Comparative Study Thymol Oil and Some Gel Face Washing on Resistance *Propionibacterium Acnes*

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Abstract

Acne is elevated of skin secretion with hyperkeratosis causing *Propionibacterium acnes*. The goal of study was to assess the anti-inflammatory, and antibacterial potential of Thymol oil compare Gel face ,and is the main bacterium involved in the acne. The unpredictable use of antibiotics for the treatment of acne may end up within the advancement of bacterial resistance.

Key words: *Thymol oil , P. acnes, oil, Gel face, Hyperkeratosis*

Introduction

A Gram-positive P. acnes is, anaerobic bacteria which colonizing the lipid-rich sebaceous surface of the human skin [1]. It has a place to the clinical gather of skin commensals, but can every so often cause genuine contaminations deciding the nearness of *P. acnes* contamination can be troublesome. Due to its less harm-fulness, contaminations are less dolente [2].

Skin break out could be an incessant incendiary illness of the pilosebaceous joins together, fundamentally of the confront, nose, shoulders and upper arms. It is one of the most common dermatoses affecting high school populace [3]. Acne vulgaris is one of the most common skin disarranges, and dermatologists are still have long struggled to treat acne completely. It primarily influences young people, in spite of the fact that it may display at any age. It is nearly all inclusive malady happening in all races .The rate of seriousness of skin break out, top at (40%) in 14-17 year ancient young ladies and (35%) in boys matured 16-19 year (4). It influences the skin of the confront, neck and upper trunk. These specific sebaceous follicles have capacious follicular channels and voluminous, multi acninar sebaceous organs. Skin break out creates when these specialized follicles experience pathologic change that comes about within the arrangement of non-inflammatory injuries (comedons) and fiery injuries (papules, pustules and knobs [5]. The intemperate utilize of anti-microbial for long periods has led to expanded resistance in skin break out causing microbes i.e. *P.acne* and *S. epidermidis* against a number of anti-microbial utilized to treat skin break out [6].

The antibacterial properties of (EO) has long been recognized and broadly tried in vitro against a broad run of pathogenic microscopic organisms, counting both (G^{+ve}) and (G^{-ve}) bacteria [7]. One of the foremost copious bunches of normal compounds is spoken to by the fundamental oils, Fundamental oils (EOs) are fragrant sleek fluids gotten from plant fabric.

They can amplify the rack lifeof natural or prepared nourishments by decreasing microbial development rate or reasonability, A few of these substances are moreover known in its contributions to self-defense of plants against irresistible life forms [8].

Thymol a phenolic compound show in undamental oils, may be a common monoterpene and carvacrol isomer that extricated from thyme and the other sorts of plants, Thymol is less water dissolvable at unbiased pH, but it is as well dissolvable in some natural solvents

and liquor [9].

The carvacrol and thymol antioxidant impacts of have been affirmed in a few considers, recommending their organization as nutritious components within the enhancement of novel useful nourishments. Thymol defensive nature against charms the field of drugs in dental caries [10,1 1, 13].

Material and Methods

Isolates strain were identified by microscopy and microscopy tests for identification of *P. acnes*.[16, 18]. Directly transport from the pus and sterile disposable cotton swabs, transport media and carry to the laboratory.

Final identifection by Viteck System 2 : All the presumptive isolates (on blood agar (BA) medium and Brain heart infusion (BHI) agar were tested by Viteck 2 system (Biomerix, France). This system used for diagnosis of *Propionibacterium acnes*.

Antibiotic sensitivity test *P. acnes*:

The antibiotic sensitivity test was done accordance to [14] by disc well diffusion using 5 type antibiotics.

DNA extraction and Electrophoresis:

Aaccording to the extraction kit the samples' examine the accuracy of the DNA extraction, photo absorption between (260 and 280) nm using a bio photometer .

The gel was then transferred to a transilluminator and the duplicated 1202 base pairs were examined under UV light.

Emulsion preparation:

Three samples of anti-acne O/W washing with different compositions were obtain commercial market (Table I).

Table 1- The Gel face washing

Ingredients	Amount / ml
Esknol	100µl
Pharmacies	100µl
Bio Balance	100µl

Formulation of Face wash Gel:

Antibacterial test was determined using -well diffusing method according to the CLSI Clinical Laboratory Standards Institute [26].

Extraction of essential oils:

About 20g of herb soaked in distilled water. The volatile vapour that condensed at water temperature of 80o C was called essential oils. The distilled oils were labeled and placed in a fridge until ready for use.

Result

The cases Most were obtain patients between the ages [16-21] years old in both sexes, and the distribution of acne among female was higher than that of male (14% and 4%) respectively .

Table (1) *P. acnes* infection according to age and gender groups

Age group (year)	Sample No.	Male Positive No. (%)	Female Positive No. (%)
11-15	17	3 (4.8)	4 (6.4)
16-20	20	13 (20.9)	16 (25.8)
21-25	13	2 (3.2)	2 (3.2)
Chi-square Value	----------	9.135 **	9.852 **
** ($P \leq 0.01$)			

Macroscopic examination

Colonies appeared as circular, opaque and glistening colonies with different Colors, where may be white, gray or yellow. Bacterial colonies showed weak or no hemolysis when grown on BA. Figure (1)

Figure (1): *P.acnes* on A) BHIA B) Blood agar at 37c for 48 hrs

Microscopic examination

After stained by Gram stain, all presumptive of isolates *P. acnes* isolates were Gram positive, in different forms polymorphism cells Figures(2).

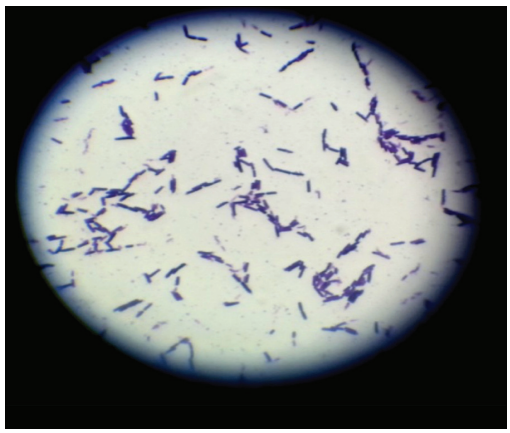

Figure (2): *P. acnes* arrangements (1000 x).

Antibiotic sensitivity test (AST) of *P. acnes*:

Result os AST show in (Figure 3) the highest sensitivity *P.acne* was to Levofloxacin then Clindamycin, while appeared highly resistance to Azithromycin , erythromycin, and metronidazole.

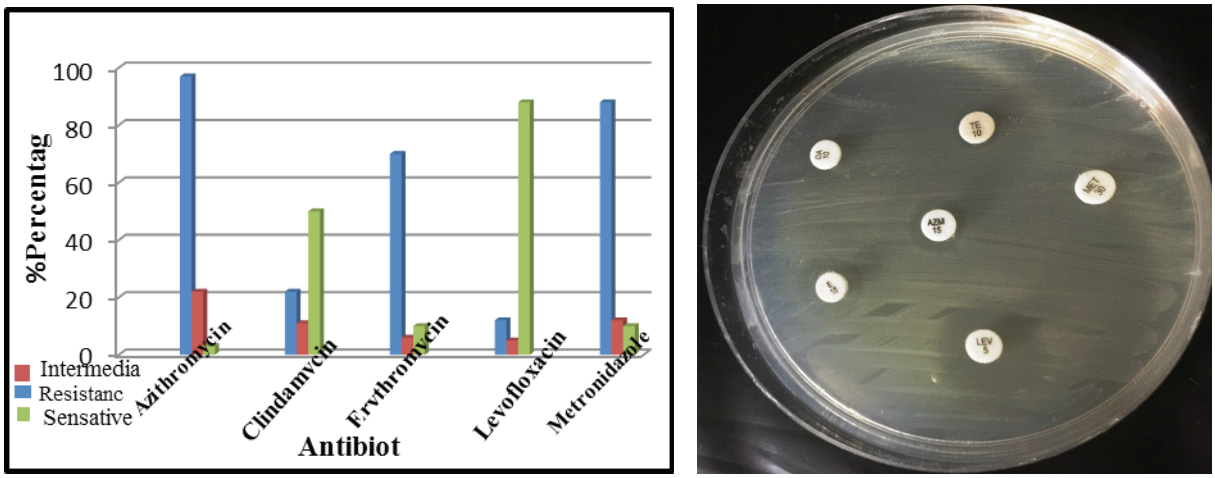

Figure (3): Antibiotic susceptibility test of *Propionibacterium acne*.

Used the morphological and biochemical tests and PCR technique to identify the *P. acnes* in lesions. The Figure(4) presents the PCR product electrophoresis on a garose gel (1.5%).

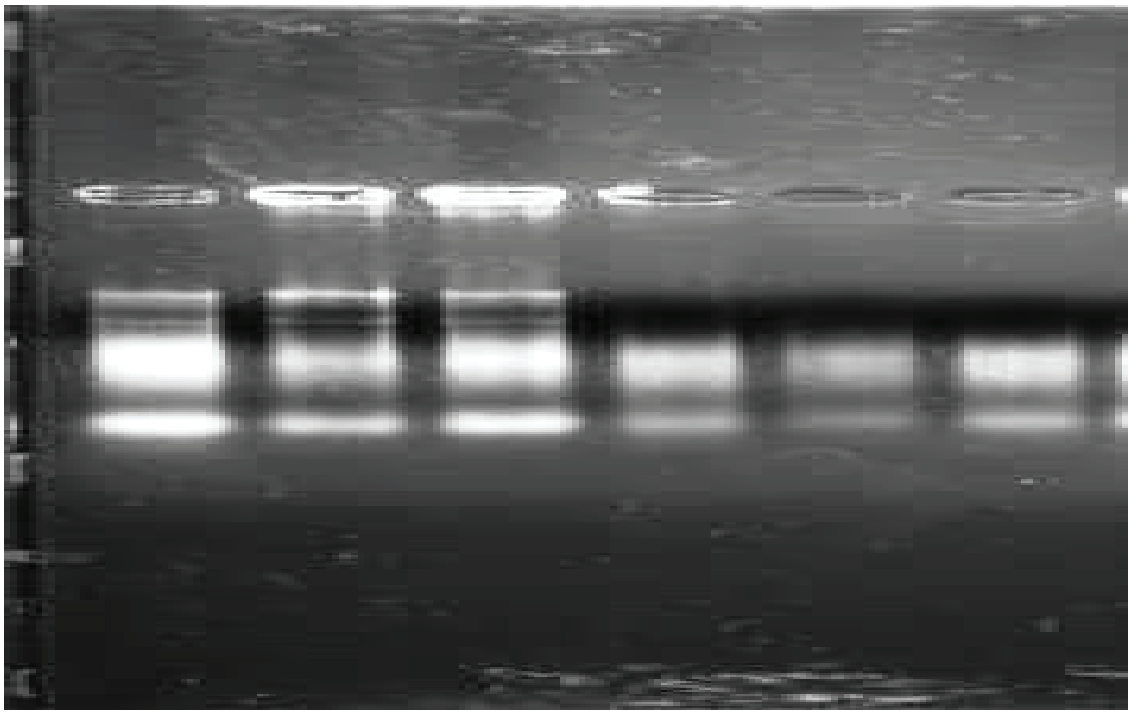

Figure 4. Amplification of *16SrDNA* (1400bp) bacterial isolates. Agarose (1.2%), 5 V/cm for 2 h, stained with Red safe and visualized under UV transilluminator. M. 100 bp DNA marker. Lane 1-10: bacterial isolates.

Table (2): comparative results used against

P. acnes

Treatment used against P. acnes	Inhibition zone diameter (mm)
Levofloxacin	9± 0.04 d
Thyme oil(commercial	20 ± 1.26 ab
Eskolin	10.4 ± 0.37 d
Pharmacies	10.5 ± 0.42 d
Bio Balance	16 ± 0.79 bc
LSD value	4.282 **
** (P<0.01).	

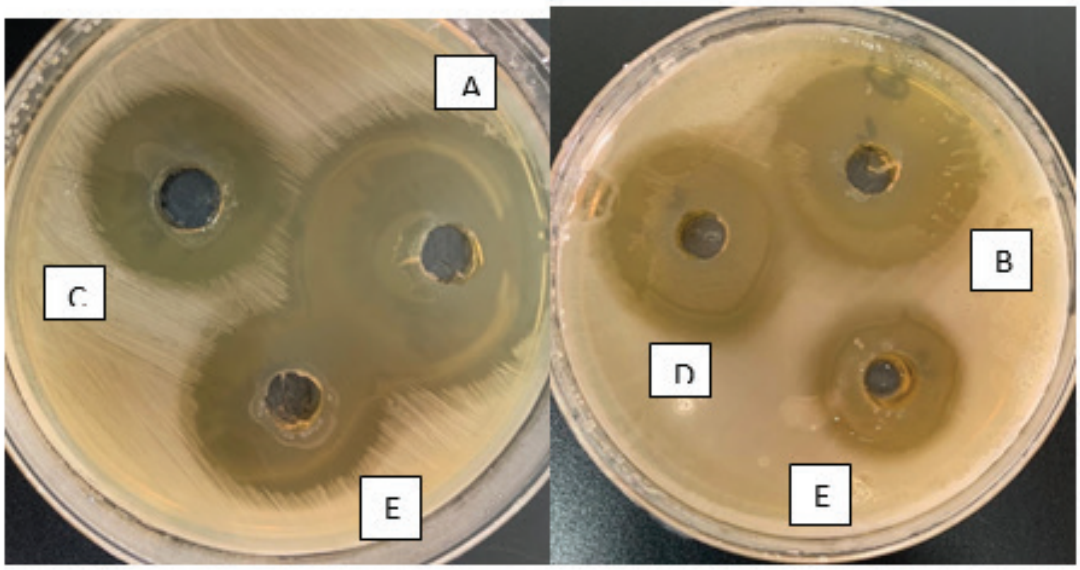

Figure (6): Comparison of the inhibitory effects against *P. acnes* A) *Thyme* oil B) Bio Balance C) Pharmacies D) Eskolin E) Levofloxacin that cultured on Moller Hinton Agar at 37 °Cfor 48 hrs. under anaerobic condition.

Discussion

The current results were coincides with previous results studied in Iraq of *P. acne* in different age (15). that acne prevalence was more in female than male, agree with most cases were in ages group between (15-20). Also agree with study in Iraq isolated *P.acne* [17] .These results for identification *P.acne* were in agreement with [18, 19]. Viteck 2 System was a rapid, sensitive, to distinguish clinical isolates (20). The result agree with [21] The most using treatment (erythromycin) were anti *P. acne*. [22]

The antibiotics is topical application like clindamycin , tetracycline most common to treatment of

acne but the major problems growing in resistance of *P. acnes* to antibiotics caused [23].

The acne-gel with retinol had lower effect in agar dilution test. but shown that is highly effective at high concentrations against aerobic and anaerobic bacteria including *P. acnes* [24] the antiacne more acts of oregano EO that of other evaluated including commercialized over the counter acne treatment tea tree [25].

Conclusion

The antibiotics play an important treatment in acne administers. Resistance *P. acnes* treatment by antibiotic compares using natural oil most affections alternative commercial washing gel in pharmacy.

Conflict of Interest: The authors declare that there is no conflict of interest regarding this study.

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Ethical Committee Approval: This work was approval by the ethical committee of Department of Biology, College of Science, University of Baghdad.

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