

A CONCEPTUAL AYURVEDIC STUDY ON DASHMOOLA TAILA AND YAVA  
KSHARADr. Chandan Lal Mehta<sup>\*1</sup>, Dr. Parikshit Shirode<sup>2</sup>, Dr. Ankit Kumar<sup>3</sup> and Dr. Sujit Kumar<sup>4</sup><sup>1,3,4</sup>PG Scholar, Department of Shalya Tantra, Parul Institute of Ayurveda, Vadodara, Gujarat.<sup>2</sup>Professor, Department of Shalya Tantra, Parul Institute of Ayurveda, Vadodara, Gujarat.**\*Corresponding Author: Dr. Chandan Lal Mehta**

PG Scholar, Department of Shalya Tantra, Parul Institute of Ayurveda, Vadodara, Gujarat.

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**ABSTRACT**

India has very rich biodiversity. There are about 47,000 species of plants reported from India. Ayurvedic Pharmacopoeia of India (API) (Anonymous, 1990), *Dashamoola* formulation is believed to have the potential for providing relief from inflammation. The plants used in the preparation of formulation are divided into two categories viz. *Brihatpanchamoola* and *Laghupanchamoola*. *Brihatpanchamoola* category. *Ksharkarma* is the treatment having more effective which was proved. *Yava-kshar* as a kshar ingredient by using *Yava-kshar Pratisaran*, But for *Pratisaran* of *Kshar*, intervention of doctor is necessary and compulsory.

**KEYWORDS:** Herbal Medicine, Dashmoola Plants, Yava Kshara.**1. INTRODUCTION****Traditional Medicine**

According to Wambebe (1990), approximately 80% of the world's population depends wholly or partially on traditional medicine for its primary healthcare needs. There are some communities, which solely rely on traditional medicines. Despite many allopathic medical facilities being made available by Government hospitals and health centres, most of the people still depend only on traditional medical practitioners. This might be due to easy accessibility and being cheap. It is also said that 72.19% of the population of India resides in villages (Anonymous, 2011). Generally, it is observed that tribes live in deep forests, which are sometimes inaccessible. Such tribes have developed very first knowledge by sheer necessity, observation and experimentation that has been perpetuating from generation to generation. This process is going on over the ages (Maheshwari, 1983).

**Ayurveda**

Ayurveda, a system of Indian traditional medicine, is being practiced for over 5000 years (Garodia et al., 2007). Ayurveda mainly focuses on use of plant-based medicines for treatment of various disorders (Parasuraman et al., 2014).

*Dashamoola* is one of the most commonly used combinations of herbs in Ayurveda. It has been praised for its potent *Vata* alleviating properties, which in turn are useful in many of the disorders from simple

inflammatory conditions to chronic degenerative problems (Anonymous, 2003; Dawane et al., 2012a).

**2. MATERIAL AND METHODOLOGY**

**Source of Data:** Materials related to Mootrakruhha and other topics have been collected from different journals, Ayurvedic and Modern text books, Authentic websites (PubMed, Drug Bank, NCBI, Medicinal Plants websites like CIMAP, CDRI etc.), Reputed Magazines, Authentic literatures, Manuscripts, Sanskrit Dictionary etc.

### 3. Drug review of dashmoola taila and yava kshara

#### Yava kshara

#### Synonyms

*	<b>Sanskrit:</b>	Paakya, Kshar, Yavakshar, Yavagraj, Darulawan.
*	<b>Hindi:</b>	Javakhar, Javaakhar, khar.
*	<b>English:</b>	Impure or fractions carbonate of potash, Impure potash carbonate, potash carbonate impure, salt of Tartar, Potash, Pearl Ash.
*	<b>Marathi:</b>	Javaakhar.
*	<b>Bangali:</b>	Yavakshar.
*	<b>Gujrati:</b>	Javakhar, Kharo.
*	<b>Tamil:</b>	Maravappu
*	<b>Telgu:</b>	Manuvappu
*	<b>Malayalam:</b>	Karam
*	<b>Kannad:</b>	Marada vappu
*	<b>Latin:</b>	Potasil Carbonas

It is found in all three kingdoms of Nature. In the Vegetable kingdom it is found either as carbonate of potash or as potash in combination with other organic acids.

Plants absorb it from the soil and when incinerated their ashes give Yavakshara. Succulent plants contain a large

proportion of it than the woody parts.

“Impure potassium carbonate” has been known from very ancient time. Its principle source in India is wood ashes because potash is an indispensable element for the growth of most plants.

**The under mentioned woods yield on the average, for 1000 parts, the following quantities potash.**

*	Pine – 0.45	*	Beech – 1.45
*	Vak – 1.53	*	Witlow – 2.85
*	Wheat straw – 3.9	*	Barley straw – 5.80
*	Vine wood 5.50	*	Stem of Maize – 6.50
*	Sunflower steam 20.00	*	Dried wheat plant Previous to blooming, 47.00

In the **mineral kingdom** it is obtained from rocks where it exists as sulphates, nitrates, carbonates and silicates. It is also found in the felspar of granite. It is obtained by fusing rock salt. It is an ingredient of various mineral waters. of the **animal kingdom** it is an essential constituent. It is found in the milk, flesh and urine of persons who take citrate or tartrate of potassium. The preparation of potash from vegetable matter is affected in three operations viz.

1. The lixiviation of the ash.
2. The boiling down of the crude liquor.
- 3) The calcination of the crude potash. (“Industry” Calcutta, April 1942, P-12).

It is prepared by reducing the ashes the green spikes of the barley, dissolving the ashes in water, straining the solution through thick cloth and evaporating it over the fire. The resulting salt is a clear amorphous powder with a satine and partly acid taste. Chemically it is carbonate of potash with some impurities.

#### Properties

*	<b>Rasa:</b>	Katu
*	<b>Guna:</b>	Laghu, Snigdha, Sukshma, Sara
*	<b>Veerya:</b>	Ushna
*	<b>Vipaka:</b>	Katu

#### Preparation of Yava Kshar

Yava sown in land and yava was cultivated. It was grown fully approximately in 3 months. Then the soil was irrigated upto 8 days. After that the plants were pulled out along with roots. Plants were dried completely in sunlight in few days. The ash was obtained by burning the all dried yava plants. Then according to kshar Nirmanvidhi, which was described in Sushrut Samhita, 107 that ash was dissolved in 6 times of water and maintained for one day. Next day that water was filtered by 12 folded fine cloth. The filtered water had appearance and smell like a cows urine. The filtered water was evaporated completely by heating it. Lastly the whitish yava kshar was obtained at bottom of container.

#### Actions

Agnideepan, Lekhan etc.

It is used in urinary diseases, uric acid diathesis, leading to gout and rheumatism, uterine irritability, piles, shoola (colic), cardialgia, acid eructation, dyspepsia, enlargement of lymphatic and secreting glands as the breasts, testicles, mesenteric and scrofulous glands, also the liver, spleen and salivary glands.

A decoction of chebulic myrobalans and Rohitaka bark (Amoor rohitaka) is given with the addition of carbonate

of potash and long pepper in enlarged spleen and liver and in tumours in abdomen called Gulma (Sharangdhara). In Strangury of painful micturation, carbonate of potash with sugar is considered a very efficacious remedy. Carbonate of potash is given to persons who are gluttonous in eating and drinking. It is useful in dropsy.

### Dashamoola

According to the Ayurvedic Pharmacopoeia of India (API) (Anonymous, 1990), *Dashamoola* formulation is believed to have the potential for providing relief from inflammation. It is mentioned under *Shothahara* (anti-inflammatory) and *Vata hara* drugs (Sharma, 1983). *Dashamoola* formulations are mainly used for *Vatavyadhi*. This combination is used as a standard Ayurvedic therapy for inflammatory disorders and to reduce pain and fever associated with inflammation (Dawane et al., 2012a). The plants used in the preparation of formulation are divided into two categories viz. *Brihatpanchamoola* and *Laghupanchamoola*. *Brihatpanchamoola* category includes 5 tree species namely, *Aegle marmelos* (L.) Corr., *Premna obtusifolia* R. Br., *Gmelina arborea* Roxb., *Oroxylum indicum* Vent. and *Stereospermum colais* Mabb. *Laghupanchamoola* category includes 5 herb species namely, *Desmodium gangeticum* (L.) DC., *Solanum anguivi* Lam., *Solanum virginianum* L., *Tribulus terrestris* L. and *Uraria picta* (Jacq.) Desv. ex DC.

### Dashamoola plants

#### 1.1 *Aegle marmelos* (L.) Corr. Family: Rutaceae.

**Vernacular names:** Bael, Vael (A); Bela, Bilva (B); Bael, Bengal Quince, Golden apple (E); Bilivaphal, Bill, Bilum (G); Bael, Sirphal (H); Bilva, Bilvapatre, Byaalada hannu (Ka); Koovalam, Kuvalam, Vilvam (M); Baela, Bel, Vel (Mt); Bela (O); Bil (P); Bilvam, Sirphala (S); Bilva, Kuvilam, Vilvam (T); Bilva, Maredi (Tu), Bel (U).

**Habitat:** Common throughout in dry deciduous forests and also planted.

**Description:** It is a small to moderate-sized tree with branches armed with strong axillary spine 1-3 cm long. Bark dark grey, slightly corky; leaves alternate, 3-foliolate, rarely 5-foliolate. Flowers greenish-white, sweet scented. Fruits globose, grey or yellowish, shell woody. Seeds numerous, ablong, compressed, with a woolly mucous testa, embedded in a clear mucilage and a mass of yellow or orange-coloured sweet aromatic mealy pulp.

**Flowering and fruiting:** April – November.

**Distribution:** Globally, this species is distributed in the Indo-Malesian region, India, Myanmar and Sri Lanka. Widely cultivated in southeast Asia, Malaysia and tropical Africa. In India, it is reported to occur

commonly throughout from coastal belt to subtropical western Himalayas, Sub-Himalayan tracts.

**References:** Oommen et al., 2000; Ravikumar and Ved, 2000; Singh and Karthikeyan, 2001.

#### 1.2 *Desmodium gangeticum* (L.) DC.

**Family:** Fabaceae.

**Vernacular names:** Salparni (B); Salwan (G); Salaparni, Sarivan (H); Kolakunaaru, Murelchonne (Ka); Moovila, Orila, Pullati (M); Salparni, Salwan (Mt); Saloporni (O); Shalparni (P); Amsumati, Salaparni, Sthira, Vidarigandha (S); Moovilai, Orila, Pullati (T); Gitanaram, Kolakuponna, Kolaponna, Nakkotokaponna (Tu).

**Habitat:** Common throughout in deciduous forests and also in open situations.

**Description:** Erect undershrubs, branches angled, grooved, sparsely pubescent. Leaves unifoliate, membranous, rounded at base, margin entire, softly pubescent beneath and lesser above. Flowers deep violet or white in axillary and terminal panicles. Pods linear, lower margin deeply undulate, pubescent with hooked hairs. Seeds flattened.

**Flowering and fruiting:** March – November.

**Distribution:** Global distribution of the species is recorded from the tropical regions of Africa, Asia and Australia. It is a shrub, found commonly in deciduous forests and teak plantations, as an under growth. In India, it is found in Kerala, Karnataka, West Bengal, Gujarat, Orissa, Manipur, etc.

**References:** Oommen et al., 2000; Ravikumar and Ved, 2000; Singh et al., 2001.

#### 1.3 *Gmelina arborea* Roxb.

**Family:** Verbenaceae

**Vernacular names:** Gamari (A); Gambhar, Gamar (B); Candhar Tree (E); Shivan (G); Gumbhar, Khambhari, Kumbhar (H); Kashmiri, Kulimavu, Shivani, Shivanigida (Ka); Kashmari (Ks); Kumil, Kumizhu, Kumpil (M); Gamar, Shewan, Shivan (Mt); Gambhari (O); Gumhar, Kumhar (P); Gambhari, Kasmari, Kasmarya (S); Gumadi, Kumil, Kumishan, Kumizhan (T); Gummadi, Gummudu, Peggummadi, Peggummudu (Tu).

**Habitat:** Common in deciduous forests and also under plantation.

**Description:** A large or moderate-sized deciduous tree. Identified by light grey bark, smooth and even grained. Leaves broad, ovate, acuminate with cordate base and 2 to 4 shining prominent glands on the under surface of the leaves between the primary nerves,

fulvous-tomentose beneath. Handsome panicles of brownish-yellow flowers. Fruits fleshy ovoid drupes, orange yellow when ripe. Seeds hard and oblong.

**Flowering and fruiting:** February – July.

**Distribution:** Globally, it is a native of Pakistan, Bhutan and India. It is an Indo-Malesian species. In India it is found in the Sub-Himalayan tracts, Uttar Pradesh, Punjab, Dehra Dun, Orissa, West Bengal, Assam, Madhya Pradesh, Andhra Pradesh, Karnataka, Kerala and Tamil Nadu.

**References:** Oommen *et al.*, 2000; Ravikumar and Ved, 2000; Singh *et al.*, 2001.

**1.4 *Oroxylum indicum* (L.) Vent. Family:** Bignoniaceae.

**Vernacular names:** Kering (A); Sonagachh (B); Tentoo (G); Arlu, Sauna, Shyonak, Sonapatha, Tentoo, Ullu, Urru (H); Alangi, Bunepaale, Dundukara, Pathagani, Tigudu (Ka); Palagripayanni, Palakappayanni, Veluttapatiri (M); Tentoo, Tetu, Ulu (Mt); Pamponiya (O); Talvarphali, Tatpaling (P); Dirghavrnta, Katvanga, Prthsumba, Shyonaka, Tintuka (S); Achi, Pana, Pei maram, Peruvagai, Vanga maram (T); Dundilum, Gumpena, Nemali chettu, Pampini (Tu); Sonapatha (U).

**Habitat:** Dry deciduous to moist deciduous forests, in ravines and moist places but rare in dry regions.

**Description:** A medium sized, soft-wooded, deciduous tree of about 5-10 m height. The stem possesses leaf scars. Bark about 6 mm thick, rough, surface brownish grey, prominently dotted with lenticels, blaze yellowish green. Branchlets robust, with prominent corky lenticles, hairless. Leaves opposite, 2-3 pinnate, 1-1.8 m long; each pinnate opposite; leaflets 3-9, odd-paired, each egg-shaped-elliptic base unequal, rounded or sometimes heart-shaped, apex acuminate, margin entire, hairless. Flowers are large, bisexual, in large erect terminal racemes; peduncle stout, robust, upto 1 m long; calyx upto 3 cm long, dark purple, bell-shaped; corolla reddish purple outside, pinkish yellow inside, about 5 cm across, tube about 8 cm long. Capsules are very large, flat, linear, brown, tapering at both ends, hairless. Seeds are many, rectangular, flat, whitish winged all around except the base.

**Flowering and fruiting:** June – December.

**Distribution:** Globally the species is distributed in the Indo-Malesian region and Sri Lanka. India, Sri Lanka, Myanmar, Malaysia and Malacca. The species is distributed throughout India, especially in Karnataka, Kerala, Tamil Nadu and commonly in Maharashtra.

**References:** Oommen *et al.*, 2000; Ravikumar and Ved, 2000; Singh *et al.*, 2001.

**1.5 *Premna obtusifolia* R. Br.**

**Family:** Verbenaceae

**Vernacular names:** Arni (H); Thakkile, Eegigida (K); Appel, Benmoenja (M); Arani, Chamari, Kharanarvel (Mt); Agnimanthah, Ganikarica (S); Minnai, Perumunnai (T); Gadanelli, Kanika (Tu).

**Habitat:** Occasional in semi evergreen and evergreen forests and also planted.

**Description:** A small tree or shrub with large branches often spinous. Branchlets unarmed. Leaves sub obtuse, very shortly acuminate or obtuse, mature glabrous or minutely hairy on the nerves above or beside the nerves beneath. Inflorescences corymbose. Flowers 0.3-0.4 cm, greenish white. Drupes 5 mm in diameter, globose, 3-4 seeded.

**Flowering and fruiting:** July – May.

**Distribution:** Globally, the species is distributed from the Indo-Malesian region to Pacific and also in Sri Lanka. Within India, it is distributed in Tamil Nadu, Andaman and Nicobar Islands. It is occasionally distributed in Maharashtra.

**References:** Oommen *et al.*, 2000; Ravikumar and Ved, 2000; Singh *et al.*, 2001.

**1.6 *Solanum anguivi* Lam.**

**Family:** Solanaceae.

**Vernacular names:** Tilabhakuri (A); Byakud (B); Poison berry (E); Ubhibharingani, Ubhibhuyaringa, Umimuyaringani (G); Badikateri, Barhauta, Birhatta, Vanabharata (H); Gulla, Heggulla, Kirugullia, Ramagulla (Ka); Cheru Vazhuthina, Cheruchunda, Putirichunda (M); Chichuriti, Dorale, Dorli (Mt); Dengabheji (O); Kandiarivaddi (P); Brhati, Sanhika, Simhi (S); Chiru vazhuthalai, Karimulli, Mullamkatti, Papparamulli, Puthirichundai (T); Cittimulaga, Tellamulaka (Tu); Kateli (U).

**Habitat:** Common in most barren land.

**Description:** Undershrubs or shrubs up to 1.5 m high. Leaves 3.10 x 1.5.6.0 cm, broadly elliptic or elliptic, oblong or ovate, prickly on nerves. Inflorescence extra axillary, racemose cymes. Flowers blue. Berries globose, yellowish, red when ripe. Seeds orange, spherical, minutely pitted.

**Flowering and fruiting:** July – February.

**Distribution:** Distributed throughout the warmer part of Nepal, India, Africa, China, etc. In India it is found in the tropical parts of India. Commonly distributed in

Maharashtra and is also under cultivation.

**References:** Kumar, 2009; Singh et al., 2001.

**1.7 *Solanum virginianum* L. Family:** Solanaceae.

**Vernacular names:** Kantakar, Katvaedana (A); Kantakari (B); Febrifuge plant, Yellow-berried nightshade (E); Bharingani (G); Bhatakataiya, Chhotikateri, Katai, Katali, Kateli, Remgani, Ringani (H); Kiragulla, Nelagulla, Nelagulli (Ka); Kantakari chunda (M); Bhauringani, Kateringani (Mt); Ankarati, Bhejibaugana, Chakada Bhoji (O); Kandiyari (P); Dhavani, Dusparsha, Kantakari, Kantakarika, Ksudra, Nidigdha, Nidigdika, Vyaghri (S); Kandangatri, Kandangathiri, Kandankatri, Kantankattiri (T); Callamulaga, Chinnamulaka, Mulaka, Nelamulaka, Pinnamulaka, Vakudu (Tu).

**Habitat:** Common throughout in waste places rarely under cultivation.

**Description:** Procumbent or trailing herb or under shrub, prostrate or decumbent, widely branched. Leaves 4.0.8.5 x 2.5.5.5 cm, ovate, elliptic, stellately hairy on both sides, prickly on nerves. Inflorescence of extra axillary, few flowered cymes. Flowers purple. Berries yellow. Seeds numerous.

**Flowering and fruiting:** December – May.

**Distribution:** Reported to occur in Ceylon and Malacca through South East Asia, Malaya, tropical Australia and Polynesia. In India, it is very commonly found in plains from seashore to hills up to 1000 m high. In Maharashtra it is common throughout in waste places on sandy river beds and fields as a weed.

**References:** Deb 1961; Singh et al., 2001; Singh and Bansal, 2003; Mohan et al., 2005; Najmi et al., 2005; Chaturvedi et al., 2008; Gabay et al., 2010; Gupta et al., 2011a; Paul and Datta, 2011.

**1.8 *Stereospermum colais* Mabb**

**Family:** Bignoniaceae

**Vernacular names:** Parul (A); Parul (B); Rose Flower Fragrant (E); Podal (G); Padal, Padaria, Paral (H); Hude, Hulave, Padramora (Ka); Padiri, Puppatri, Vedankorana (M); Padal, Parul (Mt); Boro, Patulee (O); Padal (P); Amogha, Krsnvrnta, Madhuduti, Patala, Patali, Tamrapuspi (S); Appu, Padiri (T); Kaligottu, Kokkesa, Patala, Podira (Tu).

**Habitat:** Occasional in hilly area of dry deciduous forests.

**Description:** A large deciduous tree with a spreading canopy. It is identified by grey bark with light yellow blaze. The leaves are 30-45 cm long with 7-9 leaflets, petiole and young leaves are bluish violet in colour. Flowers are yellowish with red veins and are in

branches. Corolla pale or dark purple, puberulous lobes rounded, crisped crenate pods are about 20 cm long. Curved, pendulous and brown when ripe. Seeds are many and possess membranous wings.

**Flowering and fruiting:** February – September.

**Distribution:** Globally, the species is distributed in India, Myanmar (earlier Burma), Sri Lanka, Indo-China and Malesia. It is found throughout India in the drier localities and is often planted also. This species occasionally occurs in forests of Maharashtra.

**References:** Oommen et al., 2000; Ravikumar and Ved, 2000; Singh et al., 2001.

**1.9 *Tribulus terrestris* L. Family:** Zygophyllaceae.

**Vernacular names:** Gokshura, Gukhurkata (A); Gokhri, Gokshura (B); Caltrops root (E); Be tha gokharu, Mithogokharu, Nana gokharu (G); Gokhru, Gokshri, Hussuk (H); Negalu, Neggilamullu, Neggilu, Sannanaggilu (Ka); Michirkand, Pakhda (Ks); Nerinjil, Nerinnil, Nerungil (M); Gokharu, Sarata, Sharatte (Mt); Gokhyura, Gukhura (O); Bhakhra, Gokhru (P); Goksurah, Svadamstra, Trikantaka (S); Kamaraci, Nerinjil, Neruncil, Nerunjil (T); Palleru, Palleruveru, Sannaneggilugida (Tu); Khar-e-Khasak Khurd (U).

**Habitat:** As a weed in dry places, waste lands and in cultivation fields.

**Description:** Procumbent herb. Leaves opposite, compound with lanceolate stipules, leaflets oblique at base. Flowers pedicelled, solitary and axillary. Fruit dry woody sub-globose schizocarp, which is easily recognised by the spines present all over the surface. Seeds many (or 4-6) in each of the five parts of the fruit that separate on maturity.

**Flowering and fruiting:** Almost throughout the year.

**Distribution:** The species is a native to the Mediterranean region, South Europe, South Asia, Africa and Australia. It is distributed throughout in India from sea level to 3500 m. Occurs commonly in Maharashtra.

**References:** Twaij et al., 1989; Murthy et al., 2000; Oommen et al., 2000; Ravikumar and Ved, 2000; Singh and Karthikeyan, 2001; Chu et al., 2003; Amin et al., 2006; Abbas et al., 2010.

**1.10 *Uraria picta* (Jacq.) Desv. ex DC. Family:** Fabaceae.

**Vernacular names:** Chakule, Chhalani, Salpani (B); Pithavan (G); Dabra, Pitvan, Shankaraja (H); Murele Honne, Ondele honne, Prushniparni (Ka); Muvila, Orila (M); Pithvan, Prishniparni, Prushnipamee, Ranganja (Mt); Prushnipamee, Shankarjata (O);

Detedarnee (P); Andhriparni, Citraparni, Dhavani, Kalasi, Prthakparni, Shrigalavinna, Sinhapuchchi (S); Chittirappalatai, Oripai, Sittirappaladai (T); Kolkuponna (Tu).

**Habitat:** Occurs in deciduous forests mostly on open lands.

**Description:** Undershubs, 1–2 m high. Leaflets 3.5–22.0 x 1.3–2.6 cm, apex acute, base rounded. Flowers purple or white, in close fascicles and 15–30 cm long racemes. Pods 3–6-jointed, placed one above the other. Seeds yellowish or reddish-brown, reniform.

**Flowering and fruiting:** August – September.

**Distribution:** It is reported from China, Japan, Bhutan, Bangladesh, Pakistan, Sri Lanka, India, Bhutan, Nepal, Nigeria, Egypt, Ethiopia, Congo, South Africa, Queensland Australia, Myanmar, Thailand, Brunei, Indonesia, Malaya, Phillipines, Papua New Guinea, Sabah, Cambodia, Vietnam, southern China, and Taiwan. In India it is widely distributed throughout and become rare. In Maharashtra it is distributed rarely throughout in deciduous forests.

**References:** Singh and Karthikeyan, 2001; Ohashi and Iokawa, 2007; Bhattacharya and Datta, 2010; Patel et al., 2011.

### Ethano-Botanical Uses and Ayurvedic Uses of Dashmoola Plants-

#### 1. *Aegle marmelos* (L.) Corr.

**Ethnobotanical uses:** Various plant parts of *A. marmelos* such as leaves, fruits, stem and roots are used in treatment of several ailments. Decoction of root and root bark is also known to be useful in intermittent fever, hypo-chondriasis, melancholia and palpitation of the heart (Nadkarni, 2000). Root bark of *A. marmelos* is used as a fish poison, anti dog bite, melancholia, etc. It is also used to treat gastric troubles, heart disorders, fever, anti amoebic, hypoglycemic, rheumatism, hypo-chondriasis, malaria, jaundice, and skin diseases such as ulcers, urticaria, and eczema (Kirtikar and Basu, 1935; Brijesh et al., 2009; Patel et al., 2012).

**Ayurvedic uses:** According to API, roots of *A. marmelos* are used for the Vatavyadhi, Sotha, Sula, Agnimandya, Chardi, Mutrakrechra, and Amavata (Anonymous, 1990). Its roots are also used to treat arthritis (Subramoniam et al., 2013).

**Pharmacological activities:** Root extracts are reported to have anti-inflammatory and wound healing properties (Kirtikar and Basu, 1935; Jaswanth et al., 2001; Trease and Evans, 2003; Hari and Lakshmi, 2012). Alcoholic extracts of the roots showed hypoglycemic and antidiabetic activity (Karunanayake

et al., 1984; Sabu and Kuttan, 2004; Ravi et al., 2009). The root extracts also possess anti-oxidant activity (Bramhachari et al., 2010).

**Phytochemical studies:** Marmin, a compound isolated from roots of *A. marmelos* have showed anti-inflammatory activity in carrageenan induced paw edema in rats (Pitre and Srivastava, 1987). Several chemical constituents like Alkaloid, Halopine, Coumarins (marmin, marmesin, scoparone, scopoletin, umbelliferone, umbelliferine psoralen, marmelide, xanthoxol, impertonin and skimmianine), polysaccharides (psoralin, xanthotoxin and scopolotein) and Terpenes have been extracted from roots (Farooq, 2005; Sharma et al., 2006; Patel et al., 2012; Yadav et al., 2015) and showed to possess anti-fungal activity (Rana et al., 1997; Patil et al., 2004) and anti thyroid activity (Panda and Kar, 2006).

#### 2. *Desmodium gangeticum* (L.) DC.

**Ethnobotanical uses:** Ethnomedicinal surveys have mentioned use of *D. gangeticum* for toothache, asthma bronchitis, diarrhea, dysentery, fever, mouth ulcer, typhoid, cough, vomiting, rheumatism, as antidote in snake bite, sedative agent and medicine for abortion, to cure premature ejaculation, etc. (Kirtikar and Basu, 1999a; Jain et al., 2005; Chakraborty and Bhattacharjee, 2006; Tayade and Patil, 2006; Badgujar et al., 2008; Jeyaprakash et al., 2011; Ma et al., 2011; Rastogi et al., 2011).

**Ayurvedic uses:** In Ayurveda, roots of *D. gangeticum* are used for Jvara, Meha, Arsa, Chardi, Sopha, Svasa, Kasahara, Krmi, Rajayaksha, Netra Roga, Hrdya Roga, Raktagata Vata, Vata Ardhvabhedaka, Mudha Garbha (Anonymous, 1990). The roots are also used in polyherbal formulations to treat arthritis (Subramoniam et al., 2013).

**Pharmacological activities:** Aqueous extract of root of *D. gangeticum* has been shown to have hypocholesterolemic and antioxidant effects in isoproterenol induced myocardial infraction (Govindarajan et al., 2003). Rathi et al, (2004) studied the water decoction of root for anti-inflammatory, anti-nociceptive activity in experimental animals. Ethanolic extract of root was studied for various acute and chronic ulcers in mouse models, in which it significantly decreased the ulcer index and lesion number against ethanol induced acute gastric ulcer in mice (Mahesh et al., 2012). Aqueous extract of roots have also shown anti-arthritic activity *in vitro* (Vedpal et al., 2013).

**Phytochemical studies:** Gangetin, a compound from hexane extract of *D. gangeticum*, showed significant anti-inflammatory activity in carrageenan induced edema, granuloma pouch, cotton pellet granuloma and formaldehyde induced arthritis in rat models (Ghosh and Anandkumar, 1983). Other bioactive compounds

isolated from roots of *D. gangeticum*, include 7- $\beta$ ,12 $\beta$ -dihydro-13-methoxy-3,3-dimethyl-11-(3-methyl-2-butenyl)-3H,7H-benzofuro[3,2-C]pyrano[3,2-g]benzopyran-10-ol, Gangetinin, Desmodin, 3,4-dihydroxy benzoic acid (Protocatechuic acid) (Ganjhu et al., 2014).

### 3. *Gmelina arborea* Roxb.

**Ethnobotanical uses:** Traditionally, roots of *G. arborea* are used as demulcent, lactagogue, refrigerant, stomachic, galactagogue, laxative, anthelmintic, anti-inflammatory, tonic, anthelmintic, hyperdipsia, leucorrhoea, colitis, trichogoneous, leprosy, anemia, strangury and skin disease. The root decoction is also used for abdominal tumors (Nadkarni, 1976; Kirtikar and Basu, 1984; Warriar et al., 1995; Banu et al., 2013). It is also used for urinary discharges and strangury, piles, washing and healing of septic wounds, wound healing, as antidote in scorpion sting, etc. (Shirwaikar and Somashekar, 2003; Jain et al., 2005; Ignacimuthu et al., 2006; Punjani, 2010; Panda et al., 2011; Korpenwar, 2012).

**Ayurvedic uses:** In Ayurvedic literature it is mentioned that, roots of *G. arborea* are used for Jvara, Trsna, Daha, Arsa, Sotha (Anonymous, 1990). Roots of this plant are used in polyherbal formulations to treat arthritis (Subramoniam et al., 2013).

**Pharmacological activities:** Methanol extract of root and ethyl acetate fraction of *G. arborea* showed immune stimulant activity in humoral and cell-mediated immune response in animal models (Shukla et al., 2010). Methanol extract of roots was also found to possess anti-fertility effects in Albino mice (Kalita et al., 2011). Aqueous and methanol extracts of *G. arborea* showed anti-inflammatory activity in carrageenan induced inflammation in rat model and anti-nociceptive activity by using hot plate test and writhing test in Swiss albino mice (Kulkarni et al., 2013). The petroleum ether extract of roots was found to possess the laxative activity, whereas ethanol and petroleum ether extract exhibited antipyretic activity in wistar rats (Panda et al., 2015).

**Phytochemical studies:** Roots of *G. arborea* are reported to contain umbelliferone 7- $\beta$ -apiosylglucoside, arboreol, gmelanone ceryl alcohol, gmelofuran, gmelinol, hentriacontanol-I, n-octacosanol,  $\beta$ -sitosterol, sesquiterpene, etc. (Govindachari et al., 1972; Row et al., 1974; Satyanarayana et al., 1985).

### 4. *Oroxylum indicum* Vent.

**Ethnobotanical uses:** Traditionally, root bark is used in fever, bronchitis, intestinal worms, asthma, inflammation and for anal troubles, etc. (Kirtikar and Basu, 1987). Root paste is also used externally for wound healing (Sumner, 2000). Ethnomedicinal surveys showed that roots are used for diarrhoea, dysentery, burning maturation, jaundice,

inflammation, rheumatism, stomach trouble, as antidote and abortifacient (Jain et al., 2005; Kunwar et al., 2009; Rout et al., 2009; Jamir et al., 2010; Choudhary et al., 2011).

**Ayurvedic uses:** In Ayurveda, roots are used for Vatatisara, Kasa, Aruci, Basti Roga, Amavata, Udara Roga, Urustambha, Vatavyadhi, Karna Roga and Sotha (Anonymous, 1990). Roots of this plant are used in polyherbal formulations to treat arthritis (Subramoniam et al., 2013).

**Pharmacological activities:** Dichloromethane extract of roots of *O. indicum* found to have anti-inflammatory properties (Ali et al., 1998). Ethyl acetate and Methanol extracts of *O. indicum* have found to possess antimicrobial activity (Uddin et al., 2003; Thatoi et al., 2008). Ethanol, Petroleum Ether and n-Butanol extracts have proven antiulcer activity (Khandhar et al., 2006), whereas n-Butanol extract showed Immunomodulatory potential (Zaveri et al., 2006). Alcoholic and n-Butanol extracts have also proven their gastroprotective effects in animal experiment (Zaveri and Jain, 2007). It has also shown gastroprotective effect in ethanol and WIRS-induced gastric ulcers in rats (Maitreyi and Jain, 2007). Methanol and water extracts have proven their anti-oxidant activities (Mishra et al., 2010b). n-butanol fraction of root bark of.

**Phytochemical studies:** Root bark contains Ellagic acid, Baicalein (5,6,7-trihydroxyflavone), Oroxylin-A (5,7-Dihydroxy-6-methoxyflavone), Chrysin (5,7-dihydroxyflavone) (Subramanian and Nair, 1972; Vasanth et al., 1991; Grampurohit et al., 1994; Sharma et al., 2001; Dinda et al., 2007). Chrysin has found to possess anti-inflammatory activity (Ali et al., 1998). The quantification of Baicalein, Chrysin, Biochanin-A and Ellagic acid in root bark was carried out by RP-HPLC with UV detection method (Zaveri et al., 2008).

### 5. *Premna obtusifolia* R. Br.

**Ethnobotanical uses:** Decoction of root of *P. integrifolia* (*P. obtusifolia*) is cordial, stomachic, carminative, alterative, as a tonic, good for liver complaints, and also useful in urticaria (Otsuka et al., 1993). The decoction of roots of *P. obtusifolia* is used to treat gonorrhoea (Rao et al., 1984), as an anti-parasitic agent (Desrivot et al., 2007), for cancer (George et al., 2008), and is also used for infectious disease (Tiunan et al., 2011).

**Ayurvedic uses:** Roots of *P. obtusifolia* are used in various inflammatory conditions like rheumatoid arthritis, rhinitis, and abscess. It is also suggested for Vatavyadhi, Prameha, Medoroga, Agnimandya (Kumari et al., 2011). It is used in polyherbal formulations to treat arthritis (Subramoniam et al., 2013).

**Pharmacological activities:** Methanolic extract of the roots have shown significant anti-inflammatory activity in carrageenan-induced rat hind paw edema, histamine induced wheal formation, and acetic acid-induced mouse vascular permeation (Gokani et al., 2011). Ethanol extract of roots of *P. serratifolia* (*P. obtusifolia*) were investigated against paracetamol induced oxidative stress and hepatotoxicity in blood and liver of male albino rats and found to possess hepatoprotective and anti-oxidant activity (Singh et al., 2011). Root and root callus extracts of *Premna serratifolia* L. augmented to have good anti-inflammatory activity against carrageenan induced paw edema (Singh et al., 2012). Decoction of roots of *P. integrifolia* has shown anti-inflammatory activity in carrageenan induced rat paw edema model (Kumar et al., 2015).

**Phytochemical studies:** The root has been reported to contain an alkaloid premnazole, which is a proven anti-inflammatory agent (Barik et al., 1992). Various other compounds have been isolated from roots of *P. obtusifolia* such as Pimarane I, Pimarane II, Rosane, Abietane I, Abietane II, Abietane III, Abietane IV, 6 $\alpha$ -Hydroxy-5,6-dihydrosalviasperanol, 6-Hydroxysalvinolone, Obtusinones D, Obtusinones E, 11,12-Dihydroxy-10,6,8,11,13-icetexapentan-1-one (Salae et al., 2009; Asik et al., 2010; Abdul et al., 2011; Salae et al., 2012, 2013). The antioxidant activity and active principle of the root woody tissues were investigated from *Premna serratifolia* Linn. (syn: *Premna integrifolia*, *Premna obtusifolia* R. Br.), the isolated active antioxidant principle was identified as acteoside (verbacoside) by spectroscopy studies. Acteoside was found to be more active than the crude root wood extract and therefore assumed to be responsible for most of the reported pharmacological activities of the plant (Bose et al., 2013).

#### 6. *Solanum anguivi* Lam.

**Ethnobotanical uses:** In ethno medicine, roots of *S. anguivi* are used for asthma, toothache, dry cough, bronchitis, leprosy, colic, blackleg, anthrax, disuria, chronic fever, alopecia, dropsy, jaundice and haematuria (Negi et al., 2002; Dhiman, 2005; Ishtiaq and Khan, 2008; Sikdar and Dutta, 2008; Mesfin et al., 2009; Nath and Khatri, 2010; Singh et al., 2010).

**Ayurvedic uses:** *S. anguivi* roots are used for Hrdroga, Jvara, Svasa, Sula, Agnimandya in Ayurveda (Anonymous, 1990). It is one of the ingredients of kashayas in Ayurveda, Mohaamanjishtaadi and Panchathikthakam, which is used as a therapy for arthritis and related diseases. It is also used for the treatment of rheumatoid arthritis, chronic skin diseases, anaemia, paralytic conditions, filariasis, ophthalmic diseases and obesity (Subramoniam et al., 2013).

**Pharmacological activities:** Ethanol extract of roots of *Solanum indicum* (*S. anguivi*) have shown anti-inflammatory activity in carrageenan induced rat paw edema model (Singh et al., 1998).

**Phytochemical studies:** It has been reported that roots of this plant contains wax, fatty acids, alkaloid solanine and solanidine, disogenin, lanosterol,  $\beta$ -sitosterol, solasomine, solamargine and solasidine (Deb et al., 2014).

#### 7. *Solanum virginianum* L.

**Ethnobotanical uses:** In ethno medicine, roots of *S. virginianum* are used for cough, gum pain, tooth-ache, asthma, boils, chest pain and against small pox (Tayade and Patil, 2006; Das et al., 2008; Sikdar and Dutta, 2008; Rajakumar and Shivanna, 2009; Jain and Singh, 2010).

**Ayurvedic uses:** In Ayurveda, whole plant of *S. surattense* (*S. virginianum*) is used for Svasa, Kasa, Jvara, Aruci, Pinasa, Parsvasula, Svarabheda (Anonymous, 1990). It is one of the ingredients of kashayas in Ayurveda, Mohaamanjishtaadi, which is used as a therapy for arthritis and related diseases. It is also used for the treatment of rheumatoid arthritis, chronic skin diseases, anaemia, paralytic conditions, filariasis, ophthalmic diseases and obesity (Subramoniam et al., 2013).

**Pharmacological activities:** Root extract of *S. surattense* have shown *in vitro* antioxidant activity and found to contain enzymic antioxidants such as catalase, superoxide dismutase, glutathione reductase, glutathione S-transferase and glutathione peroxidase, and non enzymic antioxidants such as ascorbic acid,  $\alpha$ -tocopherol, reduced glutathione, flavonoids and carotenoids (Priyadarsini et al., 2010). Ethyl acetate, chloroform and ethyl alcohol fractions of roots of *S. xanthocarpum* (*S. virginianum*) were found to possess free radical scavenging activity in DPPH radical scavenging assay and lipid peroxidation inhibition in rat liver homogenate (Kumar et al., 2012). Ethanolic, ethyl acetate and aqueous fractions of roots of *S. xanthocarpum* have found to possess anti-oxidant activity in reducing power assay and lipo-protective activity in lipid peroxidation inhibition assays in rat kidney tissue *in vitro* (Kumar and Pandey, 2012).

**Phytochemical studies:** Root extract of *S. surattense* contains alkaloids, carbohydrates, proteins, resins, saponins, steroid, tannin, starch, glycosides, flavonoids and triterpenoids (Kumar et al., 2012; Ghildiyal and Joshi, 2014; Archana and Jessy, 2015).

#### 8. *Stereospermum colais* Mabb.

**Ethnobotanical uses:** The roots of *S. colais* are diuretic, lithotropic, expectorant, cardio tonic, aphrodisiac, anti-inflammatory, anti-bacterial, febrifuge, tonic, anti-emetic and anti-pyretic (Kirtikar



and Basu, 1999b; Warriar et al., 2002). The decoction of root is used in asthma and cough (Warriar et al., 2002; Meena et al., 2010). In ethno medicine, roots are used to regularize menstrual disorders and for curing nervous disorders (Jain et al., 2005; Rout et al., 2009).

**Ayurvedic uses:** In Ayurveda, roots of *S. chelenoides* (*S. colais*) are used for Svasa, Sotha, Arsa, Chardi, Hikka, Trsa, Amlapitta, Rakta Vikara, Mutravikara, Agnidadha, Vrana Rujha, Visphota and Medoroga (Anonymous, 1990). Roots of this plant are also used in polyherbal formulations to treat arthritis (Subramoniam et al., 2013).

**Pharmacological activities:** Aqueous extract of root bark of *Stereospermum suaveolens* DC. (*S. colais*) has shown anti-inflammatory effects in carrageenan-induced paw edema model (Kharat et al., 2012). Acetone and methanol extracts of *S. colais* roots have shown antidiabetic, antiperoxidation, xanthine oxidase inhibition and radical scavenging activities *in vitro* (Rani and Padmakumari, 2012). Ethanolic extract of *S. colais* was studied *in vitro* in protein denaturation method using bovine serum albumin and found to possess antiarthritic activity (Latha et al., 2015).

**Phytochemical studies:** Root contains  $\alpha$ -sitosterol, n-triacontanol, lapachol, dehydro  $\alpha$ -lapachone and dehydrotectanol (Yoganarasimhan, 2000).

### 9. Tribulus terrestris L.

**Ethnobotanical studies:** In ethno medicine roots of *T. terrestris* are used for male weakness, to prevent white discharge in women, in strangury, to treat urinary troubles and to help in expelling kidney stones (Muthu et al., 2006; Chauhan et al., 2009; Punjani, 2010; Singh et al., 2010; Francis et al., 2011; Ma et al., 2011). It is also used in type II diabetes mellitus (Akram, 2013).

**Ayurvedic studies:** Roots are used for Sularoga, Hrdroga, Vataroga, Mutrakrcchra, Asmari, Kasa and Svasa (Anonymous, 1990). Roots are one of the ingredients of kashayas in Ayurveda, Raasnasapthakam, which is used as a therapy for

rheumatoid arthritis (Subramoniam et al., 2013).

**Pharmacological activities:** Aqueous extract of root of *T. terrestris* have shown antimicrobial activity against 11 species of pathogenic and non-pathogenic microorganisms (Al-Bayati and Al-Mola, 2008). The methanol extract of whole plant showed anti-inflammatory activity in Carrageenan induced inflammation in rats and antimicrobial activity against Gram (+) and Gram (-) bacteria (Baburao et al., 2009). The radiomodulatory influence of root extract was observed against radiation induced alterations in Swiss albino mice (Kumar et al., 2009).

**Phytochemical studies:** Roots contains steroidal saponins, alkaloids, lignanamides, carbohydrates and flavonoids (Deepak et al., 2002).

### 10. Uraria picta (Jacq.) Desv. ex DC.

**Ethnobotanical uses:** *U. picta* roots are used traditionally for dysentery, sore mouth, snake bite and as abortifacient (Chakraborty and Bhattacharjee, 2006; Jain and Singh, 2010; Shukla and Chakravarty, 2010).

**Ayurvedic uses:** Roots of this plant are used as Sangrahika, Vatahara, Tridoshaghna, Vrushya, Sara, Dahahara, Jwarahara, Shwasahara, Raktatisarahara, Trut hara, Vamihara (Bhavamisra, 2013).

**Pharmacological activities:** Ethanolic extract of whole plant of *U. picta* have shown inhibitory activity in NO radical scavenging assay and lipoxxygenase assay *in vitro*; and anti-inflammatory activity *in vivo* in carrageenan induced rat paw edema (Ahirrao et al., 2007).

**Phytochemical studies:** Isoflavanones, triterpenes and steroids were isolated from the roots of *U. picta* and studied for their anti-microbial activity (Rahman et al., 2007).

### Method of Preparation of Dashmoola taila

1 part of Dashmool kalka , 4 parts of Til taila and 16 parts of Dashmool kwatha(prepared by 1/4th method) mixed with each other and heated over mandagni. After signs of tailasiddhi Dashmool taila prepared (sarangdhar samhita madhyam khand 9/1-2).

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### 3. DISCUSSION AND CONCLUSION

*Dashamoola* is a group of ten plants whose roots are given in different dosage form viz. *Dashamoolarishta*, *Dashamoola Churna*, *Dashamoola Ghrita*, *Dashamoola Kalpa*, *Dashamoola Kwatha*, *Dashamoola Oil*, etc. Different formulations in different dosage forms are still practiced in which *Arista* and *Churna* are very common. Several ethnobotanical reports also support the use of *Dahsamoola* to treat inflammatory disorders. (Jagtap et al, 2006, 2009; Jagtap and Deokule, 2010; Junjarwad et al., 2011).

Traditionally used *Dashamoola*, a combination of ten plants in suitable dosage forms is routinely used for the treatment of inflammation. The formulation in an altered form with its enhanced efficacy can be a better alternative treatment modality.

Yava Kshar pratisaran was an effective Ayurvedic regimen as far as the management of 'Abhyantar Arsha' was considered. There are some procedural problem in study like possibility of application to other than diseased site, variability in amount of Kshar, no

assurance of shelf life due to hygroscopic nature of Kshar and needed intervention of doctor.

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Miss. Bhagyashri Eknath Nagarkar in the Department of Herbal Medicine, at Bharati Vidyapeeth Deemed University's Interactive Research School of Health Affairs (IRSHA), Pune.