



## Review Article

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### THERAPEUTIC SIGNALS OF BILVA (*AEGLE MARMELOS* CORR.) IN BRIHATRAYI: A REVIEW

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**ABSTRACT**

Ayurveda, ancient traditional system of medicine is very rich about holistic knowledge towards health of human being. Brihatrayi comprises three leading texts of Ayurveda i.e. Charaka Samhita, Sushruta Samhita and Ashtanga Hridaya. These texts are excellent compilation of physical ailments and their treatment by using herbal drugs. Bilva is one of them to cure many of the diseases. All parts of the plants are used to cure many different diseases like Atisara, Pravahika, Arsha, Grahani, Gulma, Kasa, Shvasa, Parshwashula, Halimaka etc. There is a thorough description about properties of Bilva in Brihatrayi. Botanically Bilva is recognised as *Aegle marmelos* Corr. In present era, plant's activities on different organ-systems of animals have been proved by different types of experimental studies. These studies strengthen the classical indications of the plant. In this article, the review of indications of Bilva from Brihatrayi in different diseases is discussed.

**Keywords:** Bilva, *Aegle marmelos*, Samhita, Brihatrayi.

**INTRODUCTION**

The history of medicine in India can be traced to the remote past in the Vedic period. The Rigveda, perhaps the oldest repositories of human knowledge having been written about 4500-1600 B.C., claims about 99 medicinal plants. Yajurveda listed 82 plants, various of them already mentioned in Rigveda. Atharvaveda, which is considered important among all four Vedas, deals with 288 plants, almost all have medicinal ingredients and were used to cure deadly diseases. Ayurveda, the science of life is considered Upaveda of Atharvaveda contains a more detailed account of many plants and their uses<sup>1</sup>. Ayurveda, our ancient traditional system of medicine, is very rich in concept of structural, functional and psychological aspect of human being as well as plants, their properties and uses. Among the various Samhitas, Charaka Samhita and Sushruta Samhita are well known to possess many formulations based on plants alone or in combination and salient feature of plants are described<sup>2</sup>. Ashtanga Hridaya is compilation of the two Samhitas. These three; Charaka Samhita, Sushruta Samhita and

Ashtanga Hridaya are collectively termed as trio of the great: Brihatrayi, which are leading texts of Ayurvedic literature. There is a huge collection of herbal drugs with their medicinal properties and uses as well as different formulations. Bilva is one them which is termed as magical plant as all parts of this plant is used to cure different diseases<sup>3,4,5</sup>.

There is a thorough description of Bilva in Vedas, Samhitas, Nighantus and other classical literature of Ayurveda and religious scriptures. The plant is of medicinal as well as religious importance. In Hindu religion, the plant is considered very sacred and the leaves of this plant is being offered to Lord Shiva during worship. It believes that mighty is king, who is strong and thorny like the Bilva tree and peace – showering at the same time<sup>6</sup>.

**Properties of Bilva in Brihatrayi:** In our Ayurvedic classics, Bilva, its properties and uses are described thoroughly for many diseases. There is vast description about Bilva in Brihatrayi. The properties are given in Brihatrayi is mentioned:<sup>3, 4, 5</sup>

**Table 1: List of the properties of Bilva in Brihatrayi**

Charaka Samhita <sup>3</sup>	Sushruta Samhita <sup>4</sup>	Ashtanga Samgraha <sup>5</sup>
Best among Samgrahika (having property to absorb fluid from gastro intestinal tract), Dipaniya (appetisers) and pacifiers of Kapha and Vata dosha (C. Su. 25/40).	Tender young fruit of Bilva pacifies Kapha and Vata, is Tikshna, Snigdha (unctuous), Samgrahika, Katu (bitter), Tikta (pungent), Kashaya (astringent) and Ushnain Virya. In ripe stage, it is sweet in Taste; Guru, Vidahi (causing burning sensation), Vishtambhkrata (difficult to digest), Putimaruta (causing foul smelling flatus) Guna, increasing doshas and has good flavour (S.Su. 46/147).	Bilvaphala, when ripen, is Durjara (difficult to digest), Doshala (aggravates the doshas) and Putimaruta (causes foul smell in the flatus); unripe fruit are Dipana (kindles digestion), mitigates Vata and Kapha; both are Grahi (fluid absorbant). (A. H. Su 6/125).

<p>1. Bilva Patra (leaves) are Vata pacifier. (C. Su. 27/107)</p> <p>2. Ripened fruit is Durjara (digested with difficulty), causes doshas and Putimaruta (causing flatus with foul smell).</p> <p>Apakkva Bilva Phala (Unripened fruit) is Snigdha (unctuous), Ushna, Tikshna, Dipana (appetiser) and alleviates Kapha and Vata. (C. Su. 27/138).</p>	<p>Bilva patra as Shaka is Tikta (bitter) in Rasa, Ushna in Virya and pacifies Vata dosha. (S. Su. 46/254).</p>	
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#### Ayurvedic Properties<sup>7</sup>

Guna : Laghu, Ruksha  
 Rasa : Kashaya, Tikta  
 Virya : Ushna  
 Vipaka : Katu  
 Doshakarma: Kapha-Vata shamaka

**Therapeutic Indication:** Almost all the plant part of the tree is used in different formulations i.e. Phala (fruit), Patra (leaves), Chhala (bark) and Mula (root); to cure different diseases. Different parts of it consists different properties and therapeutic value. All the three Samhitas mentioned its uses in almost same diseases.

**Charaka Samhita:** In Charaka Samhita, Bilva is used in Atisara (loose stool), Pravahika (dysentery), Shoth (generalised or localised swelling), Gulma (localised gas in abdominal region), Arsha ( haemorrhoids), Grahani (irritable bowel syndrome), Pandu (anaemia), Shvasa (respiratory disorders), Hikka (hiccough), Kasa (cough), Parshwashula (pain in chest bilaterally), Hritshula (cardiac problems), Udara (disorders of GI tract), Halimaka (a type of jaundice), Vataroga (nervine disorder) etc. These indications are listed below as per its formulation:<sup>3</sup>

**Table 2: List of the formulations and indications of Bilva in Charaka Samhita<sup>3</sup>**

Sr. No.	Formulation	Name of formulation	Diseases	Reference
1.	Bala bilva		Kaphaja Atisara	C. Chi. 19/114
2.	Yavagu /peya		Pachani, Grahi, Pitta- shleshmatisara	C. Su. 2/19-20
			Jvaratisara	C. Chi. 3/182
			Shvayathu, Atisara	C. Chi. 12/60-61
		Jivantyadi yavagu	Shvayathu, Atisara, Vataja gulma, Shopha, Hridroga, Mandagni	
			Shushkarsha	C. Chi. 14/89-90
			Raktarsha	C. Chi. 14/200
			Kasa, Shvasa, Hikka	C. Chi. 18/77
			Grahani, Arsha, Atisara, Gulma, Pliha	C. Chi. 15/ 113
3.	Mahakashaya		Arshoghna	C. Su. 4/11 (12)
			Asthapanopaga	C. Su.4/26
			Anuvasanopaga	C. Su.4/27
			Shvayathuhara	C. Su.4/38
4.	Nasya	Anu taila	Shiroroga	C. Su. 5/63-70
		Tvagadi tail	Shiroroga	C. Chi 26/184-185
		Baladi ghrita	Murdhagata vata vikara	C. Chi. 28/ 123
5.	Ksheera paka		Jvara parikartika	C. Chi. 3/ 235
6.	Pramathya		Madhya dosha Atisara	C. Chi. 19/20
7.	Churna/ kalka		Atisara in Rajayakshma	C. Chi. 8/ 126-127
			Pittaja atisara	C. Chi. 19/52
			Kaphaja atisara	C. Chi.19/109-110
		Nagaradya Churna	Pittaj grahni, Arsha, Gudashula, Prvahika	C. Chi.15/129-131
			Aam mala	C. Chi. 15/100
		Tryaushanadya Churna	Arsha, Grahanidosha, Shula, Anaha	C. Chi. 14/62-64
		Along with Kapittha and Sura; Shunthi churna	Shushkarsha	C. Chi.14/ 69-70
		Along with Lajjalu and Mocharasa	Urustambha	C. Chi. 27/29
		Pushyanuga churna	Yoni dosha, Rajodosh, Raktarsha, Raktatisara	C. Chi. 30/90-95
			Shula in Raktarsha	C. Chi. 14/195
8.	Kwatha		Kaphaja atisara	C. Chi. 19/104
9.	Basti	Asthapana basti	Udavarta, Vibandha	C. Su. 2/ 11
		Anuvasana basti	Pittaja atisara	C. Chi. 19/62
			Kaphaja atisara	C. Chi. 19/119
		Pippalyadi anuvasana basti	Mudhavata in Arsha	C. Chi.14/131-134
		Pichchha basti	Kaphaja atisara	C. Chi. 19/117
		Dashmuladi basti	Guda -bhramsha, Atisara	C. Chi. 19/45
	Patoladi basti	Kaphaja roga, Mandagni	C. Si. 3/58	
10.	As pathya		Kaphaja Gulma	C. Chi. 5/164-166
			Shushkarsha	C. Chi. 14/93
			Kasa	C. Chi.18/109-110

11.	Kshara	Kshara gudika	Svayathu, Pliha, Udararoga, Shvitra, Halimaka, Arsha, Pandu, Arochaka, Shosha, Shopha, Visuchika, Gulma, Gara visha, Ashmari, Shvasa, Kasa, Kushtha	C. Chi. 12/43-46
		Panchama kshara	Grahani dosha	C. Chi.15/ 188-193
		Bilva kshara siddha tail	Parshwashula in Udararoga	C. Chi. 13/169
12.	Kwatha	Bilva Kwatha svedana	Arsha	C. Chi. 14/47
13.	Ghrita	Chavyadi ghrita	Pravahika, Gudabhrmsha, Mutrakrichchhra, Gudasrava, Gudashula, Vankshanashula.	C. Chi.14/107-109
		Nagaradya ghrita	Arsha, Grahani dosha, Mutrakrichchhra, Pravahika, Gudabhrmsha, Anaha.	C. Chi.14/110-112
		Hriberadya ghrita	Arsha, Atisara, Grahani dosha, Pandu, Aruchi, Jvara, Mutrakrichchhra, Pravahika, Gudabhrmsha, Anaha.	C. Chi.14/230-233
		Sunishannaka-changeri ghrita	Arsha, Atisara, Raktsrava, Pravahana, Gudabhrmsha, Pichhasrava.	C. Chi.14/240-242
		Tryaushanadi ghrita	Mandagni	C. Chi. 15/87
		Vyoshadya ghrita	Pandu	C. Chi.15/119-120
		Tejovatyadi ghrita	Hikka, Shvasa, Shotha, Arsha, Grahani, Hritshula, Parshwaruja.	C. Chi.17/141-144
		Dashamuladi ghrita	Vata-kaphaj Shvasa	C. Chi.18/123-124
14.	Kalka		Kaphaj Pandu, Kamala	C. Chi. 16/59
15.	Yusha	Nidigdhikadi yoga	Shvasa- Hikka	C. Chi. 17/94-95
16.	Tail	Punarnavadi tail	Vataj Hridaya roga	C. Chi. 26/82
		Yavadi tail	Vata roga	C. Chi. 28/140
		Mulakadya tail	Vata roga	C. Chi. 28/167-169
		Mulaka tail	Vata roga	C. Chi. 28/172-175
		Amritadya tail	Pana, nasya, abhyanga and basti in Vatarakta	C. Chi. 29/103-109
17.	Dhoomvarti	Shatahvadi dhoomvarti	Vataja pinasa roga	C. Chi. 26/ 135
18.	Varti	Amritahvadi varti	Sannipataj netra roga	C. Chi. 26/242-245
19.	Lepa		Urustambha	C. Chi. 27/ 56-57
		Anjanadi lepa	Stana roga	C. Chi. 30/266
20.	Vamana kalp	Along with Ikshvaku	Kaphaja jvara, Kasa, Kantha roga	C. Ka. 3/15
21.	Virechana kalpa	Along with Aragvadha	Virechana	C. Ka. 8/11
		Along with Sudha	Virechana	C. Ka. 10/10

**SUSHRUTA SAMHITA:** Sushruta Samhita is mainly a surgical treatise but it has also to deal with several complications arising during the course of treatment of surgical diseases. He also describes a huge number of plants and their medicinal uses. He described Bilva in following indications:<sup>4</sup>

**Table 3: List of the formulation and indication of Bilva in Sushruta Samhita<sup>4</sup>**

Sr. no.	Formulations	Name of formulation	Diseases	Reference
1.	Bilva peshika		Pakvatisara	S. Su. 38/45-46
2.	Yavagu/peya		Leenagarbha	S. Sha. 10/62
			Atisara	S. Utt. 40/91
3.	Siddha dugdha		Ashtam masa masanumasika chikitsa	S. Sha. 10/67
		Along with Vrishcheera and Varshabhu	Jvara	S. Utt. 39/202
4.	Upanaha		Vatapradhana Vatarakta	S. Chi. 5/7
5.	Taila	Bilvadi Taila	Shodhana, Purana, Ropana in Nadivrana	S. Chi. 17/19, 27, 28
			Karna badhirya	S. Utt. 21/35
			Vatashleshma atisara	S. Utt. 40/57
			Pravahika	S. Utt. 40/145
6.	Kwatha	Prakshalana	Upadamsha	S. Chi. 19/42-44
		Snana	Ayurvedhaka rasayana	S. Chi. 28/10-12
		Parisheka	Skandapasmar, Mukhamandika, Naigamesha, Sheeta putana	S. Utt. 29/3; 35/3; 36/3.
			Amatisara	S. Utt. 40/35-46
			Pittamatisara	S. Utt. 40/63
			Samapittatisara	S. Utt. 40/67
			Pittatisara	S. Utt. 40/68
		Abhyanga	Madyaja Trishna	S. Utt. 47/52
			Amaja Trishna	S. Utt. 48/ 30
		7.	Lepa	
8.	Churna		Ayurvedhaka rasayana	S. Chi. 28/10-12
			Medha vardhaka rasayana	S. Chi. 28/17
			Amatisara	S. Utt. 40/48
			Pakvatisara	S. Utt. 40/74
9.	Anuvasana basti		Mudhavata, Arsha, Grahani, Anah, Visham Jvara, Koshthagata Vata.	S. Chi. 37/8-10
			Gulm, Anaha, Agnimandya, Grahini, Mutravarodha.	S. Chi. 37/11-14
			Vata dosh	S. Chi. 37/46
		Tailanuvasana basti	Vatajatisara	S. Utt. 40/110

10.	Asthapana basti	Guduchyadi basti	Increase Bala, Vrna, Utsah, Shakti, Agni and Prana, Vata roga.	S. Chi. 38/47-49
		Bhadradi basti	Kamala, Pandu, Prameha, Medasvi, Agimandya, Kapha roga, Galaganda, Shlipada etc.	S. Chi. 38/60-63
		Dashmuladi basti	Pandu, Alasya, Mutra- Vatavarodha, Ama, Atopa, Apachi, Krimi etc.	S. Chi. 38/64-66
		Vrishadi basti	Sannipataj roga, Gridhrasi, Sharakara, Ashthila, Tuni, Gulma.	S. Chi. 38/ 67-70
11.	Patra svedana		Shleshma Abhishyanda	S. Utt. 11/5-6
12.	Nadi svedana		Karna shula	S. Utt. 21/6
13.	Anjana prayoga		Rakta Abhishyand	S. Utt. 12/11-12
14.	Ghrita	Panchakola ghrita	Vishama jvara	S. Utt. 39/218
			Sannipatatisara	S. Utt. 40/78
		Dwipanchamuli ghrita	Rajayakshama	S. Utt. 41/48-50
		Sauvarchaladi ghrita	Shvasa	S. Utt. 51/17
		Talishadi ghrita	Shvasa	S. Utt. 51/27-29
15.	Stambhana yoga		Pakvatisara	S. Utt. 40/71
16.	Bala bilva		Raktatisara	S. Utt. 40/125
17.	Bilvadiyoga		Pitta-raktatisara	S. Utt. 40/127
18.	Swinna bilva phala		Saphenatisara	S. Utt. 40/133
19.	Vidadi yoga		Malakshaya	S. Utt. 40/138

**ASHTANGA HRIDAYA:** This is the third treatise of the Brihatrayi. Ashtanga Hridaya follows Charaka Samhita and Sushruta Samhita regarding to its text. In this treatise, Bilva is used to cure in the following diseases:<sup>5</sup>

**Table 4: List of the formulations and indications of Bilva in Ashtanga Hridaya<sup>5</sup>**

Sr. no.	Formulation	Name of formulation	Diseases	Reference
1.	Gana	Varunadi	Medoroga, Mandagni, Adhyavata, Shirahshula, Gulma, Vidradhi.	A. H. Su. 15/21-22
		Ambashthadi	Pakvatisara, Sandhaniya, Vrana ropana.	A. H. Su. 15/38-39
2.	Dhooma	Mridu dhoom	Kasa, Shvasa, Pinasa, Karna srava, Akshirava, Tandra.	A. H. Su. 21./13-15
3.	Bala bilva	Along with Tila and Masha	Linagarbha chikitsa	A. H. Sha. 2/ 19
			Masanumasika yoga in 8 <sup>th</sup> month	A. H. Sha. 2/58
4.	Peya		Jwaratisara	A. H. Chi. 1/27-28
			Kapha – pitta atisara	A. H. Chi.9/13-14
			Pakvatisara	A. H. Chi.9/23
		Along with Hreebera, Dhataki pushpa and Duralabha	Raktapitta	A. H. Chi. 1/16-18
			Vataja Kasa, Kati-hrit-parshva-koshtha shula, Shvasa, Hikka	A. H. Chi. 3/20-21
		Deepan along with Patha, Karavi, Panchkola, Tumburu.	Dipana in Arsha	A. H. Chi. 8/ 50-51
			Kapha – pitta atisara	A. H. Chi.9/13-14
			Shopha, Atisara, Hridroga, Gulma, Arsha, Alpagni.	A. H. Chi.17/20-21
			Pakvatisara	A. H. Chi.9/23
5.	Yusha		Shvasa, Hikka	A. H. Chi. 4/20-22
			Pravahika	A. H. Chi.9/29
6.	Ghrita	Pippalyadi ghrita	Jvara, Agni vaishmya, Halimaka, Aruchi, Ansatapa (Burning sensation in shoulders), Vamathu, Parshvaruja and Shiroruja, Kshaya	A. H. Chi. 1/ 90-91
		Tejovatyadi ghrita	Vata localised in extremities, Arsha, Grahani, Hikka, Hrit-Parshwa Vedana	A. H. Chi. 4/52-55
			Arsha, Atisara, Grahani, Pandu, Jvara, Mutrakrachchhra, Gudabhramsha, Basti- Anaha, Pichhasrava	A.H.Chi.8/130-133
			Vata-Kaphaj Kasa	A. H. Chi. 3/56
			Mrittikabhakshanajanyaroga	A.H. Chi. 16/36-37
			Shopha, Arsh, Gulma	A. H. Chi. 17/12
		Tilvakadi ghrita	Vata in one part of body or whole body, Yonivyapad, Gulma, Vardhmudara	A.H.Chi. 21/32-33
7.	Ksheera	Siddha dugdha	Jvara, Shopha	A. H. Chi. 1/ 115
8.	Anuvasana basti		Jvara	A.H.Chi.1/123-124
			Mudhavata in Arsh, Mutkrichra, Pravahika, Kati-uru- prishtha daurbalya, Anaha, Pichchhasrava	A. H. Chi. 8/89-90
			Atisara	A. H. Chi.9/119
9.	Leha	Vashishtha haritaki	Kasa	A. H. Chi. 133-140
		Kutajavaleha	Sarvarsha, Grahanidosha, Shwasa, Kasa	A.H.Chi.8/108-111
			Sashula Pravahika	A. H. Chi.9/35

10.	Kwatha		Shwasa, Hikka	A. H. Chi. 4/24	
			Madhya and alpa dosha atisara	A. H. Chi. 9/6-7	
			Pittaja atisara	A. H. Chi.9/58	
			Pittaja atisara	A. H. Chi.9/62-63	
			Kapaja atisara	A. H. Chi.9/104	
11.	Nasya pan and basti		Hridroga	A. H. Chi. 6/27	
12.	Taila	Abhyanga with Bilva mula taila	Arsha	A. H. Chi. 8/15	
13.	Takra tarpana	Along with Kapittha	Arsha	A. H. Chi. 8/35	
			Arsha	A. H. Chi. 8/161	
14.	Churna		Raktarsha	A.H.Chi.8/115-116	
			Kaphaja atisara	A. H. Chi.9/109	
			Along with Chitraka and Nagara	Aama mala associated with vata & shleshma and shula	A. H. Chi. 10/ 10
			Nagaradi churna	Paittika grahani, Pravahika, Arsha, Gudaroga	A. H. Chi.10/39-40
			Kapitthashtaka churna	Atisara, Grahani, Kshaya, Gulma, Kasa, Shwasa, Arsha	A. H. Chi.9/111
15.	Kalka		Pravahika	A. H. Chi.9/25	
			Pravahika	A. H. Chi.9/27	
16.	Bilva kshara taila		Parshva shula, Upastambha, Hridgraha	A. H. Chi. 15/45	
17.	Pathya	Bilva siddha matsya	Localised Vata in umbilical region	A. H. Chi. 21/15	
18.	Nasya	Along with Bala and Godugdha	Shirogata Vata	A. H. Chi. 21/62	

Table 5: List of pharmacological activity of *Aegle marmelos* Corr.

Sr. no.	Pharmacological activity	Research work
1.	Anti-diarrhoeal/ dysenteric property	The ethanolic extract of dried fruit pulp of <i>Aegle marmelos</i> was found effective against all tested intestinal pathogens. The inhibition of microbial growth at concentration as low as 250 micro gram / ml indicates the potent antimicrobial activity of this extract and maximum inhibition is observed with <i>Shigella sonnei</i> . <sup>11</sup>
2.	Anti-inflammatory, Antipyretic and analgesic activity	The result of the study confirmed the traditional claims suggested for <i>Aegle marmelos</i> (V. Arul et.al.) All the extracts of leaves of <i>Aegle marmelos</i> were found to significantly inhibit the carrageenan induced rat paw oedema, a test, which has significant predictive value for anti- inflammatory agents acting by inhibiting the mediators of acute inflammation <sup>12</sup> . All the extracts derived from the leaves of <i>Aegle marmelos</i> exhibited analgesic activity in mice, by inhibiting the acetic acid- induced writhing; which is a model of visceral pain <sup>12</sup> . In addition, all the extracts derived from the leaves of <i>Aegle marmelos</i> showed anti-pyretic activity in mice made hyper thermic by dried yeast infection <sup>12</sup> .
3.	Anti-microbial property	1.The anti-biogram analysis showed that zone of inhibition was observed 19 mm against <i>S. aureus</i> for ethyl acetate extract. The MIC value is obtained 1.98 mg/ml in ethanolic and ethyl acetate extract of fruits against <i>S. aureus</i> and 11.90 mg/ml in methanolic extract against <i>P. aeruginosa</i> . The antibacterial compound mainly found in <i>Aegle marmelos</i> were tannins, phlobatannins, saponins, terpenoids, alkaloids and poly phenols <sup>13</sup> . 2.All plant extracts were found to show antibacterial activity against test bacterial stains and variability in activity were also found in fruit, leaf and stem extracts in different solvents. The study is done on <i>Escherichia coli</i> MTCC1652, <i>Pseudomonas aeruginosa</i> MTCC 647, <i>Bacillus subtilis</i> MTCC 441, <i>Salmonella typhi</i> MTCC733 <sup>14</sup> . 3.The <i>in vitro</i> anti-helminthiasis was analysed against the goat intestinal parasite. The result showed that <i>Aegle marmelos</i> and Aegeline treated parasite. The study is done on <i>Teania solium</i> <sup>15</sup> .
4.	Anti-spasmodic effect	<i>Aegle marmelos</i> extract possesses the maximum amount of antispasmodic activity. The study is done on smooth muscle contraction, especially in tubular organs of gastrointestinal tract of chicken of both sex <sup>15</sup> .
5.	Anti-diabetic Activity	The study indicates that 75% methanolic extract of <i>Aegle marmelos</i> (100 mg/kg b. wt.) significantly decrease glucose level in hyperglycaemic animal. Male wistar strain rats were used for the study <sup>16</sup> .
6.	Anxiolytic and antidepressant property	Methanol extract of <i>Aegle marmelos</i> shows significant anxiolytic and antidepressant activities possibly by increasing monoamine levels at post synaptic sites. Albino mice were taken for the experiment <sup>17</sup> .
7.	Cardioprotective	The high dose of <i>Aegle marmelos</i> leaves extract (AMLE 500mg/kg) possess good cardioprotective activity against Isoproterenol (ISO) induced myocardial necrosis in rats but the low dose of AMLE (100mg/kg) failed to show significant cardio-protection <sup>18</sup> .
8.	Respiratory infection	Activation of histamine receptor is essential for allergic and asthmatic manifestation <sup>19</sup> . The alcoholic extract of Bael leaves antagonized the histamine-induced contraction and demonstrated positive relaxant effect in isolated guinea pig ileum and tracheal chain, suggesting inhibition of H <sub>1</sub> -receptor activity by this extract may underline these effect <sup>20</sup> .

**Botanical Description of Bilva:** In modern science of plant systematics, Bilva is recognised as *Aegle marmelos* Corr. and give the identification characteristics of the plant as given below:<sup>8</sup>

Botanical name: *Aegle marmelos* (Linn.) Correa  
Family: Rutaceae

Habitat: A moderate-sized tree, growing wild throughout the deciduous forests of India ascending up to an altitude, 1200 m in the western Himalayas and also in Andaman Islands.

Habit: A small or medium sized deciduous tree armed with straight sharp axillary thorns, 2.5 cm. long. **Leaves:** Leaves alternate, 3-foliolate, rarely 5-foliolate; petiole 2.5-6.3 cm. long, terete. Leaflets 5-10 by 2.5-6.3 cm., ovate or abovate-

lanceolate, crenate, acuminate, membranous, pellucid-punctate, the lateral opposite, subsessile, the terminal long-petioled. **Flowers:** Flowers greenish white, sweet-scented, about 2.5 cm. across, 2-sexual, in short axillary panicles. **Calyx:** Calyx flat, pubescent, 4-lobed; lobes rounded, sometimes obscure. **Petals:** Petals 4, spreading, oblong, thick, gland-dotted, much exceeding the sepals, imbricate. **Stamens:** Stamens numerous; anthers elongate, apiculate; filaments free or fascicled, inserted round an inconspicuous disc. **Ovary:** Ovary ovoid, cells 10-20; style terminal, short, deciduous; stigma capitate; ovules numerous, 2-seriate. **Fruit:** Fruit 5-18 cm. diam., globose, grey or yellowish, rind woody. **Seed:** Seed numerous, oblong, compressed, with a woolly mucous testa, embedded in orange-coloured sweet pulp.

**Chemical Constituent:** as per researches, there are many chemical constituents which are investigated through the extracts of different parts in different medium. Some are minor and some are major. These can be listed as:<sup>9</sup>

Major:  $\gamma$  – Fagarine, marmesin, mermesinine, marmin, umbelliferone.

Minor: Aeglin, Aeglinol, Aurapten, Lupeol, Chloromarmine<sup>9</sup>.

Leaf contains Skimmianine, Aegeline, Lupeol, Cineol, Citral, Citronella, Cuminaldehyde, Eugenol, Marmesinine; in **bark**, Skimmianine, Fagarine, Marmin; in **fruit** Marmelosin, Luvangelin, Aurapten, Psoralen, Marmelide, Tannin<sup>10</sup>.

## DISCUSSION

Since ages, plants have remained important sources of medicines in our country, which is evidenced through their uses in traditional system of medicine i. e. Ayurveda, Siddha, Unani, Homeopathy and Chinese (Mukherjee, 2010). The earliest documentation about the usage of plant remedies comes from India as evident from Rigveda (4500-1600 B.C.H.) where Aoushadhi Sukta includes a good number of plants for various ailments. Realizing the importance of medicinal plants as a natural source of newer medicines, now the world is moving towards the plant based medicine or phytomedicines that repair and strengthens bodily systems and help to destroy offending pathogens without toxic side effects. Owing to various side effects of allopathic/synthetic medicine, plant based medicines are gaining popularity in world market as a whole.

In this article, the properties and medicinal uses of Bilva (*Aegle marmelos* Corr.) have been explored as the plant is used since very ancient time to cure the diseases. The plant and its different parts are used in the form of different formulations like Kwatha (decoction), Kalka (paste), Churna (powder), Peya, Yavagu, Leha, Ghrita, Basti etc. as mentioned in Brihattryi. It is used to cure many diseases like Atisara (diarrhoea), Pravahika (dysentery), Shoth (generalised or localised swelling), Gulma (localised gas), Arsha (haemorrhoids), Grahani (irritable bowel syndrome), Pandu (anaemia), Shvasa (respiratory disorders), Hikka (hiccup), Kasa (cough), Parshvashula (pain in chest bilaterally), Hritshula (cardiac problems), Udararoga (disorders of g. i. tract), Halimaka (a type of jaundice), Vataroga (nervine disorder) etc. which are proved by animal experimental studies done by different scholars mentioned in the article. Approximate all the medicinal uses are proven by the animal experimentation and evidences. The therapeutic use of plant shows significant effect on multiorgan system without any adverse effects. Thus, the plant and its various formulations can be used to cure the mentioned diseases, without any hazardous effect on health. However, there is need of future researches for tremendous work of herbal drugs to make their use efficient and effective.

## CONCLUSION

Bilva (*Aegle marmelos* Corr.) is a plant with very high therapeutic value since Vedic period. The present review of Bilva from Brihattryi (i.e. Charaka Samhita, Sushruta Samhita and Ashtanga Hridaya) can be useful to know about the different formulations and indication of it, in which every part of this plant has been used. In this way, we can use Bilva to cure different ailments. In this regard, further studies are needed to carry out to explore other useful aspects of this for its therapeutic potential in preventing and curing the diseases.

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