ABSTRAK

Umbi taka tergolong spesies tanaman terabaikan dan kurang dimanfaatkan. Saat ini, beberapa daerah telah membudidayakan taka secara ekstensif. Masyarakat setempat mengolahnya menjadi pati untuk menghilangkan senyawa anti gizi pada umbi. Rendemen pati dari umbi taka tergolong tinggi, dan potensinya belum banyak dimanfaatkan. Pati umbi taka (PUT) tergolong pati tinggi amilosa, sehingga potensial dikembangkan menjadi pati taka retrogradasi (PTR) yang tinggi pati resisten (RS). Proses *autoclaving-cooling* (AC) dapat digunakan dalam menyiapkan PTR. Peningkatan kadar RS pada PTR dapat dicapai melalui proses *acid hydrolysis* (AH) menggunakan asam sitrat, selanjutnya disingkat ACAH. RS pada PTR diduga kuat memiliki potensi antiobesitas, sehingga efeknya harus dievaluasi secara *in vivo* pada tikus sehat yang diberi diet *fructose-medium fat* (FMF). Tujuan penelitian yaitu 1) mengkarakterisasi sifat fisik dan kimia PUT dari berbagai lokasi tumbuh, untuk menentukan lokasi tumbuh yang menghasilkan PUT dengan rendemen dan kadar amilosa paling tinggi; 2) mempelajari karakteristik fisik dan kimia PTR yang disiapkan dengan proses ACAH, serta menentukan konsentrasi dan waktu AH optimal yang menghasilkan PTR tinggi RS; 3) mengevaluasi potensi antiobesitas PTR pada tikus sehat diet FMF. Hasil penelitian menunjukkan bahwa setiap lokasi tumbuh menghasilkan rendemen (21,16-26,42%), komposisi proksimat (air, abu, lemak, protein dan karbohidrat), kadar amilosa (32,81-35,26%), kadar pati (97,35-98,36%), profil warna, daya pengembangan (15,66-16,58 g/g), kelarutan (13,96-15,33%), kapasitas pengikatan air (0,77-0,90 g/g) dan minyak (0,65-0,71 g/g), struktur morfologi, ukuran partikel (20,21-40,43 μm), kristalinitas, profil termal dan profil viskositas PUT yang berbeda antara satu sama lain. Umbi taka asal Garut menghasilkan PUT dengan rendemen dan kadar amilosa paling tinggi. Proses ACAH secara umum mempengaruhi sifat fisik dan kimia PTR. Peningkatan konsentrasi dan waktu AH tidak mempengaruhi komposisi proksimat. Namun, terjadi peningkatan kadar amilosa (37,96-51,36%), RS (18,02-32,40%), kelarutan (5,69-17,88 g/g), kapasitas pengikatan minyak (0,53-0,61 g/g), kristalinitas relatif (35,54-45,94%), profil termal, dan suhu awal pemastaan (56,53-60,08 °C). Peningkatan tersebut disertai dengan perubahan struktur kristal, profil warna, dan morfologi, serta penurunan daya pengembangan (9,65-4,70%), kapasitas pengikatan air (3,12-2,80 g/g) dan profil viskositas PTR. Proses ACAH dengan asam sitrat 0,3 M selama 4 jam menghasilkan PTR dengan kadar RS tertinggi. RS dari PTR memiliki efek antiobesitas pada tikus sehat yang diberi diet FMF. Pemberian PTR dengan dosis minimal 2,5% RS (menggantikan serat 50%) mampu mengendalikan konsumsi pakan dan asupan kalori tikus, mengendalikan peningkatan berat dan panjang badan, mencegah terjadinya penumpukan lemak di jaringan adiposa, menjaga kadar glukosa darah puasa dan insulin darah agar tetap normal, mencegah terjadinya resistensi insulin (HOMA-IR) dan kerusakan sel β-pankreas (HOMA-β).

Kata kunci: pati umbi taka, *autoclaving-cooling*, hidrolisis asam, pati taka retrogradasi, antiobesitas.

ABSTRACT

Tacca tubers are classified as neglected and underutilized plant species. Currently, several regions have extensively cultivated tacca. Local communities process it into starch to eliminate anti-nutritional compounds in the tubers. The starch yield of tacca tubers is relatively high, and its potential has not been widely utilized. Tacca tuber starch (PUT) is classified as high amylose starch, so it has the potential to be developed into retrograded tacca starch (PTR) which is high in resistant starch (RS). The autoclaving-cooling (AC) process can be used to prepare PTR. Increasing the RS content in PTR can be achieved through the acid hydrolysis (AH) process using citric acid, then shortened to ACAH. RS in PTR is strongly suspected of having antiobesity potential, so its effects must be evaluated in vivo in healthy rats fed a fructose-medium fat (FMF) diet. The objectives of the study were 1) to characterize the physical and chemical properties of PUT from various growing locations, to determine the growing location that produces PUT with the highest amylose yield and content; 2) to study the physical and chemical characteristics of PTR prepared by ACAH process, and determining the optimal AH concentration and time that produce high RS PTR; 3) evaluating the antiobesity potential of PTR in healthy rats on FMF diet. The results showed that each growing location produced starch yield (21.16-26.42%), proximate composition (moisture, ash, lipid, protein and carbohydrate), amylose content (32.81-35.26%), starch content (97.35-98.36), color profile, swelling power (15.66-16.58 g/g), solubility (13.96-15.33%), water binding capacity (0.77-0.90 g/g), oil binding capacity (0.65-0.71 g/g), morphological structure, particle size (20.21-40.43 μm), crystallinity, thermal properties, and viscosity profiles of PUT that were different from each other. Tacca tubers from Garut produced PUT with the highest yield and amylose content. The ACAH process generally affected the physical and chemical properties of PTR. Increasing the concentration and time of AH did not affect the proximate composition. However, there was an increase in amylose content (37.96-51.36%), RS (18.02-32.40%), solubility (5.69-17.88 g/g), oil binding capacity (0.53-0.61 g/g), crystallinity (35.54-45.94%), thermal properties, and pasting temperature (56.53-60.08 °C). This increase was also accompanied by changes in crystal structure, color profile and morphology, as well as a decrease in swelling power (9.65-4.70%), water binding capacity (3.12-2.80 g/g) and viscosity profile of PTR. The ACAH process with 0.3 M citric acid for 4 hours produced PTR with the highest RS content. RS from PTR has an antiobesity effects on healthy rats fed an FMF diet. Use of PTR at a minimum dose of 2.5% RS (replacing 50% dietary fiber) can control feed consumption and calorie intake of rats, prevent weight gain and fat accumulation in adipose tissue, control of fasting blood glucose and insulin levels to remain normal, and prevent insulin resistance (HOMA-IR) and damage to β-pancreatic cells (HOMA-β).

Keywords: tacca tuber starch, autoclaving-cooling, acid hydrolysis, retrograded tacca starch, antiobesity.