebagai antikolesterol alami.

Kata kunci: kitin, kitosan, kolesterol, *P. monodon*, *P. pelagicus*.

ABSTRACT

Juandi Ikhwan, NIM. 8236148002 (2025). Natural Cholesterol Lowering Based on Chitosan from Crab Shells (*Portunus pelagicus*)

Cholesterol is an important fat substance for the body found in the bloodstream. However, excessive amounts can cause serious health problems such as coronary heart disease and stroke. This study aims to measure the characteristics of chitin, chitosan and the activity of crab chitosan and its synergy with tiger shrimp chitin on cholesterol levels in vitro. The study began with the process of isolating chitin from crab shells (*P. pelagicus*) including the demineralization and deproteinization stages, the process of synthesizing chitosan from chitin through the deacetylation stage. Measurements of ash content, water content and the percentage degree of deacetylation were carried out. The next stage was testing the activity of chitosan and its synergy with tiger shrimp chitin (*P. monodon*) on cholesterol levels. The cholesterol levels measured included cholesterol, triglycerides, HDL and LDL. The results of chitin isolation showed that the chitin powder was yellowish white with a yield of 53.49% containing functional groups in the FTIR spectrum including N–H stretching (3255 cm^{-1}), C=O stretching (1621 cm^{-1}), and N–H bending (1552 cm^{-1}). Chitosan synthesis showed that the chitosan powder was cloudy white with a yield of 71.05%, the ash content of chitosan was 1.68%, the water content was 6.78% and the degree of deacetylation was 84.96%. The FTIR spectrum obtained showed similar results to chitin, but the acetyl group in chitin was replaced by a bent –NH₂ functional group with a wavenumber of 1653 cm^{-1} . The results of the chitosan anticholesterol activity test showed that chitosan affected cholesterol, triglycerides, HDL, and LDL levels with a significance level of $P < 0.05$. Crab chitosan synergized with shrimp chitin had a stronger effect on cholesterol, triglycerides, HDL, and LDL levels. Thus, crab chitosan synergized with shrimp chitin has potential as a natural anticholesterol.

Keywords: chitin, chitosan, cholesterol, *P. monodon*, *P. pelagicus*.