



Phytotherapeutics and Endodontics - A Review

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ABSTRACT : Over the years, Phytomedicine has been gaining attention worldwide. It has been used in dentistry as anti-inflammatory, antibiotic, analgesic, sedative and also as endodontic irrigant. The herbal alternatives for endodontic usage might prove to be advantageous. This review focuses on various natural drugs and products as well as their therapeutic applications when used as phytomedicine in endodontics.

Keywords: Phytotherapeutics, Phytomedicine, Endodontics, Endodontic Irrigants, Intracanal Medicaments.

I. INTRODUCTION

Phytotherapeutics and phytomedicine focuses on the role of medicinal plants in various aspects of medical science. With the increasing tolerance and resistance of micro-organisms to currently used medicine and their frequent toxicity incidences have compelled to choose a much safer way. In endodontics because of the cytotoxic reactions of the most of the commercial intracanal medicaments used and their inability to eliminate bacteria from dentinal tubules, trend of recent medicine attends to use biologic medication [1]. On the other hand phytotherapeutic substances have shown substantial antibiotic, anti-inflammatory and analgesic effects. They can be used as irrigants and medicaments.

II. CLASSIFICATION

Phytotherapeutic substances are generally classified in to three groups [2].

- 2.1. Plant products
- 2.2. Animal products
- 2.3. Mineral origin

III. ENDODONTIC IRRIGANTS

3.1. *Morinda citrifolia* Linn. (Ashyuka - Indian mulberry)

A native from south East Asia or Australia grows in shady forests as well as on open rock. A number of major components have been identified in the this plant such as scopoletin, octoanoic acid, potassium, vitamin C, terpenoids, alkaloids, anthraquinones, β -sitosterol, carotene, vitamin A, flavone glycosides, linoleic acid, Alizarin, amino acids, acubin, L-asperuloside, caproic acid, caprylic acid, ursolic acid, rutin, and a putative proxeronine. It has antibacterial, anti-inflammatory, antiviral, antitumor, antihelmenthic, analgesic, hypotensive, and immune enhancing effects [3].

3.2. *Triphala* (Haritaki, Bibhitaki and Amalaki)

Triphala is one of the well-known Indian Ayurvedic herbal formulation consisting of dried and powdered fruits of three medicinal plants [4]. Its fruit is rich in citric acid, which may aid in removal of smear

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layer thereby acting as chelating agent. It has antioxidant properties and it can effectively inhibit the biofilm formation.

3.3. Azadirachta indica A. Juss (Nimba – Neem tree)

This product has been proved to be effective against *E. faecalis* and *Candida albicans*. Its antioxidant and antimicrobial properties makes it a potential agent for root canal irrigation as an alternative to sodium hypochlorite. This quality was proved by Pai et al in 2004 [5].

3.4. Salavadora persica Linn. (Peelu – Mustard tree)

It has anticaries, anti-inflammatory and antimycotic effects. Its chewing sticks contain trimethyl amine, salvadorime chloride and fluoride in large amounts. Tests have shown that these sticks contain natural antibiotics, fluoride, and other anti-cavity components. 15% alcoholic extracts of it has maximum antimicrobial action [6].

3.5. Allium sativum Linn. (Rason - Garlic)

Garlic contains sulfur containing compound allin, which is converted to active ingredient “allicin” when the garlic bulb is crushed. This compound has an inhibitory effect upon the key enzymes involved in cholesterol biosynthesis [7]. Hence Allicin destroys cell wall and cell membrane of root canal bacteria.

IV. INTRACANAL MEDICAMENT

4.1. Propolis

This is prepared from resins collected by bees from trees of poplars and conifers or from flowers of genera *Clusia*. It also contains viscidone. Oncag et al. (2008) proved the antibacterial efficacy of propolis against *Enterococcus faecalis* [8]. It is used as intracanal medicament. It can also be used as root canal irrigant and storage media for avulsed teeth to maintain viability of periodontal ligament.

4.2. Carvacrol

Carvacrol (thymol isomer) is present in the essential oil of *Origanum vulgare*, which is edible plant oil used in food products. It has a broad spectrum of antibacterial activity; it works by inhibiting ATPase activity and increasing the nonselective permeability of bacterial cell membranes. Therefore, it not only inhibits microbial colonization, but also makes microbes more sensitive to antibacterial agents. Antibacterial effect of carvacrol against *E. faecalis* has been proved. Carvacrol also has anti-inflammatory effects. It also helps in repair of periapical tissues. This property is due to the presence of phenolic component, which stimulates pulpal fibers, phenomena known as hormesis. . In 2009 Seghatoleslami et al concluded that 0.31 mg/ml concentration of the extract has sufficient antibacterial property [9].

4.3. Citrus limonum Risso. (Nimbuka - Lemon)

Lemon solution (pH2.21) is a natural source of citric acid (pH1.68) with lower acidity. Fresh lemon solution is used as root canal medicament due to its wide antibacterial efficiency including *E. faecalis*. Oil of lemon is topically used for the treatment of oral thrush and stomatitis. Swason et al has proved the efficacy of the same.

4.4. Green Tea (Camellia sinensis)

It is a tea made solely from the leaves of *camellia sinensis*. The antimicrobial activity is due to inhibition of bacterial enzyme gyrase by binding to ATP B sub unit [4]. Green tea exhibits antibacterial activity on *E-faecalis* plaknotic cells as shown by Chow et al. It is also found to be a good chelating agent.

4.5. Aloe barbadensis Miller (Kumari - Aloe)

Aloe leaves contain a clear gel and green part of the leaf that surrounds the gel is used to produce juice or dried substance. It contains aloins and barbadoins as main chemical constituents. In dentistry, *A. vera* is used in cases of apthous ulcers, lichen planus, alveolar osteitis. *A. vera* gel has inhibitory effects on *Streptococcus pyogens* and *E. faecalis* because of anthraquinone [11].

V. MISCELLANEOUS

Apart from being used as irrigants and medicaments, phytotherapeutic substances are also helpful in other aspects for example **Orange Oil** It is oil produced by glands inside the rind of an orange fruit and is suggested as an alternative to chloroform or xylene for gutta-percha softening and also in dissolving endodontic sealers. Also **Turmeric** and **Acacia** which is widely available in India have shown significant antibiotic efficacy.

VI. CONCLUSION

The in vitro studies conducted so far have shown that phytomedicine can have a promising role as root canal irrigants and medicaments. However, further clinical trials and investigations are required to be considered as effective alternatives to the synthetic materials used in endodontics. Also, development of these products can be a great relief on the part of endodontist and patients.

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