



**CLINICAL USES AND APPLICATION OF WITHANIA SOMNIFERA  
(ASHWAGANDHA): IN DENTISTRY: A NARRATIVE REVIEW**

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**ABSTRACT:**

Dental health have always been an area of upwardly displaced threshold gaining a widespread global importance in the health and wellness scenario. The higher incidence of all dental conditions with dental caries being the habitual one still calls upon to be an high priority health concern globally with its indefinite grasp entangling populations in an unbiased manner and



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classification. The treatment and management of dental health issues continue to persist at its peak due to uphill demand and rise of expensive dental services and dental products which aberrantly remains from the outreach of customary members of the local communities prevailing in developing nations. The predominant absence of any available dental insurance schemes and highly inaccessibly monetary demands still pursuits the dependent categories from indulging into accepting any forms of dental services inclined for their beneficiary needs thereby entrusting the precedence for the maintenance of their general health over their dental demands. Researchers and health promoters including clinicians have been in a constant effort to amend treatment modalities with the existent dental products and thereby deliver these dental services in a cost effective manner as possible. A vast majority of the commercially available products which are notably advantageous and utilized in rendering the most acceptable dental treatment still persist with high monetary demands along with existent cytotoxic and reliable side effects. *Withania somnifera* (Ashwagandha) is one of the most important Indian herb displaying high medicinal values which is distributed widely in Indian subtropical regions. *Withania somnifera* have been deeply evaluated and studied for its highly acclamable medicinal benefits, hence this review will evaluate the profound applications of *Withania somnifera* in dentistry.

**Key Words:** *Withania somnifera*, Herbal, Dentistry

## INTRODUCTION

In this era of technologically advanced living scenario dental health continues to move with an upward trend requiring extreme contemplation thereby deliberating the presumed standards of general health of the defined patients. <sup>[1]</sup> In vast majority of the developing nations a grandeur decline in the estimated oral health conditions continues to prevail amidst such advanced and exacerbated quality of living. The lack of awareness coupled with exponentially high financial constraints results in not resorting to the available dental services within the locality thereby resulting in hampering of the individual's quality of life. These irresistible hindrances thereby creates an unresolvable void thus hampering the individual's oral health, speech and routine activities.<sup>[2]</sup> The present global scenario describes an ultimate and widespread depletion of the predefined oral health among the needy population thereby raising an awareness and alarm on the importance of necessitating the urgent needs of addressing this scenario at global level.<sup>[1,2]</sup> The management of dental diseases continue to persist as one of the sought out speciality with highly anticipated and expected financial burden.<sup>[3]</sup> This existent financial burden and non accessibility in availing the recommended dental health care services for the deserveable ones in the community still remains questionable in terms of existent facilities, technologies and generated knowledge and awareness regarding the demandable maintenance of dental health in par with the general health of the affected individuals. The commercially available dental products due to its proven beneficial effects have been in avid and routine utilization in various dental treatments as it has been studied for its enormous dental and medicinal effects even though with persistent side effects ranging from oral ulcers, mucosal irritation, discoloration, staining and unpleasant taste.<sup>[4,5]</sup> The researchers have been under constant quest to substitute these pre existing products with more

reliable, easily available and financially pliable naturally occurring derivatives with minimal adverse reactions.<sup>[6]</sup> This led to the incorporation of sparsely utilized herbs and ayurvedic combinations into formulation of the advisable alternatives for the existent dental products. These have been evidenced to provide with more biocompatible, tissue tolerant and consistent beneficial effects when in comparison to the synthetically available dental materials.<sup>[7]</sup>

Current research and experimental studies aligning in the field of Herbal have upto a certain level have undoubtedly proclaimed the fact that characteristically inherent integrants in the preexistent medicinal plants would undoubtedly alter in providing a nominal risk factor presumably engaged in scheduling a well devised treatment protocol with evidently absence of any noticeable adverse reactions on its consumption.<sup>[8,9]</sup> The recommended routine utilization of these herbal derivatives thereby results in providing with more acceptable, biocompatible and highly evidential treatment plan and objectives with systematic and scheduled importance in maintenance of dental health in the instituted period of observation.<sup>[10,11]</sup> The newer evidence based research have incredibly proven the fact that all these recorded herbal medicines comprising of databases of shrubs, herbs and other plant varieties have found to contribute immensely in counteracting the deteriorating factors thereby resulting in oral health competency to a greater extent.<sup>[12]</sup> It has been well documented that the designated biproducts from these herbal medicinal plants have also been included in formulation of novel alternatives which could enhance the dental health management and maintenance in a very acceptable and reliable manner.<sup>[13]</sup> There has been numerous well documented herbal products which have been in line since ages in dentistry which includes tulsi, curcumin, aloe vera, mint, ginger etc.<sup>[14]</sup>

The experimental research and available literature thereby signifies the fact that these available plant extracts have remarkable inhibitory effects against the occurrence of dental caries and other associated oral diseases. *Withania somnifera* is considered as one of the most noticeable predominant herbs which has found its extensive utility for its immense medicinal values.<sup>[15]</sup> This review will discuss in detail about the dental implications of *Withania somnifera*, which is a widely distributed herb in Indian subcontinent and had been evidenced to exhibit undeniable medicinal properties.<sup>[16,17]</sup>

### **Withania somnifera (Ashwagandha)**

*Withania somnifera* (Ashwagandha) has always been an important medicinal herb included in traditional medicine in Ayurveda and has been dated back to about 3000 years in history. The roots of Ashwagandha have been considered as an ideal constituent of several medicinal formulations aimed at enhancing longevity, empowering the body's immune response and estimated protection against pandemic outbreaks. Several clinical trials and researches have been conducted to assess the medicinal values and application of *Withania somnifera*.<sup>[18]</sup>

*Withania somnifera* have always been considered as an interesting topic of concern for the researchers have always been keen interest for researchers. *Withania somnifera* has been

ineherently composed of essential alkaloids such as ashwagandhine, tropine, cuscihygrine and anahydrine.<sup>[19]</sup> It also constitutes of saponins which is assumed to possess an additional component of acyl group which have been defined to possess additional medicinal properties. In addition to these constituents it also composes several essential highly prominent amino acids such as aaspartic acid, proline, tyrosine, alanine, glycine, glutamic acid, cysteine and tryptophan. Ashwagandha is chemically characteized as 4b,27- dihydroxy- 5b-6b-epoxy-1-oxowitha-2, 24-dienolide.<sup>[20]</sup>

### **Botanical and biological properties**

Withania somnifera is a very unique tiny ha is a small, arboraceous plant species belonging to t Solanaceae family.<sup>[21,22]</sup> The plant is assumed to grow to an ardent height of two feet. The shrub has been estimated to have a vast majority of its growth and vegetation in Asian and African subcontinent claiming its extensive and widespread distribution across India, Africa and Mediterranean tropical lands and vegetation.<sup>[23]</sup> The terminal roots of Ashwagandha are found to be rotund pouched, brownish in color, with ovular shaped leaves; flowers are unostentatious, with a vibrant shade of greenish yellow in color. Ashwagandha considerably bears to constitute unianimously arranged bunch of cymes.<sup>[24,25]</sup> The plant constitutently bears tiny reddish orange globular berries enclosed in the persistent calyx with highly vivid yellow colored seeds. The roots of Ashwagandha have been proven of high therapeutic values along with inconsiderable medicinal importance and curing effects with elaborated applications of scientific importance thereby defining its involvement for benefit of mankind. Ashwagandha bears a dark red fruit which is generally harvested during the spring season.<sup>[26]</sup> The entire plant with its varying parts including rots, leaves, fruits, stem and bark had been utilized advently for enormous purposes.

### **SCIENTIFIC CLASSIFICATION.**<sup>[27,28,29]</sup>

<b>Kingdom</b>	<i>Plantae, Plants</i>
<b>Subkingdom</b>	<i>Tracheobionta, Vascular plants;</i>
<b>Super Division</b>	<i>Spermatophyta, Seeds plants;</i>
<b>Division</b>	<i>Angiosperma</i>
<b>Class</b>	<i>Dicotyledons</i>
<b>Order</b>	<i>Tubiflorae</i>
<b>Family</b>	<i>Solanaceae</i>
<b>Genus</b>	<i>Withania</i>
<b>Species</b>	<i>somnifera Dunal</i>

**LOCAL NAMES** <sup>[30]</sup>

<b>Sanskrit</b>	Ashwagandha
<b>English</b>	Winter Cherry
<b>Hindi</b>	Asgandh
<b>Bengali</b>	Asvagandha
<b>Rajasthani</b>	Chirpotan
<b>Bombay</b>	Asgund, asvagandha
<b>Gujarati:</b>	Asan,Asoda
<b>Telugu</b>	Viremaddlinagadde, Pannaeru, aswagandhi,
<b>Tamil</b>	Amukkura, amkulang
<b>Kannada</b>	Viremaddlinagadde, Pannaeru, aswagandhi

**APPLICATIONS IN MEDICINE** <sup>[31]</sup>

<b>Parts</b>	<b>Properties</b>	<b>Formulation</b>	<b>Diseases</b>
Root	Antioxidant property	Oral suspension	epilepsy, schizophrenia, Parkinson's, Alzheimer's, Pneumonia
	Antianxiolytic property		<b><u>Behavioural distress, Chronic stress,</u></b> cognitive deficit, immunosuppression, sexual dysfunction, gastric ulceration, irregularities in glucose homeostasis
	Neurotrophic property		Management Of Alzheimers disease and neuronal degeneration
	Antiparkinsonian property		Catalepsy Reversal, Tardive dyskinesia
	Antiinflammatory property		
	Antitumor property/Anticacer		Skin cancers, Head and Neck cancers
	Antivenom property		Antitoxin PLA2 against snake bite

	CVS protection		Management of Hypertension Tachycardia and Hyperlipedemia
	Antiaddiction Drug		Benzodiazepene, ethanol and Opioid addiction

## **APPLICATIONS IN DENTISTRY**

### **ANTIMICROBIAL ACTIVITY**

The antimicrobial efficacy of *Withania somnifera* have been detailed in the above table, however its inhibitory action against *S. mutans* is still an evolutionary pathway. In a well acclaimed study conducted by Pandit S et al. methanolic extract of *Withania somnifera* primarily constituted of both mono and disaccharides along with addictive inclusion of limited range of alcohol sugars and certain organic acid groups.<sup>[32]</sup> These components are well explained to possess both bacteriostatic as well as bactericidal properties at considerably higher concentrations. The extract showed commentable inhibitory effects on the growth and acidic activity of *S. mutans* and *S. sobrinus* at optimal minimal inhibitory concentration. This establishes the fact that this herbal extract can hence prove to act as a dominant restrainer in inhibiting the cariogenic activity of these causative microorganisms up to an estimated level of tolerance.<sup>[32]</sup>

### **INTRACANAL MEDICAMENT VEHICLE**

Dausage P et al. in his study conducted on ion diffusion from Calcium hydroxide with herbal pastes through dentin has clearly stated the fact that Ashwagandha preparations provided additional benefits of diffusion of ions through the dentinal tubules in a sustained manner (up to 168 hours) in comparison with normal saline. Hence it can be an ideal agent to be customized as a vehicle with Calcium hydroxide for utilization as intracanal medicament.<sup>[33]</sup>

### **BONE REGENERATIVE MATERIALS FOR IMPLANTS**

Bhat S et al. in his experimental study has clearly established that herbal extract in combination with Ashwagandha remains exclusively and evidently possess osteogenic potential by increasing alkaline phosphatase and lactate dehydrogenase activity which results in bone regeneration.<sup>[34]</sup> This as a result can be utilized for alternate treatment of titanium implant surfaces. Hence these ayurvedic combinations containing Ashwagandha extract will randomly enhance alkaline phosphatase and lactate dehydrogenase activity which hence would be a highly demanding utility in dental and orthopaedic implants as it substantially promotes inherent osseointegration.<sup>[34]</sup>

### **ANTICARCINOGENIC AGENT**

*Withania somnifera* commonly known as the Queen of ayurvedha is considered to possess anticarcinogenic properties to a great extent. Experimental laboratory findings estimate that

Ashwagandha strategically possess phytochemicals namely withananine, choline, trapino, and alkaloids which displays ideal anti angiogenic properties thereby inhibiting cancer formation in in any of the associated blood vessels.<sup>[35]</sup> Saeed et al. hence have elaborated this anticarcinogenic property and have have destined the fact that it is evidently active against any modes of cancers including oral cancers to a great extent.<sup>[35]</sup>

### **ANTIBIOFILM EFFICACY AGAINST ENDO-PERIO PATHOGENS**

Kiran R et al. in his experimental research conducted by extracting inherent fungi from *Withania somnifera* with its addition to Silver nanoparticle mixture was proven to be actively efficacious against endo-perio pathogens including *P. gingivalis*, *B. pumilus*, and *E. faecalis* and hence can be incorporated in to various modalities of periodontal therapies as an adjunct to existing antimicrobials agents and antiseptics precisely.<sup>[36,37]</sup>

### **CONCLUSION**

Oral hygiene and associated diseases have always a widespread threat globally to mankind irrespective of age gender or region of settlement. The commercially available dental products which are on large scale synthetically synthesized still continue to possess undesirable side effects including allergic reactions to the surrounding tissues. However due to prevailing financial constraints and existing aberrant side effects naturally occurring herbal seems to be one of the most affordable emerging treatment trends as it seems to find a validated solution which appears to be non-toxic to both surrounding tissues as well as environment.<sup>[38,39]</sup> *Withania somnifera* is one of the most precious herb which has found wide applications in Ayurveda and Medicine due to its excellent inherent medicinal properties. It has already been proven to provide ultimate medicinal uses along with substantiated and beneficial health effects. Ashwagandha presents with highly appreciable health benefits and it is high biocompatibility thereby requires the need for more research and analytical studies on its avid applications in dentistry and the need for procurement of more dental products with the alternative and superficial beneficial effects of coconut.<sup>[40]</sup>

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