

Research & Reviews: Journal of Pharmacognosy and Phytochemistry

BIOLOGICAL ACTIVITIES OF ESSENTIAL OILS

A. Divya

Department of Pharmaceutics, Ratnam Institute of Pharmacy, Nellore, AP, India

Short Communication

Received date: 20/04/2015

Accepted date: 22/04/2015

Published date: 27/04/2015

*For Correspondence

Divya A, Department of Pharmaceutics, Ratnam Institute of Pharmacy, Nellore, AP, India.

E-mail: Divyapharma15@gmail.com

INTRODUCTION

Essential oils are liquid merchandise of steam or water distillation of plant components (leaves, stems, bark, seeds, fruits, roots and plant exudates). Expression is employed completely for the extraction of citrus oil from the fruit peel, as a result of chemical components of the oil are simply broken by heat. An essential oil may contain many hundred chemical elements and this advanced mixture of compounds offers the oil its characteristic fragrance and flavour. The plant components will be extracted with organic solvents to supply oleoresins, concretes and absolutes or extracted with close to or critical solvent like dioxide to supply terribly prime quality extracts. These oleoresins and extracts contain not solely the volatile oil however additionally the targeted non-volatile flavour elements and these have wide application within the food and pharmaceutical industries. The solvent extraction processes are harder and sophisticated than steam distillation and can ordinarily be on the far side the money resources of most little scale processors, however activity the raw materials to those extraction plants will be a market choice^[1-3].

ESSENTIAL OILS AS ANTIOXIDANT AGENTS

Free radicals different reactive element species turn out reaction of proteins, amino acids, unsaturated lipids and Deoxyribonucleic acid. The human body has defense mechanisms against free radicals present in most of the cells. Balance between free radicals and antioxidants can be recovered from an external supply of antioxidants^[4-6]. Essential oils are rich in phenolic compounds, and for this reason, attract investigators to gauge their activity as antioxidants or free radical scavengers. The essential oils of basil, cinnamon, clove, nutmeg, oregano and thyme have tested radical-scavenging and antioxidant properties in the DPPH radical assay at room temperature^[7,8].

ESSENTIAL OILS AS ANTIBACTERIAL AGENTS

Essential oils will act as antibacterial agents against a wide spectrum of morbidic bacterial strains, including: *Listeria monocytogenes*, *Listeria innocua*, *Salmonella typhimurium*, *Escherichia coli* O157:H7, *Shigella dysenteria*, *Bacillus cereus*, *Staphylococcus aureus* and *Salmonella typhimurium* etc. Also, *Commiphora africana* volatile oil can inhibit some pathogenic bacterial strains, such as *Staphylococcus aureus*, *Escherichia coli*, *Candida albicans* and *Helicobacter pylori*. The activity of *Commiphora africana* volatile oil against *Helicobacter Pylori*, is comparable to the one in every of notable antimicrobial agents, however the latter might favor the emergence of resistant colonies and conjointly gift a possible for the disruption of intestinal microbial flora, that is liable for facet effects^[9-25].

ESSENTIAL OILS AS ANTIFUNGAL AGENTS

It has been estimated that many of the people in industrialized countries suffer from a food borne illness annually. One such chance is the use of essential oils as food additives that may act as antibacterial and antifungal additives. The antimicrobial activity of essential oils was monitored by the macrodilution technique. The mycelia growth inhibition, fungi static and fungicidal concentrations were recorded for each strain that showed sensitivity to the essential oils. The essential oils of catnip, cinnamon,

tea tree and thyme essential oils exhibited large spectrum antimicrobial activities. Strong in vitro evidence indicates that some essential oils like *Thymus schimperi* Ronniger essential oil, can act as antibacterial agents against a wide spectrum of pathogenic fungal isolates including *Penicillium chrysogenum*, *Verticillium sp.*, *Aspergillus tubingensis*, *Aspergillus minutus*, *Beauveria bassiana* and *Microsporium gypseum* [26-30].

ACKNOWLEDGEMENT

I would like to thank my colleagues Sateesh Vemuri, Rakesh Mederametla for their everlasting support.

This short commentary is reviewed and approved by Murali M.

REFERENCES

- Douglas M, Heyes J, Smallfield B. Herbs, spices and essential oils: post-harvest operations in developing countries. Food and Agriculture Organization of the United Nations (FAO). 2005.
- Green C. Export Development of Essential Oils and Spices by Cambodia. International Trade Centre. Geneva. 2002.
- Marketing Manual and Web Directory for Organic Spices, Herbs and Essential Oils. International Trade Centre (ITC) UNCTAD/WTO. 2004.
- Gardner P. Superoxide-driven aconitase FE-S center cycling. Biosci Rep. 1997; 17: 33-42.
- Butterfield DA, Lauderback CM. Lipid peroxidation and protein oxidation in Alzheimer's disease brain: Potential causes and consequences involving amyloid beta-peptide associated free radical oxidative stress. Free Radic Biol Med. 2002; 32: 1050-1060.
- Zarkovic N. 4-Hydroxynonenal as a bioactive marker of pathophysiological processes. Mol Aspects Med. 2003; 24: 281-291.
- Halliwell B, Gutteridge JM. The antioxidants of human extracellular fluids. Arch Biochem Biophys. 1990; 280: 1-8.
- Abdollahi M, Ranjbar A, Shadnia S, Nikfar S, Rezaie A. Pesticides and oxidative stress: a review. Med Sci Monit. 2004; 10: 141-147.
- Food safety and foodborne illness. World Health Organization Fact sheet 237, Geneva, Switzerland, 2002.
- World health report 2002: Reducing risks, promoting healthy life. World Health Organization, Geneva, Switzerland.
- Guideline: Sodium intake for adults and children, World Health Organization (WHO), Geneva, Switzerland.
- Smith RL, Cohen SM, Doull J, Feron VJ, Goodman JI, et al. A procedure for the safety evaluation of natural flavor complexes used as ingredients in food: Essential oils. Food Chem Toxicol. 2005; 43: 345-363.
- Hajhashemi V, Ghannadi A, Sharif B. Anti-inflammatory and analgesic properties of the leaf extracts and essential oil of *Lavandula angustifolia* Mill. J Ethnopharmacol. 2003; 89: 67-71.
- Perry NS, Bollen C, Perry EK, Ballard C. *Salvia* for dementia therapy: review of pharmacological activity and pilot tolerability clinical trial. Pharmacol.Biochem Behav. 2003; 75: 651-659.
- Carson CF, Riley TV. Non-antibiotic therapies for infectious diseases. Commun Dis Intell. 2003; 27: 143-146.
- Jirovetz L, Buchbauer G, Denkova Z. Antimicrobial testing's and gas chromatographic analysis of pure oxygenated monoterpenes 1,8-cineol, α -terpineol, terpene-4-ol and camphor as well as target compounds in essential oils of pine (*Pinus pinaster*), rosemary (*Rosmarinus officinalis*) and tee tree (*Melaleuca alternifolia*). Sci Pharm. 2005; 73: 27-39.
- Burt S. Essential oils: Their antibacterial properties and potential applications in foods- A review. Int J Food Microbiol. 2004; 94: 223-253.
- Angioni A, Barra A, Coroneo V, Dessi S, Cabras P. Chemical composition, seasonal variability, and antifungal activity of *Lavandula stoechas* L. ssp. *stoechas* essential oils from stem/leaves and flowers. J Agric Food Chem. 2006; 54: 4364-4370.
- Simic A, Sokovic MD, Ristic M, Grujic-Jovanovic S, Vukojevic JJ, et al. The chemical composition of some Lauraceae essential oils and their antifungal activities. Phytother Res. 2004; 18: 713-717.
- Leistner L. Hurdle effect and energy saving. In: Downey WK (Ed), Food Quality and Nutrition, Applied Science Publ., London, UK. 1978; 553.
- Deans S, Ritchie G. Antibacterial properties of plant essential oils. Int J Food Microbiol. 1987; 5: 165-180.
- Akor JS, Anjorin TS. Phytochemical and antimicrobial studies of *Commiphora africana* (A. Rich) Engl. root extracts. Int J Agric Biol. 2009; 11: 795-797.

23. Epifano F, Menghini L, Pagiotti R, Angelini P, Genovese S, et al. In vitro inhibitory activity of boropinic acid against *Helicobacter pylori*. *Bio org Med Chem Lett*. 2006; 16: 5523-5525.
24. Tuley de Silva K. A Manual on the essential oil industry. United Nations Industrial Development Organization, Vienna 1996, p. 232.
25. Smid EJ, Gorris LGM. Natural antimicrobials for food preservation. In: Rahman MS (Ed.), *Handbook of Food Preservation*. Marcel Dekker, New York, USA. 1999, pp. 285-308.
26. Angelini P, Pagiotti R, Menghini A, Vianello B. Antimicrobial activities of various essential oils against foodborne pathogenic or spoilage moulds. *Ann Microbiol*. 2006; 56: 65-69.
27. Pfaller MA, Diekema DJ. Rare and emerging opportunistic fungal pathogens: Concern for resistance beyond *Candida albicans* and *Aspergillus fumigatus*. *J Clin Microbiol*. 2004; 42: 4419-4431.
28. Singh N, Rogers P, Atwood CW, Wagener MM, Yu VL. Short-course empiric antibiotic therapy for patients with pulmonary infiltrates in the intensive care unit. *Am J Resp Crit Care Med*. 2000; 162: 505-511.
29. Fridkin SK. The changing face of fungal infections in health care settings. *Clin Infect Dis*. 2005; 41: 1455-1460.
30. Angelini P, Rubini A, Gigante D, Reale L, Pagiotti R, et al. The endophytic fungal communities associated with the leaves and roots of the common reed (*Phragmites australis*) in Lake Trasimeno (Perugia, Italy) in declining and healthy stands. *Fungal Ecol*. 2012; 5: 683-693.