

IDENTIFIKASI KANDUNGAN FORMALIN PADA TAHU PUTIH DI PASAR TRADISIONAL KECAMATAN KLATEN TENGAH DENGAN METODE SPEKTROFOTOMETRI UV-VIS

Alifia Nuraini¹, Mitsalina Fildzah Arifah²

INTISARI

Latar belakang: Tahu putih merupakan pangan tinggi protein yang banyak dikonsumsi, namun memiliki umur simpan yang pendek karena kadar air yang tinggi. Untuk memperpanjang masa simpan, beberapa pedagang menggunakan formalin sebagai pengawet, meskipun penggunaannya dilarang karena bersifat toksik dan berisiko menyebabkan gangguan pencernaan, kerusakan organ, hingga kanker. Pasar tradisional Kecamatan Klaten Tengah menjadi sentral ekonomi bagi masyarakat, namun informasi keberadaan formalin pada tahu putih masih terbatas. Untuk menjamin keamanan pangan yang beredar, diperlukan penelitian untuk mengidentifikasi keberadaan formalin pada tahu putih.

Tujuan: Untuk mengidentifikasi keberadaan formalin pada tahu putih yang dijual di pasar tradisional Kecamatan Klaten Tengah secara kualitatif dan kuantitatif.

Metode: Penelitian dilakukan dengan rancangan non-eksperimental deskriptif dengan uji organoleptis selama tiga hari, analisis kualitatif menggunakan reagen KMnO_4 , Fehling A & B, Schiff, asam kromatofat dan uji penentuan panjang gelombang maksimum, serta kuantitatif dengan metode spektrofotometri UV-Vis.

Hasil: Tanda pembusukan diamati pada seluruh sampel secara organoleptis. Perubahan warna pada uji tabung dan puncak serapan pada 580 nm tidak terdeteksi. Validitas metode spektrofotometri UV-Vis ditunjukkan dengan nilai linieritas dan kisaran linier $r = 0,999$, %*Recovery* dari akurasi 97,807-101,023%, %RSD dari presisi sebesar 1,206%, batas deteksi (LOD) 2,811 ppm, dan batas kuantifikasi (LOQ) 8,519 ppm. Sampel yang diduga mengandung formalin terkonfirmasi tidak mengandung formalin dari uji kuantitatif. Keterbatasan penelitian ini terletak pada kurangnya sensitivitas terhadap kadar formalin yang sangat rendah.

Kesimpulan: Keberadaan formalin pada seluruh sampel tidak terdeteksi secara organoleptis, kualitatif, serta kuantitatif. Validitas metode spektrofotometri UV-Vis dapat memenuhi parameter validasi.

Kata kunci: Formalin; Klaten; Pasar Tradisional; Spektrofotometri UV-Vis; Tahu

¹Mahasiswa Farmasi Universitas Jenderal Achmad Yani Yogyakarta

²Dosen Farmasi Universitas Jenderal Achmad Yani Yogyakarta

IDENTIFICATION OF FORMALIN CONTENT IN WHITE TOFU AT TRADITIONAL MARKETS IN CENTRAL KLATEN DISTRICT USING UV-VIS SPECTROPHOTOMETRY METHOD

Alifia Nuraini¹, Mitsalina Fildzah Arifah²

ABSTRACT

Background: White tofu was a high-protein food widely consumed by the public but had a short shelf life due to its high water content. To extend its shelf life, some vendors used formalin as a preservative, although its use was prohibited due to its toxic nature and potential to cause digestive disorders, organ damage, and even cancer. Traditional markets in Central Klaten District served as economic centers for the local community; however, information regarding the presence of formalin in white tofu remained limited. To ensure the safety of circulating food products, a study was conducted to identify the presence of formalin in white tofu.

Objective: To identify the presence of formalin in white tofu sold at traditional markets in Central Klaten District, both qualitatively and quantitatively.

Method: This study was conducted using a non-experimental descriptive design, involving organoleptic testing over three days, qualitative analysis using $KMnO_4$, Fehling A & B, Schiff, and chromotropic acid reagents, as well as determination of the maximum wavelength, and quantitative analysis using the UV-Vis spectrophotometry method.

Result: Signs of spoilage were observed in all samples through organoleptic testing. No colour change was detected in qualitative analysis, and no absorption peak was observed at 580 nm. The validity of the UV-Vis spectrophotometry method was demonstrated by a linearity and linear range with $r = 0.999$, %Recovery from accuracy was 97.807-101.023%, %RSD from precision were 1.206%, a limit of detection (LOD) of 2.811 ppm, and a limit of quantification (LOQ) of 8.519 ppm. The samples suspected of containing formalin were confirmed to be free of formalin based on the quantitative test. The limitation of this study lay in the lack of sensitivity toward very low concentrations of formalin.

Conclusion: The presence of formalin in all samples was not detected through organoleptic and qualitative test, and quantitative test. The validity of the UV-Vis spectrophotometry method met the required validation parameters.

Keywords: Formalin; Klaten; Tofu; Traditional market; Spectrophotometry UV-Vis

¹Student of Pharmacy Universitas Jenderal Achmad Yani Yogyakarta

²Lecturer of Pharmacy Universitas Jenderal Achmad Yani Yogyakarta