



## Review on *Rasayana* (Rejuvenative) Plants of Various *Nighantus* (Ayurvedic Materia Medica)

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### Abstract

In the current era people are much more health conscious and make sincere efforts to retain and promote their health status and *Ayurveda*, the Indian science of life brings nature's own reward for rejuvenation and revitalization. *Rasayana* is a distinctive branch of *Ayurveda* which mainly deals with the conservation and promotion of fitness and longevity by revitalizing the metabolism and enhancing resistance against diseases. Inclusion of *Rasayana* herbs in the management of certain life-style disorders such as cancer, diabetes, hypertension, osteo-arthritis and obesity can play a crucial role. The lot of plants with *Rasayana* (Rejuvenative) properties possess diversified actions like immuno-enhancement, anti-oxidant, free-radical scavenging, adaptogenic or anti-stress, nutritive effects etc. These *Rasayana* herbs are mentioned in classical texts of *Ayurveda* mainly in various *Nighantus* (Ayurvedic Materia Medica). This ancient wisdom needs to be seen in the light of present day scientific information for effective application but we are still deficient in having quantitative records of *Rasayana* (Rejuvenative) plants which will serve as a ready reckoner for researchers as well as physicians. Thus it is necessary to assemble the quantitative scientific data from various *Nighantus*. This article aims to compile and quantify the Rejuvenative plants described in various *Nighantus*.

**Key words:** *Rasayana*; Rejuvenative; *Nighantu*; *Rasayana* herbs

### INTRODUCTION

We know that health is wealth. In this hectic, over-busy and contaminated world, our natural health, pleasure and internal sense of well-being are masked by the accumulation of impurities. These impurities or toxins cause worsening of normal body functioning and the quality of life as well as lifespan get affected. *Rasayana* is an answer to solve this problem and achieve healthful longevity including mental development and resistance against diseases. Living the healthy life is the prime motto of this current era. Conservation of immunity, physical and psychological health is the way to attain the normal life span. *Ayurveda*, the 'science of life' deals with a preventive and curative measures for the well-being of creature.<sup>1</sup> *Ayurveda* describes *Rasayana herbs* that are believed to re-establish and detoxify the body and mind, prevent degeneration and delay aging or rather reverse the aging process. From the *Rasayana* treatment, one attains longevity, memory, intelligence, freedom from disorders, youthful age, excellence of lustre, complexion and voice, oratory, optimum strength of physique and sense organs, respectability and brilliance.<sup>2</sup>

The literal meaning of the word '*Rasayana*' is the path that '*Rasa*' takes ('*Rasa*': Fluid or plasma; *Ayana*: Path). According to *Ayurveda* the physical structure is composed of seven *Dhatu*s starting from *Rasa* (*Rasadi Dhatu*s) and *Rasayana* is the way to produce superior quality *Dhatu*s (body tissues). The qualities of

the 'Rasadhātu' have an effect on the health of other successive *Dhatus* (tissues) of the body as these *Dhatus* develop sequentially and nourish further *Dhatus*. Hence the medicine that improves the quality of 'Rasa' should promote or strengthen the health of all tissues of the body. *Rasayana* herbs influence the fundamental aspect of the body viz. *Dhatus*, *Agni* and *Srotasas* and helps in the prevention of aging. Thus *Rasayana* is that process by which all the body tissues are nourished. The ideal quality that all *Rasayana* medicines have is the enrichment of *Rasa* (essence), leading in promotion of health and vigour of the tissues. As a result *Rasayana* helps in regeneration, revival and revitalization of *Dhatus*.

Traditional herbal drugs have a few or no side effects and are claimed to be safer ones.<sup>3</sup> That's why the researchers of the globe are keenly busy in screening of plants for bioactivities with therapeutic usefulness. Demand for crude drugs, herbal preparations and active bio-molecules are ever rising in developing and developed nations. India can become a global leader if accurate documentation, accreditation, validation and quantification of phyto-chemicals, secondary metabolites and active principles is accomplished with standard methods but even today we are short of quantitative data of *Rasayana* (Rejuvenating) plants. Numerous single *Rasayana* plants possess diversified actions like immuno-enhancement, free-radical scavenging, adaptogenic or anti-stress, cyto-protective, anti-oxidant, nutritive effects etc. These *Rasayana* herbs are described in *Ayurveda* literature mainly *Nighantus* (*Ayurvedic material medica*) for their utilization in health promotion and cure of diseases with improvement in the quality of life. Present article is an effort to highlight the quantitative data of these *Rasayana* plants.

The complete reference books for Indian medicines of herbal, mineral and animal sources are *Nighantus* (lexicons). Several *Nighantus* (*Ayurvedic material medica*) are available in *Ayurveda* however the most appreciated were selected based on their universal use among academicians and practitioners. These were *Dhanvantari Nighantu* (D.N. - 10th Century A.D.), *Madanapala Nighantu* (M.N. - 14th Century A.D.), *Raja Nighantu* (R.N. - 14th Century A.D.), *Kaiyadeva Nighantu* (K.N. - 1450 A.D.), *Bhavaprakasha Nighantu* (B.N. - 16th Century A.D.), and *Shaligrama Nighantu* (S.N. - 1896 A.D.). Each and every varga (chapter) of these *Nighantus* (lexicons) were screened for plants showing *Rasayana* property. All these plants were gathered. The assembled data was analyzed and presented in alphabetical order as given in the Table 1.

**Table 1:** Documentation of *Rasayana* plants in various *Nighantus*

Sr. No.	Sanskrit Name	Latin Name	D.N.	M.N.	R.N.	K.N.	B.N.	S.N.
1.	<i>Aadityapatra, Suvarchala</i> <sup>12, 195</sup>	<i>Cleome viscosa</i> Linn.	+					+
2.	<i>Aakashvalli</i> <sup>48, 189</sup>	<i>Cassytha filiformis</i> Linn.			+			+
3.	<i>Aakhukarni, Dravanti</i> <sup>72, 198</sup>	<i>Ipomoea reniformis</i> Chois			+			+
4.	<i>Aakhukarni-Laghu</i> <sup>197</sup>	<i>Ipomoea</i> sp.						+
5.	<i>Aamalaki</i> <sup>6, 88, 123, 151</sup>	<i>Emblia officinalis</i> Gaertn	+		+		+	+
6.	<i>Ajashringi</i> <sup>186</sup>	<i>Pergularia extensa</i> N. E. Br.						+
7.	<i>Amrutsrava</i> <sup>52</sup>	<i>Vitis latifolia</i> Roxb.			+			
8.	<i>Ashwagandha</i> <sup>22, 106, 136, 174</sup>	<i>Withania somnifera</i> (Linn.)Dunal.		+		+	+	+
9.	<i>Ativisha</i> <sup>29</sup>	<i>Aconitum hererophyllum</i> Wall. ex Royle		+				
10.	<i>Bakuchi</i> <sup>5, 27, 100, 125, 157</sup>	<i>Psoralea corylifolia</i> Linn.	+	+		+	+	+
11.	<i>Beejak</i> <sup>41, 104, 144, 204</sup>	<i>Pterocarpus marsupium</i> Roxb.		+		+	+	+
12.	<i>Bhanga</i> <sup>158</sup>	<i>Cannabis sativa</i> Linn.						+
13.	<i>Bhringraj</i> <sup>28, 115, 138, 182</sup>	<i>Eclipta alba</i> Hassk.		+		+	+	+

14.	<i>Bhringraj- Neel</i> <sup>59, 181</sup>	<i>Eclipta alba</i> Hassk.?			+				+
15.	<i>Brahmi</i> <sup>35, 102, 142, 194</sup>	<i>Bacopa monnieri</i> (Linn.)Pennell		+		+	+	+	+
16.	<i>Chanak-Krisnna</i> <sup>93, 208</sup>	<i>Cicer arietinum</i> Linn.var.			+				+
17.	<i>Chanchu (Brihat)</i> <sup>60, 211</sup>	<i>Corchorus</i> sp.			+				+
18.	<i>Chandalkand</i> <sup>79, 216</sup>	<i>Amorphophallus</i> sp.			+				+
19.	<i>Chitrak</i> <sup>154</sup>	<i>Plumbago zeylanica</i> Linn.							+
20.	<i>Chitrak- Rakta</i> <sup>75, 155</sup>	<i>Plumbago indica</i> Linn.			+				+
21.	<i>Chivilli, Gholika-Kshudra</i> <sup>66, 209</sup>	<i>Portulaca quadrifida</i> Linn.			+				+
22.	<i>Dugdhaferi</i> <sup>68, 193</sup>	<i>Taraxacum officinale</i> Weber ex Wiggers			+				+
23.	<i>Dveepantarvacha</i> <sup>156</sup>	<i>Smilax china</i> Linn.							+
24.	<i>Eranda</i> <sup>92, 165, 218</sup>	<i>Ricinus communis</i> Linn.			+				+
25.	<i>Gambhari</i> <sup>18, 95, 129, 160</sup>	<i>Gmelina arborea</i> Roxb.		+		+	+	+	+
26.	<i>Gandhatrun</i> <sup>84</sup>	<i>Cymbopogon citratus</i> (DC.) Stapf.			+				
27.	<i>Gokshur- Brihat</i> <sup>53, 162</sup>	<i>Pedaliu murex</i> Linn.			+				+
28.	<i>Gorakshdugdhi</i> <sup>73</sup>	<i>Euphorbia thymifolia</i> Linn.			+				
29.	<i>Gokshur- Khudra</i> <sup>53, 162, 163</sup>	<i>Tribulus terrestris</i> Linn.			+				+
30.	<i>Guduchi</i> <sup>4, 17, 46, 94, 128, 146, 159, 213</sup>	<i>Tinospora cordifolia</i> (Willd) Miers ex Hook.f. & Thoms.	+	+	+	+	+	+	+
31.	<i>Guggulu</i> <sup>38, 90, 112, 127, 148</sup>	<i>Commiphora mukul</i> (Hook.ex Stocks) Engl.		+	+	+	+	+	+
32.	<i>Hanspadi</i> <sup>69, 187</sup>	<i>Adiantum lunulatum</i> Burm.			+				+
33.	<i>Haritaki</i> <sup>16, 89, 98, 122, 150</sup>	<i>Terminalia chebula</i> Retz.		+	+	+	+	+	+
34.	<i>Ingudi</i> <sup>83, 205</sup>	<i>Balanites aegyptica</i> (Linn.) D			+				+
35.	<i>Jalamadhook</i> <sup>15, 87, 201</sup>	<i>Madhuca longifolia</i> (Koen.) Macb.	+		+				+
36.	<i>Jayanti- Krishna</i> <sup>57</sup>	<i>Sesbania bicolor</i> W.A.?			+				
37.	<i>Jeevanti</i> <sup>20, 97, 131, 164</sup>	<i>Leptadenia reticulata</i> W. & A.		+		+	+	+	+
38.	<i>Jyotishmati</i> <sup>219</sup>	<i>Celastrus paniculatus</i> Willd.							+
39.	<i>Kakadani</i> <sup>51</sup>	<i>Anamirta cocculus</i> (Linn.) Wight & Arn.			+				
40.	<i>Kakmachi</i> <sup>10, 30, 58, 101, 139, 184</sup>	<i>Solanum nigrum</i> Linn.	+	+	+	+	+	+	+
41.	<i>Kaknasa</i> <sup>50, 185</sup>	<i>Martynia annua</i> Linn.?			+				+
42.	<i>Kamal- Neel, Sougandhik</i> <sup>14, 86, 201</sup>	<i>Nelumbo stellata</i> Willd.	+		+				+
43.	<i>Katumbini-Arkpushpi</i> <sup>67, 192</sup>	<i>Holostemma rheedei</i> Wall.			+				+
44.	<i>Ketaki</i> <sup>85</sup>	<i>Pandanus tectorius</i> Soland. ex Parkinson			+				
45.	<i>Ketaki- Suvarna</i> <sup>200</sup>	<i>Pandanus tectorius</i> Soland. ex Parkinson?							+
46.	<i>Kshirvidari</i> <sup>170</sup>	<i>Ipomoea digitata</i> Linn.							+
47.	<i>Kumari</i> <sup>36, 63, 120, 137, 178</sup>	<i>Aloe vera</i> Tourn. Ex Linn.		+	+	+	+	+	+
48.	<i>Kushtha</i> <sup>149</sup>	<i>Saussurea lappa</i> C.B. Clarke							+
49.	<i>Lakshmana</i> <sup>81, 167, 217</sup>	<i>Panax schinseng</i> Nees			+				+
50.	<i>Lashun</i> <sup>43, 77, 111, 126, 214</sup>	<i>Allium sativum</i> Linn.		+	+	+	+	+	+

51.	<i>Lingini</i> <sup>47, 183</sup>	<i>Bryonopsis laciniosa</i> (Linn.) Naud.			+			+
52.	<i>Mahamundi- Mahashravani</i> <sup>62, 177</sup>	<i>Sphaeranthus Africans</i> Linn.			+			+
53.	<i>Mahashatavari</i> <sup>8, 24, 56, 109, 173</sup>	<i>Asparagus sarmentosus</i> Linn.	+	+	+	+		+
54.	<i>Mansrohini</i> <sup>11, 91</sup>	<i>Soymida febrifuga</i> A.Juss.	+		+			
55.	<i>Marich- Shwet</i> <sup>74, 152</sup>	<i>Piper nigrum</i> Linn.			+			+
56.	<i>Mundi(Shravani)</i> <sup>176</sup>	<i>Sphaeranthus indicus</i> Linn.						+
57.	<i>Mushali</i> <sup>33, 119, 134, 171</sup>	<i>Asparagus adscendens</i> Roxb.		+		+	+	+
58.	<i>Mushali- Krishna</i> <sup>80</sup>	<i>Curculigo orchioides</i> Gaertn.			+			
59.	<i>Nagbala</i> <sup>25, 107</sup>	<i>Sida veronicaefolia</i> Linn.		+		+		
60.	<i>Palash</i> <sup>206</sup>	<i>Butea monosperma</i> (Lam.) Kuntze.						+
61.	<i>Pilu</i> <sup>40, 99</sup>	<i>Salvadora persica</i> Linn.		+		+		
62.	<i>Pippali</i> <sup>9, 37, 110, 124, 153</sup>	<i>Piper longum</i> Linn.	+	+		+	+	+
63.	<i>Pooga</i> <sup>203</sup>	<i>Areca catechu</i> Linn.						+
64.	<i>Punarnava- Kshudra</i> <sup>21</sup>	<i>Boerhavia diffusa</i> Linn.		+				
65.	<i>Punarnava- Neel</i> <sup>70, 180</sup>	<i>Boerhaavia sp. ?</i>			+			+
66.	<i>Punarnava- Shewt</i> <sup>179</sup>	<i>Boerhavia verticillata</i> Poir.						+
67.	<i>Rohish</i> <sup>168</sup>	<i>Cymbopogon martini</i> (Roxb.)Wats						+
68.	<i>Rudanti</i> <sup>64, 222</sup>	<i>Cressa cretica</i> Linn.			+			+
69.	<i>Sahasramoolika</i> <sup>210</sup>	<i>Comeyllia communis</i> Linn.						+
70.	<i>Shaliparni</i> <sup>19, 96, 130, 161</sup>	<i>Desmodium gangeticum</i> DC.		+		+	+	+
71.	<i>Shalmali</i> <sup>42, 82, 105, 145, 207</sup>	<i>Salmalia malabarica</i> (DC.)Schott & Endl.		+	+	+	+	+
72.	<i>Shankhapushpi</i> <sup>13, 34, 113, 141, 191</sup>	<i>Convolvulus pluricaulis</i> Choisy	+	+		+	+	+
73.	<i>Sharpunkha</i> <sup>175</sup>	<i>Tephrosia purpurea</i> Pers.						+
74.	<i>Sharpunkha- Shwet</i> <sup>55</sup>	<i>Tephrosia candida</i> DC.			+			
75.	<i>Shatavari</i> <sup>7, 23, 56, 108, 135, 172</sup>	<i>Asparagus racemosus</i> Willd.	+	+	+	+	+	+
76.	<i>Shigru, Shobhanjan- Rakta</i> <sup>76, 166</sup>	<i>Morianga concanensis</i> Nimmo			+			+
77.	<i>Shimrudi</i> <sup>61</sup>	?			+			
78.	<i>Somlata, Somvalli</i> <sup>32, 103, 140, 188, 220</sup>	<i>Sarcostemma brevistigma</i> Wig. & Arn.		+		+	+	+
79.	<i>Sudhamooli</i> <sup>221</sup>	<i>Polygonatum cirrhifolium</i> Royle						+
80.	<i>Sunishannak, Shitavari</i> <sup>54, 212</sup>	<i>Marsilea minuta</i> Linn.			+			+
81.	<i>Tilak</i> <sup>39, 114, 143, 199</sup>	<i>Wendlandia exserta</i> DC.		+		+	+	+
82.	<i>Vandak</i> <sup>65, 190</sup>	<i>Loranthus longiflorus</i> Desr.			+			+
83.	<i>Vandhyakarkotaki</i> <sup>49, 196</sup>	<i>Momordica dioica</i> Roxb. Will.			+			+
84.	<i>Varahi</i> <sup>44, 78, 118, 132, 147, 215</sup>	<i>Dioscorea bulbifera</i> Linn.		+	+	+	+	+
85.	<i>Vasuk-Shwet</i> <sup>71</sup>	<i>Trianthema portulacastrum</i> Linn.			+			
86.	<i>Vidari</i> <sup>26, 117, 133, 169</sup>	<i>Pueraria tuberosa</i> DC.		+		+	+	+
87.	<i>Vruddhadaru</i> <sup>31, 116, 223</sup>	<i>Argyreia speciosa</i> Sweet.		+		+		+
88.	<i>Yavtikta</i> <sup>45, 121</sup>	<i>Euphorbia dracunculoides</i> Lamk?		+		+		
TOTAL – 88			1 2	3 0	5 0	2 8	2 4	72

W.H.O. mentions that health is a state of complete physical, mental and social well being of a person and not merely absence of disease. *Rasayana* is a multi-angled approach taking care of the body, mind and spirit, thus responsible for total health of a person. *Rasayana* is a unique stream of medication for immune-promotive, anti-degenerative and rejuvenative health care and is recognized for preventing the effects of ageing or retarding ageing and getting better quality of life of healthy as well as diseased individuals.

*Ayurveda* mentions that a person is healthy when *Doshas* are in equilibrium and a disease occurs when this equilibrium gets disturbed. Thus homeostasis is maintained by *Doshas*, those regulate all the metabolic processes in the human body. *Vata Dosha* is accountable for the catabolic activity (tissue wear and tear) i.e. *Karshana*, *Pitta Dosha* deals with the process of nutrients assimilation into tissues i.e. *Pachana* and *Kapha Dosha* governs synthesis of newer tissues i.e. *Brihana*. The action of these three *Doshas* takes place through body tissues (*Dhatus*). The destruction (decay created by the interaction of *Agnis*) and regeneration of body tissues (through proper diet (*Aahar*), physical work (*Vihar*) or medicine (*Aoshadha*) is a constant process that occurs in the body. The continuous replenishment of tissues is required for maintaining *Dhatusamya* (homeostasis). In a diseased condition, there is disturbance in the equilibrium in the element level hence replenishment of the deficient elemental factor through appropriate herbs is necessary to get rid of the disease. *Agni* plays an important role in bio-transformation and *Saptadhatwagni* are responsible for tissue metabolism. The toxic waste of metabolism is called *Aam*. When *Agni* gets hampered, *Aam* doesn't resolve through *Agni* because of its hypo-functioning leading to obstruction of the *Srotasas* (channels of micro-circulation). There is a need of clear *Srotasas* for tissue perfusion. The clear channels help in *Dhatu Poshana* (Tissue Nutrition) by nourishing *Dhatus* which finally results in production of excellence of tissues and boosts *Ojas* (immunity). Thus according to *Ayurveda* behind healthy regeneration of tissues; Nutrition, unimpaired tissue perfusion and *Ojas* are significant factors. *Rasayana* means the way for attaining excellence in all body tissues through some special measures and medicines.<sup>224</sup> *Shushruat* defines *Rasayana Tantra* as the measure which delays the ageing process, increases intellect and strength, prolongs life and cures the disorders<sup>225</sup>. *Rasayana* acts at the level of *Rasa*, *Agni* and the *Srotas*,<sup>226</sup> thus enabling the organism to procure the most excellent qualities of different *Dhatus*. *Sharandhara* mentions that *Rasayana* is the means by which old age and diseases are averted.<sup>227</sup>

### ***Rasayana* plants act through three basic mechanisms-**

1. *Rasa* enhancers (enriches the nutritional value of the circulating plasma) - e.g. *Shatavari*, *Vidari* etc. The action of the herbs depends on *Rasapanchaka* (Pharmacodynamics of the plant). As these herbs possess *Madhura Rasa*, *Sheeta Veerya*, *Guru*, *Snigdha* & *Sheeta Gunas*, these herbs act at level of *Rasa* by promoting the nutritional value of the *Rasa* which in turn facilitate the synthesis and nourishment of the best quality of successive *Dhatus*.
2. *Agni* enhancers (improves digestion and metabolism) - e.g. *Chitrak*, *Pippali* etc. These *Rasayana* drugs have predominant *Katu Rasa*, *Ushna Veerya*, *Laghu* and *Ruksha Guna* and act at level of *Agni*. They encourage the organic metabolism by *Agnideepan* and *Dhatwagnideepan* action resulting in improved structural & functional form of *Dhatus* and obtaining the *Rasayana* effects.
3. *Srotas*- channels clearing agents (cleans and activates microcirculation and improves tissue perfusion) e.g. *Haritaki*, *Guggulu*, *Lashun* etc. These *Rasayana* drugs with probably *Katu*, *Tikta*, *Kashaya Rasa*; *Vishada*, *Ruksha*, *Laghu Gunas*; *Ushna Veerya* and *Katu Vipaka* perform the function of *Aampachan* and *srotas-shodhana* i.e. these herbs clean the channels by detoxifying the metabolic waste and support the nourishment of *Dhatus*. But instead of *Katu Vipaka* *Haritaki* has *Madhur Vipaka* alongwith *Ushna Veerya* which conducts *Anuloman Karma* i.e. it digests, breaks the adhesions and removes wastes through lower route.



After proper digestion and assimilation of food or drug, the respective *Dhatu* (tissue) get enriched with the nutrition (essence) and carry out their respective functions in optimum power. Thus *Rasayana* plants help to attain better nutritional status and the creation and development of viable cells and tissues that help to prolong aging.

Some *Rasayana* plants are general acting while others are tissue or organ specific. These tissue or organ specific herbs have affinity for specific tissue or organ and possess specific intention of action. This action of *Rasayana* herbs helps to choose the proper *Rasayana* herb for a particular patient.

#### **Dhatus or Tissues Specific Rasayana Herbs are as following**

1. *Rasa: Gambhari* etc.
2. *Rakta: Aamalaki* etc.
3. *Mansa: Ashwagandha* etc.
4. *Meda: Haritaki, Guduchi* etc.
5. *Asthi: Guggulu* etc.
6. *Majja: Shankhapushpi* etc.
7. *Shukra: Mushali, Pippali, Nagbala* etc.

#### **Organs Specific Rasayana Herbs are as following**

1. *Medhya Rasayana* for brain like *Shankhapushpi, Brahmi* etc.
2. *Chakshusya Rasayana* for the eyes like *Shatavari* etc.
3. *Keshya Rasayana* for the hair like *Bhringaraj* etc.
4. *Hridya Rasayana* for the heart like *Guggulu* etc.

**Kamya Rasayana** herbs are used to fulfil a wish or desire or to serve a special purpose (*Kama* means desire). These are helpful in healthy persons for promotion of health. These are of three types

- i) *Prana Kamya Rasayana* herbs - *Prana* means life energy. These promote age-stabilization, longevity and vitality like *Guduchi* etc.
- ii) *Shri Kamya Rasayana* herbs- These promote complexion like *Kumari* etc.
- iii) *Medhya Kamya Rasayana* herbs- These promote mental competence like *Shankhapushpi* etc.

*Naimittika Rasayana* herbs are utilized for specific curative function. These speed up the recovery from diseases of the patients.

#### **Disease Specific Rasayana herbs are as following**

Eye diseases – *Haritaki* etc.

Heart diseases - *Shaliparni* etc.

Skin diseases - *Bakuchi* etc.

Granthi (Tumors) - *Chitrak* etc.

Prameha (Diabetes) - *Aamalaki, Haridra* etc.

Stholya (Obesity) - *Guggulu, Haritaki* etc.

The factors like *Vaya, Prakriti, Kala* and *Desha* need to be taken into consideration while using the *Rasayana* herbs.

#### **Vaya (Age):**

According to Ayurveda there are three parts of the lifespan of an individual known as *Vaya*. These are *Balavastha* (childhood), which lasts up to the age of 16 years and is governed by *Kapha dosha* responsible for growth and development; *Madhyavastha* (young and middle age), which lasts from the age of 16 years to

60–70 years and *Pitta* is the predominant *dosha* during this period which is responsible for the vigour and vitality of youth.; and *Vridhdhavastha* or *Jirnavastha* (old age), which is the period after 60 or 70 years and during this stage *Vata* is the predominant *Dosha* and which is responsible for most of the manifestations of aging.<sup>228,229,230</sup>

While assessing the path toward optimal health, the particular stage of life is one of many factors need to consider. Rasayana herbs like *Pippali*, *Lashun* etc. are useful in *balavastha*, *Aamalaki*, *Guduchi* etc. are useful in *Madhyavastha* and in *Vridhdhavastha*, *Nagbala*, *Ashwagandha* etc. are helpful. Different drugs had different action property in different age groups.<sup>231</sup> *Vagbhata* and *Sharangdhara* have mentioned that loss of some age related qualities occur in specific decades of life. If this loss is compensated by providing a specific *Rasayana* for that deficient factor in specific age groups then the speed of aging can be reduced to some amount and long life can be obtained. Age specific *Rasayana herbs* are given below in the following table no 2.

**Table No. 2:** Age Specific Rasayana Herbs

Decade of life	Loss of impact	Useful Rasayana Herbs
1 <sup>st</sup>	<i>Balya</i> - Corpulence	<i>Vacha</i>
2 <sup>nd</sup>	<i>Vridhhi</i> - Growth	<i>Ashwagandha</i>
3 <sup>rd</sup>	<i>Chhavi</i> - Lusture	<i>Aamalaki</i>
4 <sup>th</sup>	<i>Medha</i> - Intellect	<i>Shankhapushpi</i>
5 <sup>th</sup>	<i>Twak</i> - Skin glow	<i>Bhringraj</i>
6 <sup>th</sup>	<i>Drishti</i> -Vision	<i>Haritaki</i>
7 <sup>th</sup>	<i>Shukra</i> -Virility	<i>Ashwagandha</i>
8 <sup>th</sup>	<i>Vikrama</i> - Strength	<i>Aamalaki</i>
9 <sup>th</sup>	<i>Buddhi</i> - Mentia	<i>Brahmi</i>
10 <sup>th</sup>	<i>Karmendriya</i> - Locomotion	<i>Bala</i>

### **Prakriti (Constitution):**

Likewise consideration of Vaya factor, Rasayana drugs are administered to individuals considering their constitution or Prakriti. On the basis of pharmacodynamics of Rasayana herbs, they are used in the relavant Prakriti. Some examples are as following-

*Vataj Prakriti:* *Nagbala*, *Ashwagandha* (*Vata*-alleviating)

*Pittaj Prakriti:* *Aamalaki*, *Shatavari* (*Pitta*-alleviating)

*Kaphaja Prakriti:* *Chitrak*, *Pippali*, *Vacha*, *Guggulu* (*Kapha*-alleviating)

*Manas Prakriti:* *Ashwagandha*, *Shankhapushpi*, *Bramhi* (Mental health promoters)

### **Kala (Seasons):**

*Rasayana* herbs may be *Kala* or season specific means person may need different *Rasayana* herbs in different *Ritu* or seasons. Here again the Pharmacodynamic properties of different *Rasayana* herbs have to be taken into the consideration. The suitable *Rasayana* herbs to be used in different *Ritu* or seasons are as following

*Aadan Kala* (February to July) - *Sheeta Veerya* herbs like *Aamalaki*

*Visarga Kala* (August to January) - *Ushna Veerya* herbs like *Lashun*

### **Desha (Place):**

According to the Pharmacodynamic of *Rasayana* herbs, these suitable herbs are used in appropriate *Desha* or places. *Desha* Specific *Rasayana* herbs are as following

*Jangal Desha*- Herbs of *Snigdha* and *Ushna Guna*

*Aanup Desha*- Herbs of *Ruksha* and *Usnha Guna*

*Sadharana Desha* - *Sadharana herbs*

Thus *Vaya*, *Prakriti*, *Kala* and *Desha* are important factors and require consideration when wishing to achieve all valuable health benefits of *Rasayana* herbs. *Bhavaprakash* defines *Rasayana* as a measure which may delay aging and prevent diseases. Longevity and improvement in mental faculties have been claimed as the classical *Rasayana* effects. *Rasayana* nourishes the tissue elements more, replenishes them, increases the anabolic activity and boosts immune system, restores spirit, vitality, delays the ageing process and improves the quality of life thereupon. *Rasayana* potential of *Guduchi*, *Kakmachi*, and *Shatavari* has been stated by all six *Nighantus* selected for study. The maximum number of *Rasayana* herbs (72) is mentioned by *Shaligram Nighantu*. Some *Rasayana* herbs like *Chitrak*, *Guduchi*, *Ashwagandha*, *Brahmi*, *Gokshur*, *Haritaki*, *Pippali*, *Bhringraj*, *Shankhapushpi* etc. have been thoroughly investigated to screen them for various therapeutic *Rasayana* benefits.

The life expectancy has been improved by successful application of modern technology but the number of people suffering with aging and degenerative disorders is rising merely because they are living longer. Regeneration of tissues after the diseased conditions like Osteoarthritis, Age Related Macular Degeneration (ARMD), Alzheimer's, Heart attack, Stroke, accident, injuries or trauma, aging remains a challenge to modern medicine. *Ayurveda* concentrates on the preventive aspect to arrest the degenerative processes. *Acharya Charaka* states that a single drug may have many applications owing to its diverse actions just as a man is able to perform various actions.<sup>232</sup> Hence, the *Rasayana* herbs have many targets and activities. These drugs are useful in management of diseases *viz.* degenerative, autoimmune and metabolic diseases and mainly aging. These antiaging attributes will also comprise being Adaptogen, Antioxidant, Anti cancer, Cyto-protective and Immuno-modulator.

In experimental study some *Rasayana* plants have revealed biological activities like Anti-oxidant (*Guduchi*<sup>233</sup>, *Shaliparni*<sup>234</sup>, *Punarnava*<sup>235</sup> etc.), Immuno-modulatory (*Guduchi*<sup>236</sup>, *Aamalaki*<sup>237</sup>, *Shatavari*<sup>238</sup> etc.), Immuno-stimulatory (*Guduchi*<sup>239</sup> etc.), Cyto-protective (*Haritaki*<sup>240</sup>, *Aamalaki*<sup>241</sup> etc.), Prevents DNA break (*Haritaki*<sup>242</sup> etc.), Anti-mutagenic (*Haritaki*<sup>243</sup> etc.), Free radical scavenger (*Aamalaki*<sup>244</sup> etc.), Adaptogenic (*Aamalaki*<sup>244</sup>, *Shatavari*<sup>245</sup> etc.), Anti-microbial (*Aamalaki*<sup>246</sup>, *Gokshur*<sup>247</sup> etc.), Cardio-protective(*Shaliparni*<sup>248</sup>, *Ashwagandha*<sup>249</sup> etc.), Hepato-protective (*Aamalaki*<sup>250</sup>, *Haritaki*<sup>251</sup> etc.), Nephro-protective (*Aamalaki*<sup>250</sup>, *Haritaki*<sup>251</sup> etc.), Anti-stress (*Ashwagandha*<sup>249</sup>, *Punarnava*<sup>252</sup> etc. ), Anti-inflammatory (*Kumari*<sup>253</sup>, *Guggulu*<sup>254</sup> etc.), Anti-tumor (*Kumari*<sup>253</sup> etc.), Anti-carcinogenic (*Ashwagandha*<sup>249</sup>, *Chitrak*<sup>255</sup> etc.), Memory-enhancer (*Aamalaki*<sup>250</sup> etc.) and Aphrodisiac- activity (*Gokshur*<sup>247</sup> etc. ).

The neuro-nutrient impact of Ayurvedic *Rasayana* therapy in brain aging validates *Rasayana* as micronutrients and being tissue and organ specific.<sup>256</sup> *Rasayana* drugs are rich in antioxidants and are good hepato-protective, nephro-protective, and immune-modulating agents.<sup>257</sup> The drugs intended for *Rasayana* purpose are currently explored under the various pharmacological contexts such as anti-ageing, antioxidant, cognitive enhancers and nootropic, adaptogenic, immune-modulators, etc.<sup>258</sup> Several recent researches revealed that *Rasayana* drugs have adaptogenic,<sup>244</sup> antioxidant,<sup>259,260</sup> and anti-inflammatory<sup>261</sup> potentials. *Rasayanas* are among its most commonly prescribed medicines, now recognized for their ability to stimulate the immune system<sup>262,263</sup> in a series of experiments. It has also been reported that *Rasayanas* have immune-modulatory and anti-tumor functions.<sup>244,264</sup> *Ayurvedic Rasayana* drugs are also reported to act as adjuvant and shown significant effects in reducing the adverse effects of radiotherapy and chemotherapy.<sup>265</sup> *Rasayana* drugs induce immune-stimulation & improves defense mechanisms against free radical damage.<sup>244</sup>

Healthy state of mind and body can be obtained by *Rasayana* or Rejuvenating herbs which possess adaptogenic effect. The adaptogens, coined by Lazarev in 1947 are defined as substances meant to put the



organism into a state of non specific heightened resistance in order to resist stresses and adapt to extraordinary challenges. The adaptogens encompass relative actions like immuno-stimulants (which heighten the resistance), nootropics (which improve higher integrative brain functions like memory, learning, thinking and understanding), anabolics (which activate the growth), tonics (which mitigate the weakness) and geriatrics (which prevent the old age diseases). *Rasayana* drugs have been proved effective against biological, physical, and chemical stressors as judged by using markers of stress responses and objective parameters for stress.<sup>244</sup> Drugs in various '*Rasayana*' forms, which act by modulating the neuro-endocrino-immune systems, have found to be a rich source of antioxidants.<sup>244,266</sup>

The emerging data suggest that the possible mechanisms of *Rasayana* drugs may be immune-stimulation, quenching free radicals, enhancing cellular detoxification mechanisms; repair damaged non-proliferating cells, inducing cell proliferation and self-renewal of damaged proliferating tissues, and replenishing them by eliminating damaged or mutated cells with fresh cells.<sup>267</sup>

Today, with the use of radiotracers and nuclear imaging techniques, it proposes to break new grounds in understanding the action of *Ayurvedic* drugs at the molecular level, particularly the *Rasayana* drugs and *Medhya Rasayana* (memory enhancing drugs).<sup>268</sup> The research has just begun in the immuno-modulation and memory aspects but the detail study is required.

For biology of regeneration, *Rasayana* herbs offer research opportunities. Tissue-specific *Rasayanas* can be tried for differentiation of stem cells and regenerate specific tissue of choice.<sup>269</sup> Systems approach needs to be followed by stem cell biologists and Ayurveda experts to know complex molecular pathways through which *Rasayanas* act and contribute to steering cellular differentiation pathways in a predictable mode.<sup>269</sup>

The research is focusing only one or couple of aspects of *Rasayana* herbs' therapeutic benefits. The extensive research on all salutary benefits of single *Rasayana* plant will be more definite validation of submissions made in *Ayurvedic* classics and then these *Rasayana* herbs will surely provide a ray of hope for prevention and cure of the degenerative, autoimmune and metabolic diseases on the highest level of therapeutic efficacy. The research work on controversial *Rasayana* plants like *Shimrudi*, *Krishna-Jayanti*, *Neel-punarnava*, *Suvarna-ketaki* etc. is necessary to confirm their botanical identity.

## CONCLUSION

It is an attempt on the part of this review paper to draw attention towards the documented herbs in *Nighantus* which have *Rasayana* properties. The present study revealed 88 plants with *Rasayana* activity are compiled according to their alphabetical order. These *Rasayana* plants need to be explored further intensely for finding solutions to degenerative and aging disorders in the current society. This quantitative screening will be very valuable for future research, product development by pharmaceutical industries and the treatment of particularly life style diseases and degenerative disorders.

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