

Antimicrobial resistance, environmental contamination, climate change, biodiversity, and habitat loss.

Evaluating the efficacy of antimicrobial activity of five herbal oleoresins against acne-causing *Propionibacterium acne*

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Acne vulgaris is a skin disorder that is primarily found affecting the facial area although it can also affect the upper arms, trunk, and back among millions of people worldwide. It not only affects physical appearance but also significantly impacts an individual's quality of life, causing distress and lowering self-esteem. Acne vulgaris is mainly caused by a gram-positive bacterium, *Propionibacterium acne*. This bacterium instigates an inflammatory response, culminating in the formation of diverse acne lesions. Effective acne control methods are essential to alleviate these negative effects and promote overall well-being. While both herbal and synthetic drugs are used to treat acne vulgaris traditional herbal remedies have garnered attention for their potential in acne management because of their perceived safety and efficacy. This study was conducted to evaluate the efficacy of the antimicrobial activity of five herbal oleoresins against acne-causing *Propionibacterium acne* and the development of face serum. Acne lesion samples were collected from 4 patients and *P. acne* was isolated and purified using unique colony morphology and biochemical characterization (Catalase test, Gelatin hydrolysis and Methyl red test). Antimicrobial activity was tested for the five oleoresins of *Camellia sinensis*, *Ocimum tenuiflorum*, *Senna alata*, *Curcuma longa*, and *Plectranthus amboinicus* extracted by solvent extraction method. The agar well diffusion assay method was used and the antimicrobial activity was evaluated by measuring the inhibition zone diameter. The resulting data was analyzed using one-way ANOVA to compare the effectiveness of all oleoresins followed by Tukey pairwise comparisons at a 95% confidence level to determine significant differences among the treatments. The plant oleoresins of *C. longa*, *C. sinensis*, *S. alata*, *P. amboinicus*, *O. tenuiflorum* showed significantly a high activity against *P. acnes* with an inhibition zone diameter of 2.43 mm, 2.60 mm, 2.66 mm, 2.71 mm and 2.73 mm respectively as compared to control (2.81 mm). According to Tukey pairwise comparisons *C. longa* showed the highest antimicrobial activity followed by *C. sinensis* against the *Propionibacterium acne*. Hence, the present study concludes that *Curcuma longa* and *C. sinensis* have a good potential to be used in herbal facial application products designed for acne-prone skin.

Keywords: Acne care, Acne vulgaris, antimicrobial resistance, Herbal Cosmetics

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