

EFFECT OF WATER, ETHANOL AND N-HEXANE EXTRACT OF LEMON GRASS ON *ACNE VULGARIS* (PIMPLES)

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ABSTRACT

Acne vulgaris (pimples) is a major problem for teenagers, which has emotionally and financially impacted sufferers. This research aimed to reduce the severity of *Acne vulgaris* and improve the appearance of the affected part of the individual using the plant-based product. *Cymbopogon citratus* (lemongrass) are essential oils, and their bioactive component is citral, which possesses antimicrobial solid efficacy against pathogenic bacteria and fungi. Three preparations from *C. citratus* extracts were used in cream production and tested on volunteered individuals. *C. citratus* was soaked for 24 hours, filtered and left to evaporate in the drying cabinet, while ethanol and n-hexane were used as solvents to extract *C. citratus* oil using a soxhlet extractor. The three extracts were incorporated into the cream. At the end of the trials, observation shows that ethanol and n-hexane extracts were more effective than water extract of lemon grasses. *C. citratus* extract from ethanol and n-hexane was very effective in eliminating acne and repairing the scar and spotty areas of the skin.

Keywords: *Acne vulgaris*, *Cymbopogon citratus*

INTRODUCTION

Acne vulgaris (Pimples) is a common skin condition (may be a symptom of acne) caused by clogged or inflamed oil glands or an increased presence of pimple-causing bacteria on the skin, most commonly on the face, chest, shoulder and upper back (Cleveland Clinic, 2022). It affects teenagers and adults undergoing hormonal changes and can affect babies (Cleveland Clinic, 2022). There are six types of pimples:- Papules, Blackheads, whiteheads, Nodules, Pustules and Cysts. Skin-to-skin contact can spread to another person (Cleveland Clinic, 2022). Different acne variants include acne conglobate, acne fulminants, acne mechanica, acne vulgaris, neonatal and infantile acne and occupational (John and Anatoli, 2011). Acne lesions are caused by alteration of follicular keratinization, which leads to comedones; increased and altered sebum production under androgen control; follicular colonization by *Propionibacterium acnes* and complex inflammatory mechanisms that involve both innate and acquired immunity; genetic; diet; dairy consumption; environmental factors; occupational exposure; hormonal base therapies (Tan *et al.*; 2017). There is no universally agreed system for grading acne, and the grading system used in clinical trials varies greatly from number and types of lesions, severity, comedonal versus inflammatory acne to standardizing photographs (Tan *et al.*, 2017).

There are different treatment regimens for acne, such as topical retinoid, topical antimicrobial, salicylic acid washes, benzoyl peroxide, clindamycin, erythromycin, tetracyclines, trimethoprim-sulfamethoxazole, oral antibiotic and oral isotretinoin (John and Anatoli, 2011).



Cymbopogon citratus (lemongrass) is widely used in various forms, such as in curries, soup, tea and various cuisines worldwide, especially in Southeast Asia (Geetha *et al.*, 2020). Essential oils extracted from plants have multiple pharmacological properties, such as antibacterial, antifungal, and antiviral properties. They offer better biocompatibility with fewer side effects on the human body. They are considered potential alternatives to synthetic medication (Shanjun *et al.*, 2020). Lemongrass essential oil and its bioactive component citral possess strong antimicrobial efficacy against pathogenic bacteria and fungi (Shanjun *et al.*, 2020); anti-amoebic, anti-diarrheal, anti-inflammatory and anti-filarial properties (Geetha *et al.*, 2020).

A. vulgaris (Pimples) affect teenagers psychosocially (society and social groups) and psychologically (self-perception and behavior). It is associated with anxiety, depression, mood disorders and suicidal thoughts. Therefore, this research aims to reduce the severity of pimples and improve the appearance of the affected part of the individual using plant-based products.

MATERIAL AND METHODS

Collection and Preparation of Samples

Lemon grasses were collected within Umaru Ali Shinkafi Polytechnic premises. Debris and insects were removed and then rinsed with water. The leaves were cut into smaller pieces before being air-dried. The dried lemon grasses were pulverized to coarse particles using an electric blender.

Extraction

Water extraction

Out of the pulverized lemongrasses, 5g was weighed, and 50 ml of water was added. It was shaken vigorously and sonicated for 24 hours at room temperature. It was filtered using Whatman filter paper No. 1. The filtrate was placed in the drying cabinet to dry and stored for further use.

Soxhlet extraction using ethanol and n-hexane solvents

A 5g of the pulverized lemongrasses were placed in a thimble, and 250 ml ethanol was used for the extraction. After evaporating the solvent, the oil was poured into a dark, air-tight bottle for use. The same procedure was maintained for the n-hexane solvent.

Cream production

Beeswax (8 g) was poured into a clean bowl and placed in a pot containing water. It was heated until the beeswax was melted. It was removed from the heat, added 20 ml of mineral oil, and stirred vigorously. A 1.5 ml of ethanol extract was incorporated into the cream. This was repeated for the n-hexane extract. At the same time, 1 g of the powdered water extract was incorporated into another batch of cream.

Efficacy test of lemongrass extracts

The test was conducted on three free-willing students with acne for seven (7) consecutive days. Each student was given one of the three infused lemongrass creams.

RESULTS AND DISCUSSION

Three preparations from *C. citratus* extracts were used in cream production, which were tested on volunteered individuals Fig.1. Observation at the end of the trial shows that ethanol and n-hexane extracts were more effective than water extract of lemon grasses. This is because plant extraction using organic solvents tended to show more antibacterial activity than water as a solvent for extraction (Geetha *et al.*, 2020). The effectiveness of lemongrass extract is collaborated by the work of (Taghreed *et al.*, 2020), which suggested that lemongrass may be used for skin treatment in burned patients infected with pathogenic microorganisms.

Approximately 80 % of women fail multiple courses of systemic antibiotic medications, and 30 % to 40 % fail after a course of isotretinoin, especially women over the age of 25 years. Also, pregnant and lactating women are at risk of taking some of these drugs; they need counseling (Tan *et al.*, 2017). For these reasons, it is advisable to use safe organic products with no side effects, like *C. citratus* cream extracts.

CONCLUSION

C. citratus extracts from ethanol and n-hexane effectively eliminate acne and repair the scar and spotty areas of the skin. More studies must be carried out to monitor these creams' long-term efficacy and side effects.

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