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LITERARY REVIEW ON DEVDARVADYARISHTA W.S.R TO ITS ANTI-DIABETIC POTENTIAL

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ABSTRACT

Asava–Arishta has found extensive therapeutic uses from pediatrics to geriatrics, but questions regarding application of them in Diabetic patients still need to be addressed. Devdarvadyarishta is a traditional unexplored formulation with indication in Prameha roga. In the present study, literature regarding Devdarvadyarishta is sorted out from various classics to check for any aberration between different readings and is expounded with all possible details. Individual drugs of the chosen formulation from Bhaishja Ratnavali is expanded with respect to their synonyms, botanical details including Latin name, family, botanical description and parts used, Rasa Panchaka and chemical constituents and their anti-diabetic references as cited in various Nighantus and modern research articles. Nearly all the contents of Devdarvadyarishta including honey are found to possess anti-diabetic property both in Ayurveda and Bio medical Science which advocated its usefulness in Diabetic patients to some extent, however, detailed experimental trials should be carried out to validate the same.

KEYWORDS: Devdarvadyarishta, Anti-diabetic, Devdaru, Honey.

INTRODUCTION

Gada Nigraha by Acharya Shodhala (12th century) is the first lexicon to describe Devdarvadyarishta in context of

Prameha Roga. But later on, many more references are found in other texts with slight difference in versions regarding drugs & their composition.

Table 1: Various references of Devdarvadyarishta.

S. No.	Name of Book	Reference
1	Gada Nigraha (12 th century)	Part-I Prayog Khanda 6/46-51, P-359
2	Sharanagdhara Samhita (13 th century)	Madhyam Khanda 10/53-59, P-251-52
3	Sahasra Yogam	Arishta Prakrana P-166
4	Bhaishajya Ratnavali	37/237-243, P-741
5	Rastantra Saar Va Siddha Prayog Sangraha Part-1	Asavadi Prakrana P-384
6	Bharat Bhaishajya Ratnakar	Vol-3, Yog No-3127, P-87
7	Ayurveda Sara Sangraha	Asava-Arishta Prakrana P-649
8	Ayurvedic Formulary of India Part-1	Vol-I, Part-A-19, P-241-247

The formulation is given by the name of Devdarvasava in Gada Nigraha and Bharat Bhaishajya Ratnakar but the method of preparation is by Kwatha formation. In Gada Nigraha, Indravaruni is mentioned in place of Indrayava, and Guduchi, Chitraka, Shweta Chandana, Yavani, Kutaki, Kutaja are described to be taken 5 pal instead of 10 pal and Priyangu to be taken 2 pal instead of 4 pal as compared to Bhaishajya Ratnavali, rest of the composition is same. In Sahasra Yogam, Asana is mentioned in place of Kutaja in the verse, but in Hindi commentary Kutaja is written thereby making no difference in the formulation as given in Bhaishajya Ratnavali. In Rasa Tantra Sara and Siddha Prayog Sangraha, the verse is same as in Sharangdhara Samhita, but honey is said to be taken 11 saer instead of 15 saer in the commentary. Apart from above cited differences, there is no change in the composition of the formulation in other texts.

MATERIAL AND METHODS

In the present study, literary review is compounded as per the reference of Bhaishajya Ratnavali which includes botanical description and rasa panchaka as per Ayurvedic Pharmacopoeia of India whereas chemical composition and anti-diabetic references of ingredients from different Ayurvedic texts as well as from modern research articles.

1-Devdaru (Cedrus deodara- Pinaceae)- It is an evergreen tree whose heart wood is used having tikta rasa, ushna virya, katu vipaka, laghu, snighdha guna and vata kapha hara, dushta vrana shodhaka properties. Alkaloids, glycoside, flavonoids, terpenoids, steroid, phenolic compound and carbohydrates are the active ingredients present.^[1] Pradeep Singh et al had been reported to found anti-diabetic property of devdaru in STZ induced diabetic rats.^[2]

2-Vasa (Adhatoda vasica- Acanthaceae)- It is a bushy herb whose leaves are used having chemical ingredients viz. Phenols, tannins, alkaloids, anthraquinones, saponins, flavonoids, aminoacids and reducing sugars.^[3] Its anti-diabetic effect has been found by Deepali Gupta et al in alloxan induced diabetic mice.^[4] It posseses tikta, kashaya rasa, laghu guna, shita virya, katu vipaka and Kaphapittahara, Hridya, Kasaghna, Raktasamgrahika properties.

3-*Manjishtha* (*Rubia cordifolia- Rubiaceae*)- A Perennial prickly creeper/climber having Kaphapittashamaka, Varnya, Vishahara, Rasayana, Swarya, Stambhana, Shothaghna, Kusthaghna, Krimighna, Pramehaghna, Aartavajanana, Vrishya, Shonitasthapana properties posseses kashaya, tikta, madhura rasa, guru guna, ushna virya and katu vipaka. Active ingredients present in stem are Anthraquinones, Glycosides other than cardiac glycosides, saponins, resin and steroids/ terpenoids.^[5] Bhaskara et al reported its anti-diabetic activity.^[6]

4- *Kutaja* (*Holarrhena anti-dysenterica- Apocynaceae*)-It is a medium tree whose stem bark as well as seeds known as Indrayava are used for therapeutic purpose. Seeds are having katu, tikta rasa, laghu, ruksha guna, shita virya, katu vipaka and deepana, samgrahi, tridosha shamaka properties whereas stem bark is tikta, kashaya rasa and kapha-pitta shamaka in nature. Active ingredients being alkaloids, steroidal alkaloids, carbohydrates, sugar, oils in Indrayava.^[7] and alkaloids (1.8-4.3%), steroids, tannins in stem bark.⁸ Both the plant parts have been found to possess anti-diabetic effect.^[9-10]

5- Danti (Baliospermum montanum- Euphorbiaceae)- It is a leafy under shrub whose root is katu rasa, tikshna, sara, laghu guna, ushna virya, katu vipaka and Kaphahara, Deepana, Rochaka, Vid-hara, Ratadoshahara, Vikasi, Virechana properties. Chemical constituents include flavonoids, glycosides, sterols, esters, and absence of alkaloids, saponins and terpenoids.^[11]

6- *Tagara (Valeriana wallichii- Valerianaceae)*- A perennial herb with rhizome being Tikta, Katu, Kashaya rasa, laghu, snigdha guna, ushna virya, katu rasa and Tridosha hara, Vishaghna, Raktadoshahara, Manasadoshahara properties. Sesquiterpenoids, alkaloids, glucoside, resins, terpineol, flavonoids are the active ingredients present.^[12]

7- Haridra (Curcuma longa- Zingiberaceae)- Commonly known as Turmeric is a perennial herb with rhizome being the useful part is tikta, katu rasa, ruksha guna, ushna virya, katu vipaka and Kaphapittanut, Vishaghna, Varnva. Kushthaghna, Krimighna, Pramehaghna activities. It contains 70 to 76 % curcumin (phenolic compound),16% demethoxycurcumin and 8% bisdemethoxycurcumin, alkaloids, cardiac glycosides, terpenes and steroids, resins.¹³ Anti-diabetic activity of haridra is well documented.^[14]

8- *Daruharidra (Berberis aristata- Berberidaceae)*- It is a deciduous shrub with stem being the useful part containing Berberine 2.23% and palmatine as the active ingredient.^[15] Daruharidra is Tikta rasa, ruksha guna, ushna virya and Stanya shodhana, Stanya Doshahara, Dosha Pachana properties. Mild hyperglycaemic activity has been reported in Daruharidra by Rehan et al.^[16]

9- *Rasna (Pluchea lanceolata- Asteraceae)*- An annual under shrub with active ingredients present in leaves being quercetin, beta-sitosterol, triterpenoids.^[17] Leaves are tikta rasa, guru, ushna virya, katu vipaka and Kaphvatahara, Amapachana properties.

10- Vidanga (Embelia ribes- Myrsinaceae)- Fruits of this large shrub possesses Katu, Tikta rasa, Ruksha, Laghu, Tikshna guna, ushna virya, katu vipaka and Kriminashana, Dipana, Anulomana, Vatakaphapaha properties. Quinone derivative-embelin, an alkaloid christembine, a volatile oil and vilangin are the active ingredients.¹⁸ Uma et al has reported anti-hyperglycaemic activity of Embelia ribes in STZ induced diabetes rats.^[19]

11- *Mustaka (Cyperus rotundus- Cyperaceae)*- Rhizomes of this herb are tikta, Katu, Kashaya rasa, Laghu, Ruksha guna, shita virya, katu vipaka and Pittakaphahara, Jvaraghna, Sthaulyahara, Shothahara, Dipana, Pachana, Grahi, Trishnanigrahana, Krimighna activities. Essential oils, terpenes, flavonoids, b-sitosterol, and ascorbic acid are the main active ingredients.^[20] Anti-diabetic activity is well documented.^[21]

12- Shirisha (Albizzia lebbeck- Fabaceae)- It is a large tree whose stem bark is having Tikta, Katu, Kashaya rasa, laghu guna, anushna virya, katu vipaka and Vishaghna, Tvagdoshahara, Tridoshahara, Shothahara, Varnya properties. Tanins & Pseudotanins are mainly responsible for therapeutic benefits.^[22] Ahmed et al has

reported anti-diabetic as well as anti-oxidant potential of Shirisha in STZ induced diabetic rats.^[23]

13- Khadira (Acacia catechu- Leguminosae)- Heartwood of this moderate sized tree possesses Catechuic acid, catechutannic acid (25%-33%), acacatechin (10%-12%), catechu red(pseudotanin), catechin (2% - 12%),epicatechin, phlebotanin (25%-33%),gummy matter, quercitin (phenolic flavonoid), tannins, polyphenols.² Rasa panchaka includes Tikta, Kashaya rasa, Laghu, guna, shita virya, Ruksha katu vipaka and Kaphapittahara, Dantya Raktashodhaka, Krimighna, Kushthaghna, Medohara attributes. Hypoglycaemic effects in alloxan induced rats is well documented.^[25]

14- Arjuna (Terminalia arjuna- Combretaceae)- Stem bark of this deciduous tree is having kashaya yasa, ruksha guna, shita virya, katu vipaka and Kaphahara, Pittahara, Hridya, Vrana nashana,Bhagnasandhanakara properties. Sarajita Barman has reported hypoglycaemic effects, active ingredients being Tannins, triterpenoid saponins (arjunic acid, arjunolic acid, arjungenin and arjunic acid), flavonoids, gallic acid, ellagic acid and phytosterols.^[26]

15- Yavani (Trachyspermum ammi- Umbelliferae)- Fruits of this erect herb possess Katu, Tikta rasa, Laghu, Ruksha, Tikshna guna, ushna virya, katu vipaka and Dipana, Pachana, Rucya, Anulomana, Shulahara, Krimighna properties. Active chemical constituents are Fiber (11.9%), carbohydrates (38.6%), tannins, glycosides, moisture (8.9%), protein (15.4%), fat (18.1%), saponins, flavone and mineral matter (7.1%) containing calcium, phosphorous, iron and nicotinic acid.^[27]

16- Shweta Chandana (Santalum album- Santalaceae)-Heart wood of this evergreen tree is Tikta, Madhura rasa, laghu, ruksha guna, shita virya, katu vipaka and Pittahara, Kaphahara, Vishaghna Durgandhahara, Varnya, Dahaprashamana, Hridya, Trishnahara, Vrishya, Krimighna activities. Sandalwood contains 95% sesquiterpene alcohols²⁸ and has been reported to show anti-hyperglycaemic activity.^[29]

17- Guduchi (Tinospora cordifolia- Menispermaceae) – Commonly known as Giloy is a perennial climber with stem being used for medicinal purpose. Giloy is Tikta, Kashaya rasa, laghu guna, ushna virya, madhura vipaka and Tridoshashmaka, Sangrahi, Balya, Dipana, Rasayana, Raktashodhaka, Jvaraghna. It has been found to attenuate oxidative stress and distorted carbohydrate metabolism in experimentally induced type 2 diabetes in rats.^[30] Chemically it contains alkaloids, diterpenoid lactones, glycosides, steroids, phenolics, sesquiterpenoid, aliphatic compounds, polysaccharides, protein (11.2%), calcium and phosphorus.^[31]

18- Kutaki (Picrorrhiza kurroa- Scrophulariaceae)-Rhizomes of this perennial herb is Tikta, Katu rasa, laghu guna, ushna virya, katu vipaka and Pittahara, Dipani, Bhedini, Hridya, Jvarahara in nature. Terpenoids, iridoid glycosides, phenolic glycosides and phenylethanoid glycosides are the main active constituents.^[32] Antidiabetic activity of standardized extract of Picrorhiza kurroa in rat model of NIDDM has been reported.^[33]

19- *Chitraka (Plumbago zeylanica- Plumbaginaceae)*- It is a perennial shrub whose roots possess katu rasa, Laghu, Ruksha, Tikshna guna, ushna virya, katu vipaka and Dipana, Pachana, Grahi, Kaphavatahara, Arshohara, Shulahara, Shothahara properties. Antidiabetic effect of Plumbago zeylanica and its effect on GLUT4 translocation in streptozotocin-induced diabetic rats has been reported.^[34] Naphthoquinones, binaphthoquinones, coumarins, di-phenyl sulfone, carboxylic acids and esters,meroterpenes, triterpenoids, amino acids, anthraquinones, steroids, steroid glucosides, sugars are the main chemical constituents.^[35]

20-Dhataki (Woodfordia fruticosa- Lythraceae)- Flowers of this under shrub is widely used for fermentation purpose which are Kashaya, Katu rasa, laghu guna, shita virya, katu vipaka and Grahi, Vishaghna, Kriminut Sandhaniya, Garbhasthapana properties. Carbohydrates, tannins, glycosides in major quantities, phenols in moderate quantities, anthraquinones and flavonoids in minor quantities are the active constituents.^[36]

21- *Madhu (Mel)*- Commonly called as Honey is Madhura, Kashaya rasa, Guru, Ruksha guna, shita virya, katu vipaka and Raktapittanashak, Sandhanakar, Medohara, Kapha-pittanashak in nature. Fructose,glucose, phenolic compounds, flavonoids, organic acids, enzymes and vitamins are the chemical constituents present.^[37] Antioxidant Protective Effect of Glibenclamide and Metformin in Combination with Honey in Pancreas of STZ Induced Diabetic Rats has been reported.^[38]

22- Shunthi (Zingiber officinale- Zingiberaceae)-Rhizome of this perennial herb is katu rasa, Laghu, Snigdha guna, ushna virya, madhura vipaka and Dipana, Pachana, Hridya Anulomana, Amadoshahara, Vatakaphapaha in nature. Anti-diabetic and hypolipidaemic properties of ginger (Zingiber officinale) in streptozotocin-induced diabetic rats has been well documented.^[39] Chemically, it contains Gingerols, their related dehydration products, the shogaols, volatile oils and sesquiterpenes.^[40]

23- Maricha (Piper nigrum- Piperaceae)- Fruits of this climber are Katu, Tikta rasa, Laghu, Ruksha, Tikshna guna, ushna virya, katu vipaka and Shleshmahara, Pittakara,Vataroga Kaphavatajit, Vatahara, Chedana, Dipana, Ruchya, Jantunashana, Medohara, Chedi, Hridroga properties. 1-2.5% volatile oil, 5-9% alkaloids are present in it.⁴¹ Protective effects of piper nigrum and

vinca rosea in alloxan induced diabetic rats has been studied. $^{\left[42\right] }$

24- Pippali (Piper longum- Piperaceae)- Fruits of this climber are Katu, Tikta, Madhura rasa, Snigdha, Laghu guna, anushna virya, madhura vipaka and Vatakaphahara, Dipana, Rucya, Rasayana, Hridya, Recana properties. Vrishya, Antidiabetic and antihyperlipidemic activity of Piper longum root aqueous extract in STZ induced diabetic rats has been reported.^[43] 1% volatile oil, resin, a waxy alkaloid, a terpenoid substance, alkaloids viz. piperine and piperlongumine are present chemically.[44]

25- *Twak (Cinnamomum zeylanicum- Lauraceae)*- Bark of this evergreen tree is Katu, Tikta, Madhura rasa, Ruksha, Laghu, Tikshna guna, ushna virya, katu vipaka and Kaphavatahara, Vishaghna, Kanthashuddhikara, Rucya. 70-80% eugenol, 50-65% cinnamic aldehyde, being the chemical constituents are found responsible for its therapeutic activity.^[45]

26- *Ela (Elettaria cardamomum- Zingiberaceae)*- Fruits of this large perennial herb contains 2.8-6.2% volatile oil which are responsible for its aromatic fragrance.^[46] Rasa panchaka includes Katu, Madhura rasa, laghu guna, shita virya, madhura vipaka and Rochana, Dipana, Mutrala Anulomana, Hridya activities.

27- *Tejpatra* (*Cinnamomum tamala- Lauraceae*) – Leaves of this evergreen tree are Katu, Madhura rasa, Laghu, Picchila, Tikshna guna, ushna virya, katu vipaka and Rucya, Kaphavatahara, Arshoghna properties. Antidiabetic and Antioxidant Activities of Cinnamomum tamala Leaf Extracts in Stz-Treated Diabetic Rats has been reported.^[47] Methyl eugenol (46.65%), eugenol (26.70%), trans-cinnamyl acetate (12.48%) and Beta-Caryophyllene (6.26%) are the chemical constituent present.^[48]

28- *Naagkeshar (Mesua ferrea- Guttiferae)*- Stamens of this evergreen tree are Tikta, Katu, Kashaya rasa, Laghu, Ruksha guna, ushna virya, katu vipaka and Kaphahara, Varnya, Vastivatamayaghna, Urdhvajatrugata -rogahara properties. Lipids, carbohydrates, proteins, oleo-resins are present chemically.^[49]

29- Priyangu (Callicarpa macrophylla- Verbenaceae)-Inflorescence of this erect shrub is Tikta, Kashaya rasa, ruksha guna, shita virya, katu vipaka and Vatahara, Pittahara, Rakta Prasadana, Sandhaniya, Daurgandhyahara, Purishasangrahaniya, Mutravirajaniya properties. Anti-diabetic activity is well reported with chemical constituents being Diterpenoids, faty acids and steroids.^[50-51]

Т	able	2:	Prameha-har	property	of	drugs	found	in A	vurveda	a .
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Drug	Anti Diabetic References in Nighantus
	प्रमेह ज्वरनाशनम् । रा.नि. चन्दनादि वर्ग–29 / 400
	प्रमेहपीनस । भा.प्र. कर्पूरादि वर्ग—23 / 187
Davidana	प्रमेहविनिवर्तनम्। ध.नि. गुडूच्यादि वर्ग ७७ / २९
Devdaru	ज्वरमेहविबन्ध। कै.नि. औषधि वर्ग 1310 / 242
	प्रमेहे च हितं। प्रिय.नि. हरीतक्यादि वर्ग 75 / 19
	प्रमेहपीनस । महौ.नि. चन्दनादि वर्ग 6 / 73
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X7	ज्वरमेहारुचि। कै.नि. औषधि वर्ग 14/6
vasa	मेहकुष्ठ । म.नि. अभयादि वर्ग 37 / 8
	मेहकुष्ठक्षयापहः । महौ.नि. बिल्वादि वर्ग 28 / 115
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	व्रणमेहनुत् । भा.प्र. हरीतक्यादि वर्ग 191 / 107
	मेहास्त्रविष। ध.नि. गुडूच्यादि वर्ग १८ / १९
Manjishtha	विसर्पमेहकुष्ठ। कै.नि. औषधि वर्ग 1427 / 264
5	व्रणमेहजित् । म.नि. अभयादि वर्ग २७ / ४५
	प्रमेहान् । प्रिय.नि. पिप्पल्यादि वर्ग 76/71
	मेहकफापहा। महौ.नि. महौषधि वर्ग 115 / 54
	मेहकण्डूव्रणान् । रा.नि. पिप्पल्यादि वर्ग १९९ / १७५
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Hanidaa	मेहत्वग्दोष। कै.नि. औषधि वर्ग 1115 / 206
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Darunariura	मेहत्वग्दोष। कै.नि. औषधि वर्ग 1117 / 206
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	मेदोमेहोव्रणान् । भा.प्र. वटादि वर्ग २७ / ५११
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	प्रमेहश्वास । भा.प्र. गुडूच्यादि वर्ग १० / २५७
Guduchi	मेहत्रिदोषजित् । ध.नि. गुडूच्यादि वर्ग 6/17
Guducin	मेहतृष्णाकासान् । कै.नि. औषधि वर्ग १० / ५
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DISCUSSION

Different drugs, menstra and pharmaceutical procedures consequence into a formulation and potency of which alters with change in qualities of drugs. Before fabricating any formulation, prime importance must be given to the calibration of its constituents. So, to ascertain the qualities of DevdarvadyArishta, detail of its ingredients are narrated in this present study. Devdaru, the main constituent of Devdarvadyarishta finds extensive use in Anti-diabetic formulations in major treatise of Ayurveda and is also known to exhibit the same along with various other pharmacological actions viz. anti-inflammatory, hypolipidaemic, anti-cancer, antibacterial, anti-convulsant, anti-arthritic, anti-spasmodic as per modern scientific research. Majority of the constituents(22 out of 30) except Danti, Tagara, Rasna, Yavani, Dhataki, Twak, Ela and Naagkeshar of Devdarvadyarishta are reported with Anti-diabetic potential either or both in Ayurveda and Modern Science which advocates its utility as an anti-diabetic agent.

CONCLUSION

Description of Devdarvadyarishta is not found in major treatise of Ayurveda, although Devdaru-the main content of this formulation has been used in number of formulations indicated in Prameha. Almost all the contents including honey are found to possess antidiabetic property both in Ayurveda and Modern Science. The pharmacological profile shows Devdarvadyarishta to possess anti-diabetic as well anti-oxidant property by virtue of scientifically proven above cited properties of various functional groups viz. alkaloids, tannins, saponins, flavonoids, glycosides and terpenoids present in varied proportion.

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