

## A Critical Review on the Pramehahara dravyas of Dhanwantari Nighantu

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### Abstract

**Introduction:** *Prameha* has been mentioned among the *Astamahagadhas* in *Ayurvedic* classics and is considered the *Yapya*. Diabetes mellitus can be correlated to the *Madhumeha*, which is one of the types of *Vataja Prameha* and is characterised by the impaired metabolism of glucose. According to *Ayurvedic* literature, *Prameha* is considered the *Santarpanajanya Vyadhi* that is mainly characterised by *Trishna* which can be Polydipsia; *Paani Paada Daha*-burning sensation of the palms and feet; and *Prabhutaavilamutrata*, which can be considered Polyuria. Worldwide, the prevalence rate of diabetes mellitus (DM) has been increasing, and India is the rising capital of diabetes. Until 2000, the total number of recorded diabetes patients was 171 million, and it is expected to increase by around 366 million by the year 2030. The need of the hour is to find efficient management for the alleviation of *Prameha*.

*Dhanwantari Nighantu* is an *Ayurvedic* classical book known as *Guduchyadi Nighantu* that deals with many *Pramehahara dravyas*.

**Purpose:** The purpose of this study is to enlist the *dravyas* useful in *prameha* from *Dhanwantari Nighantu* and analyse critically based on the studies and their *Rasapanchakas*.

**Materials and methods:** Along with *Dhanwantari Nighantu* other suitable *Ayurvedic* literature, journals, and Internet media were also used for collecting information.

**Results and Discussion:** The drugs are classified into seven *Vargas* in this *Nighantu* among them, 34 drugs have *Pramehahara* property. These drugs help physicians and researchers either treat *Prameha* or explore unknown drugs for *Prameha*. So, the present study has been done to analyse the potent herbal remedies for the management of *Prameha*.

**Keywords:** *Dhanwantari Nighantu*; *Prameha*; Diabetes mellitus; *Pramehahara Dravyas*; *Madhumeha*.

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## INTRODUCTION

India's rich herbal tradition is crucial in effectively addressing the prevalence of diseases such as diabetes mellitus (DM), projected to affect 366 million people by 2030.<sup>1</sup> DM can be correlated to one of the 20 types of Prameha, characterized by *Prabhuta Avila Murata and Trishna*,<sup>2</sup> mirroring DM symptoms such as polyurea and polydipsia. This condition results from metabolic imbalances exacerbated by modern lifestyles. Dhanwantari Nighantu, attributed to Mahendra Bhogika,<sup>3</sup> offers valuable insights into herbs beneficial for managing Prameha. By exploring these Pramehahara dravyas through Ayurvedic principles, we can enhance diabetes management and provide a holistic approach to prevention and treatment in today's health landscape.

## MATERIALS AND METHODS

For collecting information regarding the topic *Dhanwantari Nighantu* and other suitable Ayurvedic literature, contemporary literature, journals, and other internet media were also used. The following herbs have been sorted out from *Dhanwantari Nighantu* and compared with the studies done on them regarding anti-diabetic effects.

The herbs having *pramehahara* actions from *Dhanwantari Nighantu* are listed below in the tables along with their Botanical name, Family, *Rasapanchakas*, *Roghagnata*, etc., and analysed on the principles of *Dravya guna*.

## OBSERVATION

The tables provided a comprehensive list of plants, *Rasa dravyas*, *Ahara dravyas*, and *Mishraka dravyas* with *Pramehahara* properties, categorized according to their *Rasa Panchakas*.

**Table 1:** List of plants having *Pramehahara* property with *Rasa Panchakas*

Name of the Drug Botanical Name	Family	Part used	Rasa	Guna	Veerya	Vipaka	Dosha Karma	Roghagnata
Guduchi <sup>4</sup> ( <i>Tinospora cordifolia</i> willd.)	Menispermaceae	Kanda Patra	Tikta Kashaya	Guru	Ushna	Katu	Tridoshajit	Mehajit
Murva <sup>5</sup> ( <i>Marsdenia tenacissima</i> )	Capparidaceae	Moola	Madhura	Snigdha	Ushna	Madhura	Kapha Vatajit	Mehanashini
Manjistha <sup>6</sup> ( <i>Rubia cordifolia</i> )	Rubiaceae	Moola	Madhura, Kashaya	Guru	Ushna	Madhura	Kaphahara	Mehanajayet
Dhanwayasa <sup>7</sup> ( <i>Alhagi camelorum</i> Fisch.)	Leguminosae	Moola	Swadu, Tikta	Laghu, Snigdha	Ushna	Madhura	Vata pittashamaka	Mehavinashini
Haridra <sup>8</sup> ( <i>Curcuma longa</i> )	Zingiberaceae	Kanda	Tikta	Ruksha	Ushna	Katu	Kaphapittanut	Mehanut
Katphala <sup>9</sup> ( <i>Myrica nagi</i> Thunb.)	Myricaceae	Kanda, Twak	Kashaya	Laghu, Teekshna	Ushna	Katu	Kapha Vataghni	Mehajit
Devadaru <sup>10</sup> ( <i>Cedras deodara</i> roxb.)	Pinaceae	Kanda, Twak	Tikta	Snigdha	Ushna	Katu	Shleshma Vatajit	Mehavinirtakam
Shalaparni <sup>11</sup> ( <i>Desmodium gangaticum</i> DC.)	Papilionaceae	Moola	Tikta	Guru	Ushna	Katu	Vatadoshajit	Mehanashani
Gokshura <sup>12</sup> ( <i>Tribulus terrestris</i> Linn.)	Zygophyllaceae	Phala	Swadu	Guru, Snigdha	Sheeta	Madhura	Tridoshaghna	Pramehahara
Pashanabheda <sup>13</sup> ( <i>Bergenia ligulate</i> )	Saxifragaceae	Panchanga	Tikta	Laghu	Sheeta	Katu	Tridoshajit	Mehajit
Sariva <sup>14</sup> ( <i>Ichnocarpus frutescens</i> R.Br.)	Apocynaceae	Moola	Madhura	Guru, Snigdha	Sheeta	Madhura	Kapha Vata jit	Mehanashane
Asmantaka <sup>15</sup> ( <i>Bauhinia racemosa</i> Lam.)	Caesapinae	Patra	Kashaya	Sheeta	Sheeta	Katu	Pitta kaphaapaha	Mehajit
Haritaki <sup>16</sup> ( <i>Terminalia chebula</i> Retz. &willd.)	Combretaceae	Phala	Pancha rasa	Ruksha, Laghu	Ushna	Madhura	Tridoshaghna	Mehajit

Name of the Drug Botanical Name	Family	Part used	Rasa	Guna	Veerya	Vipaka	Dosha Karma	Roghagnata
Aragvadha <sup>17</sup> (Cassia fistula Linn. & Willd.)	Leguminosae	Phala	Tikta	Guru	Ushna	Katu	Kaphahara	Mehaghna
Dravanti <sup>18</sup> (Jatropa glandulifera roxb.)	Euphorbiaceae	Moola, Ksheera	Katu	Teekshna, Ushna, Guru	Ushna	Katu	Tridoshaghna	Pramehe
Raktapushpa <sup>19</sup> (Achyranthes aspera Linn.)	Amranathaceae	Panchanga	Katu	Sheeta	Sheeta	Katu	Kaphavaatanut	Mehaghna
Usheera <sup>20</sup> (Vetiveria zizanioides)	Graminaeae	Moola	Tikta	Laghu, Snigdha	Sheeta	Madhura	Vataghnam	Mehanut
Jatiphala <sup>21</sup> (Myristica fragrans Houutt.)	Myristicaceae	Phala	Kashaya	Laghu	Ushna	Katu	Vatahara	Mehaghnam
Guggulu <sup>22</sup> (Commiphora mukul Engl.)	Burseraceae	Niryasa	Katu, Tikta Kashaya	Pichila, laghu, Sukshma, Ruksha	Ushna	Katu	Vata balasajit	Mehajit
Brahmi <sup>23</sup> (Bacopa monnieri Linn.)	Scrophulariaceae	Panchanga	Kashaya, Tikta	Laghu	Sheeta	Madhura	Vatabalasa jit	Mehajit
Vruddhadaru <sup>24</sup> (Argyrea nervosa)	Convolvulaceae	Moola and Patra	Katu, Tikta	Laghu, Snigdha	Ushna	Katu	Kapha vatajit	Mehahara
Vamsha <sup>25</sup> (Bambusa aurundinaceae Retz.)	Gramineae	Moola, Patra, Patrankura, Phala and Vamshalochana	Amla, Katu, Tikta, and Kashaya	Ruksha, Laghu, Teekshna	Sheeta	Madhura	Shleshma Vatajit	Mehanaashanah
Aruka <sup>26</sup> (Prunus armeniaca Linn.)	Rosaceae	Phala	-	-	-	-	-	Mehanaashanani
Rajadana (Ksheerika) <sup>27</sup> (Mimusops hexandraRoxb.)	Sapotaceae	Phala	Swadu	Snigdha	Sheeta	Amla	Vatahara	Mehanashakrut
Oustrighruta <sup>28</sup>			Katu			Katu	Kapha vataghna	Mehanaashanam

**Table 2:** List of *Rasa dravyas* having *Prameh ahara* property with Rasa Panchakas

Name of the Drug	Rasa	Guna	Veerya	Vipaka	Dosha Karma	Rogagnata
Shilajattu <sup>29</sup>	TiktaKatu	Guru, Sheeta	Ushna	Katu	Vatapittahara	Mehanaashanam
Vanga <sup>30</sup>	Tikta	Ruksha	Ushna		Pittahara	Mehahara
Loha <sup>31</sup>	Kashaya, tikta	Ruksha	Ushna		Kapha pittahara	Mehajit
Mandura <sup>32</sup>	Kashaya, tikta	Ruksha	Ushna		Kapha pittahara	Mehanashanaaya
Vaikranta <sup>33</sup>	Shadrasa	Guru, sheeta	Sheeta	Madhura	Tridoshaghna	Mehajit

**Table 3:** List of Ahara dravyas having *Pramehahara* property with Rasa Panchakas

Name of the Drug	Rasa	Guna	Veerya	Vipaka	Dosha Karma	Pramehahara
Takra <sup>34</sup>	Kashaya	Laghu	Ushna		Kapha vatajit	Mehishu
Mardvika <sup>35</sup>	Madhura	Sara	Ushna	Madhura	Alpa pitta anilaha	Mehanaashanam

**Table 4:** List of *Mishrakadravyas* having *Pramehahara* property

Name of the Drug	Part Used	Doshaghna	Pramehahara
Triphala <sup>36</sup>	Phala	Tridoshaghni	Mehahara
Trunapanchamoola <sup>37</sup>	Moola	Pittahara	Pramehamnashayet

**Table 5:** Number of *Pramehahara dravyas* according to *Varga*:

Name of the Varga	Number of Drugs
Guduchyaadivarga	16
Chandanaadivarga	4
Karaveeraadivarga	3
Amraadivarga	2
Suvarnaadivarga	7
Misrakaadivarga	2

### References of drugs with their Experimental / Clinical studies:

1. **Guduchi:** A study clearly showed that *Guduchi* [*Tinospora cordifolia* (willd.) Miers] has significant anti-diabetic activity in diabetic animals, and when compared to insulin, it has efficacy of 40% to 80%. It caused a decrease in glycogen phosphorylase activity and increased hepatic glycogen synthesis. The probable mechanism by which the drug may act as an anti-hyperglycaemic is not through the secretion of the insulin; it may be due to an increase in the glycogen storage in the liver or decrease in the secretion of glucose from the liver.<sup>38</sup>
2. **Murva:** A study has been conducted on *Marsdenia tenacissima* in comparison with *Sphaeranthus indicus* and has shown that *Murva* has more hypoglycaemic effect. The result of the study revealed that the hypoglycaemic activity was prominent in basic and neutral media compared to acidic mediums.<sup>39</sup>
3. **Manjishta:** A study suggests that *Rubia cordifolia* is a natural antioxidant, which might be helpful in the management of diabetes. The study represents the root of *Rubia cordifolia* as a potential hypoglycaemic agent.<sup>40</sup>
4. **Dhanwayasa:** A study was conducted to evaluate the anti-diabetic activity of *Dhanwayasa*. A considerable decline in the blood glucose levels was observed in STZ-induced diabetic mice. The anti-hyperglycaemic effect of *Fagonia ctrelica* treated animals was high (105+3.22\*\*) as compared to the standard drug (128.6+3.22\*\*mg dL<sup>-1</sup>).<sup>41</sup>
5. **Haridra:** The study conducted on the effect of *Curcuma longa* freeze rhizome powder with milk in STZ-induced diabetic rats showed a

significant reduction of 38.2% (P<0.001) in fasting blood sugar and 44.1% (P<0.001) in postprandial blood glucose levels.<sup>42</sup>

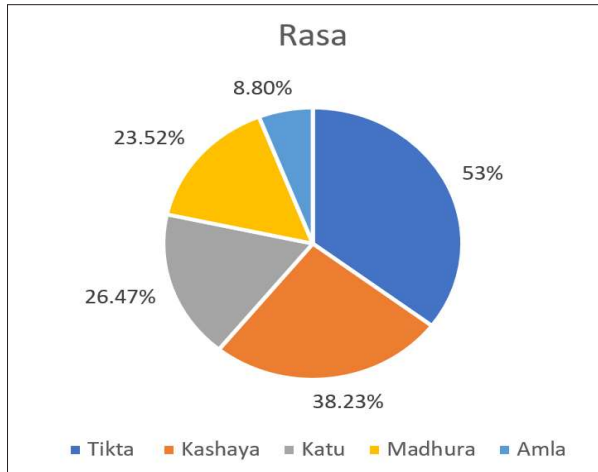
6. **Katphala:** The study conducted on the methanolic extract of *Myrica esculenta* leaves showed dose-dependent anti-diabetic activity by a significant decrease in body weight, blood glucose, and cholesterol levels compared to the positive vehicle-treated group.<sup>43</sup>
7. **Devadaru:** As per the studies, an Aqueous extract of *Cedrus deodara* has been found to reduce blood sugar levels in alloxan-induced diabetic rats, which could be seen from the 5<sup>th</sup> day after administration of the extract continuously and on the 21<sup>st</sup> day, levels of the sugar were found to be reduced by around 40.20%. The results of the study suggest that the aqueous extract of *Cedrus deodara* is effective in controlling DM.<sup>44</sup>
8. **Shalaparni:** As per the studies, *Desmodium gangeticum* extract (DG, 100 and 250mg/kg body weight) for 3 weeks showed a significant reduction in the blood glucose. It also had a role on the lipid profile of the rats by causing reduction in cholesterol and triglycerides and increasing in HDL significantly (p<0.05) by stimulating the insulin secretion by pancreatic islet cells.<sup>45</sup>
9. **Gokshura:** As per the study, the extract of *Tribulus terrestris* had shown a significant decrease in the blood glucose levels in normal and alloxan-induced diabetic mice, mainly due to increased serum insulin levels.<sup>46</sup>
10. **Pashanabheda:** A study was conducted to evaluate the anti-diabetic effect of *Pashanabheda* and the results showed that ethanolic extract of the root of *Bergenia ligulate* exhibited significant antidiabetic activity in alloxan-induced diabetes in rats.<sup>47</sup>
11. **Haritaki:** The study conducted on *Haritaki* has shown a significant anti-hyperglycaemic effect without hypoglycaemic action in normal rats, and was lower than glibenclamide in alloxan models but higher in the adrenaline-induced model.<sup>48</sup>
12. **Asmanataka:** Biological activity of *Bauhinia racemosa* against diabetes and interlinked disorders like obesity and hyperlipidaemia was conducted and found that the petroleum ether extract of *Asmantaka* leaves prevented a rise in blood glucose levels in STZ-induced

- diabetic animals. Further more, the extract showed a significant antiadipogenic and antihyperlipidemic effect. It improves lipid profile by decreasing the levels of serum triglycerides, total cholesterol, low-density lipoprotein, and increasing the high-density lipoprotein cholesterol.<sup>49</sup>
13. **Guggulu:** Administration of the *Commiphora mukul* significantly increased insulin secretion and normalized the deranged metabolism of carbohydrates and lipids in diabetic rats by enhancing the utilization of glucose and decreasing hepatic glucose production, thereby exhibiting antidiabetic effects.<sup>50</sup>
  14. **Aragvadha:** An in-vitro study has been conducted and found that there was a dose-dependent increase in percentage inhibitory activity against the alpha-amylase enzyme. A maximum decrease in glucose diffusion was observed in *Cassia fistula* L. ethanolic extract as compared to control values.<sup>51</sup>
  15. **Dravanti:** Anti-diabetic effect of *Jatropha* leaf extract on Alloxan-induced diabetic albino rats showed a reduction in the blood glucose levels and has great hypoglycaemic effect.<sup>52</sup>
  16. **Raktapushpa:** An in vivo anti-diabetic activity against Streptozotocin-induced diabetic rats on ethanolic extract of *Achyranthes aspera* leaves. Streptozotocin causes selective destruction of beta-cells, which helps in the production of insulin. Deficiency of insulin leads to an elevation in the blood glucose after streptozotocin treatment. There was a significant reduction in the blood glucose levels with the aqueous extract.<sup>53</sup>
  17. **Brahmi:** As per the study, *Bacopa monnieri* possesses antioxidant and anti-hyperglycaemic effects in STZ-induced rats.<sup>54</sup>
  18. **Vruddhadaru:** As per the study, it has shown that the ethanol and aqueous extract of *Argyreia speciosa* root has been endowed with anti-diabetic (single dose one-day study and multi-dose fifteen-day study) and anti-lipidemic activity in standardised STZ-induced rats, justifying its use in DM.<sup>55</sup>
  19. **Shilajattu:** A study was conducted for the effect of *Shilajattu* in Alloxan-induced rats. In the diabetic rats, all 3 doses of *Shilajattu* produced a significant reduction in blood glucose levels and also produced beneficial effects on the lipid profile. The maximum effect was observed with the 100mg/kg/day dose of *Shilajattu*. A combination of *Shilajattu* (100mg/kg/day) with glibenclamide (5mg/kg/day) or metformin (0.5gm/kg/day) significantly enhanced the glucose-lowering ability and improvement in lipid profile than any of these drugs given alone.<sup>56</sup>
  20. **Triphala:** Dhanwantari Nighantu mentioned *triphala* as *Mehahara*, and as per the study conducted as a single-blind comparative study done in 60 patients having 30 in each group, one group was treated with *Triphala churna* 5g along with Luke warm water as *anupana* and the other group received *Triphala churna* 5g with honey as *anupana*. The group that received along with honey showed a more beneficial result.<sup>57</sup>

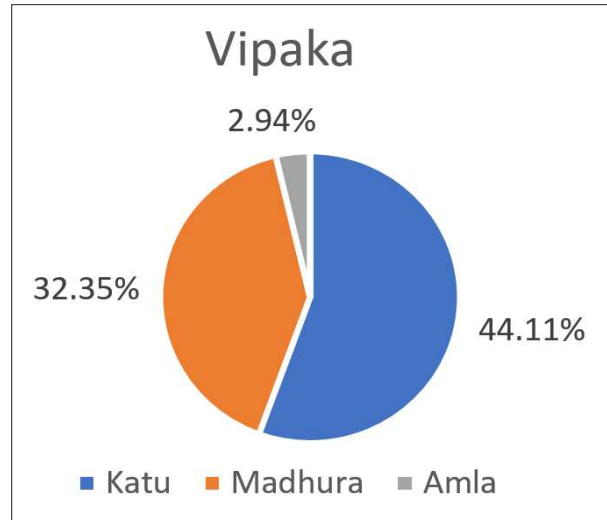
## RESULTS AND DISCUSSION

The drugs are classified into seven Vargas in this Nighantu among them, 34 drugs have Pramehahara property. These drugs help physicians and researchers either treat Prameha or explore unknown drugs for Prameha. So, the present study has been done to analyse the potent herbal remedies for the management of Prameha.

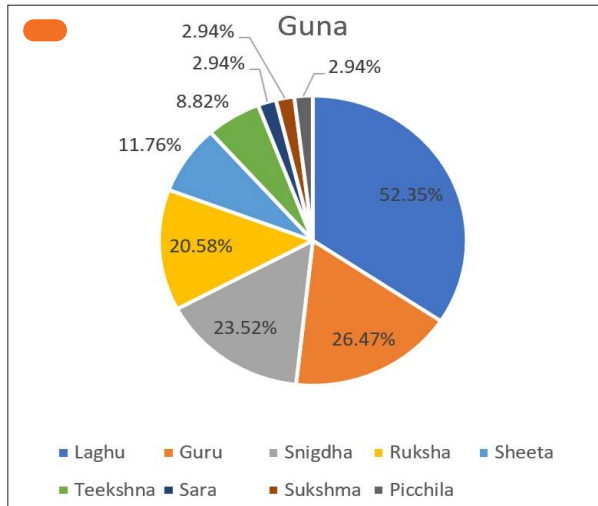
- Based on the *Rasa*, among the 34 dravyas identified, 18 dravyas have *Tikta rasa*, 13 dravyas have *Kashaya rasa*, 9 dravyas have *Katurasa*, 8 dravyas have *Madhura rasa*, and 3 dravyas have *Amla rasa*.
- Based on the *Guna* of the dravyas, it was observed that among 34 dravyas, 11 dravyas have *Laghu Guna*, 9 dravyas have *Guru Guna*, 8 dravyas have *Snigdha Gunas*, 7 dravyas have *Ruksha Guna*, 4 dravyas have *Sheeta Guna*, 3 dravyas have *Teekshna Guna*, and 1 dravya has *Sara Guna*, 1 dravya has *Sukshma Guna*, and 1 dravya has *Picchila Guna*.
- Based on the *veerya* of the identified drugs, it was observed that 20 dravyas are *Ushna veerya* while 10 dravyas are *Sheetaveerya*.
- Based on the *Vipaka* of dravyas identified, it was observed that among dravyas, 15 are *Katu vipaka*, and 11 have *Madhura vipaka*.
- Based on the *karma*, it has been observed that out of 34 dravyas, 4 dravyas are *Vatahara*, 2 *Pittahara*, 2 dravyas are *Kaphahara*, 10 dravyas are *Kaphavatajit*, 3 dravyas are *Kaphapittahara*, and 6 dravyas are *Tridosahara*.



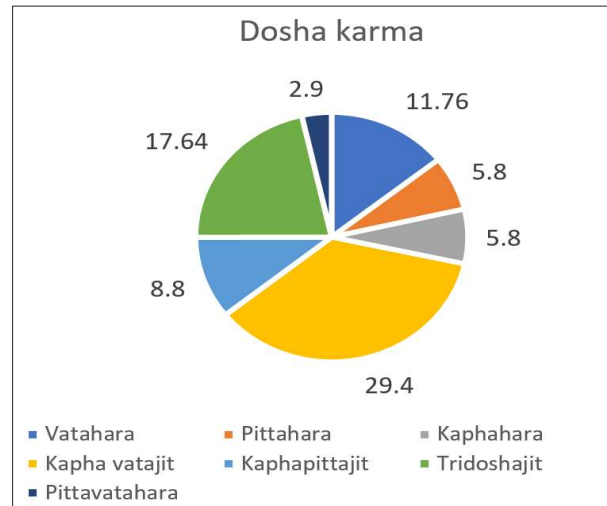
Graph 1: Showing Pramehahara Dravyas based on Rasa



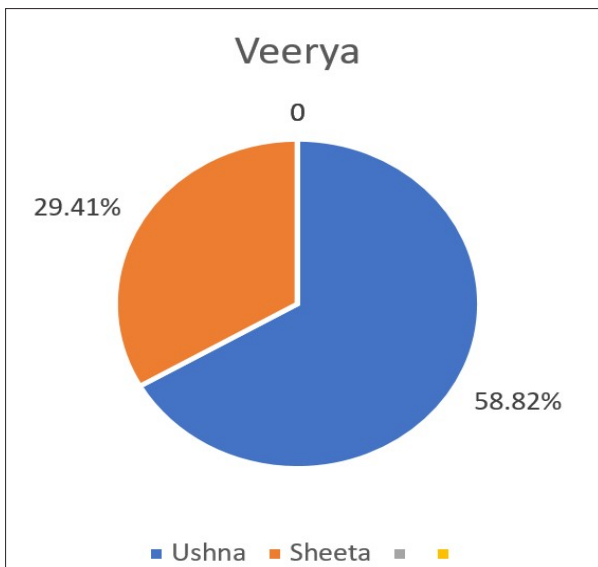
Graph 4: Showing Pramehahara dravyas based on Vipaka



Graph 2: Showing Pramehahara dravyas based on Guna



Graph 5: Showing Pramehahara dravyas based on Dosha karma



Graph 3: Showing Pramehahara Dravyas based on Veerya

According to *Ayurveda*, Prameha is a Santarpana Janya Vyadhi which is caused by the improper diets, sedentary lifestyle, and associated with metabolic disorders. The *Nidan*s involved vitiate the *Kapha dosha*, which further leads to the vitiation of the *Vata* and *Pitta doshas*, causing involvement of the *tridosha* in the manifestation of the disease. These vitiated doshas further disturb the *Dhatus* and *Malas*, expelling them out of the body by various means. Prameha is a multifactorial disease with many symptoms like *Madhurasyasta*, *Suptata*, *Paada Paani Daha*, *Ruksha Asyata*, etc. The prime symptoms of all types of Prameha include increased quality and turbidity of urine, *Mutramadhuryata* (sweetness of urine), *Madhuavivameha* (urine resembles honey), and *Madhuryaschcha tanoratha* (raised sweetness of the whole body). Since the Vyadhi is *Kaphapradhana Tridoshaja*, we need potent Dravyas that act on the

*Kapha dosha* as well as balance the *Pitta* and *Vata dosha*, respectively.

In the present study of *Pramehahara Dravyas* mentioned in the *Dhanwantari Nighantu*, it was found that there are potent herbal drugs in the management of *Prameha*. Entire *Ayurveda* classical texts have been written based on their principles and constant observations. Principles like *Tridosha*, *Panchamahabhuta Siddhanta*, *Samanya – Vishesh Siddhanta*, and the principles of *Shodhana* and *Shamana* play a vital role in the management of all ailments. Here, *dravyas* are analysed for their therapeutic action on *Prameha* based on their properties and action, keeping these basic *Siddhantas* in view. In *Prameha*, *Tridoshas* affects the constituents such as *Meda*, *Rakta*, *Sukra*, *Ambu*, *Vasa*, *Lasika*, *Majja*, *Rasa*, and *Ojas*. *Dosha* enters the *Vasti*, contaminates the *mutra*, and produces *Prameha*. In classics, *Prameha* is enumerated as 20, among these 10 being caused due to the predominance of *Kapha dosha* along with the *Vata*, *Pitta*, and *Medo dhatu*. *Pittaja Prameha* are enumerated as 6, which are caused by the *tridosha* along with *Rakta* and *Medo dhatu* as *dushyas*. *Vataja Prameha* 4 types caused due to the *tridosha* and all the *dushyas* leading to the development of *Madhumeha*. The majority of the drugs mentioned above are *Tikta*, *Kashaya*, and *Katu rasa*, which have *Shodana* and *Shamana* action. And also, these above *rasas* help in pacifying *Kapha dosha*, which is the main cause for the initiation of the disease. The drugs mentioned here are mostly *Ushna Veerya* and *Katu Vipaka*. Because of the *Ushna Veerya*, it acts as a *Kaphavata Shamaka*, and because of the *Katu vipaka dravya* as act as *Baddavinmutra*, which helps in the management of the *Prameha*. Few drugs have *Madhura rasa*, *Madhura vipaka*, and *Sheetaveerya*, which acts as a *Pitta shamaka* and that in turn helps in the nourishment of the depleted *doshas*.

## CONCLUSION

From the above study, it can be concluded that the *Dravyas* listed in the *Dhanwanthari Nighantu*, which exhibits a predominance of *Kashaya*, *Tikta*, and *Katu Rasa*, along with *Ushna Veerya* and *Katu Vipaka*, demonstrate significant *Pramehahara* properties. These substances, as described in the *Dhanwanthari Nighantu*, are traditionally recognized for their potential in managing *Prameha* due to their ability to balance the *doshas*, particularly *Kapha* and *Vata*. The specific characteristics of these *Dravyas* make them suitable for therapeutic applications in treating *Prameha*. Further, the *Dhanwanthari Nighantu* offers a systematic classification of medicinal plants and substances with anti-diabetic

properties, providing valuable insights into their therapeutic effects. Future preclinical and clinical studies are essential to validate and explore the full *Pramehahara* potential of these *Dravyas* as outlined in the *Dhanwantari Nighantu*, paving the way for evidence-based Ayurvedic interventions for diabetic management.

## REFERENCES

1. Ramchandran A, Das A K, Joshi S R, Yajnik C S, Shah S, Prasanna Kumar K M. Current Status of Diabetes in India and Need for Novel Therapeutic Agents. JAPI (June supplement)2010; 5: 7-9.
2. Agnivesha, Charaka samhita, Nidanasthana, chapter 4th, Prameha Nidana, Shloka no. 33,37, Jaydev Vidyalkara, editor. 9th edition. Reprint. New Delhi: Motilal Banarsidas; 1998. p.295.
3. National Institute of Indian Medicinal Heritage. Dhanwantari Nighantu [Internet]. Hyderabad: Central Council for Research in Ayurvedic Sciences;2012[cited 2024 Sep 20]. <https://niimh.nic.in/ebooks/e-Nighantu/dhanvantarinighantu/?mod=>.[Accessed on 2024 Sep 22]
4. National Institute of Indian Medicinal Heritage. Dhanwantari Nighantu [Internet]. Hyderabad: Central Council for Research in Ayurvedic Sciences;2012[cited 2024 Sep 20]. <https://niimh.nic.in/ebooks/e-Nighantu/dhanvantarinighantu/?mod=guDUci>. [Accessed on 2024 Sep 22]
5. National Institute of Indian Medicinal Heritage. Dhanwantari Nighantu [Internet]. Hyderabad: Central Council for Research in Ayurvedic Sciences;2012[cited 2024 Sep 20]. <https://niimh.nic.in/ebooks/e-Nighantu/dhanvantarinighantu/?mod=mUrvaa>. [Accessed on 2024 Sep 22]
6. National Institute of Indian Medicinal Heritage. Dhanwantari Nighantu [Internet]. Hyderabad: Central Council for Research in Ayurvedic Sciences;2012[cited 2024 Sep 20]. <https://niimh.nic.in/ebooks/e-Nighantu/dhanvantarinighantu/?mod=ma~jjiShThaa>. [Accessed on 2024 Sep 22]
7. National Institute of Indian Medicinal Heritage. Dhanwantari Nighantu [Internet]. Hyderabad: Central Council for Research in Ayurvedic Sciences;2012[cited 2024 Sep 20]. <https://niimh.nic.in/ebooks/e-Nighantu/dhanvantarinighantu/?mod=dhanvayaasa>. [Accessed on 2024 Sep 22]
8. National Institute of Indian Medicinal Heritage. Dhanwantari Nighantu [Internet]. Hyderabad:

- Central Council for Research in Ayurvedic Sciences;2012[cited 2024 Sep 20].<https://niimh.nic.in/ebooks/e-Nighantu/dhanvantarinighantu/?mod=haridraa>. [Accessed on 2024 Sep 22]
9. National Institute of Indian Medicinal Heritage. Dhanwantari Nighantu [Internet]. Hyderabad: Central Council for Research in Ayurvedic Sciences;2012[cited 2024 Sep 20].<https://niimh.nic.in/ebooks/e-Nighantu/dhanvantarinighantu/?mod=kaTphala>. [Accessed on 2024 Sep 22]
  10. National Institute of Indian Medicinal Heritage. Dhanwantari Nighantu [Internet]. Hyderabad: Central Council for Research in Ayurvedic Sciences;2012[cited 2024 Sep 20].<https://niimh.nic.in/ebooks/e-Nighantu/dhanvantarinighantu/?mod=devadaaru>. [Accessed on 2024 Sep 22]
  11. National Institute of Indian Medicinal Heritage. Dhanwantari Nighantu [Internet]. Hyderabad: Central Council for Research in Ayurvedic Sciences;2012[cited 2024 Sep 20].<https://niimh.nic.in/ebooks/e-Nighantu/dhanvantarinighantu/?mod=shaalaparNii>. [Accessed on 2024 Sep 22]
  12. National Institute of Indian Medicinal Heritage. Dhanwantari Nighantu [Internet]. Hyderabad: Central Council for Research in Ayurvedic Sciences;2012[cited 2024 Sep 20].<https://niimh.nic.in/ebooks/e-Nighantu/dhanvantarinighantu/?mod=gokShura>. [Accessed on 2024 Sep 22]
  13. National Institute of Indian Medicinal Heritage. Dhanwantari Nighantu [Internet]. Hyderabad: Central Council for Research in Ayurvedic Sciences;2012[cited 2024 Sep 20].<https://niimh.nic.in/ebooks/e-Nighantu/dhanvantarinighantu/?mod=paaShaaNabheda>. [Accessed on 2024 Sep 22]
  14. National Institute of Indian Medicinal Heritage. Dhanwantari Nighantu [Internet]. Hyderabad: Central Council for Research in Ayurvedic Sciences;2012[cited 2024 Sep 20].<https://niimh.nic.in/ebooks/e-Nighantu/dhanvantarinighantu/?mod=saariva>. [Accessed on 2024 Sep 22]
  15. National Institute of Indian Medicinal Heritage. Dhanwantari Nighantu [Internet]. Hyderabad: Central Council for Research in Ayurvedic Sciences;2012[cited 2024 Sep 20].<https://niimh.nic.in/ebooks/e-Nighantu/dhanvantarinighantu/?mod=ashmantaka>. [Accessed on 2024 Sep 22]
  16. National Institute of Indian Medicinal Heritage. Dhanwantari Nighantu [Internet]. Hyderabad: Central Council for Research in Ayurvedic Sciences;2012[cited 2024 Sep 20].<https://niimh.nic.in/ebooks/e-Nighantu/dhanvantarinighantu/?mod=harItaki>. [Accessed on 2024 Sep 22]
  17. National Institute of Indian Medicinal Heritage. Dhanwantari Nighantu [Internet]. Hyderabad: Central Council for Research in Ayurvedic Sciences;2012[cited 2024 Sep 20].<https://niimh.nic.in/ebooks/e-Nighantu/dhanvantarinighantu/?mod=Aragvadha>. [Accessed on 2024 Sep 22]
  18. National Institute of Indian Medicinal Heritage. Dhanwantari Nighantu [Internet]. Hyderabad: Central Council for Research in Ayurvedic Sciences;2012[cited 2024 Sep 20].<https://niimh.nic.in/ebooks/e-Nighantu/dhanvantarinighantu/?mod=dravanti>. [Accessed on 2024 Sep 22]
  19. National Institute of Indian Medicinal Heritage. Dhanwantari Nighantu [Internet]. Hyderabad: Central Council for Research in Ayurvedic Sciences;2012[cited 2024 Sep 20].<https://niimh.nic.in/ebooks/e-Nighantu/dhanvantarinighantu/?mod=raktapuShpa>. [Accessed on 2024 Sep 22]
  20. National Institute of Indian Medicinal Heritage. Dhanwantari Nighantu [Internet]. Hyderabad: Central Council for Research in Ayurvedic Sciences;2012[cited 2024 Sep 20].<https://niimh.nic.in/ebooks/e-Nighantu/dhanvantarinighantu/?mod=ushIra>. [Accessed on 2024 Sep 22]
  21. National Institute of Indian Medicinal Heritage. Dhanwantari Nighantu [Internet]. Hyderabad: Central Council for Research in Ayurvedic Sciences;2012[cited 2024 Sep 20].<https://niimh.nic.in/ebooks/e-Nighantu/dhanvantarinighantu/?mod=jaatiphala>. [Accessed on 2024 Sep 22]
  22. National Institute of Indian Medicinal Heritage. Dhanwantari Nighantu [Internet]. Hyderabad: Central Council for Research in Ayurvedic Sciences;2012[cited 2024 Sep 20].<https://niimh.nic.in/ebooks/e-Nighantu/dhanvantarinighantu/?mod=guggulu>. [Accessed on 2024 Sep 22]
  23. National Institute of Indian Medicinal Heritage. Dhanwantari Nighantu [Internet]. Hyderabad: Central Council for Research in Ayurvedic Sciences;2012[cited 2024 Sep 20].<https://niimh.nic.in/ebooks/e-Nighantu/dhanvantarinighantu/?mod=braamhi>. [Accessed on 2024 Sep 22]
  24. National Institute of Indian Medicinal Heritage. Dhanwantari Nighantu [Internet]. Hyderabad: Central Council for Research in Ayurvedic Sciences;2012[cited 2024 Sep 20].<https://niimh.nic.in/ebooks/e-Nighantu/dhanvantarinighantu/?mod=vRuddhadaaru>. [Accessed on 2024 Sep 22]
  25. National Institute of Indian Medicinal Heritage. Dhanwantari Nighantu [Internet]. Hyderabad: Central Council for Research in Ayurvedic Sciences;2012[cited 2024 Sep 20].<https://niimh.nic.in/ebooks/e-Nighantu/dhanvantarinighantu>



- ntu/?mod=vaMsha. [Accessedon 2024 Sep 22]
26. National Institute of Indian Medicinal Heritage. Dhanwantari Nighantu [Internet]. Hyderabad: Central Council for Research in Ayurvedic Sciences;2012[cited 2024 Sep 20]. <https://niimh.nic.in/ebooks/e-Nighantu/dhanvantarinighantu/?mod=aruka>. [Accessedon 2024 Sep 22]
  27. National Institute of Indian Medicinal Heritage. Dhanwantari Nighantu [Internet]. Hyderabad: Central Council for Research in Ayurvedic Sciences;2012[cited 2024 Sep 20].<https://niimh.nic.in/ebooks/e-Nighantu/dhanvantarinighantu/?mod=raajadaana>. [Accessedon 2024 Sep 22]
  28. National Institute of Indian Medicinal Heritage. Dhanwantari Nighantu [Internet]. Hyderabad: Central Council for Research in Ayurvedic Sciences;2012[cited 2024 Sep 20].<https://niimh.nic.in/ebooks/e-Nighantu/dhanvantarinighantu/?mod=auShTri ghRuta>. [Accessedon 2024 Sep 22]
  29. National Institute of Indian Medicinal Heritage. Dhanwantari Nighantu [Internet]. Hyderabad: Central Council for Research in Ayurvedic Sciences;2012[cited 2024 Sep 20].<https://niimh.nic.in/ebooks/e-Nighantu/dhanvantarinighantu/?mod=shilaaajattu>. [Accessedon 2024 Sep 22]
  30. National Institute of Indian Medicinal Heritage. Dhanwantari Nighantu [Internet]. Hyderabad: Central Council for Research in Ayurvedic Sciences;2012[cited 2024 Sep 20].<https://niimh.nic.in/ebooks/e-Nighantu/dhanvantarinighantu/?mod=va~g>. [Accessedon 2024 Sep 22]
  31. National Institute of Indian Medicinal Heritage. Dhanwantari Nighantu [Internet]. Hyderabad: Central Council for Research in Ayurvedic Sciences; 2012[cited 2024 Sep 20].<https://niimh.nic.in/ebooks/e-Nighantu/dhanvantarinighantu/?mod=loha>. [Accessedon 2024 Sep 22]
  32. National Institute of Indian Medicinal Heritage. Dhanwantari Nighantu [Internet]. Hyderabad: Central Council for Research in Ayurvedic Sciences;2012[cited 2024 Sep 20].<https://niimh.nic.in/ebooks/e-Nighantu/dhanvantarinighantu/?mod=maNDUra>. [Accessedon 2024 Sep 22]
  33. National Institute of Indian Medicinal Heritage. Dhanwantari Nighantu [Internet]. Hyderabad: Central Council for Research in Ayurvedic Sciences;2012[cited 2024 Sep 20].<https://niimh.nic.in/ebooks/e-Nighantu/dhanvantarinighantu/?mod=vaikraanta>. [Accessedon 2024 Sep 22]
  34. National Institute of Indian Medicinal Heritage. Dhanwantari Nighantu [Internet]. Hyderabad: Central Council for Research in Ayurvedic Sciences;2012[cited 2024 Sep 20]. <https://niimh.nic.in/ebooks/e-Nighantu/dhanvantarinighantu/?mod=takra>. [Accessedon 2024 Sep 22]
  35. National Institute of Indian Medicinal Heritage. Dhanwantari Nighantu [Internet]. Hyderabad: Central Council for Research in Ayurvedic Sciences;2012[cited 2024 Sep 20].<https://niimh.nic.in/ebooks/e-Nighantu/dhanvantarinighantu/?mod=maardviika>. [Accessedon 2024 Sep 22]
  36. National Institute of Indian Medicinal Heritage. Dhanwantari Nighantu [Internet]. Hyderabad: Central Council for Research in Ayurvedic Sciences;2012[cited 2024 Sep 20].<https://niimh.nic.in/ebooks/e-Nighantu/dhanvantarinighantu/?mod=triphala>. [Accessedon 2024 Sep 22]
  37. National Institute of Indian Medicinal Heritage. Dhanwantari Nighantu [Internet]. Hyderabad: Central Council for Research in Ayurvedic Sciences;2012[cited 2024 Sep 20].<https://niimh.nic.in/ebooks/e-Nighantu/dhanvantarinighantu/?mod=tRuNapa-jcamuula>. [Accessedon 2024 Sep 22]
  38. Nagaraja Puranik N, Kammar Fakruddin K, Devi S. Anti-diabetic activity of *Tinospora cordifolia* (Willd.) in streptozotocin diabetic rats; does it act like sulfonylureas? *Turk J Med Sci.*2010; 40 (2): 265-270.
  39. Nayak Arabinda. In-Vitro Hypoglycemic Activity evaluation of *Marsdenia tenacissima* and *Sphaeranthus indicus*. *Inventi Journal* July-Sept. 2014;
  40. Rani S, Mandave P, Khadke S, Jagtap S, Patil S, Kuvalekar A. Antiglycation, antioxidant and antidiabetic activity of traditional medicinal plant, *Rubia cordifolia* Linn. for management of hyperglycemia. *IJPAES* 2013 July-September; 3: 42-49.
  41. Haider Ali Khan a , Mehreen Ghufran b , Sulaiman Shams a,\* , Alam Jamal c , Muhammad Ayaz d , Mehran Ullah e , Abbas Khan f , Mohammad Imran Khan c,g,\*\*, Zuhier A. Awan
  42. Rai P K, Jaiswal D, Mehta S, Rai D K, Sharma B, Watal G. Effect of *Curcuma longa* Freeze dried Rhizome powder with milk in STZ induced Diabetic rats. *Indian Journal of Clinical Biochemistry.* 2010; 25 (2): 175-181.
  43. Rawat S, Kumar N, Kothiyal P. Evaluate the Antidiabetic activity of *Myrica esculenta* leaves in Streptozotocin induced diabetes in rat. *International Journal of Universal Pharmacy*

- and Bio Sciences. November-December 2013; 2(6): 510-524.
44. Jain S, Jain A, Malviya N, Kumar D, Jain V, Jain S. Antidiabetic Activity of Cedrus deodara Aqueous Extract and Its Relationship with Its Antioxidant Properties. *J. Pharm. Sci. Pharmacol.* 2014; 1: 187- 194.
  45. Raghavan Govindarajan, Henry Asare-Anane, Shanta Persaud, Peter Jones, Peter J. Houghton. *Planta Med* 2007; 73(5): 427-432 DOI: 10.1055/s-2007-967176
  46. Patel DK, Prasad SK, Kumar R, Hemalatha S. An overview on antidiabetic medicinal plants having insulin mimetic property. *Asian Pac J Trop Biomed* 2012; 2(4): 320-330.
  47. Singh N, Juyal V, Gupta A K, Gahlot M, Prasant U. Antidiabetic activity of ethanolic extract of root of *Bergenia ligulata* in alloxan diabetic rats.
  48. Borgohain R, Lahon K, Das S, Gohain K. Evaluation of mechanism of Anti-diabetic activity of *Terminalia chebula* on Alloxan and Adrenaline induced diabetic albino rats. *Int J Pharm Bio Sci* 2012 July; 3(3): 256 - 266.
  49. Kumar, V., Rathore, K., Jain, P. *et al.* biological activity of *Bauhinia racemosa* against Diabetes and Interlinked Disorders like Obesity and Hyperlipidemia. *Clin Phytosci* 3, 7 (2017). <https://doi.org/10.1186/s40816-017-0044-9>.
  50. Ramesh B, Karuna R, Sreenivasa Reddy S, Sudhakara G, Saralakumari D. Ethanolic Extract of *Commiphora mukul* Gum resin attenuates Streptozotocin-induced alterations in Carbohydrate and Lipid metabolism in rats. *EXCLI Journal* 2013; 12:556-568.
  51. Hena Mariam Fathima, Lakshmi Thangavelu, Anitha Roy. Anti-diabetic activity of cassia fistula (alpha amylase - inhibitory effect). *J Adv Pharm Edu Res* 2018;8(2):12-15.
  52. <https://doi.org/10.35410/IJAEB.2021.5663>.
  53. Anti diabetic Activity of Ethanolic Extract of *Achyranthes aspera* Leaves in Streptozotocin induced diabetic rats
  54. Udhaya Lavinya B, Evan Prince Sabina. Anti-hyperglycaemic effect of Brahmi (*Bacopa monnieri* L.) in streptozotocin induced diabetic rats: A study involving antioxidant, biochemical and haematological parameters. *JCAPR*.2015; 7(10): 531- 534.
  55. Habbu, P.V et. al. Antidiabetic activity of *Argyrea speciosa* (sweet) (Burm.f.) Boj. in normoglycemic and Streptozotocin-induced diabetic rats. *Oriental Pharmacy and Experimental Medicine* 2010; 10(2): 90-102.
  56. N. A. Trivedi, B. Mazumdar, J. D. Bhatt, K. G. Hemavath Effect of shilajit on blood glucose and lipid profile in alloxan-induced diabetic rats.
  57. Ignole Rajesh Kundlikrao. Antidiabetic Drugs in Ayurveda. *Int. Res. J. Pharm.* 2013; 4(6): 21-24.

