Enkapsulasi quercetin dari ekstrak daun keji beling strobilanthes crispus sebagai antioksidan alami dengan metode penguapan pelarut = Encapsulation of quercetin from strobilanthes crispus extract as natural antioxidants with solvent evaporation methods

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Abstrak

[ABSTRAK
Keji Beling (Strobilanthes crispus) merupakan tanaman potensial dengan kandungan antioksidan tinggi yang dapat melindungi sel dari radikal bebas. Paparan radikal bebas secara terus menerus dapat menyebabkan berbagai macam penyakit seperti serangan jantung, kanker, katarak, atau stroke. Keji Beling memiliki banyak zat aktif, namun ekstrak daun Keji Beling mengandung 54,5% quercetin. Quercetin di dalam ekstrak daun akan melalui proses enkapsulasi untuk melindunginya dari faktor eksternal dan memberikan profil pelepasan yang baik. Metode enkapsulasi yang digunakan adalah penguapan pelarut dengan 4 variabel bebas, yaitu variasi jenis enkapsulator (PDLLA atau Kitosan-TPP), jenis emulgator (Tween 80 atau PVA), jumlah penggunaan emulgator dan jumlah enkapsulator yang dilakukan berurutan. Partikel hasil enkapsulasi dengan menggunakan 1% PDLLA sebagai enkapsulator dan 0,1 % PVA sebagai emulgator memberikan persentase loading capacity (49,79%) dan persentase efisiensi enkapsulasi (99,08%) terbaik. Determinasi analitis dengan spektrofotometer FTIR menunjukan bahwa ekstrak telah terenkapsulasi yang dibuktikan dengan adanya gugus O-H, C-H alkana, C=O karbonil, C-C aromatik, dan C-O eter. Untuk analisis morfologi menggunakan FE-SEM diketahui bahwa ukuran
partikel yang didapatkan berada pada rentang 16,24!m sampai 112,7 !m. Penelitian
ini menunjukan untuk mendapatkan aktivitas antioksidan yang sama dengan vitamin
C murni di dalam suplemen vitamin C komersial (Vit C IPI), jumlah partikel ekstrak daun Keji Beling di partikel hasil enkapsulasi yang dibutuhkan lebih banyak 3 kali dari jumlah vitamin C murni.
ABSTRACT
Exposure to free radicals continuously can cause various diseases such as heart attack, cancer, cataracts, or stroke. Antioxidant can protect cells from free radicals. Strobilanthes crispus is a potential plant which contains high antioxidants. Strobilanthes crispus extract containing 54.5% quercetin. Quercetin is the most active antioxidant substance in Strobilanthes crispus. Quercetin will go through encapsulation process to protect it from external factors and provide good release profile. The Encapsulation method used in this experiment is the solvent evaporation with four independent variables. The first variable is the type of encapsulator (PDLLA or chitosan-TPP), second is the type of emulgator (Tween 80 or PVA), third is the concentration of emulgator in continuous phase, and fourth is the concentration of encapsulator. These variations will performed sequentially. This study showed that the particles which made by 1% PDLLA as encapculator and 0,1% PVA as emulgator gave the best percentage of loading capacity (49.79%) and the percentage of encapsulation efficiency (99.08%). FTIR Analysis is used to prove that the quercetin in extract had been encapsulated. It can be proven by the existence of O-H groups, C- H alkane, C = O carbonyl, C-C aromatic, and C-O ether. FE-SEM Analysis is used for morphological analysis. FE-SEM Analysis showed that the size of particle is in the range of 16,24 μm to 112,7 μm, so this encapsulation called

microencapsulation. This study also showed that to get the same antioxidant activities with ascorbic acid in vitamin C supplements, we needs 3 times more Strobilanthes crispus particle extract than the amount of Vitamin C commercial., Exposure to free radicals continuously can cause various diseases such as heart attack, cancer, cataracts, or stroke. Antioxidant can protect cells from free radicals. Strobilanthes crispus is a potential plant which contains high antioxidants. Strobilanthes crispus extract containing 54.5% quercetin. Quercetin is the most active antioxidant substance in Strobilanthes crispus. Quercetin will go through encapsulation process to protect it from external factors and provide good release profile. The Encapsulation method used in this experiment is the solvent evaporation with four independent variables. The first variable is the type of encapsulator (PDLLA or chitosan-TPP), second is the type of emulgator (Tween 80 or PVA), third is the concentration of emulgator in continuous phase, and fourth is the concentration of encapsulator. These variations will performed sequentially. This study showed that the particles which made by 1% PDLLA as encapculator and 0,1% PVA as emulgator gave the best percentage of loading capacity (49.79%) and the percentage of encapsulation efficiency (99.08%). FTIR Analysis is used to prove that the quercetin in extract had been encapsulated. It can be proven by the existence of O-H groups, C- H alkane, C = O carbonyl, C-C aromatic, and C-O ether. FE-SEM Analysis is used for morphological analysis. FE-SEM Analysis showed that the size of particle is in the range of 16,24 μm to 112,7 μm, so this encapsulation called microencapsulation. This study also showed that to get the same antioxidant activities with ascorbic acid in vitamin C supplements, we needs 3 times more Strobilanthes crispus particle extract than the amount of Vitamin C commercial.]