ISSN: 0975-8585

Research Journal of Pharmaceutical, Biological and Chemical Sciences

Beneficial Effects of Solanaceae towards Oral Health.

Pradeep Kumar R*.

Reader, Department of Public Health Dentistry, Saveetha Dental College, Chennai 600077.

ABSTRACT

During the last few decades there has been an increasing interest in the study of medicinal plants and their traditional use in different parts of the world. The Solanaceae, or nightshades, are an economically important family of flowering plants. The most economically important genus of the family is *Solanum*. The species are medicinal herbs and contain unique alkaloids and other biochemical constituents used for the treatment of diverse ailments. In the present review 10 species of Solanaceae have been documented which are being potentially exploited by the Indian population for oral health care. Of these Solanum surattense is found to be dominantly used for oral health care. This aim of this review is to document and summarize the information of various species in Solanaceae family its the medicinal value and their use towards oral health.

Key words: Heath, Medical, Oral, Solanaceae.

Corresponding author

ISSN: 0975-8585

INTRODUCTION

The history of medicinal plants can be traced back to Vedic Periods about 4500-1600 BC. Rigveda, the oldest of Vedas, describes about 99 plants. The Charaka Samhita, an ancient document on herbal medicine, reports on the production of 340 herbs for curing various diseases [1]. India and China are two of the largest countries in Asia, which have the richest arrays of registered and relatively well-known medicinal plants (Raven, 1998) [2].

It has been estimated that 80% of the world population under developed countries depends upon traditional medicine obtained from plants for primary health care. The ethno-medicine has gained considerable importance in the recent past, because of being safe and with no side effects. Therefore, such plants should be investigated to better understand their properties, safety and efficacy [3]. In such a way the aim of this review is to identify the various species in Solanaceae family with medical properties and their use towards oral health.

Solanaceae

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 genus *Solanum* L. consists of over 2000 species distributed worldwide is the largest in Solanaceae . The species are medicinal herbs and contain unique alkaloids and other biochemical constituents used for the treatment of diverse ailments (diabetes, cholera, bronchitis, high blood pressure) and as laxatives. [4, 5]

Methodology of the review:

The literature search was performed between using literature databases, including online catalogues of relevant institutions and e-journal consortia. Databases were chosen according to their topic (e.g. ethnology, agro forestry, ethnobotany and agriculture), geographical covering in English. Abstracts; extracted from the databases; were selected based on topic and geographical covering. Literature was downloaded as PDF-document from the Internet and obtained directly from authors. Literature comprising information without a clear source; be it primary data or other literature; was rejected. A search for additional literature; found in reference lists of collected publications (snowball principle).

Medical Properties of various species of Solanum:

In a study done by Pradeep kumar et al (2015) the ethanolic extract obtained from the leaf of the ***Solanum surattense*** was evaluated for antibacterial property by the agar well-diffusion method. Extract was placed in the wells and allowed to diffuse for 2 hrs at 4ºC and the plates were incubated at 37°C for 24 hrs. The antibacterial activity was determined by measuring the diameter of the zone of inhibition for each well and expressed in mm. The leaf extract inhibited the growth of pathogenic microorganisms. Maximum zone of inhibition was obtained in 500µg concentration of leaf extract. The minimum zone of inhibition observed in 25µg concentration of leaf extract [6].Similarly the antibacterial activity of Solanum surattense whole plant extracts and leaf extract were studied[7,8]. ***Solanum incanum*** shows Antibacterial property [9,10] whereas **Solanum torvum** (leaf, stem and roots) proved to have antibacterial and antifungal activity [11].

Presence of phytochemicals and potent antibacterial activity of leaf, root and seed extracts were found in ***Solanum nigrum*** . Parameswari.K et al observed that whole plant extract showed potential anti-bacterial activity and hence recommended that whole plant extracts may be to use in preparation of herbal drugs [13]. ***Solanum trilobatum*** (Solanaceae – herbs) is used as medicine for asthma, vomiting of blood, reducing blood glucose level and bilious matter phlegmatic rheumatism and several kinds of leprosy. It is also antibacterial, antifungal antimitotic, antioxidant and antitumouours[14,15,16].

Solanaceae and their benefits towards oral health

In the present review 10 species of Solanaceae have been documented which are being potentially exploited by the Indian population for oral health care (Table 1). Of these Solanum surattense is found to be dominantly used for oral health care.

Table 1: List of Solanaceae species and their use towards oral health care from various parts of India

S.No	Species	Dental uses
1.	***Datura stramonium***	A paste is prepared from the seeds applied for tooth ache [17].
2.	***Hyoscyamus niger***	Smoke of the seed kept in mouth for tooth ache.[18]
3.	***Solanum erianthum***	Boiled with water and the vapour is inhaled once or twice a week through mouth[19]
4.	***Solanum ferox.***	Dried seeds, flower are kept in mouth during tooth decay[20]
5.	***Solanum khasianum***	Seeds are used for Toothache[21]
6.	***Solanum nigrum***	Leaves and fruits are chewed and swallowed to cure mouth ulcer[22,23]
7.	***Solanum surattense***	Dried fruit smoke to reduce toothache.[24,25,26]
8.	***Solanum torvum***	Seeds are used for Toothache[21]
9.	***Solanum virginianum***	Fruit is dried, burnt to ash and applied in teeth.[27,28,29]
10.	***Solanum xanthocarpum***	Dried or fresh fruits are kept in fire and the smoke is inhaled through mouth to treat toothache[30]

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.

ACKNOWLEDGEMENT

The author is highly thankful to the all authors and researchers who shared their valuable information which was of immense use to prepare this brief review. The author is also thankful to the Principal and Head of the Department for their constant support and encouragement during this course of work.

REFERENCES

[1] N. D. Prajapati, S. S. Purohit, A. K. Sharma ., T. Kumar. "A handbook of medicinal plants. Agrobios, Jodhpur". India, 2003.

[2] P. H. Raven, Medicinal Plant and global sustainability. "The canary in the coal mine. In medicinal plants. A Global Heritage, proceeding of the IDRC", 14-18 .1998.

[3] Prusti, A., Mishra, S.R.,Sahoo, S. and Mishra, S.K..,2008. "Antibacterial Activity of Some Indian Medicinal Plants". Ethnobotanical Leaflets 12: 227-230. 2008.

[4] Caicedo, AL., BA Schaal . "Heterogeneous evolutionary processes affect 'R' gene diversity in natural populations of Solanum pimpinellifolium." Proceedings of the National Academy of Sciences, USA 101 (50) 2004: 17444-17449.

[5] Daunay, MC ., Chadha ML . Solanum melongena L. In: Gruben GJH & Denton OA (eds.) Plant Resources of Tropical Africa Vegetables. Wageningen: PROTA Foundations/ Backhuys Publishers /CTA.2004;p: 21-23.

[6] Pradeep kumar. R., Muralidharan N.P. Evaluation of Antibacterial Potential of solanum suratetense against streptococcus mutans. Biomedicine: 2015; 3(3) ;273-275

[7] Patil Suhas, Joshi Vijaya, Sutar Prasanna and Sambrekar Sudhir. Screening of whole plant extract of Solanum surattense for antibacterial activity. International Journal of pharmaceutical Sciences.2009;1(1):110-114.

[8] Sheeba, E. Antibacterial activity of Solanum surattense Burm. F. Kathamandu University Journal of science, Engineering and technology.2010; 6: (I). 1-4.

[9] John Britto ., Senthilkumar S. Antibacterial activity of Solanum incanum L. leaf extracts. Asian Journal of Microbiology Biotechnology Environmental Science, 2001; 3: 65-66.
[10] Pavitra P.S. Janani V.S., Charumathi k.H., Indumathy R., Sirisha Potala ., Rama S. Verma. Antibacterial activity of plants used in indian herbal medicine. International journal of green Pharmacy,2012; 23-28.
[11] Bari ,M.A., Islam,1 W.,. Khan A.R., Abul Mandal. Antibacterial and Antifungal Activity of Solanum torvum (Solanaceae). International Journal of Agricultural journal .2010; 12 (3): 386-390.
[12] Sridhar T.M., Josthna P. and Naidu C.V. In Vitro Antibacterial Activity and Phytochemical Analysis of Solanum nigrum (Linn.) - An Important Antiulcer Medicinal Plant. Journal of Experimental Sciences,2011; 2(8): 24-29.
[13] Parameswari.K, Sudheer Aluru, Kishori. In Vitro Antibacterial Activity In The Extracts Of Solanum Nigrum. Indian Streams Research Journal.2012;2(7) 1-4.
[14] Shahjahan M, Sabitha .KE,Mallika Devi .R Shyamala CS, Effect of medicinal plants on tumurogenesis Ind.J.Med.Res., 2004; 123 (5-8) : 23-27.
[15] Shahjahan M,Vani G., Shyamaladevi CS,. Effect of Solanum trilobatum on the antioxidant status during diethyl nitrosamine induced and phenobarbital promoted hepatocarcinogenesis in rat ,Chemico-Biological Interactions, 2005; 156,(2-3):113-123.
[16] Purushothaman KK, Saradambal S ,Narayanaswamy V, Chemical estimation of solanum trilobatum.L, Aust.J.Chem. 1969; 22 (7) : 1569-1570
[17] P. C. Phondani, R. K. Maikhuri, L. S. Rawat, N. A. Farooquee, C.P. Kala, S.C.R. Vishvakarma, K.S. Rao and K.G. Saxena. Ethnobotanical Uses of Plants among the Bhotiya Tribal Communities of Niti Valley in Central Himalaya, India. Ethnobotany Research & Applications.vol.8. 2010; 233-244.
[18] Dolui A.K., H.K.Sharma, Theresia Bree Marein, T.C. Lalhriatpuii. Folk herbal remidies from Mehalaya. Indian journal of traditional knowledge.vol.3 (4).2004.358-364.
[19] Ignacimuthu.S, Ayyanar.M, Sankara Sivaraman.K, Ethnobotanical investigations among tribes in Madurai District of Tamil Nadu (India) , Journal of Ethnobiology and Ethnomedicine 2006.2:25
[20] Bipul Saikia,SK Borthakar and N.Saikia. Medico-ethnobotany of Bodo trials in Gohpur of sonitpur district, Assam. Indian journal of traditional knowledge.vol.9 (1).2010.52-54.
[21] Rethy P,Singh B,Kagyung R, gajural pr. Ethnobotanical studies of Dehang-Debang biosphere reserve of Arunachal Pradesh with special reference to Membe tribe. Indian journal of traditional knowledge.vol.9 (1).2010.61-67.
[22] V.R. Mohana, A. Rajeshb, T. Athiperumalsamia and S. Suthac,"Ethnomedicinal Plants of the Tirunelveli District, Tamil Nadu" India.Ethnobotanical Leaflets 12: 79-95, 2008
[23] C. Kingston, B.S. Nisha, S. Kiruba and S. Jeeva .Ethnomedicinal Plants Used by Indigenous Community in a Traditional Healthcare System. Ethnobotanical Leaflets 11: 32-37. 2007.
[24] Meena.K.L,Yadav.B.L "Some ethnomedicinal plants of Rajasthan". Indian journal of traditional knowledge.vol.9 (1).2010.169-172.
[25] Sivaperumal.R, S. Ramya, A. Veera Ravi, C. Rajasekaran,R.Jayakumararaj, "Ethnopharmacological studies on the Medicinal Plants used by Tribal Inhabitants of Kottur Hills, Dharmapuri, Tamilnadu, India". Environ. We Int. J. Sci. Tech. 5(2010) 57-64.
[26] Kadhirvel.K, S. Ramya, T. Palin Sathya Sudha, A. Veera Ravi, C. Rajasekaran, "Ethnomedicinal Survey on Plants used by Tribals in Chitteri Hills" .Environ. We Int. J. Sci. Tech. 5 (2010) 35-46.
[27] A.B. Prusti ., K.K.Behera. "Ethnobotanical Exploration of Malkangiri District of Orissa, India" .Ethnobotanical Leaflets 11: 122-140. 2007.
[28] Badgujar S. B., Mahajan R. T. and Kosalge S. B. "Traditional Practice for Oral Health Care in Nandurbar District of Maharashtra, India" Ethnobotanical Leaflets 12: 1137-44. 2008.
[29] Achuta Nand Shukla, Sharad Srivastava, Rawat.A.K.S. "A ethnobotanical study of medicinal plants of Rewa districts.Madhya Pradesh". Indian journal of traditional knowledge.vol.9 (1).2010.191-202.
[30] Veeramuthu Duraipandiyan, Muniappan Ayyanar and Savarimuthu Ignacimuthu. "Antimicrobial activity of some ethnomedicinal plants used by Paliyar tribe from Tamil Nadu, India." BMC Complementary and Alternative Medicine 2006, 6:35