SKRIPSI SARJANA FARMASI

PENGARUH FORMULA TERHADAP STABILITAS KATEKIN GAMBIR (*Uncaria gambir* (Hunter) Roxb.)

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ABSTRAK

PENGARUH FORMULA TERHADAP STABILITAS KATEKIN GAMBIR (*Uncaria gambir* (Hunter) Roxb.)

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Katekin merupakan senyawa utama dari tanaman gambir (*Uncaria gambir* (Hunter) Roxb.) yang telah banyak digunakan dalam pengobatan tradisional. Berbagai penelitian telah membuktikan aktivitas farmakologis katekin, sehingga senyawa ini berpotensi untuk dikembangkan menjadi sediaan farmasi. Dalam pembuatan sediaan farmasi, stabilitas senyawa menjadi faktor penting yang perlu diperhatikan. Oleh karena itu, penelitian ini dilakukan untuk mengukur stabilitas katekin gambir dalam 3 sediaan, yaitu nanofitosom; effervescent; dan larutan Tween 80. Studi kinetika dilakukan di dalam *climatic chamber* pada suhu 45ºC dan kelembaban relatif (RH) 75% selama 3 bulan. Stabilitas diukur dengan menghitung kadar katekin dan hasil uraian katekin dalam sediaan menggunakan Spektrofotometer UV-Vis pada panjang gelombang serapan maksimum katekin (279 nm) dan panjang gelombang serapan maksimum hasil uraian katekin (408 nm) yang didapatkan dari penguraian katekin menggunakan larutan HCl 1 N, NaOH 1 N, dan paparan sinar matahari. Hasil penelitian menunjukkan katekin lebih stabil pada sediaan nanofitosom dilihat dari nilai t_{90} sediaan nanofitosom lebih lama (7 bulan) daripada sediaan effervescent (3 bulan) dan sediaan dalam larutan Tween 80 (5 bulan). Analisis statistik juga menunjukkan bahwa sediaan nanofitosom dan larutan Tween 80 memberikan pengaruh terhadap stabilitas katekin ($p<0,05$) dibandingkan dengan sediaan effervescent. Analisis LC-MS juga dilakukan untuk mendeteksi praduga senyawa hasil uraian katekin, didapatkan praduga senyawa hasil uraian katekin, yaitu 2-(4-hydroxyphenyl)-3,4-dihydro-2H-1-benzopyran-3,5,7-diol; 4-ethylphenol; 4-ethylbenzene-1,3-diol; 4-methylbenzene-1,3-diol ; 4-propylbenzene-1,3-diol.

Kata Kunci: Katekin; Stabilitas; *Uncaria gambir* (Hunter) Roxb; Spektrofotometer UV-Vis; LC-MS

ABSTRACT

THE EFFECT OF FORMULA ON THE STABILITY OF GAMBIR CATECHINS (*Uncaria gambir* (Hunter) Roxb.)

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Catechins are the main compounds found in gambir (Uncaria gambir (Hunter) Roxb.), which have been widely used in traditional medicine. Various studies have demonstrated the pharmacological activities of catechins, indicating their potential for development into pharmaceutical preparations. Stability of compounds is a crucial factor in the development of pharmaceutical formulations. Therefore, this study aimed to evaluate the stability of gambir catechins in three formulations: nanophytosome, effervescent, and Tween 80 solution. Kinetic studies were conducted in a climatic chamber at 45°C and 75% relative humidity (RH) for 3 months. Stability was measured by quantifying catechin content and catechin degradation products in the formulations using UV-Vis Spectrophotometry at the maximum absorption wavelength of catechins (279 nm) and the maximum absorption wavelength of catechin degradation (408 nm) products obtained from catechin degradation using 1 N HCl, 1 N NaOH, and sunlight exposure. The results showed that catechins were more stable in the nanophytosome formulation, as indicated by a longer t90 value (7 months) compared to the effervescent formulation (3 months) and the Tween 80 solution (5 months). Statistical analysis also revealed that nanophytosome and Tween 80 solution formulations had a significant impact on catechin stability ($p<0.05$) compared to the effervescent formulation. LC-MS analysis was also performed to detect potential degradation products of catechins, revealing possible degradation products including 2-(4-hydroxyphenyl)-3,4-dihydro-2H-1-benzopyran-3,5,7-diol; 4-ethylphenol; 4-ethylbenzene-1,3-diol; 4-methylbenzene-1,3-diol; and 4-propylbenzene-1,3-diol.

Keyword: Catechin; Stability; Uncaria gambier Roxb; Spectrophotometer UV-Vis; LC-MS


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