

Abstract

Diabetic wounds are chronic wounds that are susceptible to bacterial infection and therefore require optimal therapy. Robusta coffee beans (*Coffea canephora* L.) are known to contain various active compounds, including polyphenols, alkaloids, and flavonoids, which have antibacterial potential. This study aimed to develop a gel preparation based on Robusta coffee bean extract and to assess its antibacterial activity against *Staphylococcus epidermidis* and its physical properties. The extract was obtained through a maceration process using 96% ethanol and then formulated into three concentration variations: F1 (30%), F2 (50%), and F3 (75%). The tests included phytochemical screening, organoleptic evaluation, homogeneity, pH, spreadability, and antibacterial activity testing using the disc diffusion method. The screening results indicated the presence of flavonoids, alkaloids, tannins, and terpenoids in the extract. All gel formulations had good physical properties, with a pH ranging from 5.42 to 6.33 and a spreadability of 5.0 to 6.7 cm. Antibacterial activity increased with increasing extract concentration, indicated by the inhibition zone diameters of 11.98 mm (F1), 17.76 mm (F2), and 18.49 mm (F3), respectively. Thus, the Robusta coffee bean extract gel preparation meets the topical physical requirements and has the potential to be used as an alternative therapy for diabetic wounds.

Keywords: Robusta Coffee Beans, Mediklin Gel, Antibacterial, Diabetic Wounds, Staphylococcus Epidermidis.

Abstrak

Luka diabetes termasuk luka kronis yang mudah terinfeksi bakteri sehingga membutuhkan terapi yang optimal. Biji kopi robusta (*Coffea canephora* L.) diketahui mengandung berbagai senyawa aktif, antara lain polifenol, alkaloid, dan flavonoid yang berpotensi sebagai antibakteri. Penelitian ini bertujuan untuk menyusun sediaan gel berbasis ekstrak biji kopi robusta serta menilai aktivitas antibakterinya terhadap *Staphylococcus epidermidis* dan mutu fisiknya. Ekstrak diperoleh melalui proses maserasi menggunakan etanol 96%, kemudian diformulasikan menjadi tiga variasi konsentrasi, yaitu F1 (30%), F2 (50%), dan F3 (75%). Pengujian meliputi skrining fitokimia, evaluasi organoleptik, homogenitas, pH, daya sebar, serta uji aktivitas antibakteri dengan metode difusi cakram. Hasil skrining menunjukkan adanya kandungan flavonoid, alkaloid, tanin, dan terpenoid pada ekstrak. Seluruh formula gel memiliki sifat fisik yang baik dengan nilai pH berkisar 5,42–6,33 dan daya sebar 5,0–6,7 cm. Aktivitas antibakteri meningkat seiring kenaikan konsentrasi ekstrak, ditunjukkan oleh diameter zona hambat berturut-turut sebesar 11,98 mm (F1), 17,76 mm (F2), dan 18,49 mm (F3). Dengan demikian, sediaan gel ekstrak biji kopi robusta memenuhi persyaratan fisik topikal dan berpotensi digunakan sebagai alternatif terapi luka diabetes.

Kata Kunci: Biji Kopi Robusta, Gel Mediklin, Antibakteri, Luka Diabetes, Staphylococcus Epidermidis.