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RESEARCH ARTICLE

ANTI INFLAMMATORY EFFECT OF TEA TREE OIL

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ABSTRACT

Aim : To analyse THE anti-inflammatory effects of tea tree oil
Objectives : This research is done to analyse the anti-inflammatory effects of tree tea oil.
Background: Many complementary and alternative medicines have enjoyed increased popularity in recent decades.one such product is tea tree oil (tto) which is the essential oil steam distilled from the australian native plant, melaleuca alternifolia. Employed largely for its anti-inflammatory and anti-microbial properties. It is a complex mixture of approximately 100 terpenes and hydrocarbons, the main component being terpinen-4-ol which comprises at least 30% of the oil.
Materials and methods: The reaction mixture consists of test extract at different concentrations and 1% aqueous solution of bovine albumin fraction. Ph of the reaction mixture was adjusted using small amount of 1n hcl. The samples were incubated at 37oc for 20 min and then heated at 57oc for 20 min. After cooling the samples, the turbidity was measured spectrophotometrically at 660 nm. The experiment was performed in triplicate.
Results: Concentration. The percentage activity was analysed and the results were tabulated. at the concentration of 100 µl, tea tree oil showed significant activity as that of the control.

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INTRODUCTION

Inflammation is part of the complex biological response of body tissues to harmful stimuli, such as pathogens, damaged cells, or irritants and is a protective response involving immune cells, blood vessels, and molecular mediators. The function of inflammation is to eliminate the initial cause of cell injury. Anti-inflammatory refers to the property of a substance or treatment that reduces inflammation or swelling. Anti-inflammatory drugs make up about half of analgesics, remedying pain by reducing inflammation as opposed to opioids, which affect the central nervous system to block pain signaling to the brain (Karthik, 2016 and Ghayathri and Lakshmi, 2015). Many complementary and alternative medicines have enjoyed increased popularity in recent decades. Efforts to validate their use have seen their putative therapeutic properties come under increasing scrutiny in vitro and, in some cases, in vivo. One such product is tea tree oil (TTO), the volatile essential oil derived mainly from the Australian native plant Melaleuca alternifolia (Melaleuca alternifolia, 2006). Tea tree oil (TTO), or melaleuca oil, is an essential oil with a fresh camphoraceous odor and a colour that ranges from pale yellow to nearly colourless and clear Tea tree oil is toxic when taken by mouth, (Russell, 2009), but is widely used in low concentrations in cosmetics and skin washes (SCCP, 2008).

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Tea tree oil has been claimed to be useful for treating a wide variety of medical, conditions. It shows some promise as an antimicrobial. Tea tree oil may be effective in a variety of dermatologic conditions, including dandruff, acne, lice, herpes, and other skin infections (Pazyar, 2013). However, the quality of the evidence is low (Tea tree oil, 2016) and tea tree oil is not recommended for treating fungal infections or for use on children (Fungal nail infection, 2014; Fungal skin infection – foot, 2017 and Eisenhower, 2012). Employed largely for its anti inflammatory properties, TTO is incorporated as the active ingredient in many topical formulations used to treat cutaneous infections. It is widely available over the counter in Australia, Europe, and North America and is marketed as a remedy for various ailments. The present study is done to analyse the anti-inflammatory effects of Tea Oil.

MATERIAL AND METHODS

Invitro anti-inflammatory activity: Inhibition of protein denaturation

The denaturation of proteins is one of the cause of inflammation. Hence, protein denaturation can be employed as in vitro screening model for anti- inflammatory compounds. The reaction mixture consists of test extract at different concentrations and 1% aqueous solution of bovine albumin fraction. pH of the reaction mixture was adjusted using small amount of 1N HCl.

Table 1. Protein denaturation inhibiting activity of tea tree essential oil

Sample Concentration	Percentage activity	Control (Aspirin) concentration (MG)	Percentage Activity
20	6.76±0.90	50	17.97±0.50
40	19.35±0.85	100	32.68±0.57
60	32.43±1.25	150	47.39±1.50
80	58.46±1.22	200	63.07±1.46
100	72.68±1.16	250	77.12±1.42

The samples were incubated at 37oC for 20 min and then heated at 57oC for 20 min. After cooling the samples, the turbidity was measured spectrophotometrically at 660 nm. The experiment was performed in triplicate.

Percent inhibition of protein denaturation was calculated as follows: Percentage inhibition = (Abs control – Abs sample) X 100/ Abs control.

RESULTS AND DISCUSSION

The sample concentration of 20 µl is compared with control concentration of 50 MG while 40µl is compared with 100 MG, 60µl is compared with 150 MG, 80µl is compared with 200 MG and 100µl is compared with 250MG. The control is Aspirin. This test is done in vitro while the test by C.F.Carson et.al is done in vitro and in Vivo. The test is done to assess both the anti microbial properties and anti inflammatory properties while our study is totally based on the anti inflammatory properties of tea tree oil. In another study done by Dr. John Finlay et al, the results suggest that TTO may enable neutrophils to be fully active in an acute inflammatory response and eliminate foreign antigens (Essential oils, 1996). In the study done by Koh KJ et.al they proved that tea tree oil reduces histamine induced inflammation (Koh). This is the first study experimentally to prove that tea tree oil can reduce histamine induced inflammation which is similar to the present study. The latter mentioned that it can be used against gingival inflammation because of its anti inflammatory properties. While comparing sample concentration of tea tree oil with the control concentration. At the concentration of 100 µl, Tea tree oil showed significant activity as that of the Control.

Conclusion

The results show that Tea tree oil has significant anti-inflammatory effects when compared to Control. Even though Aspirin has a good anti inflammatory activity, it has a lot of side of effects and the constant use of Aspirin has a lot of risk factors. So it will be better to use a natural product with lesser side effects. Natural product are safe and has less risk factor so it can be preferred more and used against inflammation of gums and also in toothpastes.

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