

ABSTRAK

Dilla Purwaningrum. 2026. Pengaruh Suhu Terhadap Stabilitas Sediaan Pasta Gigi dengan Bahan Aktif Daun Sirih Merah (*Piper crocatum*). Skripsi. Program Studi Farmasi, FIKS, Universitas PGRI Madiun. Pembimbing (I) Dr. apt. Vevi Maritha, M.Farm, Pembimbing (II) Puri Ratna Kartini, S.KM., M.Epid.

Stabilitas fisik pasta gigi dapat dipengaruhi oleh suhu penyimpanan, terutama pada sediaan berbahan aktif alami seperti ekstrak daun sirih merah (*Piper crocatum*) yang mengandung senyawa flavonoid, tanin, alkaloid, saponin, dan fenolik yang relatif sensitif terhadap perubahan lingkungan. Penelitian ini bertujuan mengetahui karakteristik stabilitas fisik dan pengaruh variasi suhu penyimpanan terhadap stabilitas sediaan pasta gigi berbahan aktif ekstrak daun sirih merah konsentrasi 1%. Jenis penelitian ini adalah eksperimental laboratorium. Sediaan pasta gigi disimpan pada tiga variasi suhu, yaitu suhu kulkas 4°C, suhu ruang 25°C, dan suhu oven 40°C, kemudian diuji stabilitas fisiknya setiap minggu selama satu bulan meliputi organoleptik, homogenitas, pH, viskositas, daya sebar, dan daya lekat. Analisis data menggunakan uji One Way ANOVA dan Kruskal-Wallis dengan bantuan program SPSS. Hasil penelitian menunjukkan seluruh sediaan stabil secara organoleptik dan homogen selama penyimpanan. Nilai pH berkisar 8,90–8,95, daya sebar 5,45–5,63 cm, dan daya lekat 5,37–5,56 detik tidak dipengaruhi secara signifikan oleh variasi suhu penyimpanan. Sebaliknya, viskositas dipengaruhi secara signifikan oleh suhu penyimpanan, dengan nilai tertinggi pada suhu 40°C yaitu 48.596,5 cP dan berbeda signifikan dibandingkan suhu 25°C dan 4°C. Berdasarkan hasil tersebut, penyimpanan pada suhu ruang atau suhu kulkas direkomendasikan untuk menjaga konsistensi viskositas sediaan pasta gigi ekstrak daun sirih merah.

Kata Kunci: *pasta gigi, daun sirih merah, Piper crocatum, stabilitas fisik, suhu penyimpanan*

ABSTRACT

Dilla Purwaningrum. 2026. The Effect of Temperature on the Stability of Toothpaste Formulation Containing Red Betel Leaf (*Piper crocatum*) as the Active Ingredient. Undergraduate Thesis. Bachelor of Pharmacy Study Program, Faculty of Health Sciences and Science, Universitas PGRI Madiun. Supervisor I: Dr. apt. Vevi Maritha, M.Farm. Supervisor II: Puri Ratna Kartini, S.KM., M.Epid.

The physical stability of toothpaste formulations can be affected by storage temperature, particularly those containing natural active ingredients such as red betel leaf (*Piper crocatum*) extract. Red betel leaf contains bioactive compounds including flavonoids, tannins, alkaloids, saponins, and phenolic compounds, which are relatively sensitive to environmental changes. This study aimed to determine the physical stability characteristics and evaluate the effect of different storage temperatures on the stability of toothpaste formulated with 1% red betel leaf extract. This study employed an experimental laboratory design. The toothpaste formulations were stored at three different temperatures: refrigerated temperature (4°C), room temperature (25°C), and elevated temperature (40°C). Physical stability evaluations were conducted weekly for one month, including organoleptic properties, homogeneity, pH, viscosity, spreadability, and adhesiveness. Data were analyzed using the One-Way ANOVA and Kruskal–Wallis tests with SPSS software. The results showed that all toothpaste formulations remained organoleptically stable and homogeneous throughout the storage period. The pH values ranged from 8.90 to 8.95, spreadability from 5.45 to 5.63 cm, and adhesiveness from 5.37 to 5.56 seconds, with no significant differences among the storage temperatures. In contrast, viscosity was significantly affected by storage temperature, with the highest viscosity observed at 40°C (48,596.5 cP), which differed significantly from those stored at 25°C and 4°C. Based on these findings, storage at room temperature or refrigerated conditions is recommended to maintain the viscosity consistency of toothpaste containing red betel leaf extract.

Keywords: *toothpaste, red betel leaf, Piper crocatum, physical stability, storage temperature.*