



HOW TO USE ESSENTIAL OILS TO “VIRUS PROOF” YOUR ENVIRONMENT

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As you know the H5N1 virus can be spread many ways as it is often airborne and infects people by being breathed in. It also lurks on surfaces that may be touched and then transferred to the eyes, nose or mouth (and even to ears, as proposed by some scientists), where it may gain entry to the body.

With this in mind it is helpful to sanitise your direct environment in order to render it as virally “unfriendly” as possible. In the field of complementary medicine there are some amazingly powerful essential oils that are anti-bacterial, anti-viral and anti-fungal.

WHAT IS AN ESSENTIAL OIL?

An essential oil is a concentrated, hydrophobic (water repelling) liquid containing volatile aromatic compounds which are extracted from a wide variety of plants.

In fact, essential oils are not really oils at all but are highly concentrated, “essences” of plants. This aromatic essence can be produced by distillation, expression, or solvent extraction. Essential oils are used in perfumery, aromatherapy, cosmetics, incense, medicine, household cleaning products and for flavouring food and drink.

Useful anti-viral and anti-bacterial essential oils are commonly available and include oils such as Cloves, Tea-tree and Lavender, Rosemary, Eucalyptus etc.

HISTORICAL USE OF ESSENTIAL OILS

The Bubonic Plague (caused by the *Yersinia pestis* bacillus) decimated the European population in the Middle Ages and it is estimated to have killed over 30% of the population. However, in the affected areas, it was noted that the people who worked in Lavender distilleries – particularly in France - and in jobs that incorporated the use of Lavender rarely became ill. (France has long been a world leader in the practice of and research into essential oils in general, and the anti-infectious use of essential oils in particular.) As a consequence, recipes for preventing plague by using various essential oils became popular during this time. People carried bundles of dried herbs that were suffused with essential oils to ward off the plague.

There has been a steady accumulation of evidence – both anecdotal and research based – in recent years that supports the positive benefits of essential oils. Many oils are now accepted to have anti-viral and anti-bacterial properties.



In studies of essential oils, specific components have been isolated and found to have anti-viral properties. These include anethole, carvone, beta-caryophyllene, citral, eugenol, limonene, linalool, and linalyl acetate.

HOW CAN ESSENTIAL OILS HELP VIRUS-PROOF MY ENVIRONMENT?

Because of the increasing amount of research into essential oils, scientists have discovered that different plant families and the essential oils extracted from them, exhibit varying degrees of anti-viral effectiveness¹⁻¹⁴, depending on the virus strain. This seems to be primarily due to the particular molecular structures found in each type of oil.

Researchers think that the different types of oils penetrate different viruses in different ways and to varying degrees. So, the effect on each virus strain depends also on the virus structure (enveloped, non-enveloped, molecular symmetry, etc.). Scientists propose that one of the reasons for essential oils' antiviral effectiveness is their lipophilic character (they are "attracted" to oils and fats).

Essential oils are easily absorbed into your body's tissues, where they can produce excellent results. Interestingly, when studying the anti-viral effects of essential oils, scientists have found that normal cells seemed to acquire a special resistance to viral penetration when treated with anti-viral essential oils, although the exact reason for this effect is not yet known.

HOW DO ESSENTIAL OILS PROTECT US FROM VIRUSES?

There are several reasons why essential oils have a marked antiviral effect. Scientists have proposed that some essential oils obstruct surface glycoproteins in the viral envelope, thus preventing attachment of the virus to host cells. Other essential oils seem to assail viruses in the host cells, possibly at the level of the cell membrane¹⁵. Some essential oils are also known for their ability to modify your immune response and may offer some indirect protection against viral infection in this way.

At the time of writing this book, there are no studies which have examined the effectiveness of essential oils against the current COVID-19 virus, specifically. However, since essential oils have been shown to have effects against a very wide range of other viruses, the use of some of these oils is strongly recommended.

HOW TO USE ESSENTIAL OILS TO COMBAT ENVIRONMENTAL VIRAL HAZARDS

Essential oils can be dispersed with an atomizer (one to five drops essential oil for every 3 tablespoons of distilled water). For a very basic anti-microbial spray, mix a few drops of the essential oils of Lavender and Tea-tree with distilled water in a plant sprayer and spray liberally around your rooms.

Spritz the air regularly. Do feel free to add other oils as desired, as various oils do have differing anti-microbial effects – so there is a good rationale for using a mixture of any of the following essential oils:

Cloves¹⁶⁻²², Cinnamon²³⁻³¹, Thyme^{16,32-38}, Oregano³⁹⁻⁴⁵, Lavender⁴⁶⁻⁵¹, Sweet Marjoram⁵²⁻⁵⁶, Peppermint⁵⁷⁻⁶⁶, Tea-tree⁶⁷⁻⁸⁰.

Of particular relevance to Coronavirus / COVID-19; one research study has found that the essential oils mentioned above have specific properties which protect our respiratory tract from pathogens.

You can also evaporate essential oils into your environment using an “Oil Burner”. This does not in fact, actually burn the oil. Rather, a candle is placed under a small water-filled reservoir to which the essential oils have been added. As the flame heats up the water, the oils evaporate into the atmosphere.



Viral spread in the work place is a real concern – so it is essential to make sure that surfaces such as desks, keyboards and door handles are wiped over regularly with a Lavender-Tea-tree solution and it is vital to remember to disinfect telephone handsets and mouthpieces.

Make your own essential oil inhaler by dropping your favoured antimicrobial essential oils onto cotton wool and enclosing these in a plastic bag – so as to slow down the evaporation of the oils. Sniff this as desired.

Note that for regular inhalation, Lavender and Tea-tree are both safe. Some essential oils must be used with caution and it is wise to check on The Complementary Medical Association’s website The-CMA.Org.UK if you need more information about a particular essential oil.

About Jayney Goddard MSc, FCMA, Lic.LCCH, Dip.ACH, FRSM - President - [The Complementary Medical Association](#)

Jayney Goddard is considered to be one of the world's leading experts in the complementary medicine and natural health fields. She is the author of the global bestseller "Rewind Your Body Clock: The Complete Natural Guide to a Happier, Healthier, Younger You", she's a popular broadcaster, lecturer and journalist and an acknowledged thought leader and influencer in the health care arena. Jayney is the recipient of the "camexpo" award for Outstanding Contribution to Complementary Medicine and she has a special interest in immunology and anti-ageing. Natural Health magazine call Jayney "The UK's Natural Youth Guru". Jayney bases all her natural health recommendations upon strong scientific evidence, so that you know that everything she suggests is safe - and highly effective! She is the Founder and a Fellow of The Complementary Medical Association, a Fellow of the Royal Society of Medicine and a Fellow of the Royal Society of Public Health.

About The CMA:

The Complementary Medical Association is the world's leading and most highly respected professional Membership Association for Complementary Medical and Natural Healthcare practitioners, schools and suppliers.

Get Jayney's latest No 1 bestselling book, "Rewind Your Body Clock" online at Amazon etc. and in all bookshops.



For natural health and youthful, joyful vibrance tips and techniques, join Jayney's Private, Member's Only FaceBook Group: [Rewind Your Body Clock with Jayney Goddard](#)

For more helpful information on all aspects of complementary medicine and natural health please visit The Complementary Medical Association's website: The-CMA.org.uk

REFERENCES & FURTHER READING

- 1 Reichling J, Koch C, Stahl-Biskup E, Sojka C, Schnitzler P. Virucidal activity of a beta-triketonerich essential oil of *Leptospermum scoparium* (manuka oil) against HSV-1 and HSV-2 in cell culture. *Planta Med.* 2005 Dec;71(12):1123-7.
- 2 Duschatzky CB, Possetto ML, Talarico LB, Garcia CC, Michis F, Almeida NV, de Lampasona MP, Schuff C, Damonte EB. Evaluation of chemical and anti-viral properties of essential oils from South American plants. *Antivir Chem Chemother.* 2005;16(4):247-51.
- 3 Allahverdiyev A, Duran N, Ozguven M, Koltas S. Antiviral activity of the volatile oils of *Melissa officinalis* L. against Herpes simplex virus type-2. *Phytomedicine.* 2004 Nov;11(7-8):657-61.
- 4 Sinico C, De Logu A, Lai F, Valenti D, Manconi M, Loy G, Bonsignore L, Fadda AM. Liposomal incorporation of *Artemisia arborescens* L. essential oil and in vitro antiviral activity. *Eur J Pharm Biopharm.* 2005 Jan;59(1):161-8.
- 5 Vijayan P, Raghu C, Ashok G, Dhanaraj SA, Suresh B. Antiviral activity of medicinal plants of Nilgiris. *Indian J Med Res.* 2004 Jul;120(1):24-9.
- 6 Sokmen M, Serkedjieva J, Daferera D, Gulluce M, Polissiou M, Tepe B, Akpulat HA, Sahin F, Sokmen A. In vitro antioxidant, antimicrobial, and antiviral activities of the essential oil and various extracts from herbal parts and callus cultures of *Origanum acutidens*. *J Agric Food Chem.* 2004 Jun 2;52(11):3309-12.
- 7 Garcia CC, Talarico L, Almeida N, Colombres S, Duschatzky C, Damonte EB. Virucidal activity of essential oils from aromatic plants of San Luis, Argentina. *Phytother Res.* 2003 Nov;17(9):1073-5.
- 8 Minami M, Kita M, Nakaya T, Yamamoto T, Kuriyama H, Imanishi J. The inhibitory effect of essential oils on herpes simplex virus type-1 replication in vitro. *Microbiol Immunol.* 2003;47(9):681-4.
- 9 Schuhmacher A, Reichling J, Schnitzler P. Virucidal effect of peppermint oil on the enveloped viruses herpes simplex virus type 1 and type 2 in vitro. *Phytomedicine.* 2003;10(6-7):504-10.
- 10 Zhang B, Chen J, Li H, Xu X. [Study on the *Rheum palmatum* volatile oil against HBV in cell culture in vitro] *Zhong Yao Cai.* 1998 Oct;21(10):524-6. Chinese.
- 11 Primo V, Rovera M, Zanon S, Oliva M, Demo M, Daghero J, Sabini L. [Determination of the antibacterial and antiviral activity of the essential oil from *Minthostachys verticillata* (Griseb.) Epling] *Rev Argent Microbiol.* 2001 Apr-Jun;33(2):113-7. Spanish.

- 12 Schnitzler P, Schon K, Reichling J. Antiviral activity of Australian tea tree oil and eucalyptus oil against herpes simplex virus in cell culture. *Pharmazie*. 2001 Apr;56(4):343-7.
- 13 De Logu A, Loy G, Pellerano ML, Bonsignore L, Schivo ML. Inactivation of HSV-1 and HSV-2 and prevention of cell-to-cell virus spread by *Santolina insularis* essential oil. *Antiviral Res*. 2000 Dec;48(3):177-85.
- 14 Benencia F, Courreges MC. Antiviral activity of sandalwood oil against herpes simplex viruses-1 and -2. *Phytomedicine*. 1999 May;6(2):119-23.
- 15 J Appl Microbiol. 2000 Jan;88(1):170-5. The mode of antimicrobial action of the essential oil of *Melaleuca alternifolia* (tea tree oil). Cox SD, Mann CM, Markham JL, Bell HC, Gustafson JE, Warmington JR, Wyllie SG. Centre for Biostructural and Biomolecular Research, University of Western Sydney, Hawkesbury, New South Wales, Western Australia. s.cox@uws.edu.au
- 16 Phytother Res. 2000 Nov;14(7):510-6. Inhibitory effects of sudanese medicinal plant extracts on hepatitis C virus (HCV) protease. Hussein G, Miyashiro H, Nakamura N, Hattori M, Kakiuchi N, Shimotohno K. Institute of Natural Medicine, Toyama Medical and Pharmaceutical University, 2630 Sugitani, Toyama 930-0194, Japan.
- 17 J Appl Microbiol. 2000 Feb;88(2):308-16. Antimicrobial agents from plants: antibacterial activity of plant volatile oils. Dorman HJ, Deans SG. Aromatic and Medicinal Plant Group, Scottish Agricultural College, Auchincruive, South Ayrshire, UK.
- 18 Kurokawa M, Hozumi T, Basnet P, Nakano M, Kadota S, Namba T, Kawana T, Shiraki K. Purification and characterization of eugenin as an anti-herpesvirus compound from *Geum japonicum* and *Syzygium aromaticum*. *J Pharmacol Exp Ther*. 1998 Feb;284(2):728-35.
- 19 Shiraki K, Yukawa T, Kurokawa M, Kageyama S. [Cytomegalovirus infection and its possible treatment with herbal medicines] *Nippon Rinsho*. 1998 Jan;56(1):156-60. Review. Japanese.
- 20 Cai L, Wu CD. Compounds from *Syzygium aromaticum* possessing growth inhibitory activity against oral pathogens. *J Nat Prod*. 1996 Oct;59(10):987-90.
- 21 Yukawa TA, Kurokawa M, Sato H, Yoshida Y, Kageyama S, Hasegawa T, Namba T, Imakita M, Hozumi T, Shiraki K. Prophylactic treatment of cytomegalovirus infection with traditional herbs. *Antiviral Res*. 1996 Oct;32(2):63-70.
- 22 Kurokawa M, Nagasaka K, Hirabayashi T, Uyama S, Sato H, Kageyama T, Kadota S, Ohyama H, Hozumi T, Namba T, et al. Efficacy of traditional herbal medicines in combination with acyclovir against herpes simplex virus type 1 infection in vitro and in vivo. *Antiviral Res*. 1995 May;27(1-2):19-37.
- 23 O'Mahony R, Al-Khtheeri H, Weerasekera D, Fernando N, Vaira D, Holton J, Basset C. Bactericidal and anti-adhesive properties of culinary and medicinal plants against *Helicobacter pylori*. *World J Gastroenterol*. 2005 Dec 21;11(47):7499-507.

- 24 Matan N, Rimkeeree H, Mawson AJ, Chompreeda P, Haruthaithanasan V, Parker M. Antimicrobial activity of cinnamon and clove oils under modified atmosphere conditions. *Int J Food Microbiol.* 2006 Mar 15;107(2):180-5. Epub 2005 Nov 2.
- 25 Yang YC, Lee HS, Lee SH, Clark JM, Ahn YJ. Ovicidal and adulticidal activities of *Cinnamomum zeylanicum* bark essential oil compounds and related compounds against *Pediculus humanus capitis* (Anoplura: Pediculidae). *Int J Parasitol.* 2005 Dec;35(14):1595-600. Epub 2005 Sep 15.
- 26 Cheng SS, Liu JY, Hsui YR, Chang ST. Chemical polymorphism and antifungal activity of essential oils from leaves of different provenances of indigenous cinnamon (*Cinnamomum osmophloeum*). *Bioresour Technol.* 2006 Jan;97(2):306-12. Epub 2005 Apr 13.
- 27 Lopez P, Sanchez C, Batlle R, Nerin C. Solid- and vapor-phase antimicrobial activities of six essential oils: susceptibility of selected foodborne bacterial and fungal strains. *J Agric Food Chem.* 2005 Aug 24;53(17):6939-46.
- 28 Friedman M, Henika PR, Levin CE, Mandrell RE. Antibacterial activities of plant essential oils and their components against *Escherichia coli* O157:H7 and *Salmonella enterica* in apple juice. *J Agric Food Chem.* 2004 Sep 22;52(19):6042-8.
- 29 Friedman M, Buick R, Elliott CT. Antibacterial activities of naturally occurring compounds against antibiotic-resistant *Bacillus cereus* vegetative cells and spores, *Escherichia coli*, and *Staphylococcus aureus*. *J Food Prot.* 2004 Aug;67(8):1774-8.
- 30 Kalembe D, Kunicka A. Antibacterial and antifungal properties of essential oils. *Curr Med Chem.* 2003 May;10(10):813-29. Review.
- 31 Fabio A, Corona A, Forte E, Quaglio P. Inhibitory activity of spices and essential oils on psychrotrophic bacteria. *New Microbiol.* 2003 Jan;26(1):115-20.
- 32 Rasooli I, Rezaei MB, Allameh A. Ultrastructural studies on antimicrobial efficacy of thyme essential oils on *Listeria monocytogenes*. *Int J Infect Dis.* 2006 May;10(3):236-41. Epub 2006 Jan 10.
- 33 Lai PK, Roy J. Antimicrobial and chemopreventive properties of herbs and spices. *Curr Med Chem.* 2004 Jun;11(11):1451-60. Review.
- 34 Bagamboula CF, Uyttendaele M, Debevere J. Antimicrobial effect of spices and herbs on *Shigella sonnei* and *Shigella flexneri*. *J Food Prot.* 2003 Apr;66(4):668-73.
- 35 Kalembe D, Kunicka A. Antibacterial and antifungal properties of essential oils. *Curr Med Chem.* 2003 May;10(10):813-29. Review.
- 36 Dorman HJ, Deans SG. Antimicrobial agents from plants: antibacterial activity of plant volatile oils. *J Appl Microbiol.* 2000 Feb;88(2):308-16.
- 37 Cosentino S, Tuberoso CI, Pisano B, Satta M, Mascia V, Arzedi E, Palmas F. In-vitro antimicrobial activity and chemical composition of Sardinian *Thymus* essential oils. *Lett Appl*

Microbiol. 1999 Aug;29(2):130-5.

38 Smith-Palmer A, Stewart J, Fyfe L. Antimicrobial properties of plant essential oils and essences against five important food-borne pathogens. Lett Appl Microbiol. 1998 Feb;26(2):118-22.

39 Sokmen M, Serkedjieva J, Daferera D, Gulluce M, Polissiou M, Tepe B, Akpulat HA, Sahin F, Sokmen A. J Agric Food Chem. 2004 Jun 2;52(11):3309-12. In vitro antioxidant, antimicrobial, and antiviral activities of the essential oil and various extracts from herbal parts and callus cultures of *Origanum acutidens*.

40 Mol Cell Biochem. 2005 Apr;272(1-2):29-34. Minimum inhibitory concentrations of herbal essential oils and monolaurin for gram-positive and gram-negative bacteria. Preuss HG, Echard B, Enig M, Brook I, Elliott TB. Department of Physiology and Biophysics, Georgetown University Medical Center, Washington, DC 20057, USA. preussHG@georgetown.edu

41 Bozin B, Mimica-Dukic N, Simin N, Anackov G. Characterization of the volatile composition of essential oils of some lamiaceae spices and the antimicrobial and antioxidant activities of the entire oils. J Agric Food Chem. 2006 Mar 8;54(5):1822-8.

42 Chami F, Chami N, Bennis S, Bouchikhi T, Remmal A. Oregano and clove essential oils induce surface alteration of *Saccharomyces cerevisiae*. Phytother Res. 2005 May;19(5):405-8.

43 Arcila-Lozano CC, Loarca-Pina G, Lecona-Urbe S, Gonzalez de Mejia E. [Oregano: properties, composition and biological activity] Arch Latinoam Nutr. 2004 Mar;54(1):100-11. Review. Spanish.

44 Sokmen M, Serkedjieva J, Daferera D, Gulluce M, Polissiou M, Tepe B, Akpulat HA, Sahin F, Sokmen A. In vitro antioxidant, antimicrobial, and antiviral activities of the essential oil and various extracts from herbal parts and callus cultures of *Origanum acutidens*. J Agric Food Chem. 2004 Jun 2;52(11):3309-12.

45 Elgayyar M, Draughon FA, Golden DA, Mount JR. Antimicrobial activity of essential oils from plants against selected pathogenic and saprophytic microorganisms. J Food Prot. 2001 Jul;64(7):1019-24.

46 Hammer KA, Carson CF, Riley TV. Antimicrobial activity of essential oils and other plant extracts. J Appl Microbiol. 1999 Jun;86(6):985-90.

47 Forbes MA, Schmid MM. Use of OTC essential oils to clear plantar warts. Nurse Pract. 2006 Mar;31(3):53-5, 57.

48 D'Auria FD, Tecca M, Strippoli V, Salvatore G, Battinelli L, Mazzanti G. Antifungal activity of *Lavandula angustifolia* essential oil against *Candida albicans* yeast and mycelial form. Med Mycol. 2005 Aug;43(5):391-6.

49 Edwards-Jones V, Buck R, Shawcross SG, Dawson MM, Dunn K. The effect of essential oils on methicillin-resistant *Staphylococcus aureus* using a dressing model. Burns. 2004 Dec;30(8):772-7.

50 Cavanagh HM, Wilkinson JM. Biological activities of lavender essential oil. Phytother Res. 2002 Jun;16(4):301-8. Review.

- 51 Inouye S, Watanabe M, Nishiyama Y, Takeo K, Akao M, Yamaguchi H. Antisporulating and respiration inhibitory effects of essential oils on filamentous fungi. *Mycoses*. 1998 Nov;41(9-10):403-10.
- 52 Lopez P, Sanchez C, Batlle R, Nerin C. Solid- and vapor-phase antimicrobial activities of six essential oils: susceptibility of selected foodborne bacterial and fungal strains. *J Agric Food Chem*. 2005 Aug 24;53(17):6939-46.
- 53 Friedman M, Buick R, Elliott CT. Antibacterial activities of naturally occurring compounds against antibiotic-resistant *Bacillus cereus* vegetative cells and spores, *Escherichia coli*, and *Staphylococcus aureus*. *J Food Prot*. 2004 Aug;67(8):1774-8.
- 54 Lai PK, Roy J. Antimicrobial and chemopreventive properties of herbs and spices. *Curr Med Chem*. 2004 Jun;11(11):1451-60. Review.
- 55 Kalembe D, Kunicka A. Antibacterial and antifungal properties of essential oils. *Curr Med Chem*. 2003 May;10(10):813-29. Review.
- 56 Fabio A, Corona A, Forte E, Quaglio P. Inhibitory activity of spices and essential oils on psychrotrophic bacteria. *New Microbiol*. 2003 Jan;26(1):115-20. PMID: 12578319
- 57 Schuhmacher A, Reichling J, Schnitzler P. Virucidal effect of peppermint oil on the enveloped viruses herpes simplex virus type 1 and type 2 in vitro. *Phytomedicine*. 2003;10(6-7):504-10.
- 58 Logan AC, Beaulne TM. The treatment of small intestinal bacterial overgrowth with enteric-coated peppermint oil: a case report. *Altern Med Rev*. 2002 Oct;7(5):410-7.
- 59 Iscan G, Kirimer N, Kurkcuoglu M, Baser KH, Demirci F. Antimicrobial screening of *Mentha piperita* essential oils. *J Agric Food Chem*. 2002 Jul 3;50(14):3943-6. PMID: 12083863
- 60 Shapiro S, Meier A, Guggenheim B. The antimicrobial activity of essential oils and essential oil components towards oral bacteria. *Oral Microbiol Immunol*. 1994 Aug;9(4):202-8.
- 61 Edris AE, Farrag ES. Antifungal activity of peppermint and sweet basil essential oils and their major aroma constituents on some plant pathogenic fungi from the vapor phase. *Nahrung*. 2003 Apr;47(2):117-21. PMID: 12744290
- 62 Shkurupii VA, Kazarinova NV, Ogirenko AP, Nikonov SD, Tkachev AV, Tkachenko KG. [Efficiency of the use of peppermint (*Mentha piperita* L) essential oil inhalations in the combined multi-drug therapy for pulmonary tuberculosis] *Probl Tuberk*. 2002;(4):36-9. Russian.
- 63 Imai H, Osawa K, Yasuda H, Hamashima H, Arai T, Sasatsu M. Inhibition by the essential oils of peppermint and spearmint of the growth of pathogenic bacteria. *Microbios*. 2001;106 Suppl 1:31-9.
- 64 Pattnaik S, Subramanyam VR, Kole C. Antibacterial and antifungal activity of ten essential oils in vitro. *Microbios*. 1996;86(349):237-46.

65 Tassou CC, Drosinos EH, Nychas GJ. Effects of essential oil from mint (*Mentha piperita*) on *Salmonella enteritidis* and *Listeria monocytogenes* in model food systems at 4 degrees and 10 degrees C. *J Appl Bacteriol*. 1995 Jun;78(6):593-600.

66 Pattnaik S, Subramanyam VR, Rath CC. Effect of essential oils on the viability and morphology of *Escherichia coli* (SP-11). *Microbios*. 1995;84(340):195-9.

67 Bagg J, Jackson MS, Petrina Sweeney M, Ramage G, Davies AN. Susceptibility to *Melaleuca alternifolia* (tea tree) oil of yeasts isolated from the mouths of patients with advanced cancer. *Oral Oncol*. 2006 May;42(5):487-92. Epub 2006 Feb 20.

68 Carson CF, Hammer KA, Riley TV. *Melaleuca alternifolia* (Tea Tree) oil: a review of antimicrobial and other medicinal properties. *Clin Microbiol Rev*. 2006 Jan;19(1):50-62. Review.

69 Wilkinson JM, Cavanagh HM. Antibacterial activity of essential oils from Australian native plants. *Phytother Res*. 2005 Jul;19(7):643-6.

70 Al-Shuneigat J, Cox SD, Markham JL. Effects of a topical essential oil-containing formulation on biofilm-forming coagulase-negative staphylococci. *Lett Appl Microbiol*. 2005;41(1):52-5.

71 Halcon L, Milkus K. *Staphylococcus aureus* and wounds: a review of tea tree oil as a promising antimicrobial. *Am J Infect Control*. 2004 Nov;32(7):402-8. Review.

72 Carson CF, Mee BJ, Riley TV. Mechanism of action of *Melaleuca alternifolia* (tea tree) oil on *Staphylococcus aureus* determined by time-kill, lysis, leakage, and salt tolerance assays and electron microscopy. *Antimicrob Agents Chemother*. 2002 Jun;46(6):1914-20.

73 Kulik E, Lenkeit K, Meyer J. [Antimicrobial effects of tea tree oil (*Melaleuca alternifolia*) on oral microorganisms] *Schweiz Monatsschr Zahnmed*. 2000;110(11):125-30. German.

74 Sherry E, Boeck H, Warnke PH. Percutaneous treatment of chronic MRSA osteomyelitis with a novel plant-derived antiseptic. *BMC Surg*. 2001;1:1. Epub 2001 May 16.

75 Gustafson JE, Cox SD, Liew YC, Wyllie SG, Warmington JR. The bacterial multiple antibiotic resistant (Mar) phenotype leads to increased tolerance to tea tree oil. *Pathology*. 2001 May;33(2):211-5.

76 May J, Chan CH, King A, Williams L, French GL. Time-kill studies of tea tree oils on clinical isolates. *J Antimicrob Chemother*. 2000 May;45(5):639-43.

77 Cox SD, Mann CM, Markham JL, Bell HC, Gustafson JE, Warmington JR, Wyllie SG. The mode of antimicrobial action of the essential oil of *Melaleuca alternifolia* (tea tree oil). *J Appl Microbiol*. 2000 Jan;88(1):170-5.

78 Harkenthal M, Reichling J, Geiss HK, Saller R. Comparative study on the in vitro antibacterial activity of Australian tea tree oil, cajuput oil, niaouli oil, manuka oil, kanuka oil, and eucalyptus oil. *Pharmazie*. 1999 Jun;54(6):460-3.

79 Carson CF, Riley TV. Antimicrobial activity of the major components of the essential oil of *Melaleuca alternifolia*. *J Appl Bacteriol*. 1995 Mar;78(3):264-9. PMID: 7730203

80 Carson CF, Riley TV. Antimicrobial activity of the major components of the essential oil of *Melaleuca alternifolia*. *J Appl Bacteriol.* 1995 Mar;78(3):264-9. PMID: 7730203

81 Inouye S, Yamaguchi H, Takizawa T. Screening of the antibacterial effects of a variety of essential oils on respiratory tract pathogens, using a modified dilution assay method. *J Infect Chemother.* 2001 Dec;7(4):251-4. PMID: 11810593