



E-ISSN: 2278-4136  
P-ISSN: 2349-8234  
JPP 2018; 7(4): 216-220  
Received: 15-05-2018  
Accepted: 20-06-2018

**Rashmi Yadav**  
PG Scholar, Department of  
Dravyaguna, IMS, BHU,  
Varanasi, Uttar Pradesh India

**Sadhana Singh**  
Senior Resident, Department of  
Dravyaguna, IMS, BHU,  
Varanasi, Uttar Pradesh India

**Brijesh Gupta**  
Senior Resident, Department of  
Dravyaguna, IMS, BHU,  
Varanasi, Uttar Pradesh India

**KN Dwivedi**  
Professor Department of  
Dravyaguna, IMS, BHU,  
Varanasi, Uttar Pradesh India

## A review on (*Dalbergia sissoo* Roxb.) with special reference to its role in prameha as per brihtrayi and chikitsa granth

Rashmi Yadav, Sadhana Singh, Brijesh Gupta and KN Dwivedi

### Abstract

From time immemorial man has been in close contact with the flora around him. With the passage of time as his mental faculties developed he began to use them to abate the pangs of hunger and slowly his instincts also directed him to use different plants to treat various ailments. The traditional medicinal uses has been coming down from generation to generation from the time immemorial. To search for the classical uses is no less important. The analysis of *Dravya, Rasa, Guna, Virya* and *Vipaka* on the basis of Panchamahabhut is a remarkable landmark during samhita period. A number of drugs were in practical use and the data's were recorded in the form of samhita. The present encyclopaedic study aims to high lighten the therapeutic value of *Shinshapa (Dalbergia sissoo Roxb.)* with special reference in prameha.

**Keywords:** traditional medicine, shinsapa, panchamahabhut, samhita, encyclopaedic study

### Introduction

Medicinal plants have been used as natural medicines. This practice has been in existence since prehistoric times. There are different ways in which plants have been found useful in medicines such as crude extract of plants has been used directly because of the presence of natural chemical constituents such as Berberine, Morphine, Psilocin, Tannin, Flavonoids, Vincristine etc. History of drug can be studied under *Vedic kala, Upanishad, Purana, Samhita, Nighantu* and *Adhunka kala. Shinshapa (Dalbergia sissoo Roxb.)* is a popular tree, which is used by traditional practioner to cure various ailments. On comprehensive review of *Ayurvedic* classics it was found that *Shinshapa* described in *Vedic compendia*, and in *Charaka Samhita, Sushruta Samhita* and both *Ashtanga Samgraha* and *Ashtanga Hradaya*, other *samhita granthas* and in *Chikitsa grantha* like *Chakradatta, Yogaratnakara* etc. and also in *Nighantus*. Our aim was launched with an aim to explore the possibility of a better control over diabetes by *Shinsapa (Dalbergia sissoo Roxb.)*.

### Material and Method

#### Botanical description

A tree reaching 18 m. high; young part pubescent or tomentose; branches numerous. Spreading. Leaves alternate, bifarious, imparipinnate; leaf rhachis zigzag; petioles terete, very downy when young; stipules lanceolate. caducous. Leaflets 3-5. firm. 3.8-6.3 by 3-5.4 cm. distant. Alternate. Sub orbicular. Conspicuously and abruptly acuminate, puberulous when young. Soon glabrescent. Base narrowed or cuneate; petiolules 3-6 mm. long. Flowers sessile or nearly so, in axillary panicles shorter than the leaves and composed of several short subsecund spikes; rhachis and branches of the panicle densely hairy; bracts linear –subulate hairy. Calyx 4-5 mm. long. hairy; teeth short. ciliate. The 2 upper connate except at the tip. Lateral linear, obtuse. the lowest the longest. subacute. Corolla pale yellow. 6-8 mm. long; standard 4 mm. broad. with along claw. The limb obovate –orbicular. Stamens 9 in one bundle, the sheath of the filaments slit only at the top. Ovary pubescent; ovules 2-4 Pods 3.8-10 by 0.6 -1.3 cm. narrowed at the base into a long stalk which is twice as long as the calyx, thin. Strap-shaped. glabrous. Slightly reticulate. Seeds 1-4.

#### Therapeutic Uses

The bark and wood are bitter. Acrid. Aphrodisiac. Abortifacient. Expectorant. Anthelmintic. Antipyretic. Appetiser; allays thirst. Vomiting. Burning sensation; cures skin diseases. Troubles of the anus. Ulcers, diseases of the blood. Leucoderma. dyspepsia. Dysentery. The wood is bitter with a bad taste. anthelmintic ;enriches the blood ;good for diseases of the eye and of nose; used in scabies.

#### Correspondence

**Rashmi Yadav**  
PG Scholar, Department of  
Dravyaguna, IMS, BHU,  
Varanasi, Uttar Pradesh India

Burning sensation of the body. Scalding urine. Syphilis. Stomach troubles. The mucilage of the leaves mixed with sweet-oil is a good application in excoriations. A decoction of the leaves is given in the acute stage of gonorrhoea. The wood is considered useful in leprosy, boils, eruptions, and to allay vomiting <sup>[1]</sup>.

### Vedic period

Vedic compendia are embodiment of knowledge and culture of a very high order and Ayurveda being a special branch of Veda i.e. sub-scripture of Atharvaveda, represents the achievement of ancient ages in the field of medicine and allied subjects. Atharvaveda is a curious compendium of medicine in its various stages of evolution. Description of Shinsapa in Vedic compendia was found. In Rgveda Shinsapa is described in "Tritiya mandal" it is found to be useful to make cart wheel and falls under the category of "Shanta Vrksa". (R. 3/53/19, Khi. 5/15/2, Kau.Su. 8/16, 34/1. Pa. Ma.2/1/57, 5/1/2).

In Saunakiya Shakha of Atharvaveda (Sau. 6/129/1, 20/129/7), the word Shinsapa had been used, which is Sisam tree. According to Shri Whitani (Translation of Ayurveda pp.378), Shri Jimar, and Dr. Suryakant (Vedic Kosa pp.516) and other experts. Dr. V.W. Kremvelkar (The Atharveda aur Ayurveda pp. 306) has been accepted it as *Delbergia sissoo* Roxb. The words Brhmavarchasa, Saubhagyakarana, Satrusthana etc. also had been used for it in Atharvaveda, there is another word Syama also has been mentioned, which is useful in Svitra and Palitya. Lala Shaligrama Ji (Shaligrama Ausadha Shabdasagar pp.188-189) accept it as Sisama among many meanings has been given of "Syama" <sup>[2]</sup>.

### Post-vedic Period

Post-vedic period is the period when Ayurveda emerged in its crystalline form as result of discussion and serious thinking in the preceding era. This is the Samhita period. In Patanjala Mahabhasya Shinsapa is given for the example of Vrksa. (1/2/45, 64; 1/3/9, 2/1/57; 4/3/163, 5/1/2).

Shinsapa also have been listed in Kalpasutra, Padiniya Astadhyayi and Vartika <sup>[3]</sup>.

### Shinsapa in samhita grantha

In Charak Samhita, Shinsapa is mentioned in Asavayoni Sara, Kashaya skandha. In Chikitsa-Sthana, Shinsapa is mentioned for various purposes i.e. Rasayana, Kustha chikitsa, etc. In Sarira Sthana Shinsapa Sara dhuma has been used in 'Anagata prasava' (Management of uterine inertia). In Kalpa Sthana is Shinsapa mentioned in the description of jangala Desa.

In Susruta Samhita, Shinsapa is found in Salasaradi, Mushkakadi Gana and also for the treatment of kustha, Dadru, Prameha, Vasameha, Rajayakshma, Sthulata, Shopha, Jvara etc.

In Astanga Hridaya, Shinsapa has been mentioned in Sutrasthan, Chikitsasthan and Uttarasthan. Shinsapa has been used for various purposes in various formulations.

In Astanga Sangraha Shinsapa has mentioned in Asanadi gana, Muskakadi gana. Shinsapa has been used for various purposes in various formulations were indicated for prameha or could be used in prameha.

### Charaka samhita (1000 BC - 4 A.D.)

This treatise is one of the existing old medical treatises of India, Charaka Samhita can be considered as one of the oldest book of internal medicine. This text has been composed by Maharsi Agnivesha (1000 B.C.), Acharya Charak (2000 B.C.)

has reduced it and it is reconstructed by Acharya Drdhabala (4<sup>th</sup> Cent. A.D.). Commonly it is considered as the text of Kayacikitsa, but it is apparent from the following verse, that it is full of the subject matter of Dravyaguna and the properties, actions and uses of drugs are entirely mentioned throughout the text. Further in the entire text of Charak samhita the properties and actions of Ayushya (wholesome for life) and Anayushya for life have been unwholesome drugs for life have been described. Verse (C. Su. 30/23) says that Ayurveda is so named because it gives knowledge regarding properties and actions of the drugs wholesome for the life as well as the drugs unwholesome for the life. Further in the entire text of Charak samhita the properties and actions of Ayushya (wholesome for life) and unwholesome drugs for life have been described. Thus, it is evident that the entire text of Charak samhita mainly consists of knowledge of drugs i.e. subject of dravyaguna. In Charaka Samhita, Shinsapa is used for various purposes in various formulations, in the table no.1 those formulations are given which were indicated for various diseases <sup>[4]</sup>.

### Susruta samhita (1000 B.C. - 4 A.D.)

This Samhita is composed by Vrddha Susruta (1000 B.C.) and is chiefly concerned to surgery along with the other parts of medicine. This treatise was reduced by Sushruta in 2<sup>nd</sup> Cent. A.D. Later on revised by Nagarjuna, the greatest scientist of Baudhdha era during 5<sup>th</sup> cent. A.D. At present time, this samhita appears to be much recent than Charak samhita because of the fact that its amelioration (pathasuddhi) was done by Chandrata in 10<sup>th</sup> Cent. A.D. In Susruta Samhita there are various preparation of Simsapa with their various indications, in the table no.2 those formulations are given which were indicated for prameha or could be used in prameha <sup>[5]</sup>.

### Astanga hridaya (7<sup>th</sup> Cent. A.D.)

This samhita has been written by Acharya Vagbhata in 7<sup>th</sup> Cent. A.D. Several Vagbhata are known in Indian history as authors of work on different branches of learning. Among all these Vagbhatas two are important who authored Astanga Hridaya and Astanga Sangraha. Regarding identity of the author of this treatise there is a lot of controversy, some scholars believe there was only one Vagbhata who was the author of both grantha. While according to Hon'ble Prof. P.V. Sharma, there are two Vagbhatas belonging to different periods having different authorship and has proved that Vagbhata second (7<sup>th</sup> Cent. A.D.) is the author of this book. In Astanga Hridaya, Shinsapa has been mentioned in Sutrasthan, Chikitsasthan and Uttarasthan. Shinsapa has been used for various purposes in various formulations, In the table no.3 those formulations are given which were indicated for prameha or could be used in prameha <sup>[6]</sup>.

### Ashtanga sangraha (600 A.D.)

This important treatise is written by Vrddha Vagbhata. He has included 45 mahakasaya of Charaka samhita in his treatise. In Astanga Sangraha Shinsapa mentioned in Asanadi gana, Muskakadi gana. Shinsapa has been used for various purposes in various formulations, In the table no.4 those formulations are given which were indicated for prameha or could be used in prameha <sup>[7]</sup>.

### Harita samhita

Maharsi Harita was also a student of Maharsi Agnivesha & he wrote a book Harita samhita. In Samhita Shinsapa is

mentioned in Tiritiya sthana- (28/26) – Decoction of Shinsapa bark use for the washing of prameha pitika [8].

### Shinsapa in chikitsa grantha-

#### A) Yogaratnakara (17<sup>th</sup> Cent. A.D.)

This text book is written in 7<sup>th</sup> Cent., in this book ‘Shinsapa kwatha’ has been used to treat Vasamehi. (39/65) [9].

#### B) Cakradatta (11<sup>th</sup> Cent. A.D.)

This Chikitsa Grantha has been written by Chakrapanidatta, the great commentator of Charaka Samhita and Susruta Samhita has gone to as name Charak Chaturunana and Susruta Sahasraksha. He mentioned shinshapa in salasaradi leha, salasaradi kwath, and Salsaradi seka and salsarad udvartan in prameha chikitsa. In the table no.5 those formulations are given which were indicated for prameha or could be used in prameha [10].

#### C) Vangasena Samhita (12<sup>th</sup> Cent. A.D.)

In Prameha roga adhikara – Salasaradi seka. (17/123) [11].

#### D) Bhaisajya Ratnavali (18<sup>th</sup> Cent. A.D.)

Salasaradi leha is indicated in prameha chikitsa. (37/52)

In Prameh-rogadhikar ‘Shinsapa’ described i Salasaradigana. Salasaradigana kvatha used as anupana of Silajatu. (37/55) [12].

According to literature available in samhita we may say that Shinsapa has following properties and actions.

Rasa : Kasaya, Katu, Tikta

Guna : Laghu, Ruksha

Virya : Usna

Vipaka : Katu

Dosa Karma: Kaphavatasamaka, Vastirogvinasi, Medohara, Vranaghna

Indications: Kustha, Prameha, Vrana, Dustavrana, Vasameha, Krm, Jvara [13].

### Medicinal aspect and hypoglycemic activity

- Antidiabetic Evaluation of *Dalbergia sissoo* against alloxan induced diabetes mellitus in wistar albino rats (Kiran V. Pund, Neeraj S. Vyawahare Dept. of pharmacology, AISSMS College of pharmacy. J. Nat. Prod. Plant Resource. 2012, 2 (1):81-88.) [14].
- Ant diabetic activity of different extracts of *Dalbergia sissoo* Roxb. stem bark on streptozotocin –nicotinamide induced Type 2 Diabetic rats (Shivani Saini, Sunil Sharma, Guru Jambheshwar University of Science and technology, Hisar, IJPPS, Vol 5, issue 4, 2013) [15].

### Mode of action of shinsapa in prameha as ayurvedic pharmacology

Madhumeha has been described as one among the 20 types of prameha. As time passes all prameha convert into Madhumeha. It is tridosaja vyadhi. Abadhha Sleshma is particular dosa in all types of prameha. The clinical entity in which patient voids the urine having concordance with madhu i.e. of kasaya and madhura taste, ruksha texture and madhu (honey) like colour and body acquires sweetness is called madhumeha. Shinshapa possesses “Stambhana” property due to Kasaya Rasa supposed to alleviate “Bahumutrata” which is predominant in Prameha. Katu, Tikta kasaya rasa and katu vipaka have anti-diuretic property (Baddhamutrata) hence pacify the symptom Bahumutrata. Being Ruksha and Laghu it is Srotosodhaka which is desirable to remove Avarana. Ruksha and Laghu Guna and Kasaya, Katu, Tikta rasa alleviate Kapha and Meda the main culprits involved in pathogenesis of disease. Due to tikta, kasaya rasa and laghu, ruksha guna it causes scarification (lekhana) and consumption off (soshana) medodhatu. Because of USNA Virya it has Kaphasamaka property which is essential to combat “Bahudrava Slesma” main Dosa involved in causation of all the Prameha. Its USNA Virya is supposed to combat Kapha and Vata simultaneously. It has Kaphavatasamaka property which is the desirable action for Samprapti -vighatana of Madhumeha.

**Table 1:** Formulations are given which were indicated for different diseases.

S. No.	Preparation	Indication	Reference
1.	Sarasava	Kushthadi roga	C.Su. 25/49
2.	Kashaya Skandha	All santarpana janya roga	C.Vi.8/144
3.	Simsapa Sara dhuma	Anagata Prasava	C.SA. 8/38
4.	Simsapa svarasa	Baladi Rasayana	C.Ci.1/2/12
5.	Simsapa svarasa	Amalakayas Brhma Rasayana.	C.Ci. 1/3/2
6.	Mahakhadir Ghrita	Kushta, Gulma, Prameha etc.	C.Ci. 7/152

**Table 2:** Formulations are given which were indicated for prameha or could be used in prameha.

S. N	Preparation	Indication	Reference
1.	Salsaradi gana	Kushtha, Prameha, Pandu, Kaphamedovishosaka	Su. Su. 38/12
2.	Muskakadi gana	Meha, Arsa, Pandu & Mutrasarkara	Su. Su. 38/21
3.	SÁra Sneha	Dusta vrana, Krimi, Kapha, Kushtha. Vata	Su. Ci. 45/123
4.	Sura	Kushtha, Meha.	Su. Ci. 10/6
5.	Ayaskriti	Kustha, Prameha, Meda, Sthulata.	Su.Ci. 10/12
6.	Simsapa Kashaya	Vasameha	Su.Ci. 11/9
7.	Sara -sneha	Dadru, Kustha, Kitibha	Su.Ci. 31/5
8.	Simsapa pakva Kshira	Sarva jvara	Su.U. 39/203

**Table 3:** Formulations are given which were indicated for prameha or could be used in Prameha

S. No.	Preparation	Indication	Reference
1.	Asanadi gana	Svitra, Kustha, Kapharoga, Krimi, Pandu, Prameha, Medo-dosa.	A.H.Su.15/19-20
2.	Mushkakadi gana	Gulma, Prameha, Asmari etc.	A.H. Su. 15/32
3.	Simsapasara siddha Kshira	Sarva jvara Chikitsa	A. H.Ci. 8/140
4.	Piccha Basti	Guda bhramsa, Pravahana, Ruja, Kshata Kshina	A. H.Ci. 9/96-97
5.	Rasayana	Gulma, Pliha, arsha, prameha	A. H.U.39/169

**Table 4:** Formulations are given which were indicated for prameha or could be used in Prameha

S No.	Preparation	Indication	Reference
1.	Asanadi gana	Svitra, Kustha, Vitiated Kapha, Krimi Pandu, Prameha and Sthaulya.	A.S.Su. 26/13
2.	Muskakadi gana	Gulma, Meha, Asmari, Pandu, Medoroga, Arsa, Kapharoga, Sukradosa.	A.S.Su. 26/17

**Table 5:** Formulations which were indicated for prameha or could be used in prameha or madhumeha

S No.	Preparation	Indication	Reference
1.	Salasaradi Kwatha	Prameha	C.D.Gr. Ci.35/56
2.	Salasaradi Leha	Prameha	C.D.Gr. Ci.35/58
3.	Salasaradi seka	Prameha Pidika	C.D.Gr. Ci.35/63
4.	Salasaradi udvartana	Prameha Pidika	C.D.Gr. Ci.35/63

## Discussion

Discussion is the churning process done to obtain a reasonable and logical conclusion. Before establishment of truth as conclusion, discussion is mandatory. Discussion improves the knowledge and discussion with the literature becomes basic establishment of the concept. It constitutes the clinical interpretation of the findings. It is as important as an observation. *Madhumeha* has been described as one among the 20 types of *prameha*. As time passes all *prameha* convert into *Madhumeha*. It is *tridosaja vyadhi*. *Abadhha Slesma* is particular dosa in all types of *prameha*. The clinical entity in which patient voids the urine having concordance with *madhu* i.e. of *kasaya* and *madhura* taste, *ruksha* texture and *madhu* (honey) like colour and body acquires sweetness is called *madhumeha*. On comprehensive review of *Ayurvedic* classics it was found that *Shinsapa* was described in *vedic* compendia, and also described in *Charak Samhita*, *Susruta Samhita* and both *Astanga Sangraha* and *Astanga Hridaya*, and in *Chikitsa Grantha* like *Cakradatta*, *Vangsenya*, *Yogaratanakara* etc. and also in various *Nighantu*. Drug possesses “*Stambhana*” property due to *Kasaya Rasa* supposed to alleviate “*Bahumutrata*” which is predominant in *Prameha*. *Katu*, *Tikta kasaya* rasa and *katu vipaka* have anti-diuretic property (*Baddhamutrata*) hence pacify the symptom *Bahumutrata*. Being *Ruksha* and *Laghu* it is *Srotosodhaka* which is desirable to remove *Avarana*. *Ruksha* and *Laghu Guna* and *Kasaya*, *Katu*, *Tikta* rasa alleviate *Kapha* and *Meda* the main culprits involved in pathogenesis of disease. Due to *tikta*, *kasaya* rasa and *laghu*, *ruksha* guna it causes scarification (*lekhana*) and consumption off (*Sosana*) *medodhatu*. Because of *USNA Virya* it has *Kaphasamaka* property which is essential to combat “*Bahudrava Slesma*” main *Dosa* involved in causation of all the *Prameha*. Its *USNA Virya* is supposed to combat *Kapha* and *Vata* simultaneously. It has *Kaphavatasamaka* property which is the desirable action for *Samprapti - vighatana* of *Madhumeha*.

## Conclusion

The present review on *Shinsapa* starting from *vedic* era upto modern era. On review it was noted that in *vedic* compendia *Shinsapa* has mentioned in *Brahattrayi* and *Ashtanga sangraha* a lot of references regarding its synonyms, properties, indications are available. In *Brahattrayi* use of *Shinsapa* indicated in *Vatavikar*, *Prameha*, *Grdhrasi*, *Pravahika*, *Atisara*, *Agnimandhya Pravahika*, *Raktatisara*, *Vamana*, *Raktarsa*, *Krimiroga*, *Raktavikar*, *Phiranga*, *Upadansa*, *Kandu*, *Vatarakta*, *Vrana*, *Hikka*, *Svasa*, *Rajorodha*, *Kastariva*, *Raktapradara*, *Puyameha*, *Lalameha*, *Daha*, *Vasameha* etc. *Madhumeha* is one among *Vatika prameha*. Aggravated *kapha*, *pitta*, *meda* and vitiated *vata* are the factors involved chiefly pathogenesis of *prameha*. The properties of *Shinsapa* are *Kashaya*, *Katu*, *Tikta*, *Rasa*, *Laghu- Ruksha* guna and *Ushna virya* and *Katu Vipak* by all

these properties *Shinsapa* could be effective in *prameha roga* specially in *madhumeha* (Diabetes mellitus type-2). In this regard, further studies need to carry out to explore *Shinsapa* for its therapeutics potential in preventing and treating *prameharoga* (Diabetes mellitus).

## Acknowledgement

With devotion I bow down at the Lotus feet of Lord Vishwanath and my beloved parents who blessed me and my ambition to come true. With immense pleasure and gratitude, I regard my deep respect to my learned and reverend Supervisor Dr. K.N. Dwivedi (Professor) Department of Dravyaguna, Faculty of Ayurveda, Institute of Medical Sciences, Banaras Hindu University, Varanasi, those gave me scientific searchlight at every stage. It is only their guidance, ability and supervision and extra ordinary constant hard work taken in each step that has enabled me to complete my work. I also wants to thanks to Dr. Sadhna Singh.

## References

1. Lt-Colonal KR Kirtikar, Major Basu. Indian Medicinal Plants second edition, Published by Lalit Mohan Basu MB. 49, Leader Road, Allahabad. India, 1, 818.
2. Shubhshree Dr. Bindu. Vedo main Aushdhiya Sutra, Published by Chaukhamba viswabharti, Varanasi, Ed.-2010, 46.
3. Prof PV Sharma, Dravyaguna Vijyana. Published by Chaukhambha Bharti Academy, Varanasi, Ed. 2006; 4: 29.
4. Shri Agnivesha, Charaka Samhita. Revised by Charaka and Dridhbala, Introduce by Sri SN S0061stri, Elaborated Vidyotini hindi Commentry by Pt. Kasinatha Sastri And Dr. Gorakha Nath Chaturvedi, Chaukhambha Bharti Academy Varanasi, Edition, 2009.
5. Ayurveda tatvasandipika' tika of Sushruta Samhita, Kaviraj Dr. Ambika Dutt Sastri, Chaukhamba Sanskrit Santhan, Edition, 2009.
6. Kaviraj Atrideva Gupt, 'Vidyotini' Tika of Ashtanga Hridaya, Chaukhambha Prakashana, Edition, 2009.
7. Acharya Indu. 'Shashilekha' Sanskrit Comentary on Ashtanga Samgraha of Vriddha Vagbhatta, Edited by Dr. Shivprasad Sharma, Chaukhamba Sanskrit Series office, Edition. 2008, 133-134.
8. Vaidya Jaymani Pandey, Harita Samhita. Published by Chaukhambha Bharti Academy, Varanasi, Edition. 2010, 404.
9. Vaidya Laksmipati Shastri, Vidyotini hindi commentary on Yogaratnakar, Edited Bhashagratna Bramhashankar Shastri, Chaukhambha Prakashana, Edition, 2012.
10. Dr. Indradev Tripathi. Vaidhprabha' hindi commentary on Chakradutta, Edited by Prof. Ramanath Dwivedi, Chaukhamba Sanskrit Santhan, Edition, 2011, 220.

11. Pandit Hariprasad Tripathi, Vangasena Samhita, Chaukhamba Krishnadas Academy. Varanasi Edition - 2009, 188.
12. Prof. PV Sharma, Dravyaguna Vijyana, Published by Chaukhamba Bharti Academy, Varanasi, Ed. 2006; 2:806.
13. Antidiabetic Evaluation of *Dalbergia sissoo* against alloxan induced diabetes mellitus in wistar albino rats (Kiran V. Pund, Neeraj S. Vyawahare Dept. of pharmacology, AISSMS College of pharmacy. J Nat. Prod. Plant Resour. 2012; 2(1):81-88.
14. Anti- diabetic activity of different extracts of *Dalbergia sissoo Roxb.* Stem bark on streptozotocin –nicotinamide induced Type 2 Diabetic rats (Shivani Saini, Sunil Sharma, Guru Jambheshwar University of Science and technology, Hisar, IJPPS. 2013, 5(4).