ABSTRACT

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MICROENCAPSULATION OF PHENOLIC COMPOUNDS FROM *Cosmos caudatus* K. LEAVES EXTRACT

Thesis, Faculty of Science and Technology (2018).

(xv + 60 pages, 3 tables, 18 figures, 20 appendices)

Cosmos caudatus K. leaves are high in total phenolic content and have high antioxidant activity. Phenolic compounds are sensitive to light, oxygen, and heat. Encapsulation process can protect the phenolic compounds of extract. This research was aimed to study the effect of core to coating ratio (1:10 and 1:20) and spray drying inlet temperature (125, 150, and 175°C) towards the characteristics of microcapsules. In preliminary stage, *Cosmos caudatus* K. leaves were extracted with ethanol. The extract was analyzed for antioxidant activity and total phenolic content. In the main stage, the extract were encapsulated. The microcapsules were analyzed for powder recovery, total phenolic content, encapsulation efficiency, antioxidant activity, and particle size. Core to coating ratio and inlet temperature affected the powder recovery, total phenolic content, encapsulation efficiency, antioxidant activity, and particle size of microcapsules. Microcapsules with core to coating ratio 1:20 and inlet temperature 125°C gave the best result with powder recovery 59.87%, total phenolic content 24.644 mg GAE/g sample, encapsulation efficiency 98.820%, IC_{50} 1711.804 ppm, and particle size 1.55 µm. LC-MS analysis showed that there were phenolic compounds in the microcapsules, so it can be concluded that microencapsulation does not cause the loss of all phenolic compounds.

Keyword: Antioxidant, *Cosmos caudatus* K., Microencapsulation, Phenolic Compounds, Spray Drying

Reference: 69 (2003-2017)

ABSTRAK

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MIKROENKAPSULASI SENYAWA FENOLIK EKSTRAK DAUN KENIKIR (*Cosmos caudatus* K.)

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(xv + 60 halaman, 3 tabel, 18 gambar, 20 lampiran)

Daun kenikir (*Cosmos caudatus* K.) memiliki kandungan fenolik total dan aktivitas antioksidan yang tinggi. Senyawa fenolik merupakan senyawa yang sensitif terhadap cahaya, oksigen, dan panas sehingga dilakukan enkapsulasi ekstrak daun kenikir untuk melindungi senyawa fenolik ekstrak. Penelitian ini dilakukan dengan tujuan untuk mengetahui pengaruh *core to coating ratio* (1:10 dan 1:20) dan suhu *inlet spray drying* (125, 150, dan 175°C) terhadap *powder recovery*, kandungan fenolik total, efisiensi enkapsulasi, aktivitas antioksidan, dan ukuran partikel mikrokapsul. Penelitian dilakukan dalam dua tahap. Pada penelitian pendahuluan, dilakukan ekstraksi daun kenikir dengan pelarut etanol dan dilakukan analisis aktivitas antioksidan dan kandungan fenolik total ekstrak. Pada penelitian utama, dilakukan mikroenkapsulasi ekstrak daun kenikir dan dilakukan analisis *powder recovery*, kandungan fenolik total, efisiensi enkapsulasi, aktivitas antioksidan, dan ukuran partikel mikrokapsul. *Core to coating ratio* dan suhu *inlet* mempengaruhi *powder recovery*, kandungan fenolik total, efisiensi enkapsulasi, aktivitas antioksidan, dan ukuran partikel mikrokapsul. Mikrokapsul dengan *core to coating ratio* 1:20 dan suhu *inlet* 125°C memberikan hasil terbaik dengan *powder recovery* 59,87%, kandungan fenolik total 24,644 mg GAE/g sampel, efisiensi enkapsulasi 98,820%, IC_{50} 1711,804 ppm, dan ukuran partikel 1,55 μm. Hasil analisis LC-MS menunjukkan adanya senyawa fenolik dalam mikrokapsul sehingga dapat disimpulkan bahwa proses mikroenkapsulasi tidak menyebabkan hilangnya senyawa fenolik.

Kata Kunci: Antioksidan, Daun Kenikir, Mikroenkapsulasi, Senyawa Fenolik, *Spray Drying*

Referensi: 69 (2003-2017)