



## Bio-Eco-Bio Nanotechnology in (Bio-Eco-Bio Origin Plants) Essential Oils: A Review

*Amit Rastogi<sup>1</sup>, Elena Baryshnikova<sup>2</sup>, Sarah Jordan<sup>3</sup>, Josephine Langford<sup>4</sup>, Luize Salmgrieze<sup>5</sup>, Josephine Langford<sup>6</sup>, Clarie Holt<sup>7</sup>*

<sup>1</sup>Research Scientist cum Research Assistant Professor cum CEO cum Director Executive, Amit Biosciences & Bio Nanotechnology, An Autonomous Non-Employed Non-Profit Non Government Research & Development

<sup>2</sup>Co – Founder, Amit Biosciences & Bionanotechnology

<sup>3</sup>Non Payment Executive Advisor Council Member, Amit Biosciences & Bionanotechnology

<sup>4</sup>Non Payment Executive Advisor Council Member, Amit Biosciences & Bionanotechnology

<sup>5</sup>Non Payment Executive Advisor Council Member, Amit Biosciences & Bionanotechnology

<sup>6</sup>Non Payment Executive Advisor Council Member, Amit Biosciences & Bionanotechnology

<sup>7</sup>Non Payment Executive Advisor Council Member, Amit Biosciences & Bionanotechnology

### Introduction

As nanobiotechnology is rapidly growing field all around the world and getting attention of scientists for making nanoparticles and nanomaterials using plants as main source for their production. Now a days, volatiles oils based nanoparticles and nanomaterials are in the demands for industries because they are biodegradable, carbon neutral, have low environmental risk as well as beneficial for human and animal health and safety (Bakkali et al. 2008). Since many long years scientist and researchers are extracting volatile oils from plants and plants parts such as flowers. These volatile oils show complexity and variability in their biochemical composition. Because of this volatile oil based formulation and nano formulations are being used in cosmetics and pharmaceutical industries. These essential oil based volatile oils shows antimicrobial, antifungal and anti viral activity. Nanoemulsions are oil in water dispersions with droplet diameter having 10-100nm range. Nanoemulsion exhibits several advantages including greater physical stability, high bioavailability, and optical transparency which make them applicable in cosmetic, food and pharmaceutical industries. **In the Present Review Amit Rastogi is Discussing Bio-Eco-Bio Essential Oil from Plant of Male & Female Beneficial Origin & Non Toxic too.**

### Rosemary (*Rosmarinus officinalis*) essential oil

Rosemary (*Rosmarinus officinalis*) essential oil has various qualities which include antioxidant, anti-inflammatory, antimicrobial, fungicidal, and anti-cancer activities are mainly devoted of its flavonoids and terpenes content. However, till now, topical benefits of rosemary essential oil have not been clearly demonstrated.

### *Zataria multiflora* Essential oil (ZEO)

*Zataria multiflora* is commonly called Avishan-e-Shirazi which is currently being used to extract essential oil (EO) for various biological activities such as antifungal, anti-inflammatory, anti-microbial, and antierythma mainly. Such biological activities of this EO is due to the presence of high quality of carvacrol, and thymol as main phenolic compounds and p-cymene as the main non phenolic compound. However, first we have to extract its essential oil to perform these biological activities. Essential oil extraction from the arial part of *Z. multiflora* was carried out using a Clevenger- type apparatus. The extraction was carried out for 2 hours and the oil was stored in dark glass bottle in a freezer until further use (Attaran et al. 2018). *Zataria multiflora* essential oil (ZEO), was nanoencapsulated to fabricate chitosan nanoparticles which was showing improved stability and antifungal activity against a pathogenic bacterial isolate named *Butyris cinerea* which causes gray mould disease (Mohammadi et al. 2015).

Researchers are involved in to represent the applicability of SLNs as carrier for EO transportation. Recent investigation suggested the application of solid lipid nanoparticles (SLNs) as carriers for essential oil delivery as a drug for various applications such as skin sensitizing effect. Essential oil extracted from the leaf of *Zataria multiflora* was efficiently encapsulated in SLNs. These SLNs were suitable carrier for essential oils.

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### Thyme essential oil

Thyme essential oil is being encapsulating in a chitosan benzoic acid nanogel to perform different function such as a potent antifungal, antiviral and antibacterial agents. The main component of this thyme essential oil is Thymol. Wattanasatcha et al. (2012), fabricated thymol loaded Zein (a maize protein) colloidal based nanoparticles film coated with sodium caseinate to perform it as emulsifier. This microbial (nanosphere) film was able to show application in packaging material for protecting and preventing microbial infection. This film was completely in charge to perform two drug phase drug release kinetics which can be possibly used as sustained drug release material.

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### Melaleuca alterniflora essential oil

*Melaleuca alterniflora* essential oil (also known as tea tree oil) which is also known as tea tree oil represents antifungal effect against pathogenic fungi *Trichophyton rubrum* (Flores et al. 2013).

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### Carvacrol-Oregano essential oil

Carvacrol-Oregano essential oil is also applicable to represent antimicrobial activity. This essential oil was encapsulated into a nanocarrier (PLGA) to perform drug delivery application against microbial bio film (Lambert et al. 2001).

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### Final remarks

Volatile oils are requirement to fabricate green nanoparticles strategies to be utilized in cosmetic, fragrance, and volatile oils based ointments.

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