THE AYURVEDIC PHARMACOPOEIA OF INDIA

PART- I

VOLUME – I

GOVERNMENT OF INDIA

MINISTRY OF HEALTH AND FAMILY WELFARE

DEPARTMENT OF AYUSH

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LEGAL NOTICES

In India there are laws dealing with drugs that are the subject of monographs which follow. These monographs should be read subject to the restrictions imposed by these laws wherever they are applicable.

It is expedient that enquiry be made in each case in order to ensure that the provisions of the law are being complied with.

In general, the Drugs & Cosmetics Act, 1940 (subsequently amended in 1964 and 1982), the Dangerous Drugs Act, 1930 and the Poisons Act, 1919 and the rules framed thereunder should be consulted.

Under the Drugs & Cosmetics Act, the Ayurvedic Pharmacopoeia of India (A.P.I.), Part-I, Vol. I, is the book of standards for single drugs included therein and the standards prescribed in the Ayurvedic Pharmacopoeia of India, Part-I, Vol. I would be official. If considered necessary these standards can be amended and the Chairman of the Ayurvedic Pharmacopoeia Committee authorised to issue such amendments. Whenever such amendments are issued the Ayurvedic Pharmacopoeia of India, Part-I, Vol. I, would be deemed to have been amended accordingly.

GENERAL NOTICES

Title - The title of the book is "Ayurvedic Pharmacopoeia of

Name of the Drugs - The name given on the top of each monograph of the drug is in Sanskrit as mentioned in the Ayurvedic classics and/or in the Ayurvedic Formulary of India , Part-I and Part-II will be considered official. These names have been arranged in English alphabetical order. The Latin name (taxonomical nomenclature) of each drug as found in authentic scientific literature has been provided in the monograph in the introductory paragraph. The official name will be the main title of the drug and its scientific name will also be considered as legal name.

Introductory Para - Each monograph begins with an introductory paragraph indicating the part, scientific name of the drug in Latin with short description about its habit, distribution and method of collection, if any.

Synonyms - Synonyms of each drug appearing in each monograph in Sanskrit, English, Hindi, Urdu and other Indian regional languages have been mentioned as found in the classical texts, Ayurvedic Formulary of India, Part-I and Part-II as procured from the experts, scholars of Ayurveda and officials in the field from different states.

Italics - Italic type has been used for scientific name of the drug appearing in the introductory paragraph of each monograph as also for chemicals and reagents, substances or processes described in Appendix.

Odour and Taste - Wherever a specific odour has been found it has been mentioned but the description as 'odourless' or 'no odour' has in many cases been avoided in the description, as large numbers of drugs have got no specific odour. The "odour" is examined by directly smelling 25 g of the powdered drug contained in a package or freshly powdered. If the odour is discernible the sample is rapidly transferred to an open container and re-examined after 15 minutes. If the odour persists to be discernible, it is described as having odour.

The "Taste" of a drug is examined by taking a small quantity of 85 mesh powder by a tip of moist glass rod and applying it on tongue previously rinsed with water. This may not be done in case if poisonous drugs, indicated in monograph.

Mesh Number - Wherever the powdering of the drug has been required the sieve "Mesh Number 85" has been used. This will not apply for drugs containing much oily substance.

Weights and Measures - The metric system of weights and measures is employed. Weights are given in multiples or fractions of a gramme (g) or of a milligram (mg). Fluid measures are given in multiples or fractions of millilitre (ml).

When the term "drop" is used, the measurement is to be made by means of a tube, which delivers in 20 drops 1 gram of distilled water at 15°C.

Metric measures are required by the Pharmacopoeia to be graduated at 20°C and all measurements involved in the analytical operations of the Pharmacopoeia are intended, unless otherwise stated to be made at that temperature.

Identity, Purity and Strength - Under the heading "Identification" tests are provided as an aid to identification and are described in their respective monographs.

The term "Foreign Matter" is used to designate any matter, which does not form part of the drug as defined in the monograph. Vegetable drugs used as such or in formulations, should be duly identified and authenticated and be free from insects, pests, fungi, micro-organisms, pesticides, and other animal matter including animal excreta, be within the permitted and specified limits for lead, arsenic and heavy metals, and show no abnormal odour, colour, sliminess, mould or other evidence of deterioration.

The quantitative tests e.g. total ash, acid-insoluble ash, water-soluble ash, alcohol-soluble extractive, water- soluble extractive, ether-soluble extractive, moisture content, volatile oil content and assays are the methods upon which the standards of Pharmacopoeia depend. The methods for assays are described in their respective monographs and for other quantitative tests, methods are not repeated in the text of monographs but only the corresponding reference of appropriate appendix is given. The analyst is not precluded from employing an alternate method in any instance if he is satisfied that the method, which he uses, will give the same result as the Pharmacopoeial Method. In suitable instances the methods of microanalysis, if of equivalent accuracy, may be substituted for the tests and assays described. However, in the event of doubt or dispute the methods of analysis of the Pharmacopoeia are alone authoritative.

Limits for Heavy Metals – All Ayurvedic Drugs (Single/Compound formulation) must comply with the limits for Heavy Metals prescribed in individual Monograph and wherever limit is not given then they must comply with the limits given in WHO publication "Quality Control Methods for Medicinal Plants and Material".

Standards - For statutory purpose, statements appearing in the API, Part-I, Vol. V, under Description, those of definition of the part and source plants, and Identity, Purity and Strength, shall constitute standards.

Thin Layer Chromatography (T.L.C.) - Under this head, wherever given, the number of spots and Rf values of the spots with their colour have been mentioned as a guide for identification of the drug and not as Pharmacopoeial requirement. However, the analyst may use any other solvent system and detecting reagent in any instance if he is satisfied that the method which he uses, even by applying known reference standards, will give better result to establish the identity of any particular chemical constituent reported to be present in the drug.

Quantities to be weighed for Assays and Tests - In all description quantity of the substance to be taken for testing is indicated. The amount stated is approximate but the quantity actually used must be accurately weighed and must not deviate by more than 10 per cent from the one stated.

Constant Weight - the term "Constant Weight" when it refers to drying or ignition means that two consecutive weighings do not differ by more than 1.0 mg per g of the substance taken for the determination, the second weighing following an additional hour of drying on further ignition.

Constituents - Under this head only the names of important chemical constituents, groups of constituents reported in research publications have been mentioned as a guide and not as pharmacopoeial requirement.

Percentage of Solutions - In defining standards, the expression per cent (%), is used, according to circumstances, with one of the four meanings given below.

Per cent w/w (percentage weight in weight) expresses the number of grammes of active substance, in 100 grammes of product.

Per cent w/v (Percentage weight in volume) expresses the number of grammes of active substance in 100 millilitres of product.

Per cent v/v (percentage volume in volume) expresses the number of millilitres of active substance in 100 millilitres of product.

Per cent v/w (percentage volume in weight) expresses the number of millilitres of active substance in 100 grammes of product.

Percentage of alcohol - All statements of percentage of alcohol (C_2H_5OH) refer to percentage by volume at 15.56 °C.

Temperature - Unless otherwise specified all temperatures refer to centigrade (celsius), thermometric scale.

Solutions - Unless otherwise specified in the individual monograph, all solutions are prepared with purified water.

Reagents and Solutions - The chemicals and reagents required for the test in Pharmacopoeia are described in Appendices.

Solubility - When stating the solubilities of Chemical substances the term "Soluble" is necessarily sometimes used in a general sense irrespective of concomitant chemical changes.

Statements of solubilities, which are expressed as a precise relation of weights of dissolved substance of volume of solvent, at a stated temperature, are intended to apply at that temperature. Statements of approximate solubilities for which no figures are given, are intended to apply at ordinary room temperature.

Pharmacopoeial chemicals when dissolved may show slight physical impurities, such as fragment of filter papers, fibres, and dust particles, unless excluded by definite tests in the individual monographs.

When the expression "parts" is used in defining the solubility of a substance, it is to be understood to mean that 1 gramme of a solid or 1 millilitre of a liquid is soluble in that number of millilitres of the solvent represented by the stated number of parts.

When the exact solubility of pharmacopoeial substance is not known, a descriptive term is used to indicate its solubility.

The following table indicates the meaning of such terms :-

Descriptive terms	Relative quantities of solvent
Very soluble	Less than 1 part
Freely soluble	From 1 to 10 parts
Soluble	From 10 to 30 parts
Sparingly soluble	From 30 to 100 parts
Slightly soluble	From 100 to 1000 parts
Very slightly soluble	From 1000 to 10,000 parts
Practically insoluble	More than 10,000 parts

Therapeutic uses and important formulations – Therapeutic uses and important formulations mentioned in this Pharmacopoeia are, as provided in the recognised Ayurvedic classics and in the Ayurvedic Formulary of India, Part –I and Part-II.

Doses – The doses mentioned in each monograph are in metric system of weights, which are the approximate conversions from classical weights mentioned in **Ayurvedic** texts. A conversion table is appended giving classical weights of **Ayurvedic** System of Medicine with their metric equivalents. Doses mentioned in the **Ayurvedic** Pharmacopoeia of India (**A.P.I**.) are intended merely for general guidance and represent, unless otherwise stated, the average range of quantities per dose which is generally regarded suitable by clinicians for adults only when administered orally.

It is to be noted that the relation between doses in metric and Ayurvedic systems set forth in the text is of approximate equivalence. These quantities are for convenience of prescriber and sufficiently accurate for pharmaceutical purposes.

The abbreviations commonly employed are as follows:

Abbreviations of technical terms	
m	Metre
l	Litre
mm	Millimetre
cm	Centimetre
µ	Micron (0.001 mm)
kg	Kilogram
g	Gramme
mg	Milligram
ml	Millilitre
in	Normal solution
0.5 N	Half-normal solution
0.1 N	Decinormal solution
1M	Molar solution
Fam.	Family
PS	Primary Standards
TS	Transverse Section

Abbreviations used for Languages	
Sansk.	Sanskrit
Assam.	Assamese
Beng.	Bengali
Eng.	English
Guj.	Gujrati
Kan.	Kannada
Kash.	Kashmiri
Mal.	Malayalam
Mar.	Marathi
Ori.	Oriya
Punj.	Punjabi
Tam.	Tamil
Tel.	Telugu

ABBREVIATIONS FOR PARTS OF PLANTS	
Cotyledon	Cotldn.
Flower	Fl.
Fruit	Fr.
Heart Wood	Ht. Wd.
Leaf	Lf.
Pseudo-bulb	Pseudo-bulb
Root Bark	Rt. Bk.
Root	Rt.
Rhizome	Rz.
Seed	Sd.
Stem Bark	St. Bk.
Stem	St.
Tuberous Root	Tub. Rt.
Wood	Wd.
Whole Plant	Wh. Pl.

AJAGANDHĀ (Seed)

Ajagandhā consists of the seeds of *Cleome gynandra* Linn. Syn. *Gynandropsis gynandra* (Linn.) Briquet (Fam. Capparidaceae); a strong smelling, somewhat foetid herb, 0.6 - 1 m high, found abundantly throughout warmer parts of India.

SYNONYMS

Sanskrit	:	Paśugandhā
Assamese	:	Bhutmulla
Bengali	:	Hurhuria, Shulte
English	:	Dog Mustard
Gujrati	:	Talvani, Dhelitalavan
Hindi	:	Hulhul, Hurhur, Kavalia
Kannada	:	Naram bele Soppu, Nayeetulasi
Kashmiri	:	Gandi Buti
Malayalam	:	Atunari vela
Marathi	:	Tilvan, Bhatvan, Mabli, Tilavana, Tilvant
Oriya	:	Anasorisia, Anasorisa
Punjabi	:	Bugra
Tamil	:	Nal valai, Nal velai
Telugu	:	Vaminta, Vayinta
Urdu	:	--

DESCRIPTION

a) Macroscopic

Seeds, small, 1-2 mm in diameter, kidney shaped, surface rough, dark brown or black.

b) Microscopic

Dark brown, oily; under microscope shows a number of fragments of epidermis of

testa consisting of thin-walled, polygonal cells; groups of cells, resembling like stone cells, reddish-brown with non-lignified walls; a large number of oval, rounded or irregularly shaped protein bodies; starch and crystals absent.

IDENTITY, PURITY AND STRENGTH

Foreign matter	Not more than	2	per cent, Appendix	2.2.2.
Total Ash	Not more than	7	per cent, Appendix	2.2.3.
Acid-insoluble ash	Not more than	0.4	per cent, Appendix	2.2.4.
Alcohol-soluble extractive	Not less than	16	per cent, Appendix	2.2.6.
Water-soluble extractive	Not less than	7	per cent, Appendix	2.2.7.

CONSTITUENTS - Fixed oil, essential oil and oleoresin

PROPERTIES AND ACTION

Rasa : Kaṭu

Guṇa : Laghu, Rūkṣa

Vīrya : Śīta

Vipāka : Kaṭu

Karma : Hṛdya, Dīpana, Vātahara, Pittala, Śūlaghnī

IMPORTANT FORMULATIONS - Nārāyaṇa Cūrṇa

THERAPEUTIC USES - Gulma, Aṣṭhīlā, Kṛmiroga, Kaṇḍū, Karṇaroga

DOSE - 1-3 g of the drug in powder form.

AJAMODĀ (Fruit)

Ajamodā consists of dried, aromatic fruits of *Apium leptophyllum* (Pers.) F. V. M. ex Benth. (Fam. Umbelliferae); an annual herb cultivated in Andhra Pradesh, Gujarat, Madhya Pradesh and Karnataka; collected by thrashing plants on a mat and dried in shade or in drying sheds.

SYNONYMS

Sanskrit	:	Dīpyaka
Assamese	:	Bonjamani, Bonajain, Yamani, Ajowan
Bengali	:	Randhuni, Banyamani
English	:	--
Gujrati	:	Bodi Ajamo, Ajamo
Hindi	:	Ajmuda, Ajmod
Kannada	:	Oma, Ajavana, Omakki
Kashmiri	:	Fakhazur, Banjuan
Malayalam	:	Ayamodakum, Oman
Marathi	:	Ajmoda, Oova
Oriya	:	Banajuani
Punjabi	:	Valjawain, Ajmod
Tamil	:	Omam
Telugu	:	Naranji vamu
Urdu	:	Ajmod

DESCRIPTION

a) Macroscopic

Drug consists of small, ovoid fruit; bulk colour yellowish brown, mainly occur as entire cremocarps with pedicel attached or detached and bifid stylopod, free ends curved sometimes occurs as separate mericarps; cremocarps glabrous, ovoid to conical, about 1.5-3.0 mm long and 1.2-2.8 mm wide, yellow to yellowish green; separated mericarps broadly ovoid, more or less curved, dorsal surface convex with five equally distinct, longitudinal primary ridges; at the summit curved stylopodiurn, commissural surface flat, showing darker and light coloured longitudinal bands, former representing the position of vittae and vascular bundles ; odour; aromatic; taste, slightly bitter giving a

sensation of warmth to tongue.

b) Microscopic

Transverse section of fruit shows mericarps with four large vittae on dorsal surface, two on commissural surface and four primary ridges on dorsal surface; 3-5 secondary oil canals present under each primary ridge and also between ridges; carpophore present on commissural surface; epicarp cells with thin striated cuticle, outer walls drawn into papillae; stomata, anomocytic type upto 35 μ in diameter; mesocarp consists of polygonal paranchyma,: with thickened and lignified cells, measuring 30-62-95μ. in diameter with oval to round pits; collateral vascular bundles lie beneath epicarp; tracheids 25-203-388 μ in length with spiral, scalariform or reticulate thickenings; xylem parenchyma lignified, elongated with elliptical pits, measuring 52-118-176 by 13-30-44 μ large secondary vittac towards endosperm measure upto 123μ in width and towards periphery the smallest vittae measuring 184μ in diameter.

Powder-Shows moderately thick-walled cell of epicarp exhibiting characteristic striations and occasional presence of stoma, fragments of trichomes and glandular hairs, reticulate parenchymatous cells of mesocarp, fragments of yellowish-brown vittae; fragments of endosperm thick-walled polygonal cells containing aleurone grain and micro rosette crystals of calcium oxalate.

IDENTITY, PURITY AND STRENGTH

Foreign matter (Including fStalk)	Not more than	5	per cent, Appendix	2.2.2.
Total Ash	Not more than	14	per cent, Appendix	2.2.3.
Acid-insoluble ash	Not more than	4	per cent, Appendix	2.2.4.
Alcohol-soluble extractive	Not less than	14	per cent, Appendix	2.2.6.
Water-soluble extractive	Not less than	3	per cent, Appendix	2.2.7.
Volatile oil	Not less than	2	per cent v/w, Appendix	2.2.10

CONSTITUENTS - Essential oil and fixed oil

PROPERTIES AND ACTION

Rasa : Kaṭu, Tikta

Guṇa : Laghu, Rūkṣa

Vīrya : Uṣṇa

Vipāka : Kaṭu

Karma : Vidāhī, Kaphavātajit, Dīpana, Rucikṛt, Kṛmijit, Śūlaghna

IMPORTANT FORMULATIONS - Ajamodārka, Ajamodādi Cūrṇa

THERAPEUTIC USES - Aruci, Ādhmāna, Gulma, Hikkā, Chardi, Kṛmiroga, Śūla

DOSE - 1-3 g of the drug in powder form.

Note: Trachyspermum roxburghianum (DC) Sprague Syn. Carum roxburghianum Benth. Hook.f. is the common market substitute

ĀMALAKĪ (Fresh Fruit pulp)

Āmalakī consists of fresh fruit pulp of *Emblica officinalis* Gaertn. (Fam. Euphorbiaceae); a small or medium sized tree, found in mixed deciduous forests, ascending to 1300 m on hills and cultivated in gardens and homeyards.

SYNONYMS

Sanskrit	:	Āmalaka, Amṛtaphala, Dhātrīphala
Assamese	:	Amlaku, Amlakhi, Amlakhu
Bengali	:	Amla, Dhatri
English	:	Emblic Myrobalan
Gujrati	:	Ambala, Amala
Hindi	:	Amla, Aonla
Kannada	:	Nellikayi
Kashmiri	:	Embali, Amli
Malayalam	:	Nellikka
Marathi	:	Anvala, Avalkathi
Oriya	:	Anala, Ainla
Punjabi	:	Aula, Amla
Tamil	:	Nellikkai, Nelli
Telugu	:	Usirika
Urdu	:	Amla, Amlaj

DESCRIPTION

a) Macroscopic

Fruit, globose, 2.5-3.5 cm in diameter, fleshy, smooth with six prominant lines; greenish when tender, changing to light yellowish or pinkish colour when mature, with a few dark specks: taste, sour and astringent followed by delicately sweet taste.

b) Microscopic

Transverse section of mature fruit shows an epicarp consisting of single layer of epidermis and 2-4 layers of hypodermis; epidermal cell, tabular In shape, covered externally with a thick cuticle and appear in surface view as polygonal; hypodermal cells tangentially elongated, thick-walled, smaller in dimension than epidermal cells; mesocarp forms bulk of fruit, consisting of thin-walled parenchymatous cells with intercellular spaces, peripheral 6-9 layers smaller, ovoid or tangentially elongated while rest of cells larger in size, isodiametric and radially elongated; several collateral fibrovascular bundles scattered throughout mesocarp consisting of xylem and phloem; xylem composed of tracheal elements, fibre tracheids and xylem fibres; tracheal elements show reticulate scalariform and spiral thickenings; xylem fibres elongated with narrow lumen and pointed end; mesocarp contains large aggregates of numerous irregular silica crystals.

IDENTITY, PURITY AND STRENGTH

Foreign matter	Not more than	2	per cent, Appendix	2.2.2.
Total Ash	Not more than	7	per cent, Appendix	2.2.3.
Acid-insoluble ash	Not more than	2	per cent, Appendix	2.2.4.
Alcohol-soluble extractive (On dried basis)	Not less than	40	per cent, Appendix 2.2.6.	
Water-soluble extractive	Not less than	50	per cent, Appendix	2.2.7.
Moisture content	Not less than	80	per cent, Appendix	2.2.9

CONSTITUENTS - Ascorbic acid and tannins

PROPERTIES AND ACTION

Rasa : Amla, Kaṣāya, Madhura, Tikta, Kaṭu

Guṇa : Rūkṣa, Laghu

Vīrya : Śīta

Vipāka : Madhura

Karma : Tridoṣajit, Vṛṣya, Rasāyana, Cakṣuṣya

IMPORTANT FORMULATIONS - Cyavanaprāśa

THERAPEUTIC USES - Raktapitta, Amlapitta, Prameha, Dāha

DOSE - 10-20 g of the drug

5-10 ml of fresh juice

ĀMALAKĪ (Dried fruit)

Āmalakī consists of pericarp of dried mature fruits of *Emblica officinalis* Gaertn. Syn. *Phyllanthus emblica* Linn. (Fam. Euphorbiaceae); mostly collected in winter season after ripening and in Kashmir in summer, a small or medium sized tree, found both in natural state in mixed deciduous forests of the country ascending to 1300 m on hills; cultivated in gardens, homeyards or grown as a road side tree.

SYNONYMS

Sanskrit	:	Amṛtaphala, Āmalaka, Dhātrīphala
Assamese	:	Amlakhi, Amlakhu, Amlaku
Bengali	:	Amla, Dhatri
English	:	Emblic Myrobalan
Gujrati	:	Ambala, Amala
Hindi	:	Amla, Aonla
Kannada	:	Nellikayi, Bela nelli, Pottadenollikayi
Kashmiri	:	Amli, Embali
Malayalam	:	Nellikka
Marathi	:	Anvala, Avalkathi
Oriya	:	Ainla, Anala
Punjabi	:	Aula, Amla
Tamil	:	Nellikkai, Nelli
Telugu	:	Usirika
Urdu	:	Amla, Amlaj

DESCRIPTION

a) Macroscopic

Drug consists of curled pieces of pericarp of dried fruit occuring either as separated single segment; 1-2 cm long or united as 3 or 4 segments; bulk colour grey to black, pieces showing, a broad, highly shrivelled and wrinkled external convex surface to somewhat concave, transversely wrinkled lateral surface, external surface shows a few whitish specks, occasionally some pieces show a portion of stony testa (which should be removed before processing); texture rough, cartilaginous, tough; taste, sour

and astringent.

b) Microscopic

Transverse section of fruit shows epicarp consisting of a single layered epidermis, cell appearing tabular and poygonal in surface view; cuticle present; mesocarp cells tangentially elongated parenchymatous and crushed, differentiated roughly into peripheral 8 or 9 layers of tangentially elongated smaller cells, rest consisting of mostly isodiametric larger cells with walls showing irregular thickenings; ramified vascular elements occasionally present; stone cells present either isolated or in small groups towards endocarp ; pitted vascular fibres, walls appearing serrated due to the pit canals, leading into lumen.

Powder: Fine powder shows epidermis with uniformly thickened straight walled, isodiametric parenchyma cells with irregular thickened walls, occasionally short fibres and tracheids.

IDENTITY, PURITY AND STRENGTH

Foreign matter (Including seed and seed coat)	Not more than	3	per cent, Appendix 2.2.2.	
Total Ash	Not more than	7	per cent, Appendix	2.2.3.
Acid-insoluble ash	Not more than	2	per cent, Appendix	2.2.4.
Alcohol-soluble extractive	Not less than	40	per cent, Appendix	2.2.6.
Water-soluble extractive	Not less than	50	per cent, Appendix	2.2.7.

CONSTITUENTS - Ascorbic acid and gallotannins

PROPERTIES AND ACTION

Rasa : Amla, Kaṣāya, Madhura, Tikta, Kaṭu

Guṇa : Rūkṣa, Laghu

Vīrya : Śīta

Vipāka : Madhura

Karma : Tridoṣajit, Vṛṣya, Rasāyana, Cakṣuṣya

IMPORTANT FORMULATIONS - Cyavanaprāśa, Dhātrī Lauha, Dhātryādi Ghṛta, Triphalā Cūrṇa

THERAPEUTIC USES - Raktapitta, Amlapitta, Prameha, Dāha

DOSE - 3-6 g of the drug in powder form

ĀRAGVADHA (Fruit pulp)

Āragvadha consists of pulp obtained from fruits (devoid of seeds, septa and pieces of pericarp) of *Cassia fistula* Linn. (Fam. Leguminosae), a moderate sized deciduous tree, common throughout India as wild or cultivated plant, fruits collected when ripe.

SYNONYMS

Sanskrit	:	Kṛtamāla, Vyādhighāta, Śampāka, Nṛpadruma
Assamese	:	Sonaroo
Bengali	:	Sondala
English	:	Indian Laburnum, Purging cassia
Gujrati	:	Garamala, Garamalo
Hindi	:	Amaltas
Kannada	:	Aragvadha, Kakke, Kakke-gida, Kakkemara, Kakkedai, Rajataru
Kashmiri	:	Kriyangal Phali
Malayalam	:	Konna, Kritamalam
Marathi	:	Bahava, Garamala, Amaltas
Oriya	:	Sunari
Punjabi	:	Amaltas
Tamil	:	Sarakonrai, Sarakkonnai, Sarakkondi, Sharakkonrai
Telugu	:	Rela
Urdu	:	Khiyar Shambar

DESCRIPTION

a) Macroscopic

Fruit, a many celled, indehiscent pod, 35-60 cm long and 18-25 mm diameter, nearly straight and subcylindrical, chocolate-brown to almost black in colour, pod surface smooth to naked eye, but under lens showing minute transverse fissures, both dorsal and ventral sutures evident, but not prominent, short stalk attached to base of fruit and rounded distal end mucronate, pericarp thin, hard and woody, fruit initially divided by transverse septa about 5 mm, apart, each containing a single seed attached to ventral suture by a long dark, thread-like funicle about 8-12 by 6-8 mm, circular to oval, flattened, reddish-brown, smooth, extremely hard and with a distinct dark brown line extending from micropyle to base, seed initially embedded in a black viscid pulp

consisting of black, thin, shining, circular disc like masses having central depression of seed on both surfaces or as broken pieces adhered with each other, when dipped in water makes yellow solution which darkness to brownish-yellow to dark brown, on keeping, pulp fills the cell but shrinks on drying and adheres to both sides of testa, seeds often lye loose in their segments, odour faint, sickly, taste, sweet.

b) Microscopic

IDENTITY, PURITY AND STRENGTH

Foreign matter	Not more than	2	per cent, Appendix	2.2.2.
Total Ash	Not more than	6	per cent, Appendix	2.2.3.
Acid-insoluble ash	Not more than	1	per cent, Appendix	2.2.4.
Alcohol-soluble extractive	Not less than	15	per cent, Appendix	2.2.6.
Water-soluble extractive	Not less than	46	per cent, Appendix	2.2.7.

ASSAY

T.L.C.

CONSTITUENTS - Sugar, mucilage, pectin and anthraquinone.

PROPERTIES AND ACTION

Rasa : Madhura, Tikta

Guṇa : Guru

Vīrya : Uṣṇa

Vipāka : Madhura

Karma : Recana

IMPORTANT FORMULATIONS - Āragvadhādi Kvātha Cūrṇa

THERAPEUTIC USES - Vibandha, Udāvarta, Gulma, Śūla, Udararoga, Hṛdroga, Prameha

DOSE - 5-10 g of the drug in powder form; Note:- The market material contains seeds, septa etc., which form the Foreign Matter and should be separated before use.

ARKA (Root)

Arka consists of dried roots of *Calotropis procera* (Ait.) R. Br. (Fam. Asclepiadaceae) found wild more or less throughout India.

SYNONYMS

Sanskrit	:	Ravi, Bhānu, Tapana
Assamese	:	Akand, Akan
Bengali	:	Akanda, Akone
English	:	Madar Tree
Gujrati	:	Aakado
Hindi	:	Aak, Madar, Akavana
Kannada	:	Ekka, Ekkadagida, Ekkegida
Kashmiri	:	Acka
Malayalam	:	Erikku
Marathi	:	Rui
Oriya	:	Arakha
Punjabi	:	Ak
Tamil	:	Vellerukku, Erukku
Telugu	:	Jilledu
Urdu	:	Madar, Aak

DESCRIPTION

a) Macroscopic

Root:- rough, fissured longitudinally, corky and soft, externally yellowish-grey while internally white, central core cream coloured, bark easily separated from xylem, odour, characteristic: taste, bitter and acrid.

b) Microscopic

Transverse section of root shows outer most cork tissue consisting of 4-8 rows of tangentially elongated and radially arranged cells followed by 3-6 rows of moderately

thick-walled, irregular cells of secondary cortex devoid of calcium oxalate crystals and starch grains, cortex composed of large polyhedral parenchymatous cells containing abundant rounded starch grains, some cortical cells contain rosette crystals of calcium oxalate, scattered laticifer cells with brown contents, phloem consists of sieve elements and phloem parenchyama, sieve tubes thick-walled, cells more prominent towards inner region of phloem traversed by uni to tetraseriate medullary rays, phloem cells contain crystals of calcium oxalate, starch grains and laticifers similar to these found in cortex: cambium present just within the phloem consisting of 2-5 rows of thin-walled, tangentially elongated cells xylem forms the central part of root composed of vessels. tracheids, fibres and xylem parenchyma, vessels present throughout xylem region and arranged radially in groups of 2-7, sometime single vessels also occur, usually cylindrical having bordered pits on their walls, xylem fibres long, lignified with wide lumen, tapering on ends and have simple pits on walls, medullary rays 1-4 seriate and triseriate in outer region and uni or biseriate in inner region: cells of medullary rays radially elongated, filled with starch similar to those present in cortical cells.

IDENTITY, PURITY AND STRENGTH

Foreign matter	Not more than	2	per cent, Appendix	2.2.2.
Total Ash	Not more than	4	per cent, Appendix	2.2.3.
Acid-insoluble ash	Not more than	1	per cent, Appendix	2.2.4.
Alcohol-soluble extractive	Not less than	2	per cent, Appendix	2.2.6.
Water-soluble extractive	Not less than	8	per cent, Appendix	2.2.7.

ASSAY

T.L.C.

CONSTITUENTS - Glycosides (calotropin)

PROPERTIES AND ACTION

Rasa : Kaṭu, Tikta

Guṇa : Laghu

Vīrya : Uṣṇa

Vipāka : Kaṭu

Karma : Kaphavātahṛt, Dīpana, Bhedana, Kṛmighna, Vraṇahara, Viṣaghna, Kuṣṭhaghna

IMPORTANT FORMULATIONS - Mahā Viṣagarbha Taila, Dhānvantara Ghṛta

THERAPEUTIC USES - Kaṇḍū, Kuṣṭha, Kṛmiroga, Gulma, Udararoga, Vraṇa, Śvāsa

DOSE - 1-3 g of the drug for decoction

ARKA (Leaf)

Arka consists of dried leaves of *Calotropis procera* (Ait.) R.Br. (Fam. Asclepiadaceae), found wild more or less throughout India.

SYNONYMS

Sanskrit	:	Bhānu, Ravi, Tapana
Assamese	:	Akan, Akand
Bengali	:	Akanda, Akone
English	:	Madar Tree
Gujrati	:	Aakado
Hindi	:	Aak, Akavana, Madar
Kannada	:	Ekka, Ekkadagida, Ekkegida
Kashmiri	:	Acka
Malayalam	:	Erikku
Marathi	:	Rui
Oriya	:	Arakha
Punjabi	:	Ak
Tamil	:	Erukku, Vellerukku
Telugu	:	Jilledu
Urdu	:	Aak, Madar

DESCRIPTION

a) Macroscopic

Sub-sessile, 6-15 cm by 4.5-8 cm, broadly ovate, ovate-oblong, elliptic or obovate acute, pubescent when young and glabrous on both sides on maturity.

b) Microscopic

Midrib - transverse section through midrib shows an upper and lower single layered epidermis externally covered with thick, striated cuticle, few epidermal cells on both surfaces of leaf elongated to form un i-seriate, 2-3 celled trichomes, epidermal cells

cubical and radially elongated, epidermis followed by 3-8 layered collenchyma on both lower and upper surfaces, parenchymatous cells thin-walled, isodiametric to circular with intercellular spaces present in ground tissue, stele crescent shaped composed of bicollateral and open vascular bundle, xylem consists mostly of vessels and tracheids, a strip of cambium present between xylem and phloem tissues, laticifers also present in the phloem and parenchymatous zone.

Lamina - dorsiventral with mesophyll differentiated into a palisade and spongy tissue, upper and lower epidermis covered externally with a thick, striated cuticle, below upper epidermis three rows of elongated, closely arranged palisade parenchyma present, spongy parenchyma tissues almost radially elongated with intercellular spaces, central cells irregular in shape, laticifers and vascular bundles also present scattered in this region

IDENTITY, PURITY AND STRENGTH

Foreign matter	Not more than	2	per cent, Appendix	2.2.2.
Total Ash	Not more than	21	per cent, Appendix	2.2.3.
Acid-insoluble ash	Not more than	5	per cent, Appendix	2.2.4.
Alcohol-soluble extractive	Not less than	5	per cent, Appendix	2.2.6.
Water-soluble extractive	Not less than	24	per cent, Appendix	2.2.7.

CONSTITUENTS - Glycoside (Calotropin)

PROPERTIES AND ACTION

Rasa : Kaṭu, Tikta

Guṇa : Laghu, Sara, Snigdha

Vīrya : Uṣṇa

Vipāka : Kaṭu

Karma : Vātahṛt, Dīpana, Kṛmighna, Śopha, Vraṇahara, Viṣaghna, Bhedana, Śvāsahara

IMPORTANT FORMULATIONS - Arka Lavaṇa

THERAPEUTIC USES - Śotha, Kaṇḍū, Kuṣṭha, Vraṇa, Kṛmiroga, Gulma, Śleṣmodararoga, Plīhāroga, Arśa, Śvāsa

DOSE - 250-750 mg of the drug in powder form

ASANA (Heart wood)

Asana consists of heart-wood of *Pterocarpus marsupium* Roxb. (Fam. Leguminosae); a moderate to large sized, deciduous tree, upto 30 m high and 2.5 m in girth, with straight clear bole, found mostly throughout Gujarat, Madhya Pradesh, Bihar and Orissa.

SYNONYMS

Sanskrit	:	Bīijaka, Pītasāra, Asanaka, Bījasāra
Assamese	:	Aajar
Bengali	:	Piyasala, Pitasala
English	:	Indian Kino Tree
Gujrati	:	Biyo
Hindi	:	Vijayasara, Bija
Kannada	:	Bijasara, Asana
Kashmiri	:	Lal Chandeur
Malayalam	:	Venga
Marathi	:	Bibala
Oriya	:	Piashala
Punjabi	:	Chandan Lal, Channanlal
Tamil	:	Vengai
Telugu	:	Yegi, Vegisa
Urdu	:	Bijasar

DESCRIPTION

a) Macroscopic

Drug occurs as irregular pieces in variable size and thickness, golden yellowish-brown with darker streaks, on soaking in water gives yellow colour solution with blue fluorescence strong, tough, very hard, moderately heavy, fracture, difficult to break but brittle, taste, astringent.

b) Microscopic

Transverse section shows alternating bands of larger and smaller polygonal cells consisting of tracheids, fibre tracheids, xylem parenchyma and traversed by xylem rays, numerous xylem vessels distributed throughout, in singles or in groups of 2-3, showing tyloses filled with tannin; in isolated preparations, vessels, drum or barrel shaped with well-marked perforation rims and bordered pits; tracheids numerous, long, thick-walled with tapering ends and simple pits; fibre tracheids elongated, thick-walled with narrow lumen and simple pits; xylem parenchyma rectangular with simple pits, paratracheal, surrounding vessels; xylem rays uni-to-biseriate, 3-5-7 cells high, prismatic crystals of calcium oxalate present in crystal fibres, starch absent.

Powder: Brown to chocolate colour, under microscope shows vessels with bordered pits, fibre tracheids, tracheids, fragments of xylem rays and few crystal fibres, starch absent.

IDENTITY, PURITY AND STRENGTH

Foreign matter	Not more than	2	per cent, Appendix	2.2.2.
Total Ash	Not more than	2	per cent, Appendix	2.2.3.
Acid-insoluble ash	Not more than	0.5	per cent, Appendix	2.2.4.
Alcohol-soluble extractive	Not less than	7	per cent, Appendix	2.2.6.
Water-soluble extractive	Not less than	5	per cent, Appendix	2.2.7.

CONSTITUENTS - Alkaloids and resin

PROPERTIES AND ACTION

Rasa : Kaṣāya, Kaṭu, Tikta

Guṇa : Laghu, Rūkṣa

Vīrya : Uṣṇa

Vipāka : Kaṭu

Karma : Kaphapittaśāmaka, Galadoṣaghna, Keśya, Tvacya, Stambhana, Kuṣṭhaghna, Rasāyana, Raktaśodhana

IMPORTANT FORMULATIONS - Nyagrodhādi Cūrṇa, Asanabilvādi Taila

THERAPEUTIC USES - Pāṇḍu, Prameha, Medodoṣa, Kuṣṭha, Kṛmiroga

DOSE - 50-100 g of the drug for decoction

AŚOKA (Stem bark)

Aśoka consists of dried stem bark of *Saraca asoca* (Rose.) De. Willd , Syn. *Saraca indica* Linn. (Fam. Leguminosae), collected in spring from mature, wild or cultivated trees, found in Central and Eastern Himalayas, Western Ghats and Deccan.

SYNONYMS

Sanskrit	:	Kaṅkeli
Assamese	:	Ashoka
Bengali	:	Ashoka
English	:	Asok Tree
Gujrati	:	Ashoka
Hindi	:	Ashoka
Kannada	:	Ashokadamara, Ashokamara, Kankalimara
Kashmiri	:	Ashok
Malayalam	:	Asokam
Marathi	:	Ashok
Oriya	:	Ashoka
Punjabi	:	Asok
Tamil	:	Asogam, Asogu, Asokam
Telugu	:	Ashokapatta
Urdu	:	--

DESCRIPTION

a) Macroscopic

Bark channelled, externally dark green to greenish grey, smooth with circular lenticels and transversely ridged, sometimes cracked, internally reddish-brown with fine longitudinal strands and fibers, fracture splintery exposing striated surface, a thin whitish continuous layer is seen beneath the cork layer, taste, astringent.

b) Microscopic

Transverse section of stem bark shows periderm consisting of a wide layer of cork, radially flattened, narrow cork cambium, secondary cortex wide with one or two continuous layers of stone cells with many patches of sclereids, parenchymatous tissue contains yellow masses and prismatic crystals: secondary phloem consists of phloem parenchyma, sieve tubes with companion cells and phloem fibres occuring in groups, crystal fibres present.

IDENTITY, PURITY AND STRENGTH

Foreign matter	Not more than 2 per cent, Appendix	2.2.2.
Total Ash	Not more than 11 per cent, Appendix	2.2.3.
Acid-insoluble ash	Not more than 1 per cent, Appendix	2.2.4.
Alcohol (90 per cent) soluble extractive	Not less than 15 per cent, Appendix	2.2.6.
Water-soluble extractive	Not less than 11 per cent, Appendix	2.2.7.

CONSTITUENTS - Tannins and a crystalline glycoside.

PROPERTIES AND ACTION

Rasa : Kaṣāya, Tikta

Guṇa : Laghu, Rūkṣa

Vīrya : Śīta

Vipāka : Kaṭu

Karma : Grāhī, Varṇya, Hṛdya, Śothahara, Viṣaghna

IMPORTANT FORMULATIONS - Aśokāriṣṭa, Aśokaghṛta

THERAPEUTIC USES - Asṛgdara, Apacī, Dāha, Raktadoṣa, Śotha

DOSE - 20-30 g of the drug for decoction.

AŚVAGANDHĀ (Root)

Aśvagandhā consists of dried mature roots of *Withania somnifera* Dunal. (Fam. Solanaceae), a perennial shrub, found in waste land, cultivated field and open grounds throughout India, widely cultivated in certain areas of Madhya Pradesh and Rajasthan , roots collected in winter, washed and cut into short pieces.

SYNONYMS

Sanskrit	:	Hayagandhā, Vājigandhā
Assamese	:	Ashvagandha
Bengali	:	Ashvagandha
English	:	--
Gujrati	:	Asgandha
Hindi	:	Asgandh
Kannada	:	Angarberu, Hiremaddina-gida
Kashmiri	:	Asagandh
Malayalam	:	Amukkuram
Marathi	:	Asagandha, Askagandha
Oriya	:	Aswagandha
Punjabi	:	Asgandh
Tamil	:	Amukkaramkizangu
Telugu	:	Pennerugadda
Urdu	:	Asgand

DESCRIPTION

a) Macroscopic

Roots straight, unbranched, thickness varying with age. roots bear fibre-like secondary roots, outer surface buff to grey-yellow with longitudinal wrinkles, crown consists of 2-6 remains of stem base, stem bases variously thickened, nodes prominent only on the side from where petiole arises, cylindrical, green with longitudinal wrinkles, fracture, short and uneven, odour, characteristic, taste, bitter and acrid.

b) Microscopic

Transverse section of root shows cork exfoliated or crushed, when present isodiamatric and non-lignified, cork cambium of 2-4 diffused rows of cells, secondary cortex about twenty layers of compact parenchymatous cells, phloem consists of sieve tubes, companion cells, phloem parenchyma, cambium 4-5 rows of tangentially elongated cells, secondary xylem hard forming a closed vascular ring separated by multiseriate medullary rays, a few xylem parenchyma

IDENTITY, PURITY AND STRENGTH

Foreign matter	Not more than	2	per cent, Appendix	2.2.2.
Total Ash	Not more than	7	per cent, Appendix	2.2.3.
Acid-insoluble ash	Not more than	1	per cent, Appendix	2.2.4.
Alcohol (25 per cent) soluble extractive	Not less than	15	per cent, Appendix 2.2.6.	
Water-soluble extractive	Not less than		per cent, Appendix	2.2.7.

ASSAY

ASSAY -Aswagandha consists of not less than 0.2 per cent of total alkaloids, when assayed as follows:

Take about 30g accurately weighed of the powdered drug, cover with *Alcohol* (90 per cent) and allow to stand overnight. Extract for 6 hours so wet apparatus and concentrate to a syrup residue. Treat with 25, 20, 15 and 10 ml portions of 5 per cent **Sulphuric Acid** until complete extraction of alkaloid is affected.

To the combined acid extracts add an excess of Dragandorf's reagent. Filter under suction and dissolve the residue in *Acetone,* Shake the acetone solution with freshly prepared suspension of 2ml *Silver Carbonate* in 10 ml of Water. Filter the solution and wash the precipitate with *Acetone, Alcohol* and *water* in that order. Pass sufficient *Hydrogen Sulphide* through the filtrate. Boil the solution for 10 minutes, Inter and evaporate under vacuum in a tared flask. Add to the residue 5 ml of *Ethyl Alcohol* - evaporate to dryness, repeat the process once again and weight the residue to constant

weight in a vacuum dessicator.

CONSTITUENTS - Alkaloids and withanolides.

PROPERTIES AND ACTION

Rasa	:	Tikta, Kaṣāya
Guṇa	:	Laghu
Vīrya	:	Uṣṇa
Vipāka	:	Madhura
Karma	:	Vātakaphāpaha, Balya, Rasāyana, Vājīkaraṇa

IMPORTANT FORMULATIONS - Aśvagandhādyariṣṭa, Aśvagandhādi Lehya, Balāśvagandhalākṣādi Taila

THERAPEUTIC USES - Kṣaya, Daurbalya, Vātaroga, Śotha, Klaibya

DOSE - 3-6 g of the drug in powder form

AŚVATTHA (Bark)

Aśvattha consists of dried bark of *Ficus religiosa* Linn. (Fam. Moraceae), a large perennial tree, glabrous when young, found throughout the plains of India upto 170 m altitude in the Himalayas, largely planted as an avenue and roadside tree especially near temples.

SYNONYMS

Sanskrit	:	Pippala
Assamese	:	Ahant
Bengali	:	Asvattha, Ashud, Ashvattha
English	:	Pipal tree
Gujrati	:	Piplo, Jari, Piparo, Pipalo
Hindi	:	Pipala, Pipal
Kannada	:	Arlo, Ranji, Basri, Ashvatthanara, Ashwatha, Aralimara, Aralegida, Ashvathamara, Basari, Ashvattha
Kashmiri	:	Bad
Malayalam	:	Arayal
Marathi	:	Pipal, Pimpal, Pippal
Oriya	:	Aswatha
Punjabi	:	Pipal, Pippal
Tamil	:	Ashwarthan, Arasamaram, Arasan, Arasu, Arara
Telugu	:	Ravichettu
Urdu	:	---

DESCRIPTION

a) Macroscopic

Bark occurs in flat or slightly curved pieces, varying from 1.0-2.5 cm or more in thickness, outer surface brown or ash coloured, surface uneven due to exfoliation of cork, inner surface smooth and somewhat brownish, fracture, fibrous, taste, astringent.

b) Microscopic

Transverse section of bark shows compressed rectangular to cubical, thick-walled cork cells and dead elements of secondary cortex, consisting of masses of stone cells, cork cambium distinct with 3-4 rows of newly formed secondary cortex, mostly composed of stone cells towards periphery, stone cells found scattered in large groups, rarely isolated, most of parenchymatous cells of secondary cortex contain numerous starch grains and few prismatic crystals of calcium oxalate, secondary phloem a wide zone, consisting of sieve elements, phloem fibres in singles or in groups of 2 to many and non-lignified, numerous crystal fibres also present, in outer region sieve elements mostly collapsed while in inner region intact, phloem parenchyma mostly thick-walled, stone cells present in single or in small groups similar to those in secondary cortex, a number of ray-cells and phloem parenchyma filled with brown pigments, prismatic crystals of calcium oxalate and starch grains present in a number of parenchymatous cells, medullary rays uni to multiseriate, wider towards outer periphery composed of thick-walled cells with simple pits, in tangential section ray cells circular to oval in shape, cambium when present, consists of 2-4 layers of thin-walled rectangular cells.

IDENTITY, PURITY AND STRENGTH

Foreign matter	Not more than	2	per cent,	Appendix	2.2.2.
Total Ash	Not more than	7	per cent,	Appendix	2.2.3.
Acid-insoluble ash	Not more than	0.3	per cent,	Appendix	2.2.4.
Alcohol-soluble extractive	Not less than	8	per cent,	Appendix	2.2.6.
Water-soluble extractive	Not less than	9	per cent,	Appendix	2.2.7.

CONSTITUENTS - Tannins.

PROPERTIES AND ACTION

Rasa : Kaṣāya

Guṇa : Guru, Rūkṣa

Vīrya : Śīta

Vipāka : Kaṭu

Karma : Kaphapittavināśī, Varṇya, Saṃgrāhī, Bhagnasandhānakara, Mūtrasaṃgrahaṇīya

IMPORTANT FORMULATIONS - Nyagrodhādi Kvātha Cūrṇa, Nyagrodhādi Cūrṇa

THERAPEUTIC USES - Vātarakta, Raktapitta, Vraṇa, Yonidoṣa, Prameha

DOSE - 20-30 g of the drug for decoction

ATASĪ (Seed)

Atasī consists of dried, ripe seeds of *Linum usitatissimum Linn.* (Fam. Linaceae), an erect annual herb, 0.6-1.2 m high, extensively cultivated throughout the plains ofIndia upto an altitude of 800 m, capsule ripen by end of June, dried seeds separated from capsule by thrashing.

SYNONYMS

Sanskrit	:	Umā, Kṣumā
Assamese	:	Tisi, Tusi
Bengali	:	Masina, Atasi
English	:	Linseed
Gujrati	:	Alshi, Arasi
Hindi	:	Alsi
Kannada	:	Agasebeeja, Semeagare, Agasi
Kashmiri	:	Alsi
Malayalam	:	Agastha, Agasi, Cheru charm
Marathi	:	Atshi
Oriya	:	Atushi
Punjabi	:	Ali
Tamil	:	Ali, Virai
Telugu	:	Avisa
Urdu	:	Alsi, Katan

DESCRIPTION

a) Macroscopic

Seed small, brown, glossy with minutely pitted surface, about 4-6 mm long and 2-2.5 mm in maximum width, elongated-ovoid, flattened, rounded at one end and obliquely pointed at the other, near which on one edge, a light depression enclosing hilum and micropyle, embryo consisting of two yellowish-white, flattened planoconvex cotyledons and a radicle, nearly fills the seed and completely surrounded by a thin, whitish endosperm, both endosperm and embryo oily, testa mucilaginous when soaked in water, odour, characteristic, taste, oily when chewed.

b) Microscopic

Transverse section of seed shows testa consists of isodiametric cells with mucilaginous outer walls, collenchymatous cells of middle layer of seed coat cylindrical, single layered, yellowish brown, longitudinally elongated, about 120-190µ long and 14-17 µ wide, thick, lignified and with pitted walls, single layer of flattened polygonal pigment cells with reddish-brown contents, aleurone grains in the cotyledons, upto 20 µ in diameter, each with globoid and crystalloid, abundant globule of fixed oil and occasional starch grains present.

IDENTITY, PURITY AND STRENGTH

Foreign matter	Not more than	1	per cent, Appendix	2.2.2.
Total Ash	Not more than	5	per cent, Appendix	2.2.3.
Acid-insoluble ash	Not more than	2	per cent, Appendix	2.2.4.
Alcohol-soluble extractive	Not less than	30	per cent, Appendix	2.2.6.
Water-soluble extractive	Not less than	15	per cent, Appendix	2.2.7.
Fixed oil	Not less than	25	per cent, Appendix	2.2.8

CONSTITUENTS - Fixed oil, mucilage and protein

PROPERTIES AND ACTION

Rasa : Madhura, Tikta

Guṇa : Snigdha, Guru

Vīrya : Uṣṇa

Vipāka : Kaṭu

Karma : Vātaghna, Acakṣuṣya

IMPORTANT FORMULATIONS - Sarṣapādi Pralepa

THERAPEUTIC USES - Śiroroga, Kṛmiroga, Kuṣṭha, Prameha

DOSE - 3-6 g of the drug in powder form

ATIBALĀ (Root)

Atibalā consists of root of *Abutilon indicum* (Linn.) Sweet (Fam. Malvaceae), a hairy herb or under-shrub 1.0-1.5 m high, annual or more often perennial with golden yellow flowers, flowering mostly throughout the year found abundantly throughout the hotter parts of India, as a common weed on road sides and other waste places in plains and hills, upto an elevation of 600 m.

SYNONYMS

Sanskrit	:	Kaṅkatikā, Ṛṣyaprōktā
Assamese	:	Jayavandha, Jayapateri
Bengali	:	Badela
English	:	Indian Mallow
Gujrati	:	Kansaki, Khapat
Hindi	:	Kanghi
Kannada	:	Shrimudrigida, Mudragida, Turube
Malayalam	:	Uram, Katuvan, Urubam, Urabam, Vankuruntott, Oorpam, Tutti
Marathi	:	Chakrabhendi, Petari, Mudra
Oriya	:	Pedipidika
Punjabi	:	Kangi, Kangibooti
Tamil	:	Tutti, Thuthi
Telugu	:	Tutturubenda
Urdu	:	--

DESCRIPTION

a) Macroscopic

Tap roots, fairly long with a number of lateral branches, 1.5-2 cm in diameter, light brown, outer surface smooth with dot like lenticels, bark thin and can be easily peeled off, odour, feeble, taste, astringent and bitter.

b) Microscopic

Transverse section of root shows a thin cork of 4-7 or more tangentially elongated rectangular cells, cork cambium, single layered, and at the lenticel regions followed by 2-3 layers of secondary cortex of thin-walled, almost cubical or rectangular cells, containing small clusters of calcium oxalate in most of cells, phellogen followed by 3-4 layers of thin-walled cells of cortex, some cells of cortex which are above the conical strands of bast, crushed, small starch grains, 6-9 μ in diameter, present in some of the cells , phloem forms the major portions of bark and present as conical strands with their bases towards the wood and with dilate distal ends of the primary medullary ray in between them, fibres, present in groups of 10-12 in these conical strands, in tangential rows, alternating with thin-walled phloem elements, towards wood fibre groups, element in between the fibres mostly consists of phloem parenchyma, Some cells contain cluster crystals of calcium oxalate and a few others have starch grains, some phloem cells towards periphery appear compressed and crushed, inner to phloem, a cambium present, consisting of 1-2 rows of narrow, thin-walled rectangular cells, wood composed of vessels, wood fibres, wood parenchyma and medullary rays vessels vary in diameter and arranged in radial groups of 2-4, also occur in singles, some cells show tyloses formation, parenchyma thick-walled and slightly wider than fibre cells, but less thickened, single or rarely compound starch grains present, tetrarch bundle or primary xylem present at the centre of wood, medullary rays uni or biseriate widen much towards distal ends, most of the ray cells contain starch grains and some contain cluster of calcium oxalate, starch grains present in wood larger than those of bark region, a few ray cells at centre of the root contain rhomboidal crystals.

IDENTITY, PURITY AND STRENGTH

Foreign matter	Not more than	2	per cent, Appendix	2.2.2.
Total Ash	Not more than	8	per cent, Appendix	2.2.3.
Acid-insoluble ash	Not more than	3	per cent, Appendix	2.2.4.
Alcohol-soluble extractive	Not less than	3	per cent, Appendix	2.2.6.

Water-soluble extractive	Not less than	9	per cent,	Appendix	2.2.7.

CONSTITUENTS - Asparagin

PROPERTIES AND ACTION

Rasa	:	Madhura
Guṇa	:	Snigdha
Vīrya	:	Śīta
Vipāka	:	Madhura
Karma	:	Grāhī, Vātahara, Balya, Vṛṣya

IMPORTANT FORMULATIONS - Balā Taila, Nārāyaṇa Taila, Mahā Nārāyaṇa Taila

THERAPEUTIC USES - Meha, Vātarakta, Raktapitta

DOSE - 3-6 g of the drug in powder form

ATIVIṢĀ (Root)

Ativiṣā consists of dried, tuberous roots of *Aconitum heterophyllum* Wall. ex. Royle (Fam, Ranunculaceae), a perennial herb, native of western Himalayas and found in Garhwal, Kumaon and Kashmir at altitude between 2,500-4,000 m.

SYNONYMS

Sanskrit	:	Aruṇā, Ghuṇapriyā, Viṣā.
Assamese	:	Aatich
Bengali	:	Ataicha
English	:	Atis Root
Gujrati	:	Ativishni Kali, Ativikhani Kali
Hindi	:	Atis
Kannada	:	Ativisha, Athihage
Malayalam	:	Atividayam, Ativitayam
Marathi	:	Ativisha
Oriya	:	Atushi
Punjabi	:	Atisa, Atees
Tamil	:	Atividayam
Telugu	:	Ativasa
Urdu	:	Atees

DESCRIPTION

a) Macroscopic

Roots, ovoid-conical, tapering downwards to a print, 2.0-7.5 cm long, 0.4-1.6 cm or more thick at its upper extremity, gradually decreasing in thickness towards tapering end, externally light ash-grey, white or grey-brown, while internally starch white, external surface wrinkled marked with scars of fallen rootlet and with a rosette of scaly rudimentary leaves on top: fracture, short, starchy, showing uniform white surface, marked towards centre by 4-7 concentrically arranged yellowish-brown dots, corresponding to end of fibrovascular bundles traversing root longitudinally taste, bitter with no tingling sensation.

b) Microscopic

Transverse section of mature root shows, single layered epidermis consisting of light brown tabular cells rupturing on formation of cork, cork consists of 5-10 rows of tangentially elongated, thin-walled cells, cork cambium single layered consisting of tangentially elongated, thin-walled cells, cortex much wider consisting of tangentially elongated or rounded, thin-walled parenchymatous cells with intercellular spaces, cells fully packed with both simple as well as compound starch grains, compound starch gains composed of 2-4 components of spherical body, endodermis distinct composed of barrel-shaped cells, elements of vascular bundles poorly developed, vascular bundles, arranged in a ring, inter-fascicular cambium present in form of a ring composed of few layered thin-walled cells, central core consisting of thin-walled parenchymatous cells, possessing starch grains similar to those found in cortical cells.

Powder- Ash coloured to light brown, under microscope shows abundant simple and compound starch grains and parenchymatous cells.

IDENTITY, PURITY AND STRENGTH

Foreign matter	Not more than	2	per cent, Appendix	2.2.2.
Total Ash	Not more than	4	per cent, Appendix	2.2.3.
Acid-insoluble ash	Not more than	1	per cent, Appendix	2.2.4.
Alcohol-soluble extractive	Not less than	6	per cent, Appendix	2.2.6.
Water-soluble extractive	Not less than	24	per cent, Appendix	2.2.7.

CONSTITUENTS - Alkaloids (atisine, dihydroatisine, hetisined and heteratisine).

PROPERTIES AND ACTION

Rasa : Tikta, Kaṭu

Guṇa : Laghu, Rūkṣa

Vīrya : Uṣṇa

Vipāka : Kaṭu

Karma : Dīpana, Pācana, Saṃgrāhikā, Kaphapittahara

IMPORTANT FORMULATIONS - Rodhrāsava, Śivā Guṭikā, Lakṣmīnārāyaṇa Rasa, Mahā Viṣagarbha Taila, Rāsnairaṇḍādi Kvātha Cūrṇa, Sudarśana Cūrṇa, Pañcatikta Guggulu Ghṛta, Bālacāturbhadrikā Cūrṇa

THERAPEUTIC USES - Jvara, Kāsa, Chardi, Amātisāra, Kṛmiroga

DOSE - 0.6-2.0 g of the drug in powder form

BABBŪLA (Stem bark)

Babbūla consists of dried mature stem bark of *Acacia nilotica* (Linn.) Willd. ex. Del. sp. *indica* (Benth.) Brenan, Syn. *Acacia arabica* Willd. (Fam. Leguminosae) , a moderate sized, spiny, evergreen tree found throughout India.

SYNONYMS

Sanskrit	:	Bāvarī, Kinkirāta
Assamese	:	Babala
Bengali	:	Babla
English	:	Babula tree, Indian gum arabic tree
Gujrati	:	Baval, Kaloabaval
Hindi	:	Babula, Babura, Kikar
Kannada	:	Sharmeeruka, Kari Jail, Kari gobli, Pulai Jali
Kashmiri	:	Sak
Malayalam	:	Velutha Karuvelan
Marathi	:	Babhul, Babhula
Oriya	:	Babula, Babala
Punjabi	:	Kikkar
Tamil	:	Karuvelan, Karuvel
Telugu	:	Nallatumma, Thumma
Urdu	:	--

DESCRIPTION

a) Macroscopic

Bark hard, dark brown or black, deeply fissured transversely and longitudinally, inner surface, reddish brown, longitudinally striated and fibrous, breaks with difficulty and exhibits a fibrous fracture, taste, astringent.

b) Microscopic

Transverse section of mature bark shows, 15-25 layered, thin-walled, slightly flattened mostly rectangular, brown coloured cork cells, a few lenticels formed by rupturing of cork cells, secondary cortical cells ovate to elongated, many tanniferous stone cells, variable in shape and size present in large groups, secondary phloem

consists of sieve tubes, companion cells, fibres, crystal fibres and phloem parenchyma phloem fibres in many groups and thick-walled, phloem tissues filled with reddish or brown contents present, crystal fibres thick-walled, elongated, divided by transverse septa into segments, each contain a prismatic crystal of calcium oxalate, medullary rays uni to-multi- seriate run almost straight, ray cells elongated to polygonal, 20-24 cells high and 2-5 cells wide, crystals of calcium oxalate found scattered amongst the stone cell"cel1s of secondary cortex and phloem parenchyma.

Powder-Powder as such reddish brown coloured, under microscope many prismatic crystals of calcium oxalate, stone cells, both with narrow and wide lumen and striations and crystal fibres seen.

IDENTITY, PURITY AND STRENGTH

Foreign matter	Not more than	2	per cent, Appendix	2.2.2.
Total Ash	Not more than	15	per cent, Appendix	2.2.3.
Acid-insoluble ash	Not more than	2	per cent, Appendix	2.2.4.
Alcohol-soluble extractive	Not less than	6	per cent, Appendix	2.2.6.
Water-soluble extractive	Not less than	4	per cent, Appendix	2.2.7.

CONSTITUENTS - Tannins and gum

PROPERTIES AND ACTION

Rasa : Kaṣāya

Guṇa : Guru, Rūkṣa, Viśada

Vīrya : Śīta

Vipāka : Kaṭu

Karma : Grāhī, Kaphahara, Viṣaghna

IMPORTANT FORMULATIONS - Mṛtasañjīvanī Surā, Babbūlāriṣṭa

THERAPEUTIC USES - Kuṣṭha, Kṛmiroga, Atīsāra, Kāsa

DOSE - 20-30 g of the drug for decoction

BĀKUCĪ (Fruit)

Bākucī consists of dry ripe fruits of *Psoralea corylifolia* Linn. (Fam. Leguminosae), an erect, 0.3-1.8 m high annual herb, distributed throughout India, found commonly in Uttar Pradesh, Bengal and Maharashtra.

SYNONYMS

Sanskrit	:	Avalguja, Somarājī
Assamese	:	Habucha
Bengali	:	Bakuchi, Somraji, Hakucha Veeja
English	:	--
Gujrati	:	Bavachi
Hindi	:	Babchi, Bavachi, Bakuchi
Kannada	:	Bauchige, Bhavantibeeja, Bhavanchigid, Baukuchi
Kashmiri	:	Babchi
Malayalam	:	Karkokil
Marathi	:	Bawchi
Oriya	:	Bakuchi
Punjabi	:	Babchi, Bavchi
Tamil	:	Karpokarisi, Karpogalarisi, Karbogalarisi
Telugu	:	Bavanchalu
Urdu	:	Babchi

DESCRIPTION

a) Macroscopic

Fruits, dark chocolate to almost black with pericarp adhering to the seed-coat, 3-4.5 mm long, 2-3 mm broad, ovoid-oblong or bean shaped, some what compressed, glabrous rounded or mucronate, closely pitted, seeds campylotropous, non-endospermous, oily and free from starch, odourless, but when chewed smell of a pungent essential oil felt, taste, bitter, unpleasant and acrid.

b) Microscopic

Transverse section of fruit shows periocarp witb prominent ridges and depressions, consisting of collapsed parenchyma and large secretory glands containing oleo-resinous matter testa, an outer layer of palisade epidermis, layer of bearer cells which are much thickened in the inner tangential and basal radial walls and 2-3 layers of parenchyma, cotyledons of polyhedral parenchyma and three layers of palisade cells on the adaxial side.

IDENTITY, PURITY AND STRENGTH

Foreign matter	Not more than	2	per cent, Appendix	2.2.2.
Total Ash	Not more than	8	per cent, Appendix	2.2.3.
Acid-insoluble ash	Not more than	2	per cent, Appendix	2.2.4.
Alcohol-soluble extractive	Not less than	13	per cent, Appendix	2.2.6.
Water-soluble extractive	Not less than	11	per cent, Appendix	2.2.7.

CONSTITUENTS - Essential oil, fixed oil, Psoralen , psoralidin, isopsoralen and bakuchiol.

PROPERTIES AND ACTION

Rasa : Tikta, Kaṭu

Guṇa : Rūkṣa

Vīrya : Śīta

Vipāka : Kaṭu

Karma : Śleṣmāsrapittanut, Grāhī, Vraṇāpaha, Hṛdya

IMPORTANT FORMULATIONS - Somarājī Taila, Avalgujādi Lepa

THERAPEUTIC USES - Śvitra, Kuṣṭha, Kṛmiroga, Jvara, Meha

DOSE - 3-6 g of the drug in powder form

BIBHĪTAKA (Fruit)

Bibhītaka consists of pericarp of dried ripe fruits of *Terntinalia belerica* Roxb. (Fam. Combretaceae), a large deciduous tree, 10-12 m or more high, commonly found in plain and forests upto 900 m elevation, fruits ripen towards November.

SYNONYMS

Sanskrit	:	Vibhīta, Akṣa, Akṣaka
Assamese	:	Bhomora, Bhomra, Bhaira
Bengali	:	Bayada, Baheda
English	:	Beleric Myrobalan
Gujrati	:	Bahedan
Hindi	:	Bahera
Kannada	:	Tare kai, Shanti Kayi
Kashmiri	:	Babelo, Balali
Malayalam	:	Tannikka
Marathi	:	Baheda
Oriya	:	Baheda
Punjabi	:	Bahera
Tamil	:	Thanrikkai
Telugu	:	Thanikkaya
Urdu	:	Bahera

DESCRIPTION

a) Macroscopic

Fruit nearly spherical to ovoid, 2.5-4.0 cm in diameter, fresh ripe fruits slightly silvery or with whitish shiny pubescent surface, mature fruits grey or grayish brown with slightly wrinkled appearance, rind of fruit shows variation in thickness from 3-5 mm, taste, astringent.

b) Microscopic

Transverse section of fruit shows an outer epicarp consisting of a layer of epidermis, most of epidermal cells elongate to form hair like protuberance with swollen base, composed of a zone of parenchymatous cells, slightly tangentially elongated and irregularly arranged, intermingled with stone cells of varying shape and size, elongated stone cells found towards periphery and spherical in the inner zone of mesocarp in groups of 3-10, mesocarp traversed in various directions by numerous vascular strands, bundles collateral, endarch, simple starch grains and some stone cells found in most of mesocarp cells, few peripheral layers devoid of starch grains, rosettes of calcium oxalate and stone cells present in parenchymatous cells, endosperm composed of stone cells running longitudinally as well as transversely.

IDENTITY, PURITY AND STRENGTH

Foreign matter	Not more than	2	per cent, Appendix	2.2.2.
Total Ash	Not more than	7	per cent, Appendix	2.2.3.
Acid-insoluble ash	Not more than	1	per cent, Appendix	2.2.4.
Alcohol-soluble extractive	Not less than	8	per cent, Appendix	2.2.6.
Water-soluble extractive	Not less than	35	per cent, Appendix	2.2.7.

CONSTITUENTS - Gallic acid, tannic acid and glycosides

PROPERTIES AND ACTION

Rasa : Kaṣāya

Guṇa : Rūkṣa, Laghu

Vīrya : Uṣṇa

Vipāka : Madhura

Karma : Kaphapittajit, Bhedaka, Kṛmināśana, Cakṣuṣya, Keśya, Kāsahara

IMPORTANT FORMULATIONS - Triphalā Cūrṇa, Triphalādi Taila, Lavaṅgādi Vaṭī

THERAPEUTIC USES - Svarabheda, Netraroga, Kāsa, Chardi, Kṛmiroga, Vibandha

DOSE - 3-6 g of the drug in powder from

BILVA (Fruit pulp)

Bilva consists of pulp of entire, unripe or half ripe fruits of *Aegle marmelos* Carr. (Fam. Rutaceae), a tree, attaining a height of 12 m growing wild and also cultivated throughout the country, rind of fruit is removed and pulp is bruised and dried.

SYNONYMS

Sanskrit	:	Śrīphala
Assamese	:	Bael, Vael
Bengali	:	Bela, Bilva
English	:	Bengal Quince, Bael fruit
Gujrati	:	Bill, Bilum, Bilvaphal
Hindi	:	Bela, Sriphal, Bel
Kannada	:	Bilva
Kashmiri	:	Bel
Malayalam	:	Koovalam
Marathi	:	Bel, Baela
Oriya	:	Bela
Punjabi	:	Bil
Tamil	:	Vilvam
Telugu	:	Maredu
Urdu	:	Bel

DESCRIPTION

a) Macroscopic

Fruit, sub-globose, 5-18 cm in diameter, externally greenish when young, yellowish-brown when ripe, rind about 1.5 mm-3 mm thick, hard and woody, surface smooth or slightly granular bearing a circular scar at the point of attachment with peduncle, carpels, 10-15, central, each containing several hairy seeds embedded in yellowishbrown, extremely sticky mucilage, seeds oblong, flat, woody, and having white hair, fresh pulp of ripe fruit, brown, of sticky shreads, dried pulp hard and pale to dark red in colour, frequently breaks away from the rind during drying, leaving a thin layer attached to it, odour, faintly aromatic, taste, mucilaginous and slightly astringent.

b) Microscopic

IDENTITY, PURITY AND STRENGTH

Total Ash	Not more than 4 per cent, Appendix	2.2.3.
Acid-insoluble ash	Not more than 1 per cent, Appendix	2.2.4.
Alcohol-soluble extractive	Not less than 6 per cent, Appendix	2.2.6.
Water-soluble extractive	Not less than 50 per cent, Appendix	2.2.7.

ASSAY

T.L.C.

CONSTITUENTS - Marmalosin, tannins, mucilage, fatty oil and sugar.

PROPERTIES AND ACTION

Rasa : Kaṭu, Tikta, Kaṣāya

Guṇa : Laghu, Rūkṣa

Vīrya : Uṣṇa

Vipāka : Kaṭu

Karma : Dīpana, Pācana, Grāhī, Pittakṛt, Vātakaphahara, Balya

IMPORTANT FORMULATIONS - Bilvādi Leha, Bṛhat Gaṅgādhara Cūrṇa

THERAPEUTIC USES - Pravāhikā, Agnimāndya, Grahaṇīroga

DOSE - 3-6 g of the drug in powder form

CANDRAŚŪRA (Seed)

Candraśūra consists of dried seeds of *Lepidium sativum Linn.* (Fam. Cruciferae) a small erect, annual herb, about 15-45 cm high, cultivated throughout India.

SYNONYMS

Sanskrit	:	Candrikā
Assamese	:	Halim
Bengali	:	Chand Shura, Halim
English	:	Common Cress
Gujrati	:	Aseriya, Aseliyo
Hindi	:	Chansur
Kannada	:	Allibija, Kapila
Kashmiri	:	Alian
Malayalam	:	Asali
Marathi	:	Ahaliva, Haliv
Oriya	:	Chandasara, Chandasura
Punjabi	:	Holon, Taratej
Tamil	:	Allivirai
Telugu	:	Adityalu, Aadalu
Urdu	:	Halim

DESCRIPTION

a) Macroscopic

Seeds, small, oval-shaped, pointed and triangular at one end, smooth, about 2-3 mm long, 1-1.5 mm wide, reddish brown, a furrow present on both surfaces extending upto two thirds downward, a slight wing like extension present on both the edges of seed, when soaked in water seed coat swells and gets covered with a transparent, colourless mucilage, taste, mucilaginous.

b) Microscopic

Powder- Cream-yellow with a number of reddish-brown fragments of seed coats, under microscope shows pieces of seed coat, some showing red colouring matter and others with uniformly thick walls, endosperm oily.

IDENTITY, PURITY AND STRENGTH

Foreign matter	Not more than	2	per cent, Appendix	2.2.2.
Total Ash	Not more than	8	per cent, Appendix	2.2.3.
Acid-insoluble ash	Not more than	0.5	per cent, Appendix	2.2.4.
Alcohol-soluble extractive	Not less than	13	per cent, Appendix	2.2.6.

CONSTITUENTS - Alkaloids, essential oil, fixed oil and mucilage

PROPERTIES AND ACTION

Rasa : Kaṭu, Tikta

Guṇa : Laghu, Rūkṣa, Tīkṣṇa

Vīrya : Uṣṇa

Vipāka : Kaṭu

Karma : Balapuṣṭivivardhana, Vātaśleṣmahṛt

IMPORTANT FORMULATIONS - Kastūryādi (Vāyu) Guṭikā

THERAPEUTIC USES - Hikkā, Atīsāra, Vātarakta

DOSE - 3-6 g of the drug in powder form

CITRAKA (Root)

Citraka consists of dried mature root of *Plumbago zeylanica* Linn. (Fam. Plumbaginaceae) , a large perennial sub-scandent shrub, found throughout India in wile state and occasionally cultivated in gardens.

SYNONYMS

Sanskrit	:	Agni, Vahni, Jvalanākhya, Kṛśāṇu, Hutāśa, Dahana, Hutabhuk, Śikhī
Assamese	:	Agiyachit, Agnachit
Bengali	:	Chita
English	:	Lead war
Gujrati	:	Chitrakmula
Hindi	:	Chira, Chitra
Kannada	:	Chitramula, Vahni, Bilichitramoola
Kashmiri	:	Chitra, Shatranja
Malayalam	:	Vellakeduveli, Thumpokkoduveli
Marathi	:	Chitraka
Oriya	:	Chitamula, Chitoparu
Punjabi	:	Chitra
Tamil	:	Chitramoolam, Kodiveli
Telugu	:	Chitramulam
Urdu	:	Sheetraj Hindi, Cheetah

DESCRIPTION

a) Macroscopic

Roots 30 cm or more in length, 6 mm or more in diameter as also as short stout pieces, including root stocks reddish to deep brown, scars of rootlets present, bark thin and brown, internal structure striated, odour, disagreeable, taste, acrid.

b) Microscopic

Transverse section of root shows outer most tissue of cork consisting of 5 -7 row, of cubical to rectangular dark brown cells, secondary cortex consists of 2-3 rows of thin-walled rectangular, light brown cells, most of the cortex cells contain starch grains,

secondary cortex followed by a wide zone of cortex, composed of large polygonal to tangentially elongated parenchymatous cells varying in size and shape, containing starch grains and some cells with yellow contents, fibres scattered singly or in groups of 2-6, phloem a narrow zone of polygonal, thin-walled cells, consisting of usual elements and phloem fibres, similar to cortical zone, phloem fibres usually in groups of 2-5 or more but occasionally occurring singly, lignified with pointed ends and narrow lumen, similar in shape and size to those of secondary cortex, cambium indistinct, xylem light yellow to whitish, vessels radially arranged with pitted thickenings, medullary rays straight, 1-6 seriate, cells radially elongated starch filled with starch grains, stone cells absent.

IDENTITY, PURITY AND STRENGTH

Foreign matter	Not more than	3	per cent, Appendix	2.2.2.
Total Ash	Not more than	3	per cent, Appendix	2.2.3.
Acid-insoluble ash	Not more than	1	per cent, Appendix	2.2.4.
Alcohol-soluble extractive	Not less than	12	per cent, Appendix	2.2.6.
Water-soluble extractive	Not less than	12	per cent, Appendix	2.2.7.

CONSTITUENTS - Plumbagin

PROPERTIES AND ACTION

Rasa : Kaṭu

Guṇa : Laghu, Rūkṣa, Tīkṣṇa

Vīrya : Uṣṇa

Vipāka : Kaṭu

Karma : Dīpana, Pācana, Grāhī, Kaphavātahara, Arśohara, Śūlahara, Śothahara

IMPORTANT FORMULATIONS - Citrakādi Vaṭī, Citrakaharītakī, Citrakādi Cūrṇa

THERAPEUTIC USES - Agnimāndya, Grahaṇīroga, Arśa, Udaraśūla, Gudaśotha

DOSE - 1-2 g of the drug in powder form; Note - Śōdhana of this drug is to be done before use as described in the appendix

DHĀNYAKA (Fruit)

Dhānyaka consists of dried ripe fruits of *Coriandrum sativum* Linn. (Fam. Umbelliferae) , a slender, glabrous, branched, annual herb, cultivated all over India, 30-90 cm high, giving characteristic aroma when rubbed, crop matures in 2-3 months after sowing, herb is pulled out with roots, after drying, fruits threashed out and dried in sun, winnowed, and stored in bags.

SYNONYMS

Sanskrit	:	Dhanika, Dhānya, Vitunnaka, Kustumburu
Assamese	:	Dhaniya
Bengali	:	Dhane, Dhania
English	:	Coriander fruit
Gujrati	:	Dhana
Hindi	:	Dhaniya
Kannada	:	Havija, Kothambari bija
Kashmiri	:	Dhaniwal, Dhanawal
Malayalam	:	Malli, Kothampatayari
Marathi	:	Dhane, Kothimbir
Oriya	:	Dhania
Punjabi	:	Dhania
Tamil	:	Kottamalli virai, Dhaniya
Telugu	:	Dhaniyalu
Urdu	:	Kishneez

DESCRIPTION

a) Macroscopic

Fruit globular, mericarps usually united by their margins forming a cremocarp about 2-4 mm in diameter, uniformly brownish-yellow or brown, glabrous, sometimes crowned by the remains of sepals and styles, primary ridges 10, wavy and slightly inconspicuous secondary ridges 8, straight, and more prominent, endosperm coelospermous , odour, aromatic, taste, spicy and characteristic.

b) Microscopic

Transverse section of fruit shows pericarp with outer epidermis, when present with slightly thickened anticlinal wall, a few stomata, many cells with small prisms of calcium oxalate, trichomes absent, outer layer of mesocarp parenchymatous with inner cells in wavy longitudinal rows and degenerated vittae as tangentially flattened cavities, middle layer of mesocarp sclerenchymatous forming a thick layer of fusiform, pitted cells in very sinuous rows, layers often crossing at right angles with definite longitudinal strands in the secondary ridges, sinuous primary costae with some spiral vessel: inner cells of mesocarp, large, hexagonal with rather thin, lignified walls, inner epidermis of very narrow thin-walled cells slightly sinuous anticlinal wall showing parquetry arrangement, two or rarely more, normal vittae occurring on commissural side of each mesocarp containing volatile oil, endosperm of thick-walled cellulosic parenchyma containing much fixed oil, numerous aleurone grains, about 4-8 in diameter containing micro-rosettes of calcium oxalate , split carpophore passing at apex of each mericarp into raphe, adjacent to which a large cavity and on inner side of this a flattened vascular strand, carpophore consisting of fibres surrounded by spiral vessels.

Powder- Fawn to brown, epidermal cells of pericarp when present, slightly thick-walled and many containing small prism of calcium oxalate, parenchymatous cells of mesocarp without reticulate thickening, masses of sclerenchymatous cells of mesocarp in sinuous rows, often crossing at right angles, large tubular hexagonal rather thin-walled sclerenchymatous cells of endocarp, cells of inner epidermis with slightly sinnous anticlinal walls, thick-walled polygonal parenchymatous cells of endosperm, containing fixed oil and numerous small aleurone grains, micro-rosettes of calcium oxalate.

IDENTITY, PURITY AND STRENGTH

Foreign matter	Not more than	2	per cent, Appendix	2.2.2.
Total Ash	Not more than	6	per cent, Appendix	2.2.3.
Acid-insoluble ash	Not more than	1.5	per cent, Appendix	2.2.4.
Alcohol-soluble extractive	Not less than	10	per cent, Appendix	2.2.6.
Water-soluble extractive	Not less than	19	per cent, Appendix	2.2.7.
Volatile oil	Not less than	0.3	per cent, Appendix	2.2.10

CONSTITUENTS - Essential oil (coriandrol)

PROPERTIES AND ACTION

Rasa	:	Kaṭu, Madhura, Tikta, Kaṣāya
Guṇa	:	Laghu, Snigdha
Vīrya	:	Uṣṇa
Vipāka	:	Madhura
Karma	:	Dīpana, Pācana, Grāhī, Tridoṣanut, Mūtrala, Cakṣuṣya, Hṛdya

IMPORTANT FORMULATIONS - Dhānyapañcaka Kvātha Cūrṇa

THERAPEUTIC USES - Jvara, Tṛṣṇā, Chardi, Dāha, Ajīrṇa, Atīsāra

DOSE - 1-3 g of the drug in powder form

DHĀTAKĪ (Flower)

Dhātakī consists of flowers of *Woodfordia fruticosa* (Linn.) Kurz. (Fam. Lythraceae) : much branched, semi deciduous, undershrub or shrub, 1-3 m high, rarely upto 3 m, found throughout India, ascending to 1500 m in Himalayas and also in the Gangetic plains , also cultivated in gardens.

SYNONYMS

Sanskrit	:	Bahupuspī, Tāmrapuṣpī, Vahnijvālā
Assamese	:	Dhaiphool
Bengali	:	Dhaiphul
English	:	Fire flame bush
Gujrati	:	Dhavadi, Dhavani
Hindi	:	Dhai, Dhava
Kannada	:	Dhataki, Tamrapushpi
Malayalam	:	Tattiripuvu, Tatire
Marathi	:	Dhayati, Dhavati
Oriya	:	Dhaiphula, Dhatuki
Punjabi	:	Davi, Phul Dhava
Tamil	:	Kattati, Kattathi, Kattattipoo
Telugu	:	Aarl Puruvu
Urdu	:	--

DESCRIPTION

a) Macroscopic

Flower, about 1.2 cm long, occurs as single or in bunches of 2-15, calyx 1.0-1.6 cm long, ridged and glabrous, bright red when fresh but fades on drying, with campanulate base and oblique apex having 6 triangular and acute teeth, each tooth being, 2-2.5 mm long, 6, very minute accessory sepals attached outside at the juncture of calyx tooth and deeper in colour, petals 6, attached inside the mouth of calyx-tube, shightly longer than calyx tooth, alternating with calyx-tooth pale rose or whitish, thin, papery, lanceolate, acuminate, stamens 12, united at the base, about 1.5-2 cm long, filament filiform, curved at the apex, keeping anthers inside calyx-tube , anthers dorsifixed brown, almost rounded or broadly ovate, carpels 2, united, ovary superior, style filiform,

longe, than ovary and stamens, taste, astringent.

b) Microscopic

Transverse section of sepal shows, single layered cuticularised epidermis, provided with both glandular and covering trichomes ;glandular trichomes, multicellular, long, consisting of a stalk and a globose, thin-walled, multicellular head, covering trichomes, unicellular thick-walled broad at base and pointed at the apex, ground tissue consisting of thin-walled, parenchymatous cells surface view of petal shows thin-walled, parenchymatous cells, provided with very few sparsely distributed covering trichomes, transverse section of filament shows, epidermis consisting of single layered tangentially elongated cells, covered with a very thick-cuticle, ground tissue consisting of thin walled parenchymatous cells with intercellular spaces, surrounding a central. vascular cylinder of spirally thickened vessels, transverse section of anther shows, single layered epidermis, covered with cuticle followed by several layers of thickened cells, surrounding both the pollen-sacs having numerous pollen grains, pollen grains roughly tetrahedral with three pores, measuring 12-16 μ approximately , central region consisting of thin-walled cells emboding vascular bundles.

IDENTITY, PURITY AND STRENGTH

Foreign matter	Not more than	2	per cent, Appendix	2.2.2.
Total Ash	Not more than	10	per cent, Appendix	2.2.3.
Acid-insoluble ash	Not more than	1	per cent, Appendix	2.2.4.
Alcohol-soluble extractive	Not less than	7	per cent, Appendix	2.2.6.
Water-soluble extractive	Not less than	28	per cent, Appendix	2.2.7.

CONSTITUENTS - Tannin and glucoside

PROPERTIES AND ACTION

Rasa : Kaṣāya, Kaṭu

Guṇa : Laghu

Vīrya : Śīta

Vipāka : Kaṭu

Karma : Grāhī, Viṣaghna, Garbhasthāpana, Kṛminut, Sandhānīya

IMPORTANT FORMULATIONS - Bṛhat Gaṅgādhara Cūrṇa

THERAPEUTIC USES - Atīsāra, Tṛṣṇā, Visarpa, Vraṇa, Raktapitta

DOSE - 3-6 g. of drug in powder form

ERAṆḌA (Root)

Eraṇḍa consists of dried, mature roots of *Ricinus communis* Linn. (Fam. Euphorbiaceae), a tall glabrous shrub or almost small tree 2-4 m high, found throughout India, mostly growing wild on waste land and also cultivated for its oil seeds.

SYNONYMS

Sanskrit	:	Gandharvahasta, Vātāri, Pañcāṅgula, Citrā, Urubu, Rubu
Assamese	:	Eda, Era
Bengali	:	Bherenda
English	:	Castor oil plant
Gujrati	:	Erandio, Erando
Hindi	:	Arand, Erand, Andi, Rend
Kannada	:	Haralu, Oudala gida
Kashmiri	:	Aran, Banangir
Malayalam	:	Avanakku
Marathi	:	Erand
Oriya	:	Jada, Gaba
Punjabi	:	Arind
Tamil	:	Amanakku
Telugu	:	Amudapu veru
Urdu	:	Bedanjir, Arand

DESCRIPTION

a) Macroscopic

Root light in weight almost straight with few rootlets, outer surface dull yellowish brown, nearly smooth but marked with longitudinal wrinkles, some places whitish-yellow and soft, odourless, taste, acrid.

b) Microscopic

Transverse section of root shows thin layer of cork of squarish to tangentially

elongated, thin-walled cells, beneath cork, secondary cortex of thin-walled, tangentially elongated cells, narrow cortex of rounded to tangentially elongated thin-walled parenchymatous cells, some containing large oil globules, rosettes of calcium oxalate crystals and round simple or compound starch grains, phloem a broad zone, consisting of sieve tubes, phloem parenchyma and phloem fibres, fibres long, mostly septate, highly thickened, having narrow lumen, some fibres surrounded by concentric rows of cells containing crystals of calcium oxalate, sieve tubes, thin-walled with companion cells and phloem parenchyma in the inner region of phloem more prominent , some phloem parenchyma cells contain crystals of calcium oxalate , cambium 3-5 layered, cells rectangular in shape, xylem occupies major part of root, pentarch, five groups of primary xylem distinct in the centre of the wood, xylem consists of vessels, parenchyma and fibres , vessels uniformly scattered throughout the xylem region, either solitary or in groups, larger in size towards phloem, with bordered pits , xylem parenchyma less ia number around vessels containing starch grains, xylem fibres long and thick-walled, medullary rays uni-to-biseriate, more or less straight, 4-5 seriate rays, sometimes found near protoxylem groups, ray cells, thin-walled, slightly radially elongated in phloem region, thick-walled in xylem region, all ray cells contain starch grains.

IDENTITY, PURITY AND STRENGTH

Foreign matter	Not more than	2	per cent, Appendix	2.2.2.
Total Ash	Not more than	8	per cent, Appendix	2.2.3.
Acid-insoluble ash	Not more than	1	per cent, Appendix	2.2.4.
Alcohol-soluble extractive	Not less than	3	per cent, Appendix	2.2.6.
Water-soluble extractive	Not less than	9	per cent, Appendix	2.2.7.

CONSTITUENTS - Alkaloid (ricinine)

PROPERTIES AND ACTION

Rasa : Madhura

Guṇa : Guru, Snigdha

Vīrya : Uṣṇa

Vipāka : Madhura

Karma : Vṛṣya, Vātahara, Āmapācana

IMPORTANT FORMULATIONS - Gandharvahastādi Kvātha Cūrṇa, Vātāri Guggulu, Gandharvahasta taila

THERAPEUTIC USES - Āmavāta, Śotha, Vastiśūla, Kaṭiśūla, Udararoga, Jvara

DOSE - 20-30 g of the drug for decoction

GAMBHĀRĪ (Root bark)

Gambhārī consists of dried, mature root and root bark of *Gmelina arborea* Roxb. (Fam. Verbenaceae) , tree about 18 m high, with a clear bole of 6-9 m and a girth of 1.5-2.1 m, found in the lower Himalayas, the Nilgiris and the East and West Coasts of India.

SYNONYMS

Sanskrit	:	Kāśmarī, Kāśmarya
Assamese	:	Gamari
Bengali	:	Gambhar, Gamar
English	:	Candhar Tree
Gujrati	:	Shivan
Hindi	:	Gambhar, Khambhari
Kannada	:	Shivanigida, Shivani
Kashmiri	:	Kashmari
Malayalam	:	Kumizhu, Kumpil
Marathi	:	Shivan
Oriya	:	Gambhari
Punjabi	:	Gumhar, Kumhar
Tamil	:	Kumishan, Kumizhan
Telugu	:	Peggummudu, Peggummadi
Urdu	:	--

DESCRIPTION

a) Macroscopic

Root - Occurs in pieces with secondary and tertiary branches, root pieces nearly cylindrical with uneven surface, greyish brown, fracture somewhat tough in bark, brittle and predominant in woody portion.

Root bark-mature root bark when fresh, yellowish in colour, dry pieces curved and channelled, thinner ones forming single quills, external surface rugged due to presence of vertical cracks, ridges, fissures and numerous lenticels, fracture short and granular, taste, mucilaginous, sweetish with slight bitterness.

b) Microscopic

Root-transverse section of root shows 6-8 layers of cork cells, secondary cortex, including primary and secondary phloem about two third consisting of wood, cork brownish, cells arranged in tangential direction and broken at places towards upper layers, cortex characterised by the presence of thin-walled parenchymatous cells with starch grains , resin ducts present in abundance throughout cortex, scattered stone cells fibre like or elongated common, fibres present, occurring mostly in singles, cells of cortex also contain rosette crystals of calcium oxalate and oil globules, primary phloem characterised by the presence of sieve tubes with companion cells, phloem parenchyma, soft bast fibres and ray cells, phloem fibres occur singly and scattered cortical cells 40-70 µ by 25-35 µ and bast fibres, 300-1000 µ by 10-15 µ development of cork takes place in second or third layer of primary cortex, wood consists of simple pitted wood parenchyma and medullary rays, wood cells mainly composed of vessels and tracheids and inner wood consists of a major portion of fibres together with a few vessels, vessels numerous and form almost a ring near the periphery of xylem cylinder and somewhat spares, being scattered in groups or singly nearer the central region, lumen of vessels somewhat large, dimensions of vessels 130-250 µ by 50-100 µ and those of the tracheids 175-300 µ by 30-50 µ wood fibres abundant and with simple pits , cambium distinct, medullary rays generally 1-2 celled thick with abundant starch grains cells oblong to rectangular.

IDENTITY, PURITY AND STRENGTH

Foreign matter	Not more than	2	per cent, Appendix	2.2.2.
Total Ash	Not more than	5	per cent, Appendix	2.2.3.
Acid-insoluble ash	Not more than	0.3	per cent, Appendix	2.2.4.
Alcohol-soluble extractive	Not less than	7	per cent, Appendix	2.2.6.
Water-soluble extractive	Not less than	20	per cent, Appendix	2.2.7.

CONSTITUENTS - Alkaloids and lignans (arboreal, isoarboreal and related lignans)

PROPERTIES AND ACTION

Rasa : Tikta, Kaṣāya

Guṇa : Guru

Vīrya : Uṣṇa

Vipāka : Kaṭu

Karma : Dīpana, Pācana, Bhedana, Medhya, Tridoṣajit, Śothahara, Viṣaghna, Jvarahara

IMPORTANT FORMULATIONS - Daśamūlāriṣṭa, Daśamūlaharītakī, Daśamūla Ghṛta, Daśamūla Ṣaṭpalaka Ghṛta

THERAPEUTIC USES - Jvara, Tṛṣṇā, Dāha, Arśa, Śotha

DOSE - 20-30 g of the drug for decoction

GOKṢURA (Root)

Gokṣura consists of root of *Tribulus terrestris* Linn. (Fam. Zygophyllaceae): an annual prostrate herb, rarely perennial common weed of the pasture lands, road sides and other waste land, chiefly growing in hot, dry and sandy regions throughout India and upto 3,000 m in Kashmir.

SYNONYMS

Sanskrit	:	Gokṣuraka, Trikaṇṭa, Śvadaṃṣṭrā, Traikaṇṭaka
Assamese	:	Gokshura, Gukhurkata
Bengali	:	Gokshura, Gokhri
English	:	Caltrops root
Gujrati	:	Be tha gokharu, Nana gokharu, Mithogokharu
Hindi	:	Gokhru
Kannada	:	Sannanaggilu, Neggilamullu, Neggilu
Kashmiri	:	Michirkand, Pakhda
Malayalam	:	Nerinjil
Marathi	:	Sarate, Gokharu
Oriya	:	Gukhura, Gokhyura
Punjabi	:	Bhakhra, Gokhru
Tamil	:	Nerinjil, Nerunjil
Telugu	:	Palleruveru
Urdu	:	Khar-e-Khasak Khurd

DESCRIPTION

a) Macroscopic

Drug consists of root, 7-18 cm long and 0.3-0.7 cm in diameter, slender, cylindrical, fibrous, frequently branched bearing a number of small rootlets, tough, woody and yellow to light brown in colour, surface becomes rough due to presence of small nodules, fracture fibrous, odour aromatic, taste, sweetish and astringent.

b) Microscopic

Transverse section of primary roots show a layer of epidermis followed by 4-5 layers of thin-walled parenchymatous cortex, endodermis distinct, pericycle enclosing diarch stele, in mature root, cork 4-6 layered, cork cambium single layered followed by 6-14 layers of thin-walled parenchymatous cells with varying number of fibres, distributed throughout, some secondary cortex cells show secondary wall formation and reticulate thickening, fibres found in groups resembling those of phloem, secondary phloem divided into two zones, outer zone characterised by presence of numerous phloem fibres with a few sieve tubes slightly collapsed, inner zone frequently parenchymatous, devoid of fibres often showing sieve tubes and companion cells, phloem rays distinct, few cells get converted into fibres in outer region, cambium 3-5 layered, wood composed of vessels, tracheids , parenchyma and fibres and traversed by medullary rays, vessels scattered, arranged in singles or doubles towards inner side, in groups of three to four on outer side having bordered pits, tracheids long, narrow with simple pits, xylem parenchyma rectangular or slightly elongated with simple pits and reticulate thickening, xylem fibres few, trachieds elongated with simple pits, medullary rays heterogenous, 1-4 cells wide, starch grains and rosette crystals of calcium oxalate present in secondary cortex, phloem and medullary rays cells, few prismatic crystals also present in xylem ray cells.

IDENTITY, PURITY AND STRENGTH

Foreign matter	Not more than	2	per cent, Appendix	2.2.2.
Total Ash	Not more than	13	per cent, Appendix	2.2.3.
Acid-insoluble ash	Not more than	3	per cent, Appendix	2.2.4.
Alcohol-soluble extractive	Not less than	4	per cent, Appendix	2.2.6.
Water-soluble extractive	Not less than	10	per cent, Appendix	2.2.7.

CONSTITUENTS - Alkaloids and saponins

PROPERTIES AND ACTION

Rasa	:	Madhura
Guṇa	:	Guru, Snigdha
Vīrya	:	Śīta
Vipāka	:	Madhura
Karma	:	Vātanut, Vṛṣya, Bṛṃhaṇa, Mūtrala

IMPORTANT FORMULATIONS - Sahacarādi Taila, Daśamūla Kvātha Cūrṇa, Daśamūla Kaṭutraya Kvātha Cūrṇa, Daśamūlapañcakolādi Kvātha Cūrṇa

THERAPEUTIC USES - Kāsa, Śvāsa, Śūlaroga, Hṛdroga, Vātaroga, Mūtrakṛcchra, Aśmarī

DOSE - 20-30 g of the drug for decoction

GOKṢURA (Fruit)

Gokṣura consists of dried, ripe, entire fruit of Tribulus terrestris Linn. (Fam Zygopyllaceae), an annual, rarely pernnial common weed of the pasture lands, road sides and other waste places, chiefly in hot, dry and sandy regions, grows throughout India as prostrate herb and upto 3,000 m in Kashmir.

SYNONYMS

Sanskrit	:	Śvadaṃṣṭrā, Gokṣuraka, Traikaṇṭaka, Trikaṇṭa
Assamese	:	Gokhurkata, Gokshura
Bengali	:	Gokhri, Gokshura
English	:	Caltrops fruit
Gujrati	:	Bethagokharu, Mithagokhru, Nanagokharu
Hindi	:	Gokhru
Kannada	:	Neggilamullu, Neggilu, Sannaneggilu
Kashmiri	:	Pakhda, Michikand
Malayalam	:	Nerinjil
Marathi	:	Gokharu, Sarate
Oriya	:	Gokhyura, Gukhura
Punjabi	:	Bhakhra, Gokhru
Tamil	:	Nerinjil, Nerunjil
Telugu	:	Palleru Kaya
Urdu	:	Khar-e-Khasak Khurd

DESCRIPTION

a) Macroscopic

Fruit stalked, light or greenish yellow, five ribbed or angled, more or less spherical in structure and covered with short stiff or pubescent hairs, 1 cm in diameter with five pairs, of prominent short stiff spines, pointed downwards, about 0.5 cm in length, tips of spines almost meet in pairs whole together forming pentagonal frame-work around fruit, ripe fruit separates into five segment, of each cocci and each appears as single-fruit, each coccus semi-lunar or plano-convex in structure one chambered, armed with a pair of spines, starting from its middle, containing four or more seeds, taste, slightly astringent.

b) Microscopic

Transverse section of fruit shows small epidermal cells of each coccus rectangular, unicellular trichomes in abundance, mesocarp 6-10 layers of large parenchymatous cells, rosette of calcium oxalate crystals abundantly present, mesocarp followed by 3-4 compact layers of small cells containing prismatic crystals of calcium oxalate.

IDENTITY, PURITY AND STRENGTH

Foreign matter	Not more than	1	per cent, Appendix	2.2.2.
Total Ash	Not more than	15	per cent, Appendix	2.2.3.
Acid-insoluble ash	Not more than	2	per cent, Appendix	2.2.4.
Alcohol-soluble extractive	Not less than	6	per cent, Appendix	2.2.6.
Water-soluble extractive	Not less than	10	per cent, Appendix	2.2.7.

ASSAY

T.L.C.

CONSTITUENTS - Potassium nitrate, sterols, sapogenin with pyroketone ring (diosgenin), gitogenin and hecogenins.

PROPERTIES AND ACTION

Rasa : Madhura

Guṇa : Guru, Snigdha

Vīrya : Śīta

Vipāka : Madhura

Karma : Vātanut, Vr̥ṣya, Br̥ṃhaṇa, Aśmarīhara, Vastiśodhana

IMPORTANT FORMULATIONS - Gokṣurādi Guggulu, Traikaṇṭaka Ghṛta, Drākṣadi Cūrṇa

THERAPEUTIC USES - Kāsa, Śvāsa, Aśmarī, Mūtrakr̥cchra, Prameha, Arśa, Śūlaroga, Hr̥droga, Daurbalya

DOSE - 3-6 g of the drug in powder form

20-30 g of the drug for decoction

GUḌŪCĪ (Stem)

Guḍūcī consists of dried, matured pieces of stem of *Tinospora cordifolia* (Willd.) Miers. (Fam, Menispermaceae), a perennial climber found throughout Tropical India, drug collected during summer preferably in the month of May, drug is used in fresh form also.

SYNONYMS

Sanskrit	:	Amṛtavallī, Amṛtā, Madhuparṇī, Guḍūcikā, Chinnodbhavā
Assamese	:	Siddhilata, Amarlata
Bengali	:	Gulancha
English	:	--
Gujrati	:	Galac, Garo
Hindi	:	Giloe, Gurcha
Kannada	:	Amrutaballi
Kashmiri	:	Amrita, Gilo
Malayalam	:	Chittamrutu
Marathi	:	Gulvel
Oriya	:	Guluchi
Punjabi	:	Gilo
Tamil	:	Seendal, Seendil kodi
Telugu	:	Thippateega
Urdu	:	Gilo

DESCRIPTION

a) Macroscopic

Drug occurs in pieces of varying thickness ranging from 0.6-5 cm in diameter, young stems green with smooth surfaces and swelling at nodes, older ones show a light brown surface marked with warty protuberances due to circular lenticels, transversely smoothened surface shows a radial structure with conspicuous medullary rays traversing porous tissues, taste bitter.

b) Microscopic

Transverse section of stem shows outer-most layer of cork, differentiating into outer zone of thick-walled brownish and compressed cells, inner zone of thin walled colourless, tangentially arranged 3-4 rows of cells, cork broken at some places due to opening of lenticels, followed by 5 or more rows of secondary cortex of which the cells of outer rows smaller than the inner one, just within the opening of lenticels, groups of sclereids consisting of 2-10 cells found in secondary cortex region, outer zone of cortex consists of 3--5 rows of irregularly arranged, tangentially elongated chlorenchymatous cells, cortical cells situated towards inner side, polygonal in shape and filled with plenty of starch grains, simple, ovoid, or irregularly ovoid-elliptical, occasionally compound of 2-4 components, several secretory cells, found scattered in the cortex, pericyclic fibres lignified with wide lumen and pointed ends, associated with a large number of crystal fibres containing a single prism in each chamber, vascular zone composed of 10-12 or more wedge-shaped strips of xylem, externally surrounded by semi-circular strips of phloem, alternating, with wide medullary rays, phloem consists of sieve tube, companion cells and phloem parenchyma of polygonal or tangentially elongated cells, some of them contain cryste1s of calcium oxalate, cambium composed of one to two layers of tangentially elongated cells in each vascular bundle, xylem consists of vessels, tracheids, parenchyma and fibres, in primary xylem, vessels comparatively narrow devoid of tyloses, secondary xylem elements thick-walled, lignified, vessels cylindrical in shape bearing bordered pits on their walls some large vessels possess several tyloses and often contain transverse septa, meduallry rays 15-20 or more cells wide containing rounded, hemispherical, oblong, ovoid, with faintly marked concentric striations and central hilum appearing like a point, starch grains of 5.5-11.20 μ in diameter and 6-11.28 μ in length, pith composed of large, thin-walled cells mostly containing starch grains.

IDENTITY, PURITY AND STRENGTH

dried drug -Foreign matter				
Total ash	Not more than	2	per cent, Appendix	2.2.3.
Acid-insoluble ash	Not more than	16	per cent, Appendix	2.2.4.
Acid-insoluble ash	Not more than	3	per cent, Appendix	2.2.6.
Alcohol-soluble extractive	Not less than	3	per cent, Appendix	2.2.7.
Water-soluble extractive	Not less than	11	per cent, Appendix	
For fresh drug				
Foreign matter		Nil	Appendix	2.2.2.
Moisture content		75	per cent, Appendix	2.2.9.

CONSTITUENTS - Terpenoids and alkaloids.

PROPERTIES AND ACTION

Rasa : Tikta, Kaṣāya

Guṇa : Laghu

Vīrya : Uṣṇa

Vipāka : Madhura

Karma : Tridoṣaśāmaka, Saṃgrāhī, Balya, Dīpana, Rasāyana, Raktaśodhaka, Jvaraghna

IMPORTANT FORMULATIONS - Amṛtāriṣṭa, Amṛtottara Kvātha Cūrṇa, Guḍūcī Taila, Guḍūcyādi Cūrṇa, Guḍūcī Sattva, Chinnodbhavādi Kvātha Cūrṇa

THERAPEUTIC USES - Kuṣṭha, Vātarakta, Jvara, Kāmalā, Pāṇḍu, Prameha

DOSE - 3-6 g of the drug in powder form

20-30 g of the drug for decoction

GUGGULU (Exudate)

Guggulu consists of exudate of *Commiphora wightii* (Arn.) Bhand, Syn. *Balsamodendron mukul* Hook. ex Stocks *Commiphora mukul* Engl.), {Fam. Burseraceae), a small perennial tree or shrub upto 1.2-1.8 m high, occuring in rocky tracts of Rajasthan, Gujarat , exudate is collected during winter season by making the incisions in the bark or in summer, falling from the bark itself.

SYNONYMS

Sanskrit	:	Purā, Mahiṣākṣa, Kauśika, Palaṅkaṣā
Assamese	:	Guggul
Bengali	:	Guggula
English	:	Gum-gugul, Indian Bdellium
Gujrati	:	Gugal, Guggal, Gugar
Hindi	:	Guggul, Gugal
Kannada	:	Kanthagana, Guggala, Mahishaksha guggulu, Guggulugida, Guggulu
Kashmiri	:	Guggal Dhoop, Kanth Gan
Malayalam	:	Gulgulu, Guggulu
Marathi	:	Guggul, Mahishaksh
Oriya	:	Guggulu
Punjabi	:	Guggal
Tamil	:	Mahisaksi Guggalu
Telugu	:	Makishakshi guggulu, Guggipannu
Urdu	:	Muqil (Shihappu)

DESCRIPTION

a) Macroscopic

Drug occurs in vermicular or stalactitic pieces of pale yellow or brown coloured mass, makes milky emulsion in hot water and readily burns, when fresh viscid and golden coloured, odour, aromtic, taste., bitter and astringent.

b) Microscopic

IDENTITY, PURITY AND STRENGTH

Foreign matter	Not more than	4	per cent, Appendix	2.2.2.
Total Ash	Not more than	5	per cent, Appendix	2.2.3.
Acid-insoluble ash	Not more than	1	per cent, Appendix	2.2.4.
Alcohol-soluble extractive	Not less than	27	per cent, Appendix	2.2.6.
Water-soluble extractive	Not less than	53	per cent, Appendix	2.2.7.
Volatile oil	Not less than	1	per cent, v/w, Appendix	2.2.10

CONSTITUENTS - Essential oil, gum, resin, steroids

PROPERTIES AND ACTION

Rasa : Tikta, Kaṭu, Kaṣāya

Guṇa : Laghu, Sara, Viśada

Vīrya : Uṣṇa

Vipāka : Kaṭu

Karma : Vātabalāsajit, Rasāyana, Varṇya, Balya, Bhagnasandhānakṛt, Medohara

IMPORTANT FORMULATIONS - Yogarāja Guggulu, Vātāri Guggulu, Siṃhanāda Guggulu, Kaiśora Guggulu, Mahāyogarāja Guggulu, Candraprabhā Vatī

THERAPEUTIC USES - Vātavyādhi, Āmavāta, Granthi, Śopha, Gaṇḍamālā, Medoroga, Prameha, Kuṣṭha

DOSE - 2-4 g of the drug

GUÑJĀ (Seed)

Guñjā consists of seeds of *Abrus precatorius* Linn. (Fam. Leguminosae): a climber met with all along Himalayas ascending to 900 m, spreading throughout plains, flowering in August-September, and fruits ripen during winter.

SYNONYMS

Sanskrit	:	Raktikā, Kākaṇantī
Assamese	:	Rati
Bengali	:	Kunch, Shonkainch
English	:	Jequirity
Gujrati	:	Rati, Chanothee
Hindi	:	Ratti, Ghungchi
Kannada	:	Galuganji, Gulagunjee
Malayalam	:	Kunni, Cuvanna Kunni
Marathi	:	Gunja
Oriya	:	Kainch
Punjabi	:	Ratti
Tamil	:	Kuntri, Kunrimani, Kundamani
Telugu	:	Guriginja, Gurivinda
Urdu	:	Ghongcha, Ratti

DESCRIPTION

a) Macroscopic

Characterised by smooth, glossy surface and bright scarlet colour with black patch hilum, ovoid or sub-globular, 5-8 mm long, 4-5 mm broad.

b) Microscopic

Transverse section of seed shows testa about 75 μ thick, greater parts being formed by epidermis, composed of radially, much elongated cells, arranged irregularly

and measure 45-50 μ in length, Inner region of thin testa consists of collapsed cells forming a hyaline layer about 25 μ thick, endodermis composed of thick-walled cellulosic parenchyma, isodiametric cells larger towards inside, walls mainly of hemicellulose and swell considerably in water, outer one or two layers of cells of endodermis (pseudoepidermis) formed of rather smaller cells, walls of which swell to less extent in water.

IDENTITY, PURITY AND STRENGTH

Foreign matter	Not more than	2	per cent, Appendix	2.2.2.
Total Ash	Not more than	3	per cent, Appendix	2.2.3.
Acid-insoluble ash	Not more than	0.5	per cent, Appendix	2.2.4.
Alcohol-soluble extractive	Not less than	3	per cent, Appendix	2.2.6.
Water-soluble extractive	Not less than	15	per cent, Appendix	2.2.7.

CONSTITUENTS - An albuminous substance (abrine and abralin).

PROPERTIES AND ACTION

Rasa : Tikta, Kaṣāya

Guṇa : Rūkṣa, Laghu, Tīkṣṇa

Vīrya : Uṣṇa

Vipāka : Kaṭu

Karma : Vātapittajvarāpaha, Keśya, Kaṇḍūghna, Vraṇāpaha, Garbhanirodhaka

IMPORTANT FORMULATIONS - Mṛtasañjīvanī Guṭikā, Guñjābhadra Rasa

THERAPEUTIC USES - Kuṣṭha, Vraṇa, Vātavyādhi, Indralupta

DOSE - 60-180 mg of the drug in powder form*

Note: Śōdhana of this drug is to be done before use as described in the Appendix.

* The dose should not exceed the higher limits.

HARIDRĀ (Rhizome)

Haridrā consists of the dried and cured rhizomes of *Curcuma longa* Linn. (Fam. Zingiberaceae), a perennial herb extensively cultivated in all parts of the country, crop is harvested after 9-10 months when lower leaves turn yellow rhizomes carefully dug up with hand-picks between October-April and cured by boiling and dried.

SYNONYMS

Sanskrit	:	Rajanī, Niśā, Niśī, Rātri, Kṣaṇadā, Doṣā
Assamese	:	Haldhi, Haladhi
Bengali	:	Halud, Haldi
English	:	Turmeric
Gujrati	:	Haldar
Hindi	:	Haldi, Hardi
Kannada	:	Arishina
Kashmiri	:	Ledar, Ladhir
Malayalam	:	Manjal
Marathi	:	Halad
Oriya	:	Haladi
Punjabi	:	Haldi, Haldar
Tamil	:	Manjal
Telugu	:	Pasupu
Urdu	:	Haldi

DESCRIPTION

a) Macroscopic

Rhizomes ovate, oblong or pyriform (round turmeric) or cylindrical, often short branched (long turmeric), former about half as broad as long, latter 2-5 cm long and about 1-1.8 cm thick, externally yellowish to yellowish-brown with root scars and annulations of leaf bases, fracture horny, fractured surface orange to reddish brown, central cylinder twice as broad as cortex: odour and taste characteristic.

b) Microscopic

Transverse section of rhizome shows epidermis with thick-walled, cubical cells of various dimensions, cortex characterised by the presence of mostly thin-walled rounded parenchyma cells scattered collateral vascular bundles, a few layers of cork developed under epidermis and scattered oleo-resin cells with brownish contents; cork generally composed of 4-6 layers of thin-walled, brick-shaped parenchyma, cells of ground tissue contain starch grains of 4-15 μ in diameter, oil cell with suberised walls containing either orange-yellow globules of volatile oil or amorphous resinous matter, vessels mainly spirally thickened, a few reticulate and annular.

Identification-

1) On the addition of *Concentrated Sulphuric acid* or a mixture of *Concentrated Sulphuric acid* and *alcohol* to the powdered drug, a deep crimson colour is produced.

2) A piece of filter paper is impregnated with an alcoholic extract of the powder, dried, and then moistened with a solution of *Boric acid* slightly acidified with *Hydrochloric* acid, dried again, the filter paper assumes a pink or brownish red colour which becomes deep blue or greenish-black on the addition of alkali.

IDENTITY, PURITY AND STRENGTH

Foreign matter	Not more than	2	per cent, Appendix	2.2.2.
Total Ash	Not more than	9	per cent, Appendix	2.2.3.
Acid-insoluble ash	Not more than	1	per cent, Appendix	2.2.4.
Alcohol-soluble extractive	Not less than	8	per cent, Appendix	2.2.6.
Water-soluble extractive	Not less than	12	per cent, Appendix	2.2.7.
Volatile oil	Not less than	4	per cent,v/w, Appendix	2.2.10

CONSTITUENTS - Essential oil and a colouring matter (curcumin).

PROPERTIES AND ACTION

Rasa : Tikta, Kaṭu

Guṇa : Rūkṣa

Vīrya : Uṣṇa

Vipāka : Kaṭu

Karma : Kaphapittanut, Viṣaghna, Varṇya, Kuṣṭhaghna, Kṛmighna, Pramehanāśaka

IMPORTANT FORMULATIONS - Haridrā Khaṇḍa

THERAPEUTIC USES - Viṣavikāra, Kuṣṭha, Vraṇa, Tvagroga, Prameha, Pāṇḍu, Śītapitta, Pīnasa

DOSE - 1-3 g of the drug in powder form

HARĪTAKĪ (Fruit)

Harītakī consists of the pericarp of mature fruits of *Terminalia chebula* Retz. (Fam. Combretaceae), a moderate sized or large tree found throughout India, chiefly in deciduous forests and areas of light rainfall, but occasionally also in slightly moist forests, upto about 1500 m elevation, throughout India, flowers appear from April, August and fruits ripen from October-January.

SYNONYMS

Sanskrit	:	Abhayā, Kāyasthā, Śivā, Pathyā, Vijayā (Not Bhaṅgā)
Assamese	:	Shilikha
Bengali	:	Haritaki
English	:	Myrobalan
Gujrati	:	Hirdo, Himaja, Pulo-harda
Hindi	:	Harre, Harad, Harar
Kannada	:	Alalekai
Kashmiri	:	Halela
Malayalam	:	Katukka
Marathi	:	Hirda, Haritaki, Harda, Hireda
Oriya	:	Harida
Punjabi	:	Halela, Harar
Tamil	:	Kadukkai
Telugu	:	Karaka, Karakkaya
Urdu	:	Halela

DESCRIPTION

a) Macroscopic

Intact fruit yellowish-brown, ovoid, 20-35 mm long, 13-25 mm wide, wrinkled and ribbed longitudinally, pericarp fibrous, 3-4 mm thick, non-adherent to the seed, taste, astringent.

b) Microscopic

Transverse section of pericarp shows epicarp consisting of one layer of epidermal cells inner tangential and upper portions of radial wall thick, mesocarp, 2-3 layers of collenchyma, followed by a broad zone of parenchyma in which fibres and sc1ereids in group and vascular bundles scattered, fibres with peg like out growth and simple pitted walls, sclereids of various shapes and sizes but mostly elongated, tannins and raphides in parenchyma, endocarp consists of thick-walled sclereids of various shapes and sizes, mostly elongated, epidermal surface view reveal polygonal cells, uniformly thick-walled, several of them divided into two by a thin septa, starch grains simple rounded or oval in shape, measuring 2-7 μ in diameter, found in plenty in almost all cells of mesocarp.

Powder- Brownish in colour, under microscope shows a few fibres, vessels with simple pits and groups of sclereids.

IDENTITY, PURITY AND STRENGTH

Foreign matter	Not more than	1	per cent, Appendix	2.2.2.
Total Ash	Not more than	5	per cent, Appendix	2.2.3.
Acid-insoluble ash	Not more than	5	per cent, Appendix	2.2.4.
Alcohol-soluble extractive	Not less than	40	per cent, Appendix	2.2.6.
Water-soluble extractive	Not less than	60	per cent, Appendix	2.2.7.

CONSTITUENTS - Tannins, anthraquinones and polyphenolic compounds

PROPERTIES AND ACTION

Rasa : Kaṣāya, Kaṭu, Tikta, Amla, Madhura

Guṇa : Laghu, Rūkṣa

Vīrya : Uṣṇa

Vipāka : Madhura

Karma : Sarvadoṣapraśamana, Rasāyana, Cakṣuṣya, Dīpana, Anulomana, Hṛdya, Medhya

IMPORTANT FORMULATIONS - Abhayāriṣṭa, Agastya Harītakī Rasāyana, Citraka Harītakī, Dantī Harītakī, Daśamūla Harītakī, Brāhma Rasāyana, Triphalā Cūrṇa, Triphalādi Taila, Abhayā Lavaṇa, Pathyādi Lepa

THERAPEUTIC USES - Vibandha, Aruci, Udāvarta, Gulma, Udararoga, Arśa, Pāṇḍu, Śotha, Jīrṇajvara, Viṣamajvara, Prameha, Śiroroga, Kāsa, Tamakaśvāsa, Hṛdroga

DOSE - 3-6 g of the drug in powder form

HIṄGU (Oleo-gum-resin)

Hiṅgu consists of oleo-gum-resin obtained from rhizomes and roots of *Ferula foetida* Regel., *Ferula narthex* Bioss,and other species of Ferula (Fam. Umbelliferae), a perennial herb, occurring in Persia and Afghanistan, resin collected after making incisions at the upper part of tap root of more than five year old plants by scrapping in March, April, just before flowering, whole process repeated many times, after one or two days or after a few weeks when it gets hardened.

SYNONYMS

Sanskrit	:	Rāmaṭha, Sahasravedhi
Assamese	:	Hin
Bengali	:	Hing
English	:	Asfoetida
Gujrati	:	Hing, Vagharni
Hindi	:	Hing, Hingda
Kannada	:	Hing, Ingu
Kashmiri	:	Eng
Malayalam	:	Kayam
Marathi	:	Hing, Hira, Hing
Oriya	:	Hengu, Hingu
Punjabi	:	Hing
Tamil	:	Perungayam
Telugu	:	Inguva
Urdu	:	Hitleet, Hing

DESCRIPTION

a) Macroscopic

Rounded, flattened or masses of agglutinated tears, greyish-white to dull yellow, mostly 12-25 mm in diameter, freshly exposed surface, yellowish and translucent or milky white, opaque, slowly becoming pink, red, finally reddish brown, odour, strong, characteristic and persistent, taste, bitter and acrid.

b) Microscopic

IDENTITY, PURITY AND STRENGTH-

Identification

(I) Freshly broken surface when touched with *sulphuric acid* a bright red or reddish-brown colour is produced, changing to violet when acid washed off with water.

(II) Boil 0.2 g with 2 ml *Hydrochloric acid* for about 1 minute, cool, dilute with an equal volume of *water,* and filter into 3 ml of dilute solution of Ammonia, fluorescence is produced.

Absence of colophony resin:-Triturate 1 g with 10 ml of Light Petroleum (b.p. 40°-60°) for 2 minutes, filter into a test tube and add to the filtrate 10 ml of a fresh 0.5 per cent w/ v aqueous solution of copper acetate, shake well and allow the liquids to separate, petroleum layer does not show any green colour, indicating absence of colophony resin.

IDENTITY, PURITY AND STRENGTH

Foreign matter	Not more than	2	per cent, Appendix	2.2.2.
Total Ash	Not more than	15	per cent, Appendix	2.2.3.
Acid-insoluble ash	Not more than	3	per cent, Appendix	2.2.4.
Alcohol-soluble extractive	Not less than	50	per cent, Appendix	2.2.6.
Water-soluble extractive	Not less than	50	per cent, Appendix	2.2.7.

ASSAY

Place about 5 g accurately weighed, in a small beaker furnished with a glass rod, and tared add 50 ml of Alcohol (90 per cent), and boil gently. Filter the hot solution through a tared filter paper and boil the residue with further quantities of Alcohol (90 per cent); unitl all soluble matter is removed, using the glass rod to disintegrate the soluble matter. Wash the filter paper with hot alcohol (90 per cent) transfer the paper to the beaker, dry

the 100ō, and weigh. The- residue weighs not more than 50 per cent of the original sample taken.

CONSTITUENTS - Essential oil, gum and resin

PROPERTIES AND ACTION

Rasa : Kaṭu

Guṇa : Tīkṣṇa

Vīrya : Uṣṇa

Vipāka : Kaṭu

Karma : Rucya, Dīpana, Pācana, Anulomana, Kṛmighna, Vātakaphapraśamana, Hṛdya

IMPORTANT FORMULATIONS - Hiṅgvāṣṭaka Cūṛṇa, Hiṅgvādi Cūrṇa, Hiṅguvacādi Cūrṇa

THERAPEUTIC USES - Agnimāndya, Ādhmāna, Ānāha, Gulma, Śūlaroga, Udararoga, Hṛdroga, Kṛmiroga

DOSE - 125-500 mg of the drug

JATĀMĀṂSĪ (Rhizome)

Jatāmāṃsī consists of dried rhizome of *Nardostachys jatamansi* DC.(Fam. Valerianaceae) , an errect perennial herb, 10-60 cm high growing at an altitude of 3000-5000 m on the sub-alpine Himalayan tracts.

SYNONYMS

Sanskrit	:	Māṃsī, Jaṭā, Jaṭilā
Assamese	:	Jatamansi, Jatamangshi
Bengali	:	Jatamamsi
English	:	Nardus root
Gujrati	:	Baalchad, Kalichad
Hindi	:	Balchara
Kannada	:	Bhootajata, Ganagila maste
Kashmiri	:	Bhutijata
Malayalam	:	Manchi, Jatamanchi
Marathi	:	Jatamansi
Oriya	:	Jatamansi
Punjabi	:	Billilotan, Balchhar, Chharguddi
Tamil	:	Jatamanji
Telugu	:	Jatamamsi
Urdu	:	Sumbul-ut-teeb

DESCRIPTION

a) Macroscopic

Dried rhizome dark brown, 2.5-7.5 cm long, cylindrical, covered with reddish-brown fibres forming a net work, which are skeletons of sheathing leaf bases, fracture, brittle, internal colour reddish-brown, colour, strongly aromatic, taste, acrid, slightly bitter.

b) Microscopic

Transverse section of rhizome shows cork consisting of 2-5 layers of cells filled with oil globules, cortex characterised by the presence of schizogenous canals, phloem in form of patches of small cells, cambium ring distinct and continuous, xylem consists of vessles, scattered individually or in rows of two or three vessels, with scalariform thickening, older rhizomes show one or more stellate shaped rings of interxylary and medullary cork, completely or incompletely separating the rhizome into four to nine vascular strands by joining outer cork, each separated strand encircled by a few layers of cork cell consisting of an outer cortex zone followed by two or more functional vascular bundles, tissues in between the strands usually non-functional except for the cork cells which act as storage organ for oil globule.

IDENTITY, PURITY AND STRENGTH-

Identification-Shake about 2 g of the powder with 5 ml of Alcohol (80 per cent) for ten minutes and filter, Place one drop of the filtrate on a filter paper, dry and examine under ultra-violet light, a bright, bluish-white fluorescene is visible.

IDENTITY, PURITY AND STRENGTH

Foreign matter	Not more than	5	per cent, Appendix	2.2.2.
Total Ash	Not more than	9	per cent, Appendix	2.2.3.
Acid-insoluble ash	Not more than	5	per cent, Appendix	2.2.4.
Alcohol-soluble extractive	Not less than	2	per cent, Appendix	2.2.6.
Water-soluble extractive	Not less than	5	per cent, Appendix	2.2.7.
Volatile oil	Not less than	0.1	per cent,v/w, Appendix	2.2.10

CONSTITUENTS - Essential oil and resinuous matter

PROPERTIES AND ACTION

Rasa : Tikta, Kaṣāya

Guṇa : Laghu

Vīrya : Śīta

Vipāka : Kaṭu

Karma : Tridoṣanut, Medhya, Varṇya, Nidrājanana, Kuṣṭhaghna

IMPORTANT FORMULATIONS - Jaṭāmāṃsyarka

THERAPEUTIC USES - Kuṣṭha, Dāha, Visarpa, Mānasaroga, Anidrā

DOSE - 2-3 g of the drug in powder form /par5-10 g of the drug for decoction

JĀTĪPHALA (Seed)

Jātīphala consists of the endosperm of dried seeds (kernels of fruits) of *Myristica fragrans* Houtt. (Fam. Myristicaceae), dioecious or occasionally monoecious aromatic tree, about 10-20 m high, found mostly in Tamil Nadu and to some extent in Kerala, Andhra Pradesh and Assam.

SYNONYMS

Sanskrit	:	Jātiśasya, Jātīphala
Assamese	:	Jaiphal, Kanivish
Bengali	:	Jaiphala, Jaitri
English	:	Nutmeg
Gujrati	:	Jaiphala, Jayfar
Hindi	:	Jaiphal
Kannada	:	Jadikai, Jaykai, Jaidikai
Kashmiri	:	Jafal
Malayalam	:	Jatika
Marathi	:	Jaiphal
Oriya	:	Jaiphal
Punjabi	:	Jaiphal
Tamil	:	Sathikkai, Jathikkai, Jatikkai, Jadhikai, Jadhikkai
Telugu	:	Jajikaya
Urdu	:	Jauzbuwa, Jaiphal

DESCRIPTION

a) Macroscopic

Seed ellipsoid, 20-30 mm long and about 20 mm broad, externally greenish-brown sometimes marked with small irregular dark brown patches or minute dark points and lines slightly furrowed reticulately, a small light-coloured area at one end indicating the position of the radicle a groove running along the line of raphe to the darker chalaza at the opposite end, surrounded by a thin layer of peri sperm with infoldings appearing as dark ruminations in the abundant greyish-brown endosperm, embryo, in an irregular cavity, small with two widely spreading crumpled cotyledons and a small radicle odour,

strong and aromatic, taste, pungent and aromatic.

b) Microscopic

Transverse section of endosperm shows peripheral perisperm, of several layers of strongly, flattened polyhederal cells with brown contents, or containing prismatic crystals, inner layer of perisperm of thin-walled parenchyma about 40 µ thick, infolding into the tissue of the endosperm to form the ruminations containing numerous, very large oil cells with brown cell walls, vascular strands, in the peripheral region, numerous small spiral vessels, large celled, endosperm, parenchymatous With occasional tannin idioblasts with thin brown walls, containing numerous simple, rounded and compound starch grains, with upto about 10 components usually 2-8 individual grains, upto 20 µ in diameter present, most of the cells with crystalline fat and often a large aleurone grain in each cell, containing a rhombic protein crystal upto 12 µ and small aleurone grains with less regular crystalloids, embryo, of shrivelled and collapsed parenchyma.

IDENTITY, PURITY AND STRENGTH

Foreign matter	Not more than	1	per cent, Appendix	2.2.2.
Total Ash	Not more than	3	per cent, Appendix	2.2.3.
Acid-insoluble ash	Not more than	0.5	per cent, Appendix	2.2.4.
Alcohol-soluble extractive	Not less than	11	per cent, Appendix	2.2.6.
Water-soluble extractive	Not less than	7	per cent, Appendix	2.2.7.
Ether soluble extractive	Not less than	25	per cent, Appendix	2.2.8
Volatile oil	Not less than	5	per cent,v/w, Appendix	2.2.10

CONSTITUENTS - Essential oil and fixed oil

PROPERTIES AND ACTION

Rasa : Tikta, Kaṭu

Guṇa : Laghu, Tīkṣṇa

Vīrya : Uṣṇa

Vipāka : Kaṭu

Karma : Dīpana, Grāhī, Mukhakledanāśaka, Mukhadaurgandhyanāśaka, Kaphavātāpaha, Vṛṣya

IMPORTANT FORMULATIONS - Jātīphalādi Cūrṇa

THERAPEUTIC USES - Atīsāra, Grahaṇī, Chardi, Mukharoga, Pīnasa, Kāsa, Śvāsa, Śukrameha

DOSE - 0.5 - 1.0 g of the drug in powder form

KAMPILLA (Fruit)

Kampilla consists of glands and hairs of fruit of *Mallotus philippinensis Muell* . Arg. (Fam. Euphorbiaceae), a very common perennial shrub or small tree found in outer Himalayas ascending to 1500 m, mature fruits collected in February-March, reddish brown powder collected in cloth by shaking and rubbing the fruits with hands.

SYNONYMS

Sanskrit	:	Rajanaka, Kampillaka
Assamese	:	Lochan
Bengali	:	Kamlagudi
English	:	Kamala
Gujrati	:	Kapilo
Hindi	:	Kabila
Kannada	:	Kapila, Chandrahettu, Kapilathettu
Kashmiri	:	Kameelak
Malayalam	:	Kampippala, Kampipalu
Marathi	:	Shendri, Kapila
Oriya	:	Kamalagundi
Punjabi	:	Kamila
Tamil	:	Kamala, Kampila
Telugu	:	Kampillamu
Urdu	:	Kamila

DESCRIPTION

a) Macroscopic

Fine, granular powder, dull-red or madder-red coloured, floating on water.

b) Microscopic

Under microscope glands appear depressed and globular, containing deep-red coloured resin, secreted by many club shaped cell radiating from a common centre, a number of stellate trichomes present, trichomes thick-walled, branching lignified with smooth margins, yellow coloured, arranged in small radiating groups.

IDENTITY, PURITY AND STRENGTH

Foreign matter	Not more than	2	per cent, Appendix	2.2.2.
Total Ash	Not more than	6	per cent, Appendix	2.2.3.
Acid-insoluble ash	Not more than	4	per cent, Appendix	2.2.4.
Alcohol-soluble extractive	Not less than	50	per cent, Appendix	2.2.6.
Water-soluble extractive	Not less than	1.0	per cent, Appendix	2.2.7.

ASSAY

T.L.C.

CONSTITUENTS - Resinous colouring matter (rottlerin).

PROPERTIES AND ACTION

Rasa : Kaṭu

Guṇa : Laghu, Rūkṣa, Tīkṣṇa

Vīrya : Uṣṇa

Vipāka : Kaṭu

Karma : Virecana, Vraṇāpaha, Kṛmighna

IMPORTANT FORMULATIONS - Dhānvantara Ghṛta, Miśraka Sneha

THERAPEUTIC USES - Vibandha, Kṛmiroga, Ādhmāna, Gulma, Vraṇa

DOSE - 0.5-1.0 g of the drug in powder form

Note- Śōdhana of this drug is to be done before use, as described in Appendix

KĀÑCANĀRA (Stem bark)

Kāñcanāra consists of the dried, stem bark of Bauhinia variegata Blume (Fam. Leguminosae): a medium sized tree occurring in sub-Himalayan tract extending eastwards to Assam, Eastern, Central and South India.

SYNONYMS

Sanskrit	:	Kāñcanāraka
Assamese	:	Kancan, Kanchan
Bengali	:	Kanchana, Rakta Kanchana
English	:	Mountain Ebony
Gujrati	:	Champakati, Kanchnar, Kachnar
Hindi	:	Kachanar, Kanchanar, Kachnar
Kannada	:	Keyumandar, Kanchavala
Kashmiri	:	Kalad
Malayalam	:	Chuvanna Mandharam
Marathi	:	Kanchana, Raktakancana
Oriya	:	Kachana, Kaniara
Punjabi	:	Kanchnar
Tamil	:	Sigappu mandarai, Sihappu mantarai
Telugu	:	Deva Kanchanam
Urdu	:	--

DESCRIPTION

a) Macroscopic

Bark, dark brown, sometimes with silvery patches, rough, compact, exfoliating in woody strips and scales, outer surface with small transverse and longitudinal cracks, internal surface white, taste, astringent

b) Microscopic

Transverse section of mature stem bark shows a wide stratified cork, outer cork composed of thin-wailed, slightly compressed, yellow brown cells followed by a number of layers of brown coloured cells, inner cork composed of transversely elongated orange brown cells, cork interrupted at certain places due to formation of rhytidoma, some secondary cortex composed or 15 or more rows or transversely elongated to circular,

thin-walled, parenchymatous cells, some secondary cortex cells contain orange brown contents: groups of stone cells found scattered in this region occasionally arranged in 1-7 or more tangential rows, pericyclic fibres, thick-walled with narrow lumen, scattered in secondary cortex in singles or in groups, secondary phloem consists of sieve tubes, companion cells, phloem parenchyma and fibres traversed by funnel shaped medullary rays , phloem fibres arranged in radial rows throughout phloem region, prismatic and rhomboidal crystals or calcium, oxalate abundantly found in phloem and secondary cortex regions, very rarely found in cork cells, cluster crystals also present in secondary cortex and secondary phloem, crystal fibres also found in secondary phloem.

Powder - pinkish, under microscope showing abundant crystals of calcium oxalate, sc1ercids in singles or in groups with wide lumen, bits of fibres, cork and secondary cortex cells, containing coloured content, and numerous crystal fibres

IDENTITY, PURITY AND STRENGTH

Foreign matter	Not more than	2	per cent, Appendix	2.2.2.
Total Ash	Not more than	11	per cent, Appendix	2.2.3.
Acid-insoluble ash	Not more than	0.2	per cent, Appendix	2.2.4.
Alcohol-soluble extractive	Not less than	2	per cent, Appendix	2.2.6.
Water-soluble extractive	Not less than	6	per cent, Appendix	2.2.7.

CONSTITUENTS - Tannins

PROPERTIES AND ACTION

Rasa : Kaṣāya

Guṇa : Laghu, Rūkṣa

Vīrya : Śīta

Vipāka : Kaṭu

Karma : Tridoṣahara, Grāhī, Dīpana, Gaṇḍavṛddhihara

IMPORTANT FORMULATIONS - Kāñcanāra Guggulu

THERAPEUTIC USES - Kṛmiroga, Gaṇḍamālā, Apacī, Gudabhraṃśa, Vraṇa

DOSE - 20-30 g of the drug for decoction

KAṄKOLA (Fruit)

Kaṅkola consists of mature, dried fruits of *Piper cubeba* Linn.f. (Fam. Piperaceae), woody, climbing, perennial with dioeceous flowers in spike, cultivated to a small extent in India, specially in the Karnataka state, fruits collected when mature but still unripe and carefully dried.

SYNONYMS

Sanskrit	:	Kaṅkolaka, Cinoṣaṇa, Cinatīkṣṇa, Kakkola, Kaṅkolikā
Assamese	:	Kakkol, Kababcheni
Bengali	:	Kahabchini, Sugandhamaricha
English	:	Cubebs, Tailed Pepper
Gujrati	:	Chanakabab, Chinikabab
Hindi	:	Seetalchini, Kababchini
Kannada	:	Gandhamenasu, Balamenasu
Kashmiri	:	Kushfal, Kababchini
Malayalam	:	Cheenamulaku, Takkolam, Valmulaku
Marathi	:	Kankol
Oriya	:	Kababchini
Punjabi	:	Kababchini, Sardchini
Tamil	:	Vaali milaku, Valmilagu
Telugu	:	Chalavamiriyalu, Tokamiriyalu
Urdu	:	Kababchini

DESCRIPTION

a) Macroscopic

Fruit wrinkled, rounded, 5-7 mm in diameter, light brown to dark brown, about 7 mm long stalk attached, pericarp red to slightly brown, testa fused with pericarp, fruit hard and stony albumen white and oily, odour, aromatic end characteristic, taste, pungent and slightly bitter.

b) Microscopic

Transverse section of fruit shows an outer layers of epidermis, externally covered with thick cuticle, a raw of 2-5 small, crushed, brown and thick-walled cells below, mesocarp composed of large, thin-walled parenchymatous cells, oil cells and vascular bundles, endocarp of multi-layered sclereids heavily lignified with narrow lumen, testa and tegmen composed of elongated cells tegmen cells hyaline and kernel cells greyish in colour.

IDENTITY, PURITY AND STRENGTH

Foreign matter	Not more than	2	per cent, Appendix	2.2.2.
Total Ash	Not more than	8	per cent, Appendix	2.2.3.
Acid-insoluble ash	Not more than	1	per cent, Appendix	2.2.4.
Alcohol-soluble extractive	Not less than	14	per cent, Appendix	2.2.6.
Water-soluble extractive	Not less than	11	per cent, Appendix	2.2.7.

ASSAY

T.L.C.

CONSTITUENTS - Essential oil (cubebin).

PROPERTIES AND ACTION

Rasa : Kaṭu, Tikta

Guṇa : Laghu, Tīkṣṇa

Vīrya : Uṣṇa

Vipāka : Kaṭu

Karma : Dīpana, Pācana, Rucya, Kaphavātahara, Mukhadaurgandhyahara, Vastiśodhana

IMPORTANT FORMULATIONS - Daśamūlāriṣṭa, Kumāryāsava

THERAPEUTIC USES - Aruci, Mukharoga, Mūtrakṛcchra, Śūla

DOSE - 1-2 g of the drug in powder form

KAṆṬAKĀRĪ (Whole plant)

Kaṇṭakārī consists of mature, dried whole plant of *Solanum surattense* Burm. f., Syn. *Solanum xanthocarpum Schrad* . & Wendl , (Fam. Solanaceae), perennial, very prickly diffused herb of waste land, found throughout India.

SYNONYMS

Sanskrit	:	Vyāghrī, Nidigdhikā, Kṣudrā, Kaṇṭakārikā, Dhāvanī, Nidigdhā, Dusparśā
Assamese	:	Katvaedana, Kantakar
Bengali	:	Kantakari
English	:	Febrifuge plant
Gujrati	:	Bharingani
Hindi	:	Katai, Katali, Ringani, Bhatakataiya, Chhotikateri
Kannada	:	Nelagulla, Kiragulla
Malayalam	:	Kantakari chunda
Marathi	:	Bhauringani, Kataringani
Oriya	:	Bhejibaugana, Ankarati, Chakada Bhoji
Punjabi	:	Kandiari
Tamil	:	Kandangatri, Kandankatri, Kandanghathiri
Telugu	:	Nelamulaka, Pinnamulaka, Mulaka, Chinnamulaka, Vakudu
Urdu	:	--

DESCRIPTION

a) Macroscopic

Root-10-45 cm long, few mm to two cm in diameter, almost cylindrical and tapering, bearing a number of fine longitudinal and few transverse wrinkles with occasional scars or a few lenticels and small rootlets, transversely smoothened surface shows a thin bark and wide compact cylinder of wood, fracture, short, taste, bitter.

Stem-herbaceous, prickly with prominent nodes and internodes, green when fresh, young branches, covered with numerous hairs, mature ones glabrous, furrows more prominent in young stem appearing almost circular towards basal region, stem pieces 8-10 mm thick of variable length, external surface light green, when dry,

surface yellowish green and smooth, transversely smoothened surface shows a very thin bark and prominent wood, centre shows a large and distinct, pith, mr ture and dry stem often with hollow pith, fracture short to slightly fibrous.

Leaves-petiolate, exstipulate, ovate--oblong or elliptic, sinuate or sub-pinnatifid, sub-acute hairy, 4-12.5 cm long and 2-7.5 cm wide, green, veins and midrib full with sharp prickles, odour and taste not distinct.

Flower- ebracteate, pedicellate, bisexual, pentamerous, regular, complete, bright blue or bluish purple, . calyx-persistent, gamosepalous, tube short, globose, linear-lanceolate, acute, hairy, 0.5-1 .3 cm long and densely prickly, corollagamopetalous, lobes deltoid, acute, hairy, 1-2 cm long and purple in colour, stamens 5, epipetalous, basifixed, filament short 1-1.5 mm long, anther, oblong lanceolate, 0.7-0.8 cm long, ovary superior, ovoid, glabrous, bilocular with axile placentation having numerous ovules.

Fruit-Berry globular , measuring 0.8-1 cm in diameter, surrounded by persistent calyx at base unripe fruits variegated with green and white strips, ripe fruit shows different yellow and white shades.

Seeds-circular, flat, numerous, embedded in a fleshy mesocarp about 0. 2 cm in diameter. glabrous taste, bitter and acrid .

b) Microscopic

Root- transverse section of mature root shows cork composing of 3-6 layers of thin-walled, rectangular and tangentially elongated cells, cork cambium single layered followed by 6-15 layers of thin-walled, tangentially elongated to oval or circular parenchymatous cells, stone cells either single or in groups of 2-20 or even more present in this region, secondary phloem composed of sieve elements and phloem parenchyma traversed by medullary rays, stone cells present in singles or in groups of 2-20 or more in outer, and middle phloem regions, phloem rays 1-4 cells wide and 2-22 cells high, cambium 3-5 layered of thin-walled rectangular cells, xylem composed of vessels, tracheids, fibre trachieds, parenchyma and transversed by medullary rays, all elements being lignified, vessels and tracheids with bordered pits, fibres with a few simple pits, xylem parenchyama rectangular or lightly elongated with simple pits and rarely with reticulate thickening, xylem rays 1-3 cells wide and 1-20 cells high, microsphenoidal crystals of calcium oxalate as sandy masses and simple starch grains present in secondary cortex, phloem and medullary rays.

Stem-transverse section of mature stem, 1.5-2 cm thick consists of 6-12 layers of cork of thin- walled somewhat rectangular cells, epidermis remains intact for a long time, secondary cortex consists of 7-11 layers of parenchymatous cells, some cells thickened and lignified forming stone cells primary cortex remains intact even in quite mature stage but later gets crushed, pericyclic fibre, occur singly or in small groups of 2-3, secondary phloem consists of sieve elements, parenchyama, a few fibres, stone cells and traversed by phloem rays, fibres found scattered in singles or in small groups in outer and middle phloem region, inner phloem devoid of fibres, stone cells present in singles

or in small groups of 2-4, phloem rays, 1-2 or rarely 3 cells wide, cambium composed of 2-3 layers, xylem consists of vessels, tracheids, parenchyma, fibres and traversed by xylem rays, vessels vary grea tly in shape and size and show bordered pits, tracheids elongated with irregular walls and bordered pits, fibres much elongated, thick-walled and lignified with tapering and pointed ends, some having truncated ends or bifurcated at one or both ends with a few simple pits, trancheids fibres smaller than fibres, with both ends tapering and have reticulate thickening, xylem parenchyma cubical to rectangular with simple or bordered pits or reticulate thickening, xylem rays conspicuous by their pitted thickenings, longer size and radial elongation of cells, 1-2 or rarely 3 cells wide and 2-25 cells high, internal phloem composed of sieve elements and parenchyma, forming more or less continuous band and embedded in perimedullary zone, a few phloem fibres similar to those of outer phloem region also present, central region occupied by a large pith, microsphenoidal crystals of calcium oxalate as sandy masses and simple starch grains present in cortex, secondary cortex, phloem, medullary rays and pith cells.

Leaves-

(i) *Petiole*-transverse section of petiole shows circular to wavy outlines, epidermis single layered, covered externally by a thick cuticle, hypodermis consists of 3-4 layers of collenchymatous, cells, one large-crescent-shaped, bicollateral, central vascular bundle and two small lateral bundles present, rest of tissue of petiole composed of polygonal,. angular, thin-walled, parenchymatous cells, epidermis shows mostly stellate and rarely urn to tricellular hairs.

(ii) *Midrib*-transverse section of midrib shows a biconvex structure, epidermis on either side covered externally by a thick cuticle, below epidermis 3-4 layers of collenchyma present, stele composed of crescent-shaped, bicollateral, central vacscular bundle and two small lateral vascular bundles, rest of tissue composed of thin-walled, parenchyma, some stellate hair present on epidermis.

(iii) **Lamina**-transverse section shows dorsiventral structure, epidermis on either side, wavy in outline, covered externally by a thick cuticle, on upper side mesophyll composed of a single layered palisade and 4-6 layers of loosely arranged spongy parenchyma, some stellate hairs (4-8 armed) present on both sides of epidermis, anisocytic stomata present on both surfaces, vein-islet number 46-80 on lower epidermis (mean 63), 61-80 on upper epidermis (mean 70), stomatal index 20-25 (mean 22.5) on lower epidermis, 14-24 (mean 19) on upper epidermis, palisade ratio 1.7-4 (mean 2 .85).

Fruit-transverse section of mature fruit shows single layered epidermis, covered externally by a thin cuticle, 1-2 layers of collanchyma present below epidermis, mesocarp composed of thin-walled, oval to polygonal cells, some fibre., vascular bundles present scattered, seed consists of thick-walled radially elongated testa, narrow endosperm with embryo, some cells of endosperm contain oil globules.

Powder - Greenish, under microscope shows single or groups of stone cells, groups of aseptate fibre with tapering ends, pitted vessels, groups of spongy parenchyma, fragments of palisade tissue, anisocytic stomata, stellate hairs and simple, rounded

to oval starch grains measuring 2.75-11 μ in dia.

IDENTITY, PURITY AND STRENGTH

Foreign matter	Not more than	2	per cent, Appendix	2.2.2.
Total Ash	Not more than	9	per cent, Appendix	2.2.3.
Acid-insoluble ash	Not more than	3	per cent, Appendix	2.2.4.
Alcohol-soluble extractive	Not less than	6	per cent, Appendix	2.2.6.
Water-soluble extractive	Not less than	16	per cent, Appendix	2.2.7.

CONSTITUENTS - Glucoalkaloids and sterols

PROPERTIES AND ACTION

Rasa : Kaṭu, Tikta

Guṇa : Laghu, Rūkṣa

Vīrya : Uṣṇa

Vipāka : Kaṭu

Karma : Dīpana, Pācana, Āmadoṣanāśaka, Kaṇṭhya, Śothahara

IMPORTANT FORMULATIONS - Kaṇṭakāryāvaleha, Pañcatiktaka Ghṛta, Vyāghrīharītakī

THERAPEUTIC USES - Śvāsa, Kāsa, Jvara, Aruci, Pīnasa, Pārśvaśūla, Svarabheda

DOSE - 20-30 g of the drug for decoction

KANYĀSĀRA (Leaf)

Kanyāsāra consists of dried juice of leaves of *Aloe barbadensis* Mill. Syn. *Aloe vera* Tourn.ex Linn, *Aloe indica* Royle. (Fam. Liliaceae), shrub planted in many Indian gardens and found growing throughout India.

SYNONYMS

Sanskrit	:	Kumārīrasasambhava, Sahāsāra
Assamese	:	Musabhar, Machambar
Bengali	:	Ghritakalmi
English	:	Indian Aloe
Gujrati	:	Eliyo, Eariyo
Hindi	:	Musabhar, Elva
Kannada	:	Karibola, Lolesara satva, Lovalsara, Lolesara
Kashmiri	:	Musabbar, Siber
Malayalam	:	Chenninayakam
Marathi	:	Korphad
Oriya	:	Musabara
Punjabi	:	Kalasohaga, Mussabar, Alua
Tamil	:	Kattazhi, Satthukkathazhai
Telugu	:	Musambaram
Urdu	:	Musabbar, Ailiva, Siber

DESCRIPTION

a) Macroscopic

Dark chocolate brown, to black, compact, irregular masses: surface dull, opaque with slightly vitreous appearance, odour, characteristic, taste, nauseous and bitter.

b) Microscopic

Powder when mounted in glycerin or lactophenol and examined under the

microscope shows innumerable crystalline, yellowish-brown to chocolate coloured particles of varying size and shape.

IDENTITY, PURITY AND STRENGTH-

Identification:

Mix 0.5 g with 50 ml of *water,* boil until nearly dissolved, cool, add 0.5 g of *Kieselguhr* and filter, to the filtrate apply the following tests-

(i) Heat 5 ml of filtrate with 0.2 g of *Borax* until dissolved, add a few drops of this solution to a test-tube nearly filled with *Water,* a green fluorescence is produced.

(ii) Mix 2 ml of filtrate with 2 ml of a freshly prepared solution of *Bromine,* a pale yellow precipitate is produced.

IDENTITY, PURITY AND STRENGTH

Foreign matter	Not more than	2	per cent, Appendix	2.2.2.
Total Ash	Not more than	5	per cent, Appendix	2.2.3.
Acid-insoluble ash	Not more than	2	per cent, Appendix	2.2.4.
Alcohol-soluble extractive	Not less than	80	per cent, Appendix	2.2.6.
Water-soluble extractive	Not less than	60	per cent, Appendix	2.2.7.
Moisture content	Not more than	10	per cent, Per cent of its weight when dried to constant weight at 105$\bar{o}$ C	2.2.9

CONSTITUENTS - Anthraquinone, glycoside

PROPERTIES AND ACTION

Rasa : Kaṭu

Guṇa : Uṣṇa

Vīrya : Uṣṇa

Vipāka : Kaṭu

Karma : Bhedī, Pittanirharaṇa, Rajaḥpravartaka, Jvaranut

IMPORTANT FORMULATIONS - Rajaḥpravartinī Vaṭī, Cukkumtippalyādi Guṭikā

THERAPEUTIC USES - Udararoga, Kaṣṭārtava, Jvara, Yakṛdvikāra

DOSE - 125 - 500 mg of the drug in powder form

KARAÑJA (Seed)

Karañja consists of seeds of *Pongamia pinnata* (Linn.) Merr, Syn. *Pongamia glabra* vent.(Fam. Leguminosae), a medium sized glabrous tree with a short bole and spreading crown and found almost throughout India upto an altitude of 1200 m.

SYNONYMS

Sanskrit	:	Karañjaka, Naktamāla, Naktāhva, Ghṛtakarañja
Assamese	:	Korach
Bengali	:	Nata Karanja, Dahara Karanja
English	:	Smooth leaved pongamia
Gujrati	:	Kanajo, Karanji
Hindi	:	Dithouri, Karuaini
Kannada	:	Honge, Hulagilu
Malayalam	:	Avittal, Ungu, Unu, Pungu
Marathi	:	Karanja
Oriya	:	Karnja
Punjabi	:	Karanj
Tamil	:	Pungan, Pongana
Telugu	:	Lamiga, Kanuga
Urdu	:	Karanj

DESCRIPTION

a) Macroscopic

Seed usually one and rarely two, elliptic or reniform in shape, 1.7-2.0 cm long and 1.2-1.8 cm broad, wrinkled with reddish leathery testa, micropylar end of cotyledons slightly depressed while other side semi-circular in shape.

b) Microscopic

Transverse section of seed shows, testa composed of a layer of palisade like outer

epidermis, filled with brown pigment, covered externally with a thick cuticle, a layer of large, thin walled, somewhat rectangular cells, 2-4 layers of thick-walled parenchyma cells, a few rows of cells with small inter-cellular spaces, 2-3 layers of thick-walled elongated cells, a few layers of spongy parenchyma having large inter-cellular spaces, a number of parenchyma cells containing brown pigment, cotyledons composed of outer layer of epidermis with cylindrical cells, externally covered with thin cuticle, epidermis followed by rectangular to polygonal cells of mesophyll, filled with globules, also present scattered in this region.

IDENTITY, PURITY AND STRENGTH

Foreign matter	Not more than	1	per cent, Appendix	2.2.2.
Total Ash	Not more than	3	per cent, Appendix	2.2.3.
Acid-insoluble ash	Not more than	0.1	per cent, Appendix	2.2.4.
Alcohol-soluble extractive	Not less than	23	per cent, Appendix	2.2.6.
Water-soluble extractive	Not less than	13	per cent, Appendix	2.2.7.

CONSTITUENTS - Fixed oil, flavones and traces of essential oil

PROPERTIES AND ACTION

Rasa : Kaṭu, Tikta

Guṇa : Tīkṣṇa

Vīrya : Uṣṇa

Vipāka : Kaṭu

Karma : Kaphavātaghna, Kṛmijit, Kuṣṭhaghna, Vraṇaśodhana

IMPORTANT FORMULATIONS - Āragvadhādi Kvātha Cūrṇa, Pathyādi Lepa

THERAPEUTIC USES - Vraṇa, Kṛmi, Kuṣṭha

DOSE - 0.25 g of the drug in powder form /par5-10 g of the drug for decoction

KARAVĪRA (Leaf)

Karavīra consists of dried leaves of *Nerium indicum* Mill. Syn. *Nerium odorum Soland* (Fam. Apocynaceae), a large evergreen woody shrub with milky Juice, found throughout the year in upper Gangetic plains, Himalayas, from Nepal to Kashmir upto 2000 m. Central and Southern India, also cultivated near temples and gardens.

SYNONYMS

Sanskrit	:	Hayamāraka, Harapriya, Aśvamāra
Assamese	:	Karbira, Karavi, Karvir
Bengali	:	Karavi, Kalkephul
English	:	Indian Oleander
Gujrati	:	Kanera, Karena, Karen
Hindi	:	Kaner
Kannada	:	Kanagalu, Kanagile
Kashmiri	:	Gandeela, Gandula
Malayalam	:	Kanave eram, Arali, Kattalari
Marathi	:	Kanher
Oriya	:	Kaniara, Kaniar
Punjabi	:	Kaner
Tamil	:	Arali, Alari, Aatrulari
Telugu	:	Ganneru
Urdu	:	Kaner

DESCRIPTION

a) Macroscopic

Leaves exstipulate, linear, lanceolate, 10-20 cm long and upto 2.5 cm wide, thick, dark green and shining above and dotted beneath, venation unicostate, reticulate with midrib being stout and the secondary veins arising in very large number, running parallel, stomata anamocytic.

b) Microscopic

Petiole-transverse section of petiole shows a single layer of epidermis covered externally by thick cuticle, epidermal cells elongate to form unicellular, non-lignified and non-glandular hairs, a wide zone of cortex, composed of 4-7 layers of collenchymatous cells and a Wide zone of parenchyma follows the epidermis, parenchymatous cells thin-walled, more or less isodiametric with intercellular spaces, some cells contain rosette crystals of calcium oxalate, petiole receives three vascular bundles from stem, central one large and crescent shaped while other two much smaller and somewhat circular present on each side of central vascular bundle, phloem present on upper side and xylem on lower Side With usual elements.

Lamina-transverse section of lamina shows an isobilateral structure, upper epidermis composed of penta or hexagonal parenchymatous cells, externally covered with thick cuticle, below upper epidermis. 2-3 layers of hypodermis present, palisada 3-4 layered composed of elongated and compactly arranged cells, vascular strands also seen in between palisade and spongy parenchyma, spongy parenchyma filled with chlorophyll, towards lower surface 2-3 layered palisade, below which parenchyma and lower epidermis present, lower epidermis also coated with the cuticle externally, in lower surface many pits possessing stomata, unicellular, non-glandular and non-lignified trichomes, rosette crystals of calcium oxalate present throughout lamina, average palisade ratio 4: 1.

Midrib-transverse section of midrib shows epidermis composed of a layer of cells, externally covered with cuticle, some epidermal cells on upper and lower sides form unicellular hairs, between epidermis and parenchyma 2-4 rows of thick-walled cells, more prominent towards lower side, some parenchymatous cells contain rosette crystals of calcium oxalate, laticifers found scattered singly or in groups of 2 in this region, beneath the vascular bundle a sn ip of fibres present, vascular bundle 'U' shaped, xylem being towards lower side and phloem towards the upper consists of tracheids, vessels and parenchyma, vessels with end-openings, rarely with side openings tracheids many with spiral, annular or reticulate thickenings on their walls.

IDENTITY, PURITY AND STRENGTH

Foreign matter	Not more than	2	per cent, Appendix	2.2.2.
Total Ash	Not more than	9	per cent, Appendix	2.2.3.
Acid-insoluble ash	Not more than	1	per cent, Appendix	2.2.4.
Alcohol-soluble extractive	Not less than	20	per cent, Appendix	2.2.6.
Water-soluble extractive	Not less than	20	per cent, Appendix	2.2.7.

CONSTITUENTS - Cardiac glucoside (oleandrin)

PROPERTIES AND ACTION

Rasa : Kaṭu, Tikta, Kaṣāya

Guṇa : Tīkṣṇa, Laghu, Rūkṣa

Vīrya : Uṣṇa

Vipāka : Kaṭu

Karma : Jvarāpaha, Cakṣuṣya, Kuṣṭhaghna, Kaṇḍūghna, Kṛmighna, Vraṇāpaha, Śvāsahara, (Prabhāva: Hṛdya)

IMPORTANT FORMULATIONS - Kāsīsādi Taila

THERAPEUTIC USES - Jvara, Vraṇa, Kuṣṭha, Kaṇḍū, Kṛmiroga, Netraroga, Tamakaśvāsa, Hṛdroga

DOSE - 30-125 mg of the drug in powder form

*Dose should not exceed the higher limit

NOTE-Sodhana of this drug is to be done before use as described in the appendix.

KARKAṬAŚṚṄGI (Gall)

Karkaṭaśṛṅgī consists of gall-like excrescences formed by insects on the leaves, petioles and branches of the plant *Pistacia chinensia Burgo*, *Pistacia integerrima Ste*w. ex Brandis, *Rhus succedanea* Linn. (Fam. Anacardiaceae) during autumn season, growing on the steps of Western Himalayas from Indus to Kumaon at an altitude of 350-2400 m, often cultivated in Punjab plains.

SYNONYMS

Sanskrit	:	Śṛṅgī, Viṣāṇī, Karkaṭa
Assamese	:	Kakiasrngi
Bengali	:	Kankda Shringi
English	:	Crab's claw
Gujrati	:	Kakada shing, Kakada singi
Hindi	:	Kakadasingi, Kakarasingi, Gheekadava
Kannada	:	Kakadasingi, Karkatakasringi
Kashmiri	:	Kakkar, Kamaladina
Malayalam	:	Karkatasringi
Marathi	:	Kakadshingi
Oriya	:	Kakadashrungi, Kakadashringi
Punjabi	:	Kakar, Kakarsingi
Tamil	:	Karkata singi
Telugu	:	Kakarsingi, Karkatakashrungi
Urdu	:	Kakrasinghi

DESCRIPTION

a) Macroscopic

Dried galls hard, hollow, horn-like, thin-walled, generally cylindrical, tapering at both the ends, greyish brown externally and reddish brown internally, size varies from 2.5-30.0 cm or more, each gall contains numerous dead insects, odour, terebinthine, taste of powdered galls, strongly astringent and slightly bitter.

b) Microscopic

Transverse section of gall shows the collapsed epidermis on both the sides, epidermal cells thin-walled, tangentially elongated, ground tissues thin-walled and oval or circular, the outer two layers tangentially elongated while between vascular bundles radially elongated, outer few layers and some of cells of ground tissue filled with yellowish brown contents, vascular bundle scattered throughout the ground tissues in two rows, consist of phloem accompanied by a large tannin sac in each vascular bundle.

Powder-Powder greyish brown, under microscope, shows orange yellow colour isolated or associated fragments of xylem vessels and ground tissues.

IDENTITY, PURITY AND STRENGTH

Foreign matter	Not more than	2	per cent, Appendix	2.2.2.
Total Ash	Not more than	7	per cent, Appendix	2.2.3.
Acid-insoluble ash	Not more than	0.2	per cent, Appendix	2.2.4.
Alcohol-soluble extractive	Not less than	30	per cent, Appendix	2.2.6.
Water-soluble extractive	Not less than	30	per cent, Appendix	2.2.7.

CONSTITUENTS - Essential oil, tannins and resinous matters.

PROPERTIES AND ACTION

Rasa : Kaṣāya, Tikta

Guṇa : Guru

Vīrya : Uṣṇa

Vipāka : Kaṭu

Karma : Kaphavātahara, Kāsahara, Ūrdhvavātajit, Hikkānigrahaṇa

IMPORTANT FORMULATIONS - Bālacaturbhadrikā Cūrṇa

THERAPEUTIC USES - Jvara, Śvāsa, Kāsa, Hikkā, Kṣaya, Aruci, Chardi

DOSE - 3-6 g of the drug in powder form

KĀRPĀSA (Seed)

Kārpāsa consists of seeds (devoid of lint) of *Gossypium herbaceum* Linn. (Fam. Malvaceae) , an annual or perennial shrub, 0.6-2.4m high, extensively cultivated in India.

SYNONYMS

Sanskrit	:	Tuṇḍakeśi
Assamese	:	Karpasa, Tula
Bengali	:	Bona, Kapasia
English	:	Cotton plant seed
Gujrati	:	--
Hindi	:	Kapasa, Binaula
Kannada	:	Hati, Arale
Malayalam	:	Karpasi, Panji Karpasam
Marathi	:	Sarki
Oriya	:	--
Tamil	:	Parutti kkoottam
Telugu	:	Patti ginga
Urdu	:	Pambadana, Habb-ul-Qutn

DESCRIPTION

a) Macroscopic

Seed, dark brown, ovoid, 0.3-0.6 cm diameter, minute, shallow longitudinal grooves arise from funicular region of seed, taste, slightly bitter.

b) Microscopic

Transverse section of mature seed shows, two integuments forming seed coat, outer integument differentiated into epidermis, a wide zone of parenchyma and a hyaline layer, epidermis single layered, some trichomes arise from epidermis and form lint and fuzz hairs, lint hairs elongated with thin wall and wide lumen, fuzz hairs thick-walled with narrow lumen, parenchymetous zone consists of 4-8 layers of reddish-brown cells, a few vascular bundles embedded in this zone, hyaline layer consisting of 2-3 layers of

tangentially elongated, cubical, thick-walled cells, inner integument composed of palisade and parenchyma, palisade cells compactly arranged and colourless, parenchyma many layered of tangentially elongated cells with deep reddish-brown contents, cotyledons thin, large and folded, upper epidermis of cotyledon, single layered, externally covered with cuticle followed by 1 or 2 layered palisade like cells of mesophyll, beneath this zone, mesophyll cells show elongated to rounded structure without inter-cellular spaces, lower epidermis single layered, cubical or oval, covered with cuticle, some lysigenous glands filled with yellowish-brown contents also found scattered in mesophyll region, starch and calcium oxalate crystals absent.

Powder- Brown under microscope shows palisade cells, thin-walled mesophyll cells, deep brown contents and hairs, pieces of testa and fuzz intact.

IDENTITY, PURITY AND STRENGTH

Foreign matter	Not more than	2	per cent, Appendix	2.2.2.
Total Ash	Not more than	5	per cent, Appendix	2.2.3.
Acid-insoluble ash	Not more than	0.1	per cent, Appendix	2.2.4.
Alcohol-soluble extractive	Not less than	14	per cent, Appendix	2.2.6.
Water-soluble extractive	Not less than	8	per cent, Appendix	2.2.7.

ASSAY

T.L.C.

CONSTITUENTS - Fixed oil, resin and sterols

PROPERTIES AND ACTION

Rasa : Madhura

Guṇa : Snigdha, Guru

Vīrya : Śīta

Vipāka : Madhura

Karma : Stanyajanana, Vṛṣya, Kaphakara, Hṛdya

IMPORTANT FORMULATIONS - Kārpāsāsthyādi Taila

THERAPEUTIC USES - Dāha, Śrama, Bhrānti, Mūrcchā, Stanyakṣaya

DOSE - 3-6 g of he drug in powder form

KAŚERU (Rhizome)

Kaśeru consists of rhizome of *Scirpus kysoor* Roxb. (Fam. Cyperaceae), a weed commonly found on the margins of ponds and swampy places throughout India.

SYNONYMS

Sanskrit	:	Kaśeruka
Assamese	:	Kaheru
Bengali	:	Keshura
English	:	Water chestnut
Gujrati	:	Kasela, Kasola
Hindi	:	Kaseru
Kannada	:	Kasure gadd, Kaseruva, Kothigadde
Malayalam	:	Kazhi Muthanga
Marathi	:	Kasara, Kachera, Kachora
Oriya	:	Kasaru Kawda, Kasaru Kanda
Punjabi	:	Kaseru
Tamil	:	Gundatigagaddi
Telugu	:	Guntatungagaddi
Urdu	:	Kaseru

DESCRIPTION

a) Macroscopic

Rhizomes, oval to cylindrical, often branched having a number of transverse rings, black coloured roots and rounded scars, black externally and cream coloured internally, odour, aromatic, taste, bitter.

b) Microscopic

Tranverse section of rhizome shows epidermis of collapsed and brown coloured cells: hypodermis, 4-8 cells with thick brown cell walls, followed by a wide zone of cortical ground tissue of oval to rounded, thin-walled, parenchymatous cells, filled with oval to spherical starch grains, encircled by sclerenchymatous sheath, vascular bundles,

found scattered throughout cortical ground tissue, endodermis consists of brown coloured cells with heavy thickenings on thier walls, enclosing a wide central stelar ground tissue with a number of scattered vascular bundles of closed, collateral type, encircled by sclerenchymatous sheath, stelar ground tissues of rounded to oval, thin-walled and parenchymatous cells, containing oval to spherical starch grains, a number of secretory cell with orange-brown contents found throughout cortical and stelar ground tissue.

Powder- Light brown, under microscope shows abundant round to oval starch grains and orange-yellow pigments, fragments of xylem vessels with annular thickenings and thin-walled, parenchymatous tissue.

IDENTITY, PURITY AND STRENGTH

Foreign matter	Not more than	2	per cent, Appendix	2.2.2.
Total Ash	Not more than	8	per cent, Appendix	2.2.3.
Acid-insoluble ash	Not more than	3	per cent, Appendix	2.2.4.
Alcohol-soluble extractive	Not less than	4	per cent, Appendix	2.2.6.
Water-soluble extractive	Not less than	9	per cent, Appendix	2.2.7.

CONSTITUENTS - Starch, saponins, sugars and progesterone.

PROPERTIES AND ACTION

Rasa : Madhura, Kaṣāya

Guṇa : Guru

Vīrya : Śīta

Vipāka : Madhura

Karma : Pittaghna, Dāhaghna, Śukrakara, Stanyakara, Cakṣuṣya, Grāhī, Rucikara

IMPORTANT FORMULATIONS - Saubhāgyaśuṇṭhī

THERAPEUTIC USES - Dāha, Netraroga, Aruci, Atīsāra, Śukrakṣaya, Stanyakṣaya, Daurbalya

DOSE - 5-10 g of the drug in powder form.

KETAKĪ (Root)

Ketakī consists of dried, underground roots of *Pandanus tectorius* Soland.ex Parkinson (Fam. Pandanaceae), a densely branched shrub, rarely erect found along the coast of India and Andaman Island and sometimes cultivated in gardens also.

SYNONYMS

Sanskrit	:	Sūcikāpuṣpa
Assamese	:	Katki
Bengali	:	Katki
English	:	Screw pine
Gujrati	:	Kevado
Hindi	:	Kevada
Kannada	:	Kadajlmudu, Talehuvu
Kashmiri	:	----
Malayalam	:	Pookaitha
Marathi	:	Kewda
Oriya	:	Ketaki, Kia
Punjabi	:	Keora
Tamil	:	Tazhai
Telugu	:	Mogali
Urdu	:	----

DESCRIPTION

a) Macroscopic

Root pieces, 2-6 cm long, 0.3-2 cm in diameter, cylindrical, rusty or yellowish-brown, to grey, surface smooth except for protuberances at certain places, papery cork, surface uneven, easily peelable exposing a fibrous surface, fracture, usually unbreakable.

b) Microscopic

Transverse section of mature root shows a wide zone of stratified cork,

exfoliating at places, consisting of rectangular, thin-walled, tangentially elongated, radially arranged cells, upper few layers filled with reddish-brown contents, remaining cells colourless, cortex, a wide zone of rounded cells with fibre groups towards central and middle region, cells obliterated at places, endodermis barrel-shaped, slightly thick-walled , pericycle and phloem not distinct, xylem forms bulk of root consisting of vessels, fibres and parenchyma, medullary rays not distinct, vessels show annular or pitted thickening, fibres thick-walled, elongated having a few simple pits.

Powder-Yellowish-brown, under microscope shows fragments of corks, xylem vessels and fibres.

IDENTITY, PURITY AND STRENGTH

Foreign matter	Not more than	2	per cent, Appendix	2.2.2.
Total Ash	Not more than	11	per cent, Appendix	2.2.3.
Acid-insoluble ash	Not more than	2	per cent, Appendix	2.2.4.
Alcohol-soluble extractive	Not less than	9	per cent, Appendix	2.2.6.
Water-soluble extractive	Not less than	16	per cent, Appendix	2.2.7.

CONSTITUENTS - Essential oil

PROPERTIES AND ACTION

Rasa : Tikta, Madhura, Kaṭu

Guṇa : Laghu

Vīrya : Uṣṇa

Vipāka : Kaṭu

Karma : Varṇya, Keśya, Daurgandhyanāśana, Balya, Rasāyana, Dārḍhyakara, Saukhyakara, Kaphāpaha, Cakṣuṣya

IMPORTANT FORMULATIONS - Triphalādi Taila

THERAPEUTIC USES - Gulma, Kapharoga, Netraroga

DOSE - 20-30 g of the drug for decoction

KHADIRA (Heart wood)

Khadira consists of dried pieces of heart-wood of Acacia catechu (Linn. f.) Willd. (Fam. Leguminosae), a moderate sized tree, found mostly in dry parts of India.

SYNONYMS

Sanskrit	:	Gāyatri
Assamese	:	Kharira, Khara, Khayar
Bengali	:	Khera, Khayera
English	:	Black catechu, Cutch tree
Gujrati	:	Khair, Kathe, Kher
Hindi	:	Khair
Kannada	:	Kaggali, Kaggalinara, Kachinamara, Koggigida
Kashmiri	:	Kath
Malayalam	:	Karingali
Marathi	:	Khaira, Khair
Oriya	:	Khaira
Punjabi	:	Khair
Tamil	:	Karungali, Karungkali
Telugu	:	Chandra, Kaviri
Urdu	:	Chanbe Kaath

DESCRIPTION

a) Macroscopic

Heart-wood, light red, turning brownish-red to nearly black with age, attached with whitish sapwood, fracture hard, taste, astringent

b) Microscopic

Transverse section of heart-wood shows, numerous, uni-to bi-seriate medullary rays, vessels occurring isolated or in small groups of two to four, xylem fibres with narrow lumen occupying major portion of wood, xylem parenchyma usually

predominantly paratracheal, forming a sheath around vessels, wood consists of crystal fibres with 14-28 segments, each having one prismatic crystal of calcium oxalate, a few tracheids with scalariform thickening, some of cells, including vessels, filled with brown content, prismatic crystals of calcium oxalate present in a number of cells throughout the wood.

Powder- Brown coloured, under microscope shows a number of xylem fibres, vessels, crystal fibres, prismatic crystals of calcium exalate.

IDENTITY, PURITY AND STRENGTH

Foreign matter	Not more than	2	per cent,	Appendix	2.2.2.
Total Ash	Not more than	2	per cent,	Appendix	2.2.3.
Acid-insoluble ash	Not more than	1.2	per cent,	Appendix	2.2.4.
Alcohol-soluble extractive	Not less than	1	per cent,	Appendix	2.2.6.
Water-soluble extractive	Not less than	3	per cent,	Appendix	2.2.7.

CONSTITUENTS - Catechin, catechu-tannic acid and tannin

PROPERTIES AND ACTION

Rasa : Tikta, Kaṣāya

Guṇa : Laghu, Rūkṣa

Vīrya : Śīta

Vipāka : Kaṭu

Karma : Kaphapittahara, Raktaśodhaka, Kuṣṭhaghna, Medohara, Kṛmighna, Dantya

IMPORTANT FORMULATIONS - Khadirāriṣṭa, Arimedādi Taila, Khadirādi Guṭikā

THERAPEUTIC USES - Kuṣṭha, Vraṇa, Śotha, Prameha

DOSE - 20-30 g of the drug for the decoction.

KIRĀTATIKTA (Whole plant)

Kirātatikta consists of whole plant of *Swertia chirata* Buch.Ham, (Fam, Gentianaceae), a small, erect, annual, herbaceous plant, 0.6-1. 25 m high, found in temperate Himalayas at an altitude between 1200-3000 m from Kashmir to Bhutan and Khasia Hills in Meghalaya, drug collected when flowering (July-October) and dried.

SYNONYMS

Sanskrit	:	Kirāta, Kirātaka, Bhūnimba, Kirātatiktaka
Assamese	:	Chirta
Bengali	:	Chirata
English	:	Chireta
Gujrati	:	Kariyatu, Kariyatun
Hindi	:	Chirayata
Kannada	:	Nalebevu, Chirata Kaddi, Chirayat
Kashmiri	:	Lose, Chiraita
Malayalam	:	Nelaveppu, Kirayathu, Nilamakanjiram
Marathi	:	Kiraita, Kaduchiraita
Oriya	:	Chireita
Punjabi	:	Chiretta, Chiraita
Tamil	:	Nilavembu
Telugu	:	Nelavemu
Urdu	:	Chiraita

DESCRIPTION

a) Macroscopic

Drug consists of whole plant, a peculiar shining yellowish tinge all over the herb in fresh sample, stem upto 1 m long and 6 mm in diameter, glabrous, yellowish-brown to purplish, slightly quadrangular above and cylindrical below, large, continuous, easily separable yellow pith, leaf, opposite, cauline, broad at base, ovate or lanceolate, entire, acuminate, glabrous, usually with 5-7 prominent lateral veins, branching from the axils of the leaves which ramify further into paniculate inflorescence, flower, tetramerous, 2-3 mm wide, ovoid, with two glandular depressions near the base of each of corolla lobes, ovary, superior, bicarpellary, unilocular, ovoid and pointed, fruit. a capsule with

numerous, minute reticulated seed, 0.25-0.55 mm long, 0.16-0.45 mm broad irregularly ovoid.

b) Microscopic

Root-transverse section of root shows, 2-4 layers of cork, secondary cortex representee by 4-12 layers of thick-walled, parenchymataous cells, some showing radial wall formation, tangentially elongated with sinuous walls, secondary phloem composed of thin-walled strands of sieve tubes, companion cells and phloem parenchyma, secondary xylem composed of vessels, tracheids parenchyma and xylem fibres, all elements lignified and thick-walled, in older roots, centre of wood more or less spongy and hollow in most cases, outer woody ring remaining strongly lignified, vessels show scalariform thickening and also simple and bordered pits, tracheids similar in thickening as the vessels, fibres have simple pits, mucilage present in secondary cortical cells, minute acicular crystals present in abundance in secondary cortex and phloem region, resin also present as dark brown mass in secondary cortex cells.

Stem-transverse section of stem shows single layered epidermis, externally covered with a thick striated cuticle present in young stem, in older epidermis remains intact but cells flattened and tangentially elongated, four ribs also consists of an epidermis and parenchymatous cortical cells, endodermis distinct, showing anticlinal or periclinal walls, followed by single layered pericycle consisting of thin walled cells, stem possesses an amphiphloic siphonostele, external phloem represented by usual elements, cambium between external phloem and xylem composed of a thin strip of tangentially elongated cells, internal phloem similar in structure as that of external phloem excepting that sieve tube strand is more widely separated, xylem continuous and composed mostly of tracheids, a few xylem vessels present singly or rarely in groups of two while tracheids and fibres present in abundance, vessels and fibre tracheids have mostly simple and bordered pits and fibres with simple pits on the walls, medullary rays absent, central part of the stem occupied by a pith consisting of rounded and isodiametric cells with prominent intercellular spaces mucilage present in cortical cells, minute acicular crystals also present in abundance, cortical cells, in resin present as dark brown mass in some cortical cells along with oil droplets.

Leaf-transverse section of leaf shows very little differentiation of mesophyll tissues, epidermis single layered covered with a thick, striated cuticle, more strongly developed on the upper surface than the lower, stomata of anisocytic type, palisade tissue single layered, cells at places become wider and less elongated particularly in bigger veins, spongy messophyll represented by 4-7 layers of somewhat loosely arranged, tangentially elongated cells, some epidermal cells prominently arched outside at the margin, mucilage present in epidermal and mesophyll cell while minute acicular crystal also present in abundance in mesophyll cells, in leaf parenchymas oil droplets also present.

IDENTITY, PURITY AND STRENGTH

Foreign matter	Not more than	2	per cent, Appendix	2.2.2.
Total Ash	Not more than	6	per cent, Appendix	2.2.3.
Acid-insoluble ash	Not more than	1	per cent, Appendix	2.2.4.
Alcohol (60 per cent) soluble extractive	Not less than	10	per cent, Appendix 2.2.6.	
Water-soluble extractive	Not less than	10	per cent, Appendix	2.2.7.

ASSAY

Absence of tannin-On addition of *Ferric Chloride* to aqueous or alcoholic extract no blue black colour develops.

Assay -Contains not less than 1.3 per cent, of the bitter principle as determined by the following method:-

Mix 20 g in powder (No. 60 sieve) with boiling water containing 0.5 g of *Calcium Corbonate* and extract with boiling water till the last portion of the extract is devoid of bitterness, concentrate in vacuum and dissolve the residue in hot *Alcohol.* Filter while hot and wash the residue thrice on the filter with 10 ml portions of hot *Alcohol,* remove the alcohol from the filtrate and take up the residue repeatedly with 25, 15, 15, 15, and 15 ml of hot water. Shake the aqueous extract repeatedly with 25, 20, 15, 15 and 10 ml of *Ethyl Acetate,* collect the *Ethyl Acetate* extracts, evaporate, dry and weigh.

CONSTITUENTS - Xanthones, xanthone glycoside and mangiferine (Flavonoid).

PROPERTIES AND ACTION

Rasa : Tikta

Guṇa : Laghu, Rūkṣa

Vīrya : Śīta

Vipāka : Kaṭu

Karma : Jvaraghna, Vraṇaśodhana, Sāraka, Tṛṣṇāpaha, Raktaśodhaka, Kaphapittahara

IMPORTANT FORMULATIONS - Sudarśana Cūrṇa, Chinnodbhavādi Kvātha Cūrṇa

THERAPEUTIC USES - Jvara, Tṛṣṇā, Dāha, Śotha, Kuṣṭha, Vraṇa, Kṛmiroga, Kaṇḍū, Meha

DOSE - 1-3 g of the drug in powder form

20-30 g of the drug for decoction.

KṚṢṆAJĪRAKA (Fruit)

Kṛṣṇajīraka consists of dried ripe fruits of *Carum carvi* Linn. (Fam. Umbelliferae), a biennial herb, 30-90 cm high, cultivated as a cold season crop in plains of India and as summer crop in hilly areas of Kashmir, Kumaon, Garhwal and Chamba.

SYNONYMS

Sanskrit	:	Asitajīraka
Assamese	:	Krisnjeera, Ka1ajira, Kaljira
Bengali	:	Kala jira
English	:	Black Caraway
Gujrati	:	Shahjirun
Hindi	:	Kalajira
Kannada	:	Kari jeerige, Shahajeerige
Kashmiri	:	Krihunzur
Malayalam	:	Karunjiraka, Karinjeerakam
Marathi	:	Shahira, Shahajira
Oriya	:	Kalajira
Punjabi	:	Zira Siyah, Kalajira
Tamil	:	Karamjiragam, Shimai shambu
Telugu	:	Nalla Jeelakarra
Urdu	:	Zira Siyah, Kala Zira

DESCRIPTION

a) Macroscopic

Fruit, greenish-brown, slightly curved, elongated, mericarps, usually separate, free from the pedicel, carpophores, upto 7 mm long, 2 mm broad almost equally five sided, narrow, tapering to each end, arcuate, glabrous, brown with five very narrow, yellowish primary ridges' endosperm, orthospermous, odour and taste, aromatic and characteristic.

b) Microscopic

Transverse section of fruit shows pericarp with outer epidermis of polygonal tabular cells with a thick outer wall and striated cuticle, trichomes, absent, vittae four dorsal, intercostal and two commissural extending the length of each mericarp, with an epithelium of brown cells and volatile oil in the cavity, mesocarp parenchymatous without reticulate thickening, costae five in each mericarp with vascular strand consisting of an inner group of small vessels and fibres and arched, outer group of pitted sclerenchyma with a small group of phloem on each lateral surface, on the outer margin of each vascular strand a small schizogenous canal extending into both stylopod and pedicel, inner epidermis of thin -walled, subrectangular cells, elongated tangentially each about 8-12µ wide and 40-100µ long, arranged parallel with one another, endosperm of thick-walled, cellulosic parenchyma, containing much fixed oil and numerous small aleurone grains upto 10 µ in diameter, each containing one or sometimes two micro-rosette crystals of calcium oxalate, carpophore, when present, passing at the apex to a raphe in each mericarp, and with a small strand of sclerenchyma, the sclereids of which continue into the stylopod.

Powder-Colour fawn to brown, epidermal cells of pericarp with striated cuticle, fragments of brown endothelium of vittae, parenchymatous cells of the mesocarp without reticulate thickening, rectangular, finely pitted sclereids of mesocarp, thick-walled polygonal parenchymatous cells of endosperm containing much fixed oil, numerous small aleurone grains containing micro-rosette crystals of calcium oxalate, trichomes, starch and parquetry layer absent, it contains no less than 2.5 per cent of volatile oil.

IDENTITY, PURITY AND STRENGTH

Foreign matter	Not more than	2	per cent, Appendix	2.2.2.
Total Ash	Not more than	9	per cent, Appendix	2.2.3.
Acid-insoluble ash	Not more than	1.5	per cent, Appendix	2.2.4.
Alcohol-soluble extractive	Not less than	2	per cent, Appendix	2.2.6.
Water-soluble extractive	Not less than	12	per cent, Appendix	2.2.7.
Volatile oil	Not less than	3.5	per cent,v/w, Appendix	2.2.10

CONSTITUENTS - Essential oils (carvone and carvacrol).

PROPERTIES AND ACTION

Rasa : Kaṭu

Guṇa : Laghu

Vīrya : Uṣṇa

Vipāka : Kaṭu

Karma : Pācana, Dīpana, Saṃgrāhī, Jvaraghna, Rucya, Cakṣuṣya, Śothahara

IMPORTANT FORMULATIONS - Jīrakādyariṣṭa, Jīrakādi Modaka

THERAPEUTIC USES - Agnimāndya, Ādhmāna, Jīrṇajvara, Grahaṇīroga, Kṛmiroga

DOSE - 1-3 g of the drug in powder form.

KULATTHA (Seed)

Kulattha consists of dry seeds of *Vigna unquiculata* (Linn.) Walp. Syn. *Dolichos biflorus* Linn. (Fam Leguminosae); an annual branched, sub-erect or twining, downy or glabrescent ; herb; cultivated all over India.

SYNONYMS

Sanskrit	:	Khalva, Vardhipatraka
Assamese	:	--
Bengali	:	Kulattha, Kalaya
English	:	Horse gram
Gujrati	:	Kalathi, Kulathi
Hindi	:	Kulathi, Kurathi
Kannada	:	Huruli, Hurali
Malayalam	:	Mudiraa
Marathi	:	Kulitha
Oriya	:	--
Tamil	:	Kollu, Kaanam
Telugu	:	Ulavalu
Urdu	:	Kulthi

DESCRIPTION

a) Macroscopic

Seeds, hard, surface smooth, ellipsoid, flattened, greyish to reddish brown, 4-6 mm long and 4 mm wide, micropyle prominent, taste, somewhat astringent.

b) Microscopic

Transverse section of seed shows testa consisting of a single layer of columnar, thin-walled, parenchymatous, palisade like cells covered with a thin cuticle followed by single layer of rectangular to square bearer cells and 3-4 layers of thin-walled rectangular parenchymatous cells, more wide at micropyler region, cotyledon consisting

of single layer of upper and lower epidermis covered with a thin cuticle, epidermal cells thin-walled, rectangular and parenchymatous followed by mesophyll, consisting of angular parenchymatous cells, filled with numerous simple starch grains and protein bodies also present.

Powder-Whitish in colour, under microscope shows broken pieces of testa, parenchymatous cells and starch

IDENTITY, PURITY AND STRENGTH

Foreign matter	Not more than	Nil	per cent, Appendix	2.2.2.
Total Ash	Not more than	5	per cent, Appendix	2.2.3.
Acid-insoluble ash	Not more than	1	per cent, Appendix	2.2.4.
Alcohol-soluble extractive	Not less than	3	per cent, Appendix	2.2.6.
Water-soluble extractive	Not less than	12	per cent, Appendix	2.2.7.

CONSTITUENTS - An enzyme (urease) and oil.

PROPERTIES AND ACTION

Rasa : Kaṣāya

Guṇa : Laghu, Sara

Vīrya : Uṣṇa

Vipāka : Kaṭu

Karma : Vidāhī, Svedasaṃgrāhaka, Kṛmihara, Kaphavātahara

IMPORTANT FORMULATIONS - Saptasāra Kvātha Cūrṇa, Dhānvantara Taila

THERAPEUTIC USES - Aśmarī, Naṣṭārtava

DOSE - 12 g of the drug in powder form for decoction.

KUṢṬHA (Root)

Kuṣṭha consists of dried roots of *Saussurea lappa* C.B. Clarke (Fam. Compositae), a tall, robust, perennial herb with thick roots, found in Kashmir at an altitude of 2500-3600 m, roots collected in September-October.

SYNONYMS

Sanskrit	:	Āmaya, Pākala
Assamese	:	Kud, Kur
Bengali	:	Kudo
English	:	--
Gujrati	:	Upleta, Kath
Hindi	:	Kutha
Kannada	:	Changal Kustha
Kashmiri	:	Kuth
Malayalam	:	Kottam
Marathi	:	Upleta, Kustha
Oriya	:	Kudha
Punjabi	:	Kuth
Tamil	:	Goshtam, Koshtham, Kottam
Telugu	:	Changalva Koshtu
Urdu	:	Qust

DESCRIPTION

a) Macroscopic

Drug greyish to dull brown, thick, stout, fusiform to cylindrical, 7-15 cm long, 1.0-5.5 cm broad, thicker roots with collapsed centre, occasionally ridged, wrinkles longitudinal and anastomosed, rootlets rarely present, cut surface shows two regions, outer periderm ring thin, inner porous woody portion lighter in colour showing fine radial striations and often the central portion collapsed, fracture, short, horny, odour, strong, characteristically aromatic, taste, slightly bitter.

b) Microscopic

Transverse section of thin root shows thin periderm, followed by broad zone of phloem and still broader zone of xylem traversed by wide medullary rays, cork, 3-5 layered wide secondary cortical cells polygonal, mostly elongated, secondary phloem consists of mostly storage parenchyma, small groups of sieve tubes and companion cells and often phloem fibres, bast fibres thick-walled, lignified, upto 350 μ in length, with many simple pits associated with fibre, tracheids and parenchyma, wood fibres smaller than bast fibres, with wider lumen and obtusely tapering ends, meduallary rays multi seriate and wider in phloem region, resin canals found throughout as large cavities, some roots possess a central cylinder of sclerenchyma, while others have parenchymatous centre with scattered xylem elements, in older roots, wood parenchyma collapses and takes a spongy appearance in the centre of root, inulin present in storage parenchyma.

Powder-Deep brown or rusty, under microscope irregular bits of yellow, brown or orange-red fragments of resins and oils associated with thin-walled parenchymatous cells, broken bits of xylem vessels with scalariform, reticulate thickening and horizontal end walls.

IDENTITY, PURITY AND STRENGTH

Foreign matter	Not more than	2	per cent, Appendix	2.2.2.
Total Ash	Not more than	4	per cent, Appendix	2.2.3.
Acid-insoluble ash	Not more than	1	per cent, Appendix	2.2.4.
Alcohol-soluble extractive	Not less than	12	per cent, Appendix	2.2.6.
Water-soluble extractive	Not less than	20	per cent, Appendix	2.2.7.

CONSTITUENTS - Essential oil, alkaloid (saussurine) and bitter resin.

PROPERTIES AND ACTION

Rasa : Kaṭu, Tikta

Guṇa : Laghu

Vīrya : Uṣṇa

Vipāka : Kaṭu

Karma : Kaphavātajit, Śukrala, Raktaśodhaka, Varṇya

IMPORTANT FORMULATIONS - Koṭṭamcukkādi Taila

THERAPEUTIC USES - Vātarakta, Visarpa, Kuṣṭha, Kāsa, Śvāsa

DOSE - 0.2-1.0 of the drug in powder form.

KUṬAJA (Stem bark)

Kuṭaja consists of dried stem bark of *Holarrhena antidysenterica* (Roth) A. DC. (Fam. Apocynaceae): a small to medium sized tree, found throughout India, drug collected from 8-12 years old tree during the middle of rainy season (July to September) and again at the end of winter season by hewing and peeling and separated from attached wood.

SYNONYMS

Sanskrit	:	Kaliṅga, Śakra, Vatsaka
Assamese	:	Dudhkuri
Bengali	:	Kurchi
English	:	Ester tree, Conessi bark
Gujrati	:	Kuda, Kadachhal, Kudo
Hindi	:	Kurchi, Kuraiya
Kannada	:	Kodasige, Halagattigida, Halagatti Mara
Kashmiri	:	Kogad
Malayalam	:	Kutakappala
Marathi	:	Pandhra Kuda
Oriya	:	Kurei, Keruan
Punjabi	:	Kurasukk, Kura
Tamil	:	Kudasapalai
Telugu	:	Kodisapala, Palakodisa
Urdu	:	Kurchi

DESCRIPTION

a) Macroscopic

Small recurved pieces of varying sizes and thickness, outer surface buff to brownish longitudinally wrinkled and bearing horizontal lenticels, inner surface brownish, rough and scaly fracture short and granular, taste, acrid and bitter.

b) Microscopic

Transverse section of dried stem bark shows cork consisting of 4-12 rows of tangentially elongated cells, radial 15- 45 μ tangential 30-60 μ cork cambium consists of a row of thin walled tangentially elongated cells, secondary cortex usually wide, parenchymatous, interspersed with strands of stone cells, stone cell rectangular to oval, with numerous pits often containing prismatic crystals of calcium oxalate, non-lignified pericyclic fibres upto 52 mm thick, present in bark, secondary phloem wide consisting of sieve-tubes, companion cells, phloem parenchyma and stone cells, stone cells arranged in tangential rows in concentric manner associated with crystal sheath containing prisms of calcium oxalate, medullary rays mostly bi or triseriate rarely uniseriate becoming wide toward, outer part and consist of thin-walled, radially elongated, parenchymatous cells, medullary ray cells near stone cells become sclerosed.

IDENTITY, PURITY AND STRENGTH

Water-soluble extractive	Not less than	10	per cent, Appendix	2.2.7.
Foreign matter	Not more than	2	per cent, Appendix	2.2.2.
Total Ash	Not more than	7	per cent, Appendix	2.2.3.
Acid-insoluble ash	Not more than	1	per cent, Appendix	2.2.4.
Alcohol-soluble extractive	Not less than	18	per cent, Appendix	2.2.6.

ASSAY

Assay- Kuṭaja contains not less than 2 per cent of total alkloids when assayed by the following method:weigh accurately about 5 g in powder (No. 85 seive) and moisten with 10 ml of an Alcohol-chloroform mixture (1 :3) containing 2 per cent of Ammonia solution for 15 minutes. Pack the mixture in a small glass percolator surrounded by a jacket of hot water kept at 50°. Macerate with more of the alkaline Alcohol-chloroform mixture for an hour and collect 25 ml of percolate in a receiver containing 1 g of *Oxalic acid* dissolved in 5 *ml* of alcohol. Stop the percolation add l0 ml of the alcohol-chloroform mixture containing 1 per cent w/v of *Sodium Hydroxide* and macerate for fifteen minutes. Continue the percolation adding further quantities of the alcohol-chloroform mixture until the alkaloids are completely extracted. Mix the percolate well and extract by shaking with five 20 ml portions of 2 *N Hydrochloric acid.* Combine the acid extracts and make alkaline with *dilute Ammonia Solution.* Extract with four 10 ml

portions of Chloroform, add 1 ml of 0.5 *N Sodium Hydroxide,* and extract again with *Chloroform.* Wash each *Chloroform* extract with the same two 10 ml portions of water contained in different separators. Combine the *Chloroform* extracts, add 20 ml of *O.IN Sulphuric Acid* and shake well for 5 Minutes. Transfer the acid Liquid to a conical flask, wash the *Chloroform* extract with two 20 ml portions of water and add the washing to the acid liquid in the conical flask. Titrate the excess of acid with 0.1N *Sodium Hydroxide* using the mixed 3 indicator. Each ml *of 0.1N Sulphuric Acid* is equivalent to 0.01657g of total alkaloids of Kutaja.

CONSTITUENTS - Conessine and related alkaloids.

PROPERTIES AND ACTION

Rasa	:	Tikta, Kaṣāya
Guṇa	:	Laghu, Rūkṣa
Vīrya	:	Śīta
Vipāka	:	Kaṭu
Karma	:	Dīpana, Saṃgrāhī, Kaphapittaśāmaka

IMPORTANT FORMULATIONS - Kuṭajāriṣṭa, Kuṭajāvaleha, Kuṭajaghana Vaṭī

THERAPEUTIC USES - Pravāhikā, Atīsāra, Jvarātisāra, Arśa, Kuṣṭha, Tṛṣṇā

DOSE - 20-30 g of the drug for decoction.

LAVAṄGA (Flower Bud)

Lavaṅga is the dried flower bud of *Syzygium aromaticum* (Linn.) Merr. & L.M. Perry Syn. *Eugenia aromatica* Kuntze, *Eugenia caryophyllata Thunb.* (Fam. Myrtaceae), a tree. cultivated in many parts of the. world and also to a considerable extent in South India: flower buds collected twice a year, In the months of October and February when they change colour from green to crimson, dried carefully and separated from their peduncles.

SYNONYMS

Sanskrit	:	Devapuṣpa
Assamese	:	Lavang, Lan, Long
Bengali	:	Lavang
English	:	Clove
Gujrati	:	Lavang, Laving
Hindi	:	Lavanga, Laung
Kannada	:	Lavanga
Kashmiri	:	Rung
Malayalam	:	Karampu, Karayampoovu, Grampu
Marathi	:	Lavang
Oriya	:	Labanga
Punjabi	:	Laung, Long
Tamil	:	Kirambu, Lavangam
Telugu	:	Lavangalu
Urdu	:	Qarnful, Laung

DESCRIPTION

a) Macroscopic

Flower bud measuring 10-17.5 mm in length, dark brown or dusty red, consisting of a sub-cylindrical, slightly flattened, four sided hypanthium, readily exuding oil when pressed hypanthium containing in its upper portion a two celled inferior ovary with numerous ovules attached to a axile placenta, surmounted by four thick, divergent sepals

and covered by unopened corolla consisting of four membranous imbricate petals, frequently detached, enclosing numerous incurved stamens and one erect-style, odour, strongly aromatic, taste, pungent, aromatic followed by slight tingling of the tongue.

b) Microscopic

Transverse section of hypanthium shows epidermis and calyx teeth composed of straight walled cells, With thick cuticle having large anomocytic stomata, hypanthium tissue spongy, clusters of calcium oxalate crystals varying in size from 6-20 μ in diameter, small number of stone cells and prismatic crystals of calcium oxalate present in stalk, stamens, each with an oil gland in the apex of the connective, triangularly centricular pollen grains, 15-20 μ in diameter anther walls showing a typical fibrous layer, schizolysigenous glands found in all parts of clove, occasional isolate pericyclic fibres present.

Power-Dark brown, fragments of parenchyma showing large oval, schizolysigenous oil cavities, spiral tracheids and a few rather thick-walled, spindle shaped fibres, calcium oxalate crystals in rosette aggregates, 10-15 μ in diameter, fragments of anther walls with characteristic reticulated cells pollen grains numerous, tetrahedral, 15-20μ. in diameter.

IDENTITY, PURITY AND STRENGTH

Foreign matter	Not more than	2	per cent, Appendix	2.2.2.
Total Ash	Not more than	7	per cent, Appendix	2.2.3.
Acid-insoluble ash	Not more than	1	per cent, Appendix	2.2.4.
Alcohol-soluble extractive	Not less than	3	per cent, Appendix	2.2.6.
Water-soluble extractive	Not less than	9	per cent, Appendix	2.2.7.
Volatile oil	Not less than	15	per cent, Appendix	2.2.10

CONSTITUENTS - Essential oils (eugenalacetate and caryophyllene)

PROPERTIES AND ACTION

Rasa : Tikta, Kaṭu

Guṇa : Laghu, Tīkṣṇa

Vīrya : Śīta

Vipāka : Kaṭu

Karma : Dīpana, Pācana, Rucya, Kaphapittaśāmaka, Śūlahara, Kāsahara

IMPORTANT FORMULATIONS - Lavaṅgādi Vaṭī, Lavaṅgādi Cūrṇa

THERAPEUTIC USES - Kāsa, Śvāsa, Hikkā, Kṣaya, Ādhmāna, Tṛṣṇā, Chardi, Amlapitta

DOSE - 0.5-2.0 g of the drug in powder form.

LODHRA (Stem bark)

Lodhra consists of dried stem bark of *Symplocos racemosa* Roxb. (Fam. Symplocaceae): an evergreen tree, 6-8.5 m tall, found abundantly in plains and lower hills throughout India.

SYNONYMS

Sanskrit	:	Rodhra, Paiṭṭkā Lodhra, Śābara Lodhra, Tirīṭa.
Assamese	:	Mugam
Bengali	:	Lodha, Lodhra
English	:	Symplocos bark
Gujrati	:	Lodhar
Hindi	:	Lodha
Kannada	:	Lodhra
Malayalam	:	Pachotti
Marathi	:	Lodha, Lodhra
Oriya	:	--
Punjabi	:	Lodhar
Tamil	:	Vellilathi, Vellilothram
Telugu	:	Lodhuga
Urdu	:	Lodh, Lodhpathani

DESCRIPTION

a) Macroscopic

Mature stem bark occurs in channelled or curved pieces, few fiat pieces also occur in thickness upto 1cm, outer surface uneven and rough due to fissures and cracks, grayish brown to grey externally, pale to whitish-brown internally, fracture short and granular in cortical region and somewhat fibrous in inner region, taste, astringent and feebly bitter.

b) Microscopic

Transverse section of mature bark shows a wide cork of thin-walled, rectangular cells arranged in radial rows, cork cambium 1-3 layered, secondary cortex consists of thin-walled, oval and tangentially elongated parenchymatous cells towards outer side and rounded cells towards inner side, a number of stone cells, in singles or in groups present, scattered throughout the region having highly thickened walls with distinct pits, prismatic and cluster crystals of calcium oxalate, and starch grains, mostly simple present in a number of cortical cells, secondary phloem wide consisting of sieve elements, phloem parenchyma, phloem fibres and stone cells, phloem parenchyama thin-walled, oval to rectangular, containing prismatic crystals of calcium oxalate scattered in phloem parenchyma, phloem fibres lignified and present in singles or in groups, crystals not present in fibres, isolated fibres spindle shaped with pointed ends, groups of stone cells as rounded patches distributed throughout phloem region, medullary rays uni to multiseriate consisting of rectangular cells having brown colouring matter in some cells, broader medullary rays dialating towards outer phloem region, a number of phloem cells also contain starch grains, mostly arranged in groups, rarely solitary, simple and rounded.

Powder-Greyish-brown, under microscope shows fragments of cork, stone cells, fibres, prismatic and cluster crystals of calcium oxalate and starch grains.

IDENTITY, PURITY AND STRENGTH

Foreign matter	Not more than	Nil	per cent, Appendix	2.2.2.
Total Ash	Not more than	12	per cent, Appendix	2.2.3.
Acid-insoluble ash	Not more than	1	per cent, Appendix	2.2.4.
Alcohol-soluble extractive	Not less than	9	per cent, Appendix	2.2.6.
Water-soluble extractive	Not less than	15	per cent, Appendix	2.2.7.

ASSAY

T.L.C.

CONSTITUENTS - Alkaloids (loturine and colloturine) and red colouring matter.

PROPERTIES AND ACTION

Rasa	:	Kaṣāya
Guṇa	:	Laghu
Vīrya	:	Śīta
Vipāka	:	Kaṭu
Karma	:	Kaphapittanut, Grāhī, Cakṣuṣya

IMPORTANT FORMULATIONS - Rodhrāsava (Lodhrāsava), Puṣyānuga Cūrṇa, Bṛhat Gaṅgādhara Cūrṇa

THERAPEUTIC USES - Raktapitta, Atīsāra, Śotha, Pradara, Netraroga

DOSE - 3-5 g of the drug in powder form

20-30 g of the drug in for decoction

MADANA (Fruit)

Madana consists of dried fruit of *Xeromphis spinosa* (Thunb) Keay, Syn *Randia dumetorum* Lam. (Fam. Rubiaceae), a deciduous thorny shrub or a small, tree, reaching a height upto 9 m and girth about a metre, branches numerous, thick and horizontal, found in sub-Himalayan tracts extending eastwards in Sikkim upto 1200 m and southwards to Peninsular India.

SYNONYMS

Sanskrit	:	Mādanī
Assamese	:	Maen
Bengali	:	Mainaphal, Mayanaphal
English	:	Emetic nut
Gujrati	:	Mindhal, Mindhol, Mindhar
Hindi	:	Manphal
Kannada	:	Mangarikai, Karigidda, Madanaphala Maggrekai, Kari, Maggare Kayi
Kashmiri	:	Madanfal
Malayalam	:	Malankara, Malamkarakka
Marathi	:	Gal, Galphala, Giephala, Madanphala
Oriya	:	Maena, Madana
Punjabi	:	Mindhal, Rara, Manphal
Tamil	:	Marukkarai
Telugu	:	Mranga Kaya, Monga Kaya
Urdu	:	Mainphal, Jauz-ul-Qai

DESCRIPTION

a) Macroscopic

Fruit, 1.8-4.5 cm long, globose or broadly ovoid, longitudinally ribbed or smooth yellowish-brown, crowned with persistent calyx-limb, fruit, contains numerous seeds, 0.4-0.6 cm long, compressed, smooth, brown and very hard.

b) Microscopic

Fruit-trasnverse section shows epicarp consisting of single layered epidermis, sometimes obliterated in surface view, epidermal cells thin-walled and polygonal, mesocarp, broad zone consisting of thin-walled, parenchyamatous cells, some cells contain reddish-brown content, a number of vascular bundles found embedded in this zone, endocarp stony consisting of light yellow polygonal, sclerenchymatous cells of variable shape and size.

Seed-transverse section shows a seed coat, consisting of single layered, rounded to oval epidermal cells, a few layers of yellowish-brown pigmented cells, endosperm forms bulk of seed consisting of large oval and irregular shaped parenchymatous cells, albumen horny, transluscent, cells of outermost layer smaller in size.

Powder-Reddish brown, under microscope shows numerous, large, irregular, reddish brown cells sclereids of variable shape and size, pieces of xylem vessels with reticulate thickenings, thin- walled, crushed parenchymatous cells and yellow-orange pieces of seed coat

IDENTITY, PURITY AND STRENGTH

Foreign matter	Not more than	2	per cent, Appendix	2.2.2.
Total Ash	Not more than	6	per cent, Appendix	2.2.3.
Acid-insoluble ash	Not more than	0.25	per cent, Appendix	2.2.4.
Alcohol-soluble extractive	Not less than	19	per cent, Appendix	2.2.6.
Water-soluble extractive	Not less than	16	per cent, Appendix	2.2.7.

CONSTITUENTS - Essential oil, saponin, tannin and resin

PROPERTIES AND ACTION

Rasa : Madhura, Tikta

Guṇa : Laghu, Rūkṣa

Vīrya : Uṣṇa

Vipāka : Kaṭu

Karma : Vamana, Lekhana

IMPORTANT FORMULATIONS - Pippalyādi Taila

THERAPEUTIC USES - Gulma, Vidradhi, Kuṣṭha, Śleṣmajvara, Pratiśyāya

DOSE - 0.5 -1.0 g of the drug in powder form for decoction

3-6 g of the drug for induction of vomiting.

MIŚREYĀ (Fruit)

Miśreyā consists of dried ripe fruits of *Foeniculum vulgare* Mill (Fam. Umbelliferae) , an erect, glabrous, aromatic herb, 1-2 m high, cultivated extensively throughout India upto 1830 m and also sometimes found wild, fruits ripen in September, stems cut with sickles and put up in loose sheaves to dry in sun, when dry, fruits are beaten out in a cloth in sun, cleaned by winnowing and collected.

SYNONYMS

Sanskrit	:	Miśi, Misi, Madhurikā
Assamese	:	Guvamuri
Bengali	:	Marui, Panmauri
English	:	Fennel Fruit
Gujrati	:	Variyali
Hindi	:	Saunf
Kannada	:	Badisompu, Doddasompu
Kashmiri	:	Sanuf, Badnai
Malayalam	:	Kattusatakuppa, Parinjaeragum
Marathi	:	Badishop
Oriya	:	Panamadhuri
Punjabi	:	Saunf
Tamil	:	Shombu
Telugu	:	Sopu
Urdu	:	Saunf

DESCRIPTION

a) Macroscopic

Fruits, usually entire with pedicel attached, mericarps, upto about 10 mm long and 4 mm broad, five sided with a wider commissural surface, tapering lightly towards base and apex, crowned with a conical stylopod, glabrous, greenish or yellowish-brown with five paler prominent primary ridges , endosperm, orthospermous.

b) Microscopic

Transverse section of fruit shows pericarp with outer epidermis of quadrangular to polygonal cells with smooth cuticle and a few stomata, trichomes, absent vittae, 4 dorsal and 2 commissural extending with length of each mericarp, intercostal with an epithelium of brown cells and volatile oil in cavity, mesocarp, with much reticulate lignified parenchyma, costae, 5 in each mericarp, each with 1vascular strand having inner xylem strand and 2 lateral phloem strands separated by a bundle of fibres inner epidermis of very narrow, thin-walled cells arranged parallel to one another in groups of 5-7, many of these groups with longer axis of their cells at angle with those of adjacent groups (Parquetry arrangement), endosperm consists of thick-walled, cellulosic parenchyma containing much fixed oil, micro-rosette crystals of calcium oxalate, and numerous aleurone grains upto 5 μ in diameter, carpophore with very thick-walled sclerenchyma in two strands, often unsplit with two strands very close to each Other.

IDENTITY, PURITY AND STRENGTH

Foreign matter	Not more than	2 per cent, Appendix	2.2.2.
Total Ash	Not more than	12 per cent, Appendix	2.2.3.
Acid-insoluble ash	Not more than	15 per cent, Appendix	2.2.4.
Alcohol-soluble extractive	Not less than	4 per cent, Appendix	2.2.6.
Water-soluble extractive	Not less than	1 per cent, Appendix	2.2.7.
Volatile oil	Not less than	1.4 per cent v/w, Appendix	2.2.10

CONSTITUENTS - Essential oil and fixed oil

PROPERTIES AND ACTION

Rasa : Madhura, Kaṭu, Tikta

Guṇa : Laghu, Rūkṣa

Vīrya : Śīta

Vipāka : Madhura

Karma : Dīpana, Vātapittahara, Balya, Anulomana, Āmadoṣahara

IMPORTANT FORMULATIONS - Miśreyārka, Pañcasakāra Cūrṇa

THERAPEUTIC USES - Agnimāndya, Śūla, Kāsa, Raktadoṣa, Pravāhikā, Arśa

DOSE - 3-6 g of the powder in powder form

NYAGRODHA (Stem bark)

Nyagrodha consists of dried mature stem bark of *Ficus bengalensis* Linn. (Fam. Moraceae) , a large branching tree with numerous aerial roots occurring all over India.

SYNONYMS

Sanskrit	:	Vata
Assamese	:	Vat, Ahat, Vatgach
Bengali	:	Bot
English	:	Banyan tree
Gujrati	:	Vad, Vadalo
Hindi	:	Badra, Bargad, Bada
Kannada	:	Aala, Aladamara, Vata
Kashmiri	:	Bad
Malayalam	:	Peraal
Marathi	:	Vad
Oriya	:	Bata, Bara
Punjabi	:	Bhaur
Tamil	:	Aalamaram, Aalam
Telugu	:	Marri
Urdu	:	Bargad, Bad

DESCRIPTION

a) Macroscopic

Mature stern bark grey with thin, closely adhered ashy white, light bluish-green or grey patches, bark fiat or slightly curve, thickness varies with age of tree : externally rough due to presence of horizontal furrows and lenticels, mostly circular and prominent, fracture short in outer two thirds of bark while inner portion shows a fibrous fracture taste, astringent

b) Microscopic

Transverse section of mature bark shows compressed cork tissue and dead elements of secondary cortex consisting of mostly stone cells and thin-walled, compressed elements of cortex cork cells rectangular, thick-walled and containing brownish content, secondary cortex wide, forming more than half of thickness of bark, composed of large groups of stone cells and parenchymatous cells, stone cells vary in shape, parenchymatous cells thin-walled and somewhat cubical to oval few in number and occur between groups of stone cells, some of cells contain prismatic crystals of calcium oxalate, starch grains and tannin, secondary phloem composed of a few sieve elements parenchyma, fibres, stone cells and latex tube alternating with medullary rays, sieve elements compressed in .outer region of bark while intact m inner region, few thick-walled phloem parenchyma occurring in between patches of phloem fibres and stone cells, stone cells similar to those present in secondary cortex, some phloem cells contain prismatic calcium oxalate crystals also, present in fibres forming crystal fibres, medullary rays 2-5 seriate, composed of thick-walled, circular to oval cells few cells also converted into stone cells and some have pitted walls, also containing plenty of starch grains, mostly rounded, rarely oval or semi-lunar in shape, simple as well as compound type, compound starch grains consist of 2-3 components, cambium composed of a few layers of small, rectangular, thin-walled cells.

IDENTITY, PURITY AND STRENGTH

Foreign matter	Not more than	2	per cent, Appendix	2.2.2.
Total Ash	Not more than	8	per cent, Appendix	2.2.3.
Acid-insoluble ash	Not more than	3	per cent, Appendix	2.2.4.
Alcohol-soluble extractive	Not less than	6	per cent, Appendix	2.2.6.
Water-soluble extractive	Not less than	8	per cent, Appendix	2.2.7.

CONSTITUENTS - Tannins, glycosides and flavonoids

PROPERTIES AND ACTION

Rasa : Kaṣāya

Guṇa : Guru, Rūkṣa

Vīrya : Śīta

Vipāka : Kaṭu

Karma : Kaphapittajit, Vraṇāpaha, Varṇya, Stambhana, Mūtrasaṃgrahaṇīya, Dāhaghna, Yonidoṣahṛt

IMPORTANT FORMULATIONS - Nyagrodhādi Kvātha Cūrṇa, Nyagrodhādi Cūrṇa

THERAPEUTIC USES - Dāha, Tṛṣṇā, Raktapitta, Vraṇa, Visarpa, Yonidoṣa, Prameha

DOSE - 3-6 g of the drug in powder form.

PĀṢĀṆABHEDA (Rhizome)

Pāṣāṇabheda consists of rhizomes of *Bergenia ciliata* (Haw.) Sternb., Syn. *Bergenia ligulata* (Wall.) Engl. (Fam. Saxifragaceae), a small perennial herb found throughout temperate Himalayas from Bhutan to Kashmir at an altitude between 2000-3000 m and in Khasia hills upto 1200 m altitude.

SYNONYMS

Sanskrit	:	Aśmabhedaka, Śilābheda
Assamese	:	Patharkuchi
Bengali	:	Patharkuchi, Himasagara, Patrankur
English	:	--
Gujrati	:	Pashanbheda, Pakhanbheda
Hindi	:	Pakhanabheda, Silphara, Patharcua, Pakhanabhed, Silpbheda
Kannada	:	Alepgaya, Pahanbhedi, Hittaga, Pasanaberu, Hittulaka
Kashmiri	:	Pashanbhed
Malayalam	:	Kallurvanchi, Kallurvanni, Kallorvanchi
Marathi	:	Pashanbheda
Oriya	:	Pasanbhedi, Pashanabheda
Punjabi	:	Kachalu, Pashanbhed
Tamil	:	Sirupilai
Telugu	:	Kondapindi
Urdu	:	--

DESCRIPTION

a) Macroscopic

Rhizome, solid, barrel shaped, cylindrical, 1.5-3 cm long and 1-2 cm in diameter with small roots, ridges, furrows and root scars distinct, tranversely cut surface shows outer ring of brown coloured cork, short middle cortex, vascular bundles and large central pith, odour, aromatic, taste, astringent.

b) Microscopic

Transverse section of rhizome shows cork divided into two zones, outer a few layers of slightly compressed and brown coloured cells, inner zone multilayered consisting of thin-walled tangentially elongatd and colourless cells, followed by a single layered cork cambium and 2-3 layers of secondary cortex composed of thick-walled, tangentially elongated, rectangular cells with intercellular spaces, some cells contain rosette crystals of calcium oxalate and simple starch grains cortex a narrow-zone of parenchymatous cells containing a number of simple starch grains, most of cortical cells also contain large rosette crystals of calcium oxalate, endoderm is and pericycle absent. vascular bundles, arranged in a ring, collateral, conjoint and open, phloem tissues corn-posed of sieve elements and parenchyma, in outer region found as compressed masses while in inner region intact. a number of rosette crystals of calcium oxalate also found as crystal fibres, cambium present as continuous ring composed of 2-3 layers of thin-walled, tangentially elongated cells, xylem consist of fibres, tracheids, vessels and parenchyma, with centre occupied by large pith composed of circular to oval, parenchymatous cells, varying in size and containing starch grains with crystals of calcium oxalate similar to those found in cortical region.

IDENTITY, PURITY AND STRENGTH

Foreign matter	Not more than	2	per cent, Appendix	2.2.2.
Total Ash	Not more than	13	per cent, Appendix	2.2.3.
Acid-insoluble ash	Not more than	0.5	per cent, Appendix	2.2.4.
Alcohol-soluble extractive	Not less than	9	per cent, Appendix	2.2.6.
Water-soluble extractive	Not less than	15	per cent, Appendix	2.2.7.

CONSTITUENTS - Tannic acid, gallic acid and glucose

PROPERTIES AND ACTION

Rasa : Tikta, Kaṣāya

Guṇa : Laghu

Vīrya : Śīta

Vipāka : Kaṭu

Karma : Aśmarīghna, Bhedana, Vastiśodhana, Mūtravirecanīya

IMPORTANT FORMULATIONS - Aśmarīhara Kaṣāya Cūrṇa, Mūtravirecanīya Kaṣāya Cūrṇa

THERAPEUTIC USES - Meha, Mūtrakṛcchra, Aśmarī

DOSE - 3-6 g of the drug in powder form

20-30 g of the drug for decoction.

PĀṬHĀ (Root)

Pāṭhā consists of roots of *Cissampelos pareira* Linn. (Fam. Menisperrnaceae), an extensively spreading, glabrous to softy pubescent, perennial climbing shrub with nodose stem, common in warm and dry regions of tropical and sub-tropical parts of India upto an altitude of about 1500 m.

SYNONYMS

Sanskrit	:	Ambaṣṭhakī
Assamese	:	Tuprilata
Bengali	:	Patha, Akanadi
English	:	Velvet leaf
Gujrati	:	Kalipath, Karondhium, Karondium, Venivel, Karedhium
Hindi	:	Patha, Padh, Akanadi
Kannada	:	Pahadavela, Agalushunthi
Kashmiri	:	Pad
Malayalam	:	Patha
Marathi	:	Pashadvel, Paharrel, Pahadavel, Padali
Oriya	:	Kanabindhi, Patha
Punjabi	:	Patha
Tamil	:	Vatta tiruppi
Telugu	:	Adivibankatiga, chiru boddi, Boddi tiga
Urdu	:	--

DESCRIPTION

a) Macroscopic

Roots, cylindrical, often tortuous, 1-1.5 cm in diameter, light brown to yellowish in colour, surface rough and at places rugged due to transverse wrinkles, cracks and fissures, fracture short and splintery, odour, faint aromatic, taste, bitter.

b) Microscopic

Transvarse section of root shows, 6-10 layers of thin-walled, rectangular cork cells secondary cortex, 1-3 layered of oval to tangentially elongated cells, discontinuous ring consisting of 2-3 rows of stone cells and group of phloem fibres, stone cells variable in shape with simple pits, vascular strands as radiating strips usually 8-12 of xylem and phloem some reaching up to the centre, phloem consists of small strands of sieve elements and parenchyma just below the ring of stone cells, xylem consists of vessels, tracheids, fibres and xylem parenchyma, vessels and tracheids show simple pits on the walls, xylem parenchyma usually thick-walled and lignified but due to delignification patches of thin-walled parenchyma appear in the xylem region., medullary rays 1-3 seriate appear to be very wide at a number of places due to addition of delignified xylem parenchymatous cells, ray cells thin-walled, a few lignified and thick-walled while some show reticulate thickening, plenty of starch grains present in some of ray cells.

IDENTITY, PURITY AND STRENGTH

Foreign matter	Not more than	2	per cent, Appendix	2.2.2.
Total Ash	Not more than	7	per cent, Appendix	2.2.3.
Acid-insoluble ash	Not more than	1	per cent, Appendix	2.2.4.
Alcohol-soluble extractive	Not less than	11	per cent, Appendix	2.2.6.
Water-soluble extractive	Not less than	13	per cent, Appendix	2.2.7.

CONSTITUENTS - Alkaloids, saponin and quarternary ammonium bases, flavonol and sterol

PROPERTIES AND ACTION

Rasa : Tikta, Kaṭu

Guṇa : Laghu, Tīkṣṇa

Vīrya : Uṣṇa

Vipāka : Kaṭu

Karma : Tridoṣaśamana, Raktaśodhaka, Viṣaghna, Bhagnasandhānakṛt, Grāhī, Stanyaśodhana

IMPORTANT FORMULATIONS - Puṣyānuga Cūrṇa, Pradarāntaka Lauha, Sārasvata Ghṛta, Bṛhat Gaṅgādhara Cūrṇa, Stanyaśodhana Kaṣāya Cūrṇa

THERAPEUTIC USES - Śūlaroga, Atīsāra, Kuṣṭha, Kaṇḍū, Jvara, Chardi, Stanyaduṣṭi

DOSE - 3-6 g of the drug in powder form.

PŪGA (Seed)

Pūga consists of dried ripe seed of *Areca catechu* Linn. (Fam. Palmae), a graceful, slender, stemmed, perennial palm, trunk reaching a height of about 25 m cultivated in the coastal regions of Southern India, Bengal and Assam upto an altitude of 1000 m.

SYNONYMS

Sanskrit	:	Kramuka, Ghoṇṭā
Assamese	:	Tamol, Tamul
Bengali	:	Supari
English	:	Areca nut, Betle nut
Gujrati	:	Sopari
Hindi	:	Supari, Chaalia
Kannada	:	Adika
Kashmiri	:	Supari, Spari
Malayalam	:	Adakku, Pakku
Marathi	:	Supari, Pophal
Oriya	:	Gua
Punjabi	:	Supari, Spari
Tamil	:	Kamugu, Pakku, Pakhumaram
Telugu	:	Paka chekka, Vakka
Urdu	:	Fufal, Choalia

DESCRIPTION

a) Macroscopic

Ovoid, externally pale, reddish-brown to light yellowish-brown, marked with a net work of paler lines, frequently with adhering portions of silvery brittle endocarp and adhering fibres of mesocorp at base of seed, seed hard with ruminate endosperm of brownish tissue alternating with whitish tissue, odour, characteristic, taste, astringent.

b) Microscopic

Transverse section of seed shows a seed coat consisting of several rows of cells, tangentially elongated, with inner walls more or less thickened, whitish cell of endosperm tissue with thick porous walls containing oil globules and aleuronic grains, brown peri sperm tissue with thick walled cells and delicate tracheae.

Powder-Reddish brown to light brown, under microscope shows fragments of endosperm tissue with porous walls, irregularly thickened and small stone cells of seed coat, a few aleurone grains and oil globules and a few delicate tracheae, starch absent.

IDENTITY, PURITY AND STRENGTH

Foreign matter	Not more than	1	per cent, Appendix	2.2.2.
Total Ash	Not more than	3	per cent, Appendix	2.2.3.
Acid-insoluble ash	Not more than	0.4	per cent, Appendix	2.2.4.
Alcohol-soluble extractive	Not less than	19	per cent, Appendix	2.2.6.
Water-soluble extractive	Not less than	10	per cent, Appendix	2.2.7.

ASSAY

T.L.C.

CONSTITUENTS - Alkaloid (arecoline) tannins and fats

PROPERTIES AND ACTION

Rasa : Kaṣāya

Guṇa : Rūkṣa, Guru

Vīrya : Śīta

Vipāka : Kaṭu

Karma : (Prabhāva: Mohakṛt), Dīpana, Kaphapittajit, Kledanāśana, Malabhedī, Mukhaśodhana, Vikāsī

IMPORTANT FORMULATIONS - Pūgakhaṇḍa

THERAPEUTIC USES - Mukhavikāra, Aruci, Yoniśaithilya, Śvetapradara

DOSE - 1-2 g of the drug in powder form.

PUNARNAVĀ (RAKTA) (Whole plant)

Punarnavā consists of dried, matured whole plant of *Boerhaavia diffusa* Linn. (Fam Nyctaginaceae), trailing herb found throughout India and collected after rainy season, herb is diffusely branched with stout root stock and many long slender, prostrate or ascending bra nches.

SYNONYMS

Sanskrit	:	Kaṭhilla, Śophaghnī, Śothaghnī, Varṣābhu
Assamese	:	Ranga Punarnabha
Bengali	:	Rakta punarnava
English	:	Horse Purslene, Hog Weed
Gujrati	:	Dholisaturdi, Motosatodo
Hindi	:	Gadapurna, Lalpunarnava
Kannada	:	Sanadika, Kommeberu, Komma
Kashmiri	:	Vanjula Punarnava
Malayalam	:	Chuvanna Tazhutawa
Marathi	:	Ghetuli, Vasuchimuli, Satodimula, Punarnava, Khaparkhuti
Oriya	:	Lalapuiruni, Nalipuruni
Punjabi	:	ltcit (Ial), Khattan
Tamil	:	Mukurattai (Shihappu)
Telugu	:	Atikamamidi, Erra galijeru

DESCRIPTION

a) Macroscopic

Stem-greenishpurple, stiff, slender, cylindrical, swollen at nodes, minutely pubescent or n early glabrous, prostrate divericately branched, branches from common stalk, often more than a metre long.

Root- wel developed, fairly long, somewhat tortuous, cylindrical, 0.2-1.5 cm in diameter, yellowish brown to brown coloured, surface soft to touch but rough due to minute longitudinal striations and root scars, fracture, short, no distinct odour, taste, slightly bitter.

Leaves-opposite in unequal pairs, larger ones 25-37 mm long and smaller ones 12-18 mm long ovate-oblong or suborbicular, apex rounded or slightly pointed, base subcordate or rounded, green and glabrous above, whitish below, margin entire or sub-undulate, dorsal side pinkish in certain cases, thick in texture, petioles nearly as long as the blade, slender.

Flowers-very small, pink coloured, nearly sessile or shortly stalked, 10-25 cm, in small umbells, arranged on slender long stalks, 4-10 corymb, axillary and in terminal panicles, bracteoles, small, acute, perianth tube constricted above the ovary, lower part greenish, ovoid, ribbed, upper part pink, funnel-shaped, 3 mm long, tube 5 lobed, stamen 2-3.

Fruit-one seeded nut, 6 mm long clavate, rounded, broadly and bluntly 5 ribbed, viscidly glandular.

b) Microscopic

Stem-Transverse section of stem shows epidermal layer containing multi cellular, uniserite glandular trichome consisting of 9-12 stalked cells and an ellipsoidal head, 150-220 µ long, cortex consists of 1-2 layers of parenchyma, endodermis indistinct, pericycle 1-2 layered, thick-walled often containing scattered isolated fibres, stele consisting of many small vascular bundles often joined together in a ring and many big vascular bundles scattered in the ground tissue, intra fascicular cambium present.

Root-transverse section of mature root shows a cork composed of thin-walled tangentially elongated cells with brown walls in the outer few layers, cork cambium of 1-2 layers of thin walled cells secondary cortex consists of 2-3 layers of parenchymatous cells followed by cortex composed of 5-12 layers of thin-walled, oval to polygonal cells, several concentric bands of xylem tissue alternating with wide zone of parenchymatous tissue present below cortical regions, number of bands vary according to thickness of root and composed of vessels, tracheids and fibres, vessels mostly found in groups of 2-8 in radial rows, having simple pits and reticulate thickening, tracheids, small, thick-walled with simple pits, fibres aseptate, elongated, thick-walled, spindle shaped with pointed ends, phloem occurs as hemispherical or crescentic patches outside each group of xylem vessels and composed of sieve elements and parenchyma, broad zone of parenchymatous tissue, in between two successive rings of xylem elements composed of thin-walled more or less rectangular cells arranged in radial rows, central regions of root occupied by primary vascular bundles, numerous raphides of calcium oxalate, in single or in group present in cortical region and parenchymatous tissue in between xylem tissue, starch grains simple and compound having 2-4 components found in abundence in most of cells of cortex, xylem elements in parenchymatous tissue between xylem elements, simple starch grains mostly rounded in shape and measure 2.75-11 µ in diameter.

Leaves-Transverse section of leaf shows anomocytic stomata on both sides, numerous, a few short hairs, 3-4 celled, present on the margin and on veins, palisade one layered, spongy parenchyma 2-4 layered with small air spaces, idioblasts containing raphides, occasionally cluster crystal of calcium oxalate and orange-red resinous matter present in mesophyll.

Palisade ratio 3.5-6.5, stomatal index 11-16 , vein islet number 9-15.

IDENTITY, PURITY AND STRENGTH

Foreign matter	Not more than	2	per cent, Appendix	2.2.2.
Total Ash	Not more than	15	per cent, Appendix	2.2.3.
Acid-insoluble ash	Not more than	6	per cent, Appendix	2.2.4.
Alcohol-soluble extractive	Not less than	1	per cent, Appendix	2.2.6.
Water-soluble extractive	Not less than	4	per cent, Appendix	2.2.7.

ASSAY

Assay-Contains not less than 0.1 per cent of total alkaloids, when assayed by the following methods,

Take accurately about 100 g of the drug (60 mesh powder) and moisten with dilute solution of *Ammonia.* Extract continuously in a soxhlet apparatus for 18 hours with 95 *per cent Alcohol.* Remove the alcohol by distillation. Extract the residue with five 25 ml portions of 1 *N Hydrochloric acid* till complete extraction of the alkaloid is effected. Transfer the mixed acid solutions into a separating funnel and wash with 5 ml of *Chloroform,* runoff the Chloroform layer. Make the acid solution distinctly alkaline with *Ammonia* and shake with five 25 ml portions of *Chloroform* or till complete extraction of alkaloids is effected. Wash the combined chloroform extracts with two portions each of 5 ml of water. Filter the chloroform layer in tared flask and evaporate to dryness. Add to the residue 5 ml of Alcohol, evaporate to dryness, repeat the process once again and weigh the residue to constant weight in a vacuum desiccator.

CONSTITUENTS - Alkaloid (Punarnavine).

PROPERTIES AND ACTION

Rasa : Madhura, Tikta, Kaṣāya

Guṇa : Rūkṣa

Vīrya : Uṣṇa

Vipāka : Madhura

Karma : Vātaśleṣmahara, Mūtrala, Śothahara, Anulomana

IMPORTANT FORMULATIONS - Punarnavāṣṭaka Kvātha Cūrṇa, Punarnavāsava, Punarnavādi Maṇḍūra, Sukumāra Ghṛta, Śothaghna Lepa

THERAPEUTIC USES - Pāṇḍu, Śotha

DOSE - 20-30 g of the drug for decoction.

SAPTAPARṆA (Stem bark)

Saptaparṇa consists of stem bark of *Alstonia scholaris* (Llnn.) R. Br. (Fam. Apocynaceae), a tall evergreen tree, found in the Sub-Himalayan tracts ascending to 900 m from Jammu eastwards and western peninsula mostly in deciduous forests.

SYNONYMS

Sanskrit	:	Saptacchada, Saptaparṇī, Saptāhvā
Assamese	:	Chatiyan
Bengali	:	Chatin
English	:	Dita
Gujrati	:	Saptaparna, Satvana
Hindi	:	Chhativan, Satawana
Kannada	:	Maddale, Hale, Eleyalaga
Malayalam	:	Daivaphal, Ezilampala
Marathi	:	Satveen
Oriya	:	Chbatiana, Chatiana
Punjabi	:	Sathi, Satanna
Tamil	:	Ezilampalai
Telugu	:	Edakula Ponna
Urdu	:	--

DESCRIPTION

a) Macroscopic

Bark occurs in channelled or occasionally quilled pieces, 3-4mm thick from branches and cut or broken irregularly into curved or flat pieces, about 7 mm thick from stem, externally younger bark dark grey to brown, older bark very rough, uneven and much fissured transversely and longitudinally, both marked with numerous rounded or transversely elongated, grey to whitish brown lenticels, internally brownish-buff to dark greyish-brown, somewhat striated and indented, fracture, short and smooth, fractured

surface shows a narrow, inner portion traversed by numerous, fine, medullary rays and a varying spongy outer portion

b) Microscopic

Transverse section of bark shows a multi-layered, thick and thin-walled cork, a broad zone of secondary cortex composed of thin-walled, parenchymatous cells, including many rounded latex cavities, scattered throughout tissue, containing numerous rhombic to polygonal calcium oxalate crystals, numerous stone cells forming a non-continuous layer of 4-8 cells, irregular, rounded to linear, fibre-like, blunt at both ends, internal to secondary cortex a secondary phloem cells containing many sieve tubes, cork cells brick shaped to almost square in transverse and longitudinal sections and polygonal in surface view, cork cambium forms a region of two rows of cells identical to cork cells, situated in between cork and secondary cortex, secondary phloem cells smaller in dimension than cortical cells consisting of phloem parenchyma, many sieve tubes and companion cells, fibres absent.

IDENTITY, PURITY AND STRENGTH

Foreign matter	Not more than	2	per cent, Appendix	2.2.2.
Total Ash	Not more than	11	per cent, Appendix	2.2.3.
Acid-insoluble ash	Not more than	3	per cent, Appendix	2.2.4.
Alcohol-soluble extractive	Not less than	4	per cent, Appendix	2.2.6.
Water-soluble extractive	Not less than	12	per cent, Appendix	2.2.7.

ASSAY

Assay-Contains not less than 0.2 per cent of total alkaloids when assayed by the following method:-

Take 25 g in No. 60 mesh powder. Transfer to a continuous extraction apparatus and extract with 90 per cent Alcohol for 4 hours (at least 3 extractions are essential). Remove the solvent and transfer to a separating funnel with the help of a little water and 5 ml of 95 per cent Alcohol. Add about 15 ml of Water and 2 ml of solution of 20

percent Sodium Hydroxide to make the solution alkaline and extract with successive quantities of Chloroform till the extraction of alkaloid is complete. Shake the combined Chloroform extract with successive quantities of a mixture of 4 volumes of 0.2 N Sulphuric Acid and 1 volume of Alcohol until complete extraction of alkaloid is effected. Wash the mixed acid solution twice with 10 ml portion of Chloroform and then twice with 10 ml portion of Ether. Wash the combined Chloroform and Ether solution with 20 ml of 0.1 N Sulphuric acid. Transfer this washed acid extract to the original acid extract, make distinctly alkaline with solution of Sodium Hydroxide and shake with successive portions of chloroform till the extraction of the alkaloids is complete. Wash the combined chloroform solution with about 5 ml of water. Remove most of the chloroform and transfer the remainder to a small open dish. When the removal of chloroform is almost complete on water bath, add about 2 ml Dehydrated Alcohol and evaporate to dryness. Dry at 100° to constant weight and weigh as total alkaloids.

T.L.C.

CONSTITUENTS - Alkaloids (echitamine, ditamine and echitamidine).

PROPERTIES AND ACTION

Rasa : Tikta, Kaṣāya

Guṇa : Sara, Snigdha

Vīrya : Uṣṇa

Vipāka : Kaṭu

Karma : Tridoṣaghna, Dīpana, Anulomana, Raktaśodhaka, Kuṣṭhaghna, Jvaraghna

IMPORTANT FORMULATIONS - Āragvadhādi Kvātha Cūrṇa, Amṛtāriṣṭa, Vajraka Taila

THERAPEUTIC USES - Śūla, Gulma, Kṛmiroga, Kuṣṭha, Jvara, Sāndrameha

DOSE - 20-30 g of the drug for decoction.

ŚAṬĪ (Rhizome)

Śaṭī consists of sliced, dried rhizomes of *Hedychium spicatum Ham.*ex Smith (Fam. Zingiberaceae), a perennial rhizomatous herb, measuring upto 1 m occurs in parts of western and central regions of sub-tropical Himalayas at an altitude of 1500-2000 m, grows abundantly in Kumaon and Punjab.

SYNONYMS

Sanskrit	:	Śathī, Gandhamūlikā
Assamese	:	Katuri, Sati
Bengali	:	Shati, Kachri
English	:	Spiked ginger lily
Gujrati	:	Kapurkachri, Kapurkachali
Hindi	:	Kapurkachri
Kannada	:	Goul Kachora, Seenakachora, Kachora
Kashmiri	:	Kapoorkachara
Malayalam	:	Katcholam, Katchooram
Marathi	:	Kapurakachari, Gablakachari
Oriya	:	Gandhasunthi
Punjabi	:	Kachur, Kachoor
Tamil	:	Kichili Kizongu, Poolankizangu
Telugu	:	Gandha Kachuralu
Urdu	:	--

DESCRIPTION

a) Macroscopic

Rhizomes 15-20 cm long, 20-25 mm in diameter, externally yellowish-brown hut changed to dark brown on storage, drug available in pieces of 2.5 cm diameter, edge of each piece is covered by a rough reddish-brown layer marked with numerous scars and circular rings, rudiments of root-lets visible, odour, camphoraceous, taste, bitter.

b) Microscopic

Transverse section of rhizome shows an outermost thick layer of suberised, dark brown cells of outer cork consisting of 10-15 or more layers of irregular parenchymatous cells, inner cork consisting of a few layered light brown, rectangular, radially arranged cells followed by a wide zone of cortex, 30-40 cells thick, some cortical cells filled with flattened and oval-oblong starch grains, numerous oleo-resin cells also found in this region which have suberised walls containing green-yellow oil, a thin endodermal layer present beneath cortex, central cylinder distinguished by presence of peripheral plexus of irregular congested vascular bundles with poorly developed mechanical tissues, vascular bundles scattered irregularly throughout ground tissue, bundles closed and collateral possessing group of two or more xylem elements, ground tissue composed of large parenchymatous cells with abundant starch grains and oil.

IDENTITY, PURITY AND STRENGTH

Foreign matter	Not more than	1	per cent, Appendix	2.2.2.
Total Ash	Not more than	8	per cent, Appendix	2.2.3.
Acid-insoluble ash	Not more than	2	per cent, Appendix	2.2.4.
Alcohol-soluble extractive	Not less than	4	per cent, Appendix	2.2.6.
Water-soluble extractive	Not less than	8	per cent, Appendix	2.2.7.

CONSTITUENTS - Essential oil

PROPERTIES AND ACTION

Rasa : Kaṭu, Tikta, Kaṣāya

Guṇa : Laghu, Tīkṣṇa

Vīrya : Uṣṇa

Vipāka : Kaṭu

Karma : Kaphavātaghna, Mukhaśodhana, Grāhī, Śūlahara

IMPORTANT FORMULATIONS - Agastyaharītakī Rasāyana, Śaṭyādi Cūrṇa

THERAPEUTIC USES - Kāsa, Śvāsa, Mukharoga, Śūla, Chardi, Kaṇḍū

DOSE - 1-3 g of the drug in powder form.

SNUHĪ (Stem)

Snuhī consists of stem of *Euphorbia neriifolia* Linn. (Fam. Euphorbiaceae), a large branched, erect, glabrous, succulent, xerophytic shrub occurring wild on rocky ground throughout central India and extensively grown as a hedge plant.

SYNONYMS

Sanskrit	:	Sudhā, Vajradrumā, Snuk
Assamese	:	--
Bengali	:	Manasasij
English	:	Milkhedge
Gujrati	:	Thor, Kantalo
Hindi	:	Thuhar, Sehunda
Kannada	:	Muru Kanina Kalli
Malayalam	:	Kalli, Kaikalli
Marathi	:	Nivadung
Oriya	:	Thor, Kantalothor
Punjabi	:	Thohar
Tamil	:	Elaikalli, Perumbu Kalli
Telugu	:	Kadajemudu
Urdu	:	--

DESCRIPTION

a) Macroscopic

Stem, green, cylindrical, showing, spiral ridge portion only, dried stem, tough with pairs of sharp stipular thorns, with hollow space in centre containing white reticulate mass, taste, acrid.

b) Microscopic

Transverse section shows a single layered epidermis composed of squarish, thin-walled, parenchymatous cells, followed by a thick zone of cortex, differentiated into two parts, outer of thin walled, rectangular, oval and oblong parenchymatous cells of about 20 layers depth, inner wider zone, consisting of about 30-40 layers of thin-walled, oblong or ovoid, elongated parenchymatous cells having a number of rounded and oval

latex cells, some contain dark yellowish latex, the number of latex cells gradually reduce towards outer side, below cortex, about 10 layers of phloem present, containing group of fibres towards cortex, xylem consists of vessels, tracheids, fibres and xylem parenchyma, pith consists of thin-walled, rounded or oval, parenchymatous cells, starch and calcium oxalate crystals absent.

Powder- Cream yellow, under microscope shows, vessels, fibres and cortical cells, starch and calcium oxalate crystals absent.

IDENTITY, PURITY AND STRENGTH

Foreign matter	Not more than	2	per cent, Appendix	2.2.2.
Total Ash	Not more than	8	per cent, Appendix	2.2.3.
Acid-insoluble ash	Not more than	1	per cent, Appendix	2.2.4.
Alcohol-soluble extractive	Not less than	5	per cent, Appendix	2.2.6.
Water-soluble extractive	Not less than	15	per cent, Appendix	2.2.7.

CONSTITUENTS - Resin, gum and triterpenes

PROPERTIES AND ACTION

Rasa : Kaṭu, Tikta

Guṇa : Guru, Tīkṣṇa

Vīrya : Uṣṇa

Vipāka : Kaṭu

Karma : Tīkṣṇavirecana, Bhedana, Āmakaphavātahara

IMPORTANT FORMULATIONS - Citrakādi Taila, Abhayā Lavaṇa, Avittolādi Bhasma, Vajrakṣāra

THERAPEUTIC USES - Gulma, Udararoga, Meha, Kuṣṭha, Śotha

DOSE - 125 -250 mg of the drug in powder form

Note- Śōdhana of this drug is to be done before use as described in appendix.

SŪKṢMAILĀ (Fruit)

Sūkṣmailā consists seeds of dried fruits of *Elettaria cardamomum* (Linn.) Maton and its varieties (Fam. Zingiberaceae), a stout large perennial herb, growing naturally in moist forests of western ghats up to 1500 m, also cultivated in many other parts of south India at an elevation from 750-1500m.

SYNONYMS

Sanskrit	:	Truṭi, Elā
Assamese	:	Sarooplaachi
Bengali	:	Chota elaich
English	:	Cardamom
Gujrati	:	Elchi, Elachi, Elayachi
Hindi	:	Choti Ilayachi
Kannada	:	Elakki, Sanna Yalakki
Malayalam	:	Elam, Chittelam
Marathi	:	Velloda, Lahanveldoda, Velchi
Oriya	:	Gujurati, Chotaa leicha, Alaicha
Punjabi	:	Illachi, Chhoti Lachi
Tamil	:	Siruelam
Telugu	:	Chinne Elakulu, Sanna Elakulu
Urdu	:	Heel Khurd

DESCRIPTION

a) Macroscopic

Fruit - 1-2 cm long ovoid or oblong and more or less three sided with rounded, angles, greenish to pale-buff or yellowish in colour, base rounded or with the remains of pedicle, apex shortly beaked, surface almost smooth or with slight longitudinal striations, small trilocular fruit, each containing about 15-20 seeds in a row of doubles, adhering together to form compact mass.

Seed-dark brown to black, about 4 mm long and 3 mm broad, irregularly angular, transverscIy wrinkled but not pitted, with a longitudinal channel containing raphe, enclosed in a colourless, membranous aril, odour, strongly aromatic, taste, characteristic.

b) Microscopic

Transverse section of seed shows flattened, aril, thin-walled parenchymatous cells, testa with outer epidermis of thick-walled, narrow, elongated cells, followed by a layer of collapsed parenchyma, becoming 2 or 3 layered in the region of raphe, composed of large, thin-walled rectangular cells containing volatile oil, a band of 2 or 3 layers of parenchyma and an inner epidermis of thin-walled, flattened cells, inner integument 2 layered, an outer palisade sclerenchyma with yellow to reddish-brown beaker shaped cells, 20 μ long in radial direction and 12 μ wide, thickened on inner and anticlinal walls, each cell with a small bowl shaped lumen containing a warty nodule of silica and an inner epidermis of flattened cells, peri sperm cells thin-walled, packed with minute rounded polyhedral starch grains, about 1-2 to 4-6 μ in diameter and containing 1-7 small prismatic crystals of calcium oxalate, about 10-20 μ long, endosperm of thin-walled parenchyma containing protein as a granular hyaline mass in each cell, embryo, of small thin-walled cells containing aleurone grains, starch absent in endosperm land embryo, fibres sclerenchymatous, large vessels present in pericarp.

IDENTITY, PURITY AND STRENGTH

Foreign matter	Not more than	Nil	per cent, Appendix	2.2.2.
Total Ash	Not more than	6	per cent, Appendix	2.2.3.
Acid-insoluble ash	Not more than	4	per cent, Appendix	2.2.4.
Alcohol-soluble extractive	Not less than	2	per cent, Appendix	2.2.6.
Water-soluble extractive	Not less than	10	per cent, Appendix	2.2.7.
Volatile oil	Not less than	4	per cent, v/w, Appendix	2.2.10

CONSTITUENTS - Essential oi

PROPERTIES AND ACTION

Rasa : Kaṭu, Madhura

Guṇa : Laghu

Vīrya : Śīta

Vipāka : Madhura

Karma : Rocana, Dīpana, Anulomana, Hṛdya, Mūtrala

IMPORTANT FORMULATIONS - Elādi Modaka, Elādi Cūrṇa, Sitopalādi Cūrṇa

THERAPEUTIC USES - Kāsa, Śvāsa, Aruci, Chardi, Mūtrakṛcchra

DOSE - 250-500 mg of the drug in powder form.

ŚUṆṬHĪ (Rhizome)

Śuṇṭhī consists of dried rhizome of *Zingiber officinale* Roxb. (Fam. Zingiberaceae), widely cultivated in India, rhizomes dug in January-February, buds and roots removed, soaked overnight-in water, decorticated, and some times treated with lime and dried.

SYNONYMS

Sanskrit	:	Auṣadha, Muhauṣadha, Nāgara, Viśva, Viśvabheṣaja, Śṛṅgavera, Viśvā, Viśvauāṣadha
Assamese	:	Adasuth, Aadar Shuth
Bengali	:	Suntha, Sunthi
English	:	Ginger root, Ginger
Gujrati	:	Sunth, Sundh, Suntha
Hindi	:	Sonth
Kannada	:	Shunthi
Kashmiri	:	Shonth
Malayalam	:	Chukku
Marathi	:	Sunth
Oriya	:	Sunthi
Punjabi	:	Sund
Tamil	:	Sukku, Chukku
Telugu	:	Sonthi, Sunti
Urdu	:	Sonth, Zanjabeel

DESCRIPTION

a) Macroscopic

Rhizome, laterally compressed bearing short, flattish, ovate, oblique, branches on upper side each having at its apex a depressed scar, pieces about 5-15 cm long, 1.5-6.5 cm wide (usually 3-4 cm) and 1-1.5 cm thick, externally buff coloured showing longitudinal striations and occasional loose fibres, fracture short, smooth, transverse surface exhibiting narrow cortex (about one-third of radius), a well-marked endodermis and a wide stele showing numerous scattered fibro-vascular bundles and yellow

secreting cells, odour agreeable and aromatic, taste, agreeable and pungent.

b) Microscopic

Transverse section of rhizome shows cortex. of isodiametric thin-walled parenchyma with scattered vascular strands and numerous isodiametric idioblasts, about 40-80 µ In diameter containing a yellowish to reddish-brown oleo-resin, endodermis slightly thick walled, free from starch immediately inside endodermis a row of nearly continuous collateral bundles usually without fibres stele of thin-walled, parenchyma cells, arranged radially around numerous scattered, collateral vascular bundles, each consisting of a few unlignified, reticulate or spiral vessels upto about 70 µ in diameter, a group of phloem cells, unlignified, thin-walled, septate fibres upto about 30 µ wide and 600 µ long with small oblique slit, like pits, present, numerous scattered idioblasts, similar those of cortex, and associated with vascular bundles, also present, idioblasts about 8-20 µ wide and up to 130 µ long with dark reddish-brown contents: in single or in axial rows, adjacent to vessels, present, parenchyma of cortex and stele packed with flattened, rectangular, ovate, starch grains, mostly 5-15 µ - 30-60 µ long about 25 µ wide and 7 µ thick, marked by five transverse striations.

IDENTITY, PURITY AND STRENGTH

Foreign matter	Not more than	1	per cent, Appendix	2.2.2.
Total Ash	Not more than	6	per cent, Appendix	2.2.3.
Acid-insoluble ash	Not more than	1.5	per cent, Appendix	2.2.4.
Alcohol-soluble extractive	Not less than	3	per cent, Appendix	2.2.6.
Water-soluble extractive	Not less than	10	per cent, Appendix	2.2.7.

CONSTITUENTS - Essential oil, pungent constituents (gingerol and shogaol), resinous matter and starch.

PROPERTIES AND ACTION

Rasa : Kaṭu

Guṇa : Laghu, Snigdha

Vīrya : Uṣṇa

Vipāka : Madhura

Karma : Dīpana, Pācana, Anulomana, Āmadoṣahara, Vātakaphāpaha, Hṛdya

IMPORTANT FORMULATIONS - Saubhāgyaśuṇṭhī, Trikaṭu Cūrṇa, Saubhāgya Vaṭī, Vaiśvānara Cūrṇa

THERAPEUTIC USES - Agnimāndya, Ādhmāna, Pāṇḍu, Śvāsa, Udararoga, Āmavāta

DOSE - 1-2 g of the drug in powder form.

SVARṆAPATRĪ (Leaf)

Svarṇapatrī consists of dried leaves of *Cassia angustifolia* Vahl (Fam. Leguminosae), a small shrub, 60-75 cm high, found throughout the year, cultivated largely in Southern India, especially in districts of Tinnevelly, Madurai and Tiruchirapally and has also been introduced in Mysore, fully grown, thick bluish colour leaves stripped off by hand, collected and dried in shade for 7-10 days, till assume a yellowish-green colour, graded and then packed into large bales.

SYNONYMS

Assamese	:	Sonamukhi
Bengali	:	Svamamukhi, Sonapata
English	:	Indian Senna. Tinnevelly Senna
Gujrati	:	Mindhiaval, Sonamukhi
Hindi	:	Sanaya, Hindisana
Kannada	:	Nelavarika, Sonamukhi, Nelaavare, Nelavarike, Nela Avariake
Kashmiri	:	Sna
Malayalam	:	Sunnamukhi, Nilavaka, Chinnukki, Adapatiyan
Marathi	:	Sonamukhi
Oriya	:	Sunamukhi
Punjabi	:	Sannamakhi, Sanapati, Sarnapatta
Tamil	:	Nilapponnai, Avarai
Telugu	:	Sunamukhi
Urdu	:	Sena, Barg-e-Sana

DESCRIPTION

a) Macroscopic

Leaflets, 2.5-6 cm long and 7-15 mm wide at centre, pale yellowish-green, elongated lanceolate, slightly asymmetric at base, margins entire, fiat apex acute with a sharp spine, both surfaces smooth with sparse trichomes, odour, faint but distinctive, taste mucilagenous and disagreeable but not distinctly bitter.

b) Microscopic

Transverse section of leaflet through midrib shows an isobilateral structure, epidermal cells, straight walled containing mucilage, both surfaces bear scattered, unicellular hair, often conical, curved near base, thick-walled, non-lignified, warty cuticle, stomata, paracytic, numerous on both surfaces, mesophyll consists of upper and lower palisade layers with spongy layer in between, palisade cells of upper surface longer than those of lower surface the latter having wavy anticlinal walls, prismaatic crystals of calcium oxalate present on larger veins and clusters of calcium oxalate crystals distributed throughout the palisade and spongy tissues, midrib biconvex, bundles of midrib and larger veins, incompletely surrounded by a zone pericyclic fibres and a crystal sheath of parenchymatous cells containing prismatic crystals of calcium oxalate.

IDENTITY, PURITY AND STRENGTH

Foreign matter	Not more than	1	per cent, Appendix	2.2.2.
Total Ash	Not more than	14	per cent, Appendix	2.2.3.
Acid-insoluble ash	Not more than	2	per cent, Appendix	2.2.4.
Alcohol-soluble extractive	Not less than	3	per cent, Appendix	2.2.6.
Water-soluble extractive	Not less than	25	per cent, Appendix	2.2.7.

CONSTITUENTS - Anthraquinone, glucoside, flavonoids, steroids and resin.

PROPERTIES AND ACTION

Rasa : Kaṭu, Tikta, Kaṣāya

Guṇa : Laghu, Rūkṣa, Tīkṣṇa

Vīrya : Uṣṇa

Vipāka : Kaṭu

Karma : Recana

IMPORTANT FORMULATIONS - Pañcasakāra Cūrṇa, Sārivādyāsava

THERAPEUTIC USES - Vibandha, Udararoga

DOSE - 0.5-2 g of the drug in powder form.

ŚVETAJĪRAKA (Fruit)

Śvetajīraka consists of ripe fruits of *Cuminum cyminum*, Linn. (Fam. Umbelliferae), a glabrous, annual herb, 30-90 cm hight, flowers very small, white, about 38 mm long stalk in compound umbels, mostly cultivated in plains, plants pulled out, dried thrashed for collecting mature fruits.

SYNONYMS

Sanskrit	:	Ajājī, Jīraka, Ajājikā
Assamese	:	Jira
Bengali	:	Jira, Sadajira
English	:	Cumin seed. Cumin
Gujrati	:	Jirautmi, Jiru, Jiraugi, Jeeru, Jirun
Hindi	:	Jira, Safed jira
Kannada	:	Jirage, Bilejirege
Kashmiri	:	Safed Zoor
Malayalam	:	Jeerakam
Marathi	:	Pandhare jire
Oriya	:	Dhalajeera, Dalajira, Jira
Punjabi	:	Safed Jira, Chitta Jira
Tamil	:	Sheeragam, Chirakam, Jeerakam
Telugu	:	Jilakarra, Tella Jilakarra
Urdu	:	Zirah, Zirasafed

DESCRIPTION

a) Macroscopic

Fruit, a cremocarp, often separated into mericarps, brown with light coloured ridges ellipsoidal, elongated, about 4-6 mm long, 2 mm wide, tapering at ends and slightly compressed laterally, mericarps with 5 longitudinal hairy primary ridges from base to apex, alternating with 4 secondary ridges which are flatter and bear conspicuous emergences, seeds orthospermous, odour umbelliferous characteristic, taste, richly spicy.

b) Microscopic

Transverse section of fruit shows epidermis consisting of short polygonal, tabular cells densely covered with short, bristle hairs on ridges, mesocarp with few layers of parenchyma and five vascular bundles under five primary ridges, six vittae under secondary ridges, four on dorsal and two on commissural surface, endocarp consists of polygonal cells containing fixed oil and aleurone grains carpophore consists of slender fibres.

IDENTITY, PURITY AND STRENGTH

Foreign matter	Not more than	2	per cent, Appendix	2.2.2.
Total Ash	Not more than	8	per cent, Appendix	2.2.3.
Acid-insoluble ash	Not more than	1	per cent, Appendix	2.2.4.
Alcohol-soluble extractive	Not less than	7	per cent, Appendix	2.2.6.
Water-soluble extractive	Not less than	15	per cent, Appendix	2.2.7.

CONSTITUENTS - Essential oil

PROPERTIES AND ACTION

Rasa : Kaṭu

Guṇa : Laghu, Rūkṣa, Tīkṣṇa

Vīrya : Uṣṇa

Vipāka : Kaṭu

Karma : Rucya, Dīpana, Pācana, Grāhī, Kṛmighna, Kaphavātahara

IMPORTANT FORMULATIONS - Jīrakādyariṣṭa, Jīrakādi Modaka, Hiṅgvādi Cūrṇa, Hiṅguvacādi Cūrṇa

THERAPEUTIC USES - Agnimāndya, Atīsāra, Kṛmiroga

DOSE - 1-3 g of the drug in powder form.

ŚVETA SĀRIVĀ (Root)

Śveta Sārivā consists of root of *Hemidesmus indicus* (Linn.) R. Br. (Fam. Asclepiadaceae), a prostrate or semi-erect shrub found throughout India from upper Gangetic plains east-wards to Assam, throughout Central, Western and Southern India upto an elevation of 600 m.

SYNONYMS

Sanskrit	:	Anantā, Gopasutā, Sārivā
Assamese	:	Vaga Sariva
Bengali	:	Anantamul, Shvetashariva
English	:	Indian Sarsaparilla
Gujrati	:	Upalsari, Kabri
Hindi	:	Anantamul
Kannada	:	Namada veru, Bili Namadaberu, Anantamool, Sogadeberu, Namadaberu
Kashmiri	:	Anant mool
Malayalam	:	Nannari, Nannar, Naruneendi
Marathi	:	Upalsari, Anantamula
Oriya	:	Dralashvan Lai, Anantamool
Punjabi	:	Anantmool, Ushbah
Tamil	:	Ven Nannar
Telugu	:	Sugandhi Pala, Tella Sugandhi
Urdu	:	Ushba Hindi

DESCRIPTION

a) Macroscopic

Roots occur in pieces, about 30 cm long and 3-8 mm in diameter, cylindrical, thick, hard, somewhat tortuous, sparcely branched, provided with few thick rootlets and secondary roots, external appearance dark brown, sometimes with violet grey tinge, centre yellow, woody, surrounded by a mealy white cortical layer, bark brownish, corky, marked with transverse cracks and longitudinal fissures and easily detachable from the hard central core, odour, characteristic, taste, sweetish, slightly acrid and aromatic.

b) Microscopic

Transverse section of root shows periderm consisting of three layers of tissues, cork, cork cambium and secondary cortex, cork cells radially flattened and rectangular in appearance filled with dark brown contents giving reactions of tannins, cork cambium, 2 or 3 layered, compressed, and filled with deep brown contents, secondary cortex, 3-4 layers of cells, similar to cork cells, with very little or no dark brown contents, secondary phloem consists of sieve elements, parenchyma, phloem ray cells along with several laticiferous ducts, parenchyma cells filled with starch grains, diameter 7-10 μ, occasional prismatic crystals of calcium oxalate, laticiferous ducts scattered in parenchymatous tissue, cambium very narrow: xylem traversed by narrow medullary rays, vessels and tracheids characterised by the presence of pitted markings, pith absent and central region occupied by woody tissues.

IDENTITY, PURITY AND STRENGTH

Foreign matter	Not more than	2	per cent, Appendix	2.2.2.
Total Ash	Not more than	4	per cent, Appendix	2.2.3.
Acid-insoluble ash	Not more than	0.5	per cent, Appendix	2.2.4.
Alcohol-soluble extractive	Not less than	15	per cent, Appendix	2.2.6.
Water-soluble extractive	Not less than	13	per cent, Appendix	2.2.7.

T.L.C.

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CONSTITUENTS - Easential oil, saponin, resin, tannins, sterols and glucosides

PROPERTIES AND ACTION

Rasa : Madhura

Guṇa : Snigdha, Guru

Vīrya : Śīta

Vipāka : Madhura

Karma : Tridoṣanāśana, Dīpana, Raktaśodhaka, Āmanāśana, Viṣaghna, Jvarahara

IMPORTANT FORMULATIONS - Sārivādyāsava

THERAPEUTIC USES - Aruci, Agnimāndya, Atīsāra, Kāsa, Śvāsa, Kaṇḍū, Kuṣṭha, Jvara, Raktavikāra

DOSE - 20-30 g of the drug for decoction.

TAGARA (Rhizome)

Tagara consists of predominantly dried rhizome, stolon and small portion of root of *Valeriana wallichii* DC, (Fam.Valerianaceae): a hairy perennial herb, growing in temperate Himalayas from Kashmir to Bhutan and Khasia hiils upto an altitude of 3,000 m, rhizomes dug in autumn, well washed with water and dried.

SYNONYMS

Sanskrit	:	Kālānusāri, Kālānusārikā, Nata
Assamese	:	Tagar
Bengali	:	Tagar Paduka
English	:	Indian Valerian
Gujrati	:	Tagar Ganthoda, Tagar Gantho, Ghodawaj
Hindi	:	Mushkbala, Sugandhabala
Kannada	:	Mandibattal, Mandyavanthu, Mandibattalu, Tagar
Kashmiri	:	Bala, Mushkbala
Malayalam	:	Thakaram
Marathi	:	Tagar, Ganthode
Oriya	:	Tagarapaduka, Jalashiuli
Punjabi	:	Mushkobala, Sugandhbala
Tamil	:	Tagarai
Telugu	:	Grandhi Tagaramu
Urdu	:	Tagar

DESCRIPTION

a) Macroscopic

Rhizome, of about 4-8 cm long and 4-10 mm thick pieces, dull yellowish-brow. sub-cylindrica1 and dorsiventrally somewhat flattened, rough, slightly curved and unbranched, upper surface marked with raised encircling leaf scars, under surface bearing numerous, small, circular prominent, root scars and a few stout rootlets, crown bearing remains of aerial stems with scale leaves, fracture short and horny, stolon

connecting rhizomes stout, 1-5 mm long and 2-4 mm thick, yellowish-grey in colour, longitudinally wrinkled, usually with nodes and internodes and bearing adventitious roots, occasionally thin stolons 1-2 mm thick, root, yellowish-brown, 3-5 cm long and 1 mm thick, odour, strong and reminiscent of isovaleric acid, taste, bitter and somewhat camphoraceous.

b) Microscopic

Rhizome - transverse section of rhizome shows cork, consisting of 4-14 layers of lignified, cells occasionally containing oil globules, cortex parenchymatous containing numerous starch grain oil globules and yellowish-brown substance, outer 2 or 3 layers of cortex, collenchymatous occasional root traces appear as paler strands, endodermis single layered, pericycle, pareachymatous .and within it 12-18 collateral vascular bundles, separated by dark medullary ray present, pith large, parenchymatous, lacunar, containing starch grams, starch occurs as single or occasional compound grains of two components, individual grains being 7-30 μ mostly, 10-25 μ in diameter calcium oxalate crystals absent.

Stolon--transverse section of stolon shows cork, consisting of 2-5 layers, cortex upto 25 layers, pareachymatous, followed by 20 collateral vascular bundles, which in young stolons separated by cellulosic parenchymatous medullary rays and in older stolons become lignified, pith wide and lacunar, root traces absent.

Root- transverse section of root shows small, central parenchymatous pith, surroundod by tetrach to polyarch xylem and a wide parenchymatous bark.

IDENTITY, PURITY AND STRENGTH

Foreign matter	Not more than	2	per cent, Appendix	2.2.2.
Total Ash	Not more than	12	per cent, Appendix	2.2.3.
Acid-insoluble ash	Not more than	10	per cent, Appendix	2.2.4.
Alcohol-soluble extractive	Not less than	30	per cent, Appendix	2.2.6.
Water-soluble extractive	Not less than	19	per cent, Appendix	2.2.7.

CONSTITUENTS - Essential oil

PROPERTIES AND ACTION

Rasa	:	Tikta, Kaṭu, Kaṣāya
Guṇa	:	Laghu, Snigdha
Vīrya	:	Uṣṇa
Vipāka	:	Kaṭu
Karma	:	Tridoṣahara, Viṣaghna, Raktadoṣahara, Mānasadoṣahara

IMPORTANT FORMULATIONS - Dhānvantara Taila, Mahā Nārāyaṇa Taila, Devadārvādyariṣṭa, Jātīphalādi Cūrṇa

THERAPEUTIC USES - Apasmāra, Unmāda, Śiroroga, Netraroga

DOSE - 1-3 g of the drug in powder form.

TĀMALAKĪ (Root, Stem & Leaf)

Tāmalakī consists of root, stem and leaf of *Phyllanthus fraternus* Webst. Syn. *Phyllanthus niruri Hook. f. non* Linn. (Fam. Euphorbiaceae), an annual herb, 20-60 cm high, found in Central and Southern India extending to Ceylon.

SYNONYMS

Sanskrit	:	Mahidhātrikā, Bhūmyāmalakī, Bahuphalā
Assamese	:	Bhuin Amla
Bengali	:	Bhumamla, Bhumi amalaki
English	:	--
Gujrati	:	Bhoi Amali, Bhony amari, Bhonyamali
Hindi	:	Bhui Amala
Kannada	:	Nelanelli
Malayalam	:	Kizanelli, Keezhanelli, Ajjhada
Marathi	:	Bhuiawali
Oriya	:	Bhuin Amla
Tamil	:	Kizhukai nelli, Kizanelli
Telugu	:	Nela usirika
Urdu	:	--

DESCRIPTION

a) Macroscopic

Root-small, 2.5-11 .0 cm long. nearly straight, gradually tapering, with a number of fibrous secondary and tertiary roots, external surface light brown, fracture, short.

Stem-Slender, gabrous, light brown, cylindrical, 20-75 cm long, branching profuse towards upper region bearing 5-10 pairs of leaves, internode, 1-3.5 cm long, odour, indistinct, taste, slightly bitter.

Leaf-compound and leaf-let arranged in two rows with a rachis, alternate, opposite and decussate almost sessile, stipulate, oblong, entire, upto 1.5 cm long and 0.5 cm wide, greenish-brown in colour, odour, indistinct, taste, slightly bitter

b) Microscopic

Root-transverse section shows, 4-6 layers of cork consisting of thin-walled, rectangular, tangentially elongated and radially arranged cells, filled With reddish-brown content, secondary cortex consists of 8-10 layers of thin-walled, tangentially elongated parenchymatous cells, secondary phloem narrow consisting of sieve elements, phloem parenchyma and traversed by narrow phloem rays, secondary xylem represented by a broad zone of tissues, composed of vessels, tracheids, fibres and parenchyma, all elements being thick-walled and lignified having simple pits, xylem rays uniseriate.

Stem-transverse section shows, a single layered epidermis composed of thick-walled, flattened, tangentially elongated cells, older stem shows 4-5 layers of cork, composed of thin-walled, tabular, tangentially elongated and radially arranged cells, filled With reddish-brown content, cortex composed of 4-6 layers of oval, tangentially elongated, thin-walled, parenchymatous cells, some cortical cells filled with yellowish-brown content, endodermis quite distinct, pericycle represented by a discontinuous ring, composed of several tangentially elongated strands of lignified fibres with thick walls and narrow lumen, secondary phloem narrow, composed of sieve elements, dispersed in mass of phloem parenchyma, secondary xylem composed of vessels, fibres, parenchyma and traversed by numerous uniseriate rays, vessels mostly simple pitted, a few show spiral thickenings, fibres narrow elongated, with narrow or sometimes blunt ends with simple pits, centre, occupied by a pith composed of thin-walled, circular to oval parenchymatous cells, occasionally cluster crystals of calcium oxalate present in parenchymatous cells of ground tissue.

Leaf-transverse section of leaf shows, a biconvex outline, epidermis on either side, single layered covered externally by a thick cuticle, a palisade layer present beneath upper epidermis, intercepted by a few parenchymatous cells in the middle, meristele composed of small strands of xylem towards upper surface and phloem towards lower surface, rest of tissue of leaf composed of thin-walled, parenchymatous cells some having cluster crystals of calcium oxalate, lamina shows a dorsiventral structure, mesophyll differentiated into palisade and spongy parenchyma, epidermis on either side composed of thin-wa1led, tangentially elongated cells, covered externally by a thick cuticle, anisocytic type stomata present on both epidermises, palisade single layered, mesophyll composed of 3-5 layers of loosely arranged cells having a number of veins traversed in this region, a few cluster crystals of calcium oxalate present in spongy parenchyma.

Powder-Powder of the drug, brown coloured, under microscope shows, fragments of cork cells, vessels and fibres.

IDENTITY, PURITY AND STRENGTH

Foreign matter	Not more than	2	per cent, Appendix	2.2.2.
Total Ash	Not more than	16	per cent, Appendix	2.2.3.
Acid-insoluble ash	Not more than	7	per cent, Appendix	2.2.4.
Alcohol-soluble extractive	Not less than	3	per cent, Appendix	2.2.6.
Water-soluble extractive	Not less than	13	per cent, Appendix	2.2.7.

T.L.C.

CONSTITUENTS - Phyllanthin

PROPERTIES AND ACTION

Rasa : Kaṣāya, Tikta, Madhura

Guṇa : Laghu, Rūkṣa

Vīrya : Śīta

Vipāka : Madhura

Karma : Rocana, Dāhanāśanī, Pittaśāmaka, Mūtrala

IMPORTANT FORMULATIONS - Citraka Harītaki, Madhuyaṣṭyādi Taila, Pippalyādi Ghṛta, Cyavanaprāśa, Śatāvarī Guḍa

THERAPEUTIC USES - Tṛṣṇā, Kāsa, Amlapitta, Pāṇḍu, Kṣaya, Kṣata, Kuṣṭha, Prameha, Mūtraroga

DOSE - 10-20 ml of the drug in juice form

3-6 of the drug in powder form.

TVAK (Bark)

Tvak is the dried inner bark (devoid of cork and cortex) of the coppiced shoots of stem of *Cinnamomum zeylanicum* Blume. (Fam. Lauraceae), a moderate sized evergreen tree usually attaining a height of 6-7 .5 m, cultivated on the Western Ghats and adjoining hills, bark collected during April-July and October-December.

SYNONYMS

Sanskrit	:	Dārusitā
Assamese	:	Dalchini, Dalcheni
Bengali	:	Daruchini, Darchini
English	:	Cinnamon bark
Gujrati	:	Dalchini
Hindi	:	Dalchini
Kannada	:	Dalchini Chakke
Kashmiri	:	Dalchini, Dalchin
Malayalam	:	Karuvapatta, Ilavarngathely
Marathi	:	Dalchini
Oriya	:	Dalechini, Guda twak
Punjabi	:	Dalchini, Darchini
Tamil	:	Lavangapattai, Karuvapattai
Telugu	:	Lavangapatta, Dalchini chekka
Urdu	:	Darchini

DESCRIPTION

a) Macroscopic

Bark pieces about 0.5 mm thick, brittle, occurs as single or double, closely packed compound quills, upto a metre or more in length and upto about 1 cm in diameter, outer surface, dull yellowish-brown, marked with pale wavy longitudinal lines with occasional small scars or holes, inner surface darker in colour, striated with

longitudinally elongated reticulation, fracture, splintery, free from all but traces of cork, odour, fragrant, taste, sweet, aromatic with sensation of warmth.

b) Microscopic

Transverse section of bark (devoid of cork and c.ortex) shows except at certain places pericyclic sclerenchyma, 3 or 4 rows of isodiametric cells, sometimes tangentially elongated, inner and radial walls often being thicker than the outer, some containing starch grains, small groups of pericylic fibres embedded at intervals in the sclerenchyma, phloem of tangential bands of sieve tissue alternating with parenchyma, and containing axially elongated secreting cells containing volatile oil or mucilage, phloem fibres with very thick walls, upto 30 μ in diameter, isolated or in short tangential rows, sieve tubes narrow with transverse sieve plates, collapsed in outer periphery, medullary rays of isodiametric cells, mostly 2 cells wide, cortical parenchyma and medullary rays containing small starch grains mostly below 10 μ in diameter, minute acicular crystals of calcium oxalate present.

IDENTITY, PURITY AND STRENGTH

Foreign matter	Not more than	2	per cent, Appendix	2.2.2.
Total Ash	Not more than	3	per cent, Appendix	2.2.3.
Acid-insoluble ash	Not more than	2	per cent, Appendix	2.2.4.
Alcohol-soluble extractive	Not less than	2	per cent, Appendix	2.2.6.
Water-soluble extractive	Not less than	3	per cent, Appendix	2.2.7.
Volatile oil	Not less than	1	per cent, v/w, Appendix	2.2.10.

CONSTITUENTS - Essential oil, tannin and mucilage

PROPERTIES AND ACTION

Rasa : Kaṭu, Tikta, Madhura

Guṇa : Rūkṣa, Laghu, Tīkṣṇa

Vīrya : Uṣṇa

Vipāka : Kaṭu

Karma : Kaphavātahara, Viṣaghna, Kaṇṭhaśuddhikara, Rucya

IMPORTANT FORMULATIONS - Sitopalādi Cūrṇa, Caturjāta Cūrṇa

THERAPEUTIC USES - Mukhaśoṣa, Tṛṣṇā, Kaṇṭhamukharoga, Pīnasa, Kṛmiroga, Vastiroga, Arśa, Hṛdroga

DOSE - 1-3 g of the drug in powder form.

TVAKPATRA (Leaf)

Tvakpatra consists of dried mature leaves of *Cinnamomum tamala* (Buch. Ham.) Nees & Eberm. (Fam. Lauraceae): a small evergreen tree upto 7.5 m high and occurs in tropical, sub- tropical Himalayas between 900-2300 m, often raised from seeds, sown in nursery, leaves collected in dry weather from about ten years old plant during October-March.

SYNONYMS

Sanskrit	:	Patra, Varāṅga, Coca
Assamese	:	Tejpat, Mahpat
Bengali	:	Tejpatra, Tejpata
English	:	Indian Cinnamon
Gujrati	:	Tamala patra, Develee
Hindi	:	Tejpatra
Kannada	:	Tamalapatra, Dalchini Ele
Kashmiri	:	Dalchini pan, Tajpatra
Malayalam	:	Karuvapatta patram
Marathi	:	Tamalpatra
Oriya	:	Tejapatra
Punjabi	:	Tajpater
Tamil	:	Lavangapatri
Telugu	:	Akupatri
Urdu	:	Tezpat

DESCRIPTION

a) Macroscopic

Leaves-12.5-20 cm long, 5-7.5 cm wide at the centre, 3 converging nerves from base to apex young leaves pink, petiole 7.5-13 mm long, margin entire, apex acute or accuminate, both surfaces smooth, stomata paracytic odour, aromatic, taste, slightly sweet, mucilaginous and aromatic.

b) Microscopic

Petiole and midrib-transverse section of petiole and midrib shows epidermis externally covered with cuticle, uniseriate, multicellular (1 to 3 cells), trichomes present, oil cells single or in group, isolated large stone cells, much lignified showing striations found scattered, most of the parenchymatous cells of cortex with reddish-brown contents, pericycle represented by a few layers of sclerenchymatous cells, stele more or less planoconvex as in the midrib of leaf, xylem on upper and phloem on lower side consisting of usual elements, present.

Lamina-transverse section of lamina shows dorsiventral structure, represented by palisade tissue on upper and spongy parenchyma on lower side, epidermis same as in midrib, externally covered with cuticle, below upper epidermis single row of closely packed palisade layer followed by multilayered, irregular, thin-walled cells of spongy parenchyma without intercellular spaces, idioblasts containing oil globules present in mesophyll and also in palisade, lower epidermis covered externally with cuticle, lamina intervened by several small veinlets: vascular bundles covered with thick-walled fibres on both side.

IDENTITY, PURITY AND STRENGTH

Foreign matter	Not more than	2	per cent, Appendix	2.2.2.
Total Ash	Not more than	5	per cent, Appendix	2.2.3.
Acid-insoluble ash	Not more than	1	per cent, Appendix	2.2.4.
Alcohol-soluble extractive	Not less than	6	per cent, Appendix	2.2.6.
Water-soluble extractive	Not less than	9	per cent, Appendix	2.2.7.
Volatile oil	Not less than	1	per cent, v/w, Appendix	2.2.10.

CONSTITUENTS - Essential oils (d-α phellandrene and eugenol)

PROPERTIES AND ACTION

Rasa : Kaṭu, Madhura

Guṇa : Laghu, Picchila, Tīkṣṇa

Vīrya : Uṣṇa

Vipāka : Kaṭu

Karma : Rucya, Kaphavātahara, Arśoghna

IMPORTANT FORMULATIONS - Citrakādi Taila, Kāsīsādi Taila, Vajraka Taila

THERAPEUTIC USES - Aruci, Hṛllāsa, Arśa, Pīnasa

DOSE - 1-3 g of the drug in powder form.

UDUMBARA (Bark)

Udumbara consists of dried bark of *Ficus racemosa* Linn. Syn. *Ficus glomerata* Roxb. (Fam. Moraceae), a large deciduous tree distributed all over india, found throughout the year, grows in evergreen forests, moist localities and bank of streams to the elevation of 1800 m, often cultivated in villages for shade and its edible fruits.

SYNONYMS

Sanskrit	:	Sadāphala
Assamese	:	Jangedumuru, Yagyadimru
Bengali	:	Jagnadumur, Yagnadumur
English	:	Country fig, Cluster Fig
Gujrati	:	Umbro, Umerdo, Umardo, Umarado
Hindi	:	Gulara, Gular
Kannada	:	Attihanninamara, Oudumbara, Athimara, Attigida
Kashmiri	:	Rumbal
Malayalam	:	Athi
Marathi	:	Atti, Gular, Umber
Oriya	:	Jajnadimbri, Dimbiri
Punjabi	:	Kath Gular, Gular
Tamil	:	Atti
Telugu	:	Atti, Medi
Urdu	:	Gular

DESCRIPTION

a) Macroscopic

Bark greyish-green, surface soft and uneven, 0.5-1.8 cm thick, on rubbing white papery flakes come out from outer surface, inner surface light brown, fracture fibrous, taste, mucilaginous without any characteristic odour.

b) Microscopic

Transverse section of bark shows cork, 3-6 layers of thin-walled cells filled with brownish content, cork cambium single layered, secondary cortex 6-12 layered, composed of thin-walled rectangular cells arranged regularly, a number of secondary cortex cells contain starch grains and some contain rhomboidal crystals of calcium oxalate, most of the cells filled with chloroplast giving green appearance, cortex a fairly wide zone composed of circular to oblong, thin-walled cells, containing orange-brown content, most of the cells filled with simple and compound starch grains, a number of cells also contain cubical and rhomboidal crystals of calcium oxalate, some cortical cells get lignified with pitted walls found scattered singly or in large groups throughout cortical region, secondary phloem a very wide zone composed of parenchyma with patches of sieve tubes, companion cells by medullary rays, phloem parenchyma circular to oval and thin-walled, phloem fibres much elongated, lignified, very heavily thickened and possess a very narrow lumen: medullary rays uni to pentaseriate widen towards peripheral region , a number of ray cells also get lignified and show pitted wall as described above, laticiferous cells also found in phloem region similar to parenchyma but filled with small granular masses, starch grains and rhomboidal crystals of calcium oxalate also found in most of phloem parenchyma and ray cells, cambium, when present, 2-3 layered, of tangentially elongated thin-walled cells.

IDENTITY, PURITY AND STRENGTH

Foreign matter	Not more than	2	per cent, Appendix	2.2.2.
Total Ash	Not more than	14	per cent, Appendix	2.2.3.
Acid-insoluble ash	Not more than	1	per cent, Appendix	2.2.4.
Alcohol-soluble extractive	Not less than	7	per cent, Appendix	2.2.6.
Water-soluble extractive	Not less than	9	per cent, Appendix	2.2.7.

CONSTITUENTS - Tannins

PROPERTIES AND ACTION

Rasa : Kaṣāya

Guṇa : Rūkṣa, Guru

Vīrya : Śīta

Vipāka : Kaṭu

Karma : Mūtrasaṃgrahaṇīya, Vraṇaśodhaka, Vraṇaropaka, Medohara, Kaphapittaśāmaka, Raktastambhana

IMPORTANT FORMULATIONS - Nyagrodhādi Kvātha Cūrṇa, Mūtrasaṃgrahaṇīya Kaṣāya Cūrṇa

THERAPEUTIC USES - Raktapitta, Dāha, Medoroga, Yonidoṣa

DOSE - 3-6 g of the drug in powder form

20-30 g of the drug for decoction.

UPAKUÑCIKĀ (Seed)

Upakuñcikā consists of seeds of *Nigella sativa* Linn. (Fam. Ranunculaceae), a small herb, 45 -60 cm high, mostly cultivated in Punjab, Himachal Pradesh, Bihar and Assam.

SYNONYMS

Sanskrit	:	Sthūlajīraka, Upakuñcī, Suṣavī
Assamese	:	--
Bengali	:	Mota Kalajira, Kalajira
English	:	Small Fennel, Nigella Seed
Gujrati	:	Kalonji jeeru, Kalounji
Hindi	:	Kalaunji, Mangaraila
Kannada	:	Karijirige
Malayalam	:	Karinjirakam
Marathi	:	Kalaunji jire, Kalejire
Oriya	:	--
Punjabi	:	Kalvanji
Tamil	:	Karunjeerakam, Karunjiragam
Telugu	:	Peddajilakarra
Urdu	:	Kalongi

DESCRIPTION

a) Macroscopic

Seeds, flattened, oblong, angular, rugulose tubercular, small, funnel shaped, 0.2 cm. long and 0.1 cm. wide, black, odour, slightly aromatic, taste, bitter.

b) Microscopic

Transverse section of seed shows single layer of epidermis consisting of elliptical, thick-walled cells covered externally by a papillose cuticle, filled with reddish-brown content, epidermis followed by 2-4 layers of thick-walled, tangentially elongated, parenchymatous cells, followed by a pigmented layer composed of tangentially elongated, cylindrical thick-walled cells filled with reddish-brown pigment,

below pigmented layer, parenchyma composed of thick-walled rectangular, radially elongated cells, present in a layer, endosperm consists of moderately thick-walled, rectangular to polygonal cells, a few filled with oil globules, embryo embedded in endosperm.

Powder-Black, oily to touch, under microscope show, groups of parenchyma, endosperm cells and oil globules.

IDENTITY, PURITY AND STRENGTH

Foreign matter	Not more than	2	per cent, Appendix	2.2.2.
Total Ash	Not more than	6	per cent, Appendix	2.2.3.
Acid-insoluble ash	Not more than	0.2	per cent, Appendix	2.2.4.
Alcohol-soluble extractive	Not less than	20	per cent, Appendix	2.2.6.
Water-soluble extractive	Not less than	15	per cent, Appendix	2.2.7.

CONSTITUENTS - Essential oil, fixed oil, resin, saponin and tannin

PROPERTIES AND ACTION

Rasa : Kaṭu, Tikta

Guṇa : Laghu, Rūkṣa

Vīrya : Uṣṇa

Vipāka : Kaṭu

Karma : Rucya, Saṃgrāhī, Cakṣuṣya, Garbhāśayaviśodhana, Pittala, Dīpana, Pācana, Medhya, Hṛdya, Vātakaphāpaha, Kṛmighna

IMPORTANT FORMULATIONS - Nārāyaṇa Cūrṇa, Kāṅkāyana Guṭikā

THERAPEUTIC USES - Gulma, Ādhmāna, Atīsāra, Kṛmiroga

DOSE - 1-3 g of the drug in powder form.

VARUṆA (Stem bark)

Varuṇa consists of dried stem bark of *Crataeva nurvala Buch*-Ham (Fam. Capparidaceae), a small wild or cultivated tree found throughout the year in India, often found along streams, also in dry, deep boulder formation in Sub-Himalayan tracts.

SYNONYMS

Sanskrit	:	Varaṇa
Assamese	:	--
Bengali	:	Varuna
English	:	Three leaved caper
Gujrati	:	Vayvarno, Varano
Hindi	:	Baruna, Barna
Kannada	:	Bipatri, Mattamavu, Neervalamara
Malayalam	:	Neermatalam
Marathi	:	Vayavarna, Haravarna, Varun
Oriya	:	Baryno
Punjabi	:	Barna, Barnahi
Tamil	:	Maralingam
Telugu	:	Bilvarani
Urdu	:	--

DESCRIPTION

a) Macroscopic

Thickness or bark varies, usually 1-1.5 cm according to the age and portion of the plant from where the bark is removed, outer surface, greyish to greyish-brown with ash-grey patches, at places, surface rough due to a number of lenticels, shallow fissures and a few vertical or longitudinal ridges, inner most surface smooth and cream white in colour, fracture tough and short, odour, indistinct, taste, slightly bitter.

b) Microscopic

Transverse section of mature stem bark shows, an outer cork composed of thin-walled, rectangular and tangentially elongated cells, phellogen single layered, thin-walled, tangentially elongated cells followed by a wide secondary cortex, consisting of thin-walled, polygonal to tangentially elongated cells with a number of starch grains, starch grains mostly simple, occasionally compound with 2-3 components also present', large number of stone cells in groups of two or more, found scattered in secondary cortex, single stone cells not very common, stone cells vary in size and shape, being circular to rectangular or elongated with pits and striations on their walls, stone cells distributed somewhat in concentric bands in phloem region except in inner region of phloem which is devoid of stone cells, secondary phloem comparatively a wide zone, consisting of sieve tubes, companion cells, parenchyma and groups of stone cells, alternating with medullary rays, sieve elements found compressed forming ceratenchyma in outer phloem region, whereas in inner region of phloem, intact, medullary rays mostly multiseriate composed of thin-walled, radially elongated cells, tangentially elongated towards outer periphery, a number of starch grains similar to secondary cortex also present in phloem and ray cells, few rhomboidal crystals of calcium oxalate also found in this region, inner most layer is cambium.

IDENTITY, PURITY AND STRENGTH

Foreign matter	Not more than	2	per cent, Appendix	2.2.2.
Total Ash	Not more than	13	per cent, Appendix	2.2.3.
Acid-insoluble ash	Not more than	1	per cent, Appendix	2.2.4.
Alcohol-soluble extractive	Not less than	1	per cent, Appendix	2.2.6.
Water-soluble extractive	Not less than	8	per cent, Appendix	2.2.7.

CONSTITUENTS - Saponin and tannin

PROPERTIES AND ACTION

Rasa : Tikta, Kaṣāya

Guṇa : Laghu, Rūkṣa

Vīrya : Uṣṇa

Vipāka : Kaṭu

Karma : Dīpana, Bhedī, Vātaśleṣmahara

IMPORTANT FORMULATIONS - Varuṇādi Kvātha Cūrṇa

THERAPEUTIC USES - Aśmarī, Mūtrakṛcchra, Gulma, Vidradhi

DOSE - 20-30 g of the drug for decoction.

VĀSĀ (Leaf)

Vāsā consists of fresh, dried, mature leaves of *Adhatoda vasica* Nees (Fam. Acanthaceae), a sub-herbaceous bush, found throughout the year in plains and sub-Himalayan tracts in India, ascending upto 1200m, flowers during February-March and also at the end of rainy season, leaves stripped off from older stems and dried in drying sheds.

SYNONYMS

Sanskrit	:	Vṛṣa, Āṭarūṣa, Vāsaka
Assamese	:	Titabahak, Bahak, Vachaka
Bengali	:	Baksa, Vasaka
English	:	Vasaka
Gujrati	:	Aduso, Ardusi, Adulso
Hindi	:	Aduss, Arusa
Kannada	:	Adsale, Adusoge, Atarusha, Adsole, Adasale
Kashmiri	:	Vasa
Malayalam	:	Attalatakam, Atalotakam
Marathi	:	Vasa, Adulsa
Oriya	:	Basanga
Punjabi	:	Bhekar, Vansa, Arusa
Tamil	:	Vasambu, Adathodai
Telugu	:	Addasaramu
Urdu	:	Adusa, Basa

DESCRIPTION

a) Macroscopic

Leaves, 10-30 cm long and 3-10 cm broad, lanceolate to ovate-lanceolate, slightly acuminate, base tapering, petiolate, petioles 2-8 cm long, exstipulite, glabrescent, 8-10 pairs of lateral vein bearing few hairs, dried leaves dull brown above, light greyish brown below, odour, characteristic, taste, bitter.

b) Microscopic

Transverse section of leaf shows, dorsiventral surface with 2 layers of palisade cells, in surface view, epidermal cells sinuous with anomocytic stomata on both surfaces, more numerous on the lower, clothing trichomes few, 1-3, rarely upto 5 celled, thin-walled, uniseriate, upto 500 μ and glandular trichomes with nicellular stalk and 4 celled head measuring, 25-36 μ in diameter in surface view, cystoliths in mesophyll layers, elongated and cigar shaped, acicular and prismatic forms of calcium oxalate crystals present in mesophyll , palisade ratio, 5-6, 5-8.5, stomatal index, 10.8-14.2-18.1 for lower surface.

IDENTITY, PURITY AND STRENGTH

Foreign matter	Not more than	2	per cent, Appendix	2.2.2.
Total Ash	Not more than	21	per cent, Appendix	2.2.3.
Acid-insoluble ash	Not more than	1	per cent, Appendix	2.2.4.
Alcohol-soluble extractive	Not less than	3	per cent, Appendix	2.2.6.
Water-soluble extractive	Not less than	22	per cent, Appendix	2.2.7.

CONSTITUENTS - Alkaloids and essential oil

PROPERTIES AND ACTION

Rasa : Tikta, Kaṣāya

Guṇa : Laghu

Vīrya : Śīta

Vipāka : Kaṭu

Karma : Kaphapittahara, Raktasaṃgrāhikā, Kāsaghna, Hṛdya

IMPORTANT FORMULATIONS - Vāsakāsava, Vāsāvaleha

THERAPEUTIC USES - Kāsa, Śvāsa, Kṣaya, Raktapitta, Prameha, Kāmalā, Kuṣṭha

DOSE - 10-20 ml of the juice of fresh leaves /par10-20 g of the dried drug for decoction.

VIḌAṄGA (Fruit))

Viḍaṅga consists of dried mature fruits of *Embelia ribes Burm.* F. (Fam. Myrsinaceae), large scandent shrub with long slender, flexible branches, distributed throughout hilly parts of India upto 1600 m,

SYNONYMS

Sanskrit	:	Jantughna, Kṛmighna, Vella, Kṛmihara, Kṛmiripu
Assamese	:	Vidang
Bengali	:	Vidang
English	:	--
Gujrati	:	Vavding, Vavading, Vayavadang
Hindi	:	Vayavidanga, Bhabhiranga, Baberang
Kannada	:	Vayuvilanga, Vayuvidanga
Kashmiri	:	Babading
Malayalam	:	Vizhalari, Vizalari
Marathi	:	Vavading, Vavding
Oriya	:	Bidanga, Vidanga
Punjabi	:	Babrung, Vavaring
Tamil	:	Vayuvilangam, Vayuvidangam
Telugu	:	Vayuvidangalu
Urdu	:	Baobarang, Babrang

DESCRIPTION

a) Macroscopic

Fruit brownish-black, globular 2-4 mm in diameter, warty surface with a beak like projection at apex, often short, thin pedicel and persistant calyx with usually 3 or 5 sepals present, pericarp brittle enclosing a single seed covered by a thin membrane, entire seed, reddish and covered with yellowish spots (chitra tandula), odour slightly aromatic, taste, astringent.

b) Microscopic

Transverse section of fruit shows epicarp consisting of single row of tabular cells of epidermis, usually obliterated, in surface view cells rounded with wrinkled cuticle, mesocarp consists of a number of layers of reddish-brown coloured cells and numerous fibrovascular bundles and rarely a few prismatic crystals of calcium oxalate, inner part of mesocarp and endodennis composed of stone cells, endodermis consisting of single layered, thick-walled, large, palisade-like stone cells, seed coat composed of 2-3 layered reddish-brown coloured cells, endosperm cells irregular in shape, thick-walled, containing fixed oil and proteinous masses, embryo small when present otherwise most of the seeds sterile.

Powder-Reddish, under microscope shows reddish parenchyma and stone cells.

IDENTITY, PURITY AND STRENGTH-

Identification :-

(I) Shake 1 g of the powdered seeds with 20ml of *Solvent Ether* for five minutes and filter. To a portion of the filtrate add 5 per cent *vlv* solution of *Sodium Hydroxide,* a deep violet colour is developed in the aqueous layer. To the other portion add 2 drops of *Dilute Ammonia solution,* a bluish violet precipitate is obtained.

(II) Boil 5 g of the powdered seeds :with 25 ml *alcohol* and filter. Divide the deep red coloured filtrate into two portions. To one portion, add *solution of lead Acetate,* a dirty green precipitate is produced. To the other portion add *solution of ferric chloride* a reddish-brown precipitate is produced.

IDENTITY, PURITY AND STRENGTH

Foreign matter	Not more than	2	per cent, Appendix	2.2.2.
Total Ash	Not more than	6	per cent, Appendix	2.2.3.
Acid-insoluble ash	Not more than	1.5	per cent, Appendix	2.2.4.
Alcohol-soluble extractive	Not less than	10	per cent, Appendix	2.2.6.
Water-soluble extractive	Not less than	9	per cent, Appendix	2.2.7.

ASSAY

Assay:-Contains not less than 2 per cent *w/w* of embelin (limits 1.85 to 2.15) when assayed as follows:-

Weigh accurately about 10 g of powder (40 mesh) and transfer to a 500 ml glass stoppered flask Shake occasionally for thirty minutes with 150 ml of *Solvent Ether.* Pack

the whole mass in a percolator, allow to macerate for thirty minutes and extract with *Solvent Ether* till the ethereal solution ceases to give a pink colour with a drop of *Dilute Ammonia Solution.* Distil off the *Ether,* treat the residue with small quantity of *light Petroleum* (b.p. 40° C to 60° C) cool in ice, filter through a Buchner funnel under suction and reject the filtrate. Wash the residue with further small quantities of cooled *Ether* (b. p. 40° C to 60° C). Transfer the residue to a tared beaker with sufficient quantity of Solvent *Ether,* remove the *Light Petroleum* and dry the residue of embelin to constant weight at 80°. The melting range of the residue is 142° C to 144° C .

CONSTITUENTS - Benzoquinones, alkaloid (Christembine), tannin and essential oil

PROPERTIES AND ACTION

Rasa	:	Kaṭu, Tikta
Guṇa	:	Rūkṣa, Laghu, Tīkṣṇa
Vīrya	:	Uṣṇa
Vipāka	:	Kaṭu
Karma	:	Kṛmināśana, Dīpana, Anulomana, Vātakaphāpaha

IMPORTANT FORMULATIONS - Viḍaṅgāriṣṭa, Viḍaṅga Lauha, Viḍaṅgādi Lauha

THERAPEUTIC USES - Kṛmiroga, Ādhmāna, Śūla, Udararoga

DOSE - 5-10 g of the drug in powder form.

VIJAYĀ (Leaf)

Vijayā consists of dried leaves of cultivated or wild plants of *Cannabis sativa* Linn. (Fam. Cannabinaceae) , an annual, erect, dioecious herb, one to two m high, found almost throughout the year, practically naturalised in the Sub-Himalayan tracts in India and abundantly found in waste lands from Punjab eastwards to Bengal and extending Southwards.

SYNONYMS

Sanskrit	:	Bhaṅga, Mādanī
Assamese	:	Bhan, Bhang
Bengali	:	Bhang, Sidhi
English	:	Indian Hemp
Gujrati	:	Bhang
Hindi	:	Bhaang, Bhanga
Kannada	:	Bhangigida, Ganjagida
Kashmiri	:	Pang, Bangi
Malayalam	:	Kanchavu
Marathi	:	Bhang, Ganja
Oriya	:	Bhanga, Ganjei
Punjabi	:	Bhang
Tamil	:	Ganja
Telugu	:	Ganjayi
Urdu	:	Qinaab, Bhang

DESCRIPTION

a) Macroscopic

Leaves palmately compound, leaflets linear, lanceolate with serrate margins, 5-20 cm long, pointed, narrow at base, upper surface dark green and rough, lower pale, downy, leaves of female plants longer than the male, odour, strong and characteristic, taste, slightly acrid.

b) Microscopic

Transverse section of leaves and bracts, shows dorsiventral surface, upper epidermis with unicellular, pointed, curved, conical trichomes with enlarged bases containing cystoliths of calcium carbonate, mesophyll contains cluster crystals of calcium oxalate in many cells consisting of usually one layer of palisade cell and spongy tissue, trichomes on lower epidermis conical, longer, 340-500µ but without cystoliths, numerous glandular trichomes, sessile or with a multicellular stalk and a head of about eight radiating, club-shaped cells secreting oleo-resin, present in the lower epidermis especially on mid-rib, bracteoles with undifferentiated mesophyll and on lower surface bear numerous glandular trichomes.

IDENTITY, PURITY AND STRENGTH

Foreign matter	Not more than	2	per cent, Appendix	2.2.2.
Total Ash	Not more than	15	per cent, Appendix	2.2.3.
Acid-insoluble ash	Not more than	5	per cent, Appendix	2.2.4.
Alcohol-soluble extractive	Not less than	10	per cent, Appendix	2.2.6.
Water-soluble extractive	Not less than	13	per cent, Appendix	2.2.7.

CONSTITUENTS - Resin (Cannabinols, particularly tetrahydrocannabinol)

PROPERTIES AND ACTION

Rasa : Tikta

Guṇa : Laghu, Tīkṣṇa

Vīrya : Uṣṇa

Vipāka : Kaṭu

Karma : Dīpana, Pācana, Grāhī, Kaphahara, Vājīkara, Vākvardhana, Nidrājanana, Vyavāyī, (Prabhāva: Madakāri)

IMPORTANT FORMULATIONS - Jātīphalādi Cūrṇa, Madanānanda Modaka

THERAPEUTIC USES - Agnimāndya, Atīsāra, Grahaṇīroga, Klaibya, Anidrā

DOSE - 125-250 mg of the drug in powder form. /par Note:-Sodhana of this drug to be done before use as described in the appendix

YAṢṬĪ (Stem &Root)

Yaṣṭī consists of dried, unpeeled, stolon and root of *Glycyrrhiza glabra* Linn, (Fam. Leguminosae) , a tall perennial herb, upto 2 m high found cultivated in Europe. Persia, Afghanistan and to little extent in some parts of India.

SYNONYMS

Sanskrit	:	Yaṣṭīmadhūka, Yaṣṭikā, Madhuka, Madhuyaṣṭī, Yaṣṭyāhvā
Assamese	:	Jesthimadhu, Yeshtmadhu
Bengali	:	Yashtimadhu
English	:	Liquorice root
Gujrati	:	Jethimadha, Jethimard, Jethimadh
Hindi	:	Mulethi, Mulathi, Muleti, Jethimadhu, Jethimadh
Kannada	:	Jestamadu, Madhuka, Jyeshtamadhu, Atimadhura
Kashmiri	:	Multhi
Malayalam	:	Irattimadhuram
Marathi	:	Jesthamadh
Oriya	:	Jatimadhu, Jastimadhu
Punjabi	:	Jethimadh, Mulathi
Tamil	:	Athimadhuram
Telugu	:	Atimadhuramu
Urdu	:	Mulethi, Asl-us-sus

DESCRIPTION

a) Macroscopic

Stolon consists of yellowish brown or dark brown outer layer, externally longitudinally wrinkled, with occasional small buds and encircling scale leaves, smoothed transversely, cut surface shows a cambium ring about one-third of radius from outer surface and a small central pith, root similar without a pith, fracture, coarsely fibrous in bark and splintery in wood, odour, faint and characteristic, taste, sweetish.

b) Microscopic

Stolon- transverse section of stolon shows cork of 10-20 or more layers of tabular cells, outer layers with reddish-brown amorphous contents, inner 3 or 4 rows having thicker, colourless walls, secondary cortex usually of 1-3 layers of radially arranged parenchymatous cells containing isolated prisms of calcium oxalate, secondary phloem a broad band, cells of inner part cellulosic and outer lignified, radially arranged groups of about 10-50 fibres, surrounded by a sheath of parenchyma cells, each usually containing a prism of calcium oxalate about 10-35 µ long, cambium form tissue of 3 or more layers of cells, secondary xylem distinctly radiate with medullary rays, 3-5 cells wide, vessels about 80-200 µ in diameter with thick, yellow, pitted, reticulately thickend walls, groups of lignified fibres with crystal sheaths similar to those of phloem, xylem parenchyma of two kinds, those between the vessels having thick pitted walls without inter-cellular spaces, the remaining with thin walls, pith of parenchymatous cells in longitudinal rows, with inter-cellular spaces.

Root-transverse section of root shows structure closely resembling that of stolon except that no medulla is present, xylem tetrarch , usually four principal medullary rays at right angles to each other, in peeled drug cork shows phelloderm and sometimes without secondary phloem all parenchyrnatous tissues containing abundant, simple, oval or rounded starch grains, 2-20 µ in length.

IDENTITY, PURITY AND STRENGTH

Total Ash	Not more than	10	per cent, Appendix	2.2.3.
Acid-insoluble ash	Not more than	2.5	per cent, Appendix	2.2.4.
Alcohol-soluble extractive	Not less than	10	per cent, Appendix	2.2.6.
Water-soluble extractive	Not less than	20	per cent, Appendix	2.2.7.

CONSTITUENTS - Glycyrrhizin, glycyrrhizic acid, glycyrrhetinic acid, asparagine, sugars, resin and starch

PROPERTIES AND ACTION

Rasa : Madhura

Guṇa : Guru, Snigdha

Vīrya : Śīta

Vipāka : Madhura

Karma : Vātapittajit, Raktaprasādana, Balya, Varṇya, Vṛṣya, Cakṣuṣya

IMPORTANT FORMULATIONS - Elādi Guṭikā, Yaṣṭīmadhuka Taila, Madhuyaṣṭyādi Taila

THERAPEUTIC USES - Kāsa, Svarabheda, Kṣaya, Vraṇa, Vātarakta

DOSE - 2-4 g of the drug in powder form.

YAVĀNĪ (Fruit)

Yavānī consists of dried fruit of *Trachyspermum ammi* (Linn.) Sprague ex Turril Syn. *Carum copticum* Benth & Hook. f. *Ptychotis ajwan* DC. (Fam. Umbelliferae), an annual, erect herb, upto 90 cm tall, cultivated almost throughout India, uprooted and thrashed for collecting the fruits

SYNONYMS

Sanskrit	:	Dīpyaka, Yamāni, Yamānikā, Yavānikā
Assamese	:	Jain
Bengali	:	Yamani, Yauvan, Yavan, Javan, Yavani, Yoyana
English	:	Bishop's weed
Gujrati	:	Ajma, Ajmo, Yavan, Javain
Hindi	:	Ajwain, Jevain
Kannada	:	Oma, Yom, Omu
Malayalam	:	Oman, Ayanodakan
Marathi	:	Onva
Oriya	:	Juani
Tamil	:	Omam
Telugu	:	Vamu
Urdu	:	--

DESCRIPTION

a) Macroscopic

Fruit, consists of two mericaprs, greyish brown, ovoid, compressed, about 2 mm long and 1 mm wide with pale coloured protuberances, 5 ridges and 6 vittae in each mericarp, usually separate, 5 primary ridges pale in colour, odour, characteristic, thymolic, taste, pungent.

b) Microscopic

Transverse section of fruit shows two hexagonal structures attached with each

other by a carpophore, epicap consists of a single layer of tangenitially elongated tabular cells, externally covered with cuticle at some places having thick-walled, unicellular trichomes as protuberances with serrate wall, mesocarp consists of moderately thick-walled, rectangular to polygonal tangentially elongated cells having some vascular bundles and vittae, carpophore present as groups of thick-walled radially elongated cells, integument, barrel shaped of tangentially elongated cells, endosperm consists of thin-walled cells filled with oil globules, embryo, small and circular, composed of polygonal thin walled cells.

Powder-Oily, greyish-brown, under microscope, presence of Oil globules and groups of endosperm cells, characterised.

IDENTITY, PURITY AND STRENGTH

Foreign matter	Not more than	5 per cent, Appendix	2.2.2.
Total Ash	Not more than	9 per cent, Appendix	2.2.3.
Acid-insoluble ash	Not more than	0.2 per cent, Appendix	2.2.4.
Alcohol-soluble extractive	Not less than	2 per cent, Appendix	2.2.6.
Water-soluble extractive	Not less than	13 per cent, Appendix	2.2.7.
Volatile Oil	Not less than	2.5 per cent, Appendix	2.2.10.

CONSTITUENTS - Essential oil and fixed oil

PROPERTIES AND ACTION

Rasa : Kaṭu, Tikta

Guṇa : Rūkṣa, Laghu, Tīkṣṇa

Vīrya : Uṣṇa

Vipāka : Kaṭu

Karma : Dīpana, Pācana, Rucya, Anulomana, Śūlahara, Kṛmighna

IMPORTANT FORMULATIONS - Yavānī Ṣāḍava

THERAPEUTIC USES - Ādhmāna, Ānāha, Udararoga, Gulma, Kṛmiroga, Śūla

DOSE - 3-6 g of the drug in power form