

***OVERVIEW* PENGGUNAAN ENKAPSULASI PATI NANOPARTIKEL
DALAM NANO HERBAL *MEDICINE***

SKRIPSI

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



Oleh
Putri Kusuma Wardhani
1702842

PROGRAM STUDI KIMIA
DEPARTEMEN PENDIDIKAN KIMIA
FAKULTAS PENDIDIKAN MATEMATIKA DAN ILMU PENGETAHUAN ALAM
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Oleh
Putri Kusuma Wardhani
1702842

Skripsi ini diajukan untuk memenuhi salah satu syarat memperoleh gelar Sarjana
Sains pada Program Studi Kimia Departemen Pendidikan Kimia
Fakultas Pendidikan Matematika dan Ilmu Pengetahuan Alam

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PUTRI KUSUMA WARDHANI

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Disetujui dan disahkan oleh pembimbing:

Pembimbing I



Prof. Dr. Ratnaningsih Eko Sardjono, M.Si.
NIP. 196904191992032002

Pembimbing II



Prof. Dr. H. R. Asep Kadarohman, M.Si
NIP. 196305091987031002

Mengetahui,

Ketua Departemen Pendidikan Kimia



Dr. Hendrawan, M.Si
NIP. 196309111989011001

ABSTRAK

Tumbuhan telah dimanfaatkan dalam pengobatan karena mengandung senyawa obat seperti kurkumin, katekin, epikatekin, epigalokatekin, epigalokatekin-3-galat, proantosianidin, piperin, dan resveratrol yang memberikan manfaat terapeutik untuk mengobati dan mencegah suatu penyakit. Enkapsulasi menggunakan pati nanopartikel dilakukan untuk mengatasi ketidakstabilan senyawa dalam kondisi lingkungan tertentu serta permeabilitas dan bioavailabilitas yang umumnya rendah. Riset ini bertujuan untuk mengetahui kondisi enkapsulasi, karakteristik hasil enkapsulasi, efisiensi enkapsulasi, karakteristik pelepasan senyawa obat yang telah dienkapsulasi, serta mengevaluasi bioaktivitas hasil enkapsulasi berbagai senyawa obat. Riset ini merupakan literatur review dengan model narrative review, yang mengkaji 14 jenis nano herbal *medicine* dari tujuh artikel terindeks scopus Q1 dan Q3. Hasil literatur review menunjukkan bahwa kondisi enkapsulasi umumnya dilakukan pada suhu ruang, serta menggunakan medium etanol. Ukuran partikel hasil enkapsulasi berada pada rentang 50-797 nm dengan morfologi berupa sferis atau granular. Karakteristik hasil nanoenkapsulasi berdasarkan spektra FTIR menunjukkan terjadinya interaksi antara senyawa obat dengan enkapsulan yang ditandai dengan adanya pergeseran bilangan gelombang. Efisiensi enkapsulasi berada pada rentang 13-82%. Profil pelepasan senyawa obat pada kondisi pH fisiologis serta cairan usus dan lambung buatan menunjukkan bahwa terjadi pelepasan senyawa obat secara bertahap dengan waktu pelepasan berkisar 1-240 jam dan persentase pelepasan senyawa obat sebesar 3,9-96%. Senyawa obat yang telah dienkapsulasi sebagian besar dapat meningkatkan dan mempertahankan aktivitas terapeutiknya baik sebagai antioksidan, antimikroba, antiobesitas, maupun antidiabetes.

Kata kunci: enkapsulasi, pati nanopartikel, nano herbal *medicine*

ABSTRACT

Plants have been used in medicine because they contain medicinal compounds such as curcumin, catechin, epicatechin, epigallocatechin, epigallocatechin-3-gallate, proanthocyanidin, piperine, and resveratrol which provide therapeutic benefits to remedy and prevent a disease. Encapsulation using starch nanoparticles is carried out to overcome the instability of the compound under certain environmental conditions and also low permeability as well as bioavailability. This research aims to determine the conditions of encapsulation, characteristics of the encapsulated results, encapsulation efficiency, characteristics of encapsulated drug compounds, and bioactivity of various encapsulated drug compounds. This research is a literature review with a narrative review model, which examines 14 types of nano herbal medicine from seven scopus indexed articles Q1 and Q3. The results show that the encapsulation conditions are generally carried out at room temperature, and use ethanol as a medium. The encapsulated particle size is in the range of 50-797 nm with spherical or granular morphology. The characteristics of the nanoencapsulated results based on the FTIR spectra show the interaction of hydrogen bond between the drug compound and encapsulant which is characterized by a shift in wave number. Encapsulation efficiency is in the range of 13-82%. The profile of drug release under physiological pH conditions as well as artificial intestinal and gastric fluids show that drug compounds released gradually with a release time of 1-240 hours and 3,9-96% of drug compounds were released. Encapsulation process have increased and maintained the therapeutic activity of drug compounds as antioxidants, antimicrobials, antiobesity, and antidiabetic agents.

Keywords: encapsulation, starch nanoparticles, nano herbal medicine

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