

INTISARI

Karbohidrat kompleks koro pedang putih (*Canavalia ensiformis* L. DC) merupakan bahan yang dapat diperoleh dari sisa pembuatan isolat protein yang belum banyak dimanfaatkan. Karbohidrat kompleks merupakan campuran dari serat pangan yang terdiri dari serat larut dan serat tidak larut serta pati yang terdiri dari pati tercerna dan pati resisten. Perlakuan siklus *autoclaving-cooling* dapat meningkatkan total kandungan serat larut dan pati resisten pada tepung karbohidrat kompleks koro pedang putih (Tepung KKP). Peningkatan total kadar serat larut dan pati resisten diharapkan dapat memberikan potensi hipokolesterolemik bagi tepung karbohidrat kompleks koro pedang putih hasil perlakuan siklus *autoclaving-cooling* (Tepung KKPA).

Penelitian ini bertujuan untuk pertama, menentukan kondisi proses deproteinasi berulang dan pH yang dapat meningkatkan karbohidrat kompleks paling tinggi pada pembuatan tepung KKP dan karakteristiknya. Kedua, menentukan frekuensi siklus *autoclaving-cooling* berulang pada tepung KKP agar dapat dihasilkan tepung KKPA dengan kandungan total serat larut dan pati resisten tertinggi dan karakteristiknya. Ketiga, menentukan kemampuan tepung KKPA dalam menurunkan kadar kolesterol pada tikus hiperkolesterolemia. Penelitian ini dilakukan dalam 3 tahap. Pada tahap I dilakukan produksi tepung KKP dengan cara deproteinasi berulang sebanyak 4 kali pada variasi pH 9, 10, 11, dan 12 dan ditentukan karakterisasinya. Pada tahap II dilakukan penerapan siklus *autoclaving - cooling* sebanyak 5 siklus untuk memperoleh total kadar serat larut dan pati resisten tertinggi dan ditentukan karakteristiknya. Tahap III merupakan *bioassay* potensi tepung KKPA untuk menurunkan kadar kolesterol pada tikus hiperkolesterolemia.

Hasil penelitian tahap I menunjukkan bahwa perlakuan deproteinasi pada pH 12 sebanyak 2 kali paling efisien menurunkan kadar protein koro pedang putih. Selanjutnya tepung KKP hasil deproteinasi pada pH 12 sebanyak 2 kali memiliki nilai rendemen 46,17%, kadar protein 1,16%, kadar lemak 0,12%, kadar abu 1,42%, kadar air 6,72%, dan kadar karbohidrat *by difference* 90,58%. Sifat fungsionalnya adalah WHC 229 %, OHC 116 %, SC 344 %, dan CEC 30,79 meq/kg.

Hasil penelitian tahap II menunjukkan bahwa perlakuan 3 kali siklus *autoclaving - cooling* menghasilkan total kadar serat larut dan pati resisten tertinggi. Tepung KKPA memiliki karakteristik kimia: kadar serat larut 14,37%, kadar serat tidak larut 14,41%, kadar pati resisten 18,34%, kadar fenol 9,82%, kadar air 10,68%, kadar abu 0,92%, kadar lemak 0,02%, kadar protein 1,85%, kadar karbohidrat (*by difference*) 97,20%, kadar pati 68,42%, kadar HCN 14,90 ppm, serta memiliki sifat fungsional: WHC 351,67%, OHC 115,67%, SC 775,33%, dan CEC 84,63 meq/kg.

Hasil penelitian tahap III menunjukkan bahwa diet tepung karbohidrat kompleks koro pedang putih *autoclaving-cooling* (kadar serat 10%) memberikan hasil terbaik dalam perbaikan profil lipid, setara dengan kontrol positif (*simvastatin*) melalui mekanisme: (1) menghasilkan profil SCFA yang tinggi kandungan propionat, (2)

mampu mengikat asam empedu *cholic acid* dan *deoxycholic acid* dan (3) mampu mengikat kolesterol dan meningkatkan ekskresinya.

Kata kunci : karbohidrat kompleks, koro pedang putih, *autoclaving-cooling*, serat pangan, hipokolesterolemik

ABSTRACT

Complex carbohydrates of white jack bean (*Canavalia ensiformis* L. DC) are the remaining ingredients of the production of isolated proteins that have not been widely utilized. Complex carbohydrates are mixture of dietary fiber consisting of soluble fiber and insoluble fiber and starch consisting of undigested starch and resistant starch. The autoclaving-cooling cycle treatment can increase the total content of soluble fiber and resistant starch in the white jack bean complex carbohydrate flour (KKP flour). Increased total content of soluble fiber and resistant starch is expected to provide hypocholesterolemic potential for the white jack bean complex carbohydrate flour resulted from autoclaving-cooling cycle treatment (KKPA Flour).

This study aims to firstly, determine the condition of repeated deproteinization process and pH that can increase the highest complex carbohydrates in the production of KKP flour and determine its characteristics. Second, determine the frequency of repeated autoclaving-cooling cycle on the KKP flour in order to produce KKPA flour with the highest total soluble fiber and starch content and determine its characteristics. Third, determine the ability of KKPA flour in lowering cholesterol levels in hypercholesterolemic rats. This study was conducted in 3 stages. In the first phase, the production of KKP flour by four times repeated deproteinization on pH variations 9, 10, 11, and 12 and determined its characterization. In the second phase, the implementation of 5 cycles of autoclaving - cooling to obtain the highest total content of soluble fiber and resistant starch and determined its characteristics. The third phase is a bioassay of KKPA flour potential to reduce cholesterol levels in hypercholesterolemic rats.

The results of the first phase showed that the deproteinization treatment at pH 12 as much as 2 times most efficiently decreased protein levels of white jack bean. Furthermore, KKP flour resulted from 2 times deproteinization at pH 12 has a 46.17% yield, 1.16% protein content, 0.12% fat content, 1.42% ash content, 6.72% moisture content, and 90.58% carbohydrate content by difference. Its functional properties are 229% WHC, 116% OHC, 344% SC, and 30.79 meq / kg CEC.

The results of the second phase of the study showed that the 3-cycles autoclaving-cooling treatment produced the highest total soluble fiber and resistant starch content. KKPA flour has chemical characteristics: 14.37% soluble fiber content, 14.41% insoluble fiber content, 18.34% resistant starch content, 9.82% phenol content, 10.68% water content, 0.92% ash content, 0.02% fat content, 1.85% protein content, 97.20% carbohydrate content (by difference), 68.42% starch content, 14.90 ppm HCN content, and has functional properties: 351.67% WHC, 115.67% OHC, 775.33% SC and 84.63 meq / kg CEC.

The results of the third phase study showed that the diet contained white jack bean complex carbohydrate resulted from autoclaving - cooling (10% fiber content) produced the best results in the improvement of lipid profile, equivalent to positive control (simvastatin) through mechanisms: (1) generated high SCFA profiles of

propionate content, (2) able to bind bile acids (cholic acid and deoxycholic acid) and (3) able to bind cholesterol and increase its excretion.

Keywords: complex carbohydrates, white jack bean, autoclaving-cooling, dietary fiber, hypocholesterolemic