



COMPARATIVE CORRELATION OF VARIOUS PHARMACOLOGICAL SCREENING OF DALBERGIA SISSOO ROXB. WITH CLASSICAL DOCUMENTATION IN AYURVEDA: A REVIEW

Janki Lukhi ^{1*}, Dilip Jani ², Neha Parmar ³

¹3rd Year PG Scholar, Post Graduate Department of *Dravyaguna*, Government Ayurveda College, Vadodara, Gujarat, India

²Professor & HOD, Post Graduate Department of *Dravyaguna*, Government Ayurveda College, Vadodara, Gujarat, India

³Asst. Professor, Post Graduate Department of *Dravyaguna*, Government Ayurveda College, Vadodara, Gujarat, India

*Corresponding Author Email: jankilukhi@gmail.com

DOI: 10.7897/2277-4572.084147

Received on: 09/06/19 Revised on: 30/06/19 Accepted on: 05/07/19

ABSTRACT

Shisham (Shimshapa) is a medium sized tree which is used in the Indian tradition and for medicinal purpose since *Vedic* period. It is useful in making furniture, ships and other ritual purposes due to its compact firmness and long holding capacity. As medicinal uses, it has vast therapeutically activities documented in many *Ayurvedic* treatises and also observed to be practiced in the routine classical *Ayurveda* practice. This beauty of this medicinal plant has attracted many researchers including pharmacologist, biotechnologists, microbiologist, etc. to work on it and to explore its hidden capacities. In the current work, efforts have been made to amalgamate the traditional *Ayurveda* knowledge of the plant in co-relation with the various pharmacological screening. This kind of effort will help to understand the medicinal plant more precisely and correctly. It will also help to screen another unexplored property of the plant for academic as well as research purpose.

Keywords: *Ayurveda*, *Dalbergia sissoo* Roxb., Pharmacological screening, *Shimshapa*

INTRODUCTION

The first reference of *Shisham* which is known as *Shimshapa* in *Sanskrit* observed in *Rugveda*¹ where it is expressed for *Yagnakarma* (procedure to conduct environment purification). Later, every traditional text of *Ayurveda* has described the tree for various clinical applications. The Latin name of *Shisham Dalbergia sissoo* Roxb and belongs to *fabaceae* family. Its useful parts are wood, stem bark, leaves and roots. Out of all clinical applications, the medicinal plant was mainly quoted for its activity on wound, skin diseases and urinary track system. However, the conceptual aspect of the plant is also helpful to apply clinically in other diseases where an *Ayurveda* principle is applicable. Conceptually, the plant has been quoted to have *Katu* (Pungent), *Tikta* (Bitter), *Kashaya* (Astringent) taste, *Ushna Veerya* (potency)². Hence, conceptually the plant will also be useful for all those diseases where these concepts are applicable. Apart from the direct references and conceptual feedback, the plant is also explained as a therapeutic application (*Amayeeek Prayoga*) in many diseases with the details of its actual

application. Being a very easily available and easy to identify the plant has attracted many scholars to work on it. As of now, there are more than 13 Pharmacological screening were conducted on this plant. In most of the cases the plant shows a significant activity and exerts positive impression for its action. It will be very interesting and justifiable that most of the activity documented in the traditional literature were observed to be get validated by the current pharmacological screening method. The said kinds of activity not only justify the correct *Ayurvedic* documentation but also give an insight to study the basic tools used by the traditional healers to correctly document the pharmacological activity. As there were no technological gadgets, laboratories, statistical methodologies, micro-fined experiments, etc in olden days, despite of that the healers were successful to impress the present generation by claiming the actions.

The comparative observations to correlate the pharmacological screening of *Shimshapa* among conventional methods and *Ayurveda* documentations are mentioned.

PHARMACOLOGICAL ACTIVITY	DIRECT OR INDIRECT CLASSICAL REFERENCES	AYURVEDIC INTRPRETATION: AN APPLIED THERAPEUTIC FEATURE
Anti-parasitic effect: An anthelmintic activity of ethanolic extract ³ of stem bark of <i>Dalbergia sissoo</i> was against Indian earthworms <i>pheretima</i> posthuman & hematode <i>Ascardigali</i> . A significant decrease in egg mass weight & reproductive intreated ticks along with an increase in percent inhibition of oviposition.	<i>Krimighna</i> ^{4,5,6,7,8,9}	Being <i>Tikta-Katurasa</i> and having <i>Katuvipaka</i> , it can cover all the range of parasite growth.
Anti-inflammatory effect: In hexane- methanol extracts ³ of <i>D. sissoo</i> and okanin was by carrageenan induced paw oedema in rats. The methanolic extract showed maximum activity. <i>D. sissoo</i> significantly decreased the writhing movements in mice in acetic acid – induced writhing test.	<i>Shothaghna</i> ^{10,11,12,13}	<i>Shimshapa</i> has <i>Shophaghna</i> properties also have a <i>Ushna Veerya</i> & <i>Kaphaghna</i> action, it can perform the said actions
Analgesic effect: An ethanol extract ³ of the leaves of <i>D. sissoo</i> showed both peripheral and central analgesic activity in a dose dependant manner.it showed	<i>Shoolaghna</i> ^{11,13}	<i>Vata Dosha</i> is the cause for pain. <i>Shimshapa</i> is <i>Ushna</i>

significant analgesic activity as evidenced by the increase in reaction time to the pain stimulus		Veerya & also Vata Kapha Nashaka, hence it can rule out the pain.
Antidiabetic effect : The ethanol, ethyl acetate, n-butanol & petroleum ether extracts of the leaves of <i>D. sissoo</i> were investigated for antidiabetic activity in alloxan induced diabetic rats. The extracts produced a significant antidiabetic effect on first, third, fifth and seventh days at 300mg/kg body weight.	<i>Mehaghna</i> ^{4,5,6,7,14,15,16}	The direct reference is <i>Mehagna</i> (a Diabetic condition). Hence possible to exert the action
Dermatological effect: The result indicated that ethylacetate extract of bark of <i>D. sissoo</i> was non-toxic increased melanin activity. The bark of <i>D. sissoo</i> stimulates B16F10 melanogenesis at very low concentrations in the treatment of Hypopigmentation disease, such as vitiligo ³ .	<i>Kushthaghna</i> ^{2,4,6,8,12,14,17}	The direct reference is as <i>Kushthahara</i> and <i>Shwitrhara</i> (a skin disease and leucoderma). Hence possible to exert the action
Osteogenic effect: The effect of Dalbergiphenol, the neoflavonoid isolated from heartwood was evaluated in bone loss in ovariectomized Mice. The result indicated. The leaves & pods extract ³ of <i>D. sissoo</i> showed anti resorptive and bone forming effect. The positive skeletal effect attributed to active molecules presents in the extract of <i>D. sissoo</i> .	<i>Balya</i> ^{10,13}	The indirect actions like <i>Balya</i> , <i>Vranahara</i> and <i>Shophahara</i> are responsible along with <i>Kashaya Rasa</i>
Anti-microbial effect: The methanol extracts ³ were exhibited good anti-bacterial activity proved towards various pathogens, Gram positive & Gram-negative bacteria. <i>D. sissoo</i> was evaluated for its antibacterial potential against eight human pathogenic bacterial strains.	<i>Krimighna</i> ^{4,5,6,7,8,9}	<i>Shimshapa</i> is documented strongly against <i>Krimi</i> along with <i>Dushta Vrana</i> hence capable to cover maximum range of microbial growth.
Antioxidant effect: The ethanol extract ³ of the bark of <i>D. sissoo</i> was screened for lipid peroxidation inhibitory. The bark extracts exhibited significant antioxidant activity.	<i>Shramapaha</i> ¹³ , <i>Balya</i> ^{10,13}	It is having <i>Shramnahara</i> (relieves tiredness) and <i>Balya</i> (provides proper strength)
Anti-ulcer effect: The anti-ulcer effect of <i>D. sissoo</i> stem bark methanol extract ³ was studied against the diclofenac sodium – induced ulceration in rat. There was significant decrease in offensive factor like free & total acidity, pepsin, with significant increase in the defensive factor like total carbohydrate content.	<i>VataPittaghna</i> ^{9,13}	Aggravation of <i>Pitta Dosh</i> is responsible for ulcer formation. Hence, <i>Shimshapa</i> is useful as it has <i>Tikta</i> , <i>Kashaya Rasa</i> and <i>Sheetaveerya</i> along <i>Vata-Pitashamak</i> property.
Anti-diarrhoeal effect: The ether, ethanol and aqueous ³ extracts of <i>D. sissoo</i> bark were studied for anti-diarrhoeal properties in experimental diarrhoea induced by castor oil. The ether extract showed significant and dose dependent anti-diarrhoeal activity.	<i>Ateesaraghna</i> ¹⁴	There is direct reference of the drug on anti-diarrhoeal activity
Cardiac effect: The effect of alcoholic extract ³ of <i>D. sissoo</i> leaf extract was studied in isoproterenol induced myocardial injury in rats. Histopathology also showed significant improvement in herat tissue.	<i>Vranahara</i> , <i>Shokhahara</i> and <i>Medohara</i> ^{4,5,6,7,14,15,16}	<i>Vranahara</i> (wound healing), <i>Shophahara</i> (reducing inflammation) and <i>Medohara</i> (resolving extra fat) all in total can act as cardioprotective
CNS effect: The ethanolic leaf extracts ³ of <i>D. sissoo</i> attenuated behavioural alternations, oxidative damage, mitochondrial dysfunction, and striatal/hippocampus damage in 3-nitropropionic acid treated rats.it significantly enhance the learning and memory activities against the scopolamine induced dementia and significant decrease in acetylcholinesterase level in brain in animals	<i>Vataghna</i> ^{13,19}	<i>Ushna Veerya</i> & <i>Vata Shamaka</i> actions are able to control most of psychological activities.
Reproductive effect: Anti fertility effects of <i>D. sissoo</i> was investigated and shown in male mice. The anti-spermatogenic efficacy of ethanol extract ³ of stem bark in healthy fertile men. Significant reduction in epidymal sperm motility, viability, & serum level of testosterone.	<i>Kapshaghna</i> ^{2,7,16}	<i>Katu</i> , <i>Tikta</i> , <i>Kashaya Rasa</i> & <i>Katu Vipaka</i> decrease the <i>Shukra dhatu</i> & also having <i>Garbhapatini</i> action responsible to exert male infertility. The <i>Shukra</i> is the common concept in male and female

DISCUSSION

Ayurveda science is *Nitya* and *Shashwata* and hence the documented data of the herb will be correct in any situation. However, its application and tracing-out its mechanism may differ from expert to expert. Its principles, medicines, plans of treatments are directly subject to the ideology of Ayurveda. The co-relation with current Pharmacological methods may be correct but not completely validates Ayurveda actions. But it can be surely commenting that the properties and activities said by the Acharyas thousands of years ago can be carried out by the researches of today's era too. The Documentation of *Shimshapa* will help us to design the screening of action. Yet many activities like *Medohara* (Anti-cholesterol, anti-obesity, etc), *Daha Hara* (Hepatoprotective, Nuralgia, etc), *Vami* (Anti-emetic), *Shosha* (Anti-tubercular, etc), *Basti Ruk* (Lithotriptic, etc), *Pinasa*

(activities for ENT diseases), *Kandu* (Anti-itching, etc), *Varnya* (skin toner), *Ruchikara*, *Ajeerna*, *Dipya* (Carminative, Appatizer), *Garbha Patini* (abortifacient, contraceptive) are not experimentally explored through Pharmacological methods. However, the activities which were explored through screening can more precisely be screened considering overall action of *Shimshapa* as per Ayurveda concept. For Example, *Shimshapa* is screened for anti-diabetic activity. But according to Ayurveda, it is not only controlling the Blood Glucose level, but also helps in treating complication like Diabetic dermatopathy (due to *Meha-Kushthahara*), Diabetic Nephropathy (*Meha-Basti*), Non-healing wounds (*Meha-vrana*), Diabetic foot amputations (*Meha-Dushta Vrana*), etc. The amalgamation of Ayurveda and conventional system can useful for applied application of both the systems. Utilization of experimental tools and conceptual Ayurveda aspects will help to strengthen the medical science.

CONCLUSION

In this study, *Ayurvedic sutras* were correlated to the conducted pharmacological screening of herb. Proper understanding of Ayurveda principles and its micro-division will help to select the proper experimental model for screening. This activity will reduce unwanted expenditure on screening and beneficial for more accurate results. Moreover, if clubbed with the drug-discovery methodologies, there are enormous chances for new drug identification or drug-delivery system.

ACKNOWLEDGEMENT

The authors are thankful to the Principal of Govt. Ayurveda College, Vadodara and Director, State AYUSH department, Govt of Gujarat for providing the Infrastructure and necessary help for study.

REFERENCES

1. Anonymous, Compiled by Pandit Shri Ram Sharma Acharya, & Mata Bhagavati devi Sharma, *Ruga veda* (Ru. 3/53/19, Khi. 5/15/2, Kau. Su. 8/16, 34/1, Pa. 7/3/1, Pa. Ga. 4/2/80, 4/3/139,150, 4/1/99, Pa. Ma. 2/1/57, 5/1/2), Yuga Nirmaana Yojana Vistar Trust, Mathura, 2010
2. Chunekar KC, Pandey GS, *Bhavaprakash* Nighnatu of Bhavmishra, Purva khanda, vatadi varge, 9th edition, Chaukhambha Sanskrit Sansthan, Varanasi : 2005 p.-510
3. Ali Esmail Al-Snafi. Chemical constituents and pharmacological effects of *Dalbergia sissoo* - A review, IOSR Journal of Pharmacy, (e)-ISSN: 2250-3013, (p)-ISSN: 2319-4219 Volume 7, Issue 2 Version. 1 (Feb 2017). p. 59-71
4. Acharya Yadavaji Trikamji, *Sushruta Samhita* of Acharya Sushruta, *Sutra sthana* 38/20-21, Reprint, Chaukhambha Surbharti Prakashan, Varanasi, 2008 p-184
5. Hari Sadashiva Shashtri Paradakara *Astanga hridaya*, of Vagabhat, *Sutra sthana* 15/32 Reprint, Chaukhambha Prakashana, Varanasi, 2010.p-238
6. Kaviraj Atridev Gupta, *Astanga Samgraha* of acharya Vagabhat, *Sutra sthana* 16/15 , Reprint Chaukhambha Krishnadas Academy, Banaras, 2005.p-137
7. Anonymous, Madanadi Nighnatu, e-Nighantu, National Institute of Indian Medical Heritage (NIIMH), Hyderabad, central council for Reserch in Ayurvedic Sciences (CCRAS) New Delhi ; 2015
8. Anonymous, Madanapal Nighnatu vatadi sarge , e-Nighantu, National Institute of Indian Medical Heritage

- (NIIMH), Hyderabad, central council for Reserch in Ayurvedic Sciences (CCRAS) New Delhi ; 2015
9. Anonymous, priya Nighnatu Haritakyadi varge , e-Nighantu, National Institute of Indian Medical Heritage (NIIMH), Hyderabad, central council for Reserch in Ayurvedic Sciences (CCRAS) New Delhi ; 2015
10. Anonymous, edited by Prof. Priyavrat Sharma, *Dhanvantari nighantu*, 4th Edition, Chaukhambha Orientalia, Varanasi, 2005
11. Acharya Sodhala , edited by Prof. Priyavrat Sharma, *Sodhala Nighantu*, Oriental Institute , Baroda, 1978
12. Anonymous, Kaiydev Nighnatu Aaushadhi varge- 977 , e-Nighantu, National Institute of Indian Medical Heritage (NIIMH), Hyderabad, central council for Research in Ayurvedic Sciences (CCRAS) New Delhi ; 2015
13. Anonymous, Rajavallabha Nighnatu Prabhadradi Vargee, e-Nighantu, National Institute of Indian Medical Heritage (NIIMH), Hyderabad, central council for Research in Ayurvedic Sciences (CCRAS) New Delhi ; 2015
14. Pandit Hariharaprasad Trivedi, *Vangasena Samhita* of Vangasena, *Chikitsa sthana* 89/13 1st Edition, Chaukhambha Sanskrita Series Office, Varanasi, 2009 p-1201
15. Anonymous, edited by Vaidya lakshmi pati Shashtri, With Commentry “*Vidhyotani*”, *Yoga Ratnakar Meha chikitsa* 3, Reprint, Chaukhambha prakashana, Varanasi, 2010 P-84
16. Anonymous, Ashtang Nighantus Mushkakadi gana , e-Nighantu, National Institute of Indian Medical Heritage (NIIMH), Hyderabad, central council for Reserch in Ayurvedic Sciences (CCRAS) New Delhi ; 2015
17. Shri Indradev Tripathi, Shri Gangasahay Pandey, Gada Nigraha of Shodhala *Prayoga Khanda tail adhikar /315*, 4th Edition, Chaukhambha Sanskrit prakashan, Varanasi, 2003p-115
18. Prof. Sidhhinandan Misra, *Bhaishjyarnavali* of Kaviraj Govind Dasasen, 11/88. reprint, Chaukha surabharati prakashan, Varanasi, 2011p-374
19. Anonymous, By Shri Shaligram vaishyavarya, *Shaligrama Nighantu Bhushana*, Bruhat Nighantu Ratnakar Part 7-8, *Guduchyadi Varga*, reprint, Khemaraja Shrikrishnadas Prakashana, Mum-4, 19

How to cite this article:

Janki Lukhi et al. Comparative correlation of various pharmacological screening of *Dalbergia sissoo* Roxb. with classical documentation in Ayurveda: A review. J Pharm Sci Innov. 2019;8(4):162-164.

<http://dx.doi.org/10.7897/2277-4572.084147>

Source of support: Nil, Conflict of interest: None Declared

Disclaimer: JPSI is solely owned by Moksha Publishing House - A non-profit publishing house, dedicated to publish quality research, while every effort has been taken to verify the accuracy of the content published in our Journal. JPSI cannot accept any responsibility or liability for the site content and articles published. The views expressed in articles by our contributing authors are not necessarily those of JPSI editor or editorial board members.