THE AYURVEDIC PHARMACOPOEIA

OF INDIA

THE AYURVEDIC PHARMACOPOEIA

OF INDIA

PART - II (FORMULATIONS)
VOLUME - I

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GOVERNMENT OF INDIA
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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-II, Vol. I, is the book of standards for compound formulations included therein and the standards prescribed in the Ayurvedic Pharmacopoeia of India, Part-II, (Formulation) Vol. I, would be official. If considered necessary these standards can be amended and the Chairman of the Ayurvedic Pharmacopoeia Committee's authorised to issue such amendements. Whenever such amendments are issued the Ayurvedic Pharmacopoeia of India, Part-II (Formulation), Vol. I, would be deemed to have been amended accordingly.

GENERAL NOTICES

Title : The title of the book is "Ayurvedic Pharmacopoeia of India, Part-II (Formulations) Volume-I. Wherever the abbreviation "API, Pt.-II,Vol.-I" is used, it may be presumed to stand for the same and the supplements or amendments thereto.

Name of the Formulation: The name given on top of each monograph is in Samskrt, as mentioned in the Ayurvedic Formulary of India (AFI) and will be considered official. These names have been arranged in English alphabetical order under each category of dosage form.

Ingredients and Processes: Formulations are prepared from individual ingredients that comply with the requirements for those individual ingredients for which monographs are provided in the volumes of API, Part-I. Where water is used as an ingredient it should meet the requirements for Potable Water covered by its monograph in the Ayurvedic Pharmacopoeia of India-Part-I.

Monograph for each formulation includes the full composition together with directions for its preparation. Such composition and directions are intended for preparation of small quantities for short-term supply and use. When so prepared, no deviation from the stated composition and directions is permitted. However, if such a preparation is manufactured on a large scale with the intention of sale or distribution, deviations from the directions given are permitted, but maintaining the same ratio as stated in the monographs with the ingredients complying with the compendial requirements, and also that the final product meets the following criteria:

(a) complies with all of the requirements stated in the monograph on compound formulations,

(b) in the composition of certain formulations it has been allowed that a specified part of the plant may be substituted by another part of the same plant. In such cases the manufacturer should mention on the label the actual part of the plant used in the formulation.

(c) wherever an 'official substitute' is provided for, deviation from the original formulation is permitted, using the 'official substitute'.

(d) wherever a formulation composition specifies a drug that is banned from commerce, this may be omitted, and the fact mentioned on the label.

If a preparation is intended to be stored over a period of time, deterioration due to microbial contamination may be inhibited by the addition to the formula of a permitted preservative. In such circumstances the label should state the concentration of the preservative and the appropriate storage conditions. It is implied that such a preparation will be effectively preserved according to the appropriate criteria applied.

The direction that an ingredient in a formulation must be freshly prepared indicates that it must be prepared and used within 24 hours.

Monograph: Each monograph begins with a definition and introductory paragraph indicating the formulation composition, scientific names of the drugs used with their botanical parts along with a brief account of the method of preparation.

The requirements given in the monographs are not framed to provide against all impurities, contaminants or adulterants; they provide appropriate limits only for possible impurities that may be permitted to a certain extent. Material found to contain an impurity, contaminant or adulterant which is not detectable by means of the prescribed tests are also to be considered as impurity should rational consideration require its absence.

Standards: For statutory purposes, the following shall be considered official standards: Definition, Formulation composition, Identification, Physico-chemical parameters, Assay and Other requirements.

Added Substances: A formulation contains no added substances except when specifically permitted in the individual monograph. Unless otherwise specified in the individual monograph, or elsewhere in the General Notices, suitable substances may be added from the approved list of Drugs and Cosmetics Rules, under Rule 169 to a formulation to enhance its stability, usefulness, elegance, or to facilitate its preparation. Such auxiliary substances shall be harmless in the amounts used, shall not exceed the minimum quantity required to provide their intended effect, shall not impair the therapeutic efficacy or the bioavailability and safety of the preparation and shall not interfere with the tests and assays prescribed for determining compliance with the official standards. Particular care should be taken to ensure that such substances are free from harmful organisms. Though the manufacturer of a formulation is given the freedom to use an added substance, the manufacturer must guarantee the innocuousness of the added substance. The manufacturer shall also be responsible to explain to the appropriate authority, if needed, regarding the purpose of the added substance(s).

Description: Statement given under this title is not to be interpreted in a strict sense although they may help in the evaluation of an article. However substantial departure form the requirement will not be acceptable.

Capital Letters in the Text: The names of the Pharmacopoeial substances, preparations and other materials in the text are printed in capital initial letters, and these infer that materials of Pharmacopoeial quality have been used.

Italics: Italic types are used for Scientific names of the plant drugs and microorganisms, and for some sub-headings and certain notations of the chemical names. Italic types have also been used for words which refer to solvent system in TLC procedure, reagents and

substances, processes covered under Appendices. Chemicals and Reagents and Substances of Processes in Appendices have also been printed in Italics.

Odour and Taste: Wherever a specific odour has been observed it has been mentioned as characteristic for that formulation, but the description as 'odourless' or 'no odour' has generally been avoided in the Description where a substance has no odour. Where a characteristic odour is said to be present it is examined by smelling the drug directly after opening the container. If such an odour is discernible, the contents are rapidly transferred to an open vessel and re-examined after 15 minutes. If odour persists to be discernible, the sample complies with the description for odour, characteristic for that formulation.

The taste of a drug is examined by taking a small quantity of drug by the tip of moist glass rod and allowing it on tongue previously moistened with water. *This does not apply in the case of poisonous drugs.*

Powder fineness: Wherever the powder of a drug is required, it shall comply with the mesh number indicated in the Monograph.

Where particle size is prescribed in a Monographs, the specified sieve number are used to fractionate a weighed representative sample from the container, each fraction weighed separately, and expressed as a percentage of the weight taken initially, to obtain compliance with the monograph.

Weights and Measures: The metric system of weights and measures is employed. Weights are given in multiples or fractions of a gram (g) or of a milligram (mg). Fluid measures are given in multiples of fraction of milliliter (ml). 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.

When the term "drop" is used measurement is to be made by means of a tube which delivers 20 drops per gram of distilled water at 15^0.

Identity, Purity and Strength: Under the heading "Identification", tests are provided as an aid to identification and are described in the respective monographs. Microscopical characters are prescribed for the individual ingredients where these do not exceed ten in number, added '*in situ*'. Appendix 2.1 gives detailed procedure

Vegetable drugs used 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 any sign of deterioration.

The quantitative tests like total ash, acid-insoluble ash, water-soluble ash, alcohol-soluble extractive, water-soluble extractive, moisture content, volatile oil content

and assays are the parameters upon which the standards of Pharmacopoeia depend. Except for Assays, which are covered under each monograph, the methods of determination for others are given in Appendices, with a suitable reference to the specific appendix.

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 described under assay. However, in the event of doubt or dispute the methods of analysis of the Pharmacopoeia are alone authoritative. Unless otherwise prescribed, the assays and tests are carried out at a temperature between 20^0 and 30^0.

In the performance of assay or test procedures, not less than the specified number of dosage units should be taken for analysis. Proportionately larger or smaller quantities than the specified weights and volumes of assay or test substances and Reference Standards or Standard Preparations may be taken, provided the measurement is made with at least equivalent accuracy and provided that any subsequent steps, such as dilutions, are adjusted accordingly to yield concentrations equivalent to those specified and are made in such manner as to provide at least equivalent accuracy.

Where it is directed in the assay for Tablet formulation to "weigh and powder not less than" a given number, usually 20, of the tablets, it is intended that a counted number of tablets shall be weighed and reduced to a fine powder. Likewise, where it is directed in the assay for Capsules to remove, as completely as possible, the contents of not less than a given number, usually 20, of the capsules, it is intended that a counted number of capsules should be carefully opened and the contents quantitatively removed, combined, mixed, and weighed accurately. The portion of the powdered tablets or the mixed contents of the capsules taken for assay is representative of the whole tablets or capsules, respectively, and is, in turn, weighed accurately. The result of the assay is then related to the amount of active ingredients per tablet in the case of tablets and per capsule in the case of capsules from the weight of contents of each tablet/capsule.

Limits for Heavy metals, Microbial load, Pesticide residues and Aflatoxins : Formulations included in this volume are required to comply with the limits for heavy metals, microbial load, pesticide residues and aflatoxins prescribed in individual monographs and wherever limit is not given they must comply with the limits given in Appendix. The methods for determination of these parameters are given in Appendices.

Thin Layer Chromatography (TLC): Under this title, wherever given, the R_f values given in the monographs are not absolute but only indicative. The analyst may use any other solvent system and detecting reagent to establish the identity of any particular chemical constituent reported to be present in the formulation. However in case of dispute the pharmacopoeial method would prevail. Unless specified in the individual monograph all TLC have been carried out on pre-coated Silica gelG F_{254} aluminium plates.

Reference Standards: Reference substance and standard preparation are authentic substances that have been verified for there suitability for use as standards for comparison in some assays, tests and TLC of the API.

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

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 grams of active substance in 100 grams of product.

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

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

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

Percentage of Alcohol: All statements of percentage of alcohol (C_2H_5OH) refer to percentage by volumes at 15.56^0c.

Temperature: Unless otherwise specified all temperatures refer to centigrade (Celsius), thermometric scale and all measurement are made at 25^0.

Solutions: Unless otherwise specified in the individual monograph, all solutions are prepared with Purified Water.

Reagents and Solutions: Reagents required for the assay and tests of the Pharmacopoeia are defined in the Appendix showing the nature, degree of the purity and strength of solutions to be made from them.

Filtration: Where it is directed to filter, without further qualification, it is intended that the liquid be filtered through suitable filter paper or equivalent device until the filtrate is clear.

Soluble substances: The following table indicates the meaning of degree of solubilities:

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

The term 'partly soluble' is used to describe a mixture of which only some of the components dissolve.

Therapeutic uses: Therapeutic uses of the formulations mentioned in this Pharmacopoeia are as given in the Ayurvedic Formulary of India.

Doses: The doses mentioned in each monograph are in metric system which are the approximate conversions from classical weights mentioned in Ayurvedic texts. A conversion table is appended giving classical weights with their metric equivalents.(Appendix 7) Doses mentioned in the Ayurvedic Pharmacopoeia of India (API) 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. They are not to be regarded as binding upon the prescribers.

The medical practitioner will exercise his own judgment and act on his own responsibility in respect of the amount of the formulation he may prescribe or administer or on the frequency of its administration. If it is usual to administer a medicine by a method other than by mouth, the single dose suitable for that method of administration is mentioned.

Storage: Statement under the heading 'Storage' constitutes non-mandatory advice. The substances and preparations of the Pharmacopoeia are to be stored under conditions that prevent contamination and, as far as possible, deterioration. Precautions that should be taken in relation to the effects of the atmosphere, moisture, heat and light are indicated, where appropriate, in the individual monographs.

Specific directions are given in some monographs with respect to the temperatures at which Pharmacopoeial articles should be stored, where it is considered that storage at a lower or higher temperature may produce undesirable results. The conditions are defined by the following terms.

Cold- Any temperature not exceeding 8^0 and usually between 2^0 and 8^0. A refrigerator is cold place in which the temperature is maintained thermostatically between 2^0 and 8^0.

Cool- Any temperature between 8^0 and 25^0. An article for which storage in a cool place is directed may, alternately, be stored in a refrigerator, unless otherwise specified in the individual monograph.

Room temperature-The temperature prevailing in a working area.

Warm- Any temperature between 30^0 and 40^0.

Excessive heat- Any temperature above 40^0.

Protection from freezing- Where, in addition to the risk of breaking of the container, freezing results in loss of strength or potency or in destructive alteration of the characteristics of an article the label on the container bears an appropriate instruction to protect from freezing.

Storage under non-specific conditions- Where no specific storage directions or limitations are given in the individual monograph, it is to be understood that the storage conditions include protection from moisture, freezing and excessive heat.

Containers: The container is the device that holds the article. The immediate container is that which is in direct contact with the article at all times. The closure is a part of the container.

The container is designed so that the contents may be taken out for the indented purpose in a convenient manner. It provides the required degree of protection to the contents from the environmental hazards.

The container should not interact physically or chemically with the article placed in it so as to alter the strength, quality or purity of the article beyond the official requirements.

Prior to its being filled, the container should be clean. Special precautions and cleaning procedures may be necessary to ensure that each container is clean and that extraneous matter is not introduced into or onto the article.

Light-resistant Container- A light resistant container protects the contents from the effects of actinic light by virtue of the specific properties of the material of which it is made. Alternatively, a clear and colourless or a translucent container may be made light-resistant by means of an opaque (light-resistant) covering and/or stored in a dark place: in such cases, the label on the container should bear a statement that the opaque covering or storage in dark place is needed until the contents have been used up.

Well-closed Container- A well-closed container protects the contents from extraneous solids and liquids and from loss of the article under normal conditions of handling, shipment, storage and distribution.

Tightly-closed Container- A tightly-closed container protects the contents form contamination by extraneous liquids solids or vapours, from loss or deterioration of the article from effervescence, deliquescence or evaporation under normal conditions of handling, shipment, storage and distribution.

Single Unit Container- A single unit container is one that is designed to hold a quantity of the drug product intended for administration as a single finished device intended for use promptly after the container is opened. The immediate container and/or outer container or protective packaging is so designed as to show evidence of any tampering with the contents.

Multiple Unit Container- A multiple unit container is container that permits withdrawals of successive portions of the contents without changing the strength, quality or purity of the remaining portion.

Tamper-evident Container- A tamper-evident container is fitted with a device or mechanism that reveals irreversibly whether the container has been opened.

Labelling: In general, the labeling of drugs and pharmaceuticals is governed by the Drugs and Cosmetics Act, 1940 and Rules there under.

ABBREVIATIONS FOR TECHNICAL TERMS

gram(s)	-	-	g
milligram(s)	-	-	mg
kilogram(s)	-	-	kg
milliliter(s)	-	-	ml
litre(s)	-	-	l
hour(s)	-	-	h
minute(s)	-	-	min
second(s)	-	-	sec
0_C	-	-	0
Micron	-	-	µ
ortho	-	-	*o*
meta	-	-	*m*
para	-	-	*p*
parts per million	-	-	ppm
parts per billion	-	-	ppb
volume	-	-	vol
weight	-	-	wt
weight in weight	-	-	w/w
weight in volume	-	-	w/v
volume in volume	-	-	v/v
quantity sufficient	-	-	Q.S.

ABBREVIATIONS FOR PARTS OF PLANTS

Aerial root	-	-	A. Rt.
Androecium	-	-	Adr.
Aril	-	-	Ar.
Bulb	-	-	Bl.
Exudate	-	-	Exd.
Flower	-	-	Fl.
Fruit	-	-	Fr.
Fruit rind	-	-	Fr. R.
Heart wood	-	-	Ht. Wd.
Inflorescence	-	-	Ifl.
Kernel	-	-	Kr.
Leaf	-	-	Lf.
Leaf rachis	-	-	Lf. R.
Latex	-	-	Lx.
Pericarp	-	-	P
Plant (whole)	-	-	Pl.
Rhizome	-	-	Rz.
Root	-	-	Rt.
Root bark	-	-	Rt. Bk.
Root tuber	-	-	Rt. Tr.
Seed	-	-	Sd.
Stamens	-	-	Stmn.
Stem	-	-	St.
Stem bark	-	-	St. Bk.
Stem tuber	-	-	St. Tr.
Style & stigma	-	-	Stl./Stg.
Ripe fruit Pulp	-	-	Rp. Fr. Pp.
Subterranean root tuber	-	-	Sub. Rt. Tub.
Subterranean root	-	-	Sub. Rt.

PREFACE

1. Ayurveda is the most ancient science of life having a holistic health approach. The preparation of medicines i.e. pharmacy is an integral part of this science, and evolved from a very rudimentary form. In ancient times, the preparation of medicine was part of the practising physician's functions. The preparation of medicine was limited, selective and at personal level only. Hence the methodology of preparation and quality parameters more or less differed from Vaidya to Vaidya. In vedic times the practice of medicine was a personal mission without any monetary motive, and exclusively for the recovery of ailing people. Later on, this attitude changed and the profession was followed with a profit motive. The manufacture of Ayurvedic medicines also began on a larger scale. Since the last 40 years Ayurvedic practice has assumed business proportions and the manufacture of Ayurvedic drugs are on a commercial scale.

2. Ayurvedic science is dynamic and progressive. It gives importance to therapeutic strategy. The four pillars of treatment are said to be the Physician, the Medicine, the Auxiliary Staff and the Patient. In the classics, it is clearly explained that an ideal medicine should have multiple actions, should be available in different dosage forms, should possess all the required attributes suited to a patient to rid him of the disease and be devoid of any adverse effects.

3. In ancient texts the quality parameters for raw drugs and finished products including compound formulations are well described and moreover this is in practices. It is mentioned how to collect the plant material, auspicious day and specific time with offering prayer to the plant that the material to be procured will be used for the welfare of the humanity.
   Procurement of plant material in a particular time has a strong scientific base, like for collection of latex, it is advised to collect latex before sunrise to get good quality and quantity of material. Similarly after procurement of the material, use of plant material after a specific period of storage is described. For example *Vidanga* (*Embilia ribes*, seeds) are advise are to be used after one year of its procurement as the percentage of embelin (active phyto-constituents) will be stable and quantity will be more compared to freshly procured sample. This reflects the quality assurance parameters.

4. The Ayurvedic pharmaceutical preparations were evolved gradually from a simpler form to more complex forms based on plants and plant–mineral combinations. During early period, particularly in Charakacharya's time, the pharmaceutical preparations were primarily in five simple forms, which were collectively termed as "*Pa®cavidha Ka¼āya Kalpanās*". Apart from this, a number of other dosage forms were described in *Caraka Samhitā* such as *Āsava, Ārista, Cūr´a, Avaleha, K¼īrapāka, Va"aka, Varti, Taila, Gh¨ta, Lepa, Mantha, Ayask¨iti* etc. for various purposes.

5. During the period of Susruta also, a few new pharmaceutical preparations and aids were introduced, as for example *K¾āra, K¾ārodaka, K¾ārasutra, Masi, Vikesika* etc. In *A¾°a¬ga Sa¬graha* and *H¨daya* more or less similar pharmaceutical preparations were mentioned as described in the earlier texts like *Caraka* and *Susruta Sa¼hitā.* During the time of 11th AD, *Cakradatta,* added a few more preparations like *Kha´²a, Parpa*ī etc. The significant contribution of *Cakradatta* is an elaborate description of *K¾ārasūtra*.

6. *Śar¬gadhara Sa¼hitā*, which was written during 14th AD, gave new dimensions to Ayurvedic pharmacy. This book is considered as an authoritative text for Ayurvedic pharmacy. Many new pharmaceutical preparations like *Malahara, Sukta, Phala Varti* etc were defined with explanations. The concept of Phala Varti, though available in Caraka Sa¼hitā, its use was extended to urethral and vaginal disorders by *Ā²hamalla*.

7. Later, *Yoga Ratnākara* introduced a few innovative drug delivery systems and pharmaceutical preparations like *Sūcikabharana Rasa*, which were to be administered in micro quantities into the blood through scratch made by the tip of a needle. A detailed description of *Satva,* extraction with reference to *Gu²ūcī Satva* was explained, which is a reductionist approach to dosage forms.

8. During 18th A.D., *Bhaisajya Ratnāvalī*, listed a few more pharmaceutical preparations like Mūrchita Taila. Such concepts can also be observed in the commentaries on *Śār¬gādhara Sa¼hitā,* but the purpose of both the *M*ū*rchana* processes is different. Commentators on *Śār¬gādhara Sa¼hitā* advised the process of *M*ū*rchana* for removing excess water content and other unwanted residues if any from the formulated oil, while in *Bhai¾ajya Ratnāvalī* the process was advised to be followed in the expressed oil prior to use in the formulation.

9. The numbers of compound formulations are very huge, even more than 75,000, and of varied nature, using plant, mineral and animal sources. Another important characteristic feature of Ayurvedic compound formulations is that of their availability in different dosage forms such as *c*ū*r´a, gu*ī*, va*ī*, taila, gh¨ta, kvātha, āsava, avaleha, bhasma, parpa*ī*, po°°alī, malahara, lepa, pānaka* etc.

10. In recent times, even encapsulating an Ayurvedic drug in capsules is prevalent, in harmony with advancement of science and technology. Though this seems to be new to Ayurvedic sciences, the concept of encapsulating has been in tradition since centuries. For example, metallic preparations were embedded in Jaggery or banana, and such other palatable materials.

11. Ayurvedic Compound Formulations are complex in nature. The pharmaceutical processes involve any one or more of the following steps:

1. *Ansuobhedana*	Fine cutting
2. *Apakar¾a´a*	Elimination
3. *Abhiśavana*	Fermentation
4. *Avaśi®cana*	Sprinkling
5. *¡dityapāka*	Sun-cooking
6. *Ālo²ana*	Mixing a liquid
7. *Upakodana*	Baking of Cakrikas
8. *Kledana*	Moistening
9. *K¾odana/Cūrnana*	Pulverization
10. *Kha´²asaªchedana*	Cutting into pieces
11. *Jarjarikarna*	Disintegration
12. *Tāpana*	Heating
13. *Dahana*	Burning
14. *Dhūpana*	Fumigation
15. *Nirvāpa´a*	Dipping in liquid
16. *Niśkulīkarana*	Elimination of seeds
17. *Niśkvatha´a*	Boiling
18. *Niśpavana*	Winnowing
19. *Paripavana/Gālana*	Filtration
20. *Paripāna*	Soaking
21. *Parisrāva´a*	Decantation
22. *Pī²ana*	Compression
23. *Pe¾a´a*	Grinding
24. *Pu°apāka*	Heating in a closed vessel
25. *Praksālana*	Washing
26. *Pratīvāpana*	Addition
27. *Bharjana*	Roasting
28. *Bhāvānā*	Impregnation
29. *Manthana*	Churning
30. *Rasagrahana*	Extraction
31. *Vipācana*	Cooking
32. *Śodhana*	Purification
33. *Śo¾a´a*	Desiccation
34. *Ātapaśo¾a´a*	Sun-drying
35. *Chāyāso¾a´a*	Drying in shade
36. *Sadhana*	Preparation and
37. *Śvedana*	Steaming etc.

12. Any one or more of the above said processes will be integral part of Ayurvedic drug manufacturing. It is a challenging exercise to define and standardize the

above processes, and establish quality parameters for different ingredients before and during the manufacturing process as well as for the final product.

13. At present in the industry, very few generalized quality parameters are adopted. Some pharmaceutical firms may be having their in-house standard method of operations, and quality parameters for finished compound formulations. But there is no uniformity in the operating procedures i.e. in the method of preparations. This is sometimes responsible for one and the same formulation by name having different qualities in the finished products, and not having reproducibility. An effort has been made now to optimize the method of preparation, so that such differences between manufacturer's products in the market are not beyond reasonable limits.

14. It was again during the last 100 years of colonial rule, that economic conditions in India changed, a process of urbanization began and it was during this period that the Ayurvedic physicians took to cities and lost their contact with forests and drug sources. It was during this period that as a consequence of better transport facilities, the crude drug supplying agencies came up and commercial manufacture of Ayurvedic Medicines on mass scale in factories started. These were the inevitable consequences of the socio-economic changes in the country. The new economic set up was such that the Ayurvedic practitioner could no longer process and prepare his own medicines but had to depend on commercial sources for supply of crude drugs to whatever extent he needed them. There was, in a way, a forced division of professional responsibilities where the *vaidya* had no choice but to purchase his drugs. Nor had he any means to ascertain the authenticity of the medicines and formulations supplied to him. There was no Governmental control on manufacturers to ensure the quality of the marketed medicines prescribed by *vaidyas* and administered to their patients.

15. The conditions prevailing in India prior to Independence were quite discouraging for indigenous medicines to make any progress. But, during the post-independence era, many scientists took active interest in preserving the legacy of Ayurveda and other indigenous systems.

16. As an outcome of the first Health Minister's Conference of 1946, a Committee under the Chairmanship of Lt. Col. R. N. Chopra was appointed in 1946 by the Government of India. It was the Chopra Committee that had first gone into the question of need for proper identification of Ayurvedic medicinal plants as available in the bazaar, control over collection and distribution of crude drugs and made positive recommendations for compilation of an Ayurvedic Pharmacopoeia. Thereafter, the Dave' Committee [1955] reiterated the recommendations for compilation of an Ayurvedic Pharmacopoeia.

17. The Government of Bombay, was especially interested in the survey of resources of Ayurvedic Drugs, their collection, cultivation, farming, distribution and

standardization. They, therefore had appointed a Committee for Standard and Genuine Ayurvedic Herbs and Drugs in 1955 and subsequently after receiving its report, appointed a second committee with fresh set of terms of reference, called the Committee for Standard Ayurvedic Herbs and Drugs in 1957 both under the Chairmanship of Vaidya Bapalal Shah, of which Professor A. N. Namjoshi was the Member Secretary. The Bapalal Committee had very elaborately recommended the compilation of the Ayurvedic Pharmacopoeia as an urgent prerequisite for effective control of Ayurvedic Drugs to ensure quality assurance. Finally Government of India appointed the "Ayurvedic Research Evaluation Committee", under the Chairmanship of Dr. K. N. Udupa (1958) which had strongly highlighted the urgency of the compilation of an Ayurvedic Pharmacopoeia.

18. In compliance with some of these recommendations, the Union Government as also some of the State Governments had started taking positive steps. The Government of Bombay State established its Board of Research in Ayurveda, Bombay in 1951, which was subsequently reconstituted in 1955 and 1958. The Government of India established CCRIMH in 1969 for research in all aspects including drug standardization in Indian Medicine & Homeopathy. This Council was divided into 4 research councils in 1978 and the research work in Ayurveda & Siddha was entrusted to the Central Council for Research in Ayurveda & Siddha. The PLIM at Ghaziabad was established in 1970 for testing and standardization of single drugs and compound formulations. Under the auspices of the Central Council for Research in Ayurveda and Siddha, several survey units in different States were established and work of standardization of single drugs and compound medicines as also composite research work was initiated. The first Ayurvedic Pharmacopoeia Committee was constituted in 1962 under the Chairmanship of Col. Sir Ram Nath Chopra. The Committee was reconstituted in 1972 under the Chairmanship of Prof. A.N.Namjoshi to continue the work of compilation of the Ayurvedic Formulary of India as a pre-requisite for undertaking the work of Ayurvedic Pharmacopoeia of India. The first part of the Ayurvedic Formulary was published in 1978 and the second part in 2000. A revised edition of the first part also brought out in 2003.

19. After publication of the First and the Second part of the Ayurvedic Formulary of India Part-III of the Formulary is under preparation.

20. The First and Second Part of the Ayurvedic Formulary of India comprising of some 444 and 191 formulations respectively cover more than 351 single drugs of plant origin. This covers about 500 priority drugs of plant origin for which monographs have been evolved and included in several volumes of Ayurvedic Pharmacopoeia of India.

21. As a fallout of the growing interest in the renaissance of Ayurveda and the systematic efforts to investigate into the merits of this ancient science during the

post-independence period, it is of significance that the western or modern system of medicine, with its formidable armoury of synthetic drugs, chemo-therapeutic agents and antibiotics, has slowly come to terms with the adverse side effects and toxicity of synthetic drugs. The western world has now turned its attention to traditional medicines based on drugs of natural origin. An appreciation of the basic tenets of Ayurvedic therapeutics, which initially appeared to be rather abstract and difficult to interpret in terms of modern medical sciences, has now emerged, resulting in new branches of pharmacology such as pharmacogenomics.

22. With the introduction of a uniform system of Ayurvedic education all over the country, a process initiated some 50 years ago, there would be some uniformity in the education in pharmacy, pharmaceutical technology, pharmaceutical chemistry, pharmacognosy and research. With the physician and the patient needing to be assured of the quality of the medicine through research, such an advance in Ayurvedic education would have a positive effect.

23. In the absence of official standards published by Government for statutory purposes, Ayurvedic Pharmaceutical Industry in particular has been experiencing several handicaps in implementing in house standards, as in any case, they need to comply with official standards.

24. The publication of the Ayurvedic Formulary of India and the Ayurvedic Pharmacopoeia of India would now enable the Government to implement the Drugs and Cosmetic Act, 1940 in respect of quality control for the Ayurvedic, Siddha, Unani drug manufacturers, distributed and sold in India, under a license granted by it.

25. The Ayurvedic Pharmacopoeia Committee has laid down standards for single drugs based on experimental data worked out at the PLIM, Ghaziabad and in some of the units of the Central Council for Research in Ayurveda and Siddha. Published scientific literature on the subject, although scanty, has also been collected and included after due verification.

26. The western countries did pass through the same phase over 150 years ago for their medicines, their characteristics, methods of preparation and identity, purity and strength. Research towards this end was vigorous and out of the scientific data contributed by the scientists in research institutes and industry, the pharmacopoeial monographs of drugs were drafted. As a result pharmacopeiae of the western world show considerable uniformity in principles, approach and information. Thus, while for compilation of the British Pharmacopoeia, information and scientific data was available, for the compilation of the Ayurvedic Pharmacopoeia little information and published data existed and the Ayurvedic Pharmacopoeia Committee had to do a lot of spade work.

27. The Part I of Ayurvedic pharmacopoeia of India consists of Vol-I, II, III, IV and V comprising respectively 80, 78, 100, 68 and 92 monographs prescribing standards for Ayurvedic *single drugs* of plant origin, which go into one or more formulations admitted to the Ayurvedic Formularies of India, Part-I and Part-II. The Part-II of the Ayurvedic Pharmacopoeia consists of official standards for 50 *compound formulations* present in the Ayurvedic Formulary of India Part-I and Part-II.

28. The title of the monograph for each compound formulation is given in Samskrit, as in the Ayurvedic Formulary of India. This is followed by the Definition, Formulation Composition, Method of Preparation, a brief Description of the compound formulation, standards for Identity and Purity in so far as they are reflected by microscopy and physico chemical parameters. Other requirements such as tests for heavy metals, microbial content have also been prescribed. Information on therapeutic uses, dose, administration and storage is included. The raw material which complies with the standards of API were selected for developing standards for compound formulations. In a few cases, where such standards were not available, the collaborator developed them and used them as standards for that raw material.

29. The monograph gives limits under Assay, for any one constituent or group of constituents like total alkaloids or total volatile oils. In the case of water soluble or alcohol soluble extractives a minimum lower limit has been given. For impurities like Ash, Acid insoluble Ash etc, a maximum upper limit has been given. It is a well known fact that there is wide variation in such values for crude drugs of plant origin in respect of their chemical contents. Therefore, such variations had to be taken into consideration in laying down minimum and maximum standards for the compound formulations.

30. The General Notices provide guidance for the manufacturers and analysts. Official details of Apparatus, Reagents and solutions, Methods of tests, preparation of sample for microscopical examination have all been given the Appendices.

31. The Committee hopes that with the publication of Ayurvedic Pharmacopoeia of India Part-II (Formulations) Vol.-I, comprising of 50 compound formulations, would serve to exercise quality control and help in the implementation of the Drugs and Cosmetics Act. It is also expected that such implementation would create a feedback data, which is essential for improving the standards given in the pharmacopoeia.

32. The Committee urges the Government of India to recommend the adoption of these monographs for the purpose of defining Method of Preparation, Developing Standards for compound formulations for use in their Government, Semi-Government and Government aided institutions and voluntary public organizations. The Ayurvedic Pharmacopoeia of India, 2007, Part-II

(Formulations), Vol.-I may also be notified by Government as a book of standards for implementation of the Drugs and Cosmetics Act, 1940 all over India, just as the Ayurvedic Pharmacopoeia of India part I, Vol. I, II, III, IV and V have been included in the First Schedule of Drugs & Cosmetics Act 1940.

33. The Ayurvedic Pharmacopoeia Committee records with deep appreciation the contributions made by the Directors, Officer In-charges, Project Officers and scientific staff of all the collaborating laboratories and Institutions who were associated with the project work on developing Pharmacopoeial Standards for formulations allotted to them.

34. I am indebted to secretary Department of AYUSH, Ms. Anita Das for her constant inspiration and motivation for this unique work. My sincere thanks and credit to Joint Secretary, Department of AYUSH, Sh. Shiv Basant for providing constant support and strategic plan for completion of this first phase of task and momentum to on going work.

35. It is my duty to place on records our sincere thanks and appreciation to Dept. of AYUSH, Ministry of Health & Family Welfare, Govt. of India; State Governments, Institutions, Councils, Scientists and Ayurvedic Scholars, for their whole hearted co-operation in preparing the monographs on compound formulations. I sincerely thank all members of Ayurvedic Pharmacopoeia Committee for their dedicated efforts and hard work in finalizing the monographs. My thanks to Prof. S.S. Handa, Chairman; Dr. S.K. Sharma, Vice-Chairman; Miss. S. S Satakopan, Member; Prof. S.K. Dixit, Member; Prof. Ved Vrat Sharma, Member; Prof. V.K. Kapoor, Member; Dr.(Ms.) Shanta Mehrotra, Member; Dr. P.D. Sethi, Member; Dr. D.R. Lohar, Member; Prof. M.A. Iyengar, Member; Sh. J. K. Dhing, Member; Dr. J. Mohansundaram, Member; Dr. B. L. Gaur, Member; Prof. Siddhinandan Mishra, Member; Dr. P. K. Prajapati, Member; Dr. Narendra Bhatt, Member; Sh. Ranjit Puranik, Member; Prof. V. K. Joshi, Member; Prof. K.C. Chunekar, Member; Vd. Devender Triguna, Member; Dr. M.R. Uniyal, Member; Prof. V.V. Prasad, Member and Dr. Karan Vashisth, Expert member for their constant efforts in bringing out this volume. My thanks are also to Dr. MM Padhi, Deputy Director [Tech.]; Shri. Vasantha Kumar, Asst. Director [Chem.] Dr. Pramila Pant, Research Officer [Chem.], Dr. Rajiv Sharma, Senior Scientific Officer [Pharmacognosy], Sri. Ravinder Singh, Research Officer [Chem.], Dr. Jai Prakash, Research Officer [Chem.], Dr. Chhote Lal, Dr. AKS Bhadoria and Dr. MN Rangne, Dr. Bishnu Priya Dhar, Research Officer [Phar], Dr. Galib, Research Officer [Ayu.], Dr. K. Sandhya Rani, S.R.F. [Ayu.] and other associated officers, who contributed a lot in finalizing the volume. I am also thankful to Mr. Sandeep Kumar, D.E.O., who took pains in typing and arranging all the technical data into a final shape.

Dr. G.S. Lavekar
Director CCRAS & Member Secretary, APC

INTRODUCTION

The Ayurvedic system of medicine has been prevalent in India since the Vedic period, and still remains the mainstay of medical relief to over 60 per cent of the population of the nation. In earlier times the practitioners of Ayurveda (Vaidya) were themselves collecting herbs and other ingredients and preparing medicines. For the purpose of acquiring raw materials Vaidyas now depend on commercial organizations trading in crude herbal drugs. Likewise, with passage of time a number of Ayurvedic Pharmaceutical units have came up for the manufacture of Ayurvedic drugs and formulations on commercial scale.

Under the circumstances and responding to opinions of the scientific community after independence, the Govt. of India began a series of measures to introduce a quality control system, from 1964 onwards similar to that existing already under the Drugs and Cosmetics Act, 1940, for western medicine. The Government of India introduced an amendment in 1964 to the Drug and Cosmetics Act 1940, to control to a limited measure the Ayurvedic, Siddha and Unani drugs.

The Act was accordingly amended in 1964, to ensure only a limited control over the production and sale of Ayurvedic medicines namely:-

i. The manufacture should be carried out under prescribed hygienic conditions, under the supervision of a person having prescribed qualifications;

ii. The raw materials used in the preparation of drugs should be genuine and properly identified; and

iii. The formula or the true list of all the ingredients contained in the drugs should be displayed on the label of every container.

To start with, development of standards for the identity, purity and strength of single drugs and those of formulations at a later stage, assumed importance for the effective enforcement of the provision of the Act. If the raw materials to be used in a medicine and stage-by-stage processes of manufacturers are standardised, the final product namely, the compound formulation could be expected to conform to uniform standards. The requirement that the list of ingredients be displayed on the label will enable analysts to verify label claims. It will also ensure that the manufacture do not make false claim. Arrangements to evolve and lay down physical, chemical and biological standards, wherever even necessary, to identify the drugs and ascertain their quality and to detect adulterations are an urgent necessity of the profession. Setting up of Drug Standardisation Units, Research Centres, Drug Testing Institutes and Central Drug Laboratories for Ayurvedic Medicines both at national and regional level for this purpose are therefore, essential. The several Committees appointed by the Government of India to assess and evaluate the status and practice of Ayurvedic Medicine have stressed the

importance of preparing an Ayurvedic Pharmacopoeia, which is precisely a book of standards.

Having regard to all these considerations, the Central Council of Ayurvedic Research recommended the constitution of Ayurvedic Pharmacopoeia Committee consisting of experts on Ayurveda and other sciences. The Government of India accepted the recommendations of the Central Council of Ayurvedic Research and constituted the First Ayurvedic Pharmacopoeia Committee, vide their letter No. 14-8/62-ISM, dated the 20th September, 1962 for a period of three years with effect from the date of its first meeting under the Chairmanship of Col. Sir R.N. Chopra with the following member :-

1. Col. Sir Ram Nath Chopra, Drugs Research Laboratory, Srinagar.
Chairman

2. Vaidya B.V. Gokhale, 29/14-15, Erandavane, Deccan Gymkhana, Poona-4.
Member

3. Vaidya D.A. Kulkarni, Principal, Post Graduate, Training Centre in
Member
Ayurveda, Jamnagar.

4. Kaviraj B.N. Sircar, 779-780, Nicholson Road, Kashmere Gate, Delhi-6.
Member

5. Shri A.N. Namjoshi, Navyug Mansion, 19-A, Sleater Road, Bombay-7.
Member

6. Dr.B.B.Gaitonde, Profossor of Pharmacology, Grant Medical College,
Member
Bombay.

7. Dr. C.G. Pandit, Director, Indian Council of Medical Research, New Delhi.
Member

8. Dr. G.K. Karandikar, Dean, Medical College, Aurangabad.
Member

9. Dr. G.S. Pande, Honorary Director, Indian Drug Research Association,
Member
955-Sadashiv Peth, Lakshmi Road, Poona-2.

10. Dr. M.V. Venkataraghava, Chellakoti, Nungabakkum, Madras-34.
Member

11. Ayurvedachara Kaladi K. Parameswaran Pillai, Laksmivilasam *Member*

Vaidyasala, Vanchiyur, Trivandrum.

12. Dr. V. Narayanaswamy, 70, Tana Street, Vepeiy, Madras-7.
Member

13. Vaidya P.V.Dhamankar Shastri, Pardeshi Lane, Panvel, District Kolaba,
Member
Bombay.

14. S.K. Borkar, Drug Controller (India), Directorate General of Health Services,
Member
Government of India, New Delhi.

15. Shri Bapalal G.Vaidya, Principal, O.H. Nazar Ayurveda Mahavidyalaya,
Member
Surat.

16. Kumari Savita Satakopan, Drugs Control Laboratory,
Member
Near Polytechnic, National Highway 8, Baroda.

17. Vaidya Vasudev M. Dwivedi, Director of Ayurveda,
Member
Government of Gujrat, Ahmedabad.

18. Shri P.V. Bhatt, M.Sc., Chemist, The Ayurvedic Rasashala,
Member
Deccan Gymkhana, Poona.

19. Vaidya Ram Sushil Singh, Assistant Director of Ayurveda,
Member
Director of MedicalServices, (Ayurveda), Govt. of U.P.

20. Dr.Y. Kondal Rao,Secretary,
Member
Indian Medical Practitioner's Cooperative Pharmacy & Stores Limited,
Adyar, Madras-20.

21. Dr. V. Srinivasan, M.Sc., M.B.B.S., Ph.D., Director, Sarabhai
Member
Chemicals Research Institute, Shahibag, Ahmedabad-4.

22. Dr. C. Dwarakanath, Adviser in Indian System of Medicine, *Member Secretary*

Ministry of Health, New Delhi.

The Committee was assigned the following functions :-

1. To prepare an official Formulary in two parts :-

   (a) Single drugs, of whose identity and therapeutic value there is no doubt; and

   (b) Compound preparations, which are frequently used in Ayurvedic practice throughout the country.

2. To provide standards for drug and medicines of therapeutic usefulness or pharmaceutical necessity commonly used in Ayurvedic practice.

3. To lay down tests for identity, quality and purity.

4. To ensure as far as possible uniformity, physical properties and active constituents; and

5. To provide all other information regarding the distinguishing characteristics, methods of preparation, dosage, method of administration with various anupanas or vehicles and their toxicity.

As a first step in this direction the Ayurvedic Pharmacopoeia Committee started preparing the official Formulary of Ayurveda in two parts as mentioned under the assigned functions of the Committee. Since the work of preparation of Ayurvedic Formulary could not be completed after the expiry of first three years, the Government of India extended the term of the Committee by another three years vide their notification No. F. 20-1/66-RISM, dated 14th January, 1966 and a gain for a further period of three years vide their notification No. F. 1-1/69-APC, dated 9th January, 1969.

During the years that followed, Ayurvedic Formulary, Part I and II and Ayurvedic Pharmacopoeia of India, Part – I, Volume I - V were published, the former containing the compound formulations from classical Ayurvedic texts prescribed in Schedule - I to the Drug and Cosmetics Act, and the later, laying down standards for single drugs of plant origin. Amendment to the provisions introduced in 1982 further strengthen the ASU system by defining misbranded, adulterated and spurious drugs in the ASU system.

Subsequently under the 10th Five Year Plan a project was initiated by the Department to develop Method Of Preparation, Standard Operative Procedures, Pharmacopoeial Standards and Shelf Life of Compound formulations of Ayurveda appearing in Ayurvedic Formulary of India, Parts I & II.

The work of the Ayurvedic Pharmacopoeia Committee was transferred along with some technical staff to Central Council for Research in Ayurveda and Siddha, New Delhi

as a secretariat for APC vide letter no. X-19011/6/94-APC (AYUSH), dated 29th March, 2006.

Prof. A.N. Namjoshi (*1972, 1981*, *1988* and *1994*) and Vaidya I. Sanjeeva Rao (*1998*) were Chairman of reconstituted Ayurvedic Pharmacopoeia Committee during the specified periods.

The Ayurvedic Pharmacopoeia Committee (APC) was reconstituted under the Deptt. of ISM&H consisting of following members vide letter No.X-19011/6/94-APC dated 21st June, 2001.

1.	Dr. P.D. Sethi, M. Pharma, Ph.D., B-140, Shivalik Enclave, New Delhi-110 017.	Chairman
	OFFICIAL MEMBERS	
2.	Drugs Controller General (I), Ministry of Health & Family Welfare, Nirman Bhawan, New Delhi.	Member (Ex-officio)
3.	Director, Pharmacopoeial Laboratory of Indian Medicine, Central Govt. Offices Complex, Kamla Nehru Nagar, Ghaziabad-201 002.	Member (Ex-officio)
4.	Director, Central Council for Research in Ayurveda & Siddha, 61-65, Institutional Area, D-Block, Janakpuri, New Delhi.	Member (Ex-officio)
5.	Managing Director, Indian Medicines and Pharmaceuticals Ltd., Mohan, Uttaranchal (U.P.).	Member (Ex-officio)
6.	Advisor (Ayurveda), Deptt. of ISM & H, Red Cross Building, New Delhi.	Member Secretary
	NON-OFFICIAL MEMBERS	
7.	Prof. S.S. Handa, M.Pharma, Ph.D., F-7, 3rd Floor, Lajpat Nagar-III, New Delhi-110 024.	Member
8.	Ms. S. Satakopan, M.Sc.,	Member

40-A, Ist Main Road,
(Opp. Pillayar Koil) Nanganallur,
Chennai-600 061.

9. Vaidya Devendra Triguna, Ayurvedacharya, — Member
143-Sarai Kale Khan,
Nizamuddin East, New Delhi.

10. Dr. I. Sanjiva Rao, D. Ay. M., — Member
Sri Sai Krupa,
5-8-293/A-Mahesh Nagar,
Chirag Ali Lane, Hyderabad-500 001.

11. Dr. Madhavan Kutti Warrier, M.D. (Ay.), — Member
Arya Vaidya Sala,
Malappuram Distt.,
Kottakkal-676 503 (Kerala).

12. Dr. G.N. Tiwari, M.D. (Ay.), Ph.D., — Member
Shri Ayurveda Mahavidyalaya,
Nagpur.

13. Dr. V.V. Prasad, M.D. (Ay.), Ph.D., — Member
Director,
Rashtriya Ayurveda Vidyapeeth,
Dhanvantri Bhavan,
Road No.66, Punjabi Bagh (West),
New Delhi – 110 026.

14. Dr. M.R. Uniyal, — Member
Former Director, CRIA (CCRAS, Patiala)
and presently – Director (Drugs),
Maharishi Ayurved Products,
17/18, Noida Export Processing Zone,
NOIDA – 201 305 (U.P.).

15. Dr. (Prof.) S.K. Dixit, Ph.D., — Member
Head of the Department of Rasa Shastra,
Institute of Medical Sciences,
Banaras Hindu University, Varanasi – 221 005.

16. Vaidya D.R. Acharya, GAMS, Ph.D., — Member
Former Principal,
Govt. Ayurvedic College, Paprola,
P.O. Paprola, Himachal Pradesh – 176 115.

17.	Vaidya Sidhinandan Mishra, GAMS, Ph.D., Former Director, Ayurvedic Pharmacy, G.A.U., Jamnagar (Presently at Varanasi).	Member
18.	Dr. M.A. Iyengar, M.Pharma, Ph.D., Prof. of Pharmacognosy, College of Pharmaceutical Sciences, Kasturba Medical College, Manipal – 576 119.	Member
19.	Dr. M.K. Raina, M.Sc., Ph.D., 203, Rainbow Apartments, Raheja Vihar, Powai, Mumbai – 400 012.	Member
20.	Dr. K.K. Sharma, M.Sc., Ph.D., Scientist F, Wadia Himalaya Institute of Geology, Dehradun.	Member
21.	Dr. Narender Nath Mehrotra, M.Sc. Ph.D., Sr. Scientist (E II), National Information Centre for Drugs & Pharmaceuticals, Central Drug Research Institute,Lucknow.	Member
22.	Dr. M.S. Ansari, M.Sc., Ph.D., 454-E, Kaila, Behind Masjid, Ghaziabad (U.P.).	Member
23.	Dr. (Mrs.) Shanta Mehrota, M.Sc., Ph.D., Incharge of the Drug Standardization Unit, National Botanical Research Institute (CSIR), Rana Pratap Marg, P.B. No.-436, Lucknow-226 001.	Member
24.	Dr. C.K. Katiyar, M.D. (Ayu.), Ph.D., Medical Advisor, Dabur India Limited, 22, Site IV, Sahibad, Ghaziabad – 201 010.	Member
25.	Dr. G.G. Parikh, M. Pharma, Ph.D., Managing Director, Zandu Pharmaceutical Works Ltd., 70, Gokhale Road South, Dadar, Mumbai – 400025.	Member
26.	Dr. K.C. Chunekar, Ph.D.,	Member

18/7, Ratan Phatak,
Varanasi.

The present Ayurvedic Pharmacopoeia Committee (APC) was reconstituted under the Deptt. of AYUSH vide letter No.X-19011/6/94-APC (AYUSH) dated 9st March, 2006 consisting of following members.

Ms. Savita Satakopan, M.Sc. (Former Drug Analyst), Government of Gujarat, 7/4, Padmam Flats, Seventh Street, Nanganallur, Chennai – 600 061.	Chairperson (9th May 2005 to 22nd June 2006)
Prof. S.S. Handa, M. Pharma, Ph.D., (Former Director, RRL, Jammu), 522-A, Block 'C', Sushant Lok, Phase-I, Gurgaon, Haryana – 122 001.	Chairman (23rd June, 2006 to onwards)
Dr. S.K. Sharma, M.D. (Ayu.), Ph.D. Advisor (Ayurveda), Department of AYUSH, Red Cross Society Building, New Delhi – 110 001.	Vice-Chairman

OFFICIAL MEMBERS

1.	Dr. G.S. Lavekar, AVP; Ph.D. Director, Central Council for Research in Ayurveda & Siddha, 61-65, Institutional Area, D-Block, Janakpuri, New Delhi – 110 058.	Member-Secretary (Ex-officio)
2.	Dr. D.R. Lohar, M.Sc.; Ph.D. Director, Pharmacopoeial Laboratory for Indian Medicine, Central Govt. Offices Complex, Kamla Nehru Nagar, Ghaziabad – 201 002.	Member (Ex-officio)
3.	Managing Director, Indian Medicines Pharmaceutical Corporation Ltd., Mohan, Via – Ram Nagar,	Member (Ex-officio)

Distt.- Almora, Uttranchal.

4. Drugs Controller General (India), Member (Ex-officio)
Ministry of Health & Family Welfare,
Nirman Bhawan, New Delhi – 110 011.

NON-OFFICIAL MEMBERS

Phytochemistry & Chemistry Sub-Committee

1. Prof. V.K. Kapoor, M. Pharm., Ph.D. Chairman
(Former Dean and Chairman,
University Institute of Pharmaceutical Sciences,
Panjab University, Chandigarh)
1473, Pushpac Complex, 49B,
Chandigarh - 160 047.

2. Prof. S.S. Handa, M. Pharm., Ph.D., Member
(Former Director, RRL),
522-A, Block 'C', Sushant Lok, Phase-I,
Gurgaon, Haryana – 122 001.

3. Dr. P.D. Sethi, M. Pharm., Ph.D., Member
(Former Director,
Central Indian Pharmacopoeial Laboratory)
B-140, Shivalik Enclave,
New Delhi – 110 017.

4. Shri J.K. Dhing, M.Sc. Member
Former Chief Manager (Exploration),
Hindustan Copper Ltd., SF-8, Sector-5,
(Gayatri Nagar) Hiran Magri,
Udaipur – 313 002. (Rajasthan).

Pharmacognosy Sub-Committee

1. Ms. S. Satakopan, M.Sc. Chairman
(Former Drug Analyst),
Government of Gujarat,
7/4, Padmam Flats, Seventh Street,
Nanganallur, Chennai – 600 061.

2. Dr. (Mrs.) Shanta Mehrotra, M.Sc., Ph.D., Member
Emeritus Scientist,

National Botanical Research Institute,
Rana Pratap Marg, P.B. No.-436,
Lucknow – 226 001 (U.P.).

3. Dr. M.A. Iyengar, M. Pharma, Ph.D, — Member
Prof. of Pharmacognosy (Retd.),
14, HIG, HUDCO, Manipal – 576 119.

4. Dr. J. Mohanasundraram, M.D., — Member
Former Professor of Pharmacology
& Deputy Director of Medical Education,
Chennai.

Formulary Sub-Committee

(Rasa Shastra / Bhaishajya Kalpana – Ayurvedic Pharmacy)

1. Prof. S.K. Dixit, A.B.M.S.; D.Ay.M; Ph.D. — Chairman
(Former Head, Deptt. of Rasa Shastra, BHU),
B-3/402, Shivala, Varanasi 221 005 (UP.).

2. Dr. B.L. Gaur, Ph.D.; — Member
Vice-Chancellor,
Jodhpur Ayurvedic University,
Jodhpur, Rajasthan,

3. Prof. Siddhinandan Mishra, G.B.M.S.; Ph.D. — Member
Pharmacy In-charge, SDM Ayurvedic College,
P.O. Kuthpady, Udupi – 574 118,
(South Karnataka).

4. Prof. Ved Vrat Sharma, H.P.A. — Member
(Former Principal, DAV Ayurvedic College),
House No. 65, Sector-8, Panchkula, Haryana.

5. Dr. P.K. Prajapati, M.D. (Ay.), Ph. D., — Member
Reader & Head, Deptt. of Ras Shastra,
IPGT & RA, Gujarat Ayurved University,
Jamnagar, Gujarat – 361 008.

6. Dr. Narendra Bhatt, M.D. (Ay.), — Member
Chief Executive Officer,
Zandu Pharmaceutical Works Ltd.,
70, Ghokhle Road (South), Dadar,

Mumbai – 400 025.

7. Shri Ranjit Puranik, Member
General Manager,
Shree Dhootapapeshwar Ltd.,
135, Nanubhai Desai Road, Khetwadi,
Mumbai.

Ayurveda Sub-Committee
(Single Drugs of Plants, Minerals, Metals, Animal origin)

1. Prof. V.K. Joshi, M.D. (Ay.), Ph.D. Chairman
Deptt. Dravyaguna,
Institute of Medical Sciences,
Banaras Hindu University (BHU),
Varanasi – 221 005 (U.P.).

2. Prof. K.C. Chunekar, Ph.D. Member
(Former Reader, Deptt. of Dravyaguna, BHU),
18/7, Ratan Phatak,
Varanasi, (U.P.).

3. Vaidya Devender Triguna, Ayurvedacharya, Member
"PADAM SHREE", 143-Sarai Kale Khan,
Nizamuddin East, New Delhi.

4. Dr. M.R. Uniyal, M.D. (Ay.), Ph.D. Member
(Former Director, CRIA, CCRAS),
Director (Drugs), Maharishi Ayurved Products,
17/18, NOIDA Export Processing Zone,
NOIDA – 201 305.

5. Prof. V.V. Prasad, Member
Director,
Rashtriya Ayurveda Vidyapeeth,
Dhanvantri Bhawan,
Road No. 66, Punjabi Bagh (West),
New Delhi – 110 026.

CO-OPTED MEMBERS

1. Dr. G.V. Satyavathi,
Former Director General-ICMR,
Prasad-Nilaya, D-55/82, EAST-END (B),
Main Road, 9th Block,

Jaynagar, Bangalore –500069.

2. Dr. G.P. Dubey,
Ex.Dean, Ayurveda,
Project Investigator,
Center of Psychosomatic & Biofeedback
Medicine,
Faculty of Ayurveda,
Institute of Medical Sciences,
Banaras Hindu University,
Varanasi – 221 005.

1. The term of the Committee shall be for a period of three years from the date of its first meeting and the members shall hold office for that period.
2. The Chairman of the APC shall have the powers to form sub-committees whenever required and to co-opt experts from outside for such sub-committees.
3. The Committee shall have the power to frame procedures of functioning.
4. The functions of the Committee shall be as follows:

(i) To prepare Ayurvedic Pharmacopoeia of India of single and compound drugs.
(ii) To prescribe the working standards for compound Ayurvedic formulations including tests for identity, purity, strength and quality so as to ensure uniformity of the finished formulations.
(iii) Keeping in view the time constraint, to identify such methods, procedures and plan of work as would enable to publish the formulary and standards of all commonly used drugs to be brought out in a phased manner.
(iv) To prepare remaining parts of the official formulary of compound preparations from the classical texts including standardized composition of reputed institution.
(v) To develop and standardize methods of preparations, dosage form, toxicity profile etc.
(vi) To develop quality standards, safety, efficacy profile of intermediates likes extracts of Ayurvedic raw drugs.
(vii) To develop the quality standards, safety, efficacy profile of different parts of the plants; as well as to include new plants as Ayurvedic drugs.
(viii) Any other matter relating to the quality standards, shelf life, identification, new formulations etc.

5. The following are the targets focus of the Committee:

(i) To evolve standards of single drugs mentioned in the Ayurvedic Formularies of India.
(ii) To evolve standards for compound formulations mentioned in the Ayurvedic Formularies of India & other Ayurvedic formulations of National Priority.
(iii) To prepare drafts SOP of Ayurvedic Formularies of India from the classical texts and other authentic sources.

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The following institutions have carried out the scientific work of Monographs under APC scheme.

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AVALEHA

General Description:

Avaleha or *Lehya* is a semi-solid preparation of drugs, prepared with addition of jaggery, sugar or sugar-candy and boiled with prescribed juices or decoction.

These preparations generally have

(1) *Ka¾āya* or other liquids,
(2) Jaggery, sugar or sugar-candy,
(3) Powders or pulps of certain drugs,
(4) Ghee or oil and
(5) Honey.

Jaggery, sugar or sugar-candy is dissolved in the liquid and strained to remove the foreign particles. This solution is boiled over a moderate fire. When pressed between two fingers if *pāka* becomes thready (*Tantuvat*), or when it sinks in water without getting easily dissolved, it should be removed from the fire. Fine powders of drugs are then added in small quantities and stirred continuously to form a homogenous mixture. Ghee or oil, if mentioned, is added while the preparation is still hot and mixed well. Honey, if mentioned is added when the preparation becomes cool and mixed well.

The *Lehya* should neither be hard nor a thick fluid. When pulp of the drugs is added and ghee or oil is present in the preparation, this can be rolled between the fingers. When metals are mentioned, the *bhasmas* of the metals are used. In case of drugs like *Bhallātaka,* purification process is to be followed.

The *Lehya* should be kept in glass or porcelain jars. It can also be kept in a metal container which does not react with it. Normally, *Lehyas* should be used within one year.

A¾¯Ā³GĀVALEHA

(AFI, Part-II, 3:1)

Definition:

A¾°ā¬gāvaleha is a semisolid preparation made with the ingredients in the Formulation composition given below.

Formulation composition:

1.	Ka°phala API	*Myrica nagi*	St Bk.	1 part
2.	Pau¾kara (Pu¾kara API)	*Inula racemosa*	Rt.	1 part
3.	Ś¨¬gī (Karka°as¨¬gī API)	*Pistacia integerrima*	Gl.	1 part
4.	Yamānī (Yavānī API)	*Trachyspermum ammi*	Fr.	1 part
5.	Kāravī (K¨¾´ ajīraka API)	*Carum carvi*	Fr.	1 part
6.	Śu´°hī API	*Zingiber officinale*	Rz.	1 part
7.	Marīca API	*Piper nigrum*	Fr.	1 part
8.	Pippalī API	*Piper longum*	Fr.	1 part
9.	Madhu API	Honey		12 parts
10	Ārdraka API (Svarasa)	*Zingiber officinale*	Fresh juice of Rz.	Q.S. for Bhāvana

Method of preparation:

Wash, dry and powder the ingredients 1 to 8 separately and pass through sieve number 85.
Wash and peel Ārdraka, grind it, squeeze the juice and filter it through a *muslin cloth* to collect svarasa.
Mix the powdered ingredients 1 to 8 thoroughly, levigate with Ārdraka svarasa and later dry the mixture.
Add honey and stir thoroughly to form an avaleha.
Pack it in tightly closed containers to protect from light and moisture.

Description:

A blackish brown coloured semisolid sticky paste, odour pleasant, taste bitter, astringent and spicy.

Identification:

Microscopy:

Take about 5 g, wash thoroughly with water. Pour out the water without loss of material; repeat the process, each time rejecting the supernatant and keeping the sediment. Take a

few mg of the sediment, stain with *iodine solution* and mount in 50 per cent *glycerin*; clarify a few mg with *chloral hydrate* wash in water and mount in 50 per cent *glycerin*. Observe the following characters in different mounts.

Various types of stone cells solitary or in a group of 12 to 15, with narrow and broad lumen some filled with prismatic crystals of calcium oxalate, pitted fibre sclereids, pitted parenchyma, oil cells, group of parenchymatous cells with prismatic crystals of calcium oxalate, fragments of fibres **(Ka°phal)**; several collapsed epidermal cells, tissue fragments with yellowish brown contents, and large tannin-filled sacs associated with vascular bundles **(Karka°aś¨¬gī);** elongated or spindle shaped stone cells with broad lumen isolated or in groups of 2 to 8 (**Pippalī**); fragments of hypodermis in surface view, stone cells varying in sizes, shapes and thickness, mostly present in groups, interspersed among parenchyma cells (**Marica**); groups of parenchymatous cells, densely packed with starch grains, isolated starch grains, simple, oval to rod shaped, measuring 15 to 70 µ in length, hilum eccentric, lamellae distinct, yellow coloured oleo resin cells, non-lignified septate fibres, some of them bearing marks of adjacent cells pressing against them, 30 to 50 µ broad, **(Śu´°hī)**; striated epidermal debris, fragments of vittae in surface view showing honey comb like epithelial layers, groups of mesocarpic stone cell layer with polygonal cells not much longer than broad; transversely much elongated thin walled parenchymatous cell layer, with cells interlocked in a regular V joint with neighbouring cell **(K¨¾´ ajīraka)**; prismatic crystals of calcium oxalate, measuring 70 to 100 µ in dia and septate fibres **(Pu¾kara)**; papillose epidermal cells in surface view with puckered radially striated cuticle, epidermal cells with broken trichome bases, unicellular, small club shaped simple trichomes **(Yavānī)**.

Thin layer chromatography:

Extract 5 g of āvaleha in 75 ml *n-hexane* under reflux on a water-bath for 30 min. Filter and concentrate to 10 ml and carry out the thin layer chromatography. Apply 10 µl of the extract on TLC plate and develop the plate to a distance of 8 cm using *toluene : ethyl acetate* (9 : 1) as mobile phase. After development, allow the plate to dry in air and examine under ultraviolet light (254 nm). It shows major spots at R_f 0.14, 0.22, 0.26, 0.34.

Physico-chemical parameters:

Loss on drying:	Not more than 32.0 per cent,	Appendix 2.2.10.
Total ash:	Not more than 2.70 per cent,	Appendix 2.2.3.
Acid-insoluble ash:	Not more than 0.50 per cent,	Appendix 2.2.4.
Alcohol-soluble extractive:	Not less than 51.0 per cent,	Appendix 2.2.7.

Water-soluble extractive:	Not less than 47.0 per cent,	Appendix 2.2.8.
*p*H *(1% aqueous solution):*	6.3 to 6.6,	Appendix 3.3.

Other requirements:

Microbial Limits:	Appendix 2.4.
Aflatoxins:	Appendix 2.7.

Storage: Store in a cool place in tightly closed amber coloured containers, protected from light and moisture.

Therapeutic uses*:* Vātakaphajvara (fever due to vāta doşa and kapha doşa); Kāsa (cough); Śvāsa (Dyspnoea); Aruci (tastelessness); Chardi (emesis).

Dose: 3 to 5 g daily in divided doses.

Anupāna: Water.

BHALLĀTAKĀDI MODAKA

(AFI, Part-I, 3:21)

Definition:

Bhallātakādi Modaka is a solid preparation made in the form of lumps, with the ingredients given in the Formulation composition.

Formulation composition:

1.	Bhallātaka API (Śuddha)	*Semecarpus anacardium*	Fr.	1 part
2.	Pathyā (Harītakī API)	*Terminalia chebula*	P.	1 part
3.	Tila API	*Sesamum indicum*	Sd.	1 part
4.	Gu^{2}a API	Jaggery		6 parts

Method of preparation:

Take all ingredients of pharmacopoeial quality.
Treat Bhallātaka to prepare Suddha Bhallātaka (Appendix 6.2.7.7).
Powder Śuddha Bhallātakā and Harītakī and pass through sieve no. 85.
Pound Gu^{2}a in an iron mortar and add other ingredients. Pound well until it becomes a fine homogeneous blend. Roll the above mixture into modaka of approximately 2 g each.Weigh and store in suitable containers, protecting from light and moisture.

Description:

Black coloured roughly spherical lumps, firm, but crushing under pressure, with the characteristic odour of Bhallātakā and bitter, astringent taste.

Identification:

*Microscopy***:**

Weigh 5 g of the sample, and mix with 50 ml of water in a beaker with gentle warming, till the sample gets completely dispersed in water. Centrifuge the mixture and decant supernatant. Wash the sediment with distilled water and centrifuge again. Decant the supernatant. Collect the sediment. Mount a few mg in 50 per cent *glycerine* and observe the following characters.
Fragments of crisscross fibres, epidermal tissue of cells with slightly beaded walls, and occasionally divided by a thin septa **(Pathyā);** fragments of epidermis in surface view with elongated cells having lignified walls and mesocarp tissue showing oil cavities, **(Bhallātaka)**; cells of endosperm filled with oil globules and aluerone grains, occasionally sectional view of epidermal debris, with palisade like cells **(Tila**).

Thin layer Chromatography:

a) Extract 10 g of crushed modaka with 75 ml of *methanol* under reflux for 30 min. Filter, concentrate to 10 ml and carry out the thin layer chromatography. Apply 10 µl of the extract on TLC plate and develop the plate to a distance of 8 cm using *toluene : ethyl acetate : formic acid : methanol* (3 : 3 : 0.8 : 0.2) as mobile phase. After development, allow the plate to dry in air and spray with *anisaldehyde-sulphuric acid reagent* followed by heating at 110^0 for about 10 min. It shows major spots at R_f 0.12 (blue), 0.32 (blue), 0.34 (light brown, gallic acid), 0.45 (blue), 0.52 (light brown), 0.67 (violet), 0.82 (violet) and 0.90 (violet) under visible light.

b) Extract 10 g of crushed modaka with 75 ml of *n-hexane* on a water-bath for 30 min. Filter, concentrate to 10 ml and carry out the thin layer chromatography. Apply 10 µl on TLC plate and develop the plate to a distance of 8 cm using *toluene : ethyl acetate* (7 : 3) as mobile phase. After development, allow the plate to dry in air and spray with *anisaldehyde-sulphuric acid reagent* followed by heating 110^0 for about 10 min. It shows major spots at R_f 0.47 (purple), 0.69 (dark blue) and 0.7 (purple) under visible light.

Physico-chemical parameters:

Total Ash:	Not more than 2.5 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 65.0 per cent,	Appendix 2.2.7.
Water-soluble extractive:	Not less than 75.0 per cent,	Appendix 2.2.8.
Reducing sugars:	23 to 24 per cent,	Appendix 5.1.3.1.
Non reducing sugars:	56 to 58 per cent,	Appendix 5.1.3.3.
*p*H *(5% aqueous solution)*:	4 to 4.5,	Appendix 3.3.
Total tannins:	Not less than 5 per cent,	Appendix 5.1.2.

Assay:

The formulation contains not less than 5 per cent gallic acid when assayed by the following method.

Estimation of gallic acid: Dissolve 10 mg of gallic acid in 100 ml of *methanol* in a volumetric flask. From this stock solution, prepare standard solutions of 15 to 75 µg / ml by transferring aliquots (1.5 to 7.5 ml) of stock solution to 10 ml volumetric flasks and adjusting the volume to 10 ml with *methanol*.

Apply 10 µl of each standard solution corresponding to 150 ng to 750 ng of gallic acid on a TLC plate. Develop the plate to a distance of 8 cm using *toluene : ethyl acetate : formic acid : methanol* (3 : 3 : 0.8 : 0.2) as mobile phase. After development, dry the plate and scan in TLC scanner at wavelength of 280 nm. Note the area under the curve for peak corresponding to gallic acid and prepare the calibration curve by plotting peak area *vs* amount of gallic acid.

Hydrolyze accurately weighed about 5 g of crushed modaka by refluxing with 50 ml of 2N *hydrochloric acid* on a water-bath. Filter, add equal amount of water, transfer to a separating funnel and extract with *diethyl ether* (20 ml x 4). Collect the *diethyl ether* layer and dry. Dissolve the residue in 25 ml of *methanol*. Apply 10 µl on a TLC plate and develop, dry and scan the plate as described in the preceding paragraph for calibration curve of gallic acid. Note area under the curve for a peak corresponding to gallic acid. Calculate the amount of gallic acid in the test solution from the calibration curve of gallic acid.

Other requirements:

Microbial limits:	Appendix 2.4.
Aflatoxins:	Appendix 2.7.

Storage: Store in a cool place in tightly closed containers, protected from light and moisture.

Therapeutic uses: Pittārśa (anorectal growth due to pitta do¾a)

Dose: 2 to 5 g daily in divided doses.

Anupāna: Milk, Water

Caution: In some cases, patients may develop rashes over skin. In such cases, apply Nārikela Taila or Gh¨ta over the affected part and advise to take Nārikela internally.

BILVĀDILEHA
(AFI, Part-I, 3:18)

Definition:

Bilvādi Leha is a semisolid preparation made with the ingredients in the Formulation composition given below.

Formulation Composition:

1.	Bilva API– mūla	*Aegle marmelos*	Rt.	1536 g
2.	Jala API for decoction reduced to	Water		12.28 l 3.072 l
3.	Jīr´a Gu²a (Purā´a Gu²a) API	Old Jaggery		768 g
4.	Ghana (Mustā API)	*Cyperus rotundus*	Rz.	12 g
5.	Dhānya (Dhānyaka API)	*Coriandrum sativum*	Fr.	12 g
6.	Jīraka (Śvetajīraka API)	*Cuminum cyminum*	Fr.	12 g
7.	Trutī (Sūksmailā API)	*Elettaria cardamomum*	Sd.	12 g
8.	Tvak API	*Cinnamomum zeylanicum*	St. Bk.	12 g
9.	Keśara (Nāgakeśara API)	*Mesua ferrea*	Stmn.	12 g
10.	Śun°aī API	*Zingiber officinale*	Rz.	12 g
11.	Marica API	*Piper nigrum*	Fr.	12 g
12.	Pippalī API	*Piper longum*	Fr.	12 g

Method of Preparation:

Take raw material of pharmacopoeial quality.
Wash, dry, powder ingredient number 1 (Kvātha Dravya) of the formulation composition and pass through sieve number 44 to obtain coarse powder.

Clean, dry, powder the ingredients number 4 to 12 (Prak¾epa Dravya) of the formulation composition and pass through sieve number 85 to obtain fine powder.
Add specified amounts of water to the Kvātha Dravya, heat, reduce to one fourth and filter through *muslin cloth.*
Add jaggery to the Kvātha, boil to dissolve and filter through *muslin cloth.*
Reduce the kvātha to thicker consistency by gentle boiling and stirring continuously during the process.
Continue heating till the preparation attains the consistency of leha confirmed by the formation of a soft ball that doesn't disperse in water.
Remove from heat source and allow to cool to room temperature.

Add fine powders of Prak¾epa Dravya, mix thoroughly to prepare a homogeneous mass.
Pack it in tight closed containers to protect from light and moisture.

Description:

Dark brown semisolid paste with a spicy pleasant odour and sweet, astringent taste.

Identification:

Microscopy:

Take about 5 g of avaleha and wash twice or thrice with about 20 ml of water, each time rejecting the supernatant; take a few mg of the sedimented material, stain with *iodine solution* and mount in 50 per cent *glycerin*; clarify a few mg with *chloral hydrate* and mount in 50 per cent *glycerin*. Observe the following characters in different mounts. Multicellular, multiseriate trichomes, fragments of vittae in surface view showing epithelial tissue elongated along the long axis of the vittae, and mesocarpic stone cell layer with cells much longer than broad **(Śvetajīraka)**; groups of slightly wavy parenchymatous cells, each cell contains 1 to 3 rosette crystal of calcium oxalate, groups of bulbous perisperm cells packed with starch grains which also shows in the middle tiny prismatic crystal of calcium oxalate, epidermal and hypodermal cells crossing each other at right angle **(Sūkṣmailā)**; fragments of fibres with very narrow lumen, not over 600 µ long and not over 45 µ broad, parenchyma cells containing minute acicular crystals of calcium oxalate, stone cells of varying shapes and sizes with thickened walls on three sides, oil cells **(Tvak)**; crushed pieces of anther lobes containing pollen grains, pollen grains tricolporate, measuring 25 to 55 µ in dia, unicellular and multicellular uniseriate trichomes several showing a funneling tip or branching, groups of endothecial cells of anther lobe **(Nāgakeśara)**; group of parenchymatous cells, densely packed with starch grains, isolated starch grains, simple, oval to rod shaped, measuring 15 to 70 µ in length, hilum eccentric, lamellae distinct, yellow coloured oleo resin cells, non-lignified, septate fibres some of them bearing marks of adjacent cells pressing against them, 30 to 50 µ broad, **(Śu´°hī)**; tissue debris consisting of packed regular rows of fibre-sclereids of fairly uniform size, and narrow scalariformed vessel showing laterally placed simple perforation **(Mustā)**; lignified cells, isolated or in small groups measuring 130 to 190 µ in dia with broad lumen, in groups of 2 to 8 **(Pippalī)**; fragments of hypodermis in surface view with stone cells varying in sizes, shapes and thickness, present in groups, interspersed among parenchymatous cells **(Marica)**; group of sclerenchymatous cells, crisscrossing each other, epidermal tissue with fairly large cells showing stomata and octahedrons of calcium oxalate crystals, large, pentagonal, sclerenchymatous cell layer **(Dhānya)**.

Thin layer chromatography:

Extract 5 g of avaleha with 75 ml of *n-hexane* under reflux on a water-bath for 30 min. Filter and concentrate to 10 ml and carry out the thin layer chromatography. Apply 10 µl of the extract on TLC plate. Develop the plate to a distance of 8 cm using *toluene : ethyl acetate* (8 : 2) as mobile phase. After development, allow the plate to dry in air and

examine under ultraviolet light (366 nm). It shows major spots at R_f 0.23, 0.30 (both blue), 0.53 (fluorescent blue) 0.65 and 0.73 (both blue).

Physico-chemical parameters:

Loss on drying:	Not more than 20.0 per cent,	Appendix 2.2.10.
Total ash:	Not more than 2.3 per cent,	Appendix 2.2.3.
Acid-insoluble ash:	Not more than 0.22 per cent,	Appendix 2.2.4.
Alcohol-soluble extractive:	Not less than 6.8 per cent,	Appendix 2.2.7.
Water-soluble extractive:	Not less than 66.0 per cent,	Appendix 2.2.8.
*p*H *(1% aqueous solution) :*	5.8 to 6.7,	Appendix 3.3.

Other requirements:

Microbial limits:	Appendix 2.4.
Aflatoxins:	Appendix 2.7.

Storage: Store in a cool place in tightly closed containers, protected from light and moisture.

Therapeutic uses: Aruci (aversion to food); Agnimāndya (digestive impairment); Praseka (excessive salivation); Chardi (emesis).

Dose: 6 g to be licked up 2 to 3 times in small quantities each time.

CITRAKA HARĪTAKĪ

(AFI, Part-I, 3:10)

Definition:

Citraka Harītakī is a semisolid preparation made with the ingredients in the Formulation composition given below:

Formulation Composition:

1.	Citraka API – kvātha	*Plumbago zeylanica*	Rt.	4.800 l
2.	Āmalakī API - kvātha	*Phyllanthus emblica (Emblica officinalis)*	P.	4.800 l
3.	Gu²ūcī API – kvātha	*Tinospora cordifolia*	St.	4.800 l
4.	Daśāmūla API - kvātha			4.800 l
(a.)	Bilva API	*Aegle marmelos*	Rt./St. Bk.	
(b.)	Agnimantha API	*Premna mucronata (Official substitute)*	Rt./St. Bk.	
(c.)	Śyonāka API	*Oroxylum indicum*	Rt./St. Bk.	
(d.)	Kāśmarī (Gambhārī API)	*Gmelina arborea*	Rt./St. Bk.	
(e.)	Pā°alā API	*Stereospermum suaveolens*	Rt./St. Bk.	
(f.)	Śālapar´ī API	*Desmodium gangeticum*	Pl	
(g.)	P¨¾nipar´ī API	*Uraria picta*	Pl	
(h.)	Śvada¼¾trā (Gok¾ura API)	*Tribulus terrestris*	Pl	
(i.)	B¨hatī API	*Solanum indicum*	Pl	
(j.)	Kā´°akārī API	*Solanum surattense*	Pl	
5.	Pathyā (Harītakī API) – . cūrṇa	*Terminalia chebula*	P.	3.07 kg
6.	Guda API .	*Jaggery*		4.80 kg
7.	Śunthī API	*Zingiber officinale*	Rz.	96 g
8.	Marica API	*Piper nigrum*	Fr.	96 g
9.	Pippalī API	*Piper longum*	Fr.	96 g
10.	Tvak API	*Cinnamomum zeylanicum*	St. Bk.	96 g
11.	Elā (Sūkşmailā API)	*Elettaria cardamomum*	Sd.	96 g
12.	Patra (Tejapatra API) .	*Cinnamomum tamala*	Lf.	96 g
13.	Ksāra (Yava API)	*Hordeum vulgare*	Water soluble Ash of Pl.	24 g
14.	Madhu API	Honey		384 g

Note: Stem bark of the ingredient number 4 [(a) to (e)] has been used.

Method of Preparation:

Wash, dry and powder the ingredients numbered 1 to 4 (Kvātha dravya) of the Formulation composition separately and pass through sieve no. 44 to obtain a coarse powder.
Dry and powder the ingredient number 5 separately and ingredients number 7 to 13 (Prak¾epa dravyas) of the Formulation composition to a fine powder and pass through sieve no. 85.
Add required amount of water to the Kvātha dravya, heat, reduce to one fourth and filter through *muslin cloth*.
Mix all the Kvāthas together. Add Jaggery, boil to dissolve and filter through a *muslin cloth.*
Reduce the Kvātha to a thicker consistency by gentle boiling; add cūrṇa of Pathyā and stir thoroughly during the process.
Add the powdered prak¾epa dravya no. 7 to 13 while hot at 50^0, mix thoroughly to prepare a homogeneous mass.
Allow to cool to room temperature. Add honey, mix thoroughly.
Pack it in tightly closed containers to protect from light and moisture.

Description:

Blackish brown, semisolid paste with spicy, pleasant odour and bitter-astringent taste.

Identification:

Microscopy:

Take about 5 g of the sample, wash thoroughly and repeatedly in warm water to remove Guda and Madhu, each time rejecting the supernatant, and saving the residue without loss. Take the sediment in distilled water, mix thoroughly, allow to settle, and throw off supernatant. Take a few mg of the sediment, stain with *iodine solution*, mount in *glycerin* (50 per cent); take a few mg of sediment, clear in *chloral hydrate*, wash, and mount in *glycerine* (50 per cent). Observe the following characters in different mounts.
Large parenchyma cells containing elliptical, elongated starch grains, up to 50 µ in length, with hilum at one end; broad, short vessel debris, resin cells, fragments of non-lignified septate fibres that show dentation on one wall **(Śu´°hī);** fragments from hypodermis with groups of stone cells interspersed among parenchyma tissue from hypodermis, dark coloured groups of very thick walled polygonal stone cells from testa **(Marīca);** long uniseriate multicellular fragile trichomes, spindle shaped, large lumened sclerenchyma cells, isolated or in small groups **(Pippalī)**; perisperm cells with bulbous projections, packed with minute starch grains aggregates, carrying tiny prisms or clusters of calcium oxalate; large, elongated cells of aril tissue (**Sūk¾mailā)**; fragments of fibres with narrow lumen not over 600 µ long or over 45 µ midwidth, stone cells lignified on three sides only, parenchyma cells containing minute acicular crystals of calcium oxalate (**Tvak)**;

pieces of leaf epidermis with thick cuticle and sunken stomata, showing stomata and a few unicellular or bicellular short stout trichomes **(Tejapatra)**; crisscross layers of fibres, polygonal cells of epidermis showing slight beading and transverse septa, large stone cells with pits **(Harītakī**).

Thin layer chromatography:

Extract 5 g of āvaleha with 75 ml (25 ml x 3) of *n-hexane* under reflux on a water-bath for 30 min. Reflux hexane-extracted marc with 75 ml of *chloroform* (25 ml x 3)**,** filter and concentrate the combined chloroform extract to 10 ml and carry out the thin layer chromatography. Apply 10 µl of the extract on TLC plate and develop the plate to a distance of 8 cm using *toluene : ethyl acetate : formic acid* (9.8 : 0.2 : 0.04) as mobile phase. After development, allow the plate to dry in air and examine under ultraviolet light (366 nm). It shows major spots at R_f 0.36, 0.46 (both blue) and 0.27 (yellow). Spray the plate with *anisaldehyde sulphuric acid reagent* and heat it at 110^0 for about 10 min. It shows major spots at R_f 0.12, 0.18 (both green), 0.36 (blue) and 0.40 (greenish blue) under visible light.

Physico-chemical parameters:

Loss on drying:	Not more than 36.0 per cent	Appendix 2.2.10.
Total ash:	Not more than 4.7 per cent	Appendix 2.2.3.
Acid-insoluble ash:	Not more than 1.0 per cent	Appendix 2.2.4.
Alcoholic-soluble extractive:	Not less than 21.0 per cent	Appendix 2.2.7.
Water-soluble extractive:	Not less than 67.0 per cent	Appendix 2.2.8.
*p*H *(1% aqueous solution) :*	6.4 to 6.6	Appendix 3.3.

Other requirements:

Microbial Limits:	Appendix 2.4.
Aflatoxins:	Appendix 2.7.

Storage: Store in a cool place in tightly closed containers, protected from light and moisture.

Therapeutic uses: Gulma (abdominal lump); Udāvarta (upward movement of gases); Pīnasa (Chronic rhinitis/Sinusitis); Kāsa (cough); Svāsa (Dyspnoea); Arśa (Piles); Agnimāndya (loss of appetite), K¾aya (Pthisis); K¨mi (Helminthiasis / worm infestation).

Dose: 6 to 12 g daily in divided dose.

Anupāna: Warm water.

CYAVANAPRĀŚA
(AFI, Part-I, 3:11)

Definition:

Cyavanaprāśa is a semisolid avaleha preparation made with the ingredients in the Formulation composition given below:

Formulation composition:

1.	Bilva API	*Aegle marmelos*	Rt./St.Bk.	48g
2.	Agnimantha API	*Premna integrifolia*	Rt./St.Bk.	48g
3.	Śyonāka API	*Oroxylum indicum*	Rt./St.Bk.	48g
4.	Kāśmarī (Gambhārī API)	*Gmelina arborea*	Rt./St.Bk.	48g
5.	Pā°alā API	*Stereospermum suaveolens*	Rt./St.Bk.	48g
6.	Balā API	*Sida cordifolia*	Rt.	48g
7.	Śālapar´ī API	*Desmodium gangeticum*	Pl.	48g
8.	P¨śnipar´ī API	*Uraria picta*	Pl.	48g
9.	Mudgapar´ī API	*Phaseolus trilobus*	Rt. /Pl	48g
10.	Mā¾apar´ī API	*Teramnus labialis*	Rt. /Pl	48g
11.	Pippalī API	*Piper longum*	Fr.	48g
12.	Śvada¼¾°rā(Gok¾ura API)	*Tribulus terrestris*	Pl.	48g
13.	B¨hatī API	*Solanum indicum*	Pl.	48g
14.	Ka´°akārī API	*Solanum surattense*	Pl.	48g
15.	Ś¨¬gī API	*Pistacia integerrima*	Gl.	48g
16.	Tāmalakī (Bhūmyāmalakī API)	*Phyllanthus amarus*	Pl.	48g
17.	Drāk¾ā API	*Vitis vinifera*	Dr. Fr.	48g
18.	Jīvantī API	*Leptadenia reticulata*	Rt.	48g
19.	Pu¾kara API	*Inula racemosa*	Rt.	48g
20.	Agaru API	*Aquilaria agallocha*	Ht.Wd.	48g
21.	Abhayā (Harītakī API)	*Terminalia chebula*	P.	48g
22.	Am¨tā (Gu²ūcī API)	*Tinospora cordifolia*	St.	48g
23.	§ddhi API	*Habenaria intermedia*	Sub. Rt. Tr.	48g
24.	Jīvaka API	*Malaxis acuminata*	Pseudo-bulb	48g
25.	R¾abhaka API	*Malaxis muscifera*	Rt. Tr.	48g
26.	Śa°ī API	*Hedychium spicatum*	Rz.	48g
27.	Mustā API	*Cyperus rotundus*	Rt. Tr.	48g
28.	Punarnavā (Raktapunarnavā API)	*Boerhaavia diffusa*	Pl.	48g
29.	Medā API	*Polygonatum cirrhifolium*	Rt.Tr.	48g
30.	Elā (Sūk¾mailā API)	*Elettaria cardamomum*	Sd.	48g
31.	Candana (Śvetacandana API)	*Santalum album*	Ht. Wd.	48g
32.	Utpala API	*Nymphaea stellata*	Fl.	48g

33.	Vidārī (Kanda) API	*Pueraria tuberosa*	Rt. Tr.	48g
34.	V¨¾amūla (Vāsā API)	*Adhatoda vasica*	Rt.	48g
35.	Kākolī API	*Lilium polyphyllum*	Sub. Rt.	48g
36.	Kākanāsīkā API	*Martynia annua*	Fr.	48g
37.	Āmalaka (ĀmalakĪ API)	*Phyllanthus emblica (Emblica officinalis)*	P.	5 kg
38.	Jala API for decoction Reduced to	Water		12.29 l 3.07 l
39.	Gh¨ta API	Clarified butter from cow's milk		288 g
40.	Taila (Tila API)	*Sesamum indicum*	oil.	288 g
41.	Matsya´²ikā (Śarkarā API)	Sugar		2.4 kg
42.	Madhu API	Honey		288 g
43.	Tugāk¾īrī (Va¼śa API)	*Bambusa bambos*	Siliceous deposit	192 g
44.	Pippalī API	*Piper longum*	Fr.	96 g
45.	Tvak API	*Cinnamomum zeylancium*	St. Bk.	48g
46.	Elā API	*Elettaria cardamomum*	Sd.	48g
47.	Patra (Tejapatra API)	*Cinnamomum tamala*	Lf.	48g
48.	Keśara (Nāgakeśara API)	*Mesua ferrea*	Stmn.	48g

Note: Stem bark of the ingredients number 1 to 5 of the formulation composition has been used in place of root.

Method of preparation:

Take all the ingredients of pharmacopoeial quality.
Wash, dry, powder the ingredients numbered 1 to 36 (Kvātha Dravya) of the formulation composition and pass through sieve number 44.

Wash, dry, powder the ingredients numbered 43 to 48 (Prak¾epa) and pass through sieve number 85. Add sufficient amount of water to the Kvātha dravya.

Take 5 kg fresh fruits of Āmalak¤, wash and tie them into a bundle using *muslin cloth*. Immerse the bundle into the Kvātha vessel, heat and remove the bundle from the vessel when Āmalak¤ becomes soft. Continue to boiling till water reduces to one fourth and filter the decoction through a *muslin cloth*. Keep the filtrate safe for use in the formulation.

Prepare Āmalak¤ pi¾°Ī by removing the fibres and seeds by rubbing through a piece of cloth.

Fry the pi¾°Ī with Gh¨ta and Taila mixed in equal proportions. Properly fried pi¾°Ī would release the Gh¨ta and Taila.

Add Śarkarā to the filtred kvātha, also add fried pi¾°Ī and boil to Leha pāka. Final stage of Leha pāka is assessed by putting 2 to 3 g in a glass of water at room temperature. It will

settle down in the water and will not disperse at least for 5 to 10 min. Then remove the vessel from fire and allow to cool at 50^0.

Add prak¾epa Dravya and mix thoroughly to prepare a homogeneous blend. On cooling at room temperatures add Madhu.

Pack it in tightly closed containers to protect from light and moisture.

Description:

Semisolid, chocolate brown colored sticky paste, taste sweet with non-specific pleasant odour.

Identification:

Microscopy:

Take about 5 g of the sample, add a defatting solvent to remove Gh¨ta and Taila, repeat the process till sample is free from greasiness. Wash the defatted sample in warm water twice. Reject the warm water, add distilled water and stir. Allow to stand and throw off the supernatant. Take a few mg of the sediment in *iodine solution* and mount in *glycerine* (50 per cent); clear a few mg in chloral hydrate solution, wash in water, and mount in *glycerine*. Observe the following characters in the mounts:

Fragments of fibres with very narrow lumen, not over 600 µ long and not over 45 µ broad; parenchyma cells containing minute acicular crystal of calcium oxalate, stone cells of varying shape and size with thick internal walls, smaller ones somewhat rectangular, 40-60 µ in length and larger one upto 300 µ in length and 25 to 40 µ in width, oil cells, 30-50 µ in dia **(Tvak)**; groups of slightly wavy parenchymatous cells, each cell contains 1 to 3 rosette crystal of calcium oxalate, groups of perisperm cells bulbous in shape, packed with starch grains, also showing in the middle tiny prismatic crystal of calcium oxalate, epidermal and hypodermal cells crossing each other at right angle **(Elā)**; crushed pieces of anther lobes containing pollen grains, pollen grains tricolporate measuring 25 to 55 µ in dia, groups of beaded epidermal cells of anther lobe, beaded cells of endothecial layer, unicellular and multicellular uniseriate trichomes, several showing funnel tip or slight branching (**Nāgakeśara**); leaf epidermal debris, with thick cuticle, sunken stomata, and uni-or bicellular short stout trichomes (**Tamālapatra)**; large polygonal perisperm cells, isolated or in groups of 2 or 3, packed with simple and compound starch grains measuring 2 to 5 µ in dia, stone cells measuring 130 to 190 µ in dia, with broad lumen in groups of 2 to 8 (**Pippalī**); angular, sharp edged sandy particles, not affected by *conc. sulphuric or hydrochloric acids* and do not polarize light **(Tugāk¾īrī).**

Thin layer chromatography:

Extract 5 g of Cyavanaprāśa successively with 75 ml each of *n-hexane, chloroform* and *methanol* under reflux on a water-bath for 30 min drying the marc after each extraction. Filter each extract and discard the chloroform extract. Concentrate the other two extracts to 10 ml and carry out thin layer chromatography. Apply 10 µl each of hexane and

methanol extracts separately on two TLC plates and develop the plates to a distance of 8 cm using *toluene : ethyl acetate* (8.5 : 1.5) as mobile phase for hexane extract and *ethyl acetate : methanol : water* (15 : 1 : 1) for methanol extract. After development, allow the plates to dry in air and examine under ultraviolet light (254 nm). The hexane extract shows major spots at R_f 0.10, 0.16, 0.23 and 0.30; and methanol extract shows major spots at R_f 0.10, 0.47 and 0.81.

Physico-chemical parameters:

Loss on drying:	Not more than 9 per cent,	Appendix 2.2.10.
Total Ash:	Not more than 2.0 per cent,	Appendix 2.2.3.
Acid-insoluble Ash:	Not more than 1.0 per cent,	Appendix 2.2.4.
Alcohol-soluble extractive:	Not less than 50.0 per cent,	Appendix 2.2.7.
Water-soluble extractive:	Not less than 50.0 per cent,	Appendix 2.2.8.
*p*H *(1% aqueous solution):*	3.82 to 4.23,	Appendix 3.3.

Assay:

The formulation contains not less than 0.5 per cent of gallic acid when assayed by the following method.

Estimation of gallic acid: Dissolve, accurately weighed, about 25 mg of gallic acid in 20 ml of *methanol* and make up the volume with *methanol* to 25 ml in a volumetric flask. From this stock solution, prepare standard solutions containing between 1 to 5 µg of gallic acid per 10 µl. Apply 10 µl each of the standard solutions on TLC plates. Develop the plate to a distance of 8 cm using *toluene : ethyl acetate : formic acid* (5 : 5 : 1) as mobile phase. After development dry the plate in a current of hot air and scan in TLC scanner at a wavelength of 280 nm. Record the area under the curve for a peak corresponding to gallic acid and prepare the calibration curve by plotting area under the curve *vs* amount of gallic acid.

Extract, accurately weighed, about 20 mg of Cyavanaprāśa with 2 ml of 50 per cent aqueous *methanol*. Apply 13 µl of the test solution and 8 µl of gallic acid standard solution on TLC plate. Develop, dry and scan the plate as described in the preceding paragraph for calibration curve of gallic acid. Record area under the curve for a peak corresponding to gallic acid in track of test solution. Calculate the amount of gallic acid in the test solution using mean area under the curve and the calibration curve of gallic acid.

Other requirements:

Microbial limit: Appendix 2.4.
Aflatoxin: Appendix 2.7.

Storage: Store in a cool place in tightly closed amber colured containers, protected from light and moisture.

Therapeutic uses: Kāsa (cough), Śvāsa (Dyspnoea), K¾ata k¾ī´a (Debility due to chest injury), Svarabheda (hoarseness of voice), K¾aya (Pthisis), H¨droga (Heart disease), Agnimāndya (loss of appetite), Uroroga (disease of thorax), Vātarakta (Gout), Pipāsā (thirst), Mūtraroga (urinary diseases), Śukra do¾a (abnormalities in semen), Jarā (senility/progeriasis). Used as a Rasāyana (rejuvenating agents), Medhya (brain tonic/ nootropic), Sm¨tiprada (memory provider).

Dose: 25 g daily in divided doses.

Anupana: Water, Milk.

KALYĀ³ĀVALEHA

(AFI, Part-II, 3:4)

Definition:

Kalyā´āvaleha is a semisolid preparation made with the ingredients of the Formulation composition given below.

Formulation composition*:*

1.	Haridrā API	*Curcuma longa*	Rz.	1 part
2.	Vacā API	*Acorus calamus*	Rz.	1 part
3.	Ku¾°ha API	*Saussurea lappa*	Rt.	1 part
4.	Pippalī API	*Piper longum*	Fr.	1 part
5.	Śu´°hī API	*Zingiber officinale*	Rz.	1 part
6.	Ajājī (Śveta Jīraka API)	*Cuminum cyminum*	Fr.	1 part
7.	Ajamodā API	*Apium leptophyllum*	Fr.	1 part
8.	Ya¾°īmadhu (Ya¾°ī API)	*Glycyrrhiza glabra*	Rt.	1 part
9.	Saindhava lava´a API	Rock salt		1 part
10.	Sarpi (Gogh¨ta API)	Clarified butter from cow's milk		Q.S (6 parts)

Method of preparation:

Take all ingredients of pharmacopoeial quality.
Clean, dry and powder the ingredients numbered 1 to 9 separately and pass through sieve number 85. Mix all the ingredients thoroughly.
Add Sarpi (Gogh¨ta) to the mixture, stir thoroughly to form a semisolid mass.
Pack it in tightly closed containers to protect from light and moisture.

Description:

Semisolid paste, yellowish-brown in color with pungent odour, astringent and salty taste.

Identification:

Microscopy:

Take about 5 g of avaleha, wash thoroughly with *n-hexane*; repeat twice; take the sediment and wash with hot water to remove salt. Clarify a few mg with *chloral hydrate* and mount in 50 per cent *glycerine*; boil a few mg in 2 per cent *potassium hydroxide* solution , wash, and mount in *glycerine*; mount a few mg in *iodine solution*; observe the following characters in different mounts.

Groups of yellow coloured, suberized, angular parenchymatous cells, patches of pitted parenchyma with beaded cell walls, pits simple, patches of thick walled, angular cells filled with very small simple and compound, starch grains, multicellular, multiseriate trichomes, fragments of vittae **(Śvetajīraka)**; patches of thick walled angular or slightly wavy parenchyma, pitted parenchyma, parenchymatous cells with reticulate thickenings, oil cells, unicellular, simple and glandular trichomes and fragments of vittae showing large polygonal epitheial cells **(Ajamodā)**; groups of parenchymatous cells, densely packed with starch grains, isolated starch grains, simple, oval to rod shaped, measuring 15 to 70 µ in length, hilum eccentric, lamellae distinct; yellow coloured oleo resin cells, non-lignified, septate fibres some of them bearing marks of adjacent cells pressing against them, 30 to 50 µ broad, (**Śu´°hī**); groups of large perisperm cells packed with minute starch grains, elongated stone cells measuring 130 to 190 µ in dia with broad lumen isolated or in groups (**Pippalī**); groups of polygonal and elongated parenchymatous cells, orange or brownish resin cells, branched tracheids, inulin crystals **(Ku¾°ha)**; groups of large parenchymatous tissues with cells filled with spheroidal starch grains which are mostly single, rarely in 2 or 3 groups, 2 to 10 µ in dia, interrupted by aerenchymatous space, oil cells with suberized walls **(Vacā);** crystal fibres and pitted vessels showing honeycomb structure **(Ya¾°himadhu);** cells with yellow pigment turning red in *sulfuric acid* 50 per cent, and cells with large starch grains, partially gelatinised **(Haridrā).**

Thin layer chromatography:

Defat 5 g of Kalyā´āvaleha with 75 ml of *n-hexane* under reflux on a water-bath for 30 min. Filter and discard the hexane extract. Extract the defatted marc with 75 ml of *chloroform* under reflux for 30 min. Filter and concentrate the extract to 10 ml and carry out the thin layer chromatography. Apply 10 µl of the chloroform extract on TLC plate and develop the plate to a distance of 8 cm using *toluene: ethyl acetate: methanol* (9 : 1 : 1) as mobile phase. After development allow the plate to dry in air and examine under ultraviolet light (366 nm). It shows major spots at R_f 0.22 (blue), 0.29, 0.45 (both yellow), 0.60, 0.68 (both blue).

Chemical tests:
a) Treat the avaleha with *concentrated sulphuric acid*; orange red colour develops indicating the presence of curcuminoids (Haridrā).
b) Treat the avaleha with 10% solution of *sodium hydroxide* or *potassium hydroxide*; red to violet colour develops indicating the presence of curcuminoids (Haridrā).

Physico-chemical parameters:

Loss on drying: 2.2.10.	Not more than 5.5 per cent,	Appendix
Total ash: 2.2.3.	Not more than 12.0 per cent,	Appendix

Acid- insoluble ash:	Not more than 2.0 per cent,	Appendix 2.2.4.
Alcohol- soluble extractive:	Not less than 46.0 per cent,	Appendix 2.2.7.
Water- soluble extractive:	Not less than 11.0 per cent,	Appendix 2.2.8.
*p*H *(1% aqueous solution):*	5.1 and 5.3,	Appendix 3.3.
Starch:	Not less than 42.0 per cent,	Appendix 2.2.14.

Other requirements:

Microbial Limits:	Appendix 2.4.
Aflatoxins:	Appendix 2.7.

Storage: Store in a cool place in tightly closed containers, protected from light and moisture.

Therapeutic uses: Svarabheda (hoarseness of voice); Mūkatā (Aphasia).

Dose: 12 g daily in divided doses.

Anupāna: Water.

KŪ½MĀ³±AKA RASĀYANA

(Syn. Kū¾mā´²aka Kha´²a)
(AFI, Part-I, 3:7)

Definition:

Kū¾mā´²aka Rasāyana is a semisolid avaleha preparation made with the ingredients in the Formulation composition given below.

Formulation composition:

1.	Kū¾mā´²aka API	*Benincasa hispida*	Fresh Fr. 4.8 kg
2.	Gh¨ta API	Clarified butter from cow's milk	768 g
3.	Kha´²a API	Sugar candy	4.8 kg
4.	Pippalī API	*Piper longum* Fr.	96 g
5.	Ś¨¬gavera (Śu´°hī API)	*Zingiber officinale* Rz.	96 g
6.	Jīraka (Śveta jīraka API)	*Cuminum cyminum* Fr.	96 g
7.	Tvak API	*Cinnamomum zeylanicum* St. Bk.	24 g
8.	Elā (Sūksmailā API)	*Elettaria cardamomum*	Sd. 24 g
9.	Patra (Tejaptra API)	*Cinnamomum tamala*	Lf. 24 g
10	Marica API.	*Piper nigrum*	Fr. 24 g
11	Dhānya (Dhānyaka API)	*Coriandrum sativum*	Fr. 24 g
12	K¾audra (Madhu API)	Honey	384 g
13	Jala API	Water	Q.S.

Method of preparation:

Take all ingredients of pharmacopoeial quality.

Wash, dry, powder the ingredients number 4 to 11 (Prak¾epa) separately and pass through sieve number 85.

Take fresh mature fruit of Kū¾mā´²a, remove skin and seeds and cut in to small pieces of 2.5 to 5 cm. Add double the quantity of water. Heat till Kū¾mā´²a pieces become soft to make pi¾°i maintaining temperature between 90^0 to 100^0. Strain the liquid through *muslin cloth.*

Keep the strained liquid separately and crush the boiled pieces of Kū¾mā´²a in an end runner mill to make a fine paste, fry in Gh¨ta with constant stirring maintaining temperature between 80^0 to 90^0 till the mixture turns brown. Take due care to avoid over roasting or under roasting of pi¾°i

Add sugar to the strained liquid and heat to make "two-thread sugar syrup".

Add the fried paste of Kū¾mā´²a to the syrup, heat with constant stirring maintaining temperature between $90^0$to 100^0 and observe the mixture for formation of soft bolus, which does not disperse in water. Stop heating and allow to cool to 50^0.

Add fine powders of ingredients (prak¾epa) numbered 4 to 11. Mix thoroughly to prepare a homogeneous blend, allow to cool it to room temperature and add Madhu.

Pack it in tightly closed containers to protect from light and moisture.

Description:

Semi solid, malleable, sticky preparation, dark brown in color with spicy odour and pungent, sweet taste.

Identification:

Microscopy:

Weigh about 5 g of the sample, stir with 50 ml of a defatting solvent in a beaker. Pour off the solvent without loss of material and repeat the process till free from Ghrta. Wash the sediment in warm water similarly, pour out water. Wash the sediment with distilled water and centrifuge at medium speed. Decant the supernatant. Take a few mg of the sediment, warm in *chloral hydrate* and mount in *glycerine* (50 per cent). Mount a few mg in *iodine solution*. Observe the following characters in different mounts.
Sac-shaped starch grains with eccentric hilum, non-lignified xylem fibres and xylem vessels with reticulate thickenings **(Śu´°hī)**; multicellular, multiseriate trichomes and sclereid layer from mesocarp **(Jīraka);** U-shaped stone cells with thickenings on three sides **(Tvak);** bulbous perisperm cells containing starch grains and small prisms of calcium oxalate within **(Elā)**; fragments of multicellular uniseriate, short, stout trichomes and leaf epidermal fragments with sunken paracytic stomata **(Tejapatra);** highly thickened stone cells with narrow lumen from testa and groups of stone cells interspersed among parenchyma tissue from hypodermis **(Marica)**; groups of fusiform fibres of sclerenchyma crisscrossing with each other **(Dhānyaka).**

Thin layer chromatography:

Extract 5 g of sample with 75 ml of *ethyl acetate* under reflux on a water-bath for 30 min. Filter, concentrate the filtrate to 10 ml and carry out the thin layer chromatography. Apply 10 µl of the extract on two separate TLC plates and develop the plates to a distance of 8 cm using *toluene : ethyl acetate* (7 : 3) as mobile phase. After development, allow the plates to dry in air and examine one plate under ultraviolet light at 254 nm. It shows major spots at R_f 0.11, 0.24 (piperine), 0.42 and 0.47, when observed at 366 nm it shows major spots at R_f 0.10 (blue), 0.20 (green), 0.24 (blue, piperine), 0.33 (green), 0.37 (blue), 0.48 (blue) and 0.59 (blue). Derivatize the plate with modified *Dragendorff's reagent* and observe under visible light. It shows orange-coloured spots at R_f 0.24 (piperine), 0.27 and 0.83. Spray the second plate with *anisaldehyde-sulphuric* acid reagent followed by heating at 110^0 for about 10 min and examine under visible and ultraviolet light. Under visible light, it shows major spots at R_f 0.24 (green, piperine), 0.37 (violet), 0.47 (violet), 0.51 (violet) and 0.59 (violet). Under ultraviolet light (366 nm), it shows major spots at R_f 0.24, (fluorescent yellow, piperine), 0.26 (red), 0.36 (red), 0.46 (pink), 0.60 (red) and 0.70 (red).

Physico-chemical parameters:

Total Ash:	Not more than 1.0 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 45 per cent,	Appendix 2.2.7.
Water-soluble extractive:	Not less than 75 per cent,	Appendix 2.2.8
Reducing sugars:	67 to 70 per cent,	Appendix 5.1.3.1.
Non-reducing sugars:	5.6 to 5.8 per cent,	Appendix 5.1.3.3.
*p*H *(5% aqueous solution):*	4.0 to 4.5,	Appendix 3.3.

Assay:

The formulation contains not less than 0.008 per cent of piperine when assayed by the following method.

Estimation of piperine: Dissolve 5 mg of piperine in *methano*l and make up the volume to 100 ml in a volumetric flask. Pipette out aliquots of 0.8 to 4.8 ml into 10 ml volumetric flasks and adjust the volume in each flask with *methanol* to prepare standard solutions of 4 to 24 µg / ml. Apply 10 µl of each standard solution on TLC plate. Develop the plate to a distance of 10 cm using *dichloromethane : ethyl acetate* (7.5 : 1) as mobile phase. After development, dry the plate in air and scan in the TLC scanner at a wavelength of 337 nm. Note the area under the curve for a peak corresponding to piperine and prepare the calibration curve by plotting peak area *vs* concentration of piperine.

Extract, accurately weighed, about 5 g of Kū¾mā´²aka Ras¢yana in 25 ml portions of *ethyl acetate* (4 to 5 times), until it tests negative to modified *Dragendorff's reagent*. Filter, concentrate the combined extract and adjust the volume to 25 ml in a volumetric flask. Apply 10 µl of the test solution on TLC plate. Develop, dry and scan the plate as described in the preceding paragraph for calibration curve of piperine. Record area under the curve for a peak corresponding to piperine. Calculate the amount of piperine in the test solution from the calibration curve of piperine.

Other requirements:

Microbial limit	Appendix 2.4.
Aflatoxin	Appendix 2.7.

Storage: Store in a cool place in tightly closed containers, protected from light and moisture.

Therapeutic uses: Kāsa (cough); Śvāsa (Dyspnoea); Uraªk¾ata (chest wound); K¾aya (Pthisis); Purā´ajvara (chronic fever); Raktapitta (bleeding disorder); Chardi (Emesis); T¨¾´ā (thirst); Jvara (Fever); Śukra k¾aya (deficiency of semen); Daurbalya (weakness); Kārśya (Emaciation); Svarabheda (hoarseness of voice); Vaivar´ya (discoloration).

Dose: 20 g daily in divided doses.

Anupāna: Water, Milk.

M§DVĪKĀDI LEHA

(AFI, Part-I, 3:24)

Definition:

M¨dvīkādi Leha is a semisolid avaleha preparation made with the ingredients in the Formulation composition given below.

Formulation composition:

1.	M¨dvīkā (Drāk¾ā API)	*Vitis vinifera*	Dr. Fr.	50 in number
2.	Pippalī API	*Piper longum*	Fr.	30 in number
3.	Śarkarā API	Sugar		48 g
4.	Madhu API	Honey		Q.S.

Method of Preparation:

Take all ingredients of pharmacopoeial quality.

Wash the M¨dvīkā two or three times with fresh water, till it becomes clean, and drain the water completely. Remove the seeds and crush to a fine paste.

Powder dried Pippalī and Śarkarā separately and pass through sieve No. 85.

Triturate all the ingredients of the composition to a homogeneous mixture by adding required amount of Madhu, to form a semisolid mass.

Pack it in tightly closed containers to protect from light and moisture.

Description:

Dark brown coloured, semi solid, malleable, sticky preparation with a pungent, slightly sweet and sour taste.

Identification:

Microscopy:

Take about 5 g of sample, wash in two or three increments of hot water and centrifuge. Decant the supernatant and mount a small portion of the sediment in 50 per cent *glycerine*; observe the following characters. Prisms and raphides of calcium oxalate, cells filled with pinkish pigment **(M¨dvīkā)**; simple starch grains with concentric hilum and polygonal perisperm cells filled with starch grains **(Pippalī)**.

Thin layer chromatography:

Extract 20 g of the avaleha with a combination of 50 ml of a mixture of diethyl *ether : chloroform* (2 : 1) and 5 ml *methanol*. Filter, concentrate to 10 ml and carry out the thin layer chromatography. Apply 10 µl of the extracts on TLC plate and develop the plate to a

distance of 8 cm using *toluene : ethyl acetate : formic acid* (4 : 2.5 : 0.7) as mobile phase. Allow the plate to dry in air and examine under ultraviolet light (254 nm). The plate shows major spots at R_f 0.41, 0.58, 0.64 (piperine), 0.74. Under ultraviolet light (366 nm) the plate shows major spots at R_f 0.45 (blue), 0.55 (brown), 0.64 (Blue, piperine), 0.84 (red), 0.88 (red) and 0.93 (blue). Spray the plate with *anisaldehyde-sulphuric acid reagent* followed by heating at 110^0 for about 10 min. It shows major spots at R_f 0.40 (brown), 0.52 (purple), 0.58 (yellow), 0.64 (blue, piperine), 0.68 (purple) and 0.75 (violet) under visible light.

Physico-chemical parameters*:*

Total Ash:	Not more than 1.0 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 30.0 per cent,	Appendix 2.2.7.
Water-soluble extractive:	Not less than 90.0 per cent,	Appendix 2.2.8.
Total tannins:	0.4 to 0.56 per cent,	Appendix 5.1.2.
Total phenolics:	0.7 to 0.8 per cent,	Appendix 5.1.1.
Total sugar:	70 to 73 per cent,	Appendix 5.1.3.2.
Reducing sugars:	50 to 51 per cent,	Appendix 5.1.3.1.
Non-reducing sugars:	20 to 23 per cent,	Appendix 5.1.3.3.
*p*H *(5% aqueous solution):*	4.0 to 4.3,	Appendix 3.3.

Assay:

The formulation contains not less than 2.0 per cent gallic acid when assayed by the following method.

Estimation of gallic acid: Dissolve 10 mg of gallic acid in 100 ml of *methanol* in a volumetric flask. From this stock solution, prepare standard solutions of 15 to 75 µg / ml by transferring aliquots (1.5 to 7.5 ml) of stock solution to 10 ml volumetric flasks and adjusting the volume to 10 ml with *methanol*.

Apply 10 µl each of standard solution corresponding to 150 ng to 750 ng of gallic acid on a TLC plate and develop the plate to a distance of 8 cm using *toluene : ethyl acetate : formic acid : methanol* (3 : 3 : 0.8 : 0.2) as mobile phase. After development, dry the plate and scan in TLC scanner at a wavelength of 337 nm. Note the area under the curve

for a peak corresponding to gallic acid and prepare the calibration curve by plotting peak area *vs* amount of gallic acid.

Hydrolyze accurately weighed about 5 g avaleha by refluxing with 50 ml of *2N hydrochloric acid* on a water-bath. Filter, add equal amount of water, transfer to a separating funnel and extract with *diethyl ether* (20 ml x 4). Collect the diethyl ether layer and dry. Dissolve the residue in *methanol* and make up the volume to 25 ml in a volumetric flask.

Apply 10 µl on TLC plate and develop, dry and scan the plate as described in the preceding paragraph for calibration curve of gallic acid. Note area under the curve for a peak corresponding to gallic acid in each track of test solution. Calculate the amount of gallic acid in the test solution from the calibration curve of gallic acid.

Other requirements:

Microbial Limits:	Appendix 2.4.
Aflatoxins:	Appendix 2.7.

Storage: Store in a cool place in tightly closed containers, protected from light and moisture.

Therapeutic uses: Kāsa (cough).

Dose: 25 g daily in divided doses.

Anupāna: Water, Milk.

PŪGA KHA³±A

(AFI, Part-I, 3:17)

Definition:

Pūga Kha´da is a granular preparation made with the ingredients in the Formulation composition given below.

Formulation composition:

1. Pūgaphala API 384 g	*Areca catechu*	Sd.
2. Sarpi (Go gh¨ta API) 192 g	Clarified butter from cow's milk	
3. Varī rasa (Śatāvarī API) 384 ml	Asparagus racemosus	Rt.
4. Dhātrī rasa (Āmalakī API) 384 ml	Phyllanthus emblica *(Emblica officinalis)*	Fr.
5. Payasa (Godugdha API) 1.5 l	Cow's milk	
6. Sitā API 2400 g	Sugar candy	
7. Hema (Nāgakeśara API) 24 g	*Mesua ferrea*	Stmn.
8. Ambhodhara (Mustā API) 24 g	*Cyperus rotundus*	Rt. Tr.
9. Candana (Śveta candana API) 24 g	*Santalum album*	Ht. Wd.
10. Śu´°hī API 24 g	*Zingiber officinale*	Rz.
11. Marica API 24 g	*Piper nigrum*	Fr.
12. Pippalī API 24 g	*Piper longum*	Fr.
13. Dhātrī asthimajjā (Āmalakī API) 24 g	*Phyllanthus emblica* *(Emblica officinalis)*	Enm.
14. Priyālāsthi majjā (Priyala API) 24 g	*Buchanania lanzan*	Enm.
15. Tvak API 24 g	*Cinnamomum zeylanicum*	St. Bk.
16. Elā (Sūk¾mailā API) 24 g	*Elettaria cardamomum*	Sd.

17. Patra (Tejapatra API) 24 g	*Cinnamomum tamala*	Lf.
18. Śveta jīraka API 24 g	*Cuminum cyminum*	Fr.
19. K¨¾´ ajīraka API 24 g	*Carum carvi*	Fr.
20. Ś¨¬gā°aka API 24 g	*Trapa natans* var. *bispinosa*	Enm.
21. Va¼śajā (Va¼śa API) 24 g	*Bambusa bambos*	S.C.
22. Jātīphala API 24 g	*Myristica fragrans*	Sd.
23. Jātīko¾ā (Jātīphala API) 24 g	*Myristica fragrans*	Ar.
24. Lava¬ga API 24 g	*Syzygium aromaticum*	Fl. Bd.
25. Dhānyaka API 24 g	*Coriandrum sativum*	Fr.
26. Kakkola (Ka¬kola API) 24 g	*Piper cubeba*	Fr.
27. Nākulī (Īśvarī API) 24 g	*Aristolochia indica*	Rt.
28. Tagara API 24 g	*Valeriana wallichii*	Rz.
29. Ambu (Hrīvera API) 24 g	*Coleus vettiveroides*	Rt.
30. Vīra´aśiphā (Uśīra API) 24 g	*Vetiveria zizanioides*	Rt.
31. Bh¨¬ga (Bh¨¬garāja API) 24 g	*Eclipta alba*	Pl.
32. Aśvagandhā API 24 g	*Withania somnifera*	Rt.

Method of preparation:

Take all ingredients of pharmacopoeial quality.

Weigh the ingredients of prak¾epa dravya numbered 7 to 32 of the Formulation composition, clean dry, powder separately and pass through sieve number 85.

Take fully mature and dry pūgaphala (areca nuts) and break it into small pieces of about 0.5 – 1.0 cm in diameter, tie them in a *muslin cloth* to form a bundle (Pottali) and immerse into milk in a stainless steel vessel (*Dolāyantra vidhi*) and boil for 3 h.

Wash the bundle with warm water (50^0 to 55^0) and repeat washing for three times*. Dry these processed Pūgaphala in a tray-dryer at a temperature not exceeding 60^0. Grind the

dried pieces and sieve through 85 mesh. Fry the powder in Gh¨ta at low temperature between 60^0-70^0.

Crush the fresh ¡malakī, strain through a *muslin cloth* to obtain juice.

Take fresh Śatāvarī roots and wash. Remove the outer layer (epiblema) and express the juice with the help of juicer. Add sugar (Sitā) to the mixture of above juices, heat till syrup forms. Add °odhita Pūgaphala powder with continuous stirring till it becomes a thick paste. Remove the utensil from the fire and stir continuously while adding Prak¾epa dravya. Allow to cool down into granules. Spread the granules in a stainless steel tray and allow to dry.

Pack the granules in tightly closed containers to protect from light and moisture.

Description:

Light brown granules with pleasant odour and spicy, sweet, acrid and astringent taste.

Identification*:*

Thin layer chromatography:

Extract 5 g of Pūga Kha´²a successively with 75 ml each of *n-hexane* and *chloroform* under reflux on a water-bath for 30 min; drying the marc between two extractions. Filter, concentrate each extract to 10 ml and carry out the thin layer chromatography. Apply 10 µl of each extract separately on two TLC plates and develop the plates to a distance of 8 cm using *hexane : ethyl acetate* (9 : 1) as mobile phase for hexane extract and *toluene : ethyl acetate : formic acid* (5 : 5 : 1) for chloroform extract. After development, allow the plates to dry in air and examine under ultraviolet light. The hexane extract shows major spots at R_f 0.20, 0.29, 0.48 and 0.61 under ultraviolet light (254 nm). The chloroform extract shows major spots at R_f 0.28, 0.33, 0.56 and 0.62 under ultraviolet light (254 nm) and at 366 nm it shows major spots at R_f 0.27, 0.42 (both blue), 0.49, 0.52 (both red) and 0.73 (green).

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* To maintain the shelf life, cow's milk is washed off after boiling the Pūga phala. To meet the milk component of the formulation, Pūga kha´²a should be essentially taken with milk.

Physico-chemical parameters:

Loss on drying:	Not more than 5 per cent,	Appendix 2.2.10.
Total ash:	Not more than 2.40 per cent,	Appendix 2.2.3.
Acid-insoluble ash:	Not more than 1.00 per cent,	Appendix 2.2.4.
Alcohol-soluble extractive:	Not less than 17.0 per cent,	Appendix 2.2.7.
Water-soluble extractive:	Not less than 69.0 per cent,	Appendix 2.2.8.
*p*H *(1% aqueous solution):*	5.0 to 5.5,	Appendix 3.3.

Other requirements:

Microbial Limit:	Appendix 2.4.
Aflatoxin:	Appendix 2.7.

Storage: Store in a cool place in tightly closed containers, protected from light and moisture.

Therapeutic uses: Chardi (emesis); Śūla (pain); ¡mlapitta (Hyperacidity); Mūrcchā (Syncope); Vandhyāroga (Infertility); Pradara (Excessive vaginal discharge); Pā´²u (Anaemia); Raktārśa (Bleeding piles); Garbhado¾a (foetal anomaly); Jarā (senility); Śukrak¾aya (Oligospermia); Agnim¢ndya (loss of appetite); T¨° (thirst); Daurbalya (weakness); Ajīr´a (dyspepsia); Vi°sa¬ga (constipation); Mūtrasa¬ga (obstruction in urinary tract); Yak¾mā (Tuberculosis); Balya (improves strength / immunity); Var´a (improve complexion) and D¨¾°i (vision).

Dose: 12 g daily in divided doses.

Anupāna: Essentially to be taken with Milk.

SŪ§A³ ĀVALEHA

(AFI, Part I, 3:29)

Definition:

Sūra´āvaleha is a semisolid avaleha preparation made with the ingredients in the Formulation composition given below:

Formulation composition:

1.	Sūra´a API	*Amorphophallus campanulatus*	Fresh corm	4.800 kg
2.	Jala API for decoction	Water		9.600 l
	Reduced to			4.800 l
3.	Gh¨ta (Gogh¨ta API)	Clarified butter from Cow's milk		384 g
4.	Kha´²a API	Sugar candy		4.8 kg
5.	Pippalī API	*Piper longum*	Fr.	96 g
6.	Śu´°hī API	*Zingiber officinale*	Rz.	96 g
7.	Jīraka (Śveta jīraka API)	*Cuminum cyminum*	Fr.	96 g
8.	Dhānyaka API	*Coriandrum sativum*	Fr.	24 g
9.	Patra (Tejapatra API)	*Cinnamomum tamala*	Lf.	24 g
10.	Elā (Śūk¾mailā API)	*Elettaria cardamomum*	Sd.	24 g
11.	Marica API	*Piper nigrum*	Fr.	24 g
12.	Tvak API	*Cinnamomum zeylanicum*	St. Bk.	24 g
13.	K¾audra (Madhu API)	Honey		192 g

Method of preparation:

Take all material of pharmacopoeial quality.

Wash, dry, powder ingredients numbered 5 to 12 (Prak¾epa dravya) separately and pass through sieve number 85.

Remove the skin of Sūra´a, wash and cut into pieces. Add water in a quantity sufficient to boil the Sūra´a which could be mashed easily to make a paste maintaining temperature between 90^0 to 100^0 for boiling. Strain the liquid through the *muslin cloth*.

Crush the boiled pieces of Sūra´a to make a fine paste, fry the paste in Gh¨ta with constant stirring maintaining temperature between 80^0 to 90^0 till the mixture turns brown. Take all the precautions to avoid over-roasting or under roasting the paste. Add sugar and water to the strained liquid, heat to make two-thread sugar syrup.

Add the fried paste of Sūra´a, to the above syrup, heat with constant stirring maintaining temperature between 90^0 to 100^0 and observe the mixture till the formation of a soft bolus, which does not disperse in water. Stop heating and allow to cool to 50^0.

Add powders of prak¾epa dravya mix thoroughly to prepare a homogeneous blend.

On cooling to room temperature, add Madhu.

Pack it in tightly closed containers to protect from light and moisture.

Description:

Semi solid, malleable, dark brown, sticky preparation with spicy odour and pungent, sweet taste

Identification:

Microscopy:

Weigh about 5 g of the sample, stir with 50 ml of a defatting solvent in a beaker. Pour out the solvent without loss of material and repeat the process till removal of the Gh¨ta.Wash the sediment in warm water similarly, and pour out the water. Wash the sediment with distilled water and centrifuge at medium speed. Decant the supernatant. Take a few mg of the sediment, warm in *chloral hydrate* and mount in *glycerine* (50 per cent). Mount a few mg in *iodine solution*. Observe the following characters in different mounts.
Sac-shaped starch grains with eccentric hilum, non-lignified xylem fibres and xylem vessels with reticulate thickenings **(Śu´°hī);** multicellular, multiseriate trichomes and sclereid layer from mesocarp **(Jīraka);** U-shaped stone cells with thickening on three sides **(Tvak)**; bulbous perisperm cells containing starch grains and small prisms of calcium oxalate within **(Elā)**; fragments of multicellular uniseriate short stout trichomes and leaf epidermal fragments with sunken paracytic stomata **(Tejapatra)**; highly thickened stone cells with narrow lumen from testa, and groups of stone cells interspersed among parenchyma tissue from hypodermis **(Marica)**; groups of fusiform fibres of sclerenchyma crisscrossing with each other **(Dhānyaka)**.

Thin layer Chromatography:

Extract 5 g of Sūra´āvaleha with 75 ml of *n-hexane* under reflux on a water-bath for 30 min. Filter and concentrate to 10 ml and carry out the thin layer chromatography. Apply 10 µl of the extract on TLC plate and develop the plate to a distance of 8 cm using *n-hexane : ethyl acetate* (7: 3) as mobile phase. After development, allow the plate to dry in air and spray with *anisaldehyde-sulphuric acid* reagent followed by heating at 110^0 for about 10 min and examine under visible light. It shows major spots at R_f 0.19 (violet), 0.32 (pink), 0.47 (violet), 0.59 (pink) and 0.95 (violet).

Physico-chemical parameters:

Total Ash:	Not more than 0.1 per cent,	Appendix 2.2.3.
Acid-insoluble ash:	Not more than 0.05 per cent,	Appendix 2.2.4.
Alcohol-soluble extractive:	Not less than 25 per cent,	Appendix 2.2.7.

Water-soluble extractive:	Not less than 50 per cent,	Appendix 2.2.8.
Starch content:	Not less than 3 per cent,	Appendix 2.2.14.
Total sugars:	80 to 90 per cent,	Appendix 5.1.3.2.
Reducing sugars:	62 to 65 per cent,	Appendix 5.1.3.1.
Non-reducing sugars:	18 to 20 per cent,	Appendix 5.1.3.3.
*p*H *(10% aqueous solution):*	4.0 to 4.3,	Appendix 3.3.

Assay:

The formulation contains not less than 0.003 per cent of piperine, when assayed by the following method.

Estimation of piperine: Dissolve 5 mg of piperine in *methanol* and make up the volume to 100 ml in a volumetric flask. From this stock solution, pipette out aliquots of 0.8 to 4.8 ml into 10 ml volumetric flask and make up the volume with *methanol* to prepare standard solutions of 4 to 24 µg / ml. Apply 10 µl of each standard solution (corresponding to 40 to 240 ng of piperine) on TLC plate. Develop the plate to a distance of 8 cm using *dichloromethane : ethyl acetate* (7.5 : 1). After development, dry the plate and scan in a TLC scanner at a wavelength of 337 nm. Record the area under the curve for a peak corresponding to piperine and prepare the calibration curve by plotting peak area *vs* amount of piperine.

Extract accurately weighed about 5 g Sūra´āvaleha in *ethyl acetate* (25 ml x 5). Filter the extracts, pool, concentrate and adjust the volume to 25 ml in a volumetric flask. Apply 10 ml of test solution on TLC plate and develop, dry and scan the plate as described in the proceeding paragraph for calibration curve of piperine. Calculate the amount of piperine in the test solution from the calibration curve of piperine.

Other requirements:

Microbial limits:	Appendix 2.4.
Aflatoxins:	Appendix 2.7.

Storage: Store in a cool place in tightly closed containers, protected from light and moisture.

Therapeutic uses: Mandāgni (dyspepsia); Mū²havāta (obstructed movement of Vāta do¾a); Ar°a (piles) etc.

Dose: 20 g daily in divided doses.

Anupāna: Water, Milk.

VĀSĀVALEHA
(AFI, Part-I; 3:26)

Definition:

Vāsāvaleha is a semisolid avaleha preparation made with the ingredients in the Formulation composition given below.

Formulation composition:

1.	Vāsaka (Vāsā API) svarasa	*Adhatoda vasica*	Lf. (Fresh)	768 g
2.	Sitā API	Sugar candy		384 g
3.	Sarpi (Gogh¨ta API)	Clarified butter from cow's milk		96 g
4.	Pippalī API	*Piper longum*	Fr.	96 g
5.	Madhu API	Honey		384 g

Method of preparation:

Take all ingredients of pharmacopoeial quality.
Take fresh leaves of Vāsā, wash with water. Chop the leaves to about 2.5 cm, grind into a paste and prepare vāsā svarasa through *pu˚a pāka vidhi* (Annexure 6.1.4)
Clean, dry, grind Pippalī into fine powder and pass through sieve no. 85.
Add powdered Śarkarā to Vāsā svarasa, heat mildly and filter through *muslin cloth*, after complete dissolution of Śarkarā. Stir continuously while heating on mild fire.
Concentrate the above mixture by continuous stirring on low fire.
Add Gh¨ta and Pippalī to the above mixture and mix well. Continue heating till the preparation reaches the required consistency confirmed by the formation of a soft ball that does not disperse in water and cool to room temperature. Add honey and again mix well by continuous agitation with stirrer to make a homogeneous mixture.
Pack it in tightly closed containers to protect from light and moisture.

Description:

Dark brown coloured, semi solid, malleable, sticky preparation with odour of ghee; taste bitter and pungent.

Identification*:*

Microscopy*:*

Take about 5 g of sample dissolve in sufficient quantity of *n-hexane* for removal of ghee. Repeat the procedure with two further increments of solvent pouring out solvent each time, wash the sediment with warm water, followed by cold water repeatedly till a clear sediment is obtained. Take a few mg of the sediment, mount in 50 per cent *glycerine* and observe the following characters. Simple starch grains with concentric hilum, abundant

polygonal perisperm cells packed with starch grains **(Pippalī)**; multicellular, uniseriate, warty covering trichomes, sessile glandular trichomes with quadricellular head, fragments of lower epidermis showing the presence of diacytic stomata, cigar-shaped crystoliths **(Vāsā**).

Thin layer chromatography:

Extract 5 g of avaleha with 100 ml of *methanol* under reflux on a water-bath for 30 min. Filter, concentrate to 25 ml and carry out the thin layer chromatography. Apply 10 µl of the extract on TLC plate and develop the plate to a distance of 8 cm using *ethyl acetate : methanol : ammonia* (8 : 2 : 0.2) as mobile phase. After development, allow the plate to dry in air and examine under ultraviolet light. It shows major spots at R_f 0.34 (vasicine), 0.74, 0.96 (piperine) under ultraviolet light (254 nm) and at R_f 0.77 (fluorescent blue), 0.89 (blue), 0.96 (fluorescent blue – piperine) under ultraviolet light (366 nm). Derivatise the plate with modified *Dragendorff's reagent* and observe under visible light. It shows two orange coloured spots at R_f 0.34 and 0.96.

Physico-chemical parameters:

Loss on drying:	Not more than 12.16 per cent,	Appendix 2.2.10.
Total Ash:	Not more than 2.5 per cent,	Appendix 2.2.3.
Acid-insoluble ash:	Not more than 0.15 per cent,	Appendix 2.2.4.
Alcohol-soluble extractive:	Not less than 20 per cent,	Appendix 2.2.7.
Water-soluble extractive:	Not less than 60 per cent,	Appendix 2.2.8.
Total sugar:	83 to 88 per cent,	Appendix 5.1.3.2.
Reducing sugars:	44 to 45 per cent,	Appendix 5.1.3.1.
Non-reducing sugars:	38 to 43 per cent,	Appendix 5.1.3.3.
*p*H *(10% aqueous solution):*	4.35 to 4.9,	Appendix 3.3.

Assay:

The formulation contains not less than 0.2 per cent of vasicine and not less than 0.2 per cent of piperine when assayed by the following methods.

Estimation of vasicine: Dissolve 2 mg of vasicine in 25 ml of *methanol* in a volumetric flask. From this stock solution pipette out aliquots of 2 to 6 ml and make up the volume to 5 ml in volumetric flasks with *methanol*. Apply 10 ml of each standard solution (corresponding to 320 to 960 ng of vasicine) on TLC plate. Develop the plate to a

distance of 8 cm using *ethyl acetate : methanol : ammonia* (8 : 2 : 0.2) as mobile phase. After development, dry the plate and scan in TLC scanner at a wavelength of 298 nm. Note the peak area under the curve for a peak corresponding to vasicine and prepare the calibration curve by plotting peak area *vs* amount of vasicine.

Extract accurately weighed about 5 g of Vāsāvaleha in *methanol* (25 ml x 5). Filter the extract, pool, concentrate and adjust the volume to 25 ml. Apply 10 ml of test solution on TLC plate and develop, dry and scan the plate as described in the preceeding paragraph for calibration curve of vasicine. Calculate the amount of vasicine in the test solution from the calibration curve of vasicine.

Estimation of piperine: Dissolve 5 mg of piperine in 100 ml of *methanol*. From this stock solution, pipette out 0.8 to 4.8 ml aliquots into 10 ml volumetric flasks and make up the volume with *methanol* to prepare standard solutions of 4 to 24 µg / ml. Apply 10 ml of each standard solution (corresponding to 40 to 240 ng) on TLC plate and develop the plate to a distance of 8 cm using *dichloromethane : ethyl acetate* (7.5 : 1) as mobile phase. After development, dry the plate and scan in TLC scanner at a wavelength of 337 nm. Note the peak area under the curve for a peak corresponding to piperine and prepare the calibration curve by plotting peak area *vs* amount of piperine.

Extract accurately weighed about 5 g of Vāsāvaleha with ethyl acetate (25 ml x 5). Filter the extract, pool, concentrate and adjust the volume to 25 ml in a volumetric flask. Apply 10 ml of test solution on TLC plate and develop, dry and scan the plate as described in the preceding paragraph for calibration curve of piperine. Calculate the amount of piperine in the test solution from the calibration curve of piperine.

Other requirements*:*

Microbial limits:	Appendix 2.4.
Aflatoxins:	Appendix 2.7.

Storage: Store in a cool place in tightly closed containers, protected from light and moisture.

Therapeutic uses: Kāsa (cough); Śvāsa (Dyspnoea); Jvara (Fever); Raktapitta (bleeding disorders); Rājayak¾mā (Tuberculosis); Pārśvaśūla (intercostal neuralgia and pleurodynia); H¨tśūla (Angina pectoris).

Dose: 12 g daily in divided doses.

Anupāna: Milk, Water.

VYĀGHRĪ HARĪTAKĪ

(AFI, Part-II, 3:6)

Definition:

Vyāghrī Harītakī is a semisolid preparation made with the ingredients given in the Formulation composition.

Formulation composition:

1.	Ka´°akārī API	*Solanum surattense*	Pl.	4.8 kg
2.	Jala API for decoction reduced to	Water		12.9 *l* 3.07 *l*
3.	Harītakī API	*Terminalia chebula*	P. (100 in No.)	1.2 kg
4.	Gu²a API	Jaggery		4.8 kg
5.	Śu´°hī API	*Zingiber officinale*	Rz.	96 g
6.	Marica API	*Piper nigrum*	Fr.	96 g
7.	Pippalī API	*Piper longum*	Fr.	96 g
8.	Tvak API	*Cinnamomum zeylanicum*	St. Bk.	48 g
9.	Patra (Tvakpatra API)	*Cinnamomum tamala*	Lf.	48 g
10.	Elā (Sūk¾mailā API)	*Elettaria cardamomum*	Sd.	48 g
11.	Nāgakeśara API	*Mesua ferrea*	Stmn.	48 g
12.	Pu¾parasa (Madhu API)	Honey		288 g

Method of preparation:

Take raw material of Pharmacopoeial quality.

Wash, dry and grind ingredient number 1 (Kvātha Dravya) of the formulation composition and pass through sieve number 44 to obtain a coarse powder.

Clean, dry and powder the ingredients number 5 to 11(Prak¾epa Dravya) of the formulation composition and pass through sieve number 85 to obtain a fine powder.

Clean, dry the ingredient number 3 of the formulation composition and make in to small pieces by removing seeds. Tie the pieces of Harītakī in a *muslin cloth* to prepare a po°°alī.

Add specified amount of water to the Kvātha Dravya and suspend the pottali containing pieces of Harītakī in to the vessel. Heat, reduce the volume to one fourth and filter through *muslin cloth* to obtain Kvātha.

Collect the soft pieces of Harītakī from the po°°ali (bundle) and prepare fine paste.

Add jaggery to the Kvātha, boil to dissolve and later filter through *muslin cloth.* Add fine paste of Harītakī, subject to gentle boiling and stir continuously during the process. Continue heating till the preparation reaches the consistency of leha confirmed by the formation of soft ball that does not disperse in water. Stop heating.

Cool to room temp and add powdered Prak¾epa Dravya and honey.

Mix thoroughly to prepare a homogeneous mass.

Pack it in tightly closed containers to protect from light and moisture.

Description:

A blackish brown, semisolid sticky paste with bitter and astringent taste and spicy pleasant odour.

Identification:

Microscopy:

Take about 5 g of the Avaleha and wash it with warm water till guda and honey are removed. Collect the sediment. Clarify a small amount of residue with *chloral hydrate* solution, wash in cold water, and mount in *glycerin*. Take a few mg, add *iodine solution* water, and mount in *glycerin*. Observe following character in different mounts.
Fragments of hypodermis in surface view, stone cells varying in sizes, shapes and thickness, mostly present in groups interspersed among parenchyma **(Marica)**; fragments of fibres with very narrow lumen, not over 600 µ long and not over 45 µ broad; parenchyma cells containing minute acicular crystal of calcium oxalate, stone cells varying shape and size, smaller ones somewhat rectangular; oil cells present **(Tvak)**; groups of slightly wavy parenchymatous cells, each cell containing 1 to 3 rosette crystals of calcium oxalate, groups of perisperm cells bulbous in shape packed with starch grains which also shows in middle tiny prismatic crystals of calcium oxalate; epidermal and hypodermal cells crossing each other at right angle **(Sūkşmailā);** groups of parenchymatous cells, densely packed with starch grains, isolated starch grains, simple, oval to rod shaped upto 75 µ in length, hilum eccentric, lamellae distinct; yellow coloured oleo resin cells, non-lignified, septate fibres some of them bearing marks of adjacent cells pressing against them **(Śu´°hī)**; stone cells with broad lumen in groups of 2 to 8 **(Pippalī)**; crushed pieces of anther lobes containing pollen grains, each tricolporate measuring upto 55 µ in dia., groups of epidermal cells of anther lobe **(Nāgakeśara)**; groups of angular epidermal parenchytamous cells with sunken stomata, oil cells and oil globules seen, unicellular and bicellular trichomes **(Tejapatra)**.

Thin layer chromatography:

Extract 5 g of sample with *n-hexane* (25 ml x 3) under reflux on a water bath for 30 min, filter, concentrate to 10 ml and carry out thin layer chromatography. Apply 10 µl of the extract on TLC plate. Develop the plate to a distance of 8 cm using *tolune : ethyl acetate* (8 : 2) as mobile phase. After development, allow the plate to dry in air and examine under ultra violet light (366 nm). It shows major spots at R_f 0.28 (blue), 0.43 and 0.58 (faint blue). Spray the plate with *anisaldehyde- sulphuric acid reagent* followed by heating at 110^0 about for 10 min. It shows major spots at R_f 0.21 (green), 0.43 (blue) and 0.58 (brown) under visible light.

Physico-chemical parameters:

Loss on drying:	Not more than 23.0 per cent,	Appendix 2.2.10.
Total ash:	Not more than 4.0 per cent,	Appendix 2.2.3.
Acid-insoluble ash:	Not more than 0.15 per cent,	Appendix 2.2.4.
Sulphated Ash:	Not more than 0.41 per cent,	Appendix 2.2.6.
Alcohol-soluble extractive:	Not less than 20.0 per cent,	Appendix 2.2.7.
Water-soluble extractive:	Not less than 68.7 per cent,	Appendix 2.2.8.
*p*H *of 1% aqueous solution :*	5.5 and 5.6,	Appendix 3.3.

Other requirements:

Microbial limits:	Appendix 2.4.
Aflatoxins:	Appendix 2.7.

Storage: Store in a cool place in tightly closed containers, protected from light and moisture.

Therapeutic uses: Kāsa (cough); Pratiśyāya (Coryza); Śvāsa (Asthma); Svaraksaya (aphasia); Pīnasa (Chronic rhinitis / Sinusitis); Rājayak¾mā (Tuberculosis).

Dose: 5 to 15 g**.**

Anupāna: Water, Milk.

CŪR 3 A

General Description:

Drugs according to the formulation composition of the particular c*ūr´a* are collected, dried, powdered individually and passed through sieve number 85 to prepare a fine powder. They are mixed in the specified proportion and stored in well closed container.

The term c*ūr´a* may be applied to the powder prepared by a single drug or a combination of more drugs.

Raja and *K¾oda* are the synonyms for c*ūr´a. Cūr´as* may be of plant origin, or mixed with other ingredients. The following points are to be noted.

If metals / minerals are used, prepare *bhasma* or *sindura* of the minerals unless otherwise mentioned.

In cases where *pārada* and *gandhaka* are mentioned, prepare *Kajjalī* and add other drugs, one by one, according to the formula.

In general the aromatic drugs like *Hi¬gū* [Asafoetida] etc. should be fried before they are converted to fine powders.

Specific care should be taken in case of Salts and Sugars. Formulations with hygroscopic components should not usually be prepared during rainy seasons. If so, specific precautions should be taken during storage.

C*ūr´as* should be stored in air tight containers. Polyethylene and foil packing also provides damp proof protection.

Special precaution for storage should be taken in cases of formulations with salts, sugars and *Ks$āras*.

ĀMALAKYĀDI CŪR^{3}A

(AFI, Part-I, 7:3)

Definition:

Āmalakyādi Cūr´a is a powder preparation made with the ingredients in the Formulation composition given below.

Formulation composition:

1.	Āmla (Āmalakī API)	*Phyllanthus emblica (Emblica officinalis)*	P.	1 part
2.	Citraka API	*Plumbago zeylanica*	Rt.	1 part
3.	Pathyā (Harītakī API)	*Terminalia chebula*	P.	1 part
4.	Pippalī API	*Piper logum*	Fr.	1 part
5.	Saindhava lava´a API	Rock salt	-	1 part

Method of preparation:

Take all ingredients of pharmacopoeial quality.

Roast Saindhava lava´a in a stainless steel pan at low temperature till it becomes free from moisture**,** prepare fine powder and pass through sieve number 85.

Wash and dry the ingredients numbered 1 to 5, powder individually in a pulverizer and pass through sieve number 85. Weigh separately each ingredient, mix together and pass through sieve number 44 to obtain a homogeneous blend. Store it in an air-tight container.

Pack it in tightly closed containers to protect from light and moisture.

Description:

Brown-coloured, smooth powder with pleasant odour and salty, spicy taste. The powder completely pass on through sieve number 44 and not less than 50 per cent pass on through sieve number 85.

Identification:

Microscopy:

Take about 2 g of Cūr´a, and wash it thoroughly with water to remove salt, pour out the water without loss of material and mount in *glycerine*; warm a few mg with *chloral hydrate*, wash and mount in *glycerine*; treat a few mg with *iodine* in *potassium iodide solution* and mount in *glycerine*. Observe the following characters in the different mounts.

Thin walled epidermis with paracytic stomata, brachysclereids with pitted wide lumen, silica crystals in epidermal cells (**Āmalakī**); cork cells in surface view, uniseriate and multiseriate ray parenchyma cells, bifurcated short fibres and pitted vessels (**Citraka)**; Prismatic and druses of calcium oxalate crystals, groups of sclereids, criss-cross layers of fibres, thin walled fibres and broad lumen with pegged tip (**Harītakī);** perisperm cells packed with starch grains and minute crystals of calcium oxalate, uniseriate multicellular trichomes (**Pippalī**).

Thin Layer Chromatography:

Extract 4 g of cūr´a in *alcohol* (25 ml x 3) under reflux on a water-bath for 30 min, filter, concentrate to 10 ml and carry out the thin layer chromatography. Apply 10 µl of the extract on TLC plate and develop the plate to a distance of 8 cm using *toluene : ethyl acetate* (5 : 2) as mobile phase. After development, allow the plate to dry in air and examine under ultraviolet light (254 nm). It shows major spots at R_f. 0.43 (light green), 0.50 (green) and 0.85 (pale green).

Test for chloride:
Dissolve 1 g of the sample in 10 ml of deionised water and filter. Acidify the filtrate with *dilute nitric acid* and add 5 per cent w/v *silver nitrate solution*. A curdy white precipitate appears.

Physico-chemical parameters:

Loss on drying at 105^0***:***	Not more than 10 per cent,	Appendix 2.2.10.
Total ash:	Not more than 27 per cent,	Appendix 2.2.3.
Acid-insoluble ash:	Not more than 0.6 per cent,	Appendix 2.2.4.
Alcohol-soluble extractive:	Not less than 25 per cent,	Appendix 2.2.7.
Water-soluble extractive:	Not less than 46 per cent,	Appendix 2.2.8.
*p*H *(10% aqueous solution):*	3 to 4,	Appendix 3.3.

Assay:

Sodium:	Not less than 6 per cent w/w,	Appendix 5.2.9.

Other requirements:

Microbial limits:	Appendix 2.4.
Aflatoxin:	Appendix 2.7.

Storage: Store in a cool place in tightly closed containers, protected from light and moisture.

Therapeutic Uses: Aruci (anorexia); Agnimāndya (dyspepsia); Jvara (Fever); Aj॒r´a (indigestion).

Dose: 5 to 10 g daily in divided doses.

Anupāna: Water.

AVIPATTIKARA CŪR³A

(AFI, Part- I, 7:2)

Definition:

Avipattikara Cūr´a is a powder preparation made with the ingredients in the Formulation composition given below.

Formulation composition:

1.	Śu´°hī API	*Zingiber officinale*	Rz.	1 part
2.	Marica API	*Piper nigrum*	Fr.	1 part
3.	Pippalī API	*Piper longum*	Fr.	1 part
4.	Harītakī API	*Terminalia chebula*	P.	1 part
5.	Bibhītaka API	*Terminalia bellirica*	P.	1 part
6.	Āmalakī API	*Phyllanthus emblica (Emblica offcinalis)*	P.	1 part
7.	Mustā API	*Cyperus rotundus*	Rz.	1 part
8.	Vi²ā lavana	-	-	1 part
9.	Vi²a¬ga API	*Embelia ribes*	Fr.	1 part
10.	Elā (Sūk¾mailā API)	*Eletteria cardamomum*	Sd.	1 part
11.	Patra (Tejapatra API)	*Cinnamomum tamala*	Lf.	1 part
12.	Lava¬ga API	*Syzygium aromaticum*	Fl. Bd.	11 parts
13.	Triv¨t API	*Ipomoea turpethum*	Rt.	44 parts
14.	Śarkarā API	Cane sugar	-	66 parts

Method of preparation:

Take all ingredients of pharmacopoeial quality.
Clean, dry and powder the ingredients numbered 1 to 7 and 9 to 13 individually in a pulverizer and pass through sieve number 85. Prepare fine powder of Vi²a lavana and Śarkarā separately and pass through sieve number 85. Weigh separately each powdered ingredient, mix together in specified ratio and pass through sieve number 44 to obtain a homogeneous blend. Pack it in tightly closed containers to protect from light and moisture.

Description:

Light brown, fine powder, odour characteristic of clove, with a sweet, spicy and pungent taste. The powder completely pass on through sieve number 44 and not less than 50 per cent pass on through sieve number 85.

Identification:

Thin Layer Chromatography:

Extract 4 g of sample in *alcohol* (25 ml x 3) under reflux on a water-bath for 30 min, filter, concentrate to 10 ml and carry out the thin layer chromatography. Apply 10 µl of the extract on TLC plate and develop the plate to a distance of 8 cm using *toluene : ethyl acetate* (5 : 2) as mobile phase. After development allow the plate to dry in air and examine under ultraviolet (366 nm). It shows major spots at R_f 0.11, 0.23, 0.35 (all blue) and 0.72 (fluorescent blue). Spray the plate with *vanillin-sulphuric acid reagent* followed by heating at 110^0 for about 10 min and observe under visible light. The plate shows major spots at R_f 0.49, 0.54, (both violet), 0.65 and 0.73 (both pale violet).

Test for Chloride:
Dissolve 1 g of the sample in 10 ml of deionised water and filter. Acidify the filtrate with *dilute nitric acid* and add 5 per cent w/v *silver nitrate* solution. A curdy white precipitate appears.

Physico-chemical parameters:

Loss on drying at 105^0:	Not more than 7 per cent,	Appendix 2.2.10.
Total ash:	Not more than 6 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 20 per cent,	Appendix 2.2.7.
Water-soluble extractive:	Not less than 53 per cent,	Appendix 2.2.8.
*p*H *(10%) aqueous solution:*	4 to 6,	Appendix 3.3.
Total sugars:	Not less than 39 per cent,	Appendix 5.1.3.2.
Reducing sugars:	Not less than 4 per cent,	Appendix 5.1.3.1.

Other requirements:

Microbial load:	Appendix 2.4.
Aflatoxin:	Appendix 2.7.

Storage: Store in a cool place in tightly closed containers, protected from light and moisture.

Therapeutic uses: Agnimāndya (digestive impairment); Malabandha (constipation); Amlapitta (Hyperacidity); Arśa (Piles); Mūtrabandha (retention of urine); Prameha (metabolic disorder).

Dose: 10 g daily in divided doses.

Anupāna: Honey, Water, Milk.

BĀLACĀTURBHADRIKĀ CŪR 3 A

(AFI, Part-I, 7:24)

Definition:

Bālacaturbhadrikā Cūr´a is a powder preparation made with the ingredients in the Formulation composition given below:

Formulation composition:

1.	Ghana (Mustā API)	*Cyperus rotundus*	Rt.Tr.	1 part
2.	K¨¾´ā (Pippalī API)	*Piper longum*	Fr.	1 part
3.	Aru´ā (Ativi¾ā API)	*Aconitum heterophyllum*	Rt. Tr.	1 part
4.	Ś¨¬gī (Karka°aś¨¬gī API)	*Pistacia integerrima*	Gl.	1 part

Method of preparation:

Take all the ingredients of pharmacopoeial quality.
Clean, dry and powder the ingredients 1 to 4 individually and pass through sieve number 85. Weigh separately each ingredient, mix together in specified ratio and pass through sieve number 44 to obtain a homogeneous blend. Pack it in tightly closed containers to protect from light and moisture.

Description:

Pale brown powder, odour characteristic of pippali and taste slightly pungent followed by a tingling sensation. The powder completely pass on through sieve number 44 and not less than 50 per cent pass on through sieve number 85.

Identification:

Microscopy:

Take a few mg of Cūr´a and warm with *chloral hydrate*, wash and mount in *glycerine*; wash a few mg of Cūr´a in water and mount in *glycerine*; treat a few mg of Cūr´a with *iodine solution* and mount in *glycerine*; observe the following characters in the different mounts.
Parenchyma cells with reddish brown contents, starch grains simple, circular to oval upto 30 µ, narrow vessels with lateral simple perforation, walls reticulate, pitted and spiral vessels, regularly arranged sclereids from scale leaf **(Mustā);** multicellular uniseriate trichomes, perisperm cells packed with starch grains and minute crystals of calcium oxalate, spindle shaped, elongated stone cells with wide lumen **(Pippalī);** starch grains, simple and compound with 2 to 4 components, upto 65µ in size, parenchyma cells with starch grains and cork cells in surface view **(Ativi¾ā)**; collapsed thin walled epidermal

cells, tissue fragments with yellowish brown contents and large tannin containing sacs associated with vascular bundles **(Karka⁰aś¨¬gī).**

Thin Layer Chromatography:

Extract 4 g of Cūr´a in *alcohol* (25 ml x 3) under reflux on a water-bath for 30 min filter, concentrate to 10 ml and carry out the thin layer chromatography. Apply 10 µl of the extract on TLC plate and develop the plate to a distance of 8cm using *toluene : ethyl acetate* (5 : 1.5) as mobile phase. After development allow the plate to dry in air and examine under ultraviolet light (254 nm). It shows major spots at R_f 0.31, 0.37, 0.45, 0.60 (all green), 0.74 (light green) and 0.91 (blue). Under ultraviolet light (366 nm), it shows major spot at R_f 0.65 (fluorescent blue). Spray the plate with *vanillin-sulphuric acid reagent* followed by heating at 110^0 for about 10 min and observe under visible light. The plate shows major spots at R_f 0.36, 0.50 (both grey), 0.61 (blue), 0.68 (grey) and 0.81 (pink).

Physico-chemical parameters:

Loss on drying at 105⁰:	Not more than 9 per cent,	Appendix 2.2.10.
Total ash:	Not more than 7 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 14 per cent,	Appendix 2.2.7.
Water-soluble extractive:	Not less than 16 per cent,	Appendix 2.2.8.
*p*H *(10% aqueous solution):*	5 to 5.3,	Appendix 3.3.

Other requirements:

Microbial limits:	Appendix 2.4.
Aflatoxins:	Appendix 2.7.

Storage: Store in a cool place in tightly closed containers, protected from light and moisture.

Therapeutic uses: Atisāra (Diarrhoea); Chardi (Vomiting); Kāsa (cough); Śvāsa (Dyspnoea); Jvara (fever); Bāla śo¾a (emaciation in children).

Dose: 0.5 to 1 g daily in divided dose.

Anupāna: Honey.

ELĀDI CŪR³A

(AFI, Part-I, 7:5)

Definition:

Elādi Cūr´a is a powder preparation made with the ingredients in the Formulation composition given below.

Formulation composition:

1.	Elā (Sūk¾mailā API)	*Elettaria cardamomum*	Sd.	1 part
2.	Lava¬ga API	*Syzygium aromaticum*	Fl. Bd.	1 part
3.	Gajakeśara (Nāgakeśara API)	*Mesua ferrea*	Stmn.	1 part
4.	Kola majjā (Kola API)	*Zizyphus jujuba*	Rp. Fr. Pp.	1 part
5.	Lāja (Śāli API)	*Oryza sativa*	Sd.	1 part
6.	Priya¬gu API	*Callicarpa macrophylla*	Infl.	1 part
7.	Ghana (Mustā API)	*Cyperus rotundus*	Rt. Tr.	1 part
8.	Candana (Śveta candana API)	*Santalum album*	Ht. Wd.	1 part
9.	Pippalī API	*Piper longum*	Fr.	1 part

Method of preparation:

Take all ingredients of pharmacopoeial quality.

Dry Kola majja in an oven at 50^0 for 24 h and powder immediately after drying and pass through sieve number 85. Wash, dry and powder all other cleaned ingredients (number 1 to 3 and 5 to 9) individually and pass through sieve number 85. Weigh separately each powdered ingredient, mix together in specified ratio and pass through sieve number 44 to obtain a homogeneous blend. Pack it in tightly closed containers to protect from light and moisture.

Description:

Brown-coloured, smooth powder with characteristic odour of Elā, and a spicy, pungent taste. The powder completely pass on through sieve number 44 and not less than 50 per cent pass on through sieve number 85.

Identification:

Microscopy:

Take a few mg of Cūr´a and warm with *chloral hydrate*, wash and mount in *glycerine*; wash a few mg in water and mount in *glycerine*; treat a few mg with *iodine solution* and mount in *glycerine*; observe the following characters in the different mounts.

Perisperm cells with bulbous projections, packed with starch grains and also carrying minute calcium oxalate crystals, fragments of aril tissue with elongated cells and orange coloured sclerenchymatous cells **(Elā)**; pollen grains tetrahedral, spherical, biconvex, measuring 15 to 20 μ in dia, spindle shaped fibres, parenchyma with oil cells and anther wall with cluster crystals of calcium oxalate **(Lava¬ga)**; numerous golden yellow pollen grains upto 50 μ in dia and fragments of anther wall **(Nāgakeśara)**; circular to oval thin walled, reddish brown cells of mesocarp, polygonal epicarp cells in surface view **(Kola**); endosperm cells packed with minute starch grains in clusters **(Śāli)**; fragments of stellate hairs, elliptical, oval and circular pollen grains with clear exine, yellowish in colour, upto 30 μ in dia, spiral vessels **(Priya¬gu**); circular to oval starch grains measuring upto 30 μ in dia, narrow vessel with scalariform thickness, oblique pore, regular arrangement of parallel short fibres from scale leaf **(Mustā)**; abundant fragments of thick walled fibres isolated or associated with pitted vessel with tail **(Śveta candana)**; oval to elongated stone cells, measuring upto 300 μ in length, perisperm cells packed with starch grains and minute calcium oxalate crystals, multicellular uniseriate trichome **(Pippalī)**.

Thin Layer Chromatography:

Extract 4 g of sample in *alcohol* (25 ml x 3) under reflux on a water-bath for 30 min, filter, concentrate to 10 ml and carry out the thin layer chromatography. Apply 10 μl of the extract on TLC plate, develop the plate to a distance of 8 cm using *toluene : ethyl acetate* (5 : 1.5) as mobile phase. After development allow the plate to dry in air and examine under ultraviolet light (254 nm). It shows major spots at R_f 0.54, 0.71 (both blue) and 0.92 (fluorescent blue). Spray the plate with *vanillin-sulphuric acid reagent* followed by heating at 110^0 for about 10 min and observe under visible light. The plate shows major spots at R_f 0.56 (grey), 0.71 (orange), 0.92 (grey).

Physico-chemical parameters:

Loss on drying at 105^0:	Not more than 10 per cent,	Appendix 2.2.10.
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.
Water-soluble extractive:	Not less than 18 per cent,	Appendix 2.2.8.
Alcohol-soluble extractive:	Not less than 10 per cent,	Appendix 2.2.7.
*p*H *(10% aqueous solution):*	5 to 7,	Appendix 3.3.

Other requirements:

Microbial limit:	Appendix 2.4.

Storage: Store in a cool place in tightly closed containers, protected from light and moisture.

Therapeutic uses: Kāsa (cough); Śvāsa (Asthma).

Dose: 10 g daily in divided dose.

Anupāna: Honey, Sugar.

HI«GVA½¯AKA CŪR³A

(AFI, Part- I, 7:37)

Definition:

Hi¬gva¾°aka Cūr´a is a powder preparation containing the ingredients in the Formulation composition given below:

Formulation composition:

1.	Śu´°hī API	*Zingiber officinale*	Rz.	1 part
2.	Marica API	*Piper nigrum*	Fr.	1 part
3.	Pippalī API	*Piper longum*	Fr.	1 part
4.	Ajamodā API	*Apium leptophyllum*	Fr.	1 part
5.	Saindhava lava´a API	Rock salt		1 part
6.	Śveta jīraka API	*Cuminum cyminum*	Fr.	1 part
7.	K¨¾´a jīraka API	*Carum carvi*	Fr.	1 part
8.	Hi¬gu API-śuddha	*Ferula foetida*	Exd.	1 part

Method of preparation:

Take all ingredients of pharmacopoeial quality.

Roast coarsely powder Saindhava lava´a in a stainless steel pan till it become free from moisture. Prepare fine powder and pass through it sieve number 85.

Treat Hi¬gu to prepare *śuddha Hi¬gu* (Appendix 6.2.7.12). Clean and powder all other ingredients individually, pass through sieve no. 85, weigh each ingredient separately and mix thoroughly in specified ratio to obtain a homogeneous blend.

Pack it in tightly closed containers to protect from light and moisture.

Description:

Light brown; free flowing powder with a spicy and astringent taste, odour aromatic and pleasant. The powder completely pass on through sieve number 44 and not less than 50 per cent pass on through sieve number 85.

Identification:

Microscopy:

Take about 5g of Cūr´a and wash thoroughly with destilled *water* to get rid of salt; allow the material to settle, and reject the supernatant without loss of material; take a few mg and stain with *iodine solution* and mount in 50 per cent *glycerine* to examine the starch grains. Clarify a few mg with *chloral hydrate* and mount in 50 per cent *glycerine*; boil a

few mg with 2 per cent *potassium hydroxide*, wash with water and mount in *glycerine*. Observe the following character in different mounts.

Stone cells measuring 130 to 190 µ in dia with broad lumen, isolated in groups of 2 to 8 **(Pippalī)**; fragments of inner epidermis of pericarp in surface view, with groups of stone cells varying in sizes, shapes and thickness, interspersed among parenchymatous hypodermis **(Marica)**; groups of parenchymatous cells, densely packed with starch grains, isolated starch grains, simple, oval to rod shaped, measuring 15 to 70 µ in length, hilum eccentric, lamellae distinct; yellow coloured oleo resin cells, non-lignified, sepatate fibres some of them bearing marks of adjacent cells pressing against them, 30 to 50 µ broad, **(Śu´°hī)**; striated epidermal debris, transversely much elongated, thin walled parenchymatous cells in a regular V joint with neighbouring cell, stone cells from mesocarpic stone cell layer, not much longer than broad, epithelial cells of vittae arranged like honey comb **(K¨¾´a Jīraka)**; multicellular large trichomes, stone cells of mesocarpic stone cell layer much longer than broad **(Śveta Jīraka)**; epicarp tissue with radially striated or puckered papillose outgrowth, along with anomocytic stomata **(Ajamodā).**

Thin layer chromatography:

Extract 5 g of Cūr´a with *n-hexane* (25 ml x 3) under reflux on a water-bath for 30 min. Filter, concentrate the combined extract the to 10 ml. Reflux the hexane-extracted marc with *chloroform*, discard the chloroform soluble portion and then finally reflux the marc with *methanol* (25 ml x 3) on a water-bath for 30 min. Filter and concentrate to 10 ml. Apply 10 µl of the hexane extract on TLC plate and develop the plate to a distance of 8 cm using *toluene : ethyl acetate* (8 : 2) as mobile phase. After development, allow the plate to dry in air and examine under ultraviolet light (254 nm). It shows major spots at R_f 0.25, 0.31, 0.43, 0.52, 0.59 and 0.68 (blue).

Apply 10 µl of *methanol* extract of Cūr´a on TLC plate and develop the plate to a distance of 8 cm using *toluene : ethyl acetate : methanol : formic acid* (8 : 1.5 : 0.5 : 0.1) as mobile phase. After development, allow the plate to dry in air and examine under ultraviolet light (366 nm). It shows major spots at R_f 0.13, 0.19, 0.29, 0.36, 0.43, 0.53 and 0.62 (all fluorescent blue).

Physico-chemical parameters:

Loss on drying:	Not more than 13.5 per cent,	Appendix 2.2.10.
Total ash:	Not more than 23.0 per cent,	Appendix 2.2.3.
Acid-insoluble ash:	Not more than 4.5 per cent,	Appendix 2.2.4.
Alcohol-soluble extractive:	Not less than 14.0 per cent,	Appendix 2.2.7.
Water-soluble extractive:	Not less than 34.0 per cent,	Appendix 2.2.8.
*p*H *(1% aqueous solution):*	6.4 to 6.6,	Appendix 3.3.

Other requirements:

Microbial Limits: Appendix 2.4.
Aflatoxins: Appendix 2.7.

Storage: Store in a cool place in tightly closed containers, protected from light and moisture.

Therapeutic uses: Agnimāndya (digestive impairment); Śūla (pain / colic); Gulma (abdominal lump); Vātaroga (disease due to vāta do¾a)

Dose: 3 to 6 g daily in divided doses.
Anupāna: Gh¨ta.

NAVĀYASA CŪR³A

(AFI, Part-I, 7:17)

Definition:

Navāyasa Cūr´a is a powder preparation made with the ingredients in the Formulation composition given below.

Formulation composition:

1.	Śu´°hī API	*Zingiber officinale*	Rz.	1 part
2.	Marica API	*Piper nigrum*	Fr.	1 part
3.	Pippalī API	*Piper longum*	Fr.	1 part
4.	Harītakī API	*Terminalia chebula*	P.	1 part
5.	Bibhītaka API	*Terminalia bellirica*	P.	1 part
6.	Āmalakī API	*Phyllanthus emblica (Emblica officinalis)*	P.	1 part
7.	Mustā API	*Cyperus rotundus*	Rt. Tr.	1 part
8.	Vi²a¬ga API	*Embelia ribes*	Fr.	1 part
9.	Citraka API	*Plumbago zeylanica*	Rt.	1 part
10.	Ayoraja (Lauha bhasma) (30 Puti)			9 parts

Method of preparation:

Take all ingredients of pharmacopoeial quality.
Wash, dry and powder ingredients 1 to 9 individually in a pulverizer and pass through sieve number 85. Weigh separately each powdered ingredient, mix together in specified ratio along with Ayoraja (lauha) bhasma and pass through sieve number 44 to obtain a homogeneous blend. Store in an air-tight container.
Store in a cool place in tightly closed containers, protected from light and moisture.

Description:

Reddish-brown powder with pungent odour and spicy, pungent taste. All pass through sieve number 44 and not less than 50 per cent pass through sieve number 85.

Identification:

Microscopy:

Take about 5 g Cūr´a in a small beaker, add water, stir thoroughly and pass through 150 sieve to remove the Bhasma; repeat once more. Take a few mg of the washed Cūr´a and warm with *chloral hydrate*, wash and mount in *glycerine*; wash a few mg in water and mount in *glycerine*; treat a few mg with *iodine solution* and mount in *glycerine*. Observe the following characters in different mounts.

Large starch grains, oval shape upto 50 µ in size; spiral vessels and septate non lignified fibres **(Śu´°hī)**; stone cells of various shapes interspersed with parenchyma cells from hypodermis **(Marica)**; groups of isolated and spindle shaped stone cells, uniseriate multicellular trichomes (**Pippalī**); groups of elongated sclereids with pits and broad lumen, crisscross fibre tissue, thin walled fibres with broad lumen and pegged tips **(Harītakī);** unicellular trichomes with sharp tips and bulbous base, epidermal fragment with cicatrices **(Bibhītaka)**; thin walled epidermis with paracytic stomata and silica crystals, brachysclereids with pitted wide lumen, large, irregular thick walled parenchyma with prominent corner thickening **(Āmalakī);** scalariform vessels, starch grains upto 30 µ and regularly arranged, parallel sclereids from scale leaf **(Mustā);** prismatic crystals of calcium oxalate, spiral vessels and stone cells in different shapes and sizes with prominent pits from testa and elongated sclereids with broad lumen and pitted walls **(Vi²a¬ga**) ; cork cells in surface view and ray parenchyma cells with pits and thin walled fibres with pointed tips **(Citraka).**

Thin Layer Chromatography:

Extract 4 g of cūr´a in *alcohol* (25 ml x 3) under reflux on a water-bath for 30 min, filter, concentrate to 10 ml and carry out the thin layer chromatography Apply 10 µl of the extrct on TLC plate and develop the plate to a distance of 8 cm using *toluene : ethyl acetate* (5 : 1.5) as mobile phase. After development allow the plate to dry in air and examine under ultraviolet light (254 nm). It shows major spots at R_f 0.26, 0.31, 0.43 (all blue) and 0.91 (fluorescent blue).

Physico-chemical Parameters:

Loss on drying at 105^0:	Not more than 6 per cent,	Appendix 2.2.10.
Total ash:	Not more than 56 per cent,	Appendix 2.2.3.
Acid-insoluble ash:	Not more than 14 per cent,	Appendix 2.2.4.
Alcohol-soluble extractive:	Not less than 11 per cent,	Appendix 2.2.7.
Water-soluble extractive:	Not less than 12 per cent,	Appendix 2.2.8.
*p*H *(10% aqueous solution):*	3 to 4,	Appendix 3.3.

Assay:

Iron:	Not less than 33 per cent,	Appendix 5.2.5.

Other requirements:

Microbial limit: Appendix 2.4.
Aflatoxin: Appendix 2.7.

Storage: Store in a cool place in tightly closed containers, protected from light and moisture.

Therapeutic uses: P¢´²u (anaemia); Kāmalā (jaundice); Prameha (metabolic disorder); Pī²aka (carbuncle); H¨droga (heart disease); Ku¾°ha (diseases of Skin); Arśa (piles).

Dose: 2 g daily in divided doses.

Anupāna: Honey, Water.

NIMBĀDI CŪR³A

(AFI, Part-I, 7:20)

Definition:

Nimbādi Cūr´a is a powder preparation made with the ingredients in the Formulation composition given below:

Formulation composition:

1.	Nimba API	*Azadirachta indica*	St. Bk.	48 g
2.	Am¨tā (Gu²ūcī API)	*Tinospora cordifolia*	St.	48 g
3.	Abhayā (Harītakī API)	*Terminalia chebula*	P.	48 g
4.	Dhātrī (Āmalakī API)	*Emblica officinalis*	P.	48 g
5.	Somarājī (Bākucī API)	*Psoralea corylifolia*	Fr.	48 g
6.	Śu´°hī API	*Zingiber officinale*	Rz.	12 g
7.	Vi²a¬ga API	*Embelia ribes*	Fr.	12 g
8.	E²agaja (Cakramarda API)	*Cassia tora*	Sd.	12 g
9.	Ka´ā (Pippalī API)	*Piper longum*	Fr.	12 g
10.	Yamānī (Yavānī API)	*Trachyspermum ammi*	Fr.	12 g
11.	Ugragandhā (Vacā API)	*Acorus calamus*	Rz.	12 g
12.	Jīraka (Śveta Jīraka API)	*Cuminum cyminum*	Fr.	12 g
13.	Ka°ukā API	*Picrorrhiza kurroa*	Rt./Rz.	12 g
14.	Khadira API	*Acacia catechu*	Ht. Wd.	12 g
15	Saindhava Lava´a API	Rock salt	-	12 g
16	K¾āra (Yava API)	*Hordeum vulgare*	Water soluble ash of Pl.	12 g
17	Haridrā API	*Curcuma longa*	Rz.	12 g
18	Dāruharidrā API	*Berberis aristata*	St.	12 g
19	Mustaka (Mustā API)	*Cyperus rotundus*	Rt. Tr.	12 g
20	Devadāru API	*Cedrus deodara*	Ht. Wd.	12 g
21	Ku¾°ha API	*Saussurea lappa*	Rt.	12 g

Method of preparation:

Roast coarsely powdered Saindhava lava´a (number 15) in a stainless steel pan at a low temperature till it becomes free from moisture. Prepare fine powder and pass through sieve number 85. Clean, dry and powder the other ingredients 1 to 21 (except number 15) individually in a pulverizer and sift through sieve number 85 mesh separately. Weigh separately each ingredient, mix together in specified ratio and pass through sieve number 44 to obtain a homogeneous blend. Pack it in tightly closed containers to protect from light and moisture.

Description:

Yellowish brown, smooth powder, taste bitter, salty and odour pungent. The powder completely pass on through sieve number 44 and not less than 50 per cent pass on through sieve number 85.

Identification:

Thin Layer Chromatography:

Extract 4 g of curna in alcohol (25 ml x 3) under reflux on a water-bath for 30 min filter, concentrate to 10 ml and carry out the Thin Layer Chromatography. Apply 10 µl of the extract on TLC plate and develop the plate to a distance of 8 cm using *toluene : ethyl acetate* (5 : 3) as mobile phase. After development of the plate, allow it to dry in air and examine under ultraviolet light (254 nm). It shows major spots at R_f 0.25 (fluorescent blue), 0.52 (yellow), 0.67and 0.82, (both blue). Under ultraviolet light (366 nm), it shows major spots at R_f 0.25, 0.52, 0.57, 0.62, 0.72 and 0.82 (all pale blue). Spray the plate with *vanillin-sulphuric acid reagent* followed by heating at 110^0 for about 10 min and observe under visible light. The plate shows major spots at R_f 0.72 (grey), 0.82 (pink) and 0.87 (grey).

Test for chloride: Dissolve 1 g of the sample in 10 ml of *purified water* and filter. Acidify the filtrate with *dilute nitric acid* and add 5 per cent w/v *silver nitrate* solution. A curdy white precipitate shows the presence of chlorides.

Physico-chemical parameters:

Loss on drying at 105^0:	Not more than 8 per cent,	Appendix 2.2.10.
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 18 per cent,	Appendix 2.2.7.
Water-soluble extractive:	Not less than 23 per cent,	Appendix 2.2.8.
*p*H *(10% aqueous solution):*	4 to 5,	Appendix 3.3.

Assay:

Sodium:	Not less than 0.6 per cent w/w,	Appendix 5.2.9.

Other requirements

Microbial limits:	Appendix 2.4.
Aflatoxins:	Appendix 2.7.

Storage: Store in a cool place in tightly closed containers, protected from light and moisture.

Therapeutic uses: Udara (diseases of abdomen); Āmavāta (Rheumatism); Vātarakta (Gout); Ku¾°ha (diseases of skin).

Dose: 5 g daily in divided dose.

Anupāna: Gu²ūcī kvātha, Warm water.

PAÑCASAMA CŪR^{3}A

(AFI, Part-I, 7:22)

Definition:

Pa®casama Cūr´a is a powder preparation made with the ingredients in the Formulation composition given below:

Formulation composition:

1.	Śu´°hī API	*Zingiber officinale*	Rz.	1 part
2.	Harītakī API	*Terminalia chebula*	P.	1 part
3.	K¨¾´ā (Pippalī API)	*Piper longum*	Fr.	1 part
4.	Triv¨t API	*Ipomoea turpethum*	Rt.	1 part
5.	Sauvarcala lava´a API	Black salt	-	1 part

Method of preparation:

Take the ingredients of pharmacopoeial quality.
Wash, dry and powder the cleaned ingredients 1 to 4 individually in a pulverizer also powder ingredients 5 and sift separately through sieve number 85. Weigh separately each powdered ingredient, mix together in specified ratio and pass through sieve number 44 to obtain a homogeneous blend.
Pack it in tightly closed containers to protect from light and moisture.

Description:

Pale brown, smooth powder, odour pungent and taste slightly pungent with tingling sensation. The powder completely pass on through sieve number 44 and not less than 50 per cent pass on through sieve number 85.

Identification:

Microscopy:

Take about 2 g of the Cūr´a and wash it thoroughly with water to remove the salt without loss of Cūr´a; using the washed Cūr´a make the following preparations: warm a few mg in *chloral hydrate*, wash to remove chloral hydrate and mount in *glycerine*; mount a few mg in *glycerine*; treat a few mg with solution of *iodine* solution and mount in *glycerine*: take a few mg in a watch glass add *iodine water*, and drain excess of iodine by filter paper; add a drop of *sulphuric acid* (2 parts in 1 part water), mount in *glycerine* to locate cellulosic fibres. Observe the following characters in the different mounts:
Fragments of septate non-lignified fibres, broad spiral and reticulate vessels and oval shaped starch grains upto 50 µ in size **(Śu´thī);** groups of elongated thick walled

sclereids with pits and broad lumen, crisscross thin walled fibres with broad lumen and pegged tips, polygonal epidermal cells with slight beading and dividing septum **(Harītakī)**; uniseriate, multicellular trichomes, perisperm cells packed with starch grains and minute crystals of calcium oxalate, isolated, elongated stone cells with broad lumen **(Pippalī);** Prismatic crystals of calcium oxalate and rosette crystals of calcium oxalate, vessels with regular bordered pits appearing like honey comb, stone cells and thick walled cellulosic fibres with broken ends and very narrow lumen **(Triv¨t).**

Thin Layer Chromatography:

Extract 4 g of sample in alcohol (25 ml x 3) under reflux on a water-bath for 30 min filter concentrate to 10 ml and carry out the Thin Layer Chromatography. Apply 10 µl of the extract on TLC plate and develop the plate to a distance of 8 cm using *toluene : ethyl acetate* (5 : 2) as mobile phase. After development of the plate, allow it to dry in air and examine under ultraviolet light (254 nm). It shows major spots at R_f 0.46 and 0.63 (both green). Under ultraviolet light (366 nm), it shows a major spot at R_f 0.77 (fluorescent blue). Spray the plate with *vanillin-sulphuric acid reagent* followed by heating at 110^0 for about 10 min and observe under ultraviolet light. The plate shows a major spot at R_f 0.77 (pink).

Physico-chemical parameters:

Loss on drying at 105^0:	Not more than 10 per cent,	Appendix 2.2.10.
Total ash:	Not more than 22 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 20 per cent,	Appendix 2.2.7.
Water-soluble extractive:	Not less than 35 per cent,	Appendix 2.2.8.
*p*H *(10% aqueous solution):*	4.5 to 4.7,	Appendix 3.3.

Assay:

Sodium:	Not less than 4 per cent w/w,	Appendix 5.2.9.

Other requirements:

Microbial limits:	Appendix 2.4.
Aflatoxins:	Appendix 2.7.

Storage: Store in a cool place in tightly closed containers, protected from light and moisture.

Therapeutic uses: Ādhmāna (flatulence with gurgling sound); Śūla (pain / colic); Āmavāta (Rheumatism); Arśa (Piles); Udara roga (diseases of abdomen), Vibandha (constipation).

Dose: 3 to 5 g daily in divided dose.

Anupāna: Warm water.

PU½YĀNUGA CŪR³A

(AFI, Part-I, 7:23)

Definition:

Pu¾yānuga Cūr´a is a powder preparation made with the ingredients in the Formulation composition given below.

Formulation composition:

1.	Pā°hā API	*Cissampelos pareira*	Rt.	1 part
2.	Jambū-bīja majjā API	*Syzygium cumini*	Enm.	1 part
3.	Āmra-bīja majjā API	*Mangifera indica*	Enm.	1 part
4.	Śilābheda (Pā¾ā´abheda API)	*Bergenia ligulata*	Rz.	1 part
5.	Rasā®jana API	*Berberis aristata*	Rt./St. Ext.	1 part
6.	Amba¾°hakī API	*Hibiscus sabdariffa*	Rt.	1 part
7.	Mocarasa (Śālmalī)	*Salmalia malabarica*	Exd.	1 part
8.	Sama¬gā (Lajjālu) API	*Mimosa pudica*	Rt./Pl.	1 part
9.	Padma keśara (Kamala)	*Nelumbo nucifera*	Adr.	1 part
10.	Vāhlīka (Ku¬kuma API)	*Crocus sativus*	Stl./Stg.	1 part
11.	Ativi¾ā API	*Aconitum heterophyllum*	Rt. Tr.	1 part
12.	Mustā API	*Cyperus rotundus*	Rf.Tr.	1 part
13.	Bilva API	*Aegle marmelos*	Rt./St.Bk.	1 part
14.	Lodhra API	*Symplocos racemosa*	St.Bk.	1 part
15.	Gairika (Śuddha) API	Red ochre	-	1 part
16.	Ka°phala API	*Myrica nagi(M. esculenta)*	St. Bk.	1 part
17.	Marica API	*Piper nigrum*	Fr.	1 part

18. 1 part	Śu´°hī API	*Zingiber officinale*	Rz.
19. 1 part	M¨dvīkā (Drāk¾ā API)	*Vitis vinifera*	Dr. Fr.
20. 1 part	Rakta candana API	*Pterocarpus santalinus*	Ht. Wd.
21. 1 part	Ka°va¬ga (Araluka API)	*Ailanthus excelsa*	St. Bk.
22. 1 part	Vatsaka (Ku°aja API)	*Holarrhena antidysenterica*	St. Bk.
23. 1 part	Anantā (Śveta sārivā API)	*Hemidesmus indicus*	Rt
24. 1 part	Dhātakī API	*Woodfordia fruticosa*	Fl.
25. 1 part	Madhuka (Ya¾°ī API)	*Glycyrrhiza glabra*	Rt.
26. 1 part	Arjuna API	*Terminalia arjuna*	St. Bk.

Method of preparation:

Take all the ingredients of pharmacopoeial quality.

Treat Gairika (No. 15) to prepare *¹uddha Gairika* (Appendix 6.2.7.2.), powder and pass through sieve number 85. Clean, dry and powder ingredients numbered 1 to 26 individually (except 15) and pass through sieve number 85. Weigh separately each powdered ingredient and mix together in specified ratio. Pass through sieve number 44 to prepare a homogeneous blend.

Pack it in tightly closed containers to protect from light and moisture.

Description:

Reddish brown-coloured fine powder with a pungent odour and a bitter, sweet taste. The powder completely pass on through sieve number 44 and not less than 50 per cent pass on through sieve number 85.

Identification

Thin Layer Chromatography:

Extract 4 g of cūr´a in *alcohol* (25 ml x 3) under reflux on a water-bath for 30 min filter, concentrate to 10 ml and carry out the thin layer chromatography. Apply 10 µl of the extract on TLC plate and develop the plate to a distance of 8 cm using *toluene : ethyl acetate* (5 : 2) as mobile phase. After development, allow the plate, to dry in air and

examine under ultraviolet light (366 nm). It shows major spots at R_f 0.18 (blue), 0.73 (fluorescent blue). Spray the plate with *vanillin-sulphuric acid reagent* followed by heating at 110^0 for about 10 min and observe under visible light. The plate shows major spots at R_f 0.13 (grey), 0.27 (purple), 0.33 (yellow), 0.53 (purple), 0.66 and 0.97 (both purple).

Physico-chemical parameters:

Loss on drying at 105^0:	Not more than 11 per cent,	Appendix 2.2.10.
Total ash:	Not more than 15 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 12 per cent,	Appendix 2.2.7.
Water-soluble extractive:	Not less than 13 per cent,	Appendix 2.2.8.
*p*H *(10%)aqueous solution:*	5 to 6,	Appendix 3.3.

Other requirements:

Microbial limit:	Appendix 2.4.
Aflatoxin:	Appendix 2.7.

Storage: Store in a cool place in tightly closed containers, protected from light and moisture.

Therapeutic uses: As¨gdhara (Menorrhagia), Śvetapradara (Leucorrhoea), Rajodo¾a (Menstrual disorder), Arśa (Piles), Yonido¾a (disorders of female genital tract).

Dose: 6 g daily in divided dose.

Anupāna: Milk or Ta´²ulodaka.

TĀLĪSĀDYA CŪR 3 A

(AFI, Part-I, 7:13)

Definition:

Tālīsādya Cūr´a is a powder preparation made with the ingredients in the Formulation composition given below.

Formulation composition:

1.	Tālīsā API	*Abies webbiana*	Lf.	12 g
2.	Marica API	*Piper nigrum*	Fr.	24 g
3.	Śu´°hī API	*Zingiber officinale*	Rz.	36 g
4.	Pippalī API	*Piper longum*	Fr.	48 g
5.	Va¼śa-rocana (Va¼śa)	*Bambusa bambos*	S.C.	60 g
6.	Elā (Sūk¾mailā API)	*Elettaria cardamomum*	Sd.	6 g
7.	Tvak API	*Cinnamomum zeylanicum*	St. Bk.	6 g
8.	Śarkarā API	Cane sugar	-	384 g

Method of Preparation:

Take all the ingredients of pharmacopoeial quality.
Powder separately ingredients numbered 1 to 8 and pass through sieve number 85.
Weigh separately each powdered ingredient and mix together in specified ratio. Pass the Cūrna through sieve number 44 to prepare a homogeneous blend.
Pack it in tightly closed containers to protect from light and moisture.

Description:

Creamish white fine powder with pleasant odour and a sweet, spicy and pungent taste. The powder completely pass on through sieve number 44 and not less than 50 per cent pass on through sieve number 85.

Identification:

Microscopy:

Take about 2 g of Cūr´a, wash thoroughly in water to remove sugar. Take a few mg of the washed Cūr´a and warm with *chloral hydrate*, wash and mount in *glycerine*; wash a few mg in water and mount in *glycerine*; treat a few mg with *iodine solution* and mount in *glycerine*. Observe the following characters in different mounts.
Surface view of epidermis showing sunken stomata with thick cuticle, palisade parenchymatous fragments, parenchyma cells filled with brown colour cell content

(Tālīsa); beaker shaped stone cells upto 150 µ length, tissue from hypodermis with polygonal pitted stone cells with interspersed among parenchyma cells, lumen circular **(Marica)**; large starch grains upto 35 µ in dia, eccentric hilum, reticulate and spiral vessels, septate fibres non lignified and broad lumen with sharp tips **(Śu´°hī)**; spindle shaped stone cells with or without a broad lumen, uniseriate multicellular trichome **(Pippalī)**; perisperm cells with bulbous projections, packed with minute starch grains and also carrying minute calcium oxalate crystals, fragments of aril tissue from testa, orange coloured sclerenchymatous cells **(Elā)**; fibres with thick walls narrow lumen upto 720 µ length, lignified stone cells with thick inner walls, pitted parenchyma, acicular crystals of calcium oxalate **(Tvak).**

Thin Layer Chromatography:

Extract 4 g of sample in *alcohol* (25 ml x 3) under reflux on a water-bath for 30 min filter, concentrate to 10 ml and carry out the thin layer chromatography. Apply 10 µl of the extract on TLC plate and develop the plate to a distance of 8 cm using *toluene : ethyl acetate : formic acid* (5 : 2.5 : 0.5) as mobile phase. After development allow the plate to dry in air and examine under ultraviolet (254 nm). It shows a major spot at R_f 0.59 and 0.64 (both grey).Under ultraviolet light (366 nm), it shows a major spot at R_f 0.52(fluorescent blue). Spray the plate with *vanillin-sulphuric acid reagent* followed by heating at 110^0 for about 10 min and observe under visible light. The plate shows major spots at R_f 0.45 (yellow), and 0.76 (orange).

Physico-chemical parameters:

Loss on drying at 105^0:	Not more than 4 per cent,	Appendix 2.2.10.
Total ash:	Not more than 11 per cent,	Appendix 2.2.3.
Acid-insoluble ash:	Not more than 9.5 per cent,	Appendix 2.2.4.
Alcohol-soluble extractive:	Not less than 12 per cent,	Appendix 2.2.7.
Water-soluble extractive:	Not less than 68 per cent,	Appendix 2.2.8.
*p*H (*10% aqueous solution):*	6 to 8,	Appendix 3.3.
Total sugars:	Not less than 56 per cent,	Appendix 5.1.3.2.
Reducing sugars:	Not less than 8 per cent,	Appendix 5.1.3.1.

Other requirements:

Microbial limit:	Appendix 2.4.

Storage: Store in a cool place in tightly closed containers, protected from light and moisture.

Therapeutic uses: Chardi (Vomiting), Ādhmāna (flatulence with gurgling sound), Kāsa (cough), Śvāsa (Asthma), Jvara (fever), Aruci (Anorexia), Ajīr´a (indigestion), Atisāra (Diarrhoea), Śo¾a (Cachexia), Plīhā (Splenic disease), Graha´ī (malabsorption syndrome), P¢´²u (Anaemia).

Dose: 5 g daily in divided doses.

Anupāna: Honey, warm water.

VAIŚVĀNARA CŪR[3]A

(AFI, Part-I, 7: 30)

Definition:

Vaiśvānara Cūr´a is a powder preparation made with the ingredients in the Formulation composition given below:

Formulation composition:

1.	Ma´imantha (Saindhava Lava´a API)	Rock salt	-	2 parts
2.	Yamānī (Yavānī API)	*Trachyspermum ammi*	Fr.	2 part
3.	Ajamodā API	*Apium leptophyllum*	Fr.	3 parts
4.	Nāgara (Śu´°hī API)	*Zingiber officinale*	Rz.	5 parts
5.	Harītakī API	*Terminalia chebula*	P.	12 parts

Method of preparation:

Take all the ingredients of pharmacopoeial quality.

Roast Saindhava lava´a in a stainless steel pan at a low temperature till it becomes free from moisture. Powder the ingredients 1 to 5 individually in a pulverizer and pass through sieve number 85. Weigh separately each ingredient, mix together in specified ratio and pass through sieve number 44 to obtain a homogeneous blend.

Pack it in tightly closed containers to protect from light and moisture.

Description:

Creamish-brown, smooth powder with the characteristic smell of Su´°hi; taste salty, astringent, bitter, with a tingling sensation. The powder completely pass on through sieve number 44 and not less than 50 per cent pass on through sieve number 85.

Identification:

Microscopy:

Take about 2 g of Cūr´a, and wash it thoroughly in water to remove salt without loss of Cūr´a and use the washed Cūr´a as follows; warm a few mg with *chloral hydrate*, wash and mount in *glycerine*; mount a few mg in *glycerine*; treat a few mg with *iodine solution* and mount in *glycerine*; heat a few mg in 2 per cent aqueous *potassium hydroxide*, wash in water, and mount in *glycerine*. Observe the following characters in different mounts.

Epidermis showing striated cuticle with papillose cells and short glandular outgrowths **(Yavānī);** epidermal tissue with radially striated puckered papillose outgrowths **(Ajamodā);** broad, reticulate or pitted vessel debris, long non-lignified fibres with septae and dented along one side, starch grains large, upto 50 µ, oval with eccentric hilum (**Śu´°hī);** groups of elongated sclereids with pits and broad lumen, crisscross thin walled fibres with broad lumen and pegged tips, epidermal tissue with polygonal cells, walls slightly beaded, and several showing thin transverse septa **(Harītakī).**

Thin Layer Chromatography:

Extract 4 g of sample in *alcohol* (25 ml x 3) under reflux on a water-bath for 30 min. Filter, concentrate to 10 ml and carry out the thin layer chromotographer Apply 10 µl of the extract on TLC plate, develop the plate to a distance of 8 cm using *toluene : ethyl acetate* (5 : 1) as mobile phase. After development of the plate, allow it to dry in air and examine under ultraviolet light (254 nm). It shows major spots at R_f 0.36, 0.55 (both green), 0.64 (fluorescent blue) and 0.72 (green). Under ultraviolet light (366 nm), it shows major spots at R_f, 0.52 and 0.63 (both pale blue). Spray the plate with *vanillin-sulphuric acid reagent* followed by heating at 110^0 for about 10 min and observe under visible light. The plate shows major spots at R_f 0.47, 0.62, 0.76 and 0.97 (all grey).

Test for Chloride: Dissolve 1 g of the curna in 10 ml of deionised water and filter. Acidify the filtrate with *dilute nitric acid* and add 5 per cent w/v *silver nitrate solution*. A curdy white precipitate appears.

Physico-chemical parameters:

Loss on drying at 105^0:	Not more than 10 per cent,	Appendix 2.2.10.
Total ash:	Not more than 15 per cent,	Appendix 2.2.3.
Acid-insoluble ash:	Not more than 1.8 per cent,	Appendix 2.2.4.
Alcohol-soluble extractive:	Not less than 34 per cent,	Appendix 2.2.7.
Water-soluble extractive:	Not less than 42 per cent,	Appendix 2.2.8.

Assay:

Sodium:	Not less than 3 per cent w/w,	Appendix 5.2.9.

Other requirements

Microbial limits:	Appendix 2.4.
Aflatoxins:	Appendix 2.7.

Storage: Store in a cool place in tightly closed containers, protected from light and moisture.

Therapeutic uses: Ādhmāna (flatulance with gurgling sound); Gulma (abdominal lump); Pari´āmaśūla (Duodenal ulcer); Āmavāta (Rheumatism); H¨droga (heart disease).

Dose: 5 g daily in divided doses

Anupāna: Kā®jika, butter milk, Ghee, warm water.

GHS TA

General Description:

Gh¨tas are preparations in which the *Gh¨ta* is boiled with prescribed liquid media [*Svarasa* / *Ka¾āya* etc.] and a fine paste [*Kalka*] of the drugs specified in the formulation composition. Unless specified otherwise *Gh¨ta* means *Go Gh¨ta.*

General Method of Preparation:

1. There are usually three essential components in the manufacture of *Gh¨ta Kalpanā*.
   a. *Drava* [Any liquid medium as prescribed in the composition]
   b. *Kalka* [Fine paste of the specified drugs]
   c. *Sneha dravya* [Fatty media - *Gh¨ta*]
   And, occasionally.
   d. *Gandha dravya* [Perfuming agents]
2. Unless otherwise specified in the verse, if *Kalka* is one part by weight, *Gh¨ta* should be four parts and the *Drava dravya* should be sixteen parts.

3. There are a few exceptions for the above general rule:
   a. Where *Drava dravya* is either *Kvātha* or *Svarasa*, the ratio of *Kalka* should be one-sixth and one-eighth respectively to that of *Gh¨ta.*
   If the *Drava dravya* is either *K¾īra* or *Dadhi* or *Ma¼sa rasa* or *Takra,* the ratio of *Kalka* should be one-eighth to that of *Gh¨ta.*
   b. When flowers are advised for use as *Kalka,* it should be one-eighth to that of *Sneha.*
   c. Where the number of *Drava-dravya* are four or less than four, the total quantity should be four times to that of *Gh¨ta.*
   d. Where the number of *Drava-dravyas* is more than four, each *drava* should be equal to that of *Gh¨ta.*
   e. If, *Kalka dravya* is not prescribed in a formulation, the drugs specified for the *Drava-dravya* [*Kvātha* or *Svarasa*] should be used for the preparation of *Kalka*.
   f. Where no *Drava dravya* is prescribed in a formulation, four parts of water should be added to one part of *Gh¨ta*.
4. In general, the *Gh¨ta* should be subjected to *Mūrchana* process, followed by addition of increments of *Kalka* and *Drava-dravya* in specified ratio. The contents are to be stirred continuously thoroughout the process in order to avoid charring.
5. The process of boiling is to be continued till the whole amount of moisture gets evaporated and characteristic features of *Gh¨ta* appears.

6. The whole process of *Pāka* should be carried out on a mild to moderate flame.

7. Three stages of *Pāka* are specified for therapeutic purposes.
   a. *Mrdu Pāka*: In this stage, the *Kalka* looks waxy and when rolled between fingers, it rolls like lac without sticking. The *Gh¨ita* obtained at this stage is used for *Nasya* [Nasal instillation].
   b. *Madhyama Pāka*: In this stage, the *Kalka* becomes harder and rolls into *Varti*. It burns without crackling sounds when exposed to fire and *phena* [froth] will disappears in *Gh¨ita.* The *Gh¨ita* obtained at this stage is used for *Pāna* [Internal administration] and *Vasti* [Enema].
   c. *Khara Pāka:* Further heating of the *Gh¨ita*, leads to *Khara paka*. *Kalka* becomes brittle when rolled in between fingers. The *Gh¨ita* obtained at this stage is used only for *Abhyanga* [External application].
8. The period of *Pāka* depends upon the nature of liquid media used in the process.

a.	*Takra* or *Āranala*	5 Nights
b.	*Svarasa*	3 Nights
c.	*K¥Ãra*	2 Nights

11. *Patra Pāka:* It is the process by which the *Gh¨ita* is augmented or flavored by certain prescribed substances. The powdered drugs are suspended in a vessel containing warm, filtered *Gh¨ita.*

    The medicated *Gh¨ita* will have the odour, colour and taste of the drugs used in the process. If a considerable amount of milk is used in the preparation, the *Gh¨ita* will become thick and may solidify in cold seasons.

    Gh¨itas are preserved in good quality of glass, steel or polythene containers. These medicated preparations retain the therapeutic efficacy for sixteen months.

BRĀHMĪ GHS̱TA

(AFI, Part-I, 6:32)

Definition:

Brāhmī gh¨ta is a semisolid preparation made with the ingredients in the Formulation composition given below with Gh¨ta as the basic ingredient.

Formulation composition:

1.	Brāhmī svarasa (Brāhmī API)	*Bacopa monnieri*	Pl.	1.536 l
2.	Gh¨ta (Go Gh¨ta) API	Clarified butter from cow's milk		768 g
3.	Śu´°hī API	*Zingiber officinale*	Rz.	12 g
4.	Marica API	*Piper nigrum*	Fr.	12 g
5.	Pippalī API	*Piper longum*	Fr.	12 g
6.	Śyāmā (Triv¨t API)	*Operculina turpethum*	Rt.	12 g
7.	Triv¨t API	*Operculina turpethum*	Rt.	12 g
8.	Dantī API	*Baliospermum montanum*	Rt.	12 g
9.	Śa¬khapu¾pī API	*Convolvulus pluricaulis*	W. P.	12 g
10.	N¨padruma (Āragvadha API)	*Cassia fistula*	Fr. Pulp	12 g
11.	Saptalā API	*Euphorbia dracunculoides*	W. P.	12 g
12.	K¨mihara (Vi²a¬ga API)	*Embelia ribes*	Fr.	12 g

Method of preparation:

Take all ingredients of pharmacopoeial quality.

Take fresh *Brāhmī* and wash thoroughly with water. Grind and filter with *muslin cloth* to obtain Brāhmī svarasa.

Treat *Gh¨ta* to prepare *Mūrchita Gh¨ta* (Appendix 6.2.8.2.).

Take the other ingredients (*Kalka dravya*) numbered 3 to 12, wash, dry, powder and pass through sieve number 85. Transfer the powdered ingredients to the wet grinder and grind with sufficient quantity of water to prepare a homogeneous blend.

Take *Mūrchita Gh¨ta* in a stainless steel vessel and heat it mildly.

Add increments of *Kalka*. Stir thoroughly while adding Brāhmī svarasa in the specified ratio.

Heat for 3 h with constant stirring maintaining the temperature between 50^0 and 90^0 during the first hour of heating. Stop heating and allow to stand overnight. Start the heating next day and observe the boiling mixture for subsidence of froth (*phena śānti*) and constantly check the *kalka* for formation of *varti (madhyama pāka lak¾a´a).*

Expose the *varti* to flame and confirm the absence of crackling sound indicating absence of moisture. Stop heating when the *kalka* forms a varti and the froth subsides. Filter while hot (about 80^0) through a *muslin cloth* and allow to cool.
Pack it in tightly closed glass containers to protect from light and moisture.

Description*:*

A low melting *Gh ̈ita*, green in colour with soft, unctuous touch, pleasant odour and bitter taste.

Identification*:*

Thin layer chromatography:

Extract 2 g of the sample with 20 ml of *alcohol* at about 40^0 for 3 h. Cool, separate the alcohol layer, filter, concentrate to 5 ml and carry out the thin layer chromatography. Apply 10 µl of the extract on TLC plate and develop the plate to a distance of 8 cm using *toluene : ethyl acetate : hexane* (6 : 3 : 1) as mobile phase. After development, allow the plate to dry in air and spray with *ethanol-sulphuric acid reagent* followed by heating at 110^0 for about 10 min. It shows major spots at R_f 0.15 (both grey), 0.28, 0.40 and 0.51 (all light grey) under visible light.

Physico-chemical parameters:

Refractive index at 40^0:	1.454 to1.465,	Appendix 3.1.
Weight per ml at 40^0:	0.930g to 0.945g,	Appendix 3.2.
Saponification value:	190 to 230,	Appendix 3.10.
Iodine value:	30 to 40,	Appendix 3.11.
Acid value:	Not more than 2,	Appendix 3.12
Peroxide value:	Not more than 4,	Appendix 3.13.
Congealing point:	21^0 to 17^0,	Appendix 3.4.2.

Other requirements:

Mineral oil:	Absent,	Appendix 3.15.
Microbial Limits:		Appendix 2.4.
Aflatoxins:		Appendix 2.7.

Storage: Store in a cool place in tightly closed containers, protected from light and moisture.

Therapeutic uses: Apasmāra (Epilepsy); Unmāda (Insanity); Vandhyatva (infertility); Ku¾°ha (skin disorders); Vāksvara bha¬ga (inability to speak properly); Sm¨ti k¾aya (memory loss) and Buddhi māndya (mental retardation).

Dose: 12 to 24 g daily in divided doses.

Anupāna: Warm milk and warm water.

DAŚAMŪLA GH§TA

(AFI, Part-I, 6:16)

Definition:

Daśamūla Gh¨ta is a medicated preparation made with the ingredients in the Formulation composition given below with Gh¨ta as the basic ingredient.

Formulation composition:

1.	Bilva API	*Aegle marmelos*	St.Bk.	307.6 g
2.	Śyonāka API	*Oroxylum indicum.*	St.Bk.	307.6 g
3.	Gambhārī API	*Gmelina arborea*	St.Bk.	307.6 g
4.	Pā°alā API	*Stereospermum suaveolens*	St.Bk.	307.6 g
5.	Agnimantha API	*Premna integrifolia* (Official substitute)	St.Bk.	307.6 g
6.	Śālapar´ī API	*Desmodium gangeticum*	Pl.	307.6 g
7.	P¨śnipar´ī API	*Uraria picta*	Pl.	307.6 g
8.	B¨hatī API	*Solanum indicum*	Pl.	307.6 g
9.	Ka´°akārī API	*Solanum xanthocarpum*	Pl.	307.6 g
10.	Gok¾ura API	*Tribulus terrestris*	Fr.	307.6 g
11.	Jala API for decoction	Water		12.29 l
	Reduced to			3.07 l
12.	Gh¨ta (Gogh¨ta API)	Clarified butter from cow's milk		768 g
13.	Pu¾karāhvā (Pu¾kara API)	*Inula racemosa*	Rt.	12 g
14.	Śa°ī (Śa°i API)	*Hedychium spicatum*	Rz.	12 g
15.	Bilva API	*Aegle marmelos*	St.Bk.	12 g
16.	Surasā (Tulasī API)	*Ocimum sanctum*	Pl.	12 g
17.	Śu´°hī API	*Zingiber officinale*	Rz.	12 g
18.	Marica API	*Piper nigrum*	Fr.	12 g
19.	Pippalī API	*Piper longum*	Fr.	12 g
20.	Hi¬gu API - Śuddha	*Ferula foetida*	Exd.	12 g

Method of preparation:

Take all ingredients of pharmacopoeial quality.
Clean and dry all the herbal raw materials thoroughly before pulverization.
Treat *Gh¨ta* to prepare *Mūrchita Gh¨ta* (Appendix 6.2.8.2)**.**
Pulverize ingredients numbered 1 to 10 (*Kvātha dravya*), to coarse powder, add 4 parts of water, keep for four hours, heat and reduce the volume to one-fourth. Filter with *muslin cloth* to obtain *Daśamūla kvātha.*

Note: Stem bark of the ingredients number 1 to 5 & 15 of the formulation composition has been used.

Treat *Hi¬gu* to prepare *Śodhita Hi¬gu* (Appendix 6.2.7.12.) and keep aside for addition during *snehapāka.*

Take the other ingredients (*kalka dravya*) numbered 13 to 19 in the formulation composition, with the exception of *Tulasī,* clean, dry, powder and pass through sieve number 85. Grind Tulasī in a wet grinder.

Transfer all the *Kalka Dravyās* (number 13 to 20) to the wet grinder and grind with sufficient quantity of water to prepare a homogeneous blend (*Kalka*).

Take *Mūrchita Gh¨ta* in a stainless steel vessel and heat mildly.

Add increments of *Kalka*. Stir thoroughly while adding *Daśamūla kvātha.*

Heat for 3 h with constant stirring maintaining the temperature between 50 and 90^0 during the first hour of heating. Stop heating and allow to stand overnight. Start heating next day and observe the boiling mixture for subsidence of froth (*phena śānti*) and constantly check the kalka for formation of *varti (madhyama pāka lak¾ana).*

Expose the *varti* to flame and confirm the absence of crackling sound indicating absence of moisture. Stop heating when the *kalka* forms a varti and the froth subsides. Filter while hot (about 80^0) through a *muslin cloth* and allow to cool.

Pack it in tightly closed glass containers to protect from light and moisture.

Description:

A low melting Gh¨ta, yellowish green in color with pleasant odour and bitter taste.

Identification:

Thin layer chromatography:

Extract 2 g of the sample with 20 ml of *alcohol* at about 40^0 for 3 h. Cool, separate the alcohol layer, filter, concentrate to 5 ml and carry out the thin layer chromatography. Apply 10 µl of the extract on TLC plate and develop the plate to a distance of 8 cm using *toluene: ethyl acetate: hexane* (6 : 3 : 1) as mobile phase. After development, allow the plate to dry in air and spray with *ethanol-sulphuric acid reagent* followed by heating at 110^0 for about 10 min. It shows spots at R_f 0.11 (light grey), 0.38 (light grey), 0.50 (grey), 0.63 (grey), 0.70 (light grey), 0.78 (light grey) and 0.90 (light grey) under visible light.

Physico-chemical parameters:

Refractive index at 40^0:	1.450 to 1.453,	Appendix 3.1.
Weight per ml at 40^0:	0.910 g to 0.940 g,	Appendix 3.2.

Saponification value:	180 to 210,	Appendix 3.10.
Iodine value:	120 to 150,	Appendix 3.11.
Acid value:	Not more than 3,	Appendix 3.12.
Peroxide value:	Not more than 6,	Appendix 3.13.
Congealing point:	22^0 to 17^0	Appendix 3.4.2.

Other requirements:

Mineral oil:	Absent,	Appendix 3.15.
Microbial Limits:		Appendix 2.4.
Aflotoxins:		Appendix 2.7.

Storage: Pack it in tightly closed containers to protect from light and moisture.

Therapeutic uses: Vātaja kāsa (cough due to Vāta do¾a); Kaphaja kāsa (cough due to Kapha do¾a); Vātakapha roga (diseases due to Vāta Kapha do¾a); Sūtikā roga (Puerperal disorders) and Hasta pāda dāha (burning sensation in palms & soles).

Dose: 12 g daily in divided doses.

Anupāna: Warm water, warm milk.

DAŚAMŪLA½A¯PALAKA GH§TA

(AFI, Part-I, 6:17)

Definition:

Daśamūla¾a°palaka Gh¨ta is a medicated preparation made with the ingredients in the Formulation composition given below with Gh¨ta as the basic ingredient.

Formulation composition:

1.	Bilva API	*Aegle marmelos*	St.Bk.	240 g
2.	Śyonāka API	*Oroxylum indicum*	St.Bk.	240 g
3.	Gambhārī API	*Gmelina arborea*	St.Bk.	240 g
4.	Pā°alā API	*Stereospermum suaveolens*	St.Bk.	240 g
5.	Agnimantha API	*Premna integrifolia*	St.Bk.	240 g
6.	Śālapar´ī API	*Desmodium gangeticum*	Pl.	240 g
7.	P¨śnipar´ī API	*Uraria picta*	Pl.	240 g
8.	B¨hatī API	*Solanum indicum*	Pl.	240 g
9.	Ka´°akārī API	*Solanum xanthocarpum*	Pl.	240 g
10.	Gok¾ura API	*Tribulus terrestris*	Pl	240 g
11.	Jala API for decoction	Water		12.29 l
	Reduced to			3.07 l
12.	K¾īra (Godugdha API)	Cow's milk		3.072 l
13.	Pippalī API	*Piper longum*	Fr.	21.33 g
14.	Pippalī mūla API	*Piper longum*	Rt.	21.33 g
15.	Cavya API	*Piper chaba*	Rt.	21.33 g
16.	Citraka API	*Plumbago zeylanica*	Rt.	21.33 g
17.	Śu´°hī API	*Zingiber officinale*	Rz.	21.33 g
18.	K¾āra (Yava API)	*Hordeum vulgare*	Ash of Pl.	21.33 g
19.	Sarpi (Gogh¨ta API)	Clarified butter from cow's milk		768 g

Method of preparation:

Take all ingredients of pharmacopoeial quality.
Wash and dry the raw materials thoroughly before pulverization.
Treat Gh¨ta to prepare *Mūrchita Gh¨ta* (Appendix 6.2.8.2.).

Note: Stem bark of the ingredients number 1 to 5 of the formulation composition has been used in place of root.

Pulverize *Daśamūla* ingredients 1 to 10. *(Kvātha dravya)* to coarse powder, add specified quantity of water, keep for four hours, heat and reduce the volume to one fourth. Filter with *muslin cloth* to obtain *Daśamūla kvātha.*

Take the other ingredients *(kalka dravya)* numbered 13 to 18 of the formulation composition, powder and pass through sieve number 85. Transfer the powdered ingredients to wet grinder and grind with sufficient quantity of water to prepare a homogeneous blend *(Kalka)*

Take *Mūrchita Gh¨ta* in a stainless steel vessel and heat mildly.

Add increments of *Kalka*. Stir thoroughly while adding *Daśamūla kvātha* and *Godugdha*.

Heat for 3 h with constant stirring maintaining the temperature between 50 and 90^0 during the first hour of heating. Stop heating and allow to stand overnight.

Start heating next day and observe the boiling mixture for subsidence of froth (*phena śānti*) and constantly check the *kalka* for formation of *varti (madhyama pāka lak¾a´a).*

Expose the varti to flame and confirm the absence of crackling sound indicating absence of moisture. Stop heating when the kalka forms a varti and the froth subsides. Filter while hot (about 80^0) through a *muslin cloth* and allow to cool.

Pack it in tightly closed glass containers to protect from light and moisture.

Description:

A low melting Gh¨ta, yellowish green in color with pleasant odour and bitter and astringent taste.

Identification:

Thin layer chromatography:

Extract 2 g of the sample with 20 ml of *alcohol* at about 40^0 for 3 h. Cool, separate the alcohol layer, filter and concentrate to 5 ml and carry out the thin layer chromatography. Apply 10 µl of the extract on TLC plate and develop the plate to a distance of 8 cm using *toluene: ethyl acetate: hexane* (6 : 3 : 1) as mobile phase. After development, allow the plate to dry in air and spray with *ethanol-sulphuric acid reagent* followed by heating at 110^0 for about 10 min. It shows spots at R_f 0.12 (grey), 0.19 (grey), 0.35 (grey), 0.71 (light brown), 0.8 (brown) and 0.92 (brown) under visible light.

Physico-chemical parameters:

Refractive index at 40^0:	1.448 to 1.530,	Appendix 3.1.
Weight per ml at 40^0:	0.910 g to 0.940g,	Appendix 3.2.
Saponification value:	180 to 210,	Appendix 3.10.
Iodine value:	30 to 47,	Appendix 3.11.

Acid value:	Not more than 3,	Appendix 3.12.
Peroxide value:	Not more than 6,	Appendix 3.13.
Congealing point:	22^0 to 17^0,	Appendix 3.4.2.

Other requirements:

Mineral oil:	Absent,	Appendix 3.15.
Microbial Limits:		Appendix 2.4.
Aflatoxins:		Appendix 2.7.

Storage: Pack it in tightly closed containers to protect from light and moisture.

Therapeutic uses: Agnimāndya (loss of appetite); Pā´²u (anaemia); Kāsa (cough); Ajīr´a (indigestion); Jvara (Fever) and Plīhāroga (Spleen disease).

Dose: 12 g daily in divided doses.

Anupāna: Warm milk and warm water.

DHĀTRYĀDI GHS̱TA

(AFI, Part-I, 6:21)

Definition:

Dhātryādi Gh¨ta is a medicated preparation made with the ingredients in the Formulation composition given below with Gh¨ta as the basic ingredient.

Formulation composition:

1.	Dhatrī rasa (Āmalakī API)	*Phyllanthus emblica (Emblica officinalis)*	P.	768 ml
2.	Vidārī rasa (Vidārī API)	*Pueraria tuberosa*	Rt.Tr.	768 ml
3.	Ik¾u rasa (Ik¾u API)	*Saccharum officinarum*	St.(Juice)	768 ml
4.	Śatāvarī rasa (Śatāvarī API)	*Asparagus racemosus*	Rt.	768 ml
5.	Kū¾mā´²aka rasa (Kū¾ma´²a API)	*Benincasia hispida*	Fr.P.	768 ml
6.	Sarpi (Gogh¨ta API)	Clarified butter from cow's milk		768 ml
7.	K¾īra (Godugdha API)	Cow's milk		768 ml
8.	M¨dvīkā (Drāk¾ā API)	*Vitis vinifera*	Dr.Fr.	24 g
9.	Ya¾°yāhvā (Ya¾°ī API)	*Glycyrrhiza glabra*	Rt.	24 g
10	Candana (Śveta candana API)	*Santalum album*	Ht.Wd.	24 g
11	Sitā API	Sugar candy		24 g

Method of preparation:

Take all ingredients of pharmacopoeial quality.

Treat *Gh¨ta* to prepare *Mūrchita Gh¨ta* (Appendix 6.2.8.2)

Obtain ingredients numbered 1 to 5 in fresh form, wash thoroughly, grind and express *svarasa* through *muslin cloth*.

Take the other ingredients (*Kalka dravya*) numbered 9 and 10, clean, dry, powder and pass through sieve number 85. Transfer the powdered ingredients to the wet grinder, add cleaned *M¨dvīkā* and grind with sufficient quantity of water to prepare a homogeneous blend.

Take *Mūrchita Gh¨ta* in a stainless steel vessel and heat it mildly.

Add increments of *Kalka*. Stir thoroughly while adding *Svarasa* and *Godugdha*.

Heat for 3 h with constant stirring maintaining the temperature between 50^0 and 90^0 during the first hour of heating. Stop heating and allow to stand overnight.

Start the heating next day and observe the boiling mixture for subsidence of froth (*phena śānti*) and constantly check the *kalka* for formation of *varti (madhyama pāka lak¾a´a).*

Expose the varti to flame and confirm the absence of crackling sound indicating absence of moisture. Stop heating when the *kalka* forms a varti and the froth subsides. Filter while hot (about 80^0) through a *muslin cloth* and allow to cool. After complete cooling add powdered sugar, stir vigorously for dissolution.

Pack it in tightly closed glass containers to protect from light and moisture.

Description:

Medicated Gh¨ta, greenish yellow in color with pleasant odour and sweet taste.

Identification*:*

Thin layer chromatography:

Extract 2 g of the sample with 20 ml of *alcohol* at about 40^0 for 3 h. Cool, separate the alcohol layer, filter, concentrate to 5 ml and carry out the thin layer chromatography. Apply 10 µl of the extract on TLC plate and develop the plate to a distance of 8 cm using *toluene: ethyl acetate: hexane* (6 : 3 : 1) as mobile phase. After development, allow the plate to dry in air and spray with *ethanol-sulphuric acid reagent* followed by heating at 110^0 for about 10 min. It shows spots at R_f 0.39 (light grey), 0.62 (light grey), 0.68 (light grey), 0.79 (light grey) and 0.88 (light grey) under visible light.

Physico-chemical parameters:

Refractive index at 40^0:	1.465 to 1.466,	Appendix 3.1.
Weight per ml at 40^0:	0.910 g to 0.920 g,	Appendix 3.2.
Saponification value:	175 to 205,	Appendix 3.10.
Iodine value:	35 to 45,	Appendix 3.11.
Acid value:	Not more than 2,	Appendix 3.12.
Peroxide value:	Not more than 2,	Appendix 3.13.
Congealing point:	21^0 to 17^0,	Appendix 3.4.2.

Other requirements:

Mineral oil:	Absent,	Appendix 3.15.
Microbial Limits:		Appendix 2.4.
Aflatoxins:		Appendix 2.7.

Storage: Store in a cool place in tightly closed containers, protected from light and moisture.

Therapeutic uses: Pittaja gulma (lump due to pitta do¾a); Pittaja pā´2u (Anemia due to pitta do¾a); Mada (intoxication); Mūrchā (Syncope); Madātyaya (alcoholism); Unmāda (Insanity); Raktapitta (Bleeding disorders); As¨gdara (excessive bledding from vaginal tract); Vandhyatva (Infertility); Vātarakta (Gout); pittavikāra (disorders of Pitta do¾a) and Asthisrāva (discharge from bone).

Dose: 12 g daily in divided doses.

Anupāna: Mixed with equal quantity of sugar and administer with warm milk and warm water.

JĀTYĀDI GH§TA
(Syn. Vra´a Śodhanādi Gh¨ta)
(AFI, Part-I, 6:11)

Definition:

Jātyādi Gh¨ta is a medicated preparation made with the ingredients in the Formulation composition given below with Gh¨ta as the basic ingredient.

Formulation composition:

1.	Jātī patra (Jātī API)	*Jasminum officinale* var.*grandiflorum*	Lf.	14.76 g
2.	Nimba-patra API	*Azadirachta indica*	Lf.	14.76 g
3.	Pa°ola-patra API	*Trichosanthes dioica*	Lf.	14.76 g
4.	Ka°uka API	*Picrorhiza kurroa*	Rz.	14.76 g
5.	Dārvī (Dāruharidrā API)	*Berberis aristata*	St.	14.76 g
6.	Niśā (Haridrā API)	*Curcuma longa*	Rz.	14.76 g
7.	Sārivā (Śveta sārivā API)	*Hemidesmus indicus*	Rt.	14.76 g
8.	Ma®ji¾°ā API	*Rubia cordifolia*	Rt.	14.76 g
9.	Abhaya (Uśīra API)	*Vetiveria zizanioides*	Rt.	14.76 g
10.	Siktha (Madhūcchi¾°a API)	Bee's wax		14.76 g
11.	Tuttha API	Copper sulphate		14.76 g
12.	Madhuka (Ya¾°ī API)	*Glycyrrhiza glabra*	Rt.	14.76 g
13.	Naktāhvā (Kara®ja API)	*Pongamia pinnata*	Sd.	14.76 g
14.	Sarpi (Gogh¨ta API)	Clarified butter from cow's milk		768 g
15.	Jala API	Water		3.07 l

Method of preparation:

Take all ingredients of pharmacopoeial quality.

Treat Gh¨ta to prepare *Mūrchita Gh¨ta* (Appendix 6.2.8.2)

Wash and grind fresh leaves of ingredients 1 to 3 of the formulation composition (*Kalka dravya*) in a wet grinder. Treat Tuttha to prepare *Śodhitha Tuttha* (Appendix 6.2.7.6.) and keep aside for addition during snehapāka.

Take the ingredients (*Kalka dravya*) 4 to 9 and 12 to 13, clean, dry, powder and pass through sieve number 85 seperately. Transfer the powdered ingredients to the wet grinder, add the paste of ingredients number 1 to 3 and 11, ingredient grind with sufficient quantity of water to prepare a homogeneous blend. (Kalka)

Take *Mūrchita Gh¨ta* in a stainless steel vessel and heat it mildly.

Add increments of *Kalka*. Stir thoroughly while adding water in the ratio of 1 : 4.

Heat for 3 h with constant stirring maintaining the temperature between 50^0 and 90^0 during the first hour of heating. Stop heating and allow to stand overnight.
Start heating next day, observe the boiling mixture for subsidence of froth and constantly check the Kalka for the sign of varti breaking down into pieces on attempting to form a *varti (khara pāka lak¾a ´a)*. Expose the *varti* to flame and confirm the absence of crackling sound indicating absence of moisture. Stop heating when the *kalka* breaks down into pieces on attempting to form a *varti* and the froth subsides. Filter while hot (about 80^0) through a *muslin cloth*. Add small pieces of *Siktha*, filter through *muslin cloth* and allow to cool.
Pack it in tightly closed glass containers to protect from light and moisture.

Description:

A low melting *Gh¨ta*, yellowish green in color, unctuous to touch with pleasant odour.

Identification:

Thin layer chromatography:

Extract 2 g of Jātyādi Gh¨ta with 20 ml of *alcohol* at about 40^0 for 3 h. Cool, separate the alcohol layer, filter, concentrate to 5 ml and carry out thin layer chromatography. Apply 10 µl of the extract on TLC plate and develop the plate to distance of 8 cm using *toluene : ethyl acetate : hexane* (6 : 3 : 1) as mobile phase. After development, allow the plate to dry in air and spray with *ethanol-sulphuric acid reagent* followed by heating at 110^0 for about 10 min. It shows spots at R_f 0.12 (light grey), 0.29 (grey), 0.5 (dark brown), 0.59 (brown), 0.69 (brown) and 0.85 (light grey).

Physico-chemical parameters:

Refractive index at 40^0:	*1.452 to 1.464,*	Appendix 3.1.
Weight per ml at 40^0:	0.910g to 0.935g,	Appendix 3.2.
Saponification value:	190 to 210,	Appendix 3.10.
Iodine value:	35 to 45,	Appendix 3.11.
Acid value:	Not more than 3,	Appendix 3.12.
Peroxide value:	Not more than 5,	Appendix 3.13.
Congealing point:	21^0 to 17^0,	Appendix 3.4.2.

Other requirements:

Mineral oil:	Absent,	Appendix 3.15.
Microbial Limits:		Appendix 2.4.
Aflatoxins:		Appendix 2.7.

Storage: Store in a cool place in tightly closed containers, protected from light and moisture.

Therapeutic uses: For local application in Marmāś¨ta vra´a (Ulcers in vital points); Kledī vra´a (Oozing / weeping ulcer); Gambhīra vra´a (deep-rooted ulcers); Saruja vra´a (painful ulcers), Raktaja vra´a (bleeding ulcers); Du¾°a vra´a (non-healing ulcers).

Dose: For application on various types of wounds and ulcers.

KALYĀ³AKA GH§TA

(AFI, Part-I, 6:7)

Definition:

Kalyā´aka Gh¨ta is a medicated preparation made with the ingredients in the Formulation composition given below with Gh¨ta as the basic ingredient.

Formulation composition:

1.	Harītakī API	*Terminalia chebula*	P.	12 g
2.	Bibhītaka API	*Terminalia bellirica*	P.	12 g
3.	Āmalakī API	*Phyllanthus emblica (Emblica officinalis)*	P.	12 g
4.	Viśāla API	*Citrullus colocynthis* (Official substitute)	Fr.	12 g
5.	Bhadrailā (Sthūlailā API)	*Amomum subulatum*	Sd.	12 g
6.	Devadāru API	*Cedrus deodara*	Ht.Wd	12 g
7.	Elāvāluka API	*Prunus avium*	St.Bk	12 g
8.	Śveta sārivā API	*Hemidesmus indicus*	Rt.	12 g
9.	K¨¾´a sārivā API	*Cryptolepis buchanani*	Rt.	12 g
10.	Haridrā API	*Curcuma longa*	Rz.	12 g
11.	D¢ru haridrā API	*Berberis aristata*	St.	12 g
12.	Śālapar´ī API	*Desmodium gangeticum*	Rt.	12 g
13.	P¨śnipar´ī API	*Uraria picta*	Rt.	12 g
14.	Phalinī (Priya¬gu API)	*Callicarpa macrophylla*	Infl.	12 g
15.	Nata (Tagara API)	*Valeriana wallichii*	Rt	12 g
16.	B¨hatī API	*Solanum indicum*	Pl.	12 g
17.	Ku¾°ha API	*Saussurea lappa*	Rt	12 g
18.	Ma®ji¾°ā API	*Rubia cordifolia*	St	12 g
19.	Nāgakeśara API	*Mesua ferrea*	Stmn.	12 g
20.	Dā²ima-Phala tvak API	*Punica granatum*	P.	12 g
21.	Vella (Vi²a¬ga API)	*Embelia ribes*	Fr.	12 g
22.	Tālīsā patra (Tālīsā API)	*Abies webbiana*	Lf.	12 g
23.	Elā (Sūk¾mailā API)	*Elettaria cardamomum*	Sd.	12 g
24.	Mālatī Mukula (Jātī API)	*Jasminum officinale* var.*grandiflorum*	Fl.	12 g
25.	Utpala API	*Nymphaea stellata*	Fl.	12 g
26.	Da¬tī API	*Baliospermum montanum*	Rt	12 g
27.	Padmaka API	*Prunus cerasoides*	Ht. Wd	12 g
28.	Hima (Rakta candana API)	*Pterocarpus santalinus*	Ht. Wd	12 g

29.	Sarpi (Gogh¨ta API)	Clarified butter from cow’s milk	768 g

Method of preparation:

Take all ingredients of pharmacopoeial quality.
Wash and dry all the herbal raw material thoroughly.
Treat Gh¨ta to prepare *Mūrchita Gh¨ta* (Appendix 6.2.8.2).
Take the ingredients (kalka dravya) numbered 1 to 28 in the formulation composition, clean, wash, dry, powder separately and pass through sieve number 85.
Transfer the powdered ingredients to wet grinder and grind with sufficient quantity of water to prepare a homogeneous blend (*Kalka*).
Take *Mūrchita Gh¨ta* in a stainless steel vessel and heat it mildly.
Add increments of *Kalka*. Stir thoroughly while adding water in the ratio of 1 : 4.
Heat for 3 h with constant stirring maintaining the temperature between 50^0 and 90^0 during the first hour of heating. Stop heating and allow to stand overnight.
Start heating on next day and observe the boiling mixture for subsidence of froth (*phena śānti*) and constantly check the *Kalka* for formation of varti (*madhyama pāka lak¾a´a*).
Expose the varti to flame and confirm the absence of crackling sound indicating absence of moisture. Stop heating when the kalka form in to a varti and the froth subsides. Filter while hot (about 80^0) through a *muslin cloth* and allow to cool.
Pack it in tightly closed glass containers to protect from light and moisture.

Description:

A low melting *Gh¨ta*, yellowish green in color with pleasant odour and bitter taste.

Identification:

Thin layer chromatography:

Extract 2 g of Kalyā´aka Gh¨ta with 20 ml of *alcohol* at about 40^0 for 3 h. Cool, separate the alcohol layer, filter, concentrate to 5 ml and carry out thin layer chromatography. Apply 10 µl of the extract on TLC plate and develop the plate to a distance of 8 cm using *toluene : ethyl acetate : hexane* (6 : 3 : 1) as mobile phase. After development, allow the plate to dry in air and spray with *ethanol-sulphuric acid reagent* followed by heating at 110^0 for about 10 min. It shows spots at R_f 0.12 (grey), 0.25 (light grey), 0.35 (light grey), 0.54 (light grey), 0.76 (brownish grey) and 0.92 (brown) under visible light.

Physico-chemical parameters:

Refractive index at 40^0:	1.450 to 1.461,	Appendix 3.1.
Weight per ml at 40^0:	0.920g to 0.940g,	Appendix 3.2.
Saponification value:	180 to 210,	Appendix 3.10.

Iodine value:	33 to 45,	Appendix 3.11.
Acid value:	Not more than 4.5,	Appendix 3.12.
Peroxide value:	Not more than 6,	Appendix 3.13.
Congealing point:	22^0 to 17^0,	Appendix 3.4.2.

Other requirements:

Mineral oil:	Absent,	Appendix 3.15.
Microbial Limits:	Absent,	Appendix 2.4.
Aflatoxins:	Absent,	Appendix 2.7.

Storage: Pack it in tightly closed containers to protect from light and moisture.

Therapeutic uses: Kāsa (cough); Pā´²u (Anemia); Apasmāra (Epilepsy); Bhūtonmāda (exogenous psychosis); Bālagraha (specific disorders of children); Vi¾avik¢ra (disorders due to poison); Gara vi¾a (slow/accumulated poison); Vandhyatva (Infertility); Yoni roga (diseases of the female genital tract); Ka´²u (itching); Śopha (Oedema); Meda (Adipose tissue); Moha (Delusion); Jvara (fever); Sm¨ti daurbalya (weak memory) and Daurbalya (weakness).

Dose: 12 g daily in divided doses.

Anupāna: Warm milk, Warm water.

PAÑCAGAVYA GH§TA

(AFI, Part-I, 6:25)

Definition:

Pañcagavya Gh¨ta is a semi-solid preparation made with the ingredients in the Formulation composition given below with Gh¨ta as the basic ingredient.

Formulation composition:

1.	Gomaya svarasa	Water extract of fresh cow dung	3.07 l
2.	K¾īra (Godugdha API)	Cow's milk	3.07 l
3.	Dadhi (Godadhi API)	Curd from cow's milk	3.07 kg
4.	Mūtra (Gomūtra)	Urine of cow	3.07 l
5.	Havi (Gogh¨ta API)	Clarified butter from cow's milk	768 g

Method of preparation:

Take all ingredients of pharmacopoeial quality.
Collect fresh cow dung and cow urine in clean seperate vessels taking care to avoid contamination. Use urine within 12 h of collection. Use cow dung with in 2 h to prepare *(Gomaya svarasa)*
Mix Cow dung with equal quantity of water using gloved hands and make a homogeneous solution. Filter later with *muslin cloth* to obtain Gomaya svarasa.

Treat *Gh¨ta* to prepare *Mūrchita Gh¨ta* (Appendix 6.2.8.2)**.**

Take *Mūrchita Gh¨ta* in a stainless steel vessel and heat it mildly.
Stir thoroughly while adding the *Godadhi, Godugdha, Gomūtra* and *Gomaya svarasa.*

Heat for 3 h with constant stirring maintaining the temperature between 50^0 and 90^0 during the first hour of heating. Stop heating and allow to stand overnight.
Start heating next day and observe the boiling mixture for subsidence of froth *(phena śānti*). Stop heating when the froth subsides. Filter while hot (about 80^0) through a *muslin cloth* and allow to cool.
Pack it in tightly closed glass containers to protect from light and moisture.

Description:

A low melting *Gh¨ta*, light yellow in color with phenolic odour.

Identification:

Thin layer chromatography:

Extract 2 g of the sample with 20 ml of *alcohol* at about 40^0 for 3 h. Cool, separate the alcohol layer, filter, concentrate to 5 ml and carry out the thin layer chromatography. Apply 10 µl of the extract on TLC plate and develop the plate to a distance of 8 cm using *toluene: ethyl acetate: hexane* (6 : 3 : 1) as mobile phase. After development, allow the plate to dry in air and spray with *ethanol-sulphuric acid reagent* followed by heating at 110^0 for about 10 min. It shows spots at R_f 0.15 (light grey), 0.22 (brownish grey), 0.30 (light grey), 0.50 (light grey), 0.63 (brownish grey), 0.70 (grey) and 0.82 (brownish grey) under visible light.

Physico-chemical parameters:

Refractive index at 40^0:	1.450 to 1.455,	Appendix 3.1.
Weight per ml at 40^0:	0.915 g to 0.950 g,	Appendix 3.2.
Saponification value:	200 to 225,	Appendix 3.10.
Iodine value:	35 to 45,	Appendix 3.11.
Acid value:	Not more than 3,	Appendix 3.12.
Peroxide value:	Not more than 2,	Appendix 3.13.
Congealing point:	21^0 to 17^0,	Appendix 3.4.2.

Other requirements:

Mineral oil:	Absent,	Appendix 3.15.
Microbial Limits:		Appendix 2.4.
Aflatoxins:		Appendix 2.7.

Storage: Store in a cool place in tightly closed containers, protected from light and moisture.

Therapeutic uses: Apasmāra (Epilepsy); Jvara (fever); Unmāda (Insanity) and Kāmalā (Jaundice).

Dose: 12 g daily in divided dose.

Anupāna: Warm milk, Warm water.

PA¿CATIKTA GH§TA

(AFI, Part-I, 6:26)

Definition:

Pa®catikta Gh¨ta is a medicated preparation made with the ingredients in the Formulation composition given below with Gh¨ta as the basic ingredient.

Formulation composition:

1.	Nimba API	*Azadirachta indica*	St.Bk.	480 g
2.	Pa°ola API	*Trichosanthes dioica*	Lf.	480 g
3.	Vyāghrī (Ka´°akārī API)	*Solanum surattense*	Pl.	480 g
4.	Gu²ūcī API	*Tinospora cordifolia*	St.	480 g
5.	Vāsaka (Vāsā API)	*Adhatoda vasica*	Rt.	480 g
6.	Jala API for decoction	Water		12.29 l
	reduced to			3.07 l
7.	Harītakī API	*Terminalia chebula*	P.	128 g
8.	Bibhītaka API	*Terminalia bellirica*	P.	128 g
9.	Āmalakī API	*Phyllanthus emblica (Emblica officinalis)*	P.	128 g
10.	Gh¨ta (Gogh¨ta API)	Clarified butter from cow's milk		768 g

Method of preparation:

Take all ingredients of pharmacopoeial quality.
Wash and dry all the herbal raw materials thoroughly.

Treat *Gh¨ta* to prepare *Mūrchita Gh¨ta* (Appendix 6.2.8.2).
Pulverize ingredients numbered 1 to 5 (*kvātha dravya*) to coarse powder, add specified quantity of water, heat and reduce the volume to one-fourth. Filter with *muslin cloth* to obtain *Pa®catikta kvātha*.

Take the other ingredients (*kalka dravya*) numbered 7 to 9 in the formulation composition, Powder and pass through sieve number 85. Transfer the powdered ingredients to wet grinder and grind with sufficient quantity of water to prepare a homogeneous blend (*Kalka*)

Take *Mūrchita Gh¨ta* in a stainless steel vessel and heat mildly.
Add increments of *Kalka.* Stir thoroughly while adding *kvātha.*

Heat for 3 h with constant stirring maintaining the temperature between 50^0 and 90^0 during the first hour of heating. Stop heating and allow to stand overnight.
Start heating next day and observe the boiling mixture for subsidence of froth *(phena śānti)* and constantly check the *kalka* for formation of *varti (madhyama pāka lak¾a´a).*
Expose the varti to flame and confirm the absence of crackling sound indicating absence of moisture. Stop heating when the *kalka* forms a *varti* and the froth subsides. Filter while hot (about 80^0) through a *muslin cloth* and allow to cool.

Pack it in tightly closed glass containers to protect from light and moisture.

Description:

A low melting Gh¨ta, greenish yellow color with pleasant odour and bitter taste.

Identification:

Thin layer chromatography:

Extract 2 g of the sample with 20 ml of *alcohol* at about 40^0 for 3 h. Cool, separate the alcohol layer, filter concentrate to 5 ml and carry out the thin layer chromatography. Apply 10 µl of the extract on TLC plate and develop the plate to a distance of 8 cm using *toluene: ethyl acetate: hexane* (6: 3: 1) as mobile phase. After development, allow the plate to dry in air and spray with *ethanol-sulphuric acid reagent* followed by heating at 110^0 for about 10 min. It shows spots at R_f 0.13 (light grey), 0.20 (light grey), 0.28 (light grey), 0.37 (light grey), 0.57 (light grey) and 0.89 (brown) under visible light.

Physico-chemical parameters:

Refractive index at 40^0:	1.450 to 1.452,	Appendix 3.1.
Weight per ml at 40^0:	0.910 g to 0.930 g,	Appendix 3.2.
Saponification value:	180 to 210,	Appendix 3.10.
Iodine value:	30 to 40,	Appendix 3.11.
Acid value:	Not more than 3,	Appendix 3.12.
Peroxide value:	Not more than 3,	Appendix 3.13.
Congealing point:	21^0 to 17^0	Appendix 3.4.2.

Other requirements:

Mineral oil:	Absent,	Appendix 3.15.
Microbial Limits:		Appendix 2.4.
Aflatoxins:		Appendix 2.7.

Storage: Pack it in tightly closed containers to protect from light and moisture.

Therapeutic uses: Du¾°avra´a (non-healing ulcer); Ku¾°ha (Leprosy/skin diseases); Vātavyādhi (disorders due to vitiated Vāta do¾a); Pittavyādhi (diseases due to vitiated Pitta do¾a); Kaphavikāra (disorders due to vitiated Kapha do¾a); K¨mi (worm infestation); Arśa (Piles) and Kāsa (cough).

Dose: 12 g daily in divided doses.

Anupāna: Warm milk, Warm water**.**

PHALA GHṢTA

(AFI, Part-I, 6:30)

Definition:

Phala Gh¨ta is a medicated preparation made with the ingredients in the Formulation composition given below with Gh¨ta as the basic ingredient.

Formulation composition:

1.	Ma®ji¾°hā API	*Rubia cordifolia*	Rt.	12 g
2.	Ku¾°ha API	*Saussurea lappa*	Rt.	12 g
3.	Tagara API	*Valeriana wallichii*	Rt.	12 g
4.	Harītakī API	*Terminalia chebula*	P.	12 g
5.	Bibhītaka API	*Terminalia bellirica*	P.	12 g
6.	Āmalakī API	*Phyllanthus emblica (Emblica officinalis)*	P.	12 g
7.	Śarkarā API	Sugar		12 g
8.	Vacā API	*Acorus calamus*	Rz.	12 g
9.	Haridrā API	*Curcuma longa*	Rz.	12 g
10.	Dāru haridrā API	*Berberis aristata*	St.	12 g
11.	Madhuka (Ya¾°ī API)	*Glycyrrhiza glabra*	Rt.	12 g
12.	Medā API	*Asparagus racemosus (O*fficial substitute)	Rt.Tr.	12 g
13.	Dīpyaka (Yavānī API)	*Trachyspermum ammi*	Fr.	12 g
14.	Ka°urohi´ī (Ka°ukā API)	*Picrorhiza kurroa*	Rz./ Rt.	12 g
15.	Payasyā (K¾īra vidārī API)	*Ipomoea digitata*	Rt.Tr.	12 g
16.	Hi¬gu API	*Ferula foetida*	Exd.	12 g
17.	Kākolī API	*Withania somnifera (*Official substitute)	Rt.	12 g
18.	Vājīgandhā (Aśvagandhā API)	*Withania somnifera*	Rt.	12 g
19.	Śatāvarī API	*Asparagus racemosus*	Rt.Tr.	12 g
20.	Gh¨ta (Gogh¨ta API)	Clarified butter from cow's milk		768 g
21.	K¾īra (Godugdha API)	Cow's milk		3.072 l

Method of preparation:

Take all ingredients of pharmacopoeial quality.

Treat *Gh¨ta* to prepare *Mūrchita Gh¨ta* (Appendix 6.2.8.2)**.**

Treat *Hi¬gu* to prepare *śodhita Hi¬gu* (Appendix 6.2.7.12.).

Take the ingredients (*kalka dravya*) numbered 1 to 19 except *Hi¬gu* and *Śarkarā*, wash, dry, powder and pass through sieve number 85. Transfer the powdered ingredients to the wet grinder, add *shodhita Hingu*, grind with sufficient quantity of water to prepare a homogeneous blend. (*Kalka*)

Take *Mūrchita Gh¨ta* in a stainless steel vessel and heat mildly.
Add increments of *Kalka*. Stir thoroughly while adding *Godugdha.*
Heat for 3 h with constant stirring maintaining the temperature between 50^0 and 90^0 during the first hour of heating. Stop heating and allow to stand overnight. Start heating next day and observe the boiling mixture for subsidence of froth (*phena śānti*) and constantly check the kalka for formation of *varti (madhyama pāka lak¾a ´a).* Expose the *varti* to flame and confirm the absence of crackling sound indicating absence of moisture. Stop heating when the *kalka* forms a *varti* and the froth subsides. Filter while hot (about 80^0) through a *muslin cloth* and allow to cool. After complete cooling add powdered sugar, stir vigorously for dissolution.
Pack it in tightly closed glass containers to protect from light and moisture.

Description:

A low melting Gh¨ta, greenish yellow in color with pleasant odour and astringent taste.

Identification:

Thin layer chromatography:

Extract 2 g of the sample with 20 ml of *alcohol* at about 40^0 for 3 h. Cool, separate the alcohol layer, filter, concentrate to 5 ml and carry out the thin layer chromatography. Apply 10 µl of the extract on TLC plate and develop the plate to a distance of 8 cm using *toluene : ethyl acetate : hexane* (6 : 3 : 1) as mobile phase. After development, allow the plate to dry in air and spray with *ethanol-sulphuric acid reagent* followed by heating at 110^0 for about 10 min. It shows spots at R_f 0.094 (light grey), 0.19 (light grey), 0.25 (light grey), 0.28 (light grey), 0.53 (light grey), 0.80 (light grey) and 0.97 (brownish grey) under visible light.

Physico-chemical parameters:

Refractive index at 40^0:	1.440 to 1.450,	Appendix 3.1.
Weight per ml at 40^0:	0.910g to 0.940g,	Appendix 3.2
Saponification value:	185 to 210,	Appendix 3.10.
Iodine value:	35 to 42,	Appendix 3.11.
Acid value:	Not more than 3,	Appendix 3.12.
Peroxide value:	Not more than 4,	Appendix 3.13.
Congealing point:	22^0 to 17^0	Appendix 3.4.2.

Other requirements:

Mineral oil:	Absent,	Appendix 3.15.
Microbial Limits:		Appendix 2.4.
Aflatoxins:		Appendix 2.7..

Storage: Store in a cool place in tightly closed containers, protected from light and moisture.

Therapeutic uses: Śukra vikāra (disorders of the Śukra dhāthu); Yoni vikāra (disorders of female genital tract); Vandhyatva (Infertility); Garbhi´ī roga (diseases during pregnancy) and Kārśya (Emaciation); Uttara Vasti (Vaginal Douche)
Dose: 12 g daily in divided doses.

Anupāna: Warm water.

SĀRASVATA GHṢTA

(AFI, Part-I, 6:43)

Definition:

Sārasvata Gh¨ta is a medicated preparation made with the ingredients in the Formulation composition given below with Gh¨ta as the basic ingredient.

Formulation composition:

1.	Ajā k¾īra	Goat's milk		3.07 l
2.	Abhayā (Harītakī API)	*Terminalia chebula*	P.	24 g
3.	Śu´°hī API	*Zingiber officinale*	Rz.	24 g
4.	Marica API	*Piper nigrum*	Fr.	24 g
5.	Pippalī API	*Piper longum*	Fr.	24 g
6.	Pā°hā API	*Cissampelos pareira*	Rt.	24 g
7.	Ugra (Vacā API)	*Acorus calamus*	Rz.	24 g
8.	Śigru API	*Moringa pterygosperma*	Rt.Bk.	24 g
9.	Saindhava lava´a (API)	Rock salt		24 g
10.	Jala API	Water		3.07 l
11.	Sarpi (Gogh¨ta API)	Clarified butter from cow's milk		768 g

Method of preparation:

Take all ingredients of pharmacopoeial quality.

Treat *Gh¨ta* to prepare *Mūrchita Gh¨ta* (Appendix 6.2.8.2).

Take the ingredients (*kalka dravya*) numbered 2 to 8, wash, dry, powder and pass through sieve number 85. Transfer the powdered ingredients to the wet grinder, add ingredient number 9 and grind with sufficient quantity of water to prepare a homogeneous blend (*Kalka*).

Take *Mūrchita Gh¨ta* in a stainless steel vessel and heat mildly.

Add increments of *Kalka*. Stir thoroughly while adding *Ajā-k¾īra* and water.

Heat for 3 h with constant stirring maintaining the temperature between 50^0 and 90^0 during the first hour of heating. Stop heating and allow to stand overnight.

Start heating next day and observe the boiling mixture for subsidence of froth (*phena śānti*) and constantly check the *kalka* for formation of *varti (madhyama pāka lak¾a´a)*

Expose the *varti* to flame and confirm the absence of crackling sound indicating absence of moisture. Stop heating when the *kalka* forms a varti and the froth subsides. Filter while hot (about 80^0) through a *muslin cloth* and allow to cool.

Pack it in tightly closed glass containers to protect from light and moisture.

Description:

A low melting *Gh¨ta*, greenish yellow in color with pleasant odour and bitter taste.

Identification:

Thin layer chromatography:

Extract 2 g of the sample with 20 ml of alcohol at about 40^0 for 3 h. Cool, separate the alcohol layer, filter, concentrate to 5 ml and carry out the thin layer chromatography. Apply 10 µl of the extract on TLC plate and develop the plate to a distance of 8 cm using *toluene : ethyl acetate : hexane* (6 : 3 : 1) as mobile phase. After development, allow the plate to dry in air and spray with *ethanol-sulphuric acid reagent* followed by heating at 110^0 for about 10 min. It shows eight spots at R_f 0.09 (light grey), 0.29 (light grey), 0.42 (grey), 0.52 (brown), 0.55 (light grey), 0.59 (light grey), 0.66 (grey) and 0.69 (light grey) under visible light.

Physico-chemical parameters:

Refractive index at 40^0:	1.450 to 1.453,	Appendix 3.1.
Weight per ml at 40^0:	0.910g to 0.940g,	Appendix 3.2.
Saponification value:	180 to 210,	Appendix 3.10.
Iodine value:	40 to 53,	Appendix 3.11.
Acid value:	Not more than 3.5,	Appendix 3.12.
Peroxide value:	Not more than 5,	Appendix 3.13.
Congealing point:	21^0 to 17^0	Appendix 3.4.2.

Other requirements:

Mineral oil:	Absent,	Appendix 3.15.
Microbial Limits:		Appendix 2.4.
Aflatoxins:		Appendix 2.7.

Storage: Store in a cool place in tightly closed containers, protected from light and moisture.

Therapeutic uses: Improves Vāk (speech), Medhā (intelligence), Sm¨ti (memory) and Jā°harāgni (appetite)

Dose: 12 g daily in divided dose.

Anupāna: Warm milk, Warm water.

TRAIKA³¯AKA GH§TA

(AFI, Part-I, 6:15)

Definition:

Traika´°aka Gh¨ta is a medicated preparation made with the ingredients in the Formulation composition given below with Gh¨ta as the basic ingredient.

Formulation composition:

1.	Traika´°aka (Gok¾ura API)	*Tribulus terrestris*	Fr.	768 g
2.	Jala API for decoction reduced to	Water		12.29 l 3.07 l
3.	Elā (Sūk¾mailā API)	*Eletteria cardamomum*	Sd.	9.14 g
4.	Girijatu (ŚiĹājatu)	Exd. from rock crevices		9.14 g
5.	Śilābheda (Pā¾ā´abheda API)	*Bergenia ligulata*	Rz.	9.14 g
6.	Ya¾°ī API	*Glycyrrhiza glabra*	Rt.	9.14 g
7.	Varī (Śatāvarī API)	*Asparagus racemosus*	Rt.	9.14 g
8.	Darbha API	*Imperata cylindrica*	Rt.	9.14 g
9.	Drāk¾ā API	*Vitis vinifera*	Dr. Fr.	9.14 g
10.	Ambu (Hrªvera API)	*Coleus vettiveroides*	Rt.	9.14 g
11.	Śau´²ī (Pippalī API)	*Piper longum*	Ft.	9.14 g
12.	Vasuka	*Calotropis procera* (Official substitute)	Pl.	9.14 g
13.	Vaśira (Cavya API)	*Piper chaba*	Rt.	9.14 g
14.	Kāśa API	*Saccharum spontaneum*	Rt.	9.14 g
15.	Ik¾u-mūla API	*Saccharum officinale*	Rt.	9.14 g
16.	Matsyāk¾ikā (Matsyāk¾ī API)	*Alternanthera sessilis*	Pl.	9.14 g
17.	Dugdha (Godugdha API)	Cow's milk		768 g
18.	Gh¨ta (Gogh¨ta API)	Clarified butter from cow's milk		768 g

Method of preparation:

Take all ingredients of pharmacopoeial quality.
Wash and dry all the raw materials thoroughly.
Treat *Gh¨ta* to prepare *Mūrchita Gh¨ta* (Appendix 6.2.8.2).
Pulverize *Gok¾ura (kvātha dravya)* to coarse powder and add 16 parts of water, heat and reduce the volume to one fourth. Filter with *muslin cloth* to obtain *Gok¾ura kvātha*.
Treat *Śilājatu* to prepare *Śodhita Śilājatu* (Appendix 6.2.7.10), and keep aside for addition during *snehapāka.*

Take the other ingredients *(kalka dravya)* numbered 3 and 5 to 15 in the formulation composition, powder and pass through sieve number 85. Wash and grind fresh *Matsyākṣikā* in a wet grinder and later transfer all the other powdered ingredients and *Śodhita Śilājatu* to the wet grinder and grind with sufficient quantity of water to prepare a homogeneous blend.

Take *Mūrchita Gh¨ta* in a stainless steel vessel and heat mildly.

Add increments of *Kalka*. Stir thoroughly while adding *Gokṣūra kvātha* and *Godugdha* in the specified ratio.

Heat for 3 h with constant stirring maintaining the temperature between 50^0 and 90^0 during the first hour of heating. Stop heating and allow to stand overnight.

Start the heating next day and observe the boiling mixture for subsidence of froth *(phena śānti)* and constantly check the *kalka* for formation of *varti (madhyama pāka lakṣa´a).*

Expose the *varti* to flame and confirm the absence of crackling sound indicating absence of moisture. Stop heating when the *kalka* forms a *varti* and the froth subsides. Filter while hot (about 80^0) through a *muslin cloth* and allow to cool.

Pack it in tightly closed glass containers to protect from light and moisture.

Description: A low melting Gh¨ta, greenish in color with pleasant odour and bitter taste.

Identification:

Thin layer chromatography:

Extract 2 g of Traik´°aka Gh¨ta with 20 ml of *alcohol* at about 40^0 for 3 h. Cool, separate the alcohol layer, filter, concentrate to 5 ml and carry out the thin layer chromatography. Apply 10 µl of the extract on TLC plate. Develop the plate to a distance of 8 cm using *toluene : ethyl acetate : hexane* (6 : 3 : 1) as mobile phase. After development, allow the plate to dry in air and spray with *ethanol-sulphuric acid reagent* followed by heating at 110^0 for about 10 min. It shows spots at R_f 0.33 (brown), 0.62 (yellow), 0.68 (grey), 0.80 and 0.90 (light brown) under visible light.

Physico-chemical parameters:

Refractive index at 40^0:	1.451 to 1.452,	Appendix 3.1.
Weight per ml at 40^0:	0.910g to 0.930g,	Appendix 3.2.
Saponification value:	200 to 225,	Appendix 3.10.
Iodine value:	35 to 45,	Appendix 3.11.
Acid value:	Not more than 4,	Appendix 3.12.
Peroxide value:	Not more than 5,	Appendix 3.13.

Congealing point:	22^0 to 18^0	Appendix 3.4.2.

Other requirements:

Mineral oil:	Absent,	Appendix 3.15.
Microbial Limits:		Appendix 2.4.
Aflatoxins:		Appendix 2.7.

Storage: Store in a cool place in tightly closed containers, protected from light and moisture.

Therapeutic uses: Mūtra k¨cchra (Dysuria); Prameha (metabolic disorders); Aśmarī (Urinary calculus); Mūtra śarkarā (Gravels in urine); Mūtra do¾a (urinary disorders) and Mūtra dāha (Burning micturition).

Dose: 12 g daily in divided doses.

Anupāna: Warm water, T¨´a paňca mūla Kvātha, Warm milk.

TRIPHALĀ GH§TA

(AFI, Part-I, 6:14)

Definition:

Triphalā gh¨ta is a medicated preparation made with the ingredients in the Formulation composition given below with Gh¨ta as the basic ingredient.

Formulation composition:

1.	Harītakī API	*Terminalia chebula*	P.	12 g
2.	Bibhītaka API	*Terminalia bellirica*	P.	12 g
3.	Āmalakī API	*Phyllanthus emblica (Emblica officinalis)*	P.	12 g
4.	Śu´°hī API	*Zingiber officinale*	Rz.	12 g
5.	Marica API	*Piper nigrum*	Fr.	12 g
6.	Pippalī API	*Piper longum*	Fr.	12 g
7.	Drāk¾ā API	*Vitis vinifera*	Dr.Fr.	12 g
8.	Madhuka (Ya¾°ī API)	*Glycyrrhiza glabra*	Rt.	12 g
9.	Ka°urohi´ī (Ka°ukā API)	*Picrorhiza kurroa*	Rz./Rt	12 g
10.	Prapau´²arīka (Kamala API)	*Nelumbo nucifera*	Fl.	12 g
11.	Sūk¾mailā API	*Eletteria cardamomum*	Sd.	12 g
12.	Vi²a¬ga API	*Embelia ribes*	Fr.	12 g
13.	Nāgakeśara API	*Mesua ferrea*	Stmn.	12 g
14.	Nīlotpala (Utpala API)	*Nymphaea stellata*	Fl.	12 g
15.	Śveta sārivā API	*Hemidesmus indicus*	Rt.	12 g
16.	K¨¾´a sārivā API	*Cryptolepis buchanani*	Rt.	12 g
17.	Candana (Śvetā candana API)	*Santalum album*	Ht.Wd	12 g
18.	Haridrā API	*Curcuma longa*	Rz.	12 g
19.	Dāruharidrā API	*Berberis aristata*	St.	12 g
20.	Gh¨ta (Go ghṛta API)	Clarified butter from cow's milk		768 g
21.	Pāyasa (Godugdha API)	Cow's milk		768 g
22.	*Triphalā – Kvātha	*Kvatha of Emblica officinalis*, *Terminalia chebula, Terminalia bellirica*		2.3 l

Method of preparation:

Take all ingredients of pharmacopoeial quality.
Wash and dry all the herbal raw materials thoroughly.
Treat *Gh¨ta* to prepare *Mūrchita Gh¨ta* (Appendix 6.2.8.2)**.**

Pulverize ingredient 22 (consisting of Triphalā ingredients) to a coarse powder, add 8 parts of water, heat and reduce the volume to one fourth. Filter with *muslin cloth* to obtain *Triphalā kvātha.*

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*Equal parts of Harītakī, Āmalakī and Bibhītaka.

Take the other ingredients numbered 1 to 19 in the formulation composition *(Kalka dravya)*, powder and pass through sieve number 85. Transfer the powdered ingredients to wet grinder and grind with sufficient quantity of water to prepare a homogeneous blend *(Kalka)*

Take *Mūrchita Gh¨ta* in a stainless steel vessel and heat it mildly. Add increments of *Kalka*. Stir thoroughly while adding *Triphalā kvātha* and *Godugdha* in the specified ratio.

Heat for 3 h with constant stirring maintaining the temperature between 50^0 and 90^0 during the first hour of heating. Stop heating and allow to stand overnight.

Start heating next day and observe the boiling mixture for subsidence of froth *(phena śānti)* and constantly check the *kalka* for formation of *varti (madhyama pāka lak¾a ´a)*.

Expose the *varti* to flame and confirm the absence of crackling sound indicating absence of moisture. Stop heating when the *kalka* forms into a *varti* and the froth subsides. Filter while hot (about 80^0) through a *muslin cloth* and allow to cool.

Pack it in tightly closed glass containers to protect from light and moisture.

Description:

A low melting Gh¨ta, green in colour, unctuous to touch with pleasant odour and bitter taste.

Identification:

Thin layer chromatography:

Extract 2 g of Triphalā gh¨ta with 20 ml of *alcohol* at about 40^0 for 3 h. Cool, separate the alcohol layer, filter, concentrate to 5 ml and carry out the thin layer chromatography. Apply 10 µl of the extract on TLC plate and develop the plate to a distance of 8 cm using *toluene : ethyl acetate : hexane* (6 : 3 : 1) as mobile phase. After development, allow the plate to dry in air and spray with *ethanol-sulphuric acid reagent* followed by heating at 110^0 for about 10 min. It shows spots at R_f 0.06 (grey), 0.17 (grey), 0.23 (grey), 0.32 (brownish grey), 0.37 (light grey), 0.43 (light grey), 0.59 (grey), 0.65 (grey), 0.75 (light grey) and 0.83 (greenish-grey) under visible light.

Physico-chemical parameters:

Refractive index at 40^0:	1.452 to 1.455,	Appendix 3.1.
Weight per ml at 40^0:	0.910g to 0.935g,	Appendix 3.2.
Saponification value:	200 to 225,	Appendix 3.10.
Iodine value:	35 to 45,	Appendix 3.11.

Acid value:	Not more than 3,	Appendix 3.12.
Peroxide value:	Not more than 5,	Appendix 3.13.
Congealing point:	21^0 to 17^0	Appendix 3.4.2.

Other requirements:

Mineral oil:	Absent,	Appendix 3.15.
Microbial Limits:		Appendix 2.4.
Aflatoxins:		Appendix 2.7.

Storage: Store in a cool place in tightly closed containers, protected from light and moisture.

Therapeutic uses: Arbuda (tumours); Kāmalā (Jaundice); Timira (Cataract); Visarpa (Erysepelas); Pradara (excessive vaginal discharge); Netra rujā (pain in eyes); Netra srāva (Lacrimation); Kāsa (cough); Ka´²ū (itching); Rakta do¾a (disorders of Blood); Śvayathu (oedema); Khālitya (Alopecia); Keśa patana (falling of hair); Vi¾ama jvara (intermittent fever); Arma (Pterygium); Śukla netra roga (Eye disorders related to sclera) and Vartma roga (disorders of eyelids).

Dose: 12 g daily in divided doses. It can also be used in different Netra Kriyā kalpas.

Anupāna: Warm milk, Warm water.

GUGGULU

General Description:

Guggulu is an exudate *(Niryāsa)* obtained from the plant *Commiphora mukul.* Preparations having the exudates as main effective ingredient are known as *Guggulu*. There are five different varieties of *Guggulu* described in the Ayurvedic texts. However two of the varieties, namely, *Mahi¾āksa* and *Kanaka Guggulu* are usually preferred for medicinal preparations. *Mahi¾āksa Guggulu* is dark greenish brown and *Kanaka Guggulu* is yellowish brown in color.

Before using, Guggulu is cleaned in the following manner:

1. Sand, stone, plant debris, glass etc. are first removed.
2. It is then broken into small pieces.
3. It is thereafter bundled in a piece of cloth and boiled in *Dola Yantra* containing

any one of the following fluids.

a. *Gomūtra*,
b. *Triphalā ka¾āya,*
c. *Nirgu´²ipatra Svarasa* with *Haridrā Cūr´a,*
d. *Vāsāpatra Ka¾āya,*
e. *Vāsāpatra Svarasa* and
f. *Dugdha*.

The boiling of *Guggulu* in *Dolā Yantra* is carried on until all the *Guggulu* passes into the fluid through the cloth. By pressing with fingers, much of the fluid that can pass through is taken out. The residue in the bundle is discarded. The fluid is filtered and again boiled till it forms a mass. This mass is dried and then pounded with a pestle in a stone mortar, adding ghee in small quantities till it becomes waxy.

Guggulu cleaned as above, is soft, waxy and brown in color. Characteristics of preparations of *guggulu* vary depending on the other ingredients added to the preparations.

Guggulu is kept in glass or porcelain jars free from moisture and stored in a cool place. The potency is maintained for two years when prepared with ingredients of plant origin and indefinitely when prepared with metals and minerals.

KAIŚORA GUGGULU (Vatī)
(AFI, Part-I, 5:2)

Definition:

Kaiśora Guggulu is a va°ī preparation made with the ingredients in the Formulation composition given below with Guggulu as the basic ingredient.

Formulation composition:

1.	Guggulu API- (Śuddha)	*Commiphora wightii*	Exd.	768 g
2.	Harītakī API	*Terminalia chebula*	P.	256 g
3.	Bibhītaka API	*Terminalia bellirica*	P.	256 g
4.	Āmalakī API	*Phyllanthus emblica (Emblica officinalis*)	P.	256 g
5.	Chinnaruhā (Gu²ūcī API)	*Tinospora cordifolia*	St.	1.54 kg
6.	Jala API for decoction reduced to	Water		12.29 l 6.14 l
7.	Harītakī API	*Terminalia chebula*	P.	8 g
8.	Bibhītaka API	*Terminalia bellirica*	P.	8 g
9.	Āmalakī API	*Phyllanthus emblica*	P.	8 g
10.	Śu´°hī API	*Zingiber officinale*	Rz.	24 g
11.	Marica API	*Piper nigrum*	Fr.	24 g
12.	Pippalī API	*Piper longum*	Fr.	24 g
13.	K¨miripu (Vi²a¬ga API)	*Embelia ribes*	Fr.	24 g
14.	Triv¨t API	*Operculina turpethum*	Rt.	12 g
15.	Dantī API	*Baliospermum montanum*	Rt.	12 g
16.	Am¨tā (Gu²ūcī API)	*Tinospora cordifolia*	St.	48 g
17.	Gh¨ta (Gogh¨ta API)	Clarified butter from cow's milk		384 g

Method of preparation:

Take all ingredients of pharmacopoeial quality.
Wash, dry and powder the ingredients number 7 to 16 of the formulation compostion to a fine powder separately and pass through sieve number 85.
Soak the coarse powder of ingredients 2 to 5 in potable water in the specified ratio for 1 hr, boil it till the volume is reduced to half of its original volume. Cool the *ka¾āya* and filter through a *muslin cloth*.
Boil *Śuddha-Guggulu* (Appendix 6.2.7.4) in the above *ka¾āya* in an iron vessel and concentrate, add fine powders of remaining drugs with continuous stirring. Add *Gh¨ta* to the above mixture to form a semisolid mass for preparation of *vati*.

Expel the mass through vati machine fitted with suitable die and cut vatis of desirable weight.

Dry the rolled vatis in a tray-dryer at a temperature not exceeding 60^0.

Pack it in tightly closed glass containers to protect from light and moisture.

Description:

Spherical pills, dark brown in color with pleasant odour, taste astringent and sweetish.

Identification:

Microscopy:

Take about 5 g of the sample, powder it and add *n-hexane* (20 ml), stir for 10 min thoroughly over a water-bath; pour out *hexane*. Repeat the process thrice adding fresh quantities of *hexane;* discard *hexane.* Wash the sediment in hot water thoroughly. Take a few mg of the washed material, stain with *iodine solution* and mount in 50 per cent *glycerine*. Clarify a few mg with *chloral hydrate* and mount in 50 per cent *glycerine*. Observe the following characters in different mounts.
Groups of parenchymatous epidermal cells having beaded walls, several showing a thin cross wall, crisscross layer of sclerenchymatous fibres **(Har¤takī)**; short, unicellular, thick walled trichomes with sharp tips and bulbous bases and fragments of polyhedral epidermis showing cicatrices **(Bibhītaka)**; thin walled cells of epidermal tissue with paracytic stomata and containing silica crystals, brachysclereids with pitted wide lumen, parenchymatous tissue with large irregular thick walled cells showing corner thickenings **(Āmalakī)**; groups of parenchymatous cells, densely packed with starch grains, isolated starch grains, simple, oval to rod shaped, measuring 15 to 70 µ in length, hilum eccentric, lamellae distinct, yellow coloured oleo-resin cells, non-lignified, septate fibres some of them bearing marks of adjacent cells pressing against them, 30 to 50 µ broad **(Śu´°hī)**; fragments of inner epidermis in surface view with group of stone cells, interspersed amidst parenchyma **(Marica)**; spindle shaped or elongated stone cells showing narrow boundary and broad lumen isolated or in groups of 2 to 8 **(Pippalī)**; groups of polygonal, non lignified, thick walled brown coloured cells of testa in surface view, palisade like thick walled cells of testa in transverse view measuring 55 to 80 µ in length and 15 to 30 µ in width, thick walled polygonal cells filled with yellowish brown content of mesocarp cells almost square in shape, measuring 25 to 45 µ in dia **(Vi²a¬ga)**; cortical parenchymatous cells containing rosette crystals of calcium oxalate, broken, thick rod-like cellulosic fibres, fragments of typically honeycomb like pitted vessels, resin canals lined with epithelium (**Triv¨t)**; cork cells in surface and transverse view several with tannin or red colouring matter **(Dantī)**; parenchymatous cells filled with starch grains, starch grains abundant, single and compound, ovoid, elliptical, hilum, mostly irregular in shape, measuring 5 to 10 µ in dia, fragments of bordered pitted vessels **(Gu²ūcī)**.

Thin layer chromatography:

Extract 5 g of powdered vatis (vatti powder) in 75 ml of *n- hexane* under reflux on a water-bath for 30 min. Filter and concentrate the extract to 10 ml and carry out the thin layer chrmotography. Apply 10 µl of *n*-hexane extract on TLC plate and develop the plate

to a distance of 8 cm using *n-hexane : ethyl acetate* (8.5 : 1.5) as mobile phase. After development, allow the plate to dry in air and examine under ultraviolet light (366 nm). It shows major spots at R_f 0.10, 0.17 (both blue), 0.25 (fluorescent blue) and 0.46 (blue).

Physico-chemical parameters:

Loss on drying:	Not more than 13.0 per cent	Appendix 2.2.10.
Total ash:	Not more than 9.0 per cent	Appendix 2.2.3.
Acid-insoluble ash:	Not more than 2.0 per cent	Appendix 2.2.4.
Alcohol-soluble extractive:	Not less than 40.0 per cent	Appendix 2.2.7.
Water-soluble extractive:	Not less than 34.0 per cent	Appendix 2.2.8.
*p*H *(1% aqueous solution):*	4.0 to 4.5	Appendix3.3.

Other requirements:

Microbial Limits:	Appendix 2.4.
Aflatoxins:	Appendix 2.7.

Storage: Store in a cool place in tightly closed containers, protected from light and moisture.

Therapeutic uses: Mandāgni (Dyspepsia); Vibandha (constipation); Vātaśo´ita (Gout); Pramehapi²īkā (Diabetic carbuncle); Vra´a (Ulcer); Kāsa (cough); Ku¾°ha (diseases of skin); Gulma (abdominal lump); Śvayathu (oedema); Pā´²u (anaemia); Meha (excessive flow of urine); Jarādo¾a (geriatric disorder).

Dose: 3 g daily in divided doses.

Anupāna: Mudga Yū¾a, Milk, Sugandhijala.

VA¯I AND GUT#IKĀ

General Description:

Medicines prepared in the form of tablets or pills are known as *Va°i* and *Gut#ikā.* These are made of one or more drugs of plant, animal or mineral origin. *Gut#ikā, Vataka, Modaka, Pi´²i* and *Va°i* are synonymous terms used in classics for *Va°i*.

The drugs of plant origin are dried and made into fine powders, separately. The minerals are made into *bhasma* or *sindura*, unless otherwise mentioned. In cases where *pārada* and *gandhaka* are mentioned, *Kajjalī* is made first and other drugs added, one by one, according to the formula. These are put into a *khalva* and ground to a soft paste with the prescribed fluids. When more than one liquid is mentioned for grinding, they are used in succession. When the mass is properly ground and is in a condition to be made into pills, *gandha dravyas*, like *kasturi, karpura*, which are included in the formula, are added and ground again.

The criterion to determine the final stage of the formulation before making pills is that it should not stick to the fingers when rolled. Pills may be dried in shade or in sun as specified in the texts.

In cases where sugar or jaggery *(guda)* is mentioned, *pāka* of these should be made on mild fire and removed from the oven. The powders of the ingredients are added to the *pāka* and briskly mixed. When still warm *gutikas* should be rolled and dried in shade.

Pills made of plant drugs when kept in airtight containers can be used for two years. Pills containing minerals can be used for an indefinite period. Pills and *vatis* should not lose their original color, smell, taste and form. When sugar, salt or *k¾āra* is an ingredient, the pills should be kept away from moisture.

MARICĀDI GUT#IKĀ

(AFI, Part - I, 12:20)

Definition:

Maricādi Gut#ikā is a preparation made with the ingredients in the Formulation composition given below.

Formulation composition:

1.	Maricā API	*Piper nigrum*	Fr.	12 g
2.	Pippalī API	*Piper longum*	Fr.	12 g
3.	Yavaks#āra (Yava API)	*Hordeum vulgare*	Water soluble ash of plant	6 g
4.	Dād#ima API	*Punica granatum*	Fr. R.	24 g
5.	Gud#a API	Jaggery		96 g

Method of preparation:

Take all ingredients of Pharmacopoeial quality.

Clean, dry, powder the ingredients no. 1, 2 & 4 of the formulation composition (*Prak¾epa Dravya*) and pass through sieve number 85 to obtain fine powder.

Collect *Yava ksara* in the specified ratio.

Take jaggery, add required amounts of water, boil to dissolve and filter through a *muslin cloth.*

Reduce to thicker consistency by gentle boiling to prepare *Gu²a pāka*.

Add fine powders of *Prak¾epa Dravya* and *Yava k¾āra* and mix thoroughly to prepare a homogeneous mass.

Pass the mass through a pill making machine and cut vatis of desirable weight. Roll the vatis on a flat surface by circular motion of palm. Dry the rolled vatis in a tray-dryer at a temperature not exceeding 60^0.

Pack it in tightly closed containers to protect from light and moisture.

Description:

Spherical, soft, blackish brown coloured pills with pleasant odour and sweet taste.

Identification:

Microscopy:

Take about five pills, crush, wash with water, clear in *chloral hydrate*, wash in *water* and mount in *glycerin* (80 per cent) and observe the following characters:

Group of isodiameric or slightly elongated stone cells with moderately thickened walls, interspersed with thin walled polygonal parenchyma cells **(Marica)**; groups of elongated, spindle shaped, wide lumened lignified stone cells **(Pippalī)**; groups of stone cells, oval shape, striated walls with minute central lumen **(Dād#ima)**.

Thin layer chromatography:

Extract 5 g of the powdered pills with 70 ml of *ethanol* in soxhlet apparatus on a water-bath for 6 h, filter and carry out thin layer chromatography. Apply 7.5 µl of the extract on TLC plate. Develop the plate to a distance of 8 cm using *ethyl acetate* : *n-hexane* : *formic acid* (4 : 6 : 0.1) as mobile phase. After development, allow the plate to dry in air and examine under ultraviolet light (254 nm). It shows major spots at R_f 0.14, 0.20 and 0.34 (fluorescent green). Spray the plate with *anisaldehyde- sulphuric acid* reagent and heat at 110^0 for about 10 min. The plate shows major spots at R_f 0.80 (blue), 0.65 (light violet), 0.52 (violet) and 0.11 (green) under visible light.

Physico-chemical parameters:

Loss on drying at 110 ^{0}:	Not more than 10 per cent,	Appendix 2.2.10.
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 9 per cent,	Appendix 2.2.7.
Water-soluble extractive:	Not less than 46 per cent,	Appendix 2.2.8.

Assay:

Not less than 2.83 per cent of piperine when assayed by the following method.

Estimation of Piperine: Dissolve 2.5 mg of piperine in a mixture of *methanol : chloroform* (1 : 1) and make up the volume to 25 ml in a volumetric flask. Apply 2, 5, 8, 11, 14, 17 µl of solution on TLC plate and develop the plate a distance of to 8 cm using *acetone : n-hexane* (3 : 7) as mobile phase. After development, dry the plate in a current of hot air and scan in the TLC scanner at a wavelength of 338 nm. Note the peak area and prepare the calibration curve by plotting peak area vs concentration of piperine.
Extract accurately weighed about 6 g powder of vatis in 100 ml of *alcohol* in a Soxhlet apparatus for 6 h. Filter the extract while hot and dry completely and weigh. Take 25 mg of extract in a volumetric flask and dissolve in a mixture of *methanol : chloroform* (1 : 1) and make up the volume to 25 ml. Apply 3 µl of the test solutions on TLC plate. Develop, dry and scan the plate as described in the proceeding paragraph for calibration curve of piperine. Record area under the curve for a peak corresponding to piperine in the test solution. Calculate the amount of piperine in the test solution from the calibration curve of piperine.

Other requirements:

Microbial Limits: Appendix 2.4.
Aflatoxins: Appendix 2.7.

Storage: Store in a cool place in tightly closed containers, protected from light and moisture.

Therapeutic uses: Kāsa (cough); Śvāsa (Asthma).

Dose: 3 g per day – to be dissolved slowly in the mouth.

KS$ĀRA

General Description:

Ks$*āra* are alkaline substances obtained from the water soluble ash of the drugs of plant origin.

Method of Preparation:

The drugs are cut into small pieces and dried well. The pieces are placed in an earthen pot and burnt to ash. Water is added to the ash in the ratio of 6:1 and mixed well. This is allowed to settle down over night and leter strained through a piece of cloth. This process of straining may be done two or three times till a clear liquid is obtained. This liquid is then put in an *iron* or earthen vessel and heated over a moderate fire till water evaporates completely, leaving a solid salty white substance known as *Ks*$*āra*.

Ks$*āras* are white in colour and hygroscopic in nature therefore should be kept in air-tight bottles. These last indefinitely.

APĀMĀRGA KS$ĀRA

(AFI, Part-I, 10:2)

Definition:

Apāmārga ks$āra is an off-white alkaline preparation made with the ingredients in the Formulation composition given below.

Formulation composition:

1.	Apāmārga API Bhasma	*Achyranthes aspera*	Pl.	1 part
2.	Jala API	Water		6 parts

Method of Preparation:

Take ingredients of pharmacopoeial quality.
Cut whole plant of Apāmārga into small pieces and dry completely**.** Burn to ash (*Bhasm*a).
Add 6 parts of water to the *Bhasma*, stir well and keep over night.
Next morning decant the clear liquid and filter through a three-layered *muslin cloth*. Repeat the filtering process till a colourless filtrate is obtained. Transfer filtered material to a stainless steel vessel and heat to evaporate the water. Collect *ks$āra* deposited as flakes from the bottom of the vessel and grind it to a fine powder.
Pack it in tightly closed containers to protect from light and moisture.

Description:

Fine powder, passing through sieve number 100; hygroscopic, odour faint and taste saline; freely soluble in water.

Identification:

An aqueous solution yields the reactions characteristic of *sodium* and *potassium*, Appendix 5.2.12.

Physico-chemical parameters:

Loss on drying at 110^0:	Not more than 4 per cent,	Appendix 2.2.10.
Acid- insoluble ash:	Not more than 1 per cent,	Appendix 2.2.4.
pH (10% aqueous solution)	10 to 11,	Appendix 3.3.

Assay:

Sodium:	Not less than 4 per cent,	Appendix 5.2.9.
Potassium:	Not less than 29 per cent,	Appendix 5.2.9.
Iron:	Not less than 1.2 per cent,	Appendix 5.2.5.

Storage: Store in a cool place in tightly closed containers, protected from light and moisture.

Therapeutic uses: Gulma (Abdominal Lump); Udara-śūla (Pain in the abdomen); Grahaˊī (malabsorption syndrome); Vi¾ūcikā (Gastro-enteritis with piercing pain); Alasaka (Intestinal atony); Ajīrn$a (Dyspepsia); Aruci (tastelessness); Ānāha (distention of abdomen due to obstruction to passage of urine and stool); Arśa (Piles); Śarkarā (gravel in urine); Aśmarī (Calculus); Kr$mi (Helminthiasis); Āntarvidradhi (Hernia); Śvāsa (Asthma).

Dose: 125 to 500 mg daily in divided dose.

Anupāna: Water.

ARKA LAVA^{3}A

(AFI, Part-I, 10:1)

Definition:

Arka Lava´a is a preparation made with the ingredients in the Formulation composition given below.

Formulation composition:

1.	Arka patra API	*Calotropis procera*	Lf.	1 part
2.	Saindhava lava´a API	Rock salt		1 part

Method of Preparation:

Take ingredients of pharmacopoeial quality.

Collect mature *Arka patra*. Place alternate layers of *Arka patra* and *Saindhava lava´a* in an earthen pot.

Keep a *śarāva* to cover the pot. Seal the edge of the *śarāva* and the pot with seven consecutive layers of clay-smeared cloth and allow to dry.

Subject it to fire till the pot becomes red-hot. Remove the contents from the pot and grind to a fine powder in a *khalva*.

Pack it in tightly closed containers to protect from light and moisture.

Description:

A fine powder, passing through sieve number 100; grey in colour, odourless, taste salty.

Identification:

An aqueous solution yields reactions characteristic of *sodium, potassium, calcium, chloride* and *sulphate,*

Appendix 5.2.12.

Physico-chemical parameters:

Loss on drying at 110^{0}:	Not more than 1 per cent,	Appendix 2.2.10.
Acid- insoluble ash:	Not more than 3 per cent,	Appendix 2.2.4.
pH (10% aqueous solution):	9 to 10,	Appendix 3.3.

Assay:

Sodium: Not less than 31 per cent, Appendix 5.2.9.

Potassium:	Not less than 0.3 per cent,	Appendix 5.2.9.
Iron:	Not less than 0.11 per cent,	Appendix 5.2.5.

Storage: Store in a cool place in tightly closed containers, protected from light and moisture.

Therapeutic uses: Gulma (Abdominal lump), Udara roga (diseases of abdomen), Plīhodara (Splenomegaly) Yak¨todara (enlargement of Liver).

Dose: 1g daily in divided doses.

Anupāna: Water, Butter milk.

KALYĀ³AKA KS#ĀRA

(AFI, Part-I, 10:6)

Definition:

Kalyā´aka ks$āra is a preparation made with the ingredients in the Formulation composition given below.

Formulation composition:

1.	Śu´°hī API	*Zingiber officinale*	Rz.	1 part
2.	Marica API	*Piper nigrum*	Fr.	1 part
3.	PippalĪ API	*Piper longum*	Fr.	1 part
4.	Saindhava lava´a API	Rock salt		1 part
5.	Sauvarchala lava´a API	Black salt		1 part
6.	Vi²a lava´a API	Black salt (Official subsititute)		1 part
7.	HarĪtakī API	*Terminalia chebula*	P.	1 part
8.	Bibhītakī API	*Terminalia bellirica*	P.	1 part
9.	Āmalakī API	*Phyllanthus emblica (Emblica officinalis)*	P.	1 part
10.	Dantī API	*Baliospermum montanum*	Rt.	1 part
11.	Aru¾kara (Bhallātaka API)	*Semecarpus anacardium*	Fr.	1 part
12.	Citraka API	*Plumbago zeylanica*	Rt.	1 part
13.	Sneha (Tila API)	*Sesamum indicum*	Oil	Q.S.
14.	Mūtra (Gomūtra)	Cow's urine		Q.S.

Method of preparation:

Take ingredients of pharmacopoeial quality.
Clean, dry and powder the ingredients no. 1 to 10 and 12 separately and pass through sieve number 85.
Crush *Bhallātaka* in a *khalva* to a fine state.
Mix all powdered ingredients. Levigate the above mixture with the *Tila taila* and *Gomūtra* and prepare a homogeneous blend. Keep the homogeneous blend in an earthen pot and cover with a *sarāva.* Seal the edges of the pot by seven consecutive layers of clay-smeared cloth and dry. Keep the pot on mild fire till it becomes red-hot. Remove the content from the pot and grind to a fine powder.
Pack it in tightly closed containers to protect from light and moisture.

Description:

Fine powder, passing through sieve number 100; hygroscopic, odour less, taste salty.

Identification:

i) An aqueous solution yields the reactions characteristic of *sodium, potassium*, *carbonate, sulphate, chloride* and *bicarbonate*,
Appendix 5.2.12.
ii) A solution in *dilute hydrochloric acid* gives reactions characteristic of *calcium,* and *magnesium*, Appendix 5.2.12.

Physico-chemical parameters:

Loss on drying at 110^0:	Not more than 6 per cent,	Appendix 2.2.10.
Acid- insoluble ash:	Not more than 1 per cent,	Appendix 2.2.4.
*p*H (*10% aqueous solution*):	10 to 11,	Appendix 3.3.

Assay:

Sodium:	Not less than 14 per cent,	Appendix 5.2.9.
Potassium:	Not less than 2 per cent,	Appendix 5.2.9.
Iron:	Not less than 1.6 per cent,	Appendix 5.2.5.

Storage: Store in a cool place in tightly closed containers, protected from light and moisture.

Therapeutic uses: Vibandha (Constipation), Ādhmāna (Flatulence), Gulma (Abdominal lump), Udāvarta (upward movement of gases), Arśa (Piles), Pān#d#u (anaemia); Udara roga (diseases of abdomen); Kr#mi (Helminthiasis); M$\bar{u}$trāghāta (Urinary obstruction); Aśmarī (Calculus); Śopha (oedema); Hr#droga (heart disease); Graha´ī (malabsorption syndrome); Meha (Excessive flow of urine); Plīharuja (pain due to splenic disease); Ānāha (distention of abdomen); Śvāsa (Asthma); Kāsa (cough); Agnimāndya (Digestive impairment).

Dose: 1 g daily in divided doses.

Anupāna: Gh¨ta.

MŪLAKA KS$ĀRA

(AFI, Part-I, 10:10)

Definition:

Mūlaka ks$āra is a powder preparation made with the ingredients in the Formulation composition given below.

Formulation composition:

1.	Mūlaka API Bhasma	*Raphanus sativus*	Pl.	1 part
2.	Jala API	Water		6 parts

Method of preparation:

Take ingredients of pharmacopoeial quality.
Collect mature *Mūlaka*, wash and cut into small pieces and dry completely. Burn to ash (*Bhasma*).
Add 6 parts of water to the *Bhasma*, stir well and keep overnight. Next morning decant the clear liquid and filter through a three-layered *muslin cloth*. Repeat the filtering process till a colourless filtrate is obtained. Transfer filtered material in to a stainless steel vessel and heat to evaporate the water. Collect *ks$āra* deposited as flakes from the bottom of the vessel and grind to a fine powder.
Pack it in tightly closed containers to protect from light and moisture.

Description: Fine powder, passing through sieve number 100; hygroscopic, odourless, taste salty; freely soluble in water.

Identification:

An aqueous solution yields the reactions characteristic of *sodium* and *potassium*, Appendix 5.2.12.

Physico-chemical parameters:

Loss on drying at 110^0:	Not more than 1 per cent,	Appendix 2.2.10.
Acid- insoluble ash:	Not more than 1 per cent,	Appendix 2.2.4.
*p*H (*10% aqueous solution):*	10 to 11,	Appendix 3.3.

Assay:

Sodium:	Not less than 4 per cent,	Appendix 5.2.9.
Potassium:	Not less than 28 per cent,	Appendix 5.2.9.
Iron:	Not less than 2.2 per cent,	Appendix 5.2.5.

Storage: Store in a cool place in tightly closed containers, protected from light and moisture.

Therapeutic uses: Mūtr#ak¨cchra (Dysuria); Aśmarī (Calculus); Gulma (Abdominal lump); Vātavikāra (disorders due to vata do¾a).

Dose: 1g daily in divided doses.

Anupāna: Water.

PALĀŚA KS$ĀRA

(AFI, Part-I, 10:9)

Definition:

Palāśa ks$āra is a white alkaline preparation made with the ingredients in the Formulation composition given below.

Formulation composition:

1.	Palāśa API-Bhasma	*Butea monosperma*	Pl.	1 part
2.	Jala API	Water		6 parts

Method of preparation:

Take all ingredients of pharmacopoeial quality.
Cut *Palāśa* into small pieces and dry completely. Burn to ash (*Bhasma*).
Add 6 parts of water to *Bhasma*, stir well and keep over night.
Next morning decant the clear liquid and filter through a three-layered *muslin cloth*. Repeat the filtering process till a colourless filtrate is obtained. Transfer filtered material to a stainless steel vessel and heat to evaporate the water. Collect *ks$āra* deposited as flakes from the bottom of the vessel and grind to a fine powder.
Pack it in tightly closed containers to protect from light and moisture.

Description:

Fine powder, passing through sieve number 100; hygroscopic, odourless, taste saline; freely soluble in water.

Identification:

An aqueous solution yields the reactions characteristic of *sodium* and *potassium*, Appendix 5.2.12.

Physico-chemical parameters:

Loss on drying at 110^0:	Not more than 6 per cent,	Appendix 2.2.10.
Acid- insoluble ash:	Not more than 1 per cent,	Appendix 2.2.4.
*p*H *(10% aqueous Solution):*	10 to 12,	Appendix 3.3.

Assay:

Sodium:	Not less than 0.8 per cent,	Appendix 5.2.9.
Potassium:	Not less than 35 per cent,	Appendix 5.2.9.
Iron:	Not less than 1.2 per cent,	Appendix 5.2.5.

Storage: Store in a cool place in tightly closed containers, protected from light and moisture.

Therapeutic uses: Agnimāndya (Digestive impairment); Gulma (Abdominal lump); Plīhyakrdvrddhi (Spleno-hepatomegaly); Mūtrakr$cchra (Dysuria); Aśamarī (Calculus); Śarkarā (gravel in urine); Grahan$ī (malabsorption syndrome); Ānāha (distention of abdomen due to obstruction to passage of urine and stool); Vi¾ūcikā (Gastro-enteritis with piercing pain).

Dose: ½ to 1 g daily in divided doses.

Anupāna: Warm water, Milk.

YAVA KSĀRA

(AFI, Part-I, 10:11)

Definition:

Yavaks$āra is an alkaline preparation made with the ingredient in the Formulation composition given below.

Formulation composition:

1.	Yava (API) Bhasma	*Hordeum vulgare*	Pl.	1 part
2.	Jala API	Water		6 parts

Method of preparation:

Take all ingredients of pharmacopoeial quality.
Cut *Yava* into small pieces and dry completely. Burn to ash (*Bhasma*). Add 6 parts of water to *Bhasma*, stir well and keep over night.
Next morning decant the clear liquid and filter through a three-layered muslin cloth. Repeat the filtering process till a colourless filtrate is obtained. Transfer filtered material to a stainless steel vessel and heat to evaporate the water. Collect *ks$āra* deposited as flakes from the bottom of the vessel and grind to a fine powder.
Pack it in tightly closed containers to protect from light and moisture.

Description:

Greyish white, fine powder, passing through sieve number 100; hygroscopic, odourless, taste saline; freely soluble in water.

Identification:
An aqueous solution yields the reactions characteristic of *sodium* and *potassium*, Appendix 5.2.12.

Physico-chemical parameters:

Loss on drying at 110^0:	Not more than 4 per cent,	Appendix 2.2.10.
Acid-insoluble ash:	Not more than 1 per cent,	Appendix 2.2.4.
*p*H *(10% aqueous solution):*	9 to 10,	Appendix 3.3.

Assay:

Sodium:	Not less than 17 per cent,	Appendix 5.2.9.

Potassium:	Not less than 16 per cent,	Appendix 5.2.9.
Iron:	Not less than 1.5 per cent,	Appendix 5.2.5.

Storage: Store in a cool place in tightly closed containers, protected from light and moisture.

Therapeutic uses: Ādhmāna (Flatulance); Ānāha (distention of abdomen due to obstruction to passage of urine and stool); Śūla (pain); Udara (diseases of abdomen); Gulma (Abdominal lump); Plīhāmaya (Splenic disease); Mūtrakṛ$cchra (Dysuria).

Dose: ½ to 1 g daily in divided dose.

Anupāna: Warm water, Gh¨ta.

TAILA

General Descripition:

Tailas are preparations in which *Taila* is boiled with prescribed liquid media [*Svarasa* / *Ka¾āya* Etc.] and a fine paste [*Kalka*] of the drugs specified in the formulation composition. Unless specified otherwise *Taila* means *Tila Taila.*

General Method of Preparation:

1. The *Taila* preferably should be fresh.
2. There are usually three essential components in the manufacture of *Taila Kalpanā*.
    a. *Drava* [Any liquid medium as prescribed in the composition]
    b. *Kalka* [Fine paste of the specified drug]
    c. *Sneha dravya* [*Taila*]
    d. And, occasionally,
    e. *Gandha dravya* [Perfuming agents]
3. Unless otherwise specified in the verse, if *Kalka* is one part by weight, *Taila* should be four parts and the *Drava dravya* should be sixteen parts.
4. There are a few exceptions for the above general rule:
    a. Where *Drava dravya* is either *Kvātha* or *Svarasa*, the ratio of *Kalka* should be one-sixth and one-eighth respectively to that of *Sneha.*

       If the *Drava dravya* is either *K¾īra* or *Dadhi* or *Mā¼sa rasa* or *Takra,* the ratio of *Kalka* should be one-eighth to that of *Taila.*
       When flowers are advised for use as *Kalka,* it should be one-eighth to that of *Taila.*
    b. Where the number of *Drava dravyas* are four or less than four, the total quantity should be four times to that of *Taila.*
    c. Where the number of *Drava dravyas* is more than four, each *drava* should be equal to that of *Taila.*
    d. If, *Kalka dravya* is not prescribed in a formulation, the drugs specified for the *Drava dravya* [*Kvatha* or *Svarasa*] should be used for the preparation of *Kalka*.
    e. Where no *Drava dravya* is prescribed in a formulation, four parts of water should be added to one part of *Taila*.

5. In general, the *Taila* should be subjected to *Mūrchana* process, followed by addition of increments of *Kalka* and *Drava dravya* in specified ratio. The contents are to be stirred continuously thoroughout the process in order to avoid charring.
6. The process of boiling is to be continued till the whole amount of moisture gets evaporated and characteristic features of *Taila* appears.
7. The whole process of *Paka* should be carried out on a mild to moderate flame.

8. Three stages of *Paka* are specified for therapeutic purposes.

a. *M¨du Pāka*: In this stage, the *Kalka* looks waxy and when rolled between fingers, it rolls like lac without sticking. The *Taila* obtained at this stage is used for *Nasya* [Nasal instillation].
b. *Madhyama Pāka*: In this stage, the *Kalka* becomes harder and rolls in to *Varti*. It burns without crackling sounds when exposed to fire and *phena* [Froth] will appear over the *Taila. Taila* obtained at this stage is used for *Pana* [Internal administration] and *Vasti* [Enema].
c. *Khara Pāka:* Further heating of the *Taila*, leads to *Khara paka*. *Kalka* becomes brittle when rolled in between fingers. The *Taila* obtained at this stage is used only for *Abhyanga* [Eternal application].

9. The period of *Pāka* depends upon the nature of liquid media used in the process.

a.	*Takra* or *Āranala*	5 Nights
b.	*Svarasa*	3 Nights
c.	*K¾ra*	2 Nights

10. Pātra pāka: It is the process by which the *Taila* is augmented or flavored by certain prescribed substances. The powdered drugs are suspended in a vessel containing warm, filtered *Taila*.

The medicated *Taila* will have the odour, colour and taste of the drugs used in the process. If a considerable amount of milk is used in the preparation, the *Taila* will become thick and may solidify in cold seasons.

Tailas are preserved in good quality of glass, steel or polythene containers. These medicated preparations retain the therapeutic efficacy for sixteen months.

BALĀGU±ŪCY ¡ DI TAILA
(AFI, Part-I, 8:34)

Definition:

Balāgu²ūcyādi Taila is a liquid preparation made with the ingredients in the Formulation composition given below with Tila Taila as the basic ingredient.

Formulation composition:

1.	Balā API	*Sida cordifolia*	Rt.	256 g
2.	Gu²ūcī API	*Tinospora cordifolia*	St.	256 g
3.	Surapādapa (Devadāru API)	*Cedrus deodara*	Ht.Wd.	256 g
4.	Jala API for decoction	Water		12.29 l
	Reduced to			3.07 l
5.	Ja°ā (Ja°āmā¼sī API)	*Nardostachys jatamansi*	Rt./Rz.	16 g
6.	Āmaya (Ku¾°ha API)	*Saussurea lappa*	Rt.	16 g
7.	Candana (Rakta candana API)	*Pterocarpus santalinus*	Ht.Wd.	16 g
8.	Kunduru¾ka (Kunduru API)	*Boswellia serrata*	Exd.	16 g
9.	Nata (Tagara API)	*Valeriana wallichii*	Rt.	16 g
10.	Aśvagandhā API	*Withania somnifera*	Rt.	16 g
11.	Sarala API	*Pinus roxburghii*	Ht.Wd.	16 g
12.	Rāsnā API	*Alpinia galanga* (Official substitute)	Rz.	16 g
13.	Taila (Tila Taila API)	*Sesamum indicum.*	Oil	768 g

Method of preparation:

Take all ingredients of pharmacopoeial quality.
Wash and dry all the herbal raw materials thoroughly.
Treat *Tila taila* to prepare *Mūrchita Taila* (Appendix 6.2.8.3)**.**
Pulverize the dried ingredients numbered 1to 3 (*kvātha dravya*) to a coarse powder and add the specified quantity of water, heat and reduce the volume to one fourth. Filter with *muslin cloth* to obtain *kvātha*.
Take the other ingredients (*kalka dravya*) numbered 5 to 12 in the formulation composition, powder and pass through sieve number 85. Transfer the powdered ingredients to a wet grinder and grind with sufficient quantity of *water* to prepare a homogeneous blend (*Kalka*).
Take *Mūrchita Taila* in a stainless steel vessel and heat it mildly.
Add increments of *Kalka*. Stir thoroughly while adding the *ka¾āya*.

Heat for 3 h with constant stirring maintaining the temperature between 50^0 and 90^0 during the first hour of heating. Stop heating and allow to stand overnight.
Start heating on next day, stir and constantly check the *Kalka* by rolling between the fingers.
Stop the heating when the *kalka* breaks down into pieces on attempting to form a *varti (khara pāka lak%ana)*, and at the appearance of froth over the oil. Expose the varti to flame and confirm the absence of crackling sound indicating absence of moisture.

Filter while hot (about 80^0) through a *muslin cloth* and allow to cool.
Pack it in tightly closed containers to protect from light and moisture.

Description: A medicated oil, dark reddish brown in color with pleasant odour.

Identification:

Thin layer chromatography:

Extract 2 g of the sample with 20 ml of *alcoho*l at about 40^0 for 3 h. Cool, separate the alcohol layer and filter. Concentrate to about 5 ml and carry out thin layer chromatography. Apply 10 µl of the extract on TLC plate. Develop the plate to a distance of 8 cm using *toluene : ethyl acetate : hexane* (6 : 3 : 1) as mobile phase. After development, allow the plate to dry in air and spray with *ethanol-sulphuric acid reagent* followed by heating at 110^0 for about 10 min. It shows spots at R_f 0.71 (light brown), 0.80 (light brown) and 0.88 (blackish.brown) under visible light.

Physico-chemical parameters:

Refractive index at 40^0:	1.455 to 1.460,	Appendix 3.1.
Weight per ml at 40^0:	0.915 g to 0.930 g,	Appendix 3.2.
Saponification value:	180 to 195,	Appendix 3.10.
Iodine value:	80 to 100,	Appendix 3.11.
Acid value:	Not more than 5,	Appendix 3.12.
Peroxide value:	Not more than 5,	Appendix 3.13.

Other requirements:

Mineral oil:	Absent,	Appendix 3.15.
Microbial Limits:		Appendix 2.4.

Storage: Store in a cool place in tightly closed containers, protected from light and moisture.

Therapeutic uses: In conditions of Vāta-rakta (Gout) and Raktagata-Vāta (Hypertension), Śopha (oedema), Skandhagata Vāta (frozen shoulder).

Dose: External application for Abhya¬ga.

DHĀNVANTARA TAILA
(Syn. Balā Taila)
(AFI, Part-I, 8:22)

Definition:

Dhānvantara Taila is a liquid preparation made with the ingredients in the Formulation composition given below with Tila Taila as the basic ingredient.

Formulation composition:

1.	Balā mūla (Balā API)	*Sida cordifolia*	Rt.	4.61 kg
2.	Jala API for decoction	Water		36.86 l
	Reduced to			4.61 l
3.	Payah (Godugdha API)	Cow's milk		4.61 l
4.	Yava API	*Hordeum vulgare*	Sd.	59.07 g
5.	Kola API	*Zizyphus jujuba*	Fr.	59.07 g
6.	Kulattha API	*Dolichos biflorus*	Sd.	59.07 g
7.	Bilva API	*Aegle marmelos*	St.Bk.	59.07 g
8.	Śyonāka API	*Oroxylum indicum*	St.Bk.	59.07 g
9	Gambhārī API	*Gmelina arborea*	St.Bk.	59.07 g
10.	Pā°alā API	*Stereospermum suaveolens*	St.Bk.	59.07 g
11.	Ga´ikārikā(Laghu Agnimantha API)	*Clerodendrum phlomidis*	St.Bk.	59.07 g
12.	Śālapar´ī API	*Desmodium gangeticum*	Pl.	59.07 g
13.	P¨śnipar´ī API	*Uraria picta*	Pl.	59.07 g
14.	B¨hatī API	*Solanum indicum*	Rt.	59.07 g
15	Ka´°akārī API	*Solanum surattense*	Rt.	59.07 g
16.	Gok¾ura API	*Tribulus terrestris*	Fr.	59.07 g
17.	Jala API for decoction	Water		6.144 l
	Reduced to			768 ml
18.	Taila (Tila API)	*Sesamum indicum*	Oil	768 ml
19.	Medā API	*Asparagus racemosus* (Official substitute)	Rt.	6 g
20.	Mahā Medā	*Asparagus racemosus* (Official substitute)	Rt.	6 g
21.	Dāru (Devadāru API)	*Cedrus deodara*	Ht.Wd.	6 g
22.	Ma®ji¾°ā API	*Rubia cordifolia*	Rt.	6 g
23.	Kākolī	*Withania somnifera* (Official substitute)	Rt.	6 g
24.	K¾īra Kākolī	*Withania somnifera* (Official substitute *)*	Rt.	6 g

25	Candana (Rakta candana API)	*Pterocarpus santalinus*	Ht.Wd.	6 g
26.	Śārivā (Śveta śārivā API)	*Hemidesmus indicus*	Rt.	6 g
27.	Ku¾°ha API	*Saussurea lappa*	Rt.	6 g
28.	Tagara API	*Valeriana wallichii*	Rt / Rz.	6 g
29.	Jīvaka	*Pueraria tuberosa* (Official substitute)	Rt.Tr.	6 g
30.	§¾abhaka	*Pueraria tuberosa* (Official substitute)	Rt.Tr.	6 g
31.	Saindhava lava´a API	Rock salt		6 g
32.	Kālānusārī (Tagara API)	*Valeriana wallichii*	Rz.	6 g
33.	Śaileya API	*Parmelia perlata*	Pl.	6 g
34.	Vacā API	*Acorus calamus*	Rz.	6 g
35.	Agaru API	*Aquilaria agallocha*	Ht.Wd.	6 g
36.	Punarnavā (Rakta punarnavā API)	*Boerhaavia diffusa*	Rt.	6 g
37.	Aśvagandhā API	*Withania somnifera*	Rt.	6 g
38.	Varī (Śatāvarī API)	*Asparagus racemosus*	Rt.Tr.	6 g
39.	K¾īraśukla (K¾īra Vidārī API)	*Ipomoea digitata*	Rt.Tr.	6 g
40.	Ya¾°ī API	*Glycyrrhiza glabra*	Rt.	6 g
41.	Harītakī API	*Terminalia chebula*	P.	6 g
42	Āmalakī API	*Phyllanthus emblica (Emblica officinalis)*	P.	6 g
43.	Bibhītaka API	*Terminalia bellirica*	P.	6 g
44.	Śatāhvā API	*Anethum sowa*	Fr.	6 g
45.	Sūrpapar´i (Mā¾apar´ī API)	*Teramnus labialis*	Pl.	6 g
46.	Elā (Sūk¾mailā API)	*Elettaria cardamomum*	Sd.	6 g
47.	Tvak API	*Cinnamomum zeylanicum*	St.Bk	6 g
48.	Patra (Tejapatra API)	*Cinnamomum tamala*	Lf.	6 g

Method of preparation:

Take all ingredients of Pharmacopoeial quality.
Wash and dry all the herbal raw materials thoroughly.
Treat *Tila taila* to prepare *Mūrchita Taila* (Appendix 6.2.8.3)**.**
Pulverize the dried *Balā mūla* (*kvātha dravya*) to a coarse powder, add specified amounts of water, heat and reduce the volume to one eighth. Filter with *muslin cloth* to obtain *Balā kvātha.*
Pulverize the dried ingredients numbered 4 to 16 (*kvātha dravya*) to coarse powder, add specified quantity of water, heat and reduce the volume to one eighth. Filter with *muslin cloth* to obtain *kvātha*.
Take the other ingredients (*kalka dravya*) numbered 19 to 48 in the formulation composition, powder and pass through sieve number 85. Transfer the powdered ingredients to a wet grinder and grind with sufficient quantity of water to prepare a homogeneous blend (*Kalka*).

Take *Mūrchita Taila* in a stainless steel vessel and heat it mildly.

Add increments of *Kalka*. Stir thoroughly while adding the two *ka¾āyā*.

Heat for 3 h with constant stirring maintaining the temperature between 50^0 and 90^0 during the first hour of heating. Stop heating and allow to stand overnight.

Note: Stem bark of the ingredients number 7 to 11 of the formulation composition has been used in place of root.

Start heating next day, stir and constantly check the *kalka* by rolling between the fingers. Stop heating when the *kalka* breaks down into pieces on attempting to form a *varti (khara pāka lak¾a ´a)*, and at the appearance of froth over the oil. Expose the varti to flame and confirm the absence of crackling sound indicating absence of moisture.
Filter while hot (about 80^0) through a *muslin cloth* and allow to cool.
Pack it in tightly closed containers to protect from light and moisture.

Description:

A medicated oil, redish brown in color with pleasant odour.

Identification:

Thin layer chromatography:

Extract 2 g of the sample with 20 ml of *alcoh*ol at about 40^0 for 3 h. Cool, separate the alcohol layer and filter. Concentrate to 5 ml and carry out the thin layer chromatography. Apply 10 µl of the extract on TLC plate. Develop the plate to a distance of 8 cm using *toluene : ethyl acetate : hexane* (6 : 3 : 1) as mobile phase. After development, allow the plate to dry in air and spray with *ethanol-sulphuric acid reagent* followed by heating at 110^0 for about 10 min. It shows spots at R_f 0.31 (light brown), 0.71 (brown), 0.83 (light brown) and 0.91 (blackish brown) under visible light.

Physico-chemical parameters:

Refractive index at 40^0:	1.465 to 1.465,	Appendix 3.1.
Weight per ml at 40^0:	0.930 g to 0.940 g,	Appendix 3.2.
Saponification value:	180 to 195,	Appendix 3.10.
Iodine value:	100 to 120,	Appendix 3.11.
Acid value:	Not more than 4,	Appendix 3.12.
Peroxide value:	Not more than 5,	Appendix 3.13.

Other requirements:

Mineral oil:	Absent,	Appendix 3.15.
Microbial Limits:		Appendix 2.4.
Aflatoxins:		Appendix 2.7.

Storage: Store in a cool place in tightly closed containers, protected from light and moisture.

Therapeutic uses: Vāta roga (diseases due to Vāta do¾a); Pak¾avadha (Hemiplegia); Sarvā¬ga vāta (Quadriplegia); Dhātu k¾aya (tissue wasting); Sūtikā roga (Puerperal diseases) and Bāla roga (diseases of children). External application for Abhya¬ga.

Dose: Internally 6 to 12 ml daily in divided doses; as well as external application Q.S.

GAṆDHARVAHASTA TAILA

(AFI, Part-I, 8:12)

Definition:

Gandharvahasta Taila is a liquid preparation made with the ingredients in the Formulation composition described below with Tila Taila as the basic ingredient.

Formulation composition:

1.	Gandharva hasta mūla (Eraṛ2a API)	*Ricinus communis*	Rt.	4.8 k g
2.	Yava API	*Hordeum vulgare*	Sd.	3.07 kg
3.	Nāgara (Śuṛ°hī API)	*Zingiber officinale*	Rz.	96 g
4.	Jala API for decoction Reduced to	Water		24.58 l 6.14 l
5.	K¾īra (Godugdha API)	Cow's milk		1.54 l
6.	Eraṛ2a API -Taila	*Ricinus communis*	Oil	768 g
7.	Gandharvahasta mūla (Eraṛ2a API)	*Ricinus communis*	Rt.	192 g
8.	Śuṛ°hī API	*Zingiber officinale*	Rz.	48 g

Method of preparation:

Take all ingredients of pharmacopoeial quality.
Wash and dry all the herbal raw materials thoroughly.
Treat *Eraṛ2a taila* to prepare *Mūrchita Eraṛ2a Taila* (Appendix 6.2.8.1).
Pulverize the dried ingredients numbered 1 to 3 (*kvātha dravya*) to a coarse powder, add required amount of water, heat and reduce the volume to one fourth. Filter with *muslin cloth* to obtain *kvātha*. Take the other ingredients (*kalka dravyas*) numbered 7 and 8 of the formulation composition, dry, powder and pass through sieve number 85. Transfer the powdered ingredients to wet grinder and grind with sufficient quantity of water to prepare a homogeneous blend.
Take *Mūrchita Taila* in a stainless steel vessel and heat it mildly.
Add increments of *Kalka*. Stir thoroughly while adding the *Kvātha* and *Godugdha*.
Heat for 3 h with constant stirring maintaining the temperature between 50^0 and 90^0 during the first hour of heating. Stop heating and allow to stand overnight.
Start the heating next day, stir and observe the boiling mixture for appearance of froth and constantly check the *kalka* for formation of *varti (madhyama pāka lak¾aṛa).*
Expose the *varti* to flame and confirm the absence of crackling sound indicating absence of moisture. Stop heating when the *kalka* forms a varti and the froth appears. Filter while hot (about 80^0) through a *muslin cloth* and allow to cool.
Pack it in tightly closed containers to protect from light and moisture.

Description:

A medicated oil, yellowish brown in color with characteristic odour.

Identification:

Thin layer chromatography:

Extract 2 g of the sample with 20 ml of *alcohol* at about 40^0 for 3 h. Cool, separate the alcohol layer and filter. Concentrate to 5 ml and carry out the thin layer chromatography. Apply 10 µl of the extract on TLC plate. Develop the plate to a distance of 8 cm using *toluene : ethyl acetate : hexane* (6 : 3 : 1) as mobile phase. After development, allow the plate to dry in air and spray with *ethanol-sulphuric acid reagent* followed by heating at 110^0 for about 10 min. It shows spots at R_f 0.45 (light grey), 0.52 (grey), 0.75 (dark brown) and 0.81 (dark brown) under visible light.

Physico-chemical parameters:

Refractive index at 40^0:	1.451 to 1.460,	Appendix 3.1.
Weight per ml at 40^0:	0.975 g to 0.985 g,	Appendix 3.2.
Saponification value:	180 to 200,	Appendix 3.10.
Iodine value:	75 to 100,	Appendix 3.11.
Acid value:	Not more than 4,	Appendix 3.12.
Peroxide value:	Not more than 2,	Appendix 3.13.

Other requirements:

Mineral oil:	Absent,	Appendix 3.15.
Microbial Limits:		Appendix 2.4.
Aflatoxins:		Appendix 2.7.

Storage: Store in a cool place in tightly closed containers, protected from light and moisture.

Therapeutic uses: Vidradhi (abscess); Plīhā (enlargement of spleen); Gulma (abdominal lump); Udāvarta (upward movement of gases); Śopha (oedema); Udara (diseases of abdomen) and MahāVāta roga (major neurological disorders).

Dose: 6 to12 ml daily in divided doses

Anupāna: Warm water.

KO¯AMCUKK ¡ DI TAILA
(AFI, Part-I, 8:10)

Definition:

Ko°°amcukkādi Taila is a liquid preparation made with the ingredients in the Formulation composition given below with Tila Taila as the basic ingredient

Formulation composition:

1. Ko°°am (Ku¾°ha API)	*Saussurea lappa*	Rt.	21 g
2. Cukku (Śu´°hī API)	*Zingiber officinale*	Rz.	21 g
3. Vayambu (Vacā API)	*Acorus calamus*	Rz.	21 g
4. Śigru API	*Moringa oleifera*	St Bk.	21 g
5. Laśuna API	*Allium sativum*	Bl.	21 g
6. Kārto°°i (Hi¼srā API)	*Capparis spinosa*	Rt.	21 g
7. Devadruma (Devadāru API)	*Cedrus deodara*	Ht.Wd	21 g
8. Siddhārtha (Sar¾apa API)	*Brassica campestris*	Sd.	21 g
9. Suvahā (Rāsnā API)	*Alpinia galanga*	(Official substitute) Rz.	21 g
10. Tilaja (Tila API)	*Sesamum indicum*	Oil	768 g
11. Dadhi (Godadhi API)	Curd from cow's milk		768 g
12. Ci®cā rasa (Ci®cā API)	*Tamarindus indica*	Lf.	3.07 l

Method of preparation:

Take all ingredients of pharmacopoeial quality.
Wash and dry all the herbal raw materials except ingredient 12 thoroughly.
Treat *Tila taila* to prepare *Mūrchita Taila* (Appendix 6.2.8.3)**.**
Collect fresh leaves of ingredient number 12, wash thoroughly, grind and express *svarasa* through *muslin cloth*.
Take the other ingredients (*kalka dravyas*) with the exception of *Laśuna* and *Sar¾apa*, dry, powder and pass through sieve number 85. Grind Laśuna and Sar¾apa separately, add the powdered ingredients and grind with sufficient quantity of water to prepare a homogeneous blend. (*Kalka*)
Take *Mūrchita Taila* in a stainless steel vessel and heat it mildly.
Add increments of *Kalka*. Stir thoroughly while adding the *Svarasa* and *Godadhi*.
Heat for 3 h with constant stirring maintaining the temperature between 50 and 90^0 during the first hour of heating. Stop heating and allow to stand overnight.

Start heating next day, stir and constantly check the *Kalka* by rolling between the fingers. Stop heating when the *kalka* breaks down into pieces on attempting to form a *varti (khara pāka laksana)*, and at the appearance of froth over oil. Expose the varti to flame and confirm the absence of crackling sound indicating absence of moisture.

Filter while hot (about 80^0) through a *muslin cloth* and allow to cool.

Pack it in tightly closed containers to protect from light and moisture.

Description:

A medicated oil, colour reddish brown, odour faint.

Identification:

Thin layer chromatography:

Extract 2 g of the sample with 20 ml of *alcohol* at about 40^0 for 3 h. Cool, separate the alcohol layer, filter, concentrate to 5 ml and carry out the thin layer chromatography. Apply 10 µl of the extract on TLC plate and develop the plate to a distance of 8 cm using *toluene : ethyl acetate : hexane* (6 : 3 : 1) as mobile phase. After development, allow the plate to dry in air and spray with *ethanol-sulphuric acid reagent* followed by heating 110^0 for about 10 min. It shows spots at R_f 0.32 (light grey), 0.44 (light grey), 0.53 (light grey), 0.71 (brown), and 0.80 (brown) under visible light.

Physico-chemical parameters:

Refractive index at 40^0:	1.461 to 1.463,	Appendix 3.1.
Weight per ml at 40^0:	0.920 to 0.940 g,	Appendix 3.2.
Saponification value:	150 to 175,	Appendix 3.10.
Iodine value:	75 to 100,	Appendix 3.11.
Acid value:	Not more than 8,	Appendix 3.12.
Peroxide value:	Not more than 4,	Appendix 3.13.

Other requirements:

Mineral oil:	Absent,	Appendix 3.15.
Microbial Limits:		Appendix 2.4.
Aflatoxins:		Appendix 2.7.

Storage: Store in a cool place in tightly closed containers, protected from light and moisture.

Therapeutic uses: Āmavāta (Rheumatism); Vāta roga (disorders due to Vāta do¾a) and Angastambha (stiffness of body); External application for Abhya´ga.

K¾ĪRABALĀ TAILA

(AFI, Part-I, 8:11)

Definition:

K¾īrabalā taila is a liquid preparation made with the ingredients in the Formulation composition given below with Tila Taila as the basic ingredient.

Formulation composition:

1.	Balā ka¾āya (Balā API)	*Sida cordifolia*	Rt.	16 parts
2.	Balā Kalka (Balā API)	*Sida cordifolia*	Rt.	1 part
3.	Taila API (Tila)	*Sesamum indicum*	Ol.	4 parts
4.	K¾īra (Godugdha API)	Cow's milk		4 parts
5.	Jala API	Water		16 parts

Method of preparation:

Take all ingredients of pharmacopoeial quality.
Wash and dry Balā thoroughly.
Treat *Tila taila* to prepare *Mūrchita Taila*. (Appendix 6.2.8.3).
Pulverize the dried *Balā mūla* (*Kvātha dravya*) to a coarse powder, add specified quantity of water, heat and reduce the volume to one fourth. Filter with *muslin cloth* to obtain *Balā kvātha*.
Take the ingredient (*Kalka dravya*) numbered 2 in the formulation composition, wash, dry, powder and pass through sieve number 85. Transfer the powdered ingredient to wet grinder and grind with sufficient quantity of water to prepare a homogeneous blend. (*Kalka*)
Take *Mūrchita Taila* in a stainless steel vessel and heat it mildly.
Add increments of *Kalka*. Stir thoroughly while adding the *ka¾āya*, *Godugdha* and water.
Heat for 3 h with constant stirring maintaining the temperature between 50^0 and 90^0 during the first hour of heating. Stop heating and allow to stand overnight.
Start heating next day, stir and constantly check the *Kalka* by rolling between the fingers. Stop heating when the kalka breaks down into pieces on attempting to form a *varti (khara pāka lak¾a´a)*, and at the appearance of froth over the oil. Expose the varti to flame and confirm the absence of crackling sound indicating absence of moisture. Filter while hot (about 80^0) through a *muslin cloth* and allow to cool.
Pack it in tightly closed containers to protect from light and moisture.

Description:

A medicated oil, dark brown in color with pleasant odour.

Identification:

Thin layer chromatography:

Extract 2 g of the sample with 20 ml of *alcohol* at about 40^0 for 3 h. Cool, separate the alcohol layer, filter, concentrate to 5 ml and carry out the thin layer chromatography. Apply 10 µl of the extract on TLC plate and develop the plate to a distance of 8 cm using *toluene : ethyl acetate : hexane* (6 : 3 : 1) as mobile phase. After development, allow the plate to dry in air and spray with *ethanol-sulphuric acid reagent* followed by heating at 110^0 for about 10 min. It shows spots at R_f 0.42 (brown), 0.57 (brown), 0.70 (grey) and 0.80 (light grey) under visible light.

Physico-chemical parameters:

Refractive index at 40^0:	1.451 to 1.460,	Appendix 3.1.
Weight per ml at 40^0:	0.930 g to 0.945 g,	Appendix 3.2.
Saponification value:	185 to 200,	Appendix 3.10.
Iodine value:	75 to 100,	Appendix 3.11.
Acid value:	Not more than 6.5,	Appendix 3.12.
Peroxide value:	Not more than 2,	Appendix 3.13.

Other requirements:

Mineral oil:	Absent,	Appendix 3.15.
Microbial Limits:		Appendix 2.4.
Aflatoxins:		Appendix 2.7.

Storage: Store in a cool place in tightly closed containers, protected from light and moisture.

Therapeutic uses: Vātarakta (Gout); Vāta roga (disorders due to Vāta do¾a); Śukra do¾a (Vitiation of ºukra dhatu); Rajo do¾a (Menstrual disorders); Kārśya (Emaciation); Svarabheda (hoarseness of voice). External application for Abhya¬ga, Nasya (nasal drops), Pāna (oral use), Bastiprayoga (enema).

Dose: 6 to 12 ml daily in divided doses.

Anupāna: Warm water, milk.

SAINDHAVĀDI TAILA
(AFI, Part-I, 8:60)

Definition:

Saindhav¢di Taila is a liquid preparation made with the ingredients in the Formulation composition given below with tila taila as the basic ingredients.

Formulation composition:

1.	Saindhava lava´a	Rock salt		28 g
2.	Arka API	*Calotropis procera*	Rt.	28 g
3.	Marica API	*Piper nigrum*	Fr.	28 g
4.	Jvalanākhya (Citraka) API	*Plumbago zeylanica*	Rt.	28 g
5.	Mārkava (Bh¨¬garāja) API	*Eclipta alba*	Pl.	28 g
6.	Haridrā API	*Curcuma longa*	Rz.	28 g
7.	Dāruharidrā API	*Berberis aristata*	St.	28 g
8.	Tila taila API	*Sesamum indicum*	Ol.	768 g
9.	Jala API	Water		3.07 l

Method of preparation:

Take all ingredient of pharmacopoeia quality.
Treat tila taila is prepare *Mūrchit tila taila*. (Appendix 6.2.8.3.)
Wash, dry, powder the ingredients number 2 to 7 of the formulation composition (*Kalka Dravya*) and pass through sieve number 85 to obtain fine powder. Transfer the powdered ingredients to a wet grinder, add ingredient number 1 of the formulation composition and grind with required amount of water to obtain a homogeneous blend (*Kalka*)
Take *Mūrchita taila* in a stainless steel vessel and heat it mildly.
Add increments of *Kalka*. Stir thoroughly while adding water. Heat for 3 h with constant stirring maintaining the temperature between 50^0 to 90^0 during the first hour of heating. Stop heating and allow to stand over night.
Start heating next day, stir and constantly check the *kalka* by rolling between the fingers. Stop heating when the *kalka* breaks down in to pieces on attempting to form *varti (Khara*

paka lakshana) and at the appearance of froth over oil. Expose the *varti* to flame and confirm the absence of crackling sound indication absence of moisture.

Filter while hot at about 80^0 through a *muslin cloth* and allow to cool.

Pack it in tightly closed containers to protect from light and moisture.

Description:

Reddish yellow oily liquid, sticky to touch.

Identification:

Thin layer chromatography:

Extract 25 ml of the formulation in a separatory funnel with *methanol* (20 ml x 3). Pool the methanolic extracts, concentrate and make up the volume to 20 ml and carry out the Thin Layer Chromatography. Apply 20 µl on TLC plate. Develop the plate to a distance of 8 cm using *toluene : ethyl acetate* (7 : 3) as mobile phase. After development allow the plate to dry in air and examine under ultraviolet light (254 nm). It shows major spots at R_f 0.29, 0.35, 0.50, 0.60, 0.75, 0.82 and 0.90. Under ultraviolet light (366 nm), the plate shows fluorescent spots at R_f 0.10 (light blue), 0.13 (light blue), 0.30 (light green), 0.35 (yellow), 0.53 (blue), 0.68 (light blue), 0.75 (light green), 0.86 (blue). Spray the plate with *anisaldehyde-sulphuric acid reagent* followed by heating at 110^0 for about 10 min. It shows major spots at R_f 0.15 (light violet), 0.35 (brown), 0.50 (light violet), 0.60 (light violet), 0.70 (light blue violet), 0.80 (red), 0.87 (light brown) and 0.97 (light violet) under visible light.

Physico-chemical parameters:

Refractive index at 25^0:	1.473 to 1.478,	Appendix 3.1.
Weight per ml at 25^0:	0.950 to 0.951 g,	Appendix 3.2.
Saponification value:	185 to 200,	Appendix. 3.10.
Iodine value:	100 to 115,	Appendix 3.11.
Acid value:	Not more than 5.0,	Appendix 3.12.
Peroxide value:	Not more than 6,	Appendix 3.13.

Other requirements:

Mineral oil	Absent,	Appendix 3.15.
Microbial limits:		Appendix 2.4.
Aflatoxins:		Appendix. 2.7.

Storage: Store in a cool place in tightly closed containers, protected from light and moisture.

Therapeutic uses: Kaphavātaja nā²ī vra´a (Sinus due to Kapha do¾a and Vāta do¾a).

Dose: As prescribed by the physician for Abhya¬ga (External use).

LEPA

Lepas are semi-solid preparations intended for external application to the skin or certain mucous membranes for emollient, protective, therapeutic or prophylactic purposes where a degree of occlusion is desired. They usually consist of solutions or dispersions of one or more medicaments in suitable bases.

The base should not produce irritation or sensitization of the skin, nor should it retard wound healing; it should be smooth, inert, odourless, physically and chemically stable and compatible with the skin and with incorporated medicaments.

The proportions of the base ingredients should be such that the ointment is not too soft or too hard for convenient use. The consistency should be such that the ointment spreads and softens when stress is applied.

DĀRVĪ MALAHARA (GEL)
(Based on Carak Chikitsa 25/93)

Definition:

Dārvī Malahara is a semisolid preparation made with the ingredients given in the Formulation composition.

Formulation Composition:

1.	Rasā®jana API	*Berberis aristata / B. asiatica / B. lycium*	*root extract*	2 g
2.	Sphaᵒikā	*Alum or Potable Alums*		1 g
3.	Tragacanth			2 g
4.	Xanthan gum FF			1 g
5.	Propylene glycol			4 ml
6.		Methyl paraben		0.17 g .
7.		Propyl paraben		0.03 g
8.	Disodium edentate			0.01 g
9.	Peppermint oil			0.05 ml
10.	Jala API	Water		100 g

Method of Preparation:

Preparation of Rasanjana:
Rasā®jana is the dried aqueous extract of the roots of *Dāruharidrā*, (*Berberis aristata* or *B. asiatica* or *B. lycium*, Fam. Berberidaceae), and is prepared by the following method.
Chop *Dāruharidrā* into small pieces of about 1 cm thickness. Powder the chopped roots to a *yavkuta* (powder whose all particles pass through sieve number 22 and not more than 10 per cent pass through sieve number 44). Weigh the powder and transfer to a suitable extraction vessel. Add *Purified water* (5 times the weight of drug), allow to soak overnight (12 h), followed by gentle boiling for 4 h. Stop the boiling and allow the contents to settle down. Separate the water layer and filter while hot. Repeat the extraction two times more using fresh *Purified water* (4 times the weight of drug). Remove the water from the combined extract as completely as possible. At this stage the extract solidifies on cooling. Dry the solidified extract further in an oven, preferably a vacuum oven at a temperature below 60^0.
Pack it in tightly closed containers to protect from light and moisture.

Preparation of Dārvī Malahara:
Weigh all the ingredients separately. Mix well the powders of tragacanth and xanthan gum. Take 50 ml of *purified water* in a 250-ml container and transfer gum mixture with continuous stirring to avoid formation of lumps. Keep it aside for 6 h for complete dispersion and hydration. Dissolve powder of Sphatikā (potash alum) in 10 ml of warm (60^0) *purified water* and add this solution after cooling to gum mixture with stirring. Dissolve methyl paraben, propyl paraben, disodium edetate in a mixture of 4 ml of propylene glycol and 6 ml of *purified water* and heat for 5 min at 60^0. Cool and add this solution with continuous stirring to the mixture of gums and alum. Dissolve Rasā®jana in 10 ml of *purified water* and add to the gel (mixture of gum and alum) and mix well. Adjust the weight of gel to 100 g with *purified water*. Adjust the pH between 3.7 and 4.2 with sufficient *triethanolamine* (approximately 3 to 4 drops). Add 0.1 ml of peppermint oil or other permissible flavour to the prepared gel and mix well. Fill the gel in aluminium / plastic tubes.

Description:

Yellowish-brown, non-gritty, smooth gel.

Identification*:*

Test for Berberine: Dissolve about 2 g of Dārvī Malahara in 20 ml of water and filter. Take about 2 ml of the filtrate and add 1 ml of *concentrated nitric acid*. A dark red colour is formed.
Test for Spha ̊ikā: Dip a spatula in the water solution of Dārvī Malahara. Take it out and let it dry. Hold spatula in a nonluminous flame; a violet colour is imparted to the flame.

Physico-chemical parameters:

*p*H *(5% aqueous solution) :* 3.7 to 4.2 Appendix 3.3.

Assay:

Sample contains not less than 0.08 per cent of berberine when assayed by the following method.
Estimation of Berberine: Dissolve about 25 mg of accurately weighed Berberine hydrochloride in water and makeup the volume to 25 ml in a volumetric flask. Transfer 1,2,3,4,5 and 6 ml of this stock solution separately to six 25 ml- volumetric flasks and makeup the volume in each to 25 ml.
Apply in triplicate 1 µl of each dilution on a TLC plate. Develop the plate to a distance of 8 cm using n-*propanol : formic acid : water* (8.1: 0.1: 1.8) as mobile phase. After development, dry the plate in air and scan at 343 nm in a TLC scanner. Note the area under the curve for peak corresponding to berberine and prepare the calibration curve by plotting peak area *vs* amount of berberine hydrochloride.

Dissolve accurately weighed about 1 g of Dārvī Malahara in 5 ml of *distilled water* and make up the volume to 25 ml in a volumetric flask with *distilled water*. Filter the solution and discard the first 5 ml of the solution. Collect the next 5 ml of solution and use for analysis. Apply 1 µl of solution in triplicate on a TLC plate and develop, dry and scan the plate as described in preceding paragraph for calibration curve of berberine. Calculate the amount of berberine in the test solution from the calibration curve of berberine hydrochloride and determine the concentration of berberine in the Dārvī Malahara.

Other requirements:

Microbial limits: Appendix. 2.4.
Aflatoxins: Appendix. 2.7.

Dose: 2g twice a day to be applied with applicator in vagina.
Storage: At room temperature.

Therapeutic uses: Sveta Pradara (Leucorrhoea), Yonika´²ū (Itching), Yoni sotha, (Vaginitis and other wounds and ulcers).

Precaution: Discontinue if there is any irritation or discomfort.