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REVIEW ARTICLE

THERAPEUTIC REVIEW ON PANDUHARADRAVYAS (DRUGS FOR ANAEMIA) FROM NIGHANTUS

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Abstract

Ayurveda, one of the oldest recorded medical systems in the world has its own system of classification of diseases and has used certain terminology to describe the drugs which are indicated for the management of various diseases. For this purpose certain technical terms are being suffixed with term in *hara*, *ghna*, *nashaka*, *jit* etc. which literary means to compact, counteract, overcome etc. *Panduroga*(~Anaemia), one among various disease condition described in Ayurveda is effectively compared with anaemia on the ground of its similarsigns and symptoms. Anaemia one of the more common blood disorders occurs when the level of healthy red blood cells in the body becomes too low. Classical texts of Ayurveda describe drugs which have potency to compact its desire condition. These texts describe these drugs with following actions like; with *Pandu*(~Anaemia), *Panduta*, *Pandutva*, *Panduroga*, *Pandughna*, *Pandujit*, *Pandunut*, *Pandugada*, *Pandvmaya*, *Panduhat* and *Pandushamana*properties. 135 drugs were reported to their *Pandu*combatting action in different 15 *Nighantus*, which 70 are of herbal, 28 are mineral, 15 are of animal origin and 22 are other drugs. Further, the reported haematinic activities of the drugs were reviewed from available literature.

Key-words: Anaemia, Ayurveda, Haematinic activity, Herbal drugs

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INTRODUCTION

Anaemia, the most predominant blood cell deficiency disorder, is a global public health problem affecting both developing and developed countries with major consequences for human health as well as social and economic development.[1]According WHO, anaemia is the condition in which the haemoglobin content of blood is lower than normal as a result of deficiency of one or more essential nutrients.[2] Prevalence of anaemia in all the groups is higher in India as compared to other developing countries.[3]The world health organizationclassified anaemia as a severe public health problem (prevalence > 40%) for children under five in 69 countries and for pregnant women in 68 countries.[4]According to National Family Health Survey (NFHS-3), the incidence of anaemia, in India, in urban population is 71%, in rural areas it is 84% and the overall incidence is 79%.[5]

In *Ayurvedic* classics, among the description of various disease conditions, description of *Pandu* is available in three forms i.e. *Pandu* as a prime disease, *Pandu* as a complication of certain disease and *Pandu* as a sign.[6]*Acharya Charaka*has described five types of *Pandu* i.e. *Vataja Pandu, Pittaja Pandu, Kaphaja Pandu, Tridoshja Pandu* and *Mridbhakshanajanya Pandu.* To combact these various types of *Pandu* classical texts i.e. *Samhita*, *Chikitsagrantha* and *Nighantu* have delineated various drugs either on a single drug or compound formulations.

Nighantu have been written to highlight the hidden properties of medicinal plants. Plants have been one of the important sources of medicines since the beginning of human cultivation. There is a growing demand for plant based medicines, health products, pharmaceuticals, food supplements,cosmetics etc.[7]Herbal drugs are being proved as effective as synthetic drugs with lesser side effects.[8]Drugs, noted in the *Nighantu*, have been proved to be most efficacious for various diseases like cardiac disease[9], skin problem[10] etc. Hence, in the present paper an attempt has been made to find out the drugs mentioned in various *Nighantu* towards *Pandurogaharadravya* (drugs for anaemia). A singlehand information regarding the drugs indicated for *Pandu* is lacking, which can only be possible in comprehensive review and can give a lead for future research.

MATERIALS AND METHODS

Plants having with following actions like; *pandu*, *panduta*, *pandutva*, *panduroga*, *pandughna*, *pandujit*, *pandunut*, *pandugada*, *pandvmaya*, *panduhat* and *pandushamana*werecompiled from Madanadinighantu[11], Dhanvantarinighantu[12], Dravyagunasamgraha[13], Sodhalanighantu[14],

Madhava Dravyaguna[15], Madanapalanighantu[16], Kaiyadevanighantu[17], Bhavaprakashanighantu[18], Rajnighantu[19], Rajvallabhanighantu[20], Shaligramanighantu[21], Priyanighantu[22], Ayurveda mahodadhi[23], Laghunighantu[24] and Shankaranighantu.[25]Various researchjournals and books were referred to gather the update information regarding scientific documentation of the role of plants in the prevention and management of *anaemia*. The recorded data are presented in ascientific manner with regards to their Sanskrit name, botanical identity, family, action of drug and reported haematinic activity.

RESULT AND DISCUSSION

Nighantu generally were coined, using a therapeutic text.[26]It is observed that, total 135drugs were described with an indication for treatment of *Pandu* in different 15 *Nighantu*. Among these 70 are of herbal, 28are mineral, 15are of animal origin and 22 are other drugs. Out of 70 herbal drugs, botanical identities of 68 have been established and the botanical identities of 02 plants are yet to be confirmed. Majority of these herbal drugs belongs to the family fabaceae and dipterocarpiaceae(Table 1).

Table 1: Drugs of herbal origin indicates for the treatment of *Pandu* in *Nighantu*

S.no	Drug	Botanical name	Family	Action of Drug	Reference
1.	Adraka	*Zingiber officinale* Roscoe.	Zingiberaceae	Panduroga	[22]
2.	Agatsya	*Sesbania grandiflora* Linn.	Fabaceae	Pandu Panduroga	[16], [22]
3.	Agnimantha	*Premna integrifolia* Linn.	Verbanaceae	Pandujit Panduta Pandunut Pandu	[13], [18-19], [22], [26]
4.	Ahiphena	*Papaver somniferu*m Linn.	Papaveraceae	Pandu Panduroga	[22], [26]

5.	Akhukarni	*Merremia emarginata* (L.) Cufodont.	Convolvulaceae	Pandu Panduroga	[22], [26]
6.	Akshavruksha	*Terminalia bellirica* Roxb.	Combrataceae	Panduroga Pandu Pandugada	[15-16], [22], [26]
7.	Alu	*Dioscorea species*	Dioscoreaceae	Panduroga	[26]
8.	Arjuna	*Terminalia arjuna* W. & A	Combrataceae	Panduroga	[12], [22]
9.	Ashwakarna	*Diptocarpus turbinatus* Gaertn.f	Dipterocarpiaceae	Pandu	[12], [18], [22]
10.	Bakuchi	*Psoralea corylifolia* Linn.	Fabaceae	Panduhat Pandunut Panduroga	[18-19], [22], [26]
11.	Bhrungaraja	*Eclipta alba* Hassk.	Asteraceae	Pandutva Pandughna Panduta Pandvamaya Pandunut Pandu Panduroga	[13], [15-16], [18-19], [21-22], [26]
12.	Bhudhatri	*Phyllanthus niruri* Hook. F. non Linn.	Euphorbiaceae	Pandu Panduroga	[17-19], [22], [26]
13.	Bimbi	*Coccinia indica* W. & A.	Cucurbitaceae	Pandu	[13], [18]

14.	Brahmamanduki	*Centella asiatica* Linn.	Apiaceae	Pandu	[22]
15.	Brahmasuvarchala	*Gynandropsis pentaphylla* DC.	Capparidaceae	Panduta	[22]
16.	Brahmi	*Bacopa monnieri* (Linn.) Penn.	Scrophulariaceae	Pandu Panduta Pandugada Panduroga	[17-19], [22-23], [26]
17.	Chirbhita	*Cucumis momordica* Roxb.	Cucurbitaceae	Pandu	[15]
18.	Chitraka	*Plumbago zeylanica* Linn.	Plumbaginaceae	Pandu	[13]
19.	Chitraphala (Vishala)	*Citrullus colocynthis* Schrad.	Cucurbitaceae	Pandushamani Pandu	[12], [18], [22]
20.	Chukra	*Tamarindus indica* Linn.	Caesalpiniaceae	Pandu	[17]
21.	Davadali	*Luffa echinata* Roxb.	Cucurbitaceae	Pandu Panduroga Panduta	[17-20], [22], [23], [26]
22.	Dhava	*Anogeissus latifolia* Wall. ex Bedd.	Combretaceae	Pandu Panduroga	[12], [17-19], [22]
23.	Draksha	*Vitis vinifera* Linn.	Vitaceae	Pandu	[23]
24.	Dronapushi	*Leucas aspera*	Laminceae	Panduta	[23]

		Spreng.			
25.	Durva	*Cynodon dactylon* Pers.	Poaceae	Pandu	[16], [18-19], [22]
26.	Guduchi	*Tinospora cordifolia* Linn.	Menispermaceae	Panduta Panduroga	[19], [22]
27.	Haridra	*Curcuma longa* Linn.	Zingiberaceae	Pandu Panduroga Pandujit Pandunut	[17-19], [21-22], [25-26]
28.	Haritaki	*Terminalia chebula* Linn.	Combretaceae	Pandu	[15], [16], [18], [22-23], [25]
29.	Jyotishmati	*Celastrus paniculatus* Willd.	Celastraceae	Panduta Pandu Panduroga	[18], [22], [26]
30.	Kadara	*Acacia catechu* (Linn. f.)Willd.	Mimosaceae	Pandu	[12]
31.	Kakodumbara	*Ficus hispida* Linn.	Moraceae	Panduroga Pandu	[13], [18-19], [22], [26]
32.	Kaktikta	*Peristrophe bicalyculata* Nees.	Acanthaceae	Pandu	[12]
33.	Karaskara	*Strychnos nuxvomica* Linn.	Stryachnaceae	Panduroga	[22]
34.	Karavellaka	*Momordia*	Cucurbitaceae	Pandu	[12], [17-19], [22],

		charantia Linn.		Panduroga	[26]
35.	Karkati	*Carica papaya* Linn.	Caricaceae	Pandu	[25]
36.	Kataka	*Strychnos potatorum* Linn.f.	Loganiaceae	Pandu Panduroga	[18], [22], [26]
37.	Katphala	*Myrica nagi* Hook. f. non-Thunb.	Myricaceae	Panduroga	[13], [22]
38.	Khadira	*Acacia catechu* (Linn. f.)Willd.	Mimosaceae	Pandu Panduta	[17-19], [22]
39.	Kokilaksha	*Asteracantha longifolia* Nees.	Acanthaceae	Pandu Panduroga	[18], [22], [26]
40.	Koshataki	*Luffa acutangula* (Linn.) Roxb.	Cucurbitaceae	Pandu	[12], [16-18], [22]
41.	Kumari	*Aloe barbadensis* Mill.	Liliaceae	Panduroga	[16]
42.	Lashuna	*Allium sativum* Linn.	Liliaceae	Pandu	[25]
43.	Lavaliphala	*Phyllanthus distichus* Muell.-Arg.	Euphorbiaceae	Pandu	[19]
44.	Makandikanda	-	-	Pandu	[22]
45.	Mokshaka	*Schrebera swientenioides* Roxb.	Oleaceae	Pandu Pandughna	[12], [18], [22]

46.	Mundi	*Sphaeranthus indicus* Linn.	Asteraceae	Pandujit Pandunut Panduroga	[17], [19], [22], [26]
47.	Neelapunarnava (Neela variety of spreading hogweed)	-	-	Pandu	[20]
48.	Panduphali	*Flueggea leucopyrus* Willd.	Phyllanthacea e	Pandu	[22]
49.	Pipali	*Piper longum* Linn.	Piperaceae	Pandu Panduroga	[19], [22], [26]
50.	Pushkaramula	*Inula racemosa* Hook. f.	Asteraceae	Pandu Panduroga	[20], [22], [26]
51.	Raktaeranda	*Ricinus communis* Linn.	Euphorbiaceae	Pandu	[20], [22]
52.	Raktapunarnava	*Boerhavia diffusa* Linn.	Nyctaginaceae	Pandu Panduroga	[20], [22], [26]
53.	Sehunda Sehundapatra	*Euphorbia neriifolia* auct. non Linn.	Euphorbiaceae	Panduta Panduha Panduroga	[17-19], [22], [26]
54.	Shala	*Shorea robusta* Gaertn. f.	Dipterocarpac eae	Pandu Panduroga	[22], [26]
55.	Shalabheda	*Vateria indica* Linn.	Dipterocarpac	Pandu	[18]

			eae		
56.	Shunthi	*Zingiber officinale* Rosc.	Zingiberaceae	Pandu Panduroga	[13], [22], [25], [26]
57.	Shweta Punarnava	*Trianthema portulacastrum* Linn.	Aizoaceae	Pandughni Pandu Panduroga	[19-20], [22], [26]
58.	Suryamukhy arka	*Helianthus annuus* Linn.	Asteraceae	Pandu	[22]
59.	Suvarchala	*Malva sylvestris* Linn.	Malvaceae	Panduta	[18], [19]
60.	Swadupatola	*Trichosanthes dioica* Roxb.	Cucurbitaceae	Pandujit	[15]
61.	Swarnakshiri	*Argemone mexicana* Linn.	Papaveraceae	Pandu	[12]
62.	Swarnapatri	*Cassia angustifolia* Vahl.	Caesalpiniacea e	Panduroga	[22], [26]
63.	Tavaksheera	*Curcuma angustifolia* Roxb.	Zingiberaceae	Panduroga Pandu	[22], [26]
64.	Tiktabimbi	*Cephalandra indica* Naudin	Cucurbitaceae	Pandu	[18], [20]
65.	Tinisha	*Ougeinia dalbergioides* Benth.	Fabaceae	Panduroga Panduta Pandu	[12], [18-19], [22]

66.	Trivruta	*Operculina turpethum* (Linn.) Silva Manso.	Convolvulaceae	Pandu	[13], [18], [22]
67.	Vanaja gajakarni	*Leea macrophylla* Horn.	Vitaceae	Pandugada	[18]
68.	Vanshalochana	*Bambusa bambos* (L.) Voss.	Poaceae	Pandu Panduroga	[18], [19], [22], [26]
69.	Vatsanabha	*Aconitum ferox* Wall. ex Ser.	Ranunculaceae	Pandu	[26]
70.	Vruddhadaru	*Argyreia speciosa* Sweet.	Convolvulaceae	Panduroga	[22], [26]

Out of 28mineral drugs; 13 from *Dhatuvarga*, 04 drugs included in *Maharasa*, 04 drugs from *Ratnavarga*, followed by *Ksharavarga* (2), *Uparasa* (1), *Lavana* (1), *Sikta varga* (1), others drugs are (2).[27](Table 2).

Table 2: Drugs of mineral origin indicates for the treatment of *Pandu* in *Nighantu*

S.no	**Drug**	**English name**	**Action of drug**	**Reference**
1.	Abhraka	mica	Pandugada Pandu	[19], [23]
2.	Bodarashrunga	rock fossil	Panduroga	[15]
3.	Gomeda	zircon	Pandu Panduroga	[22], [26]
4.	Hiraka/ Vajra	diamond	Pandugada Panduta Pandu	[13], [19], [26]
5.	Kansya	bronze	Pandutva	[16]
6.	Kantalauha	kanta iron	Panduroga Pandujit	[13], [18]

7.	Kasisa	green vitriol	Pandugada	[23]
8.	Krushanalauha	black iron	Pandutva	[15]
9.	Lauha	iron	Pandu Panduta Panduroga	[17-19], [22-23], [26]
10.	Makshika	copper pyrites	Panduta Pandvamaya	[18], [23]
11.	Mandura	ferric oxide (dross iron)	Pandu	[13], [23]
12.	Mundalauha	munda iron	Panduhara	[22]
13.	Panna	Emerald	Pandu Panduroga	[22], [26]
14.	Panshuja lavana	salt form soil	Pandu	[16]
15.	Pittala	brass	Panduroga Pandu Pandutva	[15], [19], [20], [22], [26]
16.	Pravala	coral	Panduroga	[13], [18], [22], [23], [26]
17.	Ranga/ Vanga	tin	Pandu	[13], [17-20], [22], [26]
18.	Shilajatu	Asphaltum	Pandu Panduta Panduroga	[15], [17-19], [22-23], [26]
19.	Sindura	red oxide of lead	Pandu	[16]
20.	Sisaka/ Naga	lead	Pandu Pandamaya Panduroga	[16], [19], [22], [26]
21.	Soraka	saltpetre	Pandu	[23]
22.	Svarjikakshara	impure sodium bicarbonate	Pandu	[12]

23.	Swarna-makshika	copper pyrite	Pandu Panduta Panduroga	[17], [19], [22], [26]
24.	Tamra	copper	PanduPanduta Pandutva Panduroga	[13], [15-20], [22-24]
25.	Taramakshika	iron pyrite	Panduroga Panduta	[22], [26]
26.	Vaikranta	tourmaline	Panduta Pandu	[13], [22]
27.	Yasada	zink	Pandu	[15-17], [19], [23], [26]
28.	Yavakshara	mixture of potassium salts	Pandu Panduroga	[15], [17-19], [21-23], [25-26]

Table 3: Drugs of animal origin indicates for the treatment of *Pandu* in *Nighantu*

S.no	**Drug**	**Probable english term**	**Action of drug**	**Reference**
1.	Ajamutra	goat urine	Pandu Panduroga	[15-18], [22], [24]
2.	Ajanavneeta	goat butter	Pandunut Pandu	[18], [22]
3.	Ajatakra	goat buttermilk	Pandvamaya Panduroga	[18], [22], [24], [26]
4.	Dugdha	qualities of milk	Panduroga	[15], [23]
5.	Godugdha	cow milk	Pandu	[18]
6.	Gomutra	cow urine	Panduroga Pandu	[16], [18], [19], [22], [23]
7.	Kaumbhasarpi	clarified butter	Panduroga	[18]

	mahaghrita			
8.	Madhu	honey	Pandu	[24]
9.	Mahishamutra	buffalo urine	Panduroga Pandu Panduta	[13-15],[18], [22]
10.	Mutra	qualities of urine	Pandu	[12-18], [22], [24]
11.	Navina ghrita	fresh clarified butter	Panduroga	[15], [19]
12.	Takra	buttermilk	Pandu Pandvamaya Panduroga Pandutva	[13-22],[24], [26]
13.	Ushtradugdha	camel milk	Pandvamaya	[18]
14.	Vanaramamsa	meat of monkey	Pandu Pandvamaya	[13], [17-18]
15.	Vrushamutra	-	Pandu	[22]

Table 4: Others drugs indicated for the treatment of *Pandu* in *Nighantu*

S.no	***Aharadravya* (food items)**	**Probable english term**	**Action of drug**	**Reference**
1.	Akshikasidhu	alcoholic preparation	Panduroga	[13]
2.	Akshikisura	belliric myrobalon alcoholic preparation	Pandvamaya Pandu	[15], [17-18]
3.	Anupadeshajala	anupadesha water	Pandu	[15]

4.	Aristha	alcoholic formulation	Panduta Pandu Panduroga	[18], [22], [24], [26]
5.	Arogyambu	healthy water	Panduroga Pandu	[22], [26]
6.	Dhanyamla	prepared by fermenting the powder of rice	Panduroga	[15]
7.	Gaudimadira	prepared by jiggery etc.	Pandu	[22]
8.	Guda	Jiggery	Pandu	[13], [18-20], [22], [26]
9.	Kanji	fermented gruel	Pandu	[21]
10.	Kohalisura	alcoholic preparation	Pandu	[15]
11.	Kwathitajala (padashesha)	¼ boiled water	Pandu	[18]
12.	Madhushukta	fermented preparation by honey	Pandu	[16]
13.	Madhvimadira	fermented preparation by grapes	Panduroga Pandu Panduta	[13], [15-16], [18], [20], [22], [24], [26]
14.	Manushamamsa	human meat	Pandu	[13]
15.	Mastu	prepared from cured	Pandu	[20]

16.	Panchasara panaka	syrup made by using five fruits	Pandu	[17]
17.	Puranaguda	old jiggery	Pandu	[20], [22]
18.	Shandaki	fermented preparation mustard, leaves of radish, water etc.	Panduhat	[18]
19.	Shukta	fermented preparation by tubers, roots, fruits rhizome etc.	Pandu Panduhat	[13-14], [16], [19], [22-24]
20.	Tilavasini Shali	*Oryza sativa* Linn.	Panduroga	[20]
21.	Tushodaka	alcoholic preparation of barley	Pandu Panduroga	[13-14], [16-22]
22.	Yavasura	fermented preparation of barley	Pandvamaya	[24]

Haematinic activity: Hematinic is a nutrient required for the formation of blood cells in the process of haematopoiesis. Deficiency in haematinics can lead to anaemia. In cases of hematinic deficiency, haematinics can be administered as medicines, in order to increase the haemoglobin content of the blood. [28] Present review reports some plants for their haematinic activity (Table 5).

Table 5: Reported haematinic drugs in various research journals

S.No	Plant name	Result
1.	*Asteracantha longifolia* Nees.	In this study, concentrate hot water extract of succulent aerial part of the pre-flowering and flowering leaf *Asteracantha longifolia*was orally administered at 40 mg/Kg body weight for 30 days, and equivalent weight of crude leaf was also administered. Pre-flowering extract effectively improved the concentration of membrane sure haemoglobin, RBC indices and concentration of serum copper and cobalt and normalized free haemoglobin concentration, percent of haematocrit, serum cobalt and lipid peroxidation.[29]
2.	*Brillantaisia nitens* Lindau.	*Brillantaisia nitens* fuel extract of the leaves was used in Phenylhydrazine (10mg/kg body weight) iatrogenic anaemic rats. Oral administration of this extract (400-3200 mg/kg/day) to rats antecedently treated with Phenylhydrazine enlarged the haemoglobin, RBC, corpuscle and PVC at intervals one week.[30]
3.	*Eclipta alba* Hassk.	A 28 days study was undertaken to guage the impact of liquid and ethanolic extracts of root of *Eclipta alba* in Asian catfish, Claris bateachus on haematological variables. Fishes were haphazardly designated into 3 cluster of twenty fishes every. Type A served as management and received vehicle solely wherever as group B and C served as take a look at received ten ppm and twenty ppm of liquid or ethanolic extract of *Eclipta alba* root severally up to twenty-eight days. Blood samples were collected on 7, 14, 21 and 28 days for medical specialty analysis and result cluster was compared statistically with management. RBC, Hb%, PCV and corpuscle counts enlarged significantly.[31]
4.	*Hibiscus cannabinus* Linn.	In this study aqueous extract of *Hibiscus cannabinus* leaves (400 mg/kg, 800 mg/kg and 1600 mg/kg) was studied on phenylhydrazine induced (10 mg/kg) anaemic rats for 3 weeks. Leaf extract of *H. cannabinus* shows a significant increase in the red blood cell count, haemoglobin concentration, and pack cell volume.[32]

5.	*Lauha Bhasma* and *Mandura Bhasma*	In this study anaemia was induced by administering mercuric chloride (9 mg/kg) in Charles Foster strain rats for 30 days. *Lauha bhasma* and *Mandura bhasma* (11mg/kg) possess significant (P<0.05) haematinic activity.[33]
6.	*Mangifera indica* Linn.	This study was conducted to evaluate the effect of crude ethanolic extract (mother) of *Mangifera indica* (0.1ml) in comparison to pure mangiferin (0.1 ml) in adult male albino rats for 14 days. Haematological indices like Hb%, TC of RBC and PCV were significantly increased in pure mangiferin group when compared to control.[34]
7.	*Mucuna pruriens* (L.) DC.	This study was evaluated for effectiveness of fresh and shade dried *Mucuna pruriens* leaf extract in managing anaemia in adult male albino rats. Haemoglobin, packed cell volume and white blood cell of rats fed fresh *Mucuna pruriens* leaf extract significantly increased after treatment. Shade-dried *Mucuna pruriens* leaf extract significantly increased red blood cell and white blood cell of the rats after treatment. Lymphocytes of the anaemic rats fed fresh and shade-dried *Mucuna pruriens* leaf extracts was significantly increased whereas there was no significant increase in the eosinophils of the anaemic rats.[35]
8.	*Murraya koenigii* (L.) Spreng.	The ethanolic extract of *Murraya koenigii* fruits is evaluated on anaemia model of rat induced by intra peritoneal injection of phenylhydrazine at 40 mg/kg for 2 days. Oral administration of these fruit extracts at 200 mg/kg/day and 400 mg/kg/day, to the rats previously treated with phenylhydrazine, increased concentration of haemoglobin and red blood cells number.[36]
9.	*Nardostachys jatamansi* DC.	In this study 24 male wistar rats were used and divided into four groups of half-dozen animals each. The animals of two groups were administered orally with liquid suspension of *Nardostachys jatamansi* at the indefinite quantity of 100, 200, 400 mg/kg weight for 15 consecutive days respectively. The extract showed vital increase in haemoglobin and

		evidenced to safeguard haematopoiesis.[37]
10.	*Opuntia elatior* Mill.	The haematinic activity of an orally administered fruit juice (5, 10 and 15 ml/kg) of *O. elatior* was studied on mercuric chloride ($Hgcl_2$) induced anaemic rats. Fruit juice at the dose of 10 ml/kg and 15 ml/kg showed a good percentage of recovering in haemoglobin, 32.99% and 38.18% respectively, which is higher than the standard treated group (29.8%) indicating the correction of anaemia induced by mercuric chloride after 30 days treatment.[38]
11.	*Picrorrhiza kurroa*Royle ex Benth.	The ethanolic extract of *Picrorrhiza kurroa* leaves is evaluated on anaemia model of rat iatrogenic by intraperitonial injection of phenyl hydrazine at 40 mg/kg for 2 days. Oral administration of those plant extract at 100 mg/kg/day and 200 mg/kg/day to the rats antecedently treated with phenyl hydrazine and increased the concentration of haemoglobin red blood cells number, haematocrit and reticulocytes rate.[39]
12.	*Rauwolfia serpentina*Benth.	In this study methanolic root extract of *Rauwolfia serpentina* (10, 30 & 60 mg/kg) was used on alloxan induced diabetic mice. Methanolic root extract of *Rauwolfia serpentina* significantly reduced blood glucose level by improving the body weights, glycosylated haemoglobin (HbA1c) to total haemoglobin (Hb) ratio, red blood cell (RBC) & white blood cell (WBC) counts, packed cell volume (PCV), mean corpuscular volume (MCV), mean corpuscular haemoglobin (MCH) and mean corpuscular haemoglobin concentration (MCHC) in test groups.[40]
13.	*Swertia chirata* (Roxb. Ex Flem.) Karst.	Ethanolic extract of *Swertia chirata* leaves (200mg/kg/day and 400 mg/kg/day) is evaluated on anaemia model of rat iatrogenic by intraperitoneal injection of phenyl hydrazine at 40 mg/kg for two days. Oral administration of this plant extracts enlarged the concentration of haemoglobin, RBC, haematocrit and reticulocytes rate.[41]
14.	*Ziziphus jujuba* Mill.	The present study is an investigation of anti-anaemic activity of aqueous and methanolic extracts of *Ziziphus jujuba* fruits induced by the

		administration of phenylhydrazine. Oral administration of aqueous and methanolic extracts at two dose levels (200 mg/kg and 400 mg/kg) significantly enhanced the red blood cell count and haemoglobin concentration when compared to the anaemic control rats.[42]

CONCLUSION

The present review can be beneficial to know about the different drugs of *Nighantu* which can be used in the treatment of Anaemia. In this review 135 drugs having *Pandughna* property, out of which 70 are herbal origin, 28 drugs are mineral origin, 15 are of animal origin and 22 drugs are others. Reported haematinic drugs may be useful as a preventive and curative aspect of anaemia. The observed result may be helpful in planning further scientific studies about the efficacy of these plants on prevention as well as management of *Panduroga*.

REFERENCES

1. De Benoist B, McLean E, Egli I, Cogswell M. Worldwide prevalence of anaemia 1993-2005 WHO Global Database on Anaemia 2008
2. Kawaljit kaur, B.D. Arya Girls College,Jalandar cantt,Punjab, European journal of zoological research 2014; 3(1):32-36
3. De Mayer EM and M Tegman, The prevalence of anaemia in the world, World health statistics quarterly 1985; 38: 302-316
4. World health organization, worldwide prevalence of Anaemia 1993-2005, World Health Organization, Geneva, Switzerland 2008
5. Richard E Behrman, Nelson text book of paediatrics; IV edition, 1992; 1231-123
6. Yadunandan Upadhyaya (editor). Madhavkar, Madhav nidan with Madhukosh commentary by Vijayrakshita and Srikanthadatta, (Part 1). EditionVaranasi: Chaukhamba;2005, 8/1; page 245
7. Kumar Sanjeev, Amit kumar, Synonyms and therapeutic review of *Mulethi* (*Glycyrrhizaglabra*Linn.) commonly known as Licorice: from *Kosha* and *Nighantus*, International journal of ayurvedic & herbal medicine July-Aug 2015; 5 (4): 1868-1874
8. Balasubramanian A, Ramalingam K, Krishnan S, Christina AJM. Anti-inflammatory activity of *Morus indica* Linn, Iran J Pharmacol Therapeutic2005; 4:13-15
9. Shashikant Prajapati, Anagha Ranade, Rabinarayan Acharya, A critical review on *Hrudayarogahara dravyas* (drugs for cardiovascular diseases) of *BhavaprakashaNighantu*, conference paper, International conference on disorders of *Trimarma,* J. S. Ayurveda Mahavidyalaya & P. D. Patel Ayurveda Hospital, Nadiad, Gujarat, 1st – 2nd Sep. 2015
10. Raghavendra Naik, Sneha D Borkar, R N Acharya, Vegetables (*Shaka Dravyas*) and their role in Prevention and Management ofDermatological Disorders: A Critical Review, Journal of Ayurveda & Holistic Medicine; 3(6): 68-89
11. Anonymous, *Madanadi Nighantu* - e book
12. Priyavrat sharma (editor). Anonymous, *Dhanvantari Nighantu*,4th edition, Varanasi:Chaukhambha Orientalia;2005

13. Yadavji Trikamji (editor). Acharya Chakrapanidatta,*Dravyagunasamgraha*,Reprint, Varanasi:Chaukhambha Orientalia; 2006

14. Priyavrat sharma(editor). Acharya Sodhala, *Sodhala Nighantu*, Baroda: Oriental Institute;1978.

15. Priyavrat sharma(editor). Acharya Madhav, *Madhav's Dravyaguna*,1st Edition, Varanasi: Chaukhambha

    Vidhyabhavan; 1973

16. Pandit Hariharprasad Trivedi (editor). Acharya madanapala, *Madanapala Nighantu*, Varanasi: ChaukhambhaKrishnadas Academy; 2009

17. Priyavrat Sharma (editor). Acharya Kaideva, *Kaiyadeva Nighantu,Aushadhi varga*20, 2nd edition, Varanasi: ChaukhambhaOrientalia, 2006

18. Pandit Shri Brahma Sankar Mishra (editor). Commentatry:*Vidyotani*Bhavmishra, *Bhavaprakasha Nighantu*,11th Edition,Varanasi:Chaukhambha Sanskrit Sansthan; 2004

19. Indradeva Tripathi (editor). Narhari pandita,*Raja Nighantu*, 4th Edition, Varanasi: Chowkhambha Krishnadas Academy; 2006; 378-379

20. Rajvallabha, *Rajvallabha nighantu*, E-book

21. Shaligramvaishyavarya(editor). Anonymous, *Shaligrama Nighantu Bhushana*, Bruhat Nighantu Ratnakar Part 7-8, *Guduchyadi Varga*, Reprint, Mumbai: Khemaraja Shrikrishnadas Prakashana; 4; 1993

22. Priyavrat sharma (editor). *Priya Nighantu*,Varanasi: Chaukhambha surbharati prakashan;2004

23. Balakrishna (editor). Sushenanighantu, Sushenadevapranita, Haridwara:Divya prakashana; 2013

24. Anonymous, *LaghuNighantu,* E-book

25. Pandit Shankaradatta Gauda (editor). Shankara nighantu, Varanasi:Chaukhambha vidhyabhavan; 2002.

26. Kumar Sanjeev, Amit kumar, Synonyms and therapeutic review of *Mulethi* (*Glycyrrhizaglabra*Linn) commonly known as licorice: from *Kosha* and *Nighantus*, International journal of ayurvedic & herbal medicine July-Aug. 2015; 5 (4): 1868-1874

27. P. Himasagara Chandra Murthy (editor). Rasasastra, 1st edition, Varanasi: Chowkhamba Sanskrit Series Office, 2008

28. [Accessed dated: 30.03.2016] Available from:https://en.wikipedia.org/wiki/Hematinic

29. Dutta GK et al., Comparative study of haematinic and iron utilization property of pre and flowering plant extract of Asteracantha longifolia (L.) Nees. Ind J Trad Knowl 2014; 13(2): 352-358.

30. Akah PA et al., The haematinic activity of the methanol leaf extract of Brillantasia nitens Lindau (Acanthaceae) in rats. Afr J Biotechnol 2009; 8(10): 2389-2393.

31. Mishra Preeti, Gupta Seema, Haematological evaluation of *Eclipta alba* root extract in catfish Clariash batrachus. Journal of Pharmaceutical and Scientific Innovation 2014; 3(3): 240-244.

32. Gabriel A Agbor, Julius E Oben, Jeanne Y Ngogang, Haematinic activity of *Hibiscus cannabinus* African Journal of Biotechnology, August 2005; 4(8): 833-837

33. Sarkar PK et al., Haematinic Evaluation of Lauha Bhasma and Mandura Bhasma on HgCl2-Induced Anaemia in Rats. Ind J Pharm Sci 2007; 6(69): 791-795.

34. Arnab Das, Chaitali Bose, Subhasish Ghosal, Indrani Chakraborty, Nirmal Pradhan, Effect Of Pure

Mangiferin Vis-A-Vis Crude Ethanolic Extract From Mangifera Indica Bark on Haematological Parameters in Male Albino Rats, World Journal of Pharmaceutical Research; 3(9): 1390-1403.

35. E.U. Madukwe, A.M. Okafor and V.U. Ogbonna, Effectiveness of Fresh and Shade-Dried *Mucuna pruriens* Leaf Extract in Controlling Anaemia in Adult Male Albino Rats, Pakistan Journal of Nutrition 2014; 13(10): 579-583
36. Atish N. Waghmare, Sachin V. Tembhurne, Dinesh M. Sakarkar, Anti-Anaemic Potential of *Murraya koenigii* Fruit Extracts in Phenylhydrazine Induced Anaemic Rats, *International Journal of Advances in Pharmaceutical Research*, May 2015; 6(05): 124 – 127
37. Damodara Gowda KM et al., Ethanolic extract of Nardostachys jatamansi potentiates haematopoietic system in albino Wistar rats, Nitte University Journal of Health Science 2013; 3(1): 25-29.
38. Sanjay P Chauhan, N R Sheth, Haematinic evaluation of fruits of *Opuntia elatior* Mill on mercuric chloride induced anaemia in rats, IJRAP, Jan-Feb 2014; 5(1)
39. Turaskar A et al., Inhibitory potential of *Picrorrhiza kurroa* Royle ex. Benth extract on phenylhydrazine induced reticulocytosis in rats. As J Pharm Clin Res 2013; 6(2): 215-216
40. Muhammad Bilal Azmi, Shamim A. Qureshi, *Rauwolfia Serpentina* Ameliorates Hyperglycemic, Haematinic and Antioxidant Status in Alloxan-Induced Diabetic Mice, Journal of Applied Pharmaceutical Science July 2013; 3(7): 136-141
41. Turaskar A et al., Anti Anemia potential of *Swertia chirata* on phenylhydrazine induced reticulocytosis in rats. Am J Phytomed Clin Therap 2013; 1(1): 37-41
42. Gummalla Pitchaiah et al., Evaluation of Anti-Anaemic And Anti-Allergic Activity of Aqueous And Methanolic Extracts of *Ziziphus Jujuba* Fruits in Rodents, International Journal of Experimental Pharmacology 2015; 5(2): 91-95

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