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Formulation and Evaluation of Blush-On Gel from Ethanol Extract of Bawang Dayak (Eleutherine bulbosa)

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ABSTRACT

Bawang dayak (Eleutherine bulbosa), a native plant of Kalimantan, is traditionally used as a medicinal herb and is known by various local names such as bawang tiwai, teki sabrang, and brambang dayak. This plant contains natural pigments, making it a potential natural colorant for cosmetic preparations. This study aimed to investigate the potential of bawang dayak bulb extract as a natural coloring agent in blush-on gel formulations at concentrations of 30%, 35%, and 40%, referred to as FI, FII, and FIII. An experimental method was employed using maceration with 96% ethanol as the extraction solvent. The extract was then formulated into gel preparations and tested from day 0 to day 15, including organoleptic evaluation, homogeneity test, pH measurement, spreadability test, adhesion test, and irritation test. The blush-on gel from bawang dayak extract produced red-colored, strawberry-scented, semi-solid/gel preparations. The results for formulations F0, FI, FII, and FIII were as follows: pH values of 6, 5, 5, and 5; spreadability of 5.3, 5.6, 6.1, and 6.4 cm; adhesion times of 28, 23, 19, and 17 seconds, respectively; and all showed negative irritation test results. These findings indicate that the formulations met the parameters of gel preparations. The ethanol extract of bawang dayak bulbs (Eleutherine bulbosa) can be successfully formulated into gel preparations and is suitable for use as a natural blush-on gel.
Keywords: Bawang dayak, anthocyanin, natural pigment, blush-on gel, cosmetic formulation.

1. BACKGROUND

Cosmetic products play an essential role in enhancing personal appearance and self-confidence. Among these, blush-on is widely used to provide a natural rosy tone to facial skin, complementing other make-up products. Conventional blush-on products often rely on synthetic colorants, which may pose potential health risks, including skin irritation and allergic reactions. Thus, the search for safer, natural alternatives is necessary.

Bawang dayak (Eleutherine bulbosa), a plant native to Kalimantan, has long been used in traditional medicine. It contains bioactive compounds such as flavonoids, saponins, and especially anthocyanins, which are responsible for its deep red pigmentation. These natural pigments are not only beneficial as antioxidants but also serve as promising alternatives to synthetic dyes in pharmaceutical and cosmetic formulations.

Previous studies have demonstrated the feasibility of using anthocyanins as natural colorants in food and topical products. However, limited research exists on their application in decorative cosmetics such as blush-on. Therefore, developing a blush-on gel formulation from bawang dayak extract offers both scientific novelty and commercial potential.

This study was conducted to evaluate the physical and chemical stability of blush-on gel formulations prepared with bawang dayak extract at varying concentrations. By assessing key parameters such as organoleptic properties, homogeneity, pH, spreadability, adhesiveness, and irritation response, this research aims to provide scientific evidence on the feasibility of bawang dayak extract as a natural cosmetic colorant.

2. RESEARCH METHODS

Research Design. This research applied an experimental laboratory design. Fresh bawang dayak bulbs were collected, processed into simplicia, and extracted using the maceration method with 96% ethanol. Extracts were then formulated into blush-on gels at concentrations of 30% (F1), 35% (F2), and 40% (F3).

Participants/Sample. The sample consisted of bawang dayak bulbs cultivated in Dusun Dasan, Desa Tanak Beak. Nine volunteer panelists participated in the irritation test to evaluate skin compatibility.

Instruments. Laboratory instruments included rotary evaporator, analytical balance, pH meter, glassware, and patch test materials.

Materials. The gel formulations contained HPMC (gelling agent), propylene glycol (humectant), strawberry essence (fragrance), methyl paraben and propyl paraben (preservatives), and distilled water as solvent.

Data Collection and Analysis. Data were collected through physical stability tests (organoleptic, homogeneity, pH, spreadability, adhesiveness) and irritation testing over 15 days. Results were tabulated and analyzed descriptively, with comparisons against standard cosmetic gel parameters.

3. RESULTS AND DISCUSSION

3.1 Results

Table 1. Evaluation Results of Blush-On Gel Extract of Bawang Dayak

Test parameter	**F0 (0%)**	**F1 (30%)**	**F2 (35%)**	**F3 (40%)**
Organoleptic	Colorless	Red, Strawberry scent, semi-solid	Red, Strawberry scent, semi-solid	Red, Strawberry scent, semi-solid
pH	6	5	5	5
Spreadability (cm)	5.3	5.6	6.1	6.4
Adhesiveness (sec)	28	23	19	17
Irritation	Negative	Negative	Negative	Negative

Discussion. The results demonstrate that all formulations (F1–F3) exhibited desirable physical characteristics and stability. The red coloration is attributed to anthocyanin compounds present in the extract, consistent with findings by Nugrahaeni et al. (2022) who reported the pigment's suitability as a natural dye.

The pH values (5–6) were within the skin's physiological range (4.5–6.5), indicating compatibility and safety for topical application. Spreadability and adhesiveness results suggest that increasing extract concentration improved gel spreadability but slightly reduced adhesiveness, a common trade-off in gel formulations.

Importantly, irritation tests on nine panelists confirmed the safety of the formulations, with no adverse reactions observed, in line with Tungadi et al. (2024) who highlighted the importance of patch testing in topical cosmetic development.

Overall, the findings align with the hypothesis that bawang dayak extract can be successfully formulated into blush-on gels with acceptable physical and chemical properties.

4. CONCLUSION

This study concluded that bawang dayak (Eleutherine bulbosa) extract contains anthocyanins that serve effectively as natural pigments for blush-on gel formulations. The gels formulated at 30%, 35%, and 40% extract concentrations met physical stability requirements, exhibited desirable sensory attributes, maintained skin-compatible pH, demonstrated good spreadability and adhesiveness, and showed no irritation. These results indicate that bawang dayak extract is a promising natural alternative to synthetic colorants in cosmetic products.

5. THANKS

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