

## ABSTRAK

Penjaminan mutu obat tradisional diperlukan untuk memastikan keamanan dan kualitas. Farmakope Herbal Indonesia (FHI) masih menggunakan metode gravimetri yang kurang sensitif mendeteksi alkaloid berkonsentrasi rendah. Selain itu, analisis kadar piperin dalam penjaminan mutu SNI diduga kurang akurat karena gangguan serapan senyawa bioaktif lain pada metode spektrofotometri UV-Vis. Penelitian ini menyelidiki kandungan alkaloid dan piperin pada ekstrak buah cabe jawa (*Piper retrofractum*) dan lada hitam (*Piper nigrum*) dengan metode analisis yang berbeda. Setelah skrining fitokimia dan ekstraksi dengan maserasi dalam pelarut etanol 96%, ekstrak dianalisis menggunakan kromatografi lapis tipis (KLT). Total alkaloid diukur menggunakan metode kolorimetri dengan pereaksi *bromocresol green* dan Dragendorff, sedangkan kadar piperin dianalisis menggunakan spektrofotometri UV-Vis dan *High Performance Liquid Chromatography* (HPLC). Hasil penelitian menunjukkan kedua simplisia mengandung alkaloid, flavonoid, kuinon, tannin, dan terpenoid, dengan karakteristik ekstrak sesuai FHI. Nilai total alkaloid hanya terdeteksi dengan pereaksi Dragendorff, mengindikasikan adanya alkaloid jenis amida. Kandungan total alkaloid pada lada hitam (30,02 mg/g) lebih besar dibandingkan cabe jawa (26,67 mg/g). Kadar piperin lada hitam juga lebih tinggi, baik melalui UV-Vis (32,83%) maupun HPLC (26,03%), dibandingkan cabe jawa (UV-Vis: 15,93%, HPLC: 13,84%). Meskipun kedua metode dapat digunakan, untuk perhitungan kadar piperin yang spesifik metode HPLC lebih direkomendasikan karena melibatkan pemisahan senyawa.

**Kata kunci:** *bromocresol green*, Dragendorff, HPLC, Kolorimetri, Piperin, Spektrofotometri UV-Vis, Total Alkaloid

## ABSTRACT

*Quality assurance of traditional medicines is needed to ensure safety and quality. The Indonesian Herbal Pharmacopoeia (FHI) still uses the gravimetric method which is less sensitive to detect low concentrations of alkaloids. In addition, the analysis of piperine levels in SNI quality assurance is suspected to be less accurate due to interference with the absorption of other bioactive compounds in the UV-Vis spectrophotometry method. This study investigated the alkaloid and piperine content in Javanese pepper (*Piper retrofractum*) and black pepper (*Piper nigrum*) fruit extracts using different analysis methods. After phytochemical screening and extraction by maceration in 96% ethanol solvent, the extracts were analyzed using thin-layer chromatography (TLC). Total alkaloids were measured using the colorimetric method with bromocresol green and Dragendorff reagents, while piperine levels were analyzed using UV-Vis spectrophotometry and High-Performance Liquid Chromatography (HPLC). The results showed that both *simplicia* contained alkaloids, flavonoids, quinones, tannins, and terpenoids, with extract characteristics according to FHI. The total alkaloid value was only detected with Dragendorff's reagent, indicating the presence of amide-type alkaloids. The total alkaloid content in black pepper (30.02 mg/g) was higher than that of Javanese chili (26.67 mg/g). The piperine content of black pepper was also higher, both through UV-Vis (32.83%) and HPLC (26.03%), compared to Javanese chili (UV-Vis: 15.93%, HPLC: 13.84%). Although both methods can be used, for specific piperine content calculations the HPLC method is more recommended because it involves compound separation.*

**Keywords:** *bromocresol green, colorimetry, Dragendorff, HPLC, Piperine, Spectrophotometry UV-Vis*