

ABSTRAK

Jamu asam urat merupakan salah satu obat bahan alam yang banyak digunakan oleh masyarakat untuk membantu mengatasi keluhan akibat peningkatan kadar asam urat. Tingginya penggunaan jamu berpotensi disalahgunakan melalui penambahan bahan kimia obat (BKO), salah satunya asam mefenamat. Penelitian ini bertujuan untuk mengidentifikasi asam mefenamat dalam jamu asam urat menggunakan metode Kromatografi Lapis Tipis (KLT) dan spektrofotometri UV-Vis yang dikombinasikan dengan teknik kemometrika. Penelitian dilakukan terhadap sampel jamu asam urat, asam mefenamat, dan campuran keduanya. Data spektral UV-Vis pada rentang 250–380 nm dianalisis menggunakan metode *Partial Least Squares* (PLS) untuk prediksi kadar dan *Partial Least Squares–Discriminant Analysis* (PLS-DA) untuk klasifikasi sampel. Hasil penelitian menunjukkan bahwa metode KLT mampu mengidentifikasi keberadaan asam mefenamat berdasarkan karakteristik kromatogram yang diperoleh. Model PLS dapat digunakan untuk memprediksi kadar asam mefenamat, meskipun masih menghasilkan nilai RMSE yang relatif besar. Model PLS-DA berhasil mengelompokkan dan membedakan sampel jamu asam urat, asam mefenamat, dan campuran keduanya dengan baik, yang didukung oleh nilai AUC-ROC sebesar 1,000 pada seluruh kelas sampel. Berdasarkan hasil penelitian dapat disimpulkan bahwa kombinasi metode KLT, spektrofotometri UV-Vis, dan teknik kemometrika berpotensi digunakan untuk analisis asam mefenamat dalam jamu asam urat. Metode PLS-DA menunjukkan kemampuan klasifikasi yang sangat baik, sedangkan model PLS masih memerlukan optimasi lebih lanjut untuk meningkatkan kemampuan prediksi.

Kata kunci: Jamu asam urat, asam mefenamat, spektrofotometri UV, kemometrika, kromatografi lapis tipis.

ABSTRACT

Hyperuricemia herbal medicine (*jamu asam urat*) is one of the traditional medicines widely used by the Indonesian community to help alleviate symptoms associated with elevated uric acid levels. The widespread use of herbal medicines creates opportunities for adulteration through the addition of pharmaceutical compounds (*Bahan Kimia Obat*; BKO), one of which is mefenamic acid. This study aimed to identify mefenamic acid in hyperuricemia herbal medicine using Thin-Layer Chromatography (TLC) and UV-Visible spectrophotometry combined with chemometric techniques. This study was conducted using hyperuricemia herbal medicine, mefenamic acid, and their mixtures. UV-Vis spectral data in the wavelength range of 250–380 nm were analyzed using Partial Least Squares (PLS) for quantitative prediction and Partial Least Squares–Discriminant Analysis (PLS-DA) for sample classification. The results demonstrated that the TLC method was able to identify the presence of mefenamic acid based on the chromatographic characteristics obtained. The PLS model could be used to predict mefenamic acid levels; however, the model still produced relatively high RMSE values. The PLS-DA model successfully classified and discriminated hyperuricemia herbal medicine, mefenamic acid, and their mixtures, as indicated by an AUC-ROC value of 1.000 for all sample classes. In conclusion, the combination of TLC, UV-Vis spectrophotometry, and chemometric techniques has potential for the analysis of mefenamic acid in hyperuricemia herbal medicine. The PLS-DA method demonstrated excellent classification performance, whereas the PLS model requires further optimization to improve its predictive capability.

Keywords: gout herbal medicine, mefenamic acid, UV spectrophotometry, chemometrics, thin layer chromatography.