

**PATI JAGUNG TERMODIFIKASI ASAM ASETAT SEBAGAI AGEN
PEMBAWA KURKUMINOID DARI EKSTRAK KUNYIT**

SKRIPSI

diajukan untuk memenuhi sebagian syarat untuk memperoleh gelar Sarjana Sains
pada Program Studi Kimia



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**PROGRAM STUDI KIMIA
FAKULTAS PENDIDIKAN MATEMATIKA DAN
ILMU PENGETAHUAN ALAM
UNIVERSITAS PENDIDIKAN INDONESIA
2023**

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Pengetahuan Alam

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LEMBAR PERNYATAAN

Dengan ini saya menyatakan bahwa skripsi dengan judul **“Pati Termodifikasi Asam Asetat sebagai Agen Pembawa Kurkuminoid dari Ekstrak Kunyit”** ini beserta seluruh isinya adalah benar-benar karya saya sendiri. Saya tidak melakukan penjiplakan atau pengutipan dengan cara-cara yang tidak sesuai dengan etika ilmu yang berlaku dalam masyarakat keilmuan. Atas pernyataan ini, saya siap menanggung risiko/sanksi apabila dikemudian hari ditemukan adanya pelanggaran etika keilmuan atau ada klaim dari pihak lain terhadap keaslian karya saya ini.

Bandung, 13 September 2023

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Penulis menyadari bahwa masih banyak kekurangan dan keterbatasan dalam skripsi ini. Oleh karena itu, penulis mengharapkan adanya kritik dan saran yang membangun dari semua pihak. Penulis berharap skripsi ini dapat bermanfaat bagi penulis, pembaca, dan penulis selanjutnya.

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ABSTRAK

Perubahan karakteristik pati akibat reagen pemodifikasi dapat memengaruhi pemuatan bahan bioaktif seperti kurkuminoid pada pati. Asam asetat dilaporkan mampu memengaruhi gugus fungsi, kristalinitas, serta susunan rantai amilopektin dan amilosa pada pati. Meski demikian, penggunaan asam asetat sebagai reagen pemodifikasi pati jagung untuk aplikasi pati sebagai agen pembawa belum diteliti lebih lanjut. Penelitian ini bertujuan untuk mengetahui pengaruh proses modifikasi pati jagung terhadap struktur dan kristalinitas, serta mengetahui pengaruh konsentrasi larutan asam asetat dan waktu pemuatan terhadap pemuatan kurkuminoid dari ekstrak kunyit pada pati termodifikasi. Ekstrak kunyit diperoleh dari pengadukan serbuk rimpang kunyit kering tanpa pemanasan dalam pelarut aseton. Proses modifikasi pati dilakukan pada pH 8 dengan variasi konsentrasi larutan asam asetat 50%, 75%, dan 99% (v/v). Struktur dan kristalinitas pati dianalisis menggunakan SEM dan FTIR. Pemuatan kurkuminoid dilakukan dengan metode absorpsi dan tren pemuatan kurkuminoid pada pati dianalisis dari plot data nilai absorbansi ekstrak kunyit (spektrofotometer UV-VIS; λ maks = 424 nm). Asam asetat menyebabkan retakan dan lekukan pada permukaan partikel pati jagung. Proses modifikasi dengan asam asetat menyebabkan struktur pati jagung menjadi kurang kristalin karena adanya pelemahan ikatan hidrogen intermolekular dan antarmolekular serta pelarutan pada pati. Pemuatan kurkuminoid pada pati termodifikasi semakin besar seiring dengan meningkatnya waktu pemuatan dan konsentrasi larutan asam asetat yang digunakan dalam proses modifikasi pati jagung.

Kata kunci: pati jagung, asam asetat, modifikasi, agen pembawa, kurkuminoid, ekstrak kunyit.

ABSTRACT

Changes in the properties of starch due to modifying reagent can impact how bioactive substances, including curcuminoids from turmeric extract, are loaded onto starch. Further research has not been done on using acetic acid as modifying reagent to alter corn starch for carrier agent application. Acetic acid is reported to be able to affect the functional groups and the arrangement of amylopectin and amylose chains in starch. This study aimed to investigate the effect of the modification process on the surface and crystallinity of corn starch, and to investigate the effect of the concentration of acetic acid solution and loading time on loading of curcuminoids from turmeric extract in modified starch. Turmeric extract was obtained from stirring dry turmeric rhizome powder without heating in acetone solvent. The starch modification process was carried out at pH 8 with varying concentrations of acetic acid solutions of 50%, 75%, and 99% (v/v). The surface and crystallinity of starch were analyzed using SEM and FTIR. Curcuminoid loading was carried out by the absorption method and the loading trend was analyzed from absorbance data plots of turmeric extract (UV-VIS spectrophotometer; λ max = 424 nm). Cracks and indentations were found on the surface of the acetic acid modified corn starch particles. Modification treatment caused a decrease in crystallinity due to disruption of intermolecular and intramolecular hydrogen bonds, leading to dissolution of starch. The loading of curcuminoids on modified starch increases with increasing loading time and concentration of acetic acid solution used in the corn starch modification process.

Keywords: corn starch, acetic acid, modification, carrier agent, curcuminoids, turmeric extract.

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