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A Glimpse of Therapeutic Potential of Seed Kernel of Medicinal Plants with Special Reference to *Bhavprakash Nighantu*: A Clinical Perspective

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Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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ABSTRACT

Medicinal plants show significant importance to mankind. Each and every part of plant exhibit different therapeutic activity. In *Ayurveda*, like medicinal fruits, seeds are also considered as potent drugs. Seeds not only beget plants but they are of healing properties too. Most seeds are used as whole powder in various diseases but their kernel or oil also possess therapeutic potential. This article has highlighted review of potential therapeutic agents from beej majja of *Phal Varga* of *Bhavaprakasha Nighantu*. This study will lead to widening of therapeutic spectrum in treatment of various ailments with the use of powdered seed kernel (*Beej Majja*) or seed oil (*Beej Taila*).

Keywords: Ayurveda; beej majja; medicinal fruits; phal varga; seed kernel.

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1. INTRODUCTION

In *Ayurveda*, medicinal plants are used as a whole (*panchang*) or in parts viz. roots, stem, leaves, flowers, fruits and seeds. Fruits are not only palatable but also help to cure certain ailments. Nowadays, due to advanced researches, there is huge demand of fruits both as food and as medicine. Unfortunately, fruit seeds are left ignored both in terms of lusciousness as well as medicinal values. Seed kernels of fruits are novel sources of natural antioxidants. Few in vitro studies has implied that these seed kernels are vital natural sources for preventing oxidative stress diseases [1].

Among *Phal varga,* most *Vaidyas* practice only *phala*(fruit pulp) and not their seeds. There are few medicinal plants in which not only fruits but seed alone or seed kernel or seed oil exhibit healing properties [2]. Seeds are packed with nutrients and have abundant health benefits. These tiny but mighty kernels are enriched with vitamins and minerals that body needs to function at ultimate performance. Seed kernels or *beej majja* of various fruits are extremely versatile therapeutic agents [3]. *Bhavprakash nighantu*, an exhaustive treatise of *Dravyaguna* explored and explained such plants whose *beej majja* gives excellent results in treatment. Among 16 classes of *Bhavprakash nighantu*, only *beej majja* of *phal varga* was selected while generating this review for creating awareness about its therapeutic potential.

1.1 Empirical Reviews

We have reviewed the available Ayurvedic, traditional books, Bhavaprakasha nighantu as well as modern literature for searching therapeutic potential of seed kernels of various fruits. The detailed list of plants with their mode of action has been depicted in Table 1 and 2.

1.2 Nutritional Composition and Health Benefits of Various Phala Beejmajja

1. *Amra* (Mango): Mango fruit is most savored as well as highly nutritive. Its botanical name is*MangiferaIndica*. Mango seed kernel is having *Madhura, Amla, Kashaya Rasa, Guru -Snigdha Guna, Sheeta Virya, Madhura Vipaka* and it is *Kapha- Pitta Shamaka*. It is useful in vomiting, diarrhoea, burning sensation, bleeding piles, abnormal uterine bleeding. 1 to 1.5 gm of seed kernel powder can cure diarrhoea and dysentery.[65]
2. *Koshamra: Koshamra* seeds are enriched with lipids and they are edible. Seed oil; also known as Makasar oil, has anti pruritic activity. It promotes hair growth as well. In Veterinary practice, seed kernel powder application over wounds has cleansing action.[66]
3. *Panasa* (Jackfruit): It is also known as *Katahal* in common language. *Panasabeeja* has *Madhura rasa, Guru guna, Sheeta Virya, Madhura Vipaka* and it is *Vata Pitta Shamaka*. Its seed kernels are aphrodisiac, constipative, and diuretic. They are rich in starch, vitamins B1 and B2.
4. *Lakucha:* Monkey Jack fruits are highly nutritious due to maximum percentage of vitamin C and beta carotene. *Lakucha* has A*mla rasa, Ushna Veerya* and *Pitta vardhaka* properties. Its seed kernels are potent laxative. Hence small quantity should be used.
5. *Chirbhita: Chirbhitabeeja* contains linoleic acid, lecithin, cephalin and cerebroside. They have good cooling effect. Seed kernels can cure burning micturition.
6. *Narikela*: *Cocos nucifera* i.e. coconut exhibits many health benefit. It has only one seed. Seed kernel is powerpacked with Albumin. It is useful in the treatment of peptic ulcer.
7. *Kalinda* (Watermelon):*Citrullus lanatus* or watermelon is a summer season fruit. Black, grey or reddish coloured, flat, numerous seeds are embedded inside the fruit. These seeds can be roasted and used in culinary preparations. It has *Madhura Rasa, Guru Guna, Ushna Virya, Madhura Vipaka*. It is *Kapha Vata Shamaka*. They are good source of minerals and vitamins. Seed contains 20-40% yellow colored oil.[67] Seed kernels has cooling, diuretic and strength promoting effect. Seed oil can be used in place of Almond oil.
8. *Kharbuja* (Muskmelon): It is also known as *Kharbuja* or*Cucumis melo*. It consists of *Madhura, Amla Rasa, Guru, Snigdha Guna, Sheeta Virya,* and *Madura Vipaka*. It is *Pitta Vata Shamaka*. This fruit is storehouse of multivitamins. It contains Iron, Copper, Phosphorus in traces. It is also rich with vitamin A, B1, B2, C. Fruit contain elongated, flat, numerous seeds. They possess good therapeutic value.

Seed kernels are diuretic and strength supporting. They can be used in treatment of dysuria/ urine retention.

9. *Trapusa*: Seeds are rich in aromatic oil. Seed ash possess 0.62% phosphate. Seed kernels are diuretic, coolant in nature. They can be used in treatment of diseases arising due to vitiated pitta, hemorrhagic disorders as well as dysuria.
10. *Guwak / Puga*: Betel nut or Supari is commonly used in *Tambul* (mouth freshener). This nut remains embedded inside orange coloured fruit (*Pugaphala*). It has 20% carbohydrates, 15% fats, 20% proteins, polyphenols and 5% alkaloids. According to *Ayurvedic* texts, *Puga* has *Kashaya rasa, Guru, Rukshaguna, Sheeta veerya, Mohajanak, Agnidipak, Rochak Karma*. It alleviates *kapha* and *pitta*. It is useful as *Dipan, Ruchya, Atisarnashak,* Worm infection, Urinary tract infection.
11. *Tala* (Toddy plam): It is also named as *Tada*, toddy plam. Toddy palm has abundance of many minerals and vitamins. It contains Carbohydrates(33.8%), Minerals(1.7%), Protein(1.2%), Calcium(0.002%), Iron(0.007%), Phosphorus(0.38%) along with vitamin B3(12.3mg/100gm). Its ripened seed possess *Madhura Rasa, laghu, Snigdha Guna, Sheeta Virya, Madhura Vipaka,* and it is *Vata Pitta Shamaka*. They are diuretic.
12. *Bilwa*: The *Bael* is considered one of the most sacred of Indian trees. It also has good medicinal value. Edible portion of fruit contains Iron, Potassium, Calcium and Phosphorus. Several hairy seeds are embedded in yellowish brown, extremely sticky mucilage inside the fruit. Seed kernel powder in dose of 1.5 gm acts as a powerful laxative.[68]
13. *Tinduka: Tinduka* fruits are commonly used in dietary preparations. Oil containing 4 to 8 seeds are present inside each fruit and they show great medicinal value. Seed oil can be used in treatment of diarrhea.
14. *Kupilu*: Nux vomica tree is distributed all over India. The fruits are attractive and look like Pilu fruits. Seeds are many, small in size, flat, grey, shining clothed on both sides with fine silky hairs radiating from the center. Seeds are toxic and its poisonous effect is fast and severe. Therefore, purification process is advised before using seeds in therapeutics. Strychnine, a principal component of seeds has stimulant action over central nervous system, respiratory system. 60 to 250 mg purified seed kernel powder can be given in *Rakta Vikara, Shula, Ardita, Ardhanga, Kampa, Nadishula.*[69] It has *dipana, pachana, shwasahara, uttejak, balya, vajikara action.*
15. 15.*Raj-jambu*: It is also known as *Jamun*, black plum. It has *Kashaya, Madura, Amla Rasa, Laghu Ruksha Guna, Sheetha Virya, Katu Vipaka* and it is *Pitta Shamaka*. Black plums contain a significant amount of vitamins and minor amount of proteins as well. It is a highly nutritive fruit. Two to five seeds are compressed together into a mass approximating a single seed. Whole seed enclosed in a cream colored, coriaceous covering, smooth, oval, rounded, brownish black with astringent taste has anti-diarrheal effect. In *Madhumeha*, seed kernels are believed to have the action of bringing down sugar level.[70]
16. *Jala jambu*: Also known as *chhoti jambu*. Its seed kernels are anti-diabetic in action.
17. *Lavali: Cicca acida* or country gooseberry is one of the trees with edible, tiny yellow berries fruits. Seeds contain terpenes, esters, aldehyde, phenol, alcohol. They are laxative in nature. Available data also claim that these seeds possess antimicrobial, antioxidant properties. Decoction of seed kernels is used in treatment of Asthma and bronchitis.
18. *Priyal: Priyal* or *chironji* is used in Indian cooking. Its seed kernel can be consumed raw or after roasting or frying. Seed kernel has 51.8% oil, 21.6% protein, 5% sucrose.[71] Seed oil (Chironji oil) can be used in place of Almond oil. According to *Ayurveda*, *Priyal* has *Madhura rasa, Snigdha, Guru, Sara, Vishtambha guna, Madhura Vipaka and Sheeta Veerya*. It pacifies pitta and *vata*. It is aphrodisiac, nutritive, relieves thirst, cough, vomiting. Seed oil can be applied to get rid of grey hairs. Seed powder externally useful in skin diseases. *Priyal* is safe for pregnant, lactating woman as well as children. Excessive use may causes indigestion.
19. *Rajadan*: It is also known as Kings Fruit. Seed kernels are wholesome and can be used in undernourished children. Seed oil has emollient and strength promoting properties.
20. *Padmaksha: Padmaksha* or *Kamalgatta* are the seeds of *Padma*. Seed kernel has cooling action. They are palatable,

Table 1. List of medicinal plants with their *Rasapanchaka* and *doshaghnata* [4-33]

Sr. no	Plant name	*Rasa*	*Veerya*	*Vipak*	*Guna*	*Doshghnata*
1.	*Amra* Botanical name- *Mangifera indica* Linn. Family- Anacardiaceae	*Madhur, Amla, Kashaya*	*Sheeta*	*Madhur*	*Laghu*	*Kapha, pitta*
2.	*Koshamra* Botanical name- *Schleichera oleosa O*ken. Family- Sapindaceae	*Amla*	*Ushna*	*Amla*	*Guru*	*Kaphavataghna, pittavardhana*
3.	*Panasa* Botanical name- *Artocarpus heterophyllus* Lam. Family- Moraceae	*Madhur*	*Sheeta*	*Katu*	*Guru*	*Vataghan, Pittaghna, Kaphvardhana*
4.	*Lakuch* Botanical name- *Artocarpus lakooch* Roxb. Family- Moraceae	*Madhur , Amla,*	*Ushna*	*Madhur*	*Guru*	*Tridoshprakopa*
5.	*Chirbhitam* Botanical name- *Cucumis melo* var. *Momordica Benth* Family- Cucurbitaceae	*Madhur*	*Aushna*	*Madhur*	*Guru, Rooksha*	*Pittaghna, Kaphaghna*
6.	*Narikela* Botanical name- *Cocos nucifera* Linn. Family- Palm syn. Arecaceae	*Madhur*	*Sheeta*	*Madhur*	*Guru , Sheeta, Snigdha,*	*Vataghan, Pittaghna,*
7.	*Kalindam* Botanical name- *Citrullus vulgaris* Schrad. Family- Cucurbitaceae	*Madhur*	*Sheeta*	*Madhur*	*Guru, sheeta*	*Pittaghna*
8.	*Kharbuja* Botanical name- *Cucumis melo* Linn. Family- Cucurbitaceae	*Madhur*	*Sheeta*	*Madhur*	*Guru, Snigdha*	*Pittaghna, Vataghna*
9.	*Trapusam* Botanical name- *Cucumis sativus* Linn. Family- Cucurbitaceae	*Madhur*	*Sheeta*	*Madhur*	*Laghu*	*Kaphghan, Pittaghna*

Sr. no	Plant name	*Rasa*	*Veerya*	*Vipak*	*Guna*	*Doshghnata*
10.	*Supari* Botanical name- *Areca catechu* Linn. Family- Palm syn. Arecaceae	*Kashaya*	*Sheeta*	*Katu*	*Guru, Sheeta, Ruksha*	*Kaphghan, pittaghna*
11.	*Tal* Botanical name- *Borassus flabellifer* Linn. Family- Palm syn. Arecaceae	*Madhur*	*Sheeta*	*Madhur*	*Guru , Sar, Snigdha,*	*Vataghan, Pittaghna,*
12.	*Bilva* Botanical name- *Aegle marmelos* Corr. Family- Rutaceae	*Madhur , Kashaya*	*Sheeta*	*Madhur*	*Grahi, Snigdha*	*Kaphaghna, pittaghna*
13.	*Tinduka* Botanical name- *Diospyros embryopteris* Pers. Family- Ebenaceae	*Kashaya*	*Sheeta*	*Katu*	*Laghu, Rooksha*	*Vatavardhak*
14.	*Kuchala* Botanical name- *Strychnos nux-vomica* Linn. Family- Loganiaceae syn. Strychnaceae	*Katu*	*Ushna*	*Katu*	*Laghu*	*Kaphaghna, Vataghna*
15.	*Raj Jambu* Botanical name- *Syzyzium cumini* (L) Skeels Family- Myrtaceae	*Madhur , Kashaya*	*Sheeta*	*Madhur*	*Laghu, Rooksha*	*Kaphaghna, pittaghna*
16.	*ChotiJambu* Botanical name- *Eugenia heyneana* Wall. Family- Myrtaceae	*Madhur, Kashaya*	*Sheeta*	*Madhur*	*Laghu, Rooksha*	*Kaphaghna, pittaghna*
17.	*Badar* Botanical name- *Zizyphus jujube* Lam. Family- Rhamnaceae	*Madhur, Amla*	*Ushna*	*Madhur*	*Guru*	*Kaphpittakar Vatahrut*

Sr. no	Plant name	*Rasa*	*Veerya*	*Vipak*	*Guna*	*Doshghnata*
18.	*Lavali* Botanical name- *Cicca acida* Linn. Family- Euphorbiaceae	*Kashaya, Amla, Tikta*	*Sheeta*	*Katu*	*Sar, Ruksh, Vishad, Guru*	*Kaphaghna, pittaghna*
19.	*Priyala* Botanical name- *Buchanania lanzan* Spreng. Family- Anacardiaceae	*Madhur*	*Sheeta*	*Madhur*	*Guru, Snigdha, Sheeta, Sar*	*Pittaghna, Vataghna*
20.	*Rajadan* Botanical name- *Mimusops hexandra* Roxb. Family-Sapotaceae	*Kashaya, madhura*	*Sheeta*	*Madhur, Amla*	*Snigdha, grahi, guru*	*Pittashamak*
21.	*Padmaksham* Botanical name- *Euryale ferox* Salisb. Family- Nymphaeaceae	*Madhur , Kashaya, Tikta*	*Sheeta*	*Madhur*	-	*Madhur , Kashaya, Tikta*
22.	*Makhannam* Botanical name- *Euryale ferox* Salisb. Family- Nymphaeaceae	*Madhur , Kashaya, Tikta*	*Sheeta*	*Madhur*	-	*Madhur , Kashaya, Tikta*
23.	*Dadima* Botanical name- *Punica granatum* Linn. Family- Punicaceae	*Amla, Madhur , Kashaya*	*Sheeta*	*Madhur*	*Snigdha*	*Tridoshghna*
24.	*Bahuvara* Botanical name- *Cordia oblique* Wild syn. Family- Boraginaceae	*Madhur , Kashaya, Tikta*	*Sheeta*	*Madhur*	*Guru, Sheeta, Pichchila*	*Kaphaghna, pittaghna*
25.	*Kataka* Botanical name- *Strychnos potatorum* Linn.	*Tikta, madhur, Kahsaya, Katu*	*Ushna*	*Katu*	*Mrudu , Guru*	*Kaphghan, Vataghan*

Sr. no	Plant name	*Rasa*	*Veerya*	*Vipak*	*Guna*	*Doshghnata*
	Family- Loganiaceae					
26.	*Vatad* Botanical name- *Prunus amygdalus* Batsch. Family- Rosaceae	*Madhur*	*Ushna*	*Madhur*	*Snigdha, Guru*	*Vataghan, Pittaghna, Kaphakar*
27.	*Pilu* Botanical name- Family- Salvadoraceae *Salvadora persica* Linn.	*Katu, Kashaya, Madhur*	*Ushna*	*Katu*	*Sar, Snigdha*	*Vataghna, Kaphaghna*
28.	*Akshota* Botanical name- *Juglans regia* Linn. Family- Juglandaceae	*Madhur*	*Ushna*	*Madhur*	*Snigdha, Guru*	*Vataghan, Pittaghna, kaphaprakopaka*
29.	*Amlika* Botanical name- *Tamarindus indica* Linn. Family- Ceasalpiniaceae	*Madhur, Amla*	*Ushna*	*Amla*	*Laghu, Ruksha*	*Vataghna, Kaphghna*
30.	*Vrkrukshamla* Botanical name- *Garcinia indica* Chois. Family- Guttiferae	*Kashaya, Amla,*	*Ushna*	*Katu*	*Ruksha, ushna*	*Vataghna, Kaphaghna*

Table 2. List of medicinal plants with their chemical constituents, therapeutic uses and formulations [4-34]

Sr. no.	Plant name	Chemical constituents	Therapeutic Uses	Formulation
1.	*Amra* Botanical name- *Mangifera indica* Linn. Family- Anacardiaceae	alkaloids, terpenoids, flavanoids, tannins, lignins, saponins and carbohydrates[35]	*Atisar* (Diarrhoea, Dysentry), Epistaxis, Vomiting, Heart Burn[4]	Seed powder
2.	*Koshamra* Botanical name- *Schleichera oleosa O*ken.	fatty acids such as- palmitic acid, myristic acid, eicosenoic acid, eicosadienoic acid, erucic acid, stearic	*Dipan, Ruchya*, Skin Diseases, Rheumatism, Hair Growth, Animal Wound Magots[5]	Seed powder and oil

Sr. no.	Plant name	Chemical constituents	Therapeutic Uses	Formulation
	Family- Sapindaceae	acid, oleic acid, arachidic acid, gadoleic acid, behanic acid, palmitoleic acid etc. Cyanogenicglucoside, Protein, Fat, Carbohydrate, Phosphoric acids, Potash[36]		
3.	*Panasa* Botanical name- *Artocarpus heterophyllus* Lam. Family- Moraceae	Starch, proteins, magnesium, manganese, sodium, potassium, phosphorus, copper, sulphur, chlorine, oxalic acid, Iron, phytin, chlorine, and thiamine. The essential amino acids cysteine, leucine, isoleucine, lysine, phenylalanine, methionine, threonine, tryptophan and valine[37]	*Vrushya* (Aphrodisiac)[6]	Seed powder
4.	*Lakuch* Botanical name- *Artocarpus lakooch* Roxb. Family- Moraceae	A lectin, artocarpin, isolectins[38]	Laxatives [7]	Seed powde
5.	*Chirbhitam* Botanical name- *Cucumis melo* var*. Momordica Benth* Family- Cucurbitaceae	seed oil has linoleic acid, lecithin, cephalin and cerebroside. The seeds of melon contain multiflorenol, isomultiflorenol, and 24-methylenecycloartenol.[39]	*Dahaprashaman*, Burning Micturation[8]	Seed powder
6.	*Narikela* Botanical name- *Cocos nucifera* Linn. Family- Palm syn. Arecaceae	Nitrogenous substances, fats, ash, lignin[40]	Peptic Ulcer[9]	Seed powder and oil
7.	*Kalindam* Botanical name- *Citrullus vulgaris* Schrad. Family- Cucurbitaceae	primary metabolites such as carbohydrates, proteins and amino acids, fatty acids and fixed oils, volatile oils, sterols and steroids the secondary metabolites like alkaloids, flavonoids, tannins, saponins, phenols, phlobtannins, glycosides, terpenoids and	*Balya*(Tonic), Diuretic[10]	Seed powder and oil

Sr. no.	Plant name	Chemical constituents	Therapeutic Uses	Formulation
		triterpenoids etc.[41]		
8.	*Kharbuja* Botanical name- *Cucumis melo* Linn. Family- Cucurbitaceae	Alkaloids, flavonoids, carbohydrates, proteins, glycosides, steroids, triterpenoids and phenolic acids[42]	*Balya*(Tonic), Diuretic[11]	Seed powder and oil
9.	*Trapusam* Botanical name- *Cucumis sativus* Linn. Family- Cucurbitaceae	good sources of protein, fat, minerals and calcium and also flavonoids, terpenoids, tannins, cardiac glycoside, phenols and carbohydrates[43]	Diuretic, Cystitis, Blood Disorders[12]	Seed powder
10.	*Supari* Botanical name- *Areca catechu* Linn. Family- Palm syn. Arecaceae	Alkaloids (arecoline, arecaine, arecaidine, guvacoline, guvacine, and choline), tannin, gallic acid, gum, and various minerals such as copper, calcium, phosphorus, and iron.[44]	*Dipan, Ruchya, Atisar,* Worm Infection, Urinary Tract Infection[13]	Seed powder
11.	*Tal* Botanical name- *Borassus flabellifer* Linn. Family- Palm syn. Arecaceae	carbohydrates, reducing sugars, triterpenoids, tannins and phenolic compounds.[45]	Diuretic[14]	Seed powder
12.	*Bilva* Botanical name- *Aegle marmelos* Corr. Family- Rutaceae	Coumarin, xanthotoxol,aegeline, marmeline, fatty acids[46]	*Virechana*[15]	Seed powder
13.	*Tinduka* Botanical name- *Diospyros embryopteris* Pers. Family- Ebenaceae	Phenols, tannins, flavonoids, alkaloids, saponin, proteins, reducing sugar and vitamin C [47]	*Atisar*[16]	Seed oil
14.	*Kuchala* Botanical name- *Strychnos nux-vomica* Linn. Family- Loganiaceae syn. Strychnaceae	Strychnine, brucine alkaloid, carbohydrate, tannin, steroid, triterpenoid, glycoside, , safonins, tannins, flavonoids, and glycosides[48]	*Balya*(Tonic), Aphrodisiac, Neurological Problems, Peripheral Neuritis, Arthritis And Other *VatajaVikar*[17]	Seed powder

Sr. no.	Plant name	Chemical constituents	Therapeutic Uses	Formulation
15.	*Raj Jambu* Botanical name- *Syzyzium cumini* (L) Skeels Family- Myrtaceae	Alkaloid, jambosine, and glycoside jambolin or antimellin, α-Pinene, camphene, β-Pinene, myrcene, limonene, cis-Ocimene, trans-Ocimene, γ-Terpinene, terpinolene, bornyl acetate, α-Copaene, β-Caryophyllene, α-Humulene, γ-Cadinene and δ-Cadinene[49]	Diabetic Mellitus[18]	Seed powder
16.	*ChotiJambu* Botanical name- *Eugenia heyneana* Wall. Family- Myrtaceae	Alkaloid, Jamboline[50]	Diabetic Mellitus[19]	Seed powder
17.	*Badar* Botanical name- *Zizyphus jujube* Lam. Family- Rhamnaceae	Leucocyanidin, Jujubosides[51]	*HikkaNigrahana*(Anti Hiccough), *Netrya*(Eyesight Promoting)[20]	Seed kernel
18.	*Lavali* Botanical name- *Cicca acida* Linn. Family- Euphorbiaceae	Terpenes, esters, aldehyde, phenol, alcohol[52]	*Virechana*[21]	Seed powder
19.	*Priyala* Botanical name- *Buchanania lanzan* Spreng. Family- Anacardiaceae	Fibres, carbohydrates, minerals, fats, vit. B1, B2, B3, vit. C, calcium, chlorine, copper, iron, magnesium, phosphorus, potassium, sodium, fatty oil[53]	*Vrushya*(Aphrodisiac), *Hrudya*(Cordical), Demulcent, Constipative, Nutrient And Nourishing,Blacken The Hair, Skin Diseases[22]	Seed powder and oil
20.	*Rajadan* Botanical name- *Mimusops hexandra* Roxb. Family-Sapotaceae	Novel saponin, phenolic compounds[54]	Nutritive [23]	Seed oil
21.	*Padmaksham* Botanical name- *Euryale ferox* Salisb.	Gallic acid, protocatechuic acid, ethyl esters,B sitosterol, daucosterol[55]	Constipative, *Vrushya*(Aphrodisiac),*Garbha-Sansthapaka* (Promote/ Help Conception),	Seed

Sr. no.	Plant name	Chemical constituents	Therapeutic Uses	Formulation
	Family- Nymphaeaceae		*Balya*, Burning Sensation, *Raktapitta*.[24]	
22.	*Makhannam* Botanical name- *Euryale ferox* Salisb. Family- Nymphaeaceae	Gallic acid, protocatechuic acid, ethyl esters,B sitosterol, daucosterol[56]	*Vrushya*(Aphrodisiac),Nutritive, Tonic[25]	Seed (roasted)
23.	*Dadima* Botanical name- *Punica granatum* Linn. Family- Punicaceae	Diglucosides, cynidin, linolenic acid, triacylglycerols[57]	Nutritive, Tonic[26]	Seed , seed oil
24.	*Bahuvara* Botanical name- *Cordia oblique* Wild syn. Family- Boraginaceae	Betulin, beta sitosterol, alpha amyrin[58]	*Dadru*[27]	Seed powder
25.	*Kataka* Botanical name- *Strychnos potatorum* Linn. Family- Loganiaceae	Alkaloids, flavonoids, glycosides, phenols, sterols[59]	Eye Diseases Like Conjunctivitis, Diabetic Mellitus, Chronic Dysentery[28]	Seed powder
26.	*Vatad* Botanical name- *Prunus amygdalus* Batsch. Family- Rosaceae	Proteins, fatty acids, carbohydrates, fibres, minerals, calcium[60]	*Bruhana*(Nutritive), *Balya* (Tonic), Respiratory And Urinary Track Diseases, Leucorrhoea[29]	Seed powder
27.	*Pilu* Botanical name- *Salvadora persica* Linn. Family- Salvadoraceae	Alpha & beta thujones, camphor, cineole, limonene, borneol[61]	*Aanulomic*, *Vishaghna*, Ulcer And Arthritis[30]	Seed powder and oil
28.	*Akshota* Botanical name- *Juglans regia*	Essential fatty acids, tocopherol, juglone, tannin, phytosterols[62]	Nutritive, Arthritis[31]	Seed powder and oil

Sr. no.	Plant name	Chemical constituents	Therapeutic Uses	Formulation
	Linn. Family- Juglandaceae			
29.	*Amlika* Botanical name- *Tamarindus indica* Linn. Family- Ceasalpiniaceae	Fatty acids- palmitic acid, oleic acid, hydrocarbons, beta sitosterol[63]	*Prameh*(Diabetes Mellitus)[32]	Seed powder
30.	*Vrkrukshamla* Botanical name- *Garcinia indica* Chois. Family- Guttiferae	Fatty acids[64]	Wound Healing For Dry Skin [33]	Seed oil (kokum seed butter)

astringent and bitter in taste, heavy, constipative, aphrodisiac, helps conception/ impregnation. They can be used to cure bleeding disorders, burning sensation.

21. *Makhannam*: Seeds are 8-20 in number, pea sized. If fried on sand, seeds swell and become tasty. Seed powder is similar to arrowroot powder. 100 gm of seeds contain large amount of protein, 12.8% moisture, 76.9% carbohydrates, 0.1% fats, Iron 1.4 mg, and minerals in traces. It is similar in properties to *Padmaksha*.[72] It is highly nutritional, delicious, aphrodisiac, and easy for digestion. It can be given in post-partum weakness, scanty semen.
22. *Bahuvara*: Sebestan fruit or Lisoda is sweet, astringent in taste. Seed kernel powder is pasted and applied on fungal infections.
23. *Dadima*: It is also famous as *Anar* or pomegranate. Sweet variety of *Dadima* is having *Madhura Kashaya, Amla Rasa, Laghu-Snigdha Guna, Anushna Virya, Madhura Vipaka* and it is *Tridosha Shamaka*. Sour variety of *Dadima* is having *Amla Rasa, Laghu Ruksha Guna, Ushna Virya, Amla Vipaka* and its *Vata Kapha Shamaka*. Pomegranate is rich in source like calcium, iron, magnesium, phosphorus, potassium, sodium, zinc and it contains vitamins like Vitamin C, Thiamin, Riboflavin, Niacin, Vitamin B-6, and folate.[73] Seed kernels can cure cardiovascular disorders, anemia, fever, thirst, male infertility, Alzheimer's disease. It also unveils few properties like antioxidant, anti-carcinogenic, and anti-inflammatory properties.
24. *Kataka*: Water clearing nut or *Kataka* has orange black berries containing 2-3, lenticular seeds. Seeds contain oligosaccharide, Alkaloids, flavonoids, glycosides, phenols, sterols. Seed kernel powder along with honey in Diabetes mellitus showed lowering of blood sugar level. Seed kernel powder pasted with water and applied in conjunctivitis. It also showed promising results in chronic dysentery.
25. *Vatad*: Almond is one of the healthy choices for all ages. Its seed kernel is sweet in taste, aphrodisiac, pacifies *pitta* and *vata*, demulcent, hot in potency and therefore not advisable in cases of hemorrhage. It is useful in wasting disease as a nutrient. It can be cooked in milk (*kshirapaka*) and given in respiratory as well as urinary tract diseases, leucorrhoea.
26. *Pilu*: This toothbrush tree has amazing red colored drupe fruits. Numerous seeds with multiple health benefits are embedded inside this fruit. Oil extracted from the seeds is used in ulcers and arthritis.
27. *Akshota*: *Akshota* or walnut has amazing health benefits. This tree has ovate-oblong, hard fruit containing four seeds. These seed kernels are enriched with vitamin A, B,C, Lecithin and other minerals in traces. Therefore they served as complete nutritive & nourishing package for individuals.
28. *Amlika*: Tamarind is one of the prominent ingredients of Indian cuisine. Fruits are pod shaped with soft pulp and 4-6 square seeds. Ash of the seed rind is useful in *Amlapitta* (Acid peptic disease)
29. *Vrukshamla*: Kokum butter tree has rounded, dark violet colored fruit with 5-8 seeds inside. Seed contains abundant fatty acids along with Garcinol. Seed oil or kokum seed butter displays excellent wound healing property in dry skin.
30. *Badar*: Indian jujube or Ber fruit are classified as *Hrudya* (cardiac tonic), *Chhardinigrahana*(anti emetic) as per *Charak samhita*. Seed kernels of Ber fruit are useful in eye diseases and hiccoughs. Animal studies using seed extract showed anticancer potential.

4. CONCLUSION

For centuries, people who eat fruits as a part of an overall healthy diet generally have reduced risk of chronic diseases. The nutrients existing in fruits are vital for the health and maintenance of the body. *Acharya Bhavmishra* has quoted medicinal qualities of various fruits in *Phal varga of Bhavaprakasha nighantu.* Fresh, succulent, juicy, seasonal fruits are always advised for rejuvenation. The said properties of the fruit are applicable also to the rind as well as seed kernel. The present review suggests that plentiful seed kernels or *beej majja* can be recommended for maintaining a healthy life and also to free from various health menaces.

NOTE

The study highlights the efficacy of "Ayurved" which is an ancient tradition, used in some parts of India. This ancient concept should be carefully

evaluated in the light of modern medical science and can be utilized partially if found suitable.

DISCLAIMER

The products used for this research are commonly and predominantly use products in our area of research and country. There is absolutely no conflict of interest between the authors and producers of the products because we do not intend to use these products as an avenue for any litigation but for the advancement of knowledge. Also, the research was not funded by the producing company rather it was funded by personal efforts of the authors.

CONSENT

It is not applicable.

ETHICAL APPROVAL

It is not applicable.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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