

INTISARI

Quinine hidroklorida merupakan garam alkaloid dari tanaman kina yang dipercaya memiliki aktivitas sebagai tabir surya. Aktivitas tabir surya *quinine* hidroklorida perlu dikombinasi bersama agen penyaring UV lain, seperti *avobenzone* dan oktil metoksisinamat untuk mencapai proteksi maksimal. Tabir surya banyak diformulasikan menjadi sediaan *lotion* karena memberikan proteksi tambahan sekaligus melembabkan kulit. Sediaan *lotion* yang stabil perlu mengkombinasikan beberapa agen pengemulsi. Penelitian ini bertujuan untuk memperoleh kombinasi agen pengemulsi pada *lotion* tabir surya yang optimum dan mengetahui aktivitas *Sun Protection Factor* (SPF) dari *quinine* hidroklorida dalam formula sediaan *lotion* tabir surya yang dikombinasi *avobenzone* dan oktil metoksisinamat.

Penentuan konsentrasi *quinine* hidroklorida didasarkan Peraturan BPOM No. 23 tahun 2019 yang selanjutnya diuji SPF menggunakan spektrofotometri UV-Vis. Sediaan *lotion* mengkombinasikan setil alkohol, *emulgate wax*, dan tween 80 sebagai agen pengemulsi yang dioptimasi menggunakan *Design expert* metode *Simplex Lattice Design* untuk memperoleh formula optimum. Formula optimum yang diperoleh kemudian diuji stabilitas dipercepat selama satu bulan dan diuji aktivitas SPFnya. Data hasil pengujian dianalisis statistik menggunakan *software* SPSS.

Hasil pengujian *quinine* hidroklorida 0,2% menunjukkan SPF 31,14 yang termasuk kategori proteksi ultra. *Quinine* hidroklorida diformulasi menjadi sediaan *lotion* dengan *avobenzone* 3% dan oktil metoksinamat 7,5%. Formula optimum yang diperoleh sediaan *lotion* tabir surya kombinasi setil alkohol 4%, *emulgate wax* 4%, dan tween 80 6% sebagai agen pengemulsi menghasilkan respon daya lekat 1,261 detik, daya sebar 4,694 cm, dan viskositas 1038,165 cPoise. Analisis statistik ANOVA hasil uji stabilitas dipercepat menunjukkan penurunan daya sebar yang tidak signifikan serta peningkatan viskositas dan daya lekat yang signifikan selama penyimpanan. Pengujian aktivitas SPF *in vitro quinine* hidroklorida dalam sediaan *lotion* tabir surya yang dikombinasi *avobenzone* dan oktil metoksisinamat memiliki SPF 44,23 yang menunjukkan peningkatan nilai SPF, tetapi tidak signifikan dibanding *lotion* tabir surya kombinasi *avobenzone* dan oktil metoksisinamat dengan SPF 44,18.

Kata kunci: *Quinine* Hidroklorida, Tabir Surya, *Sun Protection Factor*, *Lotion*

ABSTRACT

Quinine hydrochloride is an alkaloid salt from the quinine plant that is believed to have activity as a sunscreen. Sunscreen activity quinine hydrochloride needs to be combined with other UV filtering agents, such as avobenzon and octyl methoxycinnamate to achieve maximum protection. Sunscreen is widely formulated into lotion preparations because it provides additional protection while moisturizing the skin. Stable lotion preparations need to combine several emulsifying agents. This study aims to obtain the optimal combination of emulsifying agents in sunscreen lotions and determine the activity of Sun Protection Factor (SPF) of quinine hydrochloride in sunscreen lotion preparation formulas combined with avobenzon and octyl methoxycinnamate.

The determination of quinine hydrochloride concentration is based on BPOM Regulation No. 23 of 2019 which is then tested by SPF using UV-Vis spectrophotometry. The lotion preparation combines cetyl alcohol, emulgade wax, and tween 80 as an emulsifying agent optimized using the Simplex Lattice Design method to obtain the optimum formula. The optimum formula obtained is then tested for accelerated stability for one month and tested for SPF activity. The test result data was analyzed statistically using SPSS software.

The test result of 0.2% quinine hydrochloride showed SPF 31.14 which is included in the ultra-protection category. Quinine hydrochloride is formulated into lotion preparations with 3% avobenzon and 7.5% octyl methoxycinnamate. The optimum formula obtained by a sunscreen lotion preparation combination of cetyl alcohol 4%, emulgade wax 4%, and tween 80 6% as an emulsifying agent produces an adhesion response of 1.261 seconds, dispersion of 4.694 cm, and viscosity of 1038.165 cPoise. Statistical analysis of ANOVA accelerated stability test results showed an insignificant decrease in dispersion as well as a significant increase in viscosity and adhesion during storage. Testing the activity of SPF in vitro quinine hydrochloride in sunscreen lotion preparations combined with avobenzon and octyl methoxycinnamate has SPF 44.23 which shows an insignificant increase in SPF values compared to sunscreen lotion combination of avobenzon and octyl methoxycinnamate with SPF 44.18.

Keyword: Quinine Hidrochloride, Sunscreen, Sun Protection Factor, Lotion