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## Utilization of Solanaceae for dental care management in India

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### Abstract

Solanaceae family commonly known as nightshades belongs to dicot group of flowering plants. The scientific literature revealed that members of this family is predominately used to dental care like toothache and used to clean teeth *etc.* In the present review 17 species of Solanaceae family has been documented which are being exploited by different tribal and rural peoples of India for dental care purpose. The species under study are arranged alphabetically on the basis of botanical name followed by other names, distribution, part used, folk use cited by earlier workers and chemical constituents. In the present scenario, even though the accessibility of Western medicine for simple and complicated diseases is available, many people still continue to depend on medicinal plants for tooth infections. The aim of this review is to document and summarize the information on various species in Solanaceae family which are used for dental care purpose. The purpose of documentation of information is necessary before it is lost permanently.

**Keywords:** Solanaceae, dental care, folk use, documentation

### Introduction

Use of plants for healing purpose is as old as mankind itself. It has been estimated that 80% of the world population under developed countries depends upon traditional medicine obtained from plants for primary health care. In the recent past ethno-medicine gain considerable importance, mainly because of being safe and with almost no side effect. Therefore, it is the present need that such plants should be investigated to better understand their properties, safety and efficacy (Prusti *et al.*, 2008) [25]. Even though the accessibility of Western medicine for simple and complicated tooth diseases is available, many people still continue to depend on medicinal plants for tooth infections. Due to lack of interest among the younger generation there is a possibility of losing this wealth of knowledge in the near future. It thus becomes necessary to acquire and preserve this traditional system of medicine by proper documentation and identification of specimens. In such a way the aim of this review is to document the folk lore for dental care about the plants of a particular family.

The Solanaceae, or nightshades, are an economically important family of flowering plants. The family ranges from annual and perennial herbs to vines, lianas, epiphytes, shrubs, and trees and includes a number of important agricultural crops, medicinal plants, spices, weeds, and ornamentals. The most economically important genus of the family is *Solanum*. The family consists of 90 genera and more than 2000 species (Shah *et al.* 2013) [35]. The species are medicinal herbs and contain diverse alkaloids and other biochemical constituents used for the treatment of diverse ailments (diabetes, cholera, bronchitis, high blood pressure) and as laxatives (Caicedo & Schal, 2004; Daunay & Chadha, 2004) [7, 12].

### Methodology of the review

The literature survey was performed using literature study, literature databases, including online catalogues of relevant institutions and e-journal consortia.

### Results

The results of survey is presented in detail in Table 1.

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**Table 1:** List of Solanaceae species with other information towards dental care from various parts of India

Sr. No.	Botanical Name	Other Names	Distribution	Part Used	Folk Use	Active Constituents	References
1	<i>Solanum anguivi</i> Lamk.	Eng. Name: Poison berry Hin. Name: Barhanta	Wasteplaces and road sides throughout the tropical parts of India.	Fruits and seeds	Smoke of burnt fruits and seeds inhaled in toothache	Gitigenin; tigogenin, tomatidenol maltase, melibiase, saccharase	Agarwal (2003) <sup>[2]</sup> ; Chatterjee & Pakrashi (1991) <sup>[9]</sup> ; Jain (1991).
2	<i>Solanum ferox</i> Linn.	Eng. Name: Poison berry Hin. Name: Barhanta	Tropical parts of eastern and penninsular India	Fruits	Used for toothache	Beta-sitosterol, dioscin	Agarwal (2003) <sup>[2]</sup> ; Chandra (1997) <sup>[8]</sup> ; Jain (1991); Rajendran & Aswal (2000) <sup>[26]</sup> ; Rastogi & Mehrotra (1998) <sup>[32]</sup>
3	<i>Solanum incanum</i> Linn.	Eng. Name: Brinjal, Eggplant Hin. Name: Baigun	Cultivated	Berries	Smoke of powdered burnt seeds inhaled in toothache	Incanumine solasodine, solamargine, solasonine and urosolic acid	Agarwal (2003) <sup>[2]</sup> ; Duke (2002) <sup>[13]</sup> ; Gill <i>et al.</i> (1993); Jain (1991); Kothari & Londhe (2000) <sup>[19]</sup> ; Osmaston (1926) <sup>[21]</sup> ; Rastogi & Mehrotra (1995, 1998) <sup>[32]</sup>
4	<i>Solanum myriacanthum</i> Dunal.	Vern. Name: Changranlotei	Khasia Hills	Fruits and roots	Fruit paste and pounded roots applied to gums to relieve toothache	Beta- sitosterol, lanosterol, diosgenin and solasodine	Bora (2000) <sup>[6]</sup> ; Jain (1991); Rastogi and Mehrotra (1991, 1998) <sup>[32]</sup> ; Rawat & Chaudhary (1998) <sup>[33]</sup> ; Saklani & Jain (1996) <sup>[34]</sup> ; Singh (2000)
5	<i>Solanum nigrum</i> Linn.	Eng. Name: Black nightshade Hin. Name: Makoi	Throughout India upto 2700m in W. Himalaya and 1650m in Khasia Hills	Fruits	Used for toothache	Chlorogenic, caffeic acids	Bennett <i>et al.</i> , (1991) <sup>[4]</sup> ; Duke (2002) <sup>[13]</sup> ; Rastogi & Mehrotra (1991, 1998) <sup>[32]</sup> ; Saklani & Jain (1996) <sup>[34]</sup>
6	<i>Solanum surrattense</i> Burm. f.	Eng. Name: yellow berry nightshade Hin. Name: Katai	Throughout India	Seeds	Juice of berries given in toothache	isochlorogenic, neochlorogenic, caffeic acids	Bannerjee (2000); Chandra (1997) <sup>[8]</sup> ; Chatterjee & Pakrashi (1991) <sup>[9]</sup> ; Girach (1992); Jain (1991), Kumar & Goel (2000); Rastogi & Mehrotra (1991, 1998) <sup>[32]</sup> ; Malik (1996); Ranjan (1996); Singh (2000); Sinha & Sinha (2001)
7	<i>Solanum torvum</i> Sw.	Hin. Name: Ranbaigan	Throughout the tropical parts of India and Andamans	Seeds and Fruits	Fruits and Seeds burnt and inhaled for dental care and toothache	Steroidal sapogenins sisagenone and torvogonin	Saklani & Jain (1996) <sup>[34]</sup> ; Rastogi & Mehrotra (1991) <sup>[29]</sup>
8	<i>Solanum viarum</i> Dunal.	Eng. Name: Tropical Soda Apple	A naturalized weed found throughout greater parts of India	Fruit	Decoction of Fruit inhaled for toothache	Solasurine, Solamargine and solasonine	Jain (1991); Rastogi & Mehrotra (1991) <sup>[29]</sup> ; Singh <i>et al.</i> (2003); Sood & Thakur (2004)
9	<i>Solanum virgatum</i> Lam.		Occurs upto 4,500m	Fruits	Decoction of dry fruits mixed with bark of <i>Acacia nilotica</i> gargled thrice to cure toothache.		Ram <i>et al.</i> , (2002) <sup>[27]</sup>
10	<i>Solanum virginianum</i> L.	Eng. Name: Yellow berried night shade	Throughout tropical and sub tropical regions	Fruits and Seeds	Fruits and seeds used against toothdecay.		Panda & Das (2000) <sup>[22]</sup>
11	<i>Datura fastuosa</i> Linn.	Eng. Name: Egyptian thorn apple, The black datura Hin. Name: Kala datura	Commonly found throughout the tropical parts of India	Roots and Seeds	Used for brushing teeth to cure toothache	Ditigloyloxytropone, troglodine, apohyosine, hyosine, hyoscyamine.	Chauhan (1999) <sup>[10]</sup> ; Chatterjee & Pakrashi (1991) <sup>[9]</sup> ; Pandey & Verma (2002) <sup>[23]</sup> ; Rastogi & Mehrotra (1991, 1998) <sup>[29, 32]</sup> .
12	<i>Datura innoxia</i> Mill.	Hin. name: Sadadhatura	Found in tropical Parts of India	Roots	Saharia tribes of S. E Rajasthan chew the roots or use them like toothbrush to cure toothache	Atropine	Rastogi & Mehrotra (1991, 1993) <sup>[29, 32]</sup> ; Singh & Pandey (1998) <sup>[38]</sup> .
13	<i>Datura stramonium</i>	Eng. Name: Jimson weed, Stink wood. Hin. Name: Dhatura	Temperate Himalaya from Kashmir-tropical parts of India	Whole plant	Parts of seeds either alone or mixed with butter applied to infected tooth or smoke of burnt seeds inhaled to cure toothache	Hyoscyamine, atropine, hyosine, meteloidine, tropine, beta-sitosterol	Chatterjee & Pakrashi (1991) <sup>[9]</sup> ; Ganai & Nawchoo (2003); Jain (1991); Rastogi & Mehrotra (1991, 1993, 1998) <sup>[29, 30, 32]</sup> ; Sood & Thakur (2004)
14	<i>Hyoscyamus niger</i> Linn.	Eng Name: Black henbane, Henbane Hin. Name: Ajvayan, Khursani ajwain	Temperate western Himalaya: 2700-3600m	Seeds	Smoke of seeds coated with ghee inhaled for two minutes and spitting out after that to see larva coming out of infected teeth.	Linoleic, myristic, oelic, palmitic and stearic acids.	Agarwal (2003) <sup>[2]</sup> ; Chatterjee & Pakrashi (1991) <sup>[9]</sup> ; Gnai & Nawchoo (2003); Jain (1973, 1991).

15	<i>Nicotiana tabaccum</i> Linn.	Eng. Name: American tobacco Hin. Name: Tambaka, tamaku, tambaku	Commonly found throughout India	Leaf	Tobacco mixed with lime place in the cavity of teeth to cure toothache	Scopoletin, propional, isobutyral and diethyl ketone	Bhandari & Chandershekar (2002); Chatterjee & Pakrashi (1991) <sup>[9]</sup> ; Gill <i>et al.</i> (1993); Jain (1991); Watt (1972).
16	<i>Physalis minima</i> Linn.	Eng. Name: Sun berry Hin. Name: Tulatipati	Commonly found throughout tropical parts of India	Flower and Fruit	Dried fruits rolled into cigarette for smoking to cure toothache. Flowers are also used to cure toothache.		Chhetri (2005) <sup>[11]</sup> ; Saklani & Jain (1996) <sup>[34]</sup> .
17	<i>Withania coagulans</i> Dunal.	Eng. Name: Indian cheese maker, Indian rennet Hin. Name: Akari, Akri	Found in Himachal Pradesh to kumaon Hills	Twigs	Used to clean teeth		Agarwal (2003) <sup>[2]</sup> ; Chatterjee & Pakrashi (1991) <sup>[9]</sup> .

## Conclusion

Plant-based traditional knowledge has become a recognized tool in search for new sources of drugs; it is clear that Solanaceae family can offer a platform for further research in dentistry. During the last few decades there has been an increasing interest in the study of this medicinal plants and their traditional use in different parts of the world. Therefore it should be investigated further to better understand its properties, safety and efficacy.

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