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BALA CHATUSHTYA: COMBINED REVIEW ON PHARMACOLOGICAL ACTION OF VARIETIES OF BALA

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ABSTRACT

Bala chatushtya is a group of four medicinal herbs named as *Bala, Atibala, Nagabala, Mahabala* according to *Bhav Prakash Nighantu*. *Ayurveda* is branch of science of herbal drugs and their formulations in various diseases. Every drug has its own properties and own actions acting differently in different diseases. *Ayurveda* first line of treatment is prevention of occurrence of disease and reversing the pathogenesis of occurred disease. *Bala* is one of *Balya ousadha* to build up immunity of an individual. Various types of *Bala* has been mentioned in *Samhitas* and *Nighantus* under groups of *Baladvaya, Balatraya, Balachatushtaya and Balapanchaya*. In the present article we are undergoing detailed study of *Bala, Atibala, Nagabala, Mahabala i.e Balachatushtya.* All four varieties are used as medicinal plant and belongs to *Malvaceae*. Through this article, going to discuss combined and comparative study about *rasadi guna*, chemical composition, *karma* (action), therapeutic uses and administration of all four varieties. The plant *Bala, Atibala* are highly important *Ayurveda* herb in *Vedas, Samhitas and Nighantus*. *Bala, Atibala* are mainly acting as *Balya* medicinal herb extensively used to build up immunity. Ethnomedicinal uses of drug have also been discussed which opens the gate to further pharmacological experimentation of action which are not mentioned in classicals. The review declared that *Bala varieties* is used in many disorders related to aggravation of *Vata-dosha*.

KEYWORDS: Bala chatushtya, Nagabala, Mahabala, Ethnobotanical.

INTRODUCTION

Bala Chatushtya belongs to Malvaceae family which compromise approximately 244 genera with 4225 species of herbs, shrubs and trees.[1] Approximately 22 genera of the family are reported from India, many of which have ethnomedicinal value e.g *Abutilon indicum (Atibala), Sida cordifolia (Bala), Sida rhombifolia (Mahabala).*[2] In Amarkosha *Bala and Vatyalaka* are mentioned which means that can be bind together everything i.e *Bala, Ayu.*[3] Various synonyms are generated for *Bala* in *Nighantus* which may create somehow controversy. Since the time of Vedas, *Atibala* is mentioned in *Atharvaveda* in detail. Literally meaning, the '*Ati'* means very and '*Bala'* means powerful, indicating the properties of this plant as very powerful.[4] *Sida rhombifolia* Linn. known as '*Mahabala'* is ethnomedicinal plant of Malvaceae family. Traditionally *S. rhombifolia* was used in India in the form of powder/paste/extract by tribal populations in India for treating common ailments like cough and cold, fever, stomach, kidney and liver disorders, inflammations.[5] *Bala is a one of the herb in Brumhani dashaimani, Balya dashaimani, Madhura skandha.[6] The* presence of various life sustaining constituents in plants made investigator to search for their uses in treating certain diseases related to immunity, other infectious diseases management of chronic wounds and can be good source of infective agent.[7] According to *Bhavprakash Nighantu*, *Kaiydev Nighantu* there are four varieties of *Bala* as *Bala, Atibala, Nagabala, Mahabala.*[8] According to Priyavrat Sharma there are 5 varieties additionally *Rajbala* with *Bala Chatushtya.*[9]

MATERIAL AND METHOD

The extensive review research has been made from *Vedas, Samhita, Nighantu*. All referral textual has been thoroughly searched and documented systematically.

Controversy related to Bala[10]

In *Madhura skandha* various synonyms are mentioned as *bala, atibala, sehdeva, vishwa deva, sheetpaki, oudan pakai* --- these are mentioned in same varga but all are synonmys used for *Bala*. In *Madhura varga* of *Sushruta Samhita Bala* and *Atibala* are types of *sehdeva* and *vishwdeva* mentioned in *Kakolayadi varga*. Some synonyms used for Bala which are also same meaning for other drugs. In *Samhita Mahabala* is not mentioned. It may be that *sehdeva* mentioned in *Samhita* can be *Mahabala*.

Types of Different *Bala* in *Samhita and Nighantu*[11]

Table 1.

	Types of Bala	**Name**	**Botanical name**
1	*Bala Dwaya*	Bala, Atibala	Sida cordifolia Abutilon indicum
2	*Bala Traya*	Bala, Atibala, Nagabala	Sida cordifolia Abutilon indicum Sida veroniceafolia (Lom.)
3	*Bala Chatushya (Bhav Prakash/Kaiydeva Nighantu)*	Bala, Atibala, Nagabala, Mahabala	Sida cordifolia Abutilon indicum Sida veroniceafolia (Lom.) or Grewia hirsuta (Vanb.) Sida rhombifolia (Linn
4	*Bala Panchaya (Priya Varta Sharma)*	Bala, Atibala, Nagabala, Mahabala, Rajbala	Sida cordifolia Abutilon indicum Sida veroniceafolia (Lom.) or Grewia hirsuta (Vanb.) Sida rhombifolia (Linn) Sida veroniceafolia (Lom.)

Taxonomical classification[12]

Table 2.

Classification System	***Bala***	***Atibala***	***Nagabala***	***Mahabala***
Kingdom	Plantae	Plantae	Plantae	Plantae
Class	Dicotyledons	Dicotyledons	Dicotyledons	Dicotyledons
Subclass	Polypetalae	Polypetalae	Polypetalae	Polypetalae
Series	Thalamiflorae	Thalamiflorae	Thalamiflorae	Thalamiflorae
Order	Malvales	Malvales	Malvales	Malvales
Family	Malvaceae Mallow family	Malvaceae	Malvaceae	Malvaceae
Genus	Sida (Linn.) fanpetal	Abutilon	Sida	Sida
Species	cordifolia (Linn	indicum	veronicaefolia	rhombhifolia

***Rasadiguna of Bala Chatushtya* (Properties of Varieties of *Bala*)**[13]

Table-3.

Types of Bala	**Rasa**	**Guna**	**Virya**	**Vipaka**	**Dosha Karma**
Bala	Madhura	Laghu, Snigdha, Pichchhilla	Sheet	Madhura	Vatta-pitta samaka
Atibala	Madhura	Pichchhila, Singdha, Laghu	Sheeta	Madhura	Vatta-pitta samaka
Mahabala	Madhura	Pichchhila, Singdha , Guru	Sheeta	Madhura	Vatta-pitta samaka
Nagabala	Madhura, Kashya	Pichchhila, Singdha , Guru	Sheeta	Madhura	Vata-pitta samaka

Description of Various types of *Bala*

***Bala* (Sida cordifolia Linn.)**

Botanical Description

Sida cordifolia (Linn.) belongs to family *Malvaceae* is a very important Ayurveda medicinal plant used from ancient times. Small erect downy shrub with long, spreading hairs on the branches and petiole. Leaves 2.5-5 cm long, cordate, ovate-oblong crenate, obtuse or subacute and not acuminate and the petioles are 12-3.8 cm long bearing flowers. Calyx 6-8 mm long with ovate and acute lobes, corolla exceeds the calyx slightly. Carpels 10 and reticulated on the sides, cocci 12. Fruit 6-8 mm in diameter, strongly reticulated with two spiny projections on the top. It is found throughout in tropical and sub-tropical parts of India.[14]

Classical Name: *Sahadeva, Vatyalika, Vatyapushpi, Vatyayani*

Vernacular name

Sanskrit: Bala, Kharyashtika, Vatyayani, Bhardodani
English: Country mallow
Hindi: Kungyi, Bariyaar, Khareti
Bengali: Swetberela, Brela, Bala
Gujarati: Mahabala, Khapat
Kanada: Hettuthi, Hettugigada
Malyalam: Kurunthott, Vellurum
Marathi: Chikana, Khiranti
Punjabi: Kowar, Simak, Kharent
Tamil: Nilatutti, Paniar-tuthi
Telugu: Tellantisa, Tellagorra, Chiribenda[15]

Karma: *Balya* (give power and strength), *krantikara* (glowing complexion), *grahi* (absorbant), *vrshya* (spermatogenic), *ojo vardhaka* (immunomodulator), *Ayu vardhaka* (add on in age), *stambhana* (to stop blood letting), *bringhana* (increase in muscular mass), *sothhara* (anti-inflammatory), *rasayana* (immunity booster), *hridya* (healthy for heart).

***Agrya karam*:** '*Bala sangrahika balyavataharnaam*

Pharmacological activities

Aphrodisiac, diuretic, deflatulant, analgesic, anti inflammatory, tonic, emollient, cardiotonic.

Therapeutic indications

Vatavyadhi (nerve disorder), *karshya* (malnutrittion), *dourbalya* (generalished weakness), *kshaya* (debility), *raktapitta* (disorder of blood and pitta dosha), *vatarakta* (gout), *mutraatisara*, *mutra krichha* (burning micturition).

Therapeutic administration

1. Decoction of *Bala mula* with *Sanidhava lavana* is very useful in *Bala Shosa* (atrophy of arms).
2. *Bala taila* is used for bath, enema and for diet in case of *Vatarakta* (gouty arthritis).
3. In *Madatya trshna* water processed with *Bala* should be given to drink.
4. Milk processed with two types of *Bala* and *Atibala* in morning will be relieved from *asadhya slipada* (Incurable elephantiasis).

Matra: *Kwatha*: 50-100 ml.
Churna: 3-6 gm.
***Swarasa*:** 10-20 ml.

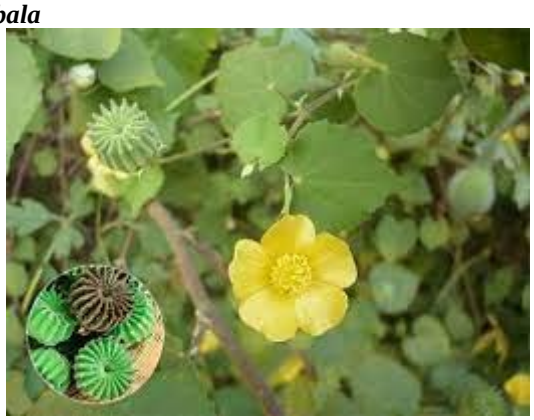
Formulations

Bala taila, kshirbala taila, balaguduchyadi taila, balarishta, masabaladi taila, baladi kashya, baladya ghrita, balaashwagandha laksadi taila.

Adverse effects

Bala is known as Indian-ephedra because it contains 0.8-1.2 % of Ephedrine. Continuous use of products of ephedrine which is an alkaloid can bear a series of risk to heath and can cause Hypertension, Headache, Tremors, Insomnia and Tachycardia. For this reason, In United State in many places dietary compliments having ephedrine has been prohibited in home-made preparations.[16]

Atibala



Atibala (*Abutilon indicum* L.)

Botanical and Drug Description

Atibala is an erect herb or under-shrub 1.0-1.5 m high, annual, or more often perennial with golden yellow flowers solitary or in pairs. Leaves are highly variable, short petiole, rhomboid lanceolate serrated towards the top, sub-glabrous. The branch bearing inflorescence often appears as pannicle due of reduction leaves. Fruits a depressed globose, enclosed with in the calyx

separating into one seeded indehiscent unit. Seeds black, smooth. Flowering mostly throughout the year found abundantly throughout the hotter parts of India, as a common weed on road sides and other waste places in plains and hills, upto an elevation of 600 m. Tap roots, long with a number of lateral branches, 1.5-2 cm in diameter, light brown, outer surface smooth with dot like lenticels, bark thin and can be easily peeled off, odour feeble, taste astringent and bitter.

Vernacular Name[18]
Sanskrit : Kankatika, kshryaprokta
Assamese : Jayavandha, Jayapateri
Bengali : Badela
English : Indian Mallow
Gujrati : Kansaki, Khapat
Hindi : Kanghi
Kannada : Shrimudrigida, Mudragida, Turube
Kashmiri : Kath
Malayalam : Uram, Katuvan, Urubam, Urabam, Vankuruntott, Oorpam, Tutti
Marathi : Chakrabhendi, Petari, Mudra
Oriya : Pedipidika
Punjabi : Kangi, Kangibooti
Tamil : Tutti, Thuthi
Telugu : Tutturubenda
Dosha karma: *Vatahara* because of *madhura rasa, madhura vipaka* and *singdha, picchila guna. Pitthara* because of *sheeta virya, madhura vipaka, madhura rasa.*

Karma (Action)
Balya (give power), *krantivardhaka* (glowing skin), *grahi* (absorbant), *mehaghna* (anti-diabetic), *vrshya* (spermatogenic), *ojovardhaka* (immunomodulator), *krimighna* (dewormer), *dahahara* (pacifies burning sensation), *trshnahara* (pacifies excessive thirst), *vishaghna* (work against poison), *chardighna* (antiemetic), *brhighana* (increase muscular mass), *kshtnasnam* (injury healer).

Pharmacological action
Diuretic, anthelmintic, anti-inflammatory, antibacterial, antifungal, analgesic, anticancerous, hypothermic.

Therapeutic indications
Dourbalya (weakness), *vatavyadhi* (nerve disorders), *vatarakta* (gouty arthritis), *kshata* (injury), *prameha* (mutra vikara), *raktapitta* (disorder of blood and pitta dosha), *krimi* (worms), *daha* (burning sensation), *trshna* (thirst), *visha* (poisoning), *chardi* (vomiting), *raktaparadara, mutrakrccha* (burning micturition).

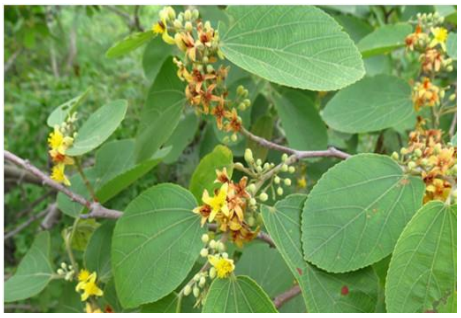
Therapeutic administration
1. Kashaya prepared from root of *Atibala* overcome mutrakrccha.
2. Fine powder from bala, *Atibala* with sarkara and madhu is beneficial in *Raktapradara* (menometorrhagia).
3.*Atibala* can be used as rasayana(immunity booster).

Matra-1-3 gm.

Formulations
Balataila, Nagarjuna yoga, Naryana taila, Ketakyadya taila, Atibala kwatha, Goksuradi churna.[19]

Nagabala


Grewia hirsute Vahl


Sida veronicaefolia L.

Two plants are mainly used with this name
1. *Nagabala* – Sida veronicaefolia
2. *Gangeruki* – Grewia hirsuta
3. *Guda sakara* – Grewia species
4. *Grewia populifolia*

Botanical Description ---- *Sida veronicaefolia* L.
Perennial branched herb mostly prostrate trilling, leaves cordate 1-2.5 cm long serrate, sparsely clothed with stellate hairs. Petiole 1-2 cm long, Flowers pale yellow coloured, seeds brown colred. Nagabala grows in hilly regions of Konkan, Rajasthan, and Bihar.

Botanical Description- *Grewia hirusta* Vahl
Grewia hirsuta belongs to Tiliaceae family. Shrub 90 cm in height. Slender branches. Leaves 5-11 cm long 1-2.5 cm wide, oblong narrowed gradually tip apex, serrate, base rounded, 3 nerved, clothed with small serrate hairs above, petiole 2.5 -4 mm long, stout, hairy, stipules 25 mm long, linear, hairy. Flowers white turning to yellow 2-4 together Fruit up to 1 cm in diameter more or less 2-4 lobed shining brown with scattered hairs.

***Sida Veronicefolia* L.**[20]
Vernacular name
English -Heart leaf fan petals, Snake mallow
Hindi- Bananiyar, Bhyunli bhuinii
Tamil- Palampasi
Marathi-Nagabala
Gujrati- Gangeti
Bengali- Goraksha chakule
Telgu- Gaypaaku, bekkinata legida
Kannada- Nagabala, Turuvegida
Malayalam- Vallikkuruntotti, Nagabala

Controversial Studies on Nagabala

The controversy on *Nagabala* or *Gangeruki* seems to be relatively recent Cakrapani considered *Gangeruki* as *Nagabala* fruit . In this context Gangadhara clarified that this plant is also known as Guda sarkara. In another context Cakrapani described *Nagabala* as *Goraksa Tandula* . *Sivadas Sen* also opined that *Nagabala* is *Goraksa Cakuliya*. Another commentator Adhamalla also mentioned that *Nagabala* and *Guda sarkara* are the synonyms of *Gangeruki*.

From the above finding it is apparent that the controversy started with the synoymn / vernacular name *Guda sarkara* which is Grewia species Thakurji described those different plants viz. Sida spinosa, sida vermicaefolia, urena lobata, Grewia populifolia & Grewia hirsuta have been accepted as *Nagabala* at various places. *Gangeruki* and *Guda sarkara* may be the two species of Grewia i.e Grewia populifolia and Grewia hirsuta respectively. Therefore, *Nagabala* can be accepted as Sida veronicaefolia.

Dosha karma

Vata-pitta samaka.Vatahara due to *Madhura vipaka, Madhura rasa*. *Pittasamaka* due to *sheet virya, Madhura vipaka* and *Madhura kasaya rasa*.

Karma (Action)

Balya (give strength), *vrishya* (spermatogenic), *kranti vardhaka* (glow in complexion), nadibalya (nervine tonic), *vranahara* (wound healer), *rasayana*(immunity booster*), jwaraghan* (drop down fever), *brimhana* (increase muscular mass).

Pharmacological action

Laxative, emmollient, demulcent, digestive, carminative, diuretic, aphrodisiac, expectorant, anodyne, antipyretic, tonic.

Therapeutic indication

Dourbalya (weakness), *sukradourbalya* (sperm deficiency), *raktapitta(*excessive bleeding*), vatavyadhi* (nerve related diseases), *nadidourbalya* (nerve signal rely weakness), *jwara* (fever), *karshya* (malnutrition)**.**

Therapeutic administration

1. *Nagabala* along with milk started with 5 gm and increase upto 40 gm for a month keeping on milk diet will promote strength.
2. Root of *Nagabala* and *Arjuna* bark is good remedy for *Hridyaroga.*

Dose

Kwath -50-100 ml
Mulatwak churna 3-6 gm
Formulation: *Baladya taila, Nagabala taila, Baladya ghrita*.[21]

Mahabala

Mahabala(Sida rhombifolia L).

Botanical and Drug Description

Sida rhombifolia belong to Malvaceae family is an erect annual or perennial undershrub, 1.5 m high, distributed throughout the country especially in moist regions, ascending to an altitude of 1800 m in the Himalayas. Drug occurs as entire root or cut pieces of varying lengths, 7-8 mm in thickness, with wavy lateral roots comparatively thinner than main roots having numerous rootlets, brownish-yellow, surface, rough due to scars of small rootlets and lenticels; fracture, hard and splintery.

Vernacular name

Sanskrit : Atibala, Pitapuspa
Bengali : Pitabedala, Kheriti
English : Country Mallow
Gujrati : Mahabala
Hindi : Pitabala, Pitabariyar
Kannada : Kisangihettutti-gida
Malalayam : Anakkuruntotti
Marthi : Mahbala
Punjabi : Khuruntis
Tamil : Kurunthotti
Telgu : Gubatada, Pedda Mutheera Pulagu

Dosha karma: *Pittaghna, Vataghna.*

Karma: *Grahi(absorbant), Sukravrddhikara (increase sperm count), Ojovardhaka (immunomodulator), Kantivardhaka (fairness in complexion), Balya (give strength).*

Therapeutics uses – *Sukraksaya*, *Kshata* (injury), *Ksaya* (debility), *Visamajvara* (fever), *Daurbalya* (weakness), *Vatavyadhi* (nerves disorder), *Vatarakta* (gouty arthritis), *Raktapitta*, *Sopha* (swelling).

Dose – 3-6 g of the root of drug in powder form.

Formulations – *Mahavisha garbha Taila, Navratna Rajamrganka Rasa.*[22-23]

Comparative Chemical constituents and Pharmacological activities of Four varieties of Bala[24]
Table 4.

Bala	Seeds contains Ephedrine, Fatty oil, Steroids, Phytosterol, Resin, Resin acids, Mucin, potassium nitrate. Root contains alkaloids—ephedrine, si-ephedrine, beta-phenethyl- amine, carboxylated tryptamines and hypaphorine, quinazoline alkaloids— vasicinone, vasicine and vasicinol. Choline and betaine have also been isolated. A sitoindoside, isolated from the plant, has been reported to exhibit adaptogenic and immunostimulatory activities. Alcoholic extract of the plant possesses antibacterial and antipyretic propeptide. Ethanolic extract of the plant depresses blood pressure in cats and dogs.
Atibala	Root contains fatty acids-linoleic, oleic, stearic, palmitic, myristic, lauric acid, B-sitosterol, b-amyrin. Total plant contains Flavones, gossypetin-8, T-Glycoside, Cyanidin-3, retinoside . The plant contains mucilage, tannins, asparagines, gallic acid and sesquiterpenes. Presence of alkaloids, leucoanthocyanins, flavonoids, sterols, triterpenoids, saponins and cardiac glycosides is also reported. Asparagine is diuretic. Gallic acid is analgesic. Mucilages act by reflex, loosen cough as well as bronchial tension. Essential oil has antibacterial and antifungal properties. The drug exhibits immunological activity. It augments antibody in animals. EtOH (50 %) extract of A. indicum
Nagabala	Cohirsine, Haiderine, Jamtine N-oxide, Trilobine, Isorilobine, Hirsutine, Cohirsitinene, Coclaurine, Magnofloriae, Sitosterol, Ginnol and Jamtinine beta-phenethyl- amines, quinazoline, carboxylated tryptamine, linoleic acid, malvalic acid, sterculic acid and gossypol.
Mahabala	Alkaloids, ephedrine, si-ephedrine and cryptolepine, are reported from aerial parts. The root contains 0.054% alkaloids, betaphenethylamine, N- methyl-beta-phenethylamine, vasicinol, vasicinone, vasicine, choline and betaine. These alkaloids are also present in the aerial parts.

Comparison of actions of Different varieties of Bala[25]
Table 5.

Bala	Juice of the plant— invigorating, spermatopoietic, used in spermatorrhoea. Seeds serve as nervine tonic. Root (official part in Indian medicine) used for the treatment of rheumatism; polyuria, dysuria, cystitis, strangury and hematuria fevers and general debility. Leaves demulcent, febrifuge; used in dysentery leucorrhoea and other uterine disorders neurological disorders (hemiplegia, facial paralysis, sciatica)
Atibala	Juice of the plant emollient. Seeds demulcent (used in cough, chronic cystitis), laxative. Leaves cooked and eaten for bleeding piles. Flowers has antibacterial, anti-inflammatory action. Bark astringent, diuretic. Root nervine tonic, given in paralysis; also prescribed in strangury. Dried, whole plant— febrifuge, anthelmintic, demulcent, diuretic, anti-inflammatory (in urinary and uterine discharges, piles, lumbago). The Ayurvedic Pharmacopoeia of India indicates the use of the root in gout, polyuria and haemorrhagic diseases
Nagabala	Root bark used for leucorrhoea and genitourinary affections Fruits and flowers used for burning sensation in micturition. Leaves juice, used for diarrhoea; poultice applied to cuts and bruises
Mahabala	Stem-mucilage demulcent and emollient. Used internally in skin diseases and as a diuretic and febrifuge. Plant used as a supporting drug in pulmonary tuberculosis, nervous diseases and rheumatism. Leaves applied to swelling as paste

Ethnobotanical uses of varieties of Bala
Abutilon indicum
A. indicum is referred to as '*Atibala'* in Classical language and its medicinal potential and therapeutic applications have been described from Vedic time period. The plant as a whole or its different parts such as leaves, flower, seed, roots, and bark have been used for treating various disease like inflammations, ulcer, diarrhoea, joint pains, stomach ailments, diabetes and wounds.[26,27] Traditional people were using the plant to treat diseases like gout, tuberculosis, ulcer, jaundice, leprosy, gonorrhea, bronchitis, lumbago malarial fever, piles and other bleeding disorders fromma very long time period.[28,29,30,31] Its roots and seeds are used in the form of decoction to cure fever and cough. Root of the plant have been used as nervine tonic to cure paralysis and also effective in strangury. The powdered form of dried leaves of this plant mixed with wheat flour is used for treating uterus displacement among some tribes in Orissa in India. Decoction of leaf and roots are used to cure dental problems. On the spot of scorpion bite topical application of leaf paste is used to relieve pain. Flowers of this plant are used by tribal population in Southern India to increase the volume of semen in human beings.[32,33,34]

Sida Rhombifolia

S. rhombifolia is known as '*Mahabala'* in ancient text and is an ingredient of many Ayurvedic medicines used for treating inflammations, increasing the immunity, and for vitality. The tribal population of many parts of India use whole plant or plant parts for treatment of piles, gout, rheumatism, kidney disorders and gonorrhoea.[35,36] Compound made from this drug is used to cure pain and swelling caused in rheumatism, muscular weakness, urinary tract wounds and also to treat tuberculosis, heart diseases and neurological disorders. Roots of the plant are used for treating snake bites. Decoction of roots is taken for rheumatic pains to treat tuberculosis and also malaria.[37,38,39,40]

In parts of Africa, hot aqueous extract of aerial parts of the plant is used for snake bites and abortion. Also leaf and root extracts are used for asthma, pneumonia and bronchitis, infusion of roots is taken for treating dysentery, diarrhoea and indigestion in Australia, Cameroon and Papua New Guinea In Europe, roots are used for treating tuberculosis. Whole plants are used for treating gout (Indonesia), irregular menses (Malaysia), fever, body ache (Thailand), skin problems, liver problems, diarrhoea (Mexico), kidney inflammation (Bolivia), dandruff and wounds (Panama) and gonorrhoea in Guatemala in Argentina, leaves of the plants are used to treat menstrual pain. Macerated leaves are orally taken for sedation, to treat hypertension and venereal diseases. In Senegal and Madagascar, flowers are rubbed on wasp stings to bring relief.[41,42,43]

Sida cordifolia

Known as "Malva branca", it is a plant used in Brazilian folk medicine for the treatment of inflammation of the oral mucosa, blennorrhoea, asthmatic bronchitis and nasal congestion,[44] stomatitis, of asthma and nasal congestion[45] and in many parts of Africa for various ailments, particularly for respiratory problems. It has been investigated as an anti-inflammatory[46-47] for preventing cell proliferation, and for encouraging liver re-growth. Because of its ephedrine content, it possesses psychostimulant properties, affecting the central nervous system and also the heart.[48]

DISCUSSION

The four different varieties of Bala which considered as 'Bala chatushtya' are very much valuable from medicinal aspect. These are considered as immunomodulator drugs (Rasayana) in Ayurveda textual and helpful to alleviate Vata dosha (nerve disorders) and highly useful in Paralysis. Bala, Atibala and Mahabala are also very much beneficial for ethnobotanical uses. All varieties are having almost same pharmacodynamic properties. *Bala, Atibala and Nagbala* are also very effective in genito-urinary infections and uterine disorders.

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