

# Unexplored Potential of Essential Oils in Reducing SARS-CoV-2 Viral Load in Dental Clinics

Corona pandemic has affected all aspects of life, and dental practice is no exception to that. The major concern in closed dental clinical settings is the transmission of coronavirus through air droplets and dental unit waterlines. There is an increased risk of virus transmission in dental clinics through aerosol formation during various dental procedures.<sup>[1]</sup> Droplets of small size travel in the air and carry the virus with them, far from where they originated. Such an airborne virus can persist in the air for several hours, thus causing a potential risk of infection for dental professionals and patients.<sup>[2]</sup> Therefore, the only decontamination of surfaces is not sufficient to prevent the spread of SARS CoV-2 in dental clinics. Another concern is that patients and dental professionals are more anxious to go to dental clinics because of the fear of getting infected with SARS CoV-2, and hence stress and risk of infection need greater attention in dental clinics during this pandemic.

Essential oils (EOs) have gained a lot of attention during the past decades, and many clinical trials have confirmed antibacterial<sup>[3]</sup> and antiviral effects<sup>[4]</sup> in addition to their property in alleviating anxiety, depression, nausea, etc. Studies show that EOs inhibit various types of viruses such as influenza virus, human herpesviruses, human immunodeficiency virus, yellow fever virus, and avian influenza.<sup>[5]</sup> Another study found that carvacrol inhibits SARS-CoV-2 main protease (M<sup>pro</sup>) and thus can prevent viral replication.<sup>[6]</sup> Few EOs such as geranium and lemon EOs and their major compounds (i.e., citronellol, geraniol, limonene, linalool, etc.) could prevent viral infection by downregulating angiotensin-converting enzyme 2 (ACE2) expression in epithelial cells, thus preventing the virus from entering into host cells.<sup>[7]</sup> Saikosaponin B<sub>2</sub> inhibits viral (HCoV-229E) attachment to cells, blocks penetration into cells, and hinders viral replication at the initial stage.<sup>[8]</sup> The use of EOs extracted from *Eucalyptus* and *Corymbia* species, and eucalyptol, their main bioactive compound, may inhibit M<sup>pro</sup>.<sup>[9]</sup> Ursolic acid, carvacrol, and oleanolic acid too were found to act as potential inhibitors of M<sup>pro</sup>. It was found that both tea tree oils showed an antiviral activity in aerosol form too.<sup>[10]</sup> EOs may act synergistically with other antiviral agents and may provide symptomatic relief in mild cases of COVID-19.<sup>[4]</sup> Data suggest that EOs may be useful in managing the anxiety of patients as well as in reducing SARS-CoV-2

viral load in closed clinical settings. More studies are required to discover the effective concentration of EOs required to inactivate aerosol form of SARS-CoV-2, when used in a diffuser (i.e., electric devices that turn aromatic oils into diffused mists) and in dental unit waterlines. EOs may cause allergic reactions including asthma and rhinitis in allergic patients; therefore, safety and efficacy data need to be established before using it in clinical settings.<sup>[11]</sup>

Some studies showed that the docking energies are less likely to interact with the virus targets as they were found to be relatively weak when tested for the individual components. However, this can be explained by the fact that EOs are a complex mixture of various components that may act synergistically. A study has shown that the antiviral activity of *EO* is much greater than the activity of individual components.<sup>[12]</sup>

The efficacy of vaccines for the coronavirus at present is not clear because of the reason that new viral strains are constantly evolving through mutations. Therefore, there is a need to think in a new dimension and to explore new chemicals that can inhibit the virus or reduce its transmission. EOs can serve as natural antivirals. However, many studies have confirmed the antiviral effects of EOs, but very scarce data are available related to its use in reducing airborne virus transmission when used as a diffuser and in dental unit waterlines. More research is needed to establish its safety and efficacy in clinical settings.

### ACKNOWLEDGEMENT

Not applicable.

### FINANCIAL SUPPORT AND SPONSORSHIP

Nil.

### CONFLICTS OF INTEREST

There are no conflicts of interest.

### AUTHORS CONTRIBUTIONS

Not applicable.

### ETHICAL POLICY AND INSTITUTIONAL REVIEW BOARD STATEMENT

Not applicable.

### PATIENT DECLARATION OF CONSENT

Not applicable.

### DATA AVAILABILITY STATEMENT

Not applicable.

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**Received** : 28-03-21

**Revised** : 14-03-21

**Accepted** : 24-04-21

**Published** : 30-07-21

### Access this article online

Quick Response Code:



**Website:** www.jispcd.org

**DOI:** 10.4103/jispcd.JISPCD\_103\_21

**How to cite this article:** Dagli N. Unexplored potential of essential oils in reducing SARS-CoV-2 viral load in dental clinics. *J Int Soc Prevent Commun Dent* 2021;11:357-8.