SINTESIS 2',6'-DIHIDROKSI-3,4-DIMETOKSIKHALKON DAN 5-HIDROKSI-3',4'-DIMETOKSIFLAVON SERTA UJI AKTIVITASNYA SEBAGAI TABIR SURYA

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INTISARI

Telah dilakukan sintesis 2',6'-dihidroksi-3,4-dimetoksikhalkon melalui dua metode, yaitu metode *grinding* menggunakan pelarut dan konvensional tanpa pelarut. Katalis basa NaOH digunakan dalam sintesis 2',6'-dihidroksi-3,4-dimetoksikhalkon melalui reaksi kondensasi Claisen-Schmidt. Selanjutnya hasil sintesis disiklisasi secara oksidatif menggunakan katalis iodin dalam pelarut DMSO, sehingga dihasilkan senyawa 5-hidroksi-3',4'-dimetoksiflavon. Kedua senyawa hasil sintesis dianalisis menggunakan spektrometer FT-IR, GC-MS, ^{1}H-NMR dan spektrofotometer UV-Vis. Senyawa khalkon dan flavon yang dihasilkan diuji aktivitasnya sebagai senyawa tabir surya secara *in vitro* menggunakan spektrofotometer UV-Vis.

Hasil penelitian ini menunjukkan bahwa terdapat perbedaan rendemen antara metode grinding (20%) dan metode konvensional (14%) dalam pembentukan khalkon. Bila ditinjau dari jumlah rendemen, lamanya waktu reaksi dan pemakaian bahan kimia, maka metode grinding merupakan metode yang lebih efektif dan ramah lingkungan. Hasil siklisasi senyawa khalkon menjadi flavon menghasilkan rendemen sebesar 69,75%. Uji aktivitas secara *in vitro* menunjukkan kedua senyawa tersebut memiliki nilai SPF dengan kategori proteksi minimal terhadap sinar UV A. Senyawa 2',6'-dihidroksi-3,4-dimetoksikhalkon pada konsentrasi 30 µg/mL menghasilkan *Sun Protection Factor* (SPF) 2,089 dan senyawa 5-hidroksi-3',4'-dimetoksiflavon pada konsentrasi 45 µg/mL menghasilkan SPF 2,067.

Kata kunci: Khalkon, flavon, tabir surya, *in vitro*.

SYNTHESIS AND ACTIVITY TEST OF 2',6'-DIHYDROXY-3,4-DIMETHOXYCHALCONE AND 5-HYDROXY-3',4'-DIMETHOXYFLAVONE AS SUNSCREEN

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ABSTRACT

The synthesis of 2',6'-dihydroxy-3,4-dimethoxychalcone has been done by using two methods, grinding method with solvent and conventional method without solvent. Claisen-Schmidt condensation reaction in the formation of the compound 2',6'-dihydroxy-3,4-dimethoxychalcone use NaOH as a catalyst. Subsequently 2',6'-dihydroxy-3,4- dimethoxychalcone which has been formed by oxidative cyclization using iodine as a catalyst in DMSO solvent, resulting 5-hydroxy-3',4'-dimethoxyflavone. Products were analyzed by using FT-IR spectrometer, GC-MS, ^{1}H-NMR and UV-Vis spectrophotometer. Both chalcone and flavon activities were *in vitro* tested as sunscreen compounds by using spectrophotometer UV-Vis.

These results indicate that there is a difference between the yield of grinding method (20%) and conventional method (14%) in chalcone synthesized. The synthesis using grinding method requires shorter reaction and higher yield, making it more effective and environmentally friendly. The results of chalcone cyclization to be flavone compound by using oxidative cyclization reactions in generating yield of 69.75%. *In vitro* tested the activity showed both compounds have SPF values with minimal protection category against UV A. At a concentration of 30 µg/mL, 2',6'-dihydroxy-3,4-dimethoxychalcone produce Sun Protection Factor (SPF) 2.089 and 5-hydroxy-3',4'-dimetoksiflavon at a concentration of 45 µg/mL produce SPF 2.067.

Keyword: Chalcone, flavone, sunscreen, in vitro.