

Editorial Note on Tea Tree Oil (*Melaleuca alternifolia*)

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EDITORIAL

The use of essential oils (EOs) in the perfumery, agriculture, food industry and cosmetics is quite common owing to their aromatic properties. Essential oils, isolated from various plant sources, are commonly utilized in first aid treatment of wounds, burns or abscesses. Recent studies shed the light on their unique antimicrobial, pesticidal, wound-healing promoting and antioxidant properties, owing to their pharmacologically active compounds, e.g. borneol, camphor, terpinen-4-ol, eucalyptol and many other compounds. Tea tree oil is an EO with immense potential for the treatment of dermatological disorders due to its antimicrobial properties against broad spectrum of micro-organisms. Tea tree oil is the essential oil obtained by steam distillation from the Australian native plant *Melaleuca alternifolia* by steam distillation and is used medicinally as a topical antiseptic. Its hydrophobic nature, volatility and sensitivity to light, air and temperature, pose challenges to formulation scientists for its effective delivery. Tea Tree oil is reported as a safe, natural and effective agent. The antibacterial and antiseptic properties of tea tree oil are legendary and have been used for centuries. Tea tree oil is commonly used to treat acne, athlete's foot, lice, nail fungus and insect bites.

Tea tree oil is composed of terpene hydrocarbons, mainly sesquiterpenes, monoterpenes, and their associated alcohols. Terpenes are volatile, aromatic hydrocarbons and may be considered polymers of isoprene, which has the formula C_5H_8 . The use of essential oils, in the biological control against mold and for the detoxification of their mycotoxins, is mainly due to their richness in antimicrobial and antioxidant substances. Administration of

M. alternifolia EO in diluted form is without adverse effects. The toxicity of this EO was demonstrated in high doses for humans and animals.

Tea tree oil is produced by steam distillation of the leaves and terminal branches of *M. alternifolia*. Once condensed, the clear to pale yellow oil is separated from the aqueous distillate. Essential oils of *M. alternifolia* was analyzed using GC/MS. GC/MS analysis of *M. alternifolia* essential oils revealed richness in oxygenated monoterpenes, representing 51.06% and 69.61% of the total oil composition. Essential oil-impregnated film-forming solutions were ultrasonically treated for 10 min to expel air bubbles.

M. alternifolia essential oil displayed wide applications in dermatology, effectively treating multiple skin diseases and infections. It is currently being amalgamated in a plethora of skin care products owing to its antimicrobial properties, predominantly due to terpinen-4-ol, its major constituent. Numerous reports showed that the anti-inflammatory, anti-oxidant, and antimicrobial properties of tea tree oil contribute to its wound healing potential. Furthermore, tea tree oil inhibited lipopolysaccharide-induced production of tumor necrosis factor-alpha, interleukin-1 β and IL-10. It has been shown that terpinen-4-ol, but not α -terpineol or 1,8-cineole, was responsible for reducing the production of inflammatory mediators. For many years cineole was erroneously considered to be a skin and mucous membrane irritant, fuelling efforts to minimize its level in tea tree oil. The cost-effectiveness of any potential tea tree oil treatments must also be considered. For example, Tea tree oil therapy may offer no cost advantage over the azoles in the treatment of tinea but is probably more economical than treatment with the allylamines.

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