Aromatherapy: A New Pragmatism in Dentistry [Part-2]
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ABSTRACT
A new and alternative way to reduce anxiety levels in dental clinics is the use of aromatherapy. Aromatherapy uses plant materials and aromatic plant oils, including essential oils and other aromatic compounds for improving psychological or physical well-being. Number of studies has been done to prove the therapeutic properties of various essential oils, but very few have been published on their use in dentistry. This review is a continuation of previous article which will provide an overview of remaining essential oils, including their therapeutic properties and applications in dentistry.

Key words: Aromatherapy, Lavender, Eucalyptus, Lemon, Peppermint

INTRODUCTION
Aromatherapy, referred to as Essential Oil therapy, which can be defined as the art and science of utilizing naturally extracted aromatic essences from plants to balance, harmonize and promote the health of body, mind and spirit. It seeks to unify physiological, psychological and spiritual processes to enhance an individual’s innate healing process.[1]

For the treatment of a wide range of complications and conditions, aromatherapy has made a name for itself. A review of the literature reveals that this therapy attracted a lot of attention in the 20th and 21st centuries as well, and because of its significance, appeal, and widespread use, it is recognised as aroma science therapy.[2]

Aromatherapy has been used for almost 6,000 years, to improve a person's mood or health and works both physically and emotionally. Aromatherapy is the use of aromatic compounds such as essential oils for therapeutic or medicinal purposes. Aromatic oils are extracted from various parts of plants, herbs, trees, and flowers for medicinal purposes, and over forty different types of oils are available.[3]

How Aromatherapy Works
The most common explanation of how aromatherapy works is that it acts on the olfactory system, which is intuitively consistent with the practice of aromatherapy. Aromatherapy oils contain volatile molecules that interact with receptors in the nose to produce an electrical signal that causes the brain to perceive smell. This perception includes reactions brought on by the limbic system, which regulates memory and emotion and is thought to be the mechanism by which odours have an impact on mood,
alertness, mental stress, arousal, and perceived health.\[4\]

1. **Eucalyptus Oil:**

Eucalyptus is a tall, evergreen tree or shrub which belongs to the Myrtaceae family. Although it originally came from Australia and Tasmania, it has already widely spread to other nations. There are roughly 700 species of eucalyptus, and more than 500 of those have leaves that contain volatile oils. Essential oils of various eucalyptus species are used in the pharmaceutical, toiletries, cosmetics, and food industries.\[5\] It has rich sources of phytochemical constituents which contain flavonoids, alkaloids, tannin and propanoids.\[6\] Eucalyptus essential oils serve a purpose in the pharmaceutical, toiletries, cosmetics, and food industries. The antiseptic, antihyperglycemic, anti-inflammatory, flavouring, and antioxidant characteristics of the oil’s molecules account for its wide range of applications.\[7\]

Table 5: Scientific aspects of Eucalyptus oil\[8\]

<table>
<thead>
<tr>
<th>Latin name</th>
<th>Eucalyptus obliqua</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Family</strong></td>
<td>Myrtaceae</td>
</tr>
<tr>
<td><strong>Synonyms</strong></td>
<td>Gum tree, southern blue gum, Tasmanian blue gum, fever tree, stringy bark.</td>
</tr>
<tr>
<td><strong>Other species</strong></td>
<td>There are over 700 different species of eucalyptus, of which at least 500 produce a type of essential oil. E. polybractea, E. radiata var. austaliana and E. smithii, E. piperita and E. citriodora.</td>
</tr>
<tr>
<td><strong>Chemical constituents</strong></td>
<td>Cineol (70-85 per cent), pinene, limonene, cymene, phellandrene, terpinene, aromadendrene, among others.</td>
</tr>
<tr>
<td><strong>Parts used</strong></td>
<td>Leaves - In both fresh and dried form</td>
</tr>
</tbody>
</table>

**Extraction:** Essential oil by steam distillation from the fresh or partially dried leaves and young twigs.\[8\]

**Therapeutic actions:** Analgesic, antineuralgic, antirheumatic, antiseptic, antispasmodic, antiviral, balsamic, cicatrisant, deodorant, diuretic, expectorant, febrifuge, hypoglycaemic, parasiticide, rubefacient, stimulant, vermifuge.\[8\]

**Applications in Dentistry**

- It shows an inhibitory effect on oral pathogens like *Lactobacillus acidophilus*, which makes this suitable to be used as an anticariogenic agent.\[9\]
- Eucalyptus oil is an anti-inflammatory germicide that helps soothe receding gums and helps stimulate the growth of new gum tissue.\[10\]

**Safety/Precautions:** Externally non-toxic, non-irritant (in dilution), non-sensitizing. When taken internally eucalyptus oil is toxic and as little as 3.5ml has been reported as fatal.\[8\]

2. **Lavender Oil:**

Lavender is traditionally alleged to have a variety of therapeutic and curative properties, ranging from inducing relaxation to treating parasitic infections, burns, insect bites, and spasm. There is growing evidence suggesting that lavender oil may be an effective medicament in treatment of several neurological disorders. Several animal and human investigations suggest anxiolytic, mood stabilizer, sedative, analgesic, and anticonvulsive and neuroprotective properties for lavender.\[11\] In aromatherapy, lavender essential oil is one of the most widely used oils. They have a sedative effect and are known to ease psychological disorders such as stress, anxiety, and depression.\[12\] However, studies have
revealed that lavender oil not only helps depression but also relieves insomnia, allergies, gastrointestinal distress, and menstrual cramps.\cite{13}

Table 4: Scientific aspects of Lavender oil\cite{8}

<table>
<thead>
<tr>
<th>Latin name</th>
<th>Lavandula angustifolia</th>
</tr>
</thead>
<tbody>
<tr>
<td>Family</td>
<td>Lamiaceae /Labiatae</td>
</tr>
<tr>
<td>Synonyms</td>
<td>L officinalis, garden lavender, common lavender, lavender “Mailette”</td>
</tr>
<tr>
<td>Other species</td>
<td>There are at least 28 species in this genus and numerous subspecies and hybrids, e.g., L spica or spicata, L Latifolia, L. delphinensis and L fragrans.</td>
</tr>
<tr>
<td>Chemical constituents</td>
<td>Over 100 constituents including linalyl acetate, linalol, lavandulol, lavandulyl acetate, terpineol, cineol, limonene, ocimene, caryophyllene, among others.</td>
</tr>
<tr>
<td>Parts used</td>
<td>Above ground parts in flower, or flowers</td>
</tr>
</tbody>
</table>

**Extraction:**

1. Essential oil by steam distillation from the fresh flowering tops.
2. An absolute and concrete are produced by solvent extraction in smaller quantities.\cite{8}

**Therapeutic actions**\cite{8}: Analgesic, anticonvulsive, antidepressant, antimicrobial, antirheumatic, antiseptic, antispasmodic, cholagogue, choleretic, cicatrisant, deodorant, diuretic, emmenagogue, hypotensive, insecticide, nervine, parasiticide, rubefacient, sedative, sudorific.

**Applications in Dentistry:**

- Lavender oil provides a soothing anti-anxiety aromatherapy choice and has been suggested for reducing the pain of the injection upon needle insertion.\cite{14}
- Due to the inhibition of prostaglandins, lavender essential oils can be a prospective replacement for non-steroidal anti-inflammatory drugs in dentistry.\cite{15}
- It can also be used locally as an ointment for gingivitis.\cite{15}

**Safety/precautions:** Non-toxic, non-irritating, non-sensitising.\cite{8}

3. Lemon Oil

Lemon belongs to the Rutaceae family and it is first originated from Southeast Asia then it is spread to Northeast India, Burma and China. Lemon essential oil is an aromatic compound which is commonly isolated from lemon peel by cold pressing. Lemon oil is widely used in perfume, cosmetic, food and pharmaceutical industries. Numerous papers reported that Lemon oil have antioxidant, antifungal and antimicrobial, anticancer, and anti-inflammatory activities. The oxygenated compounds such citral are the major contributor to the flavour and aroma of the oil. The antibacterial, antioxidant and anticancer effects are due to its high content of phenolic compounds particularly limonene.\cite{16}

Table 6: Scientific aspects of lemon oil\cite{8}

<table>
<thead>
<tr>
<th>Latin name</th>
<th>Citrus limon</th>
</tr>
</thead>
<tbody>
<tr>
<td>Family</td>
<td>Rutaceae</td>
</tr>
<tr>
<td>Synonyms</td>
<td>C. limonum, cedro oil.</td>
</tr>
<tr>
<td>Other species</td>
<td>There are about forty-seven varieties such as the Java lemon (C. javanica).</td>
</tr>
</tbody>
</table>
Chemical constituents | Limonene, terpinene, pinenes, sabinene, myrcene, citral, linalol, geraniol, octanol, nonanol, citronellal, bergamotene.

Parts used | Fruit

**Extraction:** Essential oil by cold expression from the outer part of the fresh peel.\[8\]

**Therapeutic actions**\[8\]: Antiseptic, bactericidal, antiviral, carminative; diaphoretic, febrifuge; haemostatic, alterative, antisclerotic; astringent, rubefacient, cicatrising, immune stimulant; diuretic; antirheumatic. Antiscorbutic on ingestion of the juice.

**Applications in Dentistry:**

- Lemon oil shows antifungal potential against three *Candida* species (C. albicans, Candida tropicalis, and Candida glabrata).\[16\]
- By killing bacteria, lemon oil help to avoid dental cavity and receding gums.
- Other characteristics of lemon oil are believed to promote the growth of tissue and can encourage healthier gums.\[17\]
- It serves as a natural treatment for many oral disorders, such as oral thrush and bad breath, because lemon essential oil has antibacterial and anti-fungal properties.
- It could also be used to naturally whiten the teeth and avoid dental decay.\[18\]
- Lemon oil aromatherapy was found to be effective in reducing dental anxiety in extraction patients at RSND Semarang.\[19\]

**Safety/precautions:** It may cause dermal irritation or sensitisation. Use in low dilution (1%); photo-toxic due to bergapten, do not expose skin to sunlight after application.\[8\]

**4. Peppermint Oil:**

Peppermint oil is the essential oil obtained from the flowering aerial parts and leaves of the peppermint, *Mentha piperita* L. Peppermint oil is a colourless to pale greenish yellow, clear mobile liquid that is fresh, minty, cooling, green, and sweetish in odour, with variations depending on its origin. The main producing countries of this oil are the United States, India, Russia, and China.\[20\]

**Table 7: Scientific aspects of peppermint oil**\[8\]

<table>
<thead>
<tr>
<th>Latin name</th>
<th>Mentha x piperita[20]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Family</td>
<td>Lamiaceae</td>
</tr>
<tr>
<td>Synonyms</td>
<td>Lamb mint, Brandy mint, Lam mint, Pudhina</td>
</tr>
<tr>
<td>Other species</td>
<td>M. arvensis L. var. piperascens malinvaud, M. piperita L. var. piperita and M. spicata L.</td>
</tr>
<tr>
<td>Chemical constituents</td>
<td>Menthol, menthone, limonene, isomenthone, 1,8-cineole, &gt;-pinene, menthyl acetate, neomenthol, menthofuran, and A-pinene [20]</td>
</tr>
<tr>
<td>Parts used</td>
<td>Leaf, whole plant</td>
</tr>
</tbody>
</table>

**Extraction:** Steam distillation\[8\]
Applications in Dentistry:

- Peppermint is one of the most widely used essential oils in oral care products, widely due to the antibacterial, antifungal, and biofilm-inhibiting properties.\[^{[21]}\]

- Peppermint oil has the ability to inhibit biofilm formation in the oral cavity in addition to providing a therapeutic benefit treating periodontitis, gingivitis, and halitosis.\[^{[21]}\]

- Peppermint oil can also increase salivation, which is useful because dry mouth may result in halitosis.\[^{[22]}\]

- In addition, menthol is effective in soothing the pain through increasing the stimulation threshold of cells and decreasing synaptic stimulations and thereby peppermint oil aromatherapy reduces anxiety in dental patients.\[^{[22]}\]

Therapeutic actions\[^{[8]}\]: Digestive stimulant, carminative, hepatic, cholagogue; nerve antispasmodic, tonic mucolytic, expectorant, febrifuge: anti-inflammatory: diaphoretic antiseptic, antimicrobial, vasoconstrictor, cephalic, astringent; emmenagogue, uterine tone vermifuge.

Safety/precautions\[^{[8]}\]: Avoid in pregnancy, lactation and for children under 3 years. Non-toxic, non-irritating. Possible sensitisation in some due to menthol.

CONCLUSION

The concept of the therapeutic use of aromatic essential oils is supported by aromatherapy that can produce a positive physiological effect through the sense of smell. Aromatherapy is a low-cost and efficient method of relieving anxiety in dental settings. It is a safe and favourable therapy that should be used in routine dentistry for a high-quality practice.

REFERENCES


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