Review of drugs under Laghupanchmula

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Abstract
Even as we commence the new Century with its exciting prospect of gene therapy, plant based medicines remain one of the common forms of therapy available to the world population. Apart from single use of medicinal plants many of the compound formulation based on complexity of diseases are also prescribed. Even today many of the compound formulations referred in those classics are still in practice, which shows strong health benefits of those compound formulations. A few of them noteworthy are-Triphala, Trikatu, Maharpancamula, Laghupanchmula and Dasamula etc. Considering their long tradition in our country, it was decided to science behind one of them; the compound Laghupanchmula. This compound comprises of five plants i.e. Salaparni, Prisniparni, Brihathi, Kantakari and Goksura.

Keywords: Laghupanchmula

Introduction
The vegetable drugs mentioned under Laghupanchmula are well appeared in Ayurvedic classics and later on identified botanically in different period of time, and now the accepted botanical names of the plants under Laghu are as follows- Salaparni (Desmodium gangeticum), Prisniparni (Uraria picta), Brihathi (Solanum indicum), Kantakari (Solanum surrattance) and Goksura (T. terrestris). Caraka Samhita and Susruta Samhita, the two main original classics of Ayurveda have mentioned Laghupanchmula as one of the compound formulations useful as Rasayana (C.Ci. 1/1/43, 1/1/76) [1], and in treatments of Sotha (C.Su. 4/16) [1], Jvara (C.Ci. 3/267, Su.Ci. 39/216) [1], RaktaPitta (C.Ci. 4/96) [1], Gulma (C.Ci. 5/151) [1], Kasth (C.Ci. 7/81, 7/87, Su.Ci. 9/7, 9/47) [1,2], Vrana (C.Ci. 2/77, Su.Ci. 1/77) [1,2], Vatavyadhi, (C.Ci. 28/121, Su.Ci. 5/77) [1,2], and Vata Sonita (C.Ci.29/70) [1].

Material and Method
A chronological review of all available Ayurvedic classics have been carried out, i.e., Charaka Samhita (1000 B.C. to 4th Century A.D.), Sushruta Samhita (1000 B.C. to 5th Century A.D.), Ashtanga Sangraha (6th Century A.D.), Ashtanga Hridaya (7th Century A.D) were also considered to make the picture more clear regarding drugs of Laghupanchmula [1,4]. The information was critically reviewed and the rationale behind the content of Laghupanchmula was derived. Further present scientific research work regarding each drug was gathered. All information was then critically analysed, discussed and concluded.

Observation
On comprehensive literary review it was found that the word Laghupanchmula as such is not referred in ancient Ayurvedic classics i.e. Caraka Samhita and Susruta Samhita. In Ashtanga Sangraha and Ashtanga Hridaya this term is mentioned as an component of many compound formulations (A.Ci.3/23) [1], (A.Ci.8/30) [1], (A.Ci.8/29) [1], (A.H.Ci.2/36-37) [4], (A.H.Ci.6/35-36) [4], (A.H.Ci.9/13) [4], and (A.H.Ci.22/25) [4]. It reflects that during ancient times it was known by the name of Vidarigandhadi Pancamula (C.Ci. 1/1/43) [1], Kantipancamula (S.S.38/67-68) [2], Khuddkapancamula (K.S.Kh10/83) [3] and Kanisthhapancamula (S.I.2/29) [3] whereas in medieval period by Laghupanchmula. All the above terms indicates towards habit of plants of this group i.e. either herb or shrub (Salaparni, Prisniparni, Brihathi, Kantakari and Goksura). acarya Caraka named this group as Vidarigandhadi Pancamula, based on first drug Vidarigandha (Salaparni).

Salaparni
Botanical name: Desmodium gangeticum (Linn.) DC.
Family: Fabaceae
Botanical description

General Features: An under shrub 60-120 cm high, stems irregular, clothed with appressed white hairs.

Leaves: 1-foliate., petioles 1-2 cm long., stipules scarios, 6-8 mm long linear - subulate, striate at the base, Leaflets membranaceous, 9-12.5 by 3.5 to 6.3 cm ovate - oblong acute or slightly acuminate, the margins somewhat waved. glabrous and green above, paler and clothed with dense soft whitish appressed hairs beneath, reticulately veined, base rounded, truncate., main nerves 8 -12 pairs, petiolules, 1-5 mm long, hairy, stipels 3 mm long subulate.

Flowers: Flowers in copious ascending terminal and axillary racemes 45-30 cm.long arranged in few flowered fascicles along a slender pubescent somewhat angular rhachis ipedicels 4-6 mm long, filiform, pubescent, bracts subulate, 1.5 to 3 mm long., bracteoles minute.

Calyx: Calyx 2 mm long, hairy, teeth triangular, longer than the companulate tube.

Corolla: 4 mm long, violet or white, standard 3 mm broad, cuneate at the base.

Stamens: Diadelphous, one and nine, anthers uniform Ovary, Sessile or stipitate, many ovuled, style filiform incurred with minute capitate stigma.

Pods: Subfalcate, deeply indented on the lower, slightly indented on the upper edge, joints 6-8, longer than the broad, indehiscent, sparsely clothed with minute hooked hairs, the lower edge rounded, the upper straight.

Root: Poorly developed tap root and 5-15 or more, long deep growing prominent spreading lateral roots arising from its basal part. Root bark is neither thick or fleshy. It has a characteristic yellowish white colour and a leathery texture and easily peelable.

Distribution
It is found in the lower Himalyana region upto 1600m and throughout the plains of India.

Parts Used: The root and whole plant is used.

Chemical Constituents: The aerial parts of the plant contain 5 tryptamine derivatives, Nb-Me-tetrahydroharman and 6-OMe-2-Me-carbolinium cation. The roots contain alkaloid, N, N-di-Me tryptamine & its N-oxide, N-Me-tryamine, hypophorine, hordenine, candicine, a pterocarpan, pterocarpanoids, gangetinin and desmodin. The seeds are known to contain -carboline alkaloid, indole3 -alkylamine and carbolines.

Properties and uses
The root is bitter tonic, astringent and diuretic, used in chronic fever, cough, diarrhea, vomiting, asthma, snake bite and scorpion sting. The root is one of the ingredients of a famous Ayurvedic preparation ‘Dasamula kvatha’, which is considered to be antipyretic, alterative and bitter tonic. It is reported to be beneficial in the treatment of typhoid, biliousness and also as diuretic and aphrodisiac [6].

Pharmacological Evaluation
In 2005 Mishra, et al., identified bioactive glycosides from Desmodium gangeticum [7]. Antiinamessic effects of Desmodium gangeticum DC in mice was established by Joshi et al., (2007) [8]. Effect of Desmodium gangeticum DC. extract on blood glucose in rats and on insulin secretion in vitro is also evidenced (Govindarajan, 2007) [9]. A comparative study on in vitro and in vivo antioxidant activities of aqueous extract of Desmodium gangeticum DC. root was done by Kurian, et al., (2010) [10]. The extract of the plant was found to possess antioxidant activity when studied for diphenyl picryl hydrazyl (DPPH), nitric oxide, ferryl-bipyridyl and hypochlorous acid scavenging activity along with lipid peroxidation by thioarbituric acid reactive substances method using rat brain homogenate (Govindarajan et al., 2003) [11]. Gangetin, a major pterocarpanoid isolated from the plant when administered orally as a suspension in female rats at a dose of 100 mg/kg body weight in three groups of rats for a period of 5,10 and 15days produced 40, 57 and 87.5 per cent, anti-implantation activity respectively on day 10. Gangetin administrated at a dose of 50 mg/kg body weight for 5 days showed 50 per cent anti-implantation activity in female rats. The study suggested that gangetin had effects on the uterus that helps in mobilizing the glycogen (Alam et al., 1982) [12]. The water, ethanol and acetone extracts of the root caused 25, 21 and 27 per cent, inhibition of angiotensin converting enzyme in vitro, respectively (Hansen et al., 1995) [13]. Treatment with the extract also produced significant decrease in the concentration of thioarbituric acid reactive substance and increase in activities of glutathione reductase and catalase in the myocardial tissue of rats suggesting antioxidant activity of extract. ‘Dasamula kvatha’, an Ayurvedic formulation consisting of D. gangeticum DC. besides nine other constituents produced aspirin like analgesic effects in rats. It produced significant antipyretic effect and mild anti-inflammatory effect in rats against carrageenin-induced oedema. Further, the kvÁtha produced CNS depressant effect as evident by reduction in spontaneous motor activity, potentiation of the pentobarbitone hypnosis and antagonism of amphetamine induced hyperactivity in mice. It also blocked the conditioned avoidance response in rats and reduced the normal body temperature suggesting the tranquillizing effect of the preparation (Gupta et al., 1983; 1984) [14].

Prisniparni
Botanical name : Uraria picta (Jacq.) Desv.
Family : Fabaceae

Botanical description (Gaur, 1999)
Leaves: Lower leaves 1–3-foliate, upper 5–7 foliate.

Leaflets: Linear to oblong or lanceolate, lower ones 3-10 × 2-3 cm., upper ones 6-24 × 0.5-2.5 cm, acute, rarely obtuse, minutely pubescent beneath.

Inflorescence: Rachis, 8-12 cm.

Flowers: Purple, 6-10 mm long. Racemes dense, cylindric, 20 cm long.

Bracts: Caduceus, 1.5 cm long, concealing the buds.
**Calyx:** Four to six mm long, pubescent; teeth much longer to tube.

**Corolla:** Purplish to bluish.

**Pods:** Four to five cm long, 3–6 jointed, white, glabrous, polished.

**Distribution**
It is a native of tropical zone including Nepal, Sri Lanka, Northern Australia, China, Burma. Herb grows up to 1.5 mts tall, is found in dry grassland, west places, open deciduous forests and in all plains of India extending from Himalayas to Ceylon, Malaysia and Philippines (Gaurav et al., 2008) [15]. In Flora of Taiwan second edition, four species were recognized in the genus *Uraria*, *Uraria crinita*, *U. lycopodioides* and *U. neglecta*. (Ohashi et al., 2007) [16].

**Part(S) Used**
Whole plant, root, fruit, seed, leaf.

**Chemical constituents**
Two isoflavanones 5, 7-dihydroxy-2'-methoxy-3’, 4’-methylenedioxyisoflavanone, and 4’, 5'-dihydroxy-2', 3’-dimethoxy-7-(5-hydroxychromen-7-yl)-isoflavan-one along with 6 compounds including isoflavonanes, triterpenes and steroids were isolated from roots of *Uraria picta* (Jacq.) Desv. The structures of these compounds where established unambiguously by UV, IR, MS and a series of 1D and 2D NMR analysis. The minimum inhibitory concentrations (MIC) for these compounds were found to be in the range of 12.5–200 lg /ml against bacteria (both Gram positive and Gram negative) and fungi (Rahman et al., 2007).

**Properties and uses**
*Uraria picta* (Jacq.) Desv is one of the components of *Dasmula* and is credited with fracture-healing properties. In Ghana, the plant is employed for treating heart trouble. The roots are also known to have aphrodisiac properties. Its decoction is prescribed for cough, chills and fevers. The leaves are considered antiseptic and used in gonorrhea. The roots and pods are employed in Bihar to treat prolapse of anus in infants; the pods are also employed for the treatment of sore-mouth in children (Anonymous, 1962). It is used for the treatment of urinary diseases, tumors, edema, burning sensation and difficulty breathing. Its paste, mixed with water, is used as an antidote for snake bite in Bastar, Madhya Pradesh (Parrotta et al., 2007) [18].

**Pharmacological evaluation**
Total and fractionated extracts of *U. picta* (Jacq.) Desv. have been assessed for acaricidal activity on *Ixodes ricinus*. All the extracts were acaricidal to the test organisms. Methanolic extract of this plant is a more potent acaricide compared to the aqueous extract. Similarly, the alkaline-soluble non-polar fraction of the methanolic extract exhibited greater acaricidal activity than the alkaline-insoluble non-polar fraction (Igbochi et al., 1989) [19]. Comparative evaluation of Aqueous and methanolic extracts of roots of and whole plants of *U. picta* (Jacq.) Desv. Were studied for anti-inflammatory activity using in-vitro and in-vivo animal models. The evaluation parameter of in-vivo model was NO radical scavenging assay and lipoxygenase assay and Carrageenan induced rat paw edema model was used in the in vitro model. Results indicated that the *U. picta* (Jacq.) Desv. has better anti-inflammatory potential than *Asparagus racemosus* (Ahirrao et al., 2007) [20]. Hypolipidaemic activity of Abana, an Indian herbomineral preparation containing *U. picta* (Jacq.) Desv. as one of the ingredient was studied to investigate the action of Abana on the lipid and lipoprotein metabolism in albino rats. The results showed that chronic administration of Abana significantly reduce serum lipoprotein lipid components and apoprotein level in rats indicating Abana as cardioprotective and hypolipidaemic agent (Khan et al., 1991) [21]. In another study Abana powder was administered orally in rabbits to investigate the effect of Abana. The results showed that administration of Abana for 3 days has an action similar to that chronic administration of isoprenaline which may be due to a specific depressant effect of Abana on the adrenergic receptor and a direct sensitization of the atrium (Pasnani et al., 1988) [22]. It has been clinically used as a cardioprotective drug (Parle et al., 2007) [23].

**Substitution and adulteration**
*Uraria crinita*, *U. lycopodioides*. *U. neglecta*.

**Brihati**
**Botanical Name:** Solanum indicum Linn.

**Family:** Solanaceae

**Botanical description**
**General Features:** A much branched undershrub 0.3 - 1.5 meters high, very prickly, prickles large, with a long compressed base, sharp. Branches covered with minute stellate hairs.

**Leaves:** 5-15 by 2.5 to 7.5 cm, ovate in out line, acute, subentire or with a few large triangular ovate subacute lobes, sparsely prickly on both sides, clothed above with simple hairs from bulbous bases intermixed with small stellate ones, covered below with small stellate hairs, base cordate cuneate or truncate, often unequal sided, petioles 1.3 to 2.5 cm long, prickly.

**Flowers:** Flowers in racemose extra axillary cymes., peduncles short, pedicels 6 to 13 mm long, stellately hairy and prickly.

**Filaments:** Very short, anthers oblong lancedite, opening by small pores.

**Ovary:** Often hairy at the top, style stellately hairy, curved at the apex.

**Fruit:** Berry 8 mm diameter, globose, dark yellow when ripe, glabrous or sometimes with a few stellate hairs at the apex.

**Seeds:** 4 mm diameter minutely pitted.

**Root:** Root is well developed and consists of tap root and many secondary roots and their branches which grow deep into the soil. The secondary roots are long fairly large and strong. Fresh roots have a light yellow or yellowish brown colour and are fairly smooth, except for the presence of many rootlets. Bark is thin, easily separable from the wood (Kirtikar and Basu, 1988) [24].
Distribution
Throughout Tropical India from sea level to about 667 m elevation growing in waste land, along roadsides (Anonymous, 1972) [23]. Also occurs in Sri Lanka, Malay, China, Philippines (Cooke, 1967) [26] and Indomalaysia and Tropical Africa (Yoganarsimhan, 1996, 2000) [27, 28].

Part(s) used
Whole plant, root, fruit, seed, leaf (B.N. 1982).

Chemical constituents

Properties and uses
The whole plant and roots are used as carminative and expectorant. These are beneficial in asthma, dry cough, colic, chronic fever and flatulence (Chopra et al., 1958) [30]. It relieves pain arising from difficult parturition and also used as aphrodisiac and astringent. Root is diaphoretic and stimulant, useful in catarrhal affections, dropsy, toothache, dyspepsia, colic, verminosis, diarrhea pruritus, leprosy, skin diseases, bronchitis, cardiac disorders and vomiting. Fruits are bitter, pungent, digestive and laxative. Its juice is beneficial in alopecia. Decoction of the seeds is useful in dysuria and vapour from seeds in odotalgia (Chatterjee and Pakrashi, 2003). The juice of the leaves mixed with fresh ginger is given as anti-emetic, digestive, laxative, antibacterial and useful in ringworm (Anonymous, 1996) [31].

Pharmacological evolution
Plant was reported to have hypocholesterotaemic (Kalboro et al., 1998), anthelminic, nematocidal (Qamar et al. 1998) [32], marginal choleristic, antihepatotoxic (Asha and Pushpangadan 1998) [33], anti-inflammatory, wound healing and cytotoxic (Gu et al., 2004) [34] activities.

Substitutes and adulterants

Kantkari
Botanical name: Solanum surattense Burm. F. (Syn.S. xanthocarpum Sch. & Wendi.).

Family: Solanaceae

Botanical description
Plant: A prickly perennial herb, woody at the base, spreading root and shoot system. Leaf and stem provided with straight, yellow, glabrous and shining prickles measuring 2-15 mm long.

Leaf: Simple, petiolate, elliptic, sub-acute, Sub-pinnatifid, reticulate, stellate hairs on both surface, long- yellow sharp prickles on time midrib and nerves.

Flower: Extra axillary single flower, peduncles and pedicels short, curved Stellatery hairy purple measuring 3-4 cm in diameter.

Calyx: - sepal 5 green, united at the base forming a calyx tube measuring 8 mm in length.

Androecium: - stamens 5, free, attached by short basifixed filament to the corolla tube in between the petals. Anthers bilobed, with four loculi, open by pore at the tip, glabrous. Oblong or lanceolate, measuring 8-12 mm in length.

Gynoeccium: - carpels two united, ovary 2 chambered, style short and stigma ovoid.

Fruit – Berry, fleshy, globose measuring 13-20 mm in diameter with white and green markings on the fruit wall, calyx persistent with prickles and hairs.

Seed: Numerous, embedded in the fleshy mucilaginous mass, flattened, round with a curved end measuring 2-3 mm diameter and glabrous.

Ethan botanical use
According to Ahuja (1965) [36], the white variety (Laxmana or Putrada) is known for sure birth of a son in the Ayurvedic literature, but this plant is not easily available. The pulp of the fruits is made into a paste and is applied on skin infections. The flowers are eaten to promote digestion in Jammu and Kashmir (Kaul et. al. 1991) [37].

Distribution
Solanum surattense is distributed throughout India, Sri Lanka, South East Asia, Malaysia and tropical Australia.

Parts used
Whole plant, fruits, flowers, seeds, leaves, stem and roots are used.

Chemical constituents
Alcoholic extract of plant contain fatty and resinous substances. The fruits contain carotene, caffeic, chlorogenic, isochlorogenic and neochlorogenic acids, esculin, esculetin, scopoletin, cycloartanol, diosgenin, carpesterol, solasodine, solamargine, rhamnosyl-D-glucoside, β-sitosterol and stigmasteryl glucoside. Arachidic, linoleic, oleic, palmitic and stearic acids and solanocarpine from the fruit oil and heterosdes of tomatidienol from fruit-stalk have been isolated.

The flowers contain diosgenin, apigenin and quercetin-3-O-glucopyranosyl-0-D-mannopyra-noside (Chatteriee and Pakrashi, 1995) [40].

Solasodine is present in fruits; the glycoalkaloid content of fruits collected from plants growing in Jammu and Kashmir is reported to be 3.5% (total alkaloids 1.1%). The presence of diosogenin in the plant has been reported. Solasodine has been isolated from the plant. The alkaloids can form a source for cortisone and sex hormone (Chopra et. al., 1969) [38].

Seeds (20.7% of fresh wt. of the fruit) yield 19.3% of greenish yellow, Semi-drying oil with characteristic odour. The component fatty acids of the oil are oleic, linoleic, palmitic, stearic and arachidic. The unsaponifiable matter contains two sterols one of which is carpestorol (Anonymous, 1972) [39].
Medicinal uses
According to Chatterjee and Pakrashi (1995) [41], the whole plant is alterative, antiasthmatic, aperient, astringent, digestive, febrifuge, bitter and pungent. This is used in bronchitis, cough, dropsy and constipation. A decoction of the plant is given in gonorrhoea and to promote conception. The fruits, flowers and stems are bitter and carminative and are prescribed in vesicular and watery eruptions (Chopra et al, 1956) [38]. The bud and flower juice is used in watery eyes (Agarwal, 1986) [40]. The roots are considered expectorant, diuretic, antiasthmatic and antiemetic (Chatterjee and Pakrashi, 1995) [41] and are used for cough and pain of chest (Chopra et al., 1956) [38]. The roots are beaten up and mixed with wine and are given to check vomiting. The decoction of the roots with that of Giloya (Tinospora cordifolia) is given in fever and cough.

Pharmacological evolution
Pharmacological studies on the herb have shown that aqueous and alcoholic extracts of the plant possess hypotensive effect which is partially inhibited by atropine, the more persistent secondary fall in the blood pressure and broncho-constriction are inhibited by antihistaminic drugs. Both glycoalkaloid and fatty acid fractions of the extract cause liberation of histamine from chopped lung tissue. The beneficial effect of the drug on bronchial asthma may be attributed to the depletion of histamine from bronchial lung tissue. The gluco-alkaloid saponin fraction was active in much smaller doses (0.5-2 mg/kg) in increasing cardiac contractility and tension of isolated ventricular and papillary muscles of cat, indicating a positive inotropic effects. The glycoalkaloidal fraction of the drug seems to possess cardiotoxic effects worth investigating clinically.

Substitution and adulteration
The commercial drug of S. surratense is often found adulterated with the allied species S. indicum Linn.

Gokshura
Botanical name : Tribulus terrestris Linn.
Family : Zygophyllaceae

Botanical description
General Features
It is a tap rooted herbaceous perennial plant that grows as a summer annual in colder climates. It is a trailing and spreading herb, densely covered with minute hair.

Stem-The stems radiate from the crown to a diameter of about 10 cm to over 1 m, often branching. They are usually prostrate, forming flat patches, though they may grow more upwards in shade or among taller plants.

Leaves-The leaves are pinnately compound with leaflets less than a quarter-inch long. Leaves compound, in opposite pairs, leaflets 3 to 6 pair, up to 8 cm long.

Flowers-The flowers are 4 to 10 mm wide, with five lemon yellow petals. Ovary briskly, style short and stout.

Fruit-Fruits are globose, spinous or tuberculate, consisting of fine hairy or nearly glabrous, often muriculate and woody cocci, each with two pairs of hard sharp spines, one pair longer than the other. A week after each flower blooms, it is followed by a fruit that easily falls apart into four or five single-seeded nutlets.

Seeds- The nutlets or "seeds" are hard and bear two to three sharp spines, 10 mm long and 4 to 6 mm broad point-to-point. Fruit often cling to clothes and bodies of animals. Seeds are many in woody cocci.

Occurrence and distribution
It is found in waste places and dry habitats throughout the warmer regions of India ascending up to an altitude of 3000 m including West Rajasthan and, Gujarat, Deccan and Andhra Pradesh.

Parts Used
The fruits, leaves, stems and roots are used.

Ethnobotanical Use
A decoction of the plant is used to remove gravels locally. In Peshawar valley, the fruits are used by women to ensure fecundity (Watt, 1972) [42].

Chemical Constituents
The aerial parts of the plant contains chlorogenin, diosgenin and its acetate, gitogenin, astragalin, disocin, 3-deoxy-diosgenin, gracilllin, harman, hecogenin, ruscogenin, trillin, furomostanol glycoside, spirosterol saponin and a dihydroxy spirosteroidal sapogenin, trigoginin-3-diglucorhamnoside alongwith saponins C & G. The leaves possess 3-D (6"-p-coumaroyl)-glucoside. The phytochemical investigation of the aerial parts of Tribulus terrestris Linn. resulted in the isolation of the novel furostanol sapogenin 1, named tribol, together with the known spirostanol saponins 2 and 3 and sitosterol glucoside (Conrad et al., 2004). An HPLC-ELSD-ESI-MS method has been developed for the analysis of the steroidal saponins in the aerial parts of T. terrestris (De Combarieu et al., 2003). The fruits contain glucose, rhamnose, rutin, chlorogenin and gitogenin. The flowers are reported to contain kaempferol, campesterol, 13-sitosterol and stigmasterol. Harmine have been reported in seeds and sitosterol, stigmasterol and neotigogenin have been isolated from the root (Chatterjee and Pakrashi, 1994) [41].

Medicinal Uses: Tribulus terrestris Linn. Is a diuretic, tonic and aphrodisiac, used in urinary disorders, hyperuricccemia and impotence. In Unani medicine it is used to inhibit the formation of kidney stone. Tribulus terrestris Linn. contains three groups of active phytochemicals: Dioscin, protodioscin and diosgenin. These substances have effect on sexual performance and may treat various sexual disorders, they regulate sexual energy level and strength by increasing the percentage of free testosterone level for men and they affect pregnenolone, progesterone and estrogen. The hormone balancing effects of Bulgarian T. terrestris for women makes this herb suitable for premenstrual syndrome and menopausal syndrome. These protect the prostate from swelling and in combination with the X steroidal saponins, protect the prostate from cancer. Steroidal saponins currently referred to as X steroidal saponins (Sun et al., 2003). These X steroidal saponins affect the complete immune system (Toshkov et al., 1985) [44]. They have been demonstrated to possess antibacterial and anti-viral effects. Bulgarian Tribulus terrestris Linn. is used internally and externally to treat herpetic, and virus infections such as influenza and the common cold.
**Trifolium pretense** Linn. Was found to be a rich source of calcium (Duhan et al., 1992) [43].

**Pharmacological evaluation**

It is a very potent diuretic and tonic drug (Selvam, 2008) [47]. The steroidal saponin constituents obtained from *Trifolium pretense* Linn. exhibit antimicrobial and cytototoxic effects (Chu et al., 2003) [48]. Saponins from *T. pretense* (STT) exert its cytototoxic effect on liver BEL-7402 cells by inducing apoptosis (Sun et al., 2004) [49]. Effects of *T. pretense* (TT) on hormonal secretion were evaluated in primates, rabbit and rat to evaluate its usefulness in the management of erectile dysfunction (ED) (Adaiyan et al., 2000) [50].

**Substitutes and adulterants**

The fruits of *Pedaliunm murex* Linn. are occasionally substituted to *T. pretense*, being considered as large ‘Gokshura’. The fruits of *Acanthospermum hispidum* are also used in Sodha (sootham) (In Charaka, 2000). The original classical name of Sodha is *Gokshura* [1]. It is siddhi sthan have been included for Basti [1].

- In Sushruta the drugs of Kaniyapanchamula are Trikantaka, Brijatidvaya (Brijati, Kantakari), and Prihakaparnyo (Shalaparni, Prishniparni), the properties of Kaniya panchamula are also ascribed, i.e., Kashaya, Tikta, and Madhura in Rasa as having Vataghna, Pittashamana, Brimhana, and Balavardhana Karma. In Chitkisasthana, laghupanchamula in various dosage forms, i.e., Kashaya, Kshira, Taila, and Kvatha in Vrana, Bhagana, Vatavyadhi, and Arsha, respectively [2].

- In both Ashtanga Sangraha and Ashtanga Hridaya, it is grouped under Hrisapanchamula and are Madhura Rasa and Madhura Vipaka; neither Aishita nor Atishita and Sarvadoshahara by its action i.e.neither too hot nor too cold in potency and pacify all the three doshas. In Chitkisasthana Laghupanchamula are mentioned for as Ghrita, Kvatha, and Tailoتفور Shvadhahara, Shvadha, and Kashtha, respectively [3]. The separate drug pharmacological action and research work on its medicinal uses correlate with action of laghupanchamula mention in caraka, Susruta, Astanga sangraha and Astanga hridaya.

**Conclusion**

The original classical name of Laghupanchamula is Kaniyapanchamula, Vidarigandhadi and Khuddakapanchamula, which is changed as Laghupanchamula from Astanga sangraha. This compound comprises of five plants i.e. Sarlaparni, Priniparni, Brijati, Kantakari and Gokshura. Therefore, the present review indicates that s the authentic use of these formulations in traditional Ayurvedic system for the treatment of Sodha (inflammation), Sula (painful conditions) Vrana (wound), Rasayana (Rejuvenator), Jwara (fever), Gulma (cancer) and other uses correlate with separate drug research work on its uses and pharmacological action. Further advancement in this work is required through molecular research of whole group of drug.

**References**

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