

RESEARCH ARTICLE

Peel-off gel formulation from black mulberries (*Morus nigra*) extract as anti-acne maskArif Budiman¹, Diah Lia Aulifa², Arif Satria Wira Kusuma¹, Insan Sunan Kurniawan¹, Astri Sulastri¹¹Department of Science and Technology, Faculty of Pharmacy, Universitas Padjadjaran, Jatinangor, Kabupaten Sumedang, Jawa Barat, Indonesia, ²Department of Biology Pharmacy, Sekolah Tinggi Farmasi Indonesia, Bandung Kidul, Kota Bandung, Jawa Barat, Indonesia

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ABSTRACT

Background: Acne is a skin disease characterized by chronic inflammation in the polisebasea that often occurs in adolescence. Utilization of the black mulberry fruit with a high phenolic is one alternative for the treatment of acne. **Aims and Objectives:** The aims of this research are to develop and test a peel-off mask gel prepared from black mulberries (*Morus nigra*) extracts, which has antibacterial activity against *Staphylococcus epidermidis* and *Propionibacterium acnes*. **Materials and Methods:** Black mulberry fruit was extracted with the maceration method by using ethanol (96%). Then, the antibacterial activity of the extract was determined by the disc-diffusion method, while the mean inhibitory concentration (MIC) and mean bactericidal concentration (MBC) were determined by the microdilution method. Then, the extract was formulated into the base of the peel-off mask gel containing variations in concentration of polyvinyl alcohol (7%, 9%, and 10%) and hydroxypropyl methylcellulose (2% and 2.5%). The formulations prepared were evaluated for their physical properties, including organoleptic behavior, homogeneity, pH, viscosity, spreadability, and drying time. Irritation tests were performed, and antibacterial activity of the formulation was also assessed. **Results:** The results showed that the black mulberry fruit extract has antibacterial activity with MIC value of 2.5% against *S. epidermidis* and *P. acnes*, while MBC values were 2.5% and 5%, respectively. Formulations with the best results of physical evaluation were obtained for the formula containing polyvinyl alcohol at 7% and hydroxypropyl methyl cellulose at 2.5%. The antibacterial activity of the peel-off mask gel formulation from black mulberries (*M. nigra*) extract occurs with $3 \times$ MIC and produce inhibition zone 6.11 ± 3.2 mm against *S. epidermidis* and 5.43 ± 0.6 mm against *P. acnes*. **Conclusion:** It can be concluded that the peel-off mask gel prepared from black mulberry (*M. nigra*) fruit extract is effective as well as safe to be used as a topical preparation.


KEY WORDS: *Morus nigra* Extract; Peel-off Mask Gel; Antiacne; *Staphylococcus epidermidis*; *Propionibacterium acnes*

INTRODUCTION

Acne is an chronic inflammatory skin disease that affects the skin's sebaceous glands and often occurs in the post-puberty

age.^[1,2] According to Global Burden of Disease, acne vulgaris affects approximately 85% of teenagers and young adults, i.e., the age range of 12-25 years.^[3]

One of the main causative factors of acne is the bacterial activity on the skin surface. *Propionibacterium acnes* and *Staphylococcus epidermidis* are skin microbiota that is often isolated from acne lesions and are known to contribute to the pathogenesis of acne.^[4] The previous study shows that *P. acnes* and *S. epidermidis* have resistance and low sensitivity toward several antibiotics.^[5,6] Natural plant sources have been used since centuries in Indonesia to overcome various health issues.

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