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DRUGS ACTING ON RESPIRATORY SYSTEM- THEIR PROPERTIES AND MODE OF ACTION ACCORDING TO AYURVEDA

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ABSTRACT

In Ayurveda, the body is said to be composed of *tridoshas, saptadhatus* and *trimalas.* Ayurveda also incorporates the study of *strotasa* which are channels that run throughout the body.There are thirteen of those. Out of those, one important is *Pranvaha strotasa* which is correlated with the respiratory system as this is responsible for carrying *Prana* i.e., oxygen rich air in. *Vata dosha* and *Kapha dosha* are chiefly responsible for causing respiratory ailments like *Shwasa, Kasa* and *Hikka,* so drugs which balance these *dosha* are beneficial for the respiratory system. In the following text some commonly used drugs are mentioned which are used as single or as a component of a formulation for treating diseases of *Pranvaha strotasa.*

KEYWORDS: *Tridosha, Pranvaha strotasa, Kasa, Shwasa Hikka,* respiratory system.

INTRODUCTION

Ayurveda is an age-old science which gives importance to both physical as well as mental body of an individual. As the modern medicine, in Ayurveda also the body is divided into many systems and segments. According to Ayurvedic principles, body is composed of *tridoshas, trimalas* and *saptadhatus.* It also has thirteen types of *strotasa*. For optimum health all these systems need to be in a balanced state. Out of thirteen *strotasa, Pranvaha strotasa* can be related to the respiratory system. *Pranavaha srotasa* is the channel, which carries the external air in to the body to sustain the life. Thus, the *Pranavaha srotasa* is important for life and longevity.

Pranavaha strotasa has its *moola* as *hridaya* and the *mahastrotasa.* Its normal functioning is responsible for proper respiratory function in the living beings. When this *strotasa* gets vitiated there are numerous breathing problems like *atisrishtam* (increased rate of respiration), *atibadhham* (decreased rate of respiration), *kupitam* (difficulty in breathing), *alpamalpam* (intermittent breathing), abhikshanam(disturbed breathing patterns), *sashabdashoolamuchhadsantam* (abnormal respiratory sounds like wheezing, rhonchi and painon inspiration).[1]

The common causes of its vitiation are mentioned as
Kshayat (malnutrition), *sandharnat* (forcibly withholding natural urges like those of urine, stool etc.), *raukshyad* (over indulgence in dry foods), *vyayamat kshutasya ch*(exercise in presence of hunger), *anyeshch darunam* (doing any other heavy work beyond ones physical capacity).[2]

In present era, where there is ever so increasing levels of pollution and air quality index (AQI), theliving beings are in a constant danger of getting one or many respiratory ailments. Along with the pollution there are many kinds of pathogens most recent being the Corona virus which principallydamages the respiratory system.

In Ayurveda, there are three principal *doshas* i.e., *Vata, Pitta* and *Kapha*. All three of them has further five subtypes. Respiratory problems are ascribed to imbalance of Vata and Kapha. In the *Pranvaha strotasa* or the respiratory channels *Prana vayu, Udana vayu* and *Avalambaka kapha* are responsible for normal respiration. Any imbalance in these can lead to respiratory ailments.

For keeping their respiration naturally effortless one has to avoid getting into too much polluted areas and always wear protective masks when out and adopting good sanitary habits. Ayurveda, mentions a vast variety of drugs and practices which can help the individual to attain and to maintain good health.

Few of such drugs are mentioned as follows
Kantakari
Botanical name: Solanum surattenseFamily: Solanaceae

Vernacular names
Hindi: *Chhoti Kateri, Bhatkataya*
English: Yellow berried night shade, Wild eggplant

Synonyms: *Kshudra, Duhsparsha, Nidigdhika, Vyaghari, Kasaghani, Kshudraphala.*

Ayurvedic pharmacodynamics
Rasa-Tikta, Katu
Guna-Laghu, Ruksha, Tikshna Virya-Ushana Vipaka-Katu
Karma-Kashara, Vata and Kapha shamana

Action/uses: Kasahara, Shwasahara, Jwarahara, Dipani, Grahi, Pachani, Mutrala etc.

Textual Description
- Panini described Kantakarika in his works (P.G. 4/3/154 and 167)
- Vagbhatta specifically indicated Nidigdhika for Kasa.
- Charaka samhita - Kasahara, Shothahara, Hikka nigrahana mahakashaya.
- Sushruta samhita- Brihatyadi, Varunadi, Laghupanchamula gana.

Chemical Constituents
Beta carotene, diosgenin, solasodine, solasomine.

Research Work
1. **Anti- tussive activity** The efficacy of Kantakari on non-specific cough and other respiratory disorders is reported[3]
2. **Anti-asthmatic activity** It is found to be beneficial in reducing breathlessness and cough in asthmatic patients owing to the depletion of histamine from lungs and expectorant action due to inorganic nitrate content [4]
3. **Plant powder**-Anti tussive, Expectorant, Aqueous and alcoholic - Antiviral (Whole plant), Extract - Antibacterial (Roots and fruits) [5]

Shunthi
Botanical name: Zingiber officinale Family: Zingiberaceae.

Vernacular names
Hindi: *Sonth*
English: Ginger

Synonyms: *Nagara, Shringvera, Katubhadra.*

Ayurvedic pharmacodynamics
Rasa- Katu
Guna- Laghu, Snigdha, Guru, Ruksha, Tikshana Virya-Ushana
Vipaka-Madhura (Shunthi) Katu (Ardraka) Karma-Triptighana

Action/uses: Vatashamaka, Vatanulomaka, Shwasaghana, Swaryam, Chhardi, Arshaghana etc.

Textual Description
- Charaka samhita -Triptighana, Arshoghana, Dipniya, Shoolprashamana mahakashaya.
- Sushruta samhita-Pippalyadi, Trikatu
- Ashtang hridya- Pippalyadi gana
- Kaideva Nighantu described Adra nagaram and Ardrakam (shunthi) separately. (Dravyaguna Vigyana Vol II)

Chemical Constituents
Curcumin, aromatic volatile oil, gingerol, cineol.

Research Work
1. It has Anti – Inflammatory, Antimicrobial, Antioxidant, anticancer properties. It is useful in Amavata, Cough, Cold, Gastrointestinal, Cardiovascular and Sexual disorders.[6]
2. It modulates, biochemical pathway activated in chronic inflammation.[7]

Pippali
Botanical name: Piper longumFamily: Piperaceae.

Vernacular names
Hindi: *Pipala*
English: Long pepper
Synonyms: *Kana, Tikshna tandula, Kula, Chapala.*

Ayurvedic pharmacodynamics
Rasa- Katu
Guna- Laghu, Snigdha, TikshanaVirya-Ushana
Vipaka-Madhura
Karma-Vatasleshma hara, Dipana, Vrishya, Rasayana
Action/uses: Dipana, Pachana,Vrishya, Rasayana, Medhya, Vatahara, Sleshmahara.

Textual description
- Charaka samhita-Dipniya, Kanthya, Asthapana mahakashaya.
- Sushruta samhita-Pippalyadi,Triyushna.
- In Sushruta samhita and Ashtanga hridaya it is indicated that there are two varieties of pippali –
- Pippali (Piper longum) (2) Gaja pippali (Piper chaba)
- Bhavamishra quoted the fruit of Chavya/Chavika as Gajpippali.

Chemical constituents
Piperine, Piper longuminine, Piper longumine, essential oil etc.

Research work
1. Dried Fruit mixed with honey are used to treat cough and generally used for cold as ahome remedy.[8]
2. In view of the therapeutic use of *Piper longum* in bronchial asthma by Ayurvedic physicians, studies have been carried out on the mechanism of its anti-allergic effects, as milk extract effectively reduced passive cutaneous anaphylaxis in rats and protected guinea pigs against antigen induced

bronchospasm.[9]
3. The fruits are attributed with numerous medicinal uses, and may be used for diseases of respiratory tract viz., bronchitis, asthma [10]
4. Evaluation of antiallergic activities of *Piper longum* is carried out by rat lung perfusion.[11]
5. In case of bronchial asthma, significant effect in controlling the frequency and severity of the asthmatic attack was observed.[12]

VASA
Botanical name: Adhatoda vasica Family: Acanthaceae

Vernacular names
Hindi: *Adusa, Arusha, Bansa*
English: Malabar Nut
Synonyms: *Vasaka, Vasika, Vajida, Vrisha, Sinhasya*

Ayurvedic pharmacodynamics
Rasa-Tikta, Kashaya Guna- Ruksha, Laghu Virya-Sheeta
Vipaka- Katu
Karma-Kapha Pitta shamaka

Action/uses: Kasahara, Shwasahara, Jwarahara, Kushthaghna, Hridaya etc.

Textual description
- Charaka samhita-Vayasthapana, Trishnanigrahana, Stanyashodhana, Triptighana mahakashaya.
- Sushruta samhita- Guduchyadi, Patoladi, Aaraghvadhadi, Kakolyadi gana and Vallipanchmula.

Chemical constituents
Vasicine, Vascinone, Vasakin, Essential oils.

Research work
1. Antitussive effect of Adhatoda vasica extract on mechanical or chemical stimulation induced coughing in animals. After oral administration to the guinea-pig the anti-tussive activity of Adhatoda vasica was similar to codeine against coughing induced by irritant aerosols.[13]
2. In asthma and acute stages of bronchitis, the extract of vasica offers an unflagging result by decreasing the thickness of the sputum.[14]

Maricha
Botanical name: Piper nigrum Family: Piperacea

Vernacular names
Hindi: *Kali mirch*
English: Black pepper

Synonyms: *Vellaja, Ushana, Krishna*

Ayurvedic pharmacodynamics
Rasa-Katu
Guna- Laghu, TikshnaVirya-Ushana
Vipaka-Katu
Karma-Vata shamaka, Kapha shamaka, Pitta vardhaka
Action/uses: Vatakaphahara, Shwasahara, Kasahara, Shothahara, Shoolahara, Dipana, Krimighnaetc.

Textual description
Brihattrayi describes it extensively as an appetizer, carminative and antimicrobial.
- Charaka samhita-Dipaniya, Shulaprashamana, Krimighana, Shirovirechana mahakashaya.
- Sushruta samhita- Pippalyadi, Tryushana.
- Ashtanga samgraha- Pippalyadi gana
- Ashtanga hridaya- Vatasakadi gana

Chemical constituents
Piperine, Piperidine, volatile essential oil, starch, lignin.

Research work
1. The fruit shows anti -asthamatic activity.[15]
2. It also has anti-tussive actions.[16]

Karkatshringi
Botanical name: Pistacia integerrima Family: Anacardiaceae

Vernacular names
Hindi: *Kakadsingi, Kakra, Gheekadava*
English: Crab's claw
Synonyms: *Kullirvishanika, Karkatakhya, Shringi.*

Ayurvedic pharmacodynamics
Rasa-Katu
Guna- Guru, Ruksha, TikshnaVirya-Ushana
Vipaka-Madhura
Karma-Dipana, Vatakaphaghna
Action/uses: Jwarahara, Kasahara, Shwasahara, Hikka nashaka, Aruchi bhedaka.

Textual description
- Charaka samhita: Kasahara, Hikkanigrahana mahakashaya, Madhura skandha.
- Sushruta samhita: Kakolyadi, Padmakadi gana.

Chemical constituents
Pistacienoic acids A and B, tannins, Beta-sitosterol, camphene etc.

Research work
1. It has shown anti-inflammatory actions. It was revealed from the study that the compounds isolated from the chloroform fraction of the galls i.e. flavonoids (1-4) exhibited potent anti- inflammatory actions during various assessment times (1-5h). Their impact was significantly noticed in the 3rd hour of treatment which remained up to the 5th hour.[17]
2. It shows anti-asthamatic effect by virtue of its anti-inflammatory action.[18]

Kulatha
Botanical name: Dolichos biflorus Family: Leguminosae

Vernacular names
Hindi: *Kulathi*
English: Horsegram, Cowpea

Synonyms: *Kulatha, Peetamudga, Tamravarna, Surashtra, Druk prasada.*

Ayurvedic pharmacodynamics
Rasa-Kashaya
Guna- Laghu, Ruksha, TikshnaVirya-Ushana
Vipaka- Amla
Karma-Kaphavata shamaka, Raktapitta kopaka
Action/uses: Shwasahara, Jwarahara, Sleshmahara, Ashmaribhedaka

Textual description
- Charaka samhita-Vatavyadhi chikitsa, Chhardi chikitsa, Swedopaga mahakashaya.
- Ashtanga samgraha- Niruhopaga
- Kaideva Nighantu- Krutanna varga
- Dhanwantari Nighantu- Suvarnadi varga

Chemical constituents
Genistein, Dalberioidin, Collidin, traces of urease and phosphorus.

Research work
1. Dolichos biflorus seeds decrease allergic airway inflammation and hyperresponsiveness bydecreasing the infiltration of inflammatory cells in the airway.[19]
2. It shows anti-oxidant properties.[20]

Patala
Botanical name: Sterospermum suaveolens Family: Bignoniaceae

Vernacular names
Hindi: *Padhal, Podal*
English: Rose flower fragrant (planetayurveda.com)
Synonyms: *Krushnavrinta, Madhudooti, Kuberakshi, Amogha, Kumbhipushpi.*

Ayurvedic pharmacodynamics
Rasa- Tikta, Kashaya Guna- Laghu, Ruksha Virya-Anushana (Flowers have Sheeta virya)Vipaka- Katu
Karma-Tridoshhara (Dravya Guna Vigyana, P.V. Sharma Vol II)

Textual description
- Charaka samhita: Shothhara mahakashaya
- Sushruta samhita: Aragvadhadi, Brihat panchmula, Adhobhaghara gana
- Ashtanga samgraha: Aragavadhadi gana

Chemical constituents
Leaves contain a flavone, stereolensin.
Bark-iridoid glycoside.
Root bark-n-triacontanol and beta sitosterol
Root heart wood-lapachol, ceryl alcohol, palmitic, stearic and oleic acids. (easyayurveda.com)

Research work
Hepatoprotective and antioxidant Effects of Stereospermum suaveolens on carbon tetrachloride induced hepatic damage in rats.[21]

Shyonaka
Botanical name: Oroxylum indicum Family: Bignoniaceae

Vernacular names
Hindi: *Sonapatha, Tentu, Aralu*
English: Broken bones plant
Synonyms: *Dirghavrinta, Kutannat, Brihatvriksha*

Ayurvedic pharmacodynamics
Rasa- Madhura, Tikta, Katu, Kashaya Guna- Laghu, Ruksha
Virya-UshanaVipaka-Katu
Karma-Tridosh shamaka, Kaphavata shamaka(API, Dravya Guna Vigyana, P. V. Sharma Vol II)

Textual description
- **Charaka samhita:** Purishsangrahaniya mahakashaya, Kashaya skandha
- **Sushruta samhita:** Ambasthadi gana (Dravya Guna Vigyana, P. V. Sharma Vol II)

Chemical constituents
-Baicalein, Tetuin, Oroxindin, Beta sitosterol etc. (Illustrated Dravyaguna Vijnana Vol II by Dr JLN Shastry)

Research work
Antimicrobial activity of stem bark extracts from the plant Oroxylum indicum Vent.[22] 2.Antiallergic activity of Oroxylin A flavanone has been documented.[23]

Agnimantha
Botanical name: Premna mucronata Family: Verbenaceae

Vernacular names
Hindi: *Tekar, Arni*
English: Dusky Fire Brand Bark (vikaspedia.in)
Synonyms: *Jaya, Shriparna, Gadikarika, Vataghani*

Ayurvedic pharmacodynamics
Rasa- Madhura, Katu, Tikta, Kashaya Guna- Laghu, Ruksha
Virya-Ushana Vipaka-Katu
Karma-Kaphavata shamaka(API Vol III, Dravya Guna Vigyana, P. V. Sharma Vol II)
Actions/Uses: Pandujit, Arshoghna, Shwasahara,

Kasahara.

Textual description
- **Charaka samhita:** Shothahara, Sheeta prashamana, Anuvasnopaga mahakashaya
- **Sushruta samhita:** Virtarvadi, Varunadi, Vatasamsamana gana.
- **Ashtanga samgraha:** Virtarvadi, Varunadi gana. (easyayurveda.com)

Chemical constituents
Beta sitosterol, Luteolin, Premnine, Betulin, Premnelol, Ganiarine.(Illustrated Dravya gunaVijnana Vol II by Dr JLN Shastry)

Research work
It has antioxidant, anti-inflammation and antibacterial activities.[24]

Kachoora
Botanical name: Curcuma zedoaria Family: Zingiberaceae

Vernacular names
Hindi: Banhaldi, Banharidra English: Zedoary, Wild turmeric
Synonyms: Karchura, Aranyaharidra, Sholi, Sholika, Gandhaplasha

Ayurvedic pharmacodynamics
Rasa- Tikta, Katu Guna- Laghu, Tikshna
Virya-Ushana Vipaka-Katu Karma-Deepana, Kaphahara
Actions/Uses: Mukhshodhana, Ruchikaraka, Kaphahara

Textual description
- In Bhavprakasha its properties are mentioned as Deepana, Ruchya, Katu, Tikta. It is said to have Kushtha, Arsha, Vrana and Kasa shamaka.
- In Charaka samhita it is described as "Kaphavataghana shwasahikkaarshasam hita"

Chemical constituents
The rhizome contains essential oils, alcohol, terpenes. The essential oils are cineole, gamma- terpinene, linalool and beta terpineol.

Research work
This herb shows a good number of biological activities which include antimicrobial, anticancer, analgesic, antipyretic, antiviral, antioxidant, wound healing, anti-inflammatory, insecticidal activity and cardioprotective activities.[25]

Guduchi
Botanical name: Tinospora cordifolia Family: Menispermaceae

Vernacular names
Hindi: *Giloy*
English: Heart leaved moonseed

Synonyms: *Amrita, Madhuparni, Chhinaruha, Kundalini, Chakralakshanika*

Ayurvedic pharmacodynamics
Rasa- Tikta, Katu, KashayaGuna- Laghu, Snigdha
Virya-Ushana,Vipaka-Madhura,Karma-Tridosh shamaka, Rasayana.
Action/uses: Vatahara, Kaphahara, Dipana, Jwarnashaka, Rsayana, Raktprasadana

Textual description
- Charaka samhita: Vayasthapana, Dahaprashamana, Trishna nigraha, Triptighana, Stanya shodhana mahakashaya.
- It has been mentioned as one of the four Medhya rasayana in Charaka Chikitsa Sthana.
- Priya Nighantu mentions it in Pippalyadi varga.

Chemical constituents
Berberine, Choline, Tinosporin, Palmetine, Isocolumbin, Tinosporides

Research work
1. Immunomodulatory Effects of Tinospora cordifolia (Guduchi) on macrophage activation. The results showed experimental basis of immunomodulation by biological response modifier (BRM).[26]
2. Study on Albino rats with Guduchi ghrita showed significant antipyretic activity.[27]

Pushkarmula
Botanical name: Inula racemosaFamily: Compositae

Vernacular names
Hindi: *Pokharmul*
English: Indian elecampane
Synonyms: *Padmapatra, Kashmira, Kushtha bheda, Sugandhikam*

Ayurvedic pharmacodynamics:Rasa- Tikta, Katu
Guna- Laghu, Virya- UshanaVipaka- Katu
Karma- Kaphavatajit
Actions/Uses: Jwarahara, Shwasaghna, Arochaknashaka, Shofaghna,Pandunashanam.

Textual description
- **Charaka samhita:** Shwasahara, Hikkanigrahana mahakashaya
- **Sushruta samhita:** Phala varga
- **Ashtang samgraha:** Hidhma nigrahana gana

Chemical constituents: -Alantolactone, Isoalantolactone, Inunolide, Inunol (Illustrated Dravyaguna Vijana Vol II by Dr JLN Shastry)

Research work
1. Mast cell stabilizing activity of Inula racemosa Linn. This study showed Positive results in rats.[28]
2. Antibacterial activity of isolated constituents and extract of roots of Inula racemosa. The constituent

Alantolactone showed maximum antibacterial activity as compared to other constituents.[30]

Chitraka
Botanical name: Plumbago zeylanica Linn. Family: Plumbaginaceae

Vernacular names
Hindi: *Cheeta*
English: Lead wort
Synonyms: *Anala, Dahana, Pithi, Vahni, Vyala*

Ayurvedic pharmacodynamics: Rasa- Katu
Guna-Laghu Virya-UshanaVipaka-Katu
Karma-Vatakapha shamaka
Actions/Uses: Grahanihara, Kushthahara, Krimikasnut, Dipniya, Pachniya,Shoolhara

Textual description
- Charaka samhita: Dipniya, Shoolprashamana, Arshoghana, Lekhniyamahakashaya.
- Sushruta samhita: Pippalyadi, Mustadi, Amalakadi, Varunadi and Aragvadhadi gana.
- Ashtanga samgraha- Pippalyadi, Mustadi, Varunadi, Aragvadhadi gana.
- There are three varieties quoted as Shweta, Peeta, Asita.

Chemical constituents
Chitranone, Plumbagin, Elliptinone, Plumbagic acid (Illustrated Dravyaguna Vijnana,Vol II by Dr JLN Shastry)

Research work
1. Ethanol extract and petroleum ether from the leaves and stem showed antimicrobial activity.[30]
2. It has been studied for its anti-inflammatory property showing positive results.[31]

Chavya
Botanical name: Piper retrofractumFamily: Piperaceae.

Vernacular names
Hindi: *Chaba*
English: Java long pepper root, Balinese pepper
Synonyms: Root- *Gaja pippali moola, Chavika moola* Fruit-*Gajapippali, Shreyasi, Hasti magadha*

Ayurvedic pharmacodynamics
Rasa- Katu
Guna-Laghu,RukshaVirya-Ushana Vipaka-Katu
Karma-Kaphavatahara, Pittavardhaka

Actions/Uses: Aruchinashaka, Bhedana, Pachana, Dipana, Krimighana, Garvishnashaka, Shwasahara, Kanthamaya nihanti.

Textual description
- Charaka samhita:Triptighana, Arshoghana, Dipniya, Shoolprashamana mahakashaya
- Sushruta samhita: Pippalyadi gana
- Kaideva Nighantu: Oshadhi varga
- Bhavprakasha: Haritkyadi varga

Chemical constituents
Piperine, sitosterol, piplastine (alkaloid) from stem, retractamide A, B, C, D isolated from aerial parts. (Illustrated Dravyaguna Vijnana, Vol II by Dr. JLN Shastry)

Research work
This plant possesses antioxidant, hepatoprotective, cytotoxic, larvicidal, antiproliferation, antitubercular, antileishmanial, antiphotoaging, and anti-obesity properties.[32]

Shati
Botanical name: Hedychium spicatum Family: Zingiberaceae

Vernacular names
Hindi: *Kapurkachari*
English: Spiked ginger lily
Synonyms: *Gandhmulika, Palashi*

Ayurvedic pharmacodynamics
Rasa- Tikta, Katu, Kashaya Guna- Laghu, Tikshana Virya-Ushana
Vipaka-Katu
Karma-Kaphavata shamaka

Actions/Uses: Shothhara, Vedanasthapana, Durgandhnashaka, Shwasakasa hara, Hikkanigrahana, Raktshodhaka (Dravya Guna Vigyana, P. V. Sharma Vol II)

Textual description
- Charaka samhita: Hikkanigrahana, Shwasahara mahakashaya.
- Bhavaprakasha- Karpuradi yoga

Chemical constituents
The rhizome extract contains essential oil, saccharides, sitosterol, hedychenone, limonene etc.(www.iamj.in)

Research work
1. Rhizome oil showed antibacterial activity against five pathogenic bacteria viz. E. coli, S. aureus, S. typhi,P. aeruginosa, P. vulgaris.[33]
2. Anti-inflammatory and other pharmacological effects of Hedychium spicatum Buch-Ham. This study showed that the rhizomes possess anti-inflammatory and analgesic properties.[34]

Dhanyavasaka
Botanical name: Fagonia cretica Family: Zygophyllaceae

Vernacular names
Hindi: Dhamasa

English: Khorasan thorn
Synonyms: Duralabha, Ananta, Samudranta, Gandhari, Dusparsha

Ayurvedic pharmacodynamics
Rasa- Kashya, Tikta, Madhura, Katu Guna- Laghu, Snigdha
Virya- Ushana Vipaka-Madhura
Karma-Vatapitta shamaka
Actions/Uses: Dahprashamana, Kothprashamana, Raktastambhaka, Raktaprasadana, Mutrala (Dravya Guna Vigyana, P. V. Sharma Vol II)

Textual description
- Charaka samhita: Kasahara, Hikkanigrahana mahakashaya.
- Dhanvantari Nighantu: Guduchyadi varga
- Bhavaprakasha: Mishra varga, Guduchyadi varga

Chemical constituents
Fruits are rich in ascorbic acid. Aerial parts contain several triterpenoid saponins which give sapogenin, nahagenin, oleanolic acid. They also contain Fagonone and flavonoids.

Research work
Anti-inflammatory and wound healing activity of alcohol extract herbal gel on Albino rats. This trial concluded that this extract exhibited a good wound healing effect comparable to that of Betadine.[35]

Bharangi
Botanical name: Clerodendrum serratum Family: Verbenaceae

Vernacular names
Hindi: Babhnaiti
English: Turk's turban, Blue glory, Beetle killer
Synonyms: Brahamanyashtika, Khashak, Padma
Actions/Uses: Raktutkleshaka, Shothahara, Vranpachana, Kasahara, Shwasahara, Swedajanana, Jwaraghana

Ayurvedic pharmacodynamics
Rasa- Tikta, Katu Guna- Laghu, RukshaVirya-Ushana
Vipaka-Katu
Karma-Kaphvata shamaka

Textual description
- Charaka samhita: Pureeshsangrahaniya mahakashaya
- Sushruta samhita: Pippalyadi gana
- Ashtanga samgraha: Pippalyadi gana
- Ashtnaga hridaya: Arkadi gana, Sursadi gana (easyayurveda.com)

Chemical constituents
Hispidulin,7-0 glucoronides, scutellarein, uncinatone, pectolinaigenin etc.(Illustrated Dravyaguna Vijnana Vol II by Dr JLN Shastry)

Research work
1. Aqueous extract of Bharangi has also been proved for its anti inflammatory and bronchodilatory activities.[36]
2. Therapeutic potential of roots and leaves of C. serratum has been demonstrated in the conditionslike asthma, allergy, fever, inflammation and liver disorders attributed to the presence of various flavonoids, phenolics and saponins present in the drug.[37]

Rasna
Botanical name: Pluchea lanceolata
Family: Compositae

Vernacular names
Hindi: *Rasayana, Vayusurai*
English: Greater galangal, Javaglangal (pharmaveda. com)
Synonyms: *Yukta, Elaparni, Surabhi, Sugandha*

Ayurvedic pharmacodynamics
Rasa- Tikta Guna-Guru Virya-UshanaVipaka-Katu
Karma-Kaphavata shamaka Prabhava-Vishaghna (Dravya Guna Vigyana, P. V. Sharma Vol II)

Actions/Uses: Shothahara, Sheetahara, Vedanasthapana, Aampachana, Kasa hara, Shwasa hara,Jwaraghna.

Textual description
- Charaka samhita: Anuvasanopaga, Vayasthapana mahakashaya.
- Sushruta samhita: Arkadi Gana, Sleshmashamshamana varga.
- Kaideva nighantu: Oshadhi varga
- Dhanwantari nighantu: Guduchyadi varga
- Bhavaprakasha: Haritakyadi varga
- Raj Nighantu: Pippalyadi varga.

Chemical constituents
The stem and leaves contain moretenol, neolupenol, hexacosanoic and tetracosanoicacid, triacontanol etc.

Research work
Studies have demonstrated that this drug has anti-asthamatic, anti-inflammatory, anti-biotic , antioxidant properties.[38]

Nagarmotha
Botanical name: Cyperus rotundusFamily: Cyperaceae

Vernacular names
Hindi: Motha
English: Nut grass
Synonyms: Mustaka, Varida

Ayurvedic pharmacodynamics
Rasa- Tikta, Katu, KashayaGuna- Laghu, Ruksha Virya-Sheeta
Vipaka- Katu

Karma- Pittakaphahara
Actions/Uses: Sthoulyahara, Soshahara, Dipana, Pachana, Vishaghna

Textual description
- Charaka samhita:Lekhniya, Trishnanigrahana, Kandughna, Stanyashodhana mahakashaya.
- Sushruta samhita: Mustadi, Vachadi gana
- Kaideva nighantu:Trikarsha, Chaturbhadra, Sarvaushadhi, Sugandhamalaka
- Different varieties are mentioned: Musta, Bhadra musta, Kshudra musta,Jala musta.

Chemical constituents
Cineol, Copaene, Cyperol, Sugenol etc.

Research work
Analysis and antimicrobial activity of the essential oil for Cyperus rotundus Linn. rhizomes. It exhibited antimicrobial activities Bacillus subtilis, B. pumilus,Pseudomonas aeruginosa, Shigella flexneri, Aspergillus niger and Candida albicans.[38]

Tavagakshiri (Vanshlochana)
Botanical name: Bambusa arundinaceae Family: Graminae/Poaceae

Vernacular names
Hindi: *Tabasheer*
English: Bamboo manna
Synonyms: Tugakshiri, Vanshlochna, Vamsharochna

Ayurvedic pharmacodynamics
Rasa-Kashaya, Madhura
Guna- Laghu,Tikshna, RukshaVirya- Sheeta
Vipaka-Madhura
Karma-Vatapitta shamaka, Chhedana
Actions/Uses: Vastishodhana, Shwasahara, Vajikaraka, Balya, Dhatu vardhaka

Textual description
- In Bhavaprakasha it is mentioned as Sara, Hima, Swadu, Kashaya and Vastishodhana. It is described as "trishnakasjwarshwaskashayapittastra kamla haret"
- **Charaka samhita:** Mentioned this drug as an ingredient of Sitopladi churna.

Chemical constituents
90%silica, Iron peroxide, Potash, Lime, Aluminium, Carbohydrate, Enzymes and Glucosides (Dravyaguna Vigyana Vol II, Ach. P. V. Sharma)

Research work
Waterphase extract exhibited antimicrobial activity against S.aureus, B.subtilis, E.Coli, Aspergillus niger, P. citrinum and Saccharomyces cerevisiae with a concentration dependent relationship.

Bilva
Botanical name: Aegle marmelos
Family: Rutaceae

Vernacular names
Hindi: *Bael*
English: Holy fruit tree
Synonyms: *Shandilya, Shreephala, Malur, Gandharan.*

Ayurvedic pharmacodynamics
Rasa- Tikta, KashayaGuna-Laghu, Ruksha
Virya-Ushana Vipaka-Katu
Karma-Kapha Vata shamaka (Dravya GunaVigyana, P.V. Sharma Vol II)

Actions/Uses
Stem- Kasaghna, Amavataghna, Hridaya, Agnivardhana, Dipana, Pachna. Leaves-Used in dyspepsia, gastritis, indigestion, sinusitis.
Root-Doshghna, Vamighna, Shulaghna.
Fruit-Ripe: Madhura rasa, Vishtambhkaraka, Doshakrut. Unripe: Agni pitta krut, Vatasleshmahara. (easyayurveda.com)

Textual description
- **Charaka samhita:** Shothahara, Arshoghna, Asthapanopaga Mahakashaya
- It has been mentioned as a Sthavara sneha yoni in Charaka samhita.
- **Sushruta samhita:** Varunadi, Ambashtadi, Brihatpanchmula and Dashmula.(easyayurveda.com)

Chemical constituents
Beta sitosterol (all parts), amino acids (fruits, leaves), Marmesin, Umbelliferon

Research work
Evaluation of anti-diarrheal and anti-inflammatory activity of Aegle marmelos onAlbino Wistar rats.[40]

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