

## Abstrak

# FORMULASI NANOEMULGEL EKSTRAK ETANOL DAUN SIRSAK (*Annona muricata* L.) DAN UJI EFEKTIVITASNYA TERHADAP *Propionibacterium acnes*

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**Latar Belakang:** Tanaman sirsak merupakan salah satu tanaman yang berpotensi untuk mengobati jerawat. Ekstrak etanol daun sirsak (*Annona muricata* L.) mengandung alkaloid, flavonoid, saponin, tannin, dan fenol yang memiliki efektivitas sebagai antibakteri. Namun penggunaan ekstrak tanaman secara langsung pada kulit kurang efektif sehingga perlu pengembangan ekstrak menjadi sediaan topikal berbentuk nanoemulgel. Penelitian ini bertujuan untuk membuat formulasi nanoemulgel ekstrak etanol daun sirsak yang memenuhi sifat fisik, stabilitas, karakterisasi, dan efektivitas terhadap *P. acnes*

**Metodologi:** Formulasi nanoemulgel menggunakan 4 formula berbeda (ekstrak 0%, 0,5%, 0,7%, dan 1%). Sediaan diuji sifat fisik (organoleptik, homogenitas, pH, daya sebar, viskositas), dan uji stabilitas (*Freeze-thaw*). Formula terpilih kemudian dilakukan karakterisasi meliputi morfologi, ukuran partikel, potensi zeta dan diuji efektivitasnya terhadap *P. acnes* menggunakan metode difusi. Sifat antibakteri dianalisis dengan mengukur zona hambat.

**Hasil Penelitian:** Semua formula nanoemulgel memenuhi sifat fisik dan uji *freeze-thaw* serta stabilitas. Formula tidak terjadi perubahan bentuk, warna, dan bau selama penyimpanan 28 hari, homogen, pH 4,70-5,06, viskositas sekitar 543-928 cP, daya sebar 6,7-8,15 cm, dan stabil pada pengujian *freeze-thaw*. Formula nanoemulsi terpilih memiliki ukuran partikel 20,5 nm dan potensial zeta sebesar 9,8 mV. Morfologi nanoemulgel menunjukkan bahwa globul berbentuk bulat, terdistribusi merata, dan terlihat ada tanda penggabungan globul.

**Kesimpulan:** Formula nanoemulgel ekstrak etanol daun sirsak (*Annona muricata* L.) terpilih yaitu Formula III yang mengandung 1% ekstrak memiliki efektivitas kuat terhadap *Propionibacterium acnes* sebesar 19,00 mm.

**Kata Kunci:** Daun sirsak (*Annona muricata* L.), nanoemulgel, jerawat, *Propionibacterium acnes*

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## Abstract

### FORMULATION AND EFFECTIVENESS OF NANOEMULGEL SOURSOP LEAVES ETHANOL EXTRACT (*Annona muricata* L.) AGAINST *Propionibacterium acnes*

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**Background:** Soursop is a plant has the potential to treat acne. The ethanolic extract of soursop leaves (*Annona muricata* L.) contains alkaloids, flavonoids, saponins, tannins, and phenols which have antibacterial effectiveness. However, the use of plant extracts directly on the skin is not effective, so it is necessary to formulate an extract into a topical preparation in the form of nanoemulgel that will have good antibacterial properties against *P. acnes*. This study aims to prepare a nanoemulgel formulation of soursop leaf ethanol extract that meets the physical properties, stability, characterization, and effectiveness against *P. acnes*.

**Methods:** Formulation of nanoemulgel using 4 different formulas (contain 0%, 0,5%, 0,7%, and 1% of extract). The preparations were tested for physical properties (organoleptic, homogeneity, pH, spreadability, viscosity), and stability tests (Freeze-thaw). Selected formula was then tested for characterization (morphology, particle size, potential zeta) and effectiveness against *P. acnes* using the diffusion method. Antibacterial properties were analyzed by measuring inhibition zone.

**Result:** All the nanoemulgel formulas meets the physical properties and freeze-thaw, stability test. No change in shape, color, and odor observed during 28 days of storage time, homogeneous, pH 4.70-5.06, viscosity around 543-928 cP, spreadability of 6.7-8.15 cm, and were stable in the freeze-thaw testing. Selected nanoemulsion formula had particle size of 20.5 nm and potential zeta is 9,8 mV. Nanoemulgel morphology showed that the globules where spherical, uniformly distributed, and there is a sign of coalescence.

**Conclusion:** The selected soursop leaves ethanol extract nanoemulgel formula that is Formula III contain 1% of extract has a strong effectiveness against *Propionibacterium acnes* of 19.00 mm.

**Keywords:** Soursop leaves (*Annona muricata* L.), nanoemulgel, acnes, *Propionibacterium acnes*

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