THE AYURVEDIC PHARMACOPOEIA OF INDIA

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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) Kaṣāya 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, Lehya*s* should be used within one year.

1. AṢṬĀṄGĀVALEHA

AFI, Part-II, 3:1

Definition:

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

Formulation Composition:

1.	Kaṭphala	Myrica esculenta Buch-Ham. Ex. D.Don.	(API-Vol:3/92)	(St.Bk)	1 part
2.	Puṣkaramūla (Puṣkara)	Inula racemosa Hook.f	(API-Vol:4/102)	(Rt.)	1 part
3.	Śṛṅgī (Karkaṭaśṛṅgī)	Pistacia chinensis Burgo	(API-Vol:1/66)	(Gl.)	1 part
4.	Yamānī (Yavānī)	Trachyspermum ammi (Linn.) Sprague ex Turril.	(API-Vol:1/129)	(Fr.)	1 part
5.	Kāravī (Kṛṣṇajīraka)	Carum carvi Linn	(API-Vol:1/73)	(Fr.)	1 part
6.	Śuṇṭhī	Zingiber officinale Roxb.	(API-Vol:1/103)	(Rz.)	1 part
7.	Marica	Piper nigrum Linn.	(API-Vol:3/115)	(Fr.)	1 part
8.	Pippalī	Piper longum Linn	(API-Vol:4/91)	(Fr.)	1 part
9.	Madhu	Honey			12 parts
10.	Ārdraka (Svarasa)	Zingiber officinale Rosc	(API-Vol:2/12)	(Rz.)	Fresh Juice of Rz. Q.S. for Bhāvanā

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, and 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 percent *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 **(**Kaṭphala **)**; several collapsed epidermal cells, tissue fragments with yellowish brown contents, and large tannin-filled sacs associated with vascular bundles **(**Karkaṭaśṛṅgī**);** 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, **(**Śuṇṭhī**)**; 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 **(**Kṛṣṇaj īraka**)**; prismatic crystals of calcium oxalate, measuring 70 to 100 µ in dia and septate fibres **(**Puṣkara**)**; 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 Avaleha 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.
pH (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 doṣa and Kapha doṣa), Kāsa (Cough), Śvāsa (Dyspnoea), Arucī (Tastelessness), Chardi (Emesis)

Dose: 3 to 5 g daily in divided doses.

Anupāna: Water.

2. 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 (Śuddha)	Semecarpus anacardium Linn	(API-Vol:2/19)	(Fr.)	1 part
2.	Tila	Sesamum indicum linn	(API-Vol:4/128)	(Sd.)	1 part
3.	Pathyā (Harītakī)	Terminalia chebula Retz.	(API-Vol:1/47)	(P.)	1 part
4.	Guḍa	Jaggery			6 parts

Method of preparation:

Take all ingredients of pharmacopoeial quality.

Treat Bhallātaka to prepare Śuddha Bhallātaka (Appendix 6.2.7.7).

Powder Śuddha Bhallātaka and Harītakī and pass through sieve no. 85.

Pound Guḍa 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 Bhallātaka 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.
pH (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 µµg / 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 µµl 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 µµl 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 Doṣa)

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 Ghṛta over the affected part and advise to take

Nārikela internally.

3. BILVĀDI LEHA

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 - mūla	Aegle marmelos Corr.	(API-Vol:3/29)	(Rt.)	1536 g
2.	Water for decoction				12.28 l
	reduced to				3.072 l
3.	Jīrṇa Guḍa (Purāṇa Guḍa)	Old jaggery			768 g
4.	Ghana (Mustā)	Cyperus rotundus Linn.	(API-Vol:3/129)	(Rt. Tr.)	12 g
5.	Dhānya (Dhānyaka)	Coriandrum sativum Linn	(API-Vol:1/30)	(Fr.)	12 g
6.	Jīraka (Śveta jīraka)	Cuminum cyminum Linn	(API-Vol:1/106)	(Fr.)	12 g
7.	Tṛṭī (Sūkṣmailā)	Elettaria cardamomum (Linn.) R.Br.	(API-Vol:1/101)	(Sd.)	12 g
8.	Tvak	Cinnamomum zeylanicum Blume	(API-Vol:1/113)	(St. Bk.)	12 g
9.	Keśara (Nāgakēśara)	Mesua ferrea Linn	(API-Vol:2/118)	(Stmn.)	12 g
10.	Śuṇṭhī	Zingiber officinale Roxb.	(API-Vol:1/103)	(Rz.)	12 g
11.	Marica	Piper nigrum Linn.	(API-Vol:3/115)	(Fr.)	12 g
12.	Pippalī	Piper longum Linn.	(API-Vol:4/91)	(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 (*Prakṣepa 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 Prakṣepa 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 **(Śveta Jīraka)**; 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 **(Nāgakēsara)**; 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, **(Śuṇṭhī)**; 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 **(Dhānyā).**

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 2.30 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.
pH (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: Arucī (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.

4. CITRAKA HARĪTAKĪ

AFI, Part-I, 3:10AFI, 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 - Kvātha	Plumbago zeylanica Linn.	(API-Vol:1/29)	(Rt.)	4.800 l
2.	Āmalakī - Kvātha	Emblica officinalis Gaertn.	(API-Vol:1/4)	(P.)	4.800 l
3.	Guḍūcī - Kvātha	Tinospora cordifolia (Willd.) Miers.	(API-Vol:1/41)	(St.)	4.800 l
4.	Daśamūla - Kvātha				4.800 l
a.	Bilva	Aegle marmelos Corr	(API-Vol:4/10)	(Rt./St. Bk.)	
b.	Agnimantha	Premna mucronata (Official substitute)	(API-Vol:3/3)	(Rt./St. Bk.)	
c.	Śyonāka	Oroxylum indicum Vent.	(API-Vol:3/209)	(Rt./St. Bk.)	
d.	Kāśmarī (Gambhārī)	Gmelina arborea Linn	(API-Vol:4/31)	(Rt./St. Bk.)	
e.	Pāṭalā	Stereospermum suaveolens (L.F) DC	(API-Vol:4/87)	(Rt./St. Bk.)	
f.	Śālaparṇī	Desmodium gangeticum DC.	(API-Vol:3/178)	(Pl.)	
g.	Pṛśniparṇī	Uraria picta Desv.	(API-Vol:4/99)	(Pl.)	
h.	Śvadaṃṣṭrā (Gokṣura)	Tribulus terrestris Linn	(API-Vol:1/38)	(Pl.)	
i.	Bṛhatī	Solanum indicum Linn	(API-Vol:2/27)	(Pl.)	
j.	Kāṇṭakārī	Solanum surattense Burm.f.	(API-Vol:1/59)	(Pl.)	
5.	Pathyā (Harītakī) cūrṇa	Terminalia chebula Retz.	(API-Vol:1/47)	(P.)	3.07 kg

6.	Guḍa	Jaggery			4.80 kg
7.	Śuṇṭhī	Zingiber officinale Roxb.	(API-Vol:1/103)	Rz.	96 g
8.	Marica	Piper nigrum Linn.	(API-Vol:3/115)	Fr.	96 g
9.	Pippalī	Piper longum Linn	(API-Vol:4/91)	Fr.	96 g
10.	Tvak	Cinnamomum zeylanicum Blume	(API-Vol:1/113)	St. Bk.	96 g
11.	Elā (Sūkṣmailā)	Elettaria cardamomum (Linn.) R.Br.	(API-Vol:1/101)	Sd.	96 g
12.	Patra (Tejapatra)	Cinnamomum tamala (Buch-Ham)Nees & Eberm.	(API-Vol:1/115)	Lf.	96 g
13.	Kṣāra (Yava)	Hordeum vulgare Linn	(API-Vol:5/146)	Water soluble	Ash of Pl. 24 g
14.	Madhu	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 (*Prakṣepa 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 Prakṣepa 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 Guḍa 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 **(Śuṇṭhī);** 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 **(Marica);** 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 **(Sūkṣmailā)**; 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 Avaleha 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.
pH (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), Śvāsa (Dyspnoea), Arśa (Piles), Agnimāndya (Loss of appetite), Kṣaya (Pthisis), Kṛmi (Helminthiasis / Worm infestation)

Dose: 6 to 12 g daily in divided dose.

Anupāna: Warm water.

5. 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	Aegle marmelos Corr	(API-Vol:4/10)	(Rt./St.Bk.)	48g
2.	Agnimantha	Premna integrifolia		(Rt./St.Bk.)	48g
3.	Śyonāka	Oroxylum indicum Vent.	(API-Vol:3/209)	(Rt./St.Bk.)	48g
4.	Kāśmarī (Gambhārī)	Gmelina arborea Linn	(API-Vol:4/31)	(Rt./St.Bk.)	48g
5.	Pāṭalī (Pāṭalā)	Stereospermum suaveolens (L.F) DC	(API-Vol:4/87)	(Rt./St.Bk.)	48g
6.	Balā	Sida cordifolia		(Rt.)	48g
7.	Śālaparṇī	Desmodium gangeticum DC.	(API-Vol:3/178)	(Pl.)	48g
8.	Pṛśniparṇī	Uraria picta Desv.	(API-Vol:4/99)	(Pl.)	48g
9.	Mudgaparṇī	Phaseolus trilobus		(Rt. /Pl)	48g
10.	Māṣaparṇī	Teramnus labialis Spreng.	(API-Vol:3/118)	(Rt. /Pl)	48g
11.	Pippalī	Piper longum Linn	(API-Vol:4/91)	(Fr.)	48g
12.	Śvadaṃṣṭrā (Gokṣura)	Tribulus terrestris Linn	(API-Vol:1/38)	(Pl.)	48g
13.	Bṛhatī	Solanum indicum Linn	(API-Vol:2/27)	(Pl.)	48g
14.	Kaṇṭakārī	Solanum surattense Burm.f.	(API-Vol:1/59)	(Pl.)	48g
15.	Śṛṅgī (Karkaṭaśṛṅgī)	Pistacia chinensis Burgo	(API-Vol:1/66)	(Gl.)	48g

16.	Tāmalakī (Bhūmyāmalakī)	Phyllanthus fraternus Webst.	(API-Vol:1/111)	(Pl.0	48g
17.	Drākṣā	Vitis vinifera Linn.	(API-Vol:3/45)	(Dr. Fr.)	48g
18.	Jīvantī	Leptadenia reticulata	(API-Vol:3/)	(Rt.)	48g
19.	Puṣkara	Inula racemosa Hook.f	(API-Vol:4/102)	(Rt.)	48g
20.	Agaru	Aquilaria agallocha Roxb.	(API-Vol:4/4)	(Ht.Wd)	48g
21.	Abhayā (Harītakī)	Terminalia chebula Retz.	(API-Vol:1/47)	(P.)	48g
22.	Amṛtā (Guḍūcī)	Tinospora cordifolia (Willd.) Miers.	(API-Vol:1/41)	(St.)	48g
23.	Ṛddhi	Habenaria intermedia D.Don	(API-Vol:5/157)	(Sub. Rt. Tr.)	48g
24.	Jīvaka	Malaxis acuminata D.Don	(API-Vol:5/52)	(Pseudo-bulb)	48g
25.	Ṛṣabhaka	Malaxis muscifera		(Rt. Tr.)	48g
26.	Śaṭī	Hedychium spicatum Ham . Ex.Smith	(API-Vol:1/99)	(Rz.)	48g
27.	Mustā	Cyperus rotundus Linn.	(API-Vol:3/129)	(Rt. Tr.)	48g
28.	Punarnavā (Raktapunarnavā)	Boerhavia diffusa Linn	(API-Vol:1/95)	(Pl.)	48g
29.	Medā	Polygonatum cirrhifolium Royle	(API-Vol:5/102)	(Rt.Tr.)	48g
30.	Elā (Sūkṣmailā)	Elettaria cardamomum (Linn.) R.Br.	(API-Vol:1/101)	(Sd.)	48g
31.	Candana (Śveta Candana)	Santalum album Linn.	(API-Vol:3/207)	(Ht. Wd.)	48g
32.	Utpala	Nymphaea stellata Willd.	(API-Vol:3/221)	(Fl.)	48g
33.	Vidārī (Kanda)	Pueraria tuberosa DC	(API-Vol:2/173)	(Rt. Tr.)	48g
34.	Vṛṣamūla (Vāsā)	Adhatoda zeylanica Medic	(API-Vol:4/138)	(Rt.)	48g
35.	Kākolī	Lilium polyphyllum D.Don.	(API-Vol:3/79)	(Sub. Rt.)	48g
36.	Kākanāsikā	Martynia annua Linn.	(API-Vol:3/77)	(Fr.)	48g

37.	Āmlaka (Āmalakī)	Phyllanthus emblica (Emblica officinalis Gaertn.)	(API-Vol:1/4)	(P.)	5 kg
38.	Water for decoction				12.29 l
	reduced to	-			3.07 l
39.	Ghṛta	Clarified butter from cow's milk			288 g
40.	Taila (Tila)	Sesamum indicum linn	(API-Vol:4/128)	oil.	288 g
41.	Matsyāṇḍikā (Śarkarā)	Sugar			2.4 kg
42.	Madhu	Honey			288 g
43.	Tugākṣīrī (Vaṃśa)	Bambusa bambos	(Siliceous deposit)		192 g
44.	Pippalī	Piper Longum Linn	(API-Vol:4/91)	(Fr.)	96 g
45.	Tvak	Cinnamomum zeylanicum Blume	(API-Vol:1/113)	(St. Bk.)	48g
46.	Elā (Sūkṣmailā)	Elettaria cardamomum (Linn.) R.Br.	(API-Vol:1/101)	(Sd.)	48g
47.	Patra (Tejapatra)	Cinnamomum tamala (Buch-Ham) Nees & Eberm.	(API-Vol:1/115)	(Lf.)	48g
48.	Keśara (Nāgakeśara)	Mesua ferrea Linn	(API-Vol:2/118)	(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 (*Prakṣepa Dravya*) and pass through sieve number 85. Add sufficient amount of water to the Kvātha Dravya.

Take 5 kg fresh fruits of Āmalakī, 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 Āmalakī 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 Āmalakī Piṣṭi by removing the fibres and seeds by rubbing through a piece of cloth.

Fry the piṣṭī with Ghṛta and Taila mixed in equal proportions. Properly fried piṣṭī would release the Ghṛta and Taila.

Add Śarkarā to the filtred Kvātha, also add fried Piṣṭi 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 Prakṣepa Dravya and mix thoroughly to prepare a homogeneous blend. On cooling at room temperature 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 Ghṛta 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 (**Nāgakēsara**); leaf epidermal debris, with thick cuticle, sunken stomata, and uni-or bicellular short stout trichomes (**Tamāla patra)**; 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 **(Tugākṣīrī).**

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.
pH (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), Kṣata kṣīṇa (Debility due to chest injury), Svarabheda (Hoarseness of voice), Kṣaya (Pthisis), Hṛdroga (Heart disease), Agnimāndya (Loss of appetite), Uroroga (Disease of thorax), Vātarakta (Gout), Pipāsā (Thirst), Mūtraroga (Urinary diseases), Śukra Doṣa (Abnormalities in semen), Jarā (Senility/progeriasis). Used as a Rasāyana (Rejuvenating agents), Medhya (Brain tonic/ Nootropic), Smṛtiprada (Memory provider)

Dose: 25 g daily in divided doses.

Anupana: Water, Milk.

6. KALYĀṆĀVALEHA

AFI, Part-II, 3:4

Definition:

KALYĀṆĀVALEHA is a semisolid preparation made with the ingredients of the Formulation composition given below.

Formulation composition:

1.	Haridrā	Curcuma longa Linn.	(API-Vol:1/45)	(Rz.)	1 part
2.	Vacā	Acorus calamus Linn	(API-Vol:2/168)	(Rz.)	1 part
3.	Kuṣṭha	Saussurea lappa CB. Clarke	(API-Vol:1/76)	(Rt.)	1 part
4.	Pippalī	Piper Longum Linn	(API-Vol:4/91)	(Fr.)	1 part
5.	Viśvabheṣaja (Śuṇṭhī)	Zingiber officinale Roxb.	(API-Vol:1/103)	(Rz.)	1 part
6.	Ajājī (Śveta Jīraka)	Cuminum cyminum Linn	(API-Vol:1/106)	(Fr.)	1 part
7.	Ajamodā	Apium leptophyllum (Pers.) F.V.M.ex Benth	(API-Vol:1/2)	(Fr.)	1 part
8.	Yaṣṭimadhuka (Yaṣṭī)	Glycyrrhiza glabra Linn	(API-Vol:1/127)	(Rt.)	1 part
9.	Saindhava Lavaṇa	Rock salt			1 part
10.	Sarpi (Goghṛta)	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 (*Goghṛta*) 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 **(Śveta Jīraka)**; 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, **(Śuṇṭhī);** 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 **(Kuṣṭha)** 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 **(Yaṣṭimadhu);** cells with yellow pigment turning red in *sulphuric acid* 50 per cent, and cells with large starch grains, partially gelatinised **(Haridrā)**.

Thin layer chromatography:

Defat 5 g of Kalyāṇāvaleha 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:	Not more than 5.5 per cent,	Appendix 2.2.10.
Total ash:	Not more than 12.0 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 46.0 per cent,	Appendix 2.2.7.
Water- soluble extractive:	Not less than 11.0 per cent,	Appendix 2.2.8.
pH (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.

7. KŪṢMĀṆḌAKA RASĀYANA (Synonym: Kuṣmāṇḍa Khaṇḍa)

AFI, Part-I, 3:7

Definition:

KŪṢMĀṆḌAKA RASĀYANA is a semisolid avaleha preparation made with the ingredients in the Formulation composition given below

Formulation composition:

1.	Kūṣmāṇḍa	Benincasa hispida (Thunb)Cogn.	(API-Vol:4/55)	(Fresh Fr.)	4.8kg
2.	Ghṛta	Clarified butter from cow's milk			768g
3.	Khaṇḍa	Sugar candy			4.8kg
4.	Pippalī	Piper longum Linn	(API-Vol:4/91)	(Fr.)	96g
5.	Śṛṅgavera (Śuṇṭhī)	Zingiber officinale Roxb.	(API-Vol:1/103)	(Rz.)	96g
6.	Jīraka (Śveta Jīraka)	Cuminum cyminum Linn	(API-Vol:1/106)	(Fr.)	96g
7.	Tvak	Cinnamomum zeylanicum Blume	(API-Vol:1/113)	(St.Bk.)	24g
8.	Elā (Sūkṣmailā)	Elettaria cardamomum (Linn.) R.Br.	(API-Vol:1/101)	(Sd.)	24g
9.	Patra (Tejapatra)	Cinnamomum tamala (Buch-Ham) Nees & Eberm.	(API-Vol:1/115)	(Lf.)	24g
10.	Marica	Piper nigrum Linn.	(API-Vol:3/115)	(Fr.)	24g
11.	Dhānya (Dhānyaka)	Coriandrum sativum Linn	(API-Vol:1/30)	(Fr.)	24g
12.	Kṣaudra (Madhu)	Honey			384g
13.	Jala	Water			Q.S.

Method of preparation:

Take all ingredients of pharmacopoeial quality.

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

Take fresh mature fruit of Kūṣmāṇḍa, remove skin and seeds and cut in to small pieces of 2.5 to 5 cm. Add double the quantity of water. Heat till

Kūṣmāṇḍa pieces become soft to make Piṣṭi 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 Kūṣmāṇḍa in an end runner mill to make a fine paste, fry in Ghṛta 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 Piṣṭi

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

Add the fried paste of Kūṣmāṇḍa 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 (*Prakṣepa*) 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 Ghṛta. 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 **(Śuṇṭhī)**; 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.
pH (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 µµl 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 Kūṣmāṇḍaka Rasāyana 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 µµl 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), Urakṣata (Chest wound), Kṣaya (Pthisis), Purāṇajvara (Chronic fever), Raktapitta (Bleeding disorders), Chardi (Emesis), Tṛṣṇā(Thirst), Jvara (Fever), Śukra Kṣaya (Deficiency of semen), Daurbalya (Weakness), Kārśya (Emaciation), Svarabheda (Hoarseness of voice), Vaivarṇya (Discoloration)

Dose: 20 g daily in divided doses.

Anupāna: Water, Milk.

8. MṚDVĪKĀDI LEHA

AFI, Part-I, 3:24

Definition:

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

Formulation composition

1.	Mṛdvīkā (Drākṣā)	Vitis vinifera Linn.	(API-Vol:3/45)	(Dr. Fr.)	50 in number
2.	Pippalī	Piper Longum Linn	(API-Vol:4/91)	(Fr.)	30 in number
3.	Śarkarā	Sugar			48 g
4.	Madhu	Honey			Q.S.

Method of Preparation:

Take all ingredients of pharmacopoeial quality.

Wash the Mṛdvīkā 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 Pippalīand 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 **(Mṛdvīkā)**; 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.
pH (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 µµg / 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 µµl 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 µµl 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.

9. PŪGAKHAṆḌA

AFI, Part-I, 3:17

Definition:

PŪGAKHAṆḌA is a granular preparation made with the ingredients in the Formulation composition given below.

Formulation composition:

1.	Pūgaphala (Pūga)	Areca catechu Linn.	(API-Vol:1/94)	(Sd.)	384g
2.	Sarpi (Goghṛta)	Clarified butter from cow's milk			192g
3.	Varī rasa (Śatāvarī)	Asparagus racemosus Willd	(API-Vol:4/108)	(Rt.)	384ml
4.	Dhātrī rasa (Āmalakī)	Phyllanthus emblica (Emblica officinalis)		(Fr.)	384ml
5.	Payasa (Godugdha)	Cow's milk			1.5l
6.	Sitā	Sugar candy			2.4kg
7.	Hema (Nāgakeśara)	Mesua ferrea Linn	(API-Vol:2/118)	(Stmn.)	24g
8.	Ambhodhara (Mustā)	Cyperus rotundus Linn.	(API-Vol:3/129)	(Rt. Tr.)	24g
9.	Candana (Śveta Candana)	Santalum album Linn.	(API-Vol:3/207)	(Ht. Wd.)	24g
10.	Śuṇṭhī (Śuṇṭhī)	Zingiber officinale Roxb.	(API-Vol:1/103)	(Rz.)	24g
11.	Marica	Piper nigrum Linn.	(API-Vol:3/115)	(Fr.)	24g
12.	Pippalī	Piper longum Linn	(API-Vol:4/91)	(Fr.)	24g
13.	Dhātrī Asthimajjā (Āmalakī)	Phyllanthus emblica (Emblica officinalis Gaertn.)	(API-Vol:1/4)	(Enm.)	24g
14.	Priyāla Asthimajjā (Priyāla)	Buchnania lanzan Spreng.	(API-Vol:2/143)	(Enm.)	24g
15.	Tvak	Cinnamomum zeylanicum Blume	(API-Vol:1/113)	(St. Bk.)	24g

16.	Elā (Sūkṣmailā)	Elettaria cardamomum (Linn.) R.Br.	(API-Vol:1/101)	(Sd.)	24g
17.	Patra (Tejapatra)	Cinnamomum tamala (Buch-Ham)Nees & Eberm.	(API-Vol:1/115)	(Lf.)	24g
18.	Śveta Jīraka	Cuminum cyminum Linn	(API-Vol:1/106)	(Fr.)	24g
19.	Kṛṣṇa Jīraka	Carum carvi Linn	(API-Vol:1/73)	(Fr.)	24g
20.	Śṛṅgāṭaka	Trapa natans var. bispinosa	(API-Vol:4/116)	(Enm.)	24g
21.	Vaṃśaja (Vaṃśalocana)	Bambusa bambose		(S.C.)	24g
22.	Jātīphala	Myristica fragrans Houtt.	(API-Vol:1/53)	(Sd.)	24g
23.	Jātīkōṣa (Jātīphala)	Myristica fragrans Houtt.	(API-Vol:1/53)	(Ar.)	24g
24.	Lavaṅga	Syzygium aromaticum (Linn.) Merr M.Perry.	(API-Vol:1/80)	(Fl.)	24g
25.	Dhānyaka	Coriandrum sativum Linn	(API-Vol:1/30)	(Fr.)	24g
26.	Kakkola (Kaṅkola)	Piper cubeba Linn. f.	(API-Vol:1/58)	(Fr.)	24g
27.	Nākulī (Īśvarī)	Aristolochia indica Linn.	(API-Vol:3/69)	(Rt.)	24g
28.	Tagara	Valeriana wallichii	(API-Vol:1/109)	(Rz.)	24g
29.	Ambu (Hrīvēra)	Coleus vettiveroides		(Rt.)	24g
30.	Vīraṇaśiphā (Uśīra)	Vetiveria zizaniodes (Linn.) Nash.	(API-Vol:3/219)	(Rt.)	24g
31.	Bhṛṅga (Bhṛṅgarāja)	Eclipta alba Hassk	(API-Vol:2/21)	(Pl.)	24g
32.	Aśvagandhā	Withania somnifera Dunal	(API-Vol:1/15)	(Rt.)	24g

Method of preparation:

Take all ingredients of pharmacopoeial quality.

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

Take fully mature and dry Pūga phala (*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 (Poṭṭalī) 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 (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 khaṇḍa should be essentially taken with milk). Dry these processed Pūga phala in a tray-dryer at a temperature not exceeding 60^0. Grind the dried pieces and sieve through 85 mesh. Fry the powder in Ghṛta at low temperature between 60^0-70^0.

Crush the fresh Āmalakī, 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 Śodhita Pūga phala powder with continuous stirring till it becomes a thick paste. Remove the utensil from the fire and stir continuously while adding Prakṣepa 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 Khaṇḍa 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).

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.
pH (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 / colic), Amlapitta (Hyperacidity), Mūrcchā(Syncope), Vandhyāroga (Infertility), Pradara (Excessive vaginal discharge), Pāṇḍu (Anaemia), Raktārśa (Bleeding piles), Garbhadoṣa (Foetal anomaly), Jarā (Senility), Śukra Kṣaya (Oligospermia),

Agnimāndya (Loss of appetite), Tṛṭ (Thirst), Daurbalya (Weakness), Ajīrṇa (Dyspepsia), Viṭsanga (Constipation), Mūtrasaṅga (Obstruction in urinary tract), Yakṣmā (Tuberculosis), Balya (Improves strength / immunity), Varṇya (Improve complexion), Dṛṣṭi (Improves vision.)

Dose: 12 g daily in divided doses.

Anupāna: Essentially to be taken with Milk.

10. SŪRAṆĀVALEHA

AFI, Part I, 3:29

Definition:

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

Formulation composition:

1.	Sūraṇa	Amorphophallus campanulatus (Roxb.) Blume.	(API-Vol:3/205)	(St.Tr.)	4.8kg
2.	Water for decoction	Water			9.6 g
	reduced to				4.8 l
3.	Ghṛta (Goghṛta)	Clarified butter from cow milk			384g
4.	Khaṇḍa	Sugar candy			4.8kg
5.	Pippalī	Piper longum Linn	(API-Vol:2/133)	(Fr.)	96g
6.	Śuṇṭhī	Zingiber officinale Roxb.	(API-Vol:1/103)	(Rz.)	96g
7.	Jīraka (Śveta Jīraka)	Cuminum cyminum Linn	(API-Vol:1/106)	(Fr.)	96g
8.	Dhānyaka	Coriandrum sativum Linn	(API-Vol:1/30)	(Fr.)	24g
9.	Patra (Tejapatra)	Cinnamomum tamala (Buch-Ham)Nees & Eberm.	(API-Vol:1/115)	(Lf.)	24g
10.	Elā (Sūkṣmailā)	Elettaria cardamomum (Linn.) R.Br.	(API-Vol:1/101)	(Sd.)	24g
11.	Marica	Piper nigrum Linn.	(API-Vol:3/115)	(Fr.)	24g
12.	Tvak	Cinnamomum zeylanicum Blume	(API-Vol:1/113)	(St.Bk.)	24g
13.	Kṣaudra (Madhu)	Honey			192g

Method of preparation:

Take all material of pharmacopoeial quality.

Wash, dry, powder ingredients numbered 5 to 12 (*Prakṣepa Dravya*) separately and pass through sieve number 85.

Remove the skin of Sūraṇa, wash and cut into pieces. Add water in a quantity sufficient to boil the Sūraṇa 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 Sūraṇa to make a fine paste, fry the paste in Ghṛta 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 Sūraṇa, 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 Prakṣepa 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 Ghṛta.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 **(Śuṇṭhī);** 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 Sūraṇāvaleha 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.
pH (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 µµl 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 Sūraṇāvaleha 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 mml 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), Mūḍhavāta (Obstructed movement of Vāta doṣa), Arśa (Piles etc.)

Dose: 20 g daily in divided doses.

Anupāna: Water, Milk

11. 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 Svarasa (Vāsā)	Adhatoda vasica Nees	(API-Vol:1/122)	Lf. (Fresh)	768 g
3.	Sitā	Sugar candy			384 g
4.	Sarpi (Goghṛta)	Clarified butter from cow's milk			96 g
5.	Pippalī	Piper Longum Linn	(API-Vol:4/91)	(Fr.)	96 g
6.	Madhu	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 Puṭa 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 Ghṛta 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.
pH (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 mml 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 mml 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 mml 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 mml 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), Rājayakṣmā (Tuberculosis), Pārśvaśūla (Intercostal neuralgia and pleurodynia), Hṛtśūla (Angina pectoris)

Dose: 12 g daily in divided doses.

Anupāna: Milk, Water.

12. 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.	Kaṇṭakārī	Solanum surattense Burm.f.	(API-Vol:1/59)	(Pl.)	4.8kg
2.	Water for decoction	Water			12.288l
	reduced to				3.071l
3.	Harītakī	Terminalia chebula Retz.	(API-Vol:1/47)	(Fr.R.)	1.2kg
4.	Guḍa	Jaggery			4.8kg
5.	Śuṇṭhī	Zingiber officinale Roxb.	(API-Vol:1/103)	(Rz.)	96g
6.	Marica	Piper nigrum Linn.	(API-Vol:3/115)	(Fr.)	96g
7.	Pippalī	Piper longum Linn	(API-Vol:4/91)	(Fr.)	96g
8.	Tvak	Cinnamomum zeylanicum Blume	(API-Vol:1/113)	(St.Bk.)	48g
9.	Patra (Tvakpatra)	Cinnamomum tamala (Buch-Ham)Nees & Eberm.	(API-Vol:1/115)	(Lf.)	48g
10.	Elā (Sūkṣmailā)	Elettaria cardamomum (Linn.) R.Br.	(API-Vol:1/101)	(Sd.)	48g
11.	Nāga (Nāgakeśara)	Mesua ferrea Linn	(API-Vol:2/118)	(Adr.)	48g
12.	Puṣpa rasa (Madhu)	Honey			288g

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(*Prakṣepa 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 Poṭṭalī.

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 Poṭṭalī. (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 temperature and add powdered Prakṣepa 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 guḍa 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 **(Sūkṣmailā);** 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 **(Śuṇṭhī);** 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.
pH 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), Svarakṣaya (aphasia), Pīnasa (Chronic rhinitis / Sinusitis) and Rājayakṣmā (Tuberculosis.)

Dose: 5 to 15 g

Anupāna: Water, Milk.

CŪRṆA

General Descripition:

Drugs according to the formulation composition of the particular Cūrṇa 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 Cūrṇa may be applied to the powder prepared by a single drug or a combination of more drugs.

Raja and *Kṣoda* are the synonyms for Cūrṇa. Cūrṇa*s* 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 *sindūra* 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 *Hiṅgu* [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.

Cūrṇa*s* 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 *Kṣāras*.

13. ĀMALAKYĀDI CŪRṆA

AFI, Part-I, 7:3

Definition:

ĀMALAKYĀDI CŪRṆA is a powder preparation made with the ingredients in the Formulation composition given below.

Formulation composition:

1.	Āmala (Āmalakī)	Phyllanthus emblica (Emblica officinalis)	(API-Vol:1/111)	(P.)	1 Part
2.	Citraka	Plumbago zeylanica Linn	(API-Vol:1/29)	(Rt.)	1 Part
3.	Pathyā (Harītakī)	Terminalia chebula Retz.	(API-Vol:1/47)	(P.)	1 Part
4.	Pippalī	Piper longum Linn	(API-Vol:4/91)	(Fr.)	1 Part
5.	Saindhava lavaṇa	Rock salt			1 Part

Method of preparation:

Take all ingredients of pharmacopoeial quality.

Roast Saindhava lavaṇa 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 Cūrṇa, 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 Cūrṇa 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.
pH (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: Arucī (Anorexia), Agnimāndya (Dyspepsia), Jvara (Fever), Ajīrṇa (Indigestion)

Dose: 5 to 10 g daily in divided doses.

Anupāna: Water.

14. AVIPATTIKARA CŪRṆA

AFI, Part- I, 7:2

Definition:

AVIPATTIKARA CŪRṆA is a powder preparation made with the ingredients in the Formulation composition given below.

Formulation composition:

1.	Śuṇṭhī	Zingiber officinale Roxb.	(API-Vol:1/103)	(Rz.)	1 Part
2.	Marica	Piper nigrum Linn.	(API-Vol:3/115)	(Fr.)	1 Part
3.	Pippalī	Piper longum Linn	(API-Vol:4/91)	(Fr.)	1 Part
4.	Harītakī	Terminalia chebula Retz.	(API-Vol:1/47)	(P.)	1 Part
5.	Bibhītaka	Terminalia belerica Roxb.	(API-Vol:1/26)	(P.)	1 Part
6.	Āmalakī	Emblica officinalis Gaertn. (Phyllanthus emblica)	(API-Vol:1/4)	(P.)	1 Part
7.	Mustā	Cyperus rotundus Linn.	(API-Vol:3/129)	(Rz.)	1 Part
8.	Viḍa (Viḍa Lavaṇa)	_			1 Part
9.	Viḍaṅga	Embelia ribes Burm.f.	(API-Vol:1/123)	(Fr.)	1 Part
10.	Elā (Sūkṣmailā)	Elettaria cardamomum (Linn.) R.Br.	(API-Vol:1/101)	(Sd.)	1 Part
11.	Patra (Tejapatra)	Cinnamomum tamala (Buch-Ham)Nees & Eberm.	(API-Vol:1/115)	(Lf.)	1 Part
12.	Lavaṅga	Syzygium aromaticum (Linn.) Merr M.Perry.	(API-Vol:1/80)	(Fl.Bd.)	11Parts
13.	Trivṛt	Operculina turpethum (Linn.) Silva Manso.	(API-Vol:3/213)	(Rt.)	44 Parts
14.	Śarkarā	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 Viḍa lavaṇa 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.
pH (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.

15. BĀLACĀTURBHADRIKĀ CŪRṆA

AFI, Part-I, 7:24

Definition:

BĀLACĀTURBHADRIKĀ CŪRṆA is a powder preparation made with the ingredients in the Formulation composition given below:

Formulation composition:

1.	Ghana (Mustā)	Cyperus rotundus Linn.	(API-Vol:3/129)	(Rt.Tr.)	1 part
2.	Kṛṣṇā (Pippalī)	Piper longum Linn	(API-Vol:4/91)	(Fr.)	1 part
3.	Aruṇa (Ativiṣā)	Aconitum heterophyllum Wall. Ex Royle	(API-Vol:1/22)	(Rt. Tr.)	1 part
4.	Śṛṅgī (Karkaṭaśṛṅgī)	Pistacia intergerrrima Burgo	(API-Vol:1/66)	(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 Pippalī and taste slightly pungent followed by a tingling sensation. The powder completely passes 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 Cūrṇa and warm with *chloral hydrate*, wash and mount in *glycerine*; wash a few mg of Cūrṇa in water and mount in *glycerine*; treat a few mg of Cūrṇa 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 **(Ativiṣā)**; collapsed thin walled epidermal cells, tissue fragments with yellowish brown contents and large tannin containing sacs associated with vascular bundles **(Karkaṭaśṛṅgī).**

Thin Layer Chromatography:

Extract 4 g of Cūrṇa 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 105^0:	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.
pH (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: Atīsāra (Diarrhoea), Chardi (Vomiting), Kāsa (Cough), Śvāsa (Dyspnoea), Jvara (Fever), Bāla Śoṣa (Emaciation in children)

Dose: 0.5 to 1 g daily in divided dose.
Anupāna: Honey.

16. ELĀDI CŪRṆA

AFI, Part-I, 7:5

Definition:

ELĀDI CŪRṆA is a powder preparation made with the ingredients in the Formulation composition given below.

Formulation composition:

1.	Elā (Sūkṣmailā)	Elettaria cardamomum (Linn.) R.Br.	(API-Vol:1/101)	(Sd.)	1 Part
2.	Lavaṅga	Syzygium aromaticum (Linn.) Merr M.Perry.	(API-Vol:1/80)	(Fl.Bd.)	1 Part
3.	Gajakeśara (Nāgakeśara)	Mesua ferrea Linn	(API-Vol:2/118)	(Stmn.)	1 Part
4.	Kolamajjā (Kola)	Zyzyphus jujuba Lam.	(API-Vol:3/94)	(Rp.Fr.Pp.)	1 Part
5.	Lāja (Śāli)	Oryza sativa Linn	(API-Vol:2/145)	(Sd.)	1 Part
6.	Priyaṅgu	Callicarpa macrophylla Vahl	(API-Vol:2/143)	(InFl.)	1 Part
7.	Ghana (Mustā)	Cyperus rotundus Linn.	(API-Vol:3/129)	(Rt.Tr)	1 Part
8.	Candana (Śveta Candana)	Santalum album Linn.	(API-Vol:3/207)	(Ht.Wd.)	1 Part
9.	Pippalī	Piper longum Linn	(API-Vol:4/91)	(Fr.)	1 Part

Method of preparation:

Take all ingredients of pharmacopoeial quality.

Dry Kola majjā 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 Cūrṇa 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 **(Lavaṅga)**; 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 **(Priyaṅgu)**; 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.
pH (10% aqueous solution):	5 to 7,	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: Kāsa (Cough), Śvāsa (Asthma)

Dose: 10 g daily in divided dose.

Anupāna: Honey, Sugar.

17. HIṄGVĀṢṬAKA CŪRṆA

AFI, Part- I, 7:37

Definition:

HIṄGVĀṢṬAKA CŪRṆA is a powder preparation containing the ingredients in the Formulation composition given below:

Formulation composition:

1.	Śuṇṭhī	Zingiber officinale Roxb.	(API-Vol:1/103)	(Rz.)	1 part
2.	Marica	Piper nigrum Linn.	(API-Vol:3/115)	(Fr.)	1 part
3.	Pippalī	Piper longum Linn	(API-Vol:4/91)	(Fr.)	1 part
4.	Ajamodā	Apium leptophyllum (Pers.) F.V.M.ex Benth	(API-Vol:1/2)	(Fr.)	1 part
5.	Saindhava Lavaṇa	Rock salt			1 part
6.	Śveta Jīraka	Cuminum cyminum Linn	(API-Vol:1/106)	(Fr.)	1 part
7.	Kṛṣṇa Jīraka	Carum carvi Linn	(API-Vol:1/73)	(Fr.)	1 part
8.	Hiṅgu - śuddha	Ferula foetida Regel.	(API-Vol:1/49)	(Exd.)	1 part

Method of preparation:

Take all ingredients of pharmacopoeial quality.

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

Treat Hiṅgu to prepare Śuddha Hiṅgu (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 Cūrṇa and wash thoroughly with distilled *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, **(Śuṇṭhī)**; 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 **(Kṛṣṇa 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 Cūrṇa with *n-hexane* (25 ml x 3) under reflux on a water-bath for 30 min. Filter, concentrate the combined extract then 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 Cūrṇa 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.
pH (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), Vāta Roga (Diseases due to Vāta doṣa)

Dose: 3 to 6 g daily in divided doses.

Anupāna: Ghṛta.

18. NAVĀYASA CŪRṆA

AFI, Part-I, 7:17

Definition:

NAVĀYASA CŪRṆA is a powder preparation made with the ingredients in the formulation composition given below.

Formulation composition:

1.	Śuṇṭhī	Zingiber officinale Roxb.	(API-Vol:1/103)	(Rz.)	1 part
2.	Pippalī	Piper longum Linn	(API-Vol:4/91)	(Fr.)	1 part
3.	Marica	Piper nigrum Linn.	(API-Vol:3/115)	(Fr)	1 part
4.	Harītakī	Terminalia chebula Retz.	(API-Vol:1/47)	(P.)	1 part
5.	Bibhītaka	Terminalia belerica Roxb.	(API-Vol:1/26)	(P.)	1 part
6.	Āmalakī	Emblica officinalis Gaertn. (Phyllanthus emblica)	(API-Vol:1/4)	(P.)	1 part
7.	Mustā	Cyperus rotundus Linn.	(API-Vol:3/129)	(Rt.Tr.)	1 part
8.	Viḍaṅga	Embelia ribes Burm.f.	(API-Vol:1/123)	(Fr.)	1 part
9.	Citraka	Plumbago zeylanica Linn	(API-Vol:1/29)	(Rt.)	1 part
10.	Ayoraja (Lauha) - bhasma (30 Puṭi)	-			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 Cūrṇa 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 Cūrṇa 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 **(Śuṇṭhī)**; 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 **(Viḍaṅga)** ; 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 cūrṇa 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.
pH (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: Pāṇḍu (Anaemia), Kāmalā (Jaundice), Prameha (Metabolic disorder), Piḍakā (Carbuncle), Hṛdroga (Heart disease), Kuṣṭha (Diseases of Skin), Arśa (Piles)

Dose: 2 g daily in divided doses.

Anupāna: Honey, Water.

19. NIMBĀDI CŪRṆA

AFI, Part-I, 7:20

Definition:

NIMBĀDI CŪRṆA is a powder preparation made with the ingredients in the Formulation composition given below:

Formulation composition:

1.	Nimba	Azadirachta indica	(API-Vol:2/126)	(St.Bk.)	48 g
2.	Amṛtā (Guḍūcī)	Tinospora cordifolia (Willd.) Miers.	(API-Vol:1/41)	(St.)	48 g
3.	Abhayā (Harītakī)	Terminalia chebula Retz.	(API-Vol:1/47)	(P.)	48 g
4.	Dhātrī (Āmalakī)	Emblica officinalis Gaertn.	(API-Vol:1/4)	(P.)	48 g
5.	Somarājī (Bākucī)	Psoralea corylifolia Linn	(API-Vol:1/25)	(Sd.)	48 g
6.	Śuṇṭhī	Zingiber officinale Roxb.	(API-Vol:1/103)	(Rz.)	12 g
7.	Viḍaṅga	Embelia ribes Burm.f.	(API-Vol:1/123)	(Fr.)	12 g
8.	Eḍagaja (Cakramarda)	Cassia tora Linna.	(API-Vol:3/153)	(Sd.)	12 g
9.	Kaṇā (Pippalī)	Piper longum Linn	(API-Vol:4/91)	(Fr.)	12 g
10.	Yamānī (Yavānī)	Trachyspermum ammi (Linn.) Sprague ex Turril.	(API-Vol:1/129)	(Fr.)	12 g
11.	Ugragandhā (Vacā)	Acorus calamus Linn	(API-Vol:2/168)	(Rz.)	12 g
12.	Jīraka (Śveta Jīraka)	Cuminum cyminum Linn	(API-Vol:1/106)	(Fr.)	12 g
13.	Kaṭukā	Picrorrhiza kurroa Royle ex Benth.	(API-Vol:2/85)	(Rt./Rz.)	12 g
14.	Khadira	Acacia catechu (Linn.f.) Willd.	(API-Vol:1/70)	(Ht.Wd.)	12 g
15.	Saindhava Lavaṇa	Rock salt			12 g

16.	Kṣāra (Yava)	Hordeum vulgare Linn	(API-Vol:2/175)	Water Soluble ash of (Pl.)	12 g
17.	Haridrā	Curcuma longa Linn.	(API-Vol:1/45)	(Rz.)	12 g
18.	Dāruharidrā	Berberis aristata DC	(API-Vol:2/33)	(St.)	12 g
19.	Mustaka (Mustā)	Cyperus rotundus Linn.	(API-Vol:3/129)	(Rt.Tr.)	12 g
20.	Devadāru	Cedrus deodara (Roxb.) Loud	(API-Vol:4/23)	(Ht.Wd.)	12 g
21.	Kuṣṭha	Saussurea lappa CB. Clarke	(API-Vol:1/76)	(Rt.)	12 g

Method of preparation:

Roast coarsely powdered Saindhava lavaṇa (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 Cūrṇa 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), 0.67 and 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.
pH (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), Kuṣṭha (Diseases of Skin)

Dose: 5 g daily in divided dose.

Anupāna: Guḍūcī Kvātha, Warm Water.

20. PAÑCASAMA CŪRṆA

AFI, Part-I, 7:22

Definition:

PAÑCASAMA CŪRṆA is a powder preparation made with the ingredients in the formulation composition given below:

Formulation composition:

1.	Śuṇṭhī	Zingiber officinale Roxb.	(API-Vol:1/103)	Rz.	1 part
2.	Harītakī	Terminalia chebula Retz.	(API-Vol:1/47)	P.	1 part
3.	Kṛṣnā (Pippalī)	Piper longum Linn	(API-Vol:4/91)	Fr.	1 part
4.	Trivṛt	Operculina turpethum (Linn.) Silva Manso.	(API-Vol:3/213)	Rt.	1 part
5.	Sauvarcala Lavaṇa	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 Cūrṇa and wash it thoroughly with water to remove the salt without loss of Cūrṇa; using the washed Cūrṇa 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 **(Śuṇṭhī);** 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 **(Trivṛt).**

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.
pH (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 (Flatulance 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.

21. PUṢYĀNUGA CŪRṆA

AFI, Part-I, 7:23

Definition:

PUṢYĀNUGA CŪRṆA is a powder preparation made with the ingredients in the Formulation composition given below.

Formulation composition:

1.	Pāṭhā	Cissampelos pareira Linn	(API-Vol:1/92)	(Rt.)	1 Part
2.	Jambū -bīja majjā	Syzygium cumini (Linn) Skeels	(API-Vol:2/56)	(Enm.)	1 Part
3.	Āmra - bīja majjā	Mangifera indica Linn.	(API-Vol:3/9)	(Enm.)	1 Part
4.	Śilābheda (Pāṣāṇabheda)	Bergenia ligulata (Haw) Sternb.	(API-Vol:1/90)	(Rz.)	1 Part
5.	Rasāñjana (Dāruharidrā)	Berberis aristata DC	(API-Vol:2/33)	(Rt/St.Ext.)	1 Part
6.	Ambaṣṭhakī	Hibiscus sabdariffa Linn	(API-Vol:3/5)	(Rt.)	1 Part
7.	Mocarasa (Śālmalī)	Bombax ceiba Linn. (Salmalia malabarica)	(API-Vol:3/183)	(Exd.)	1 Part
8.	Samaṅgā (Lajjālu)	Mimosa pudica Linn	(API-Vol:2/98)	(Rt./Pl.)	1 Part
9.	Padma kesara (Kamala)	Nelumbo nucifera Gaertn.	(API-Vol:3/81)	(Adr.)	1 Part
10.	Vāhlīka (Kuṅkuma)	Crocus sativus Linn	(API-Vol:4/52)	(Stl./Stg.)	1 Part
11.	Ativiṣā	Aconitum heterophyllum Wall. Ex Royle	(API-Vol:1/22)	(Rt.Tr.)	1 Part
12.	Mustā	Cyperus rotundus Linn.	(API-Vol:3/129)	(Rt.Tr.)	1 Part
13.	Bilva	Aegle marmelos Corr	(API-Vol:4/10)	(Rt/St.Bk.)	1 Part
14.	Lodhra	Symplocos racemosa Roxb.	(API-Vol:1/82)	(St.Bk.)	1 Part
15.	Gairika (Śuddha)	Red ochre			1 Part

16.	Kaṭphala	Myrica esculenta Buch-Ham. Ex. D.Don	(API-Vol:3/92)	(St.Bk.)	1 Part
17.	Marica	Piper nigrum Linn.	(API-Vol:3/115)	(Fr.)	1 Part
18.	Śuṇṭhī	Zingiber officinale Roxb.	(API-Vol:1/103)	(Rz.)	1 Part
19.	Mṛdvīkā (Drākṣā)	Vitis vinifera Linn.	(API-Vol:3/45)	(Dr.Fr.)	1 Part
20.	Rakta Candana	Pterocarpus santalinus Linn.	(API-Vol:3/155)	(Ht.Wd.)	1 Part
21.	Kaṭvaṅga (Araluka)	Ailanthus excelsa (Roxb).	(API-Vol:3/15)	(St.Bk.)	1 Part
22.	Vatsaka (Kuṭaja)	Holarrhena antidysenterica (Roth) A.DC	(API-Vol:1/78)	(St.Bk.)	1 Part
23.	Anantā (Śvēta Sārivā)	Hemidesmus indicus (Linn.) R.Br.	(API-Vol:1/107)	(Rt.)	1 Part
24.	Dhātakī	Woodfordia fruiticosa (Linn) Kurz	(API-Vol:1/32)	(Fl.)	1 Part
25.	Madhuka (Yaṣṭī)	Glycyrrhiza glabra	(API-Vol:2/102)	(Rt.)	1 Part
26.	Arjuna	Terminalia arjuna W& A.	(API-Vol:2/17)	(St.Bk.)	1 Part

Method of preparation:

Take all the ingredients of pharmacopoeial quality.

Treat Gairika (No. 15) to prepare Śuddha 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 Cūrṇa 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.
pH (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: Asṛgdara (Menorrhagia), Śveta Pradara (Leucorrhoea), Rajodoṣa (Menstrual disorder), Arśa (Piles), Yonidoṣa (Disorders of female genital tract)

Dose: 6 g daily in divided dose.

Anupāna: Milk or Taṇḍulodaka.

22. TĀLĪSĀDYA CŪRṆA

AFI, Part-I, 7:13

Definition:

TĀLĪSĀDYA CŪRṆA is a powder preparation made with the ingredients in the formulation composition given below.

Formulation composition:

1.	Tālīsa	Abies webbiana Lindl	(API-Vol:4/126)	(Lf.)	12 g
2.	Marica	Piper nigrum Linn.	(API-Vol:3/115)	(Fr.)	24 g
3.	Śuṇṭhī	Zingiber officinale Roxb.	(API-Vol:1/103)	(Rz.)	36 g
4.	Pippalī	Piper longum Linn	(API-Vol:4/91)	(Fr.)	48 g
5.	Vamśa-rocana (Vamśalocana)	Bambusa bambos		(S.C.)	60 g
6.	Elā (Sūkṣmailā)	Elettaria cardamomum (Linn.) R.Br.	(API-Vol:1/101)	(Sd.)	6 g
7.	Tvak	Cinnamomum zeylanicum Blume	(API-Vol:1/113)	(St.Bk.)	6 g
8.	Śarkarā	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 Cūrṇa 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 Cūrṇa, wash thoroughly in water to remove sugar. Take a few mg of the washed Cūrṇa 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 **(Śuṇṭhī)**; 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.
pH (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.
Aflatoxin:	Appendix 2.7.

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

Therapeutic uses: Chardi (Vomiting), Ādhmāna (Flatulance with gurgling sound), Kāsa (Cough), Śvāsa (Asthma), Jvara (Fever), Arucī (Anorexia), Ajīrṇa (Indigestion), Atīsāra (Diarrhoea), Śoṣa (Cachexia), Plīhā(Splenic disease), Grahaṇī (Malabsorption syndrome), Pāṇḍu (Anaemia)

Dose: 5 g daily in divided doses.

Anupāna: Honey, warm water.

23. VAIŚVĀNARA CŪRṆA

AFI, Part-I, 7: 30

Definition:

VAIŚVĀNARA CŪRṆA is a powder preparation made with the ingredients in the formulation composition given below:

Formulation composition:

1.	Maṇimantha (Saindhava Lavaṇa)	Rock Salt			2 Parts
2.	Yamānī (Yavānī)	Trachyspermum ammi (Linn.) Sprague ex Turril.	(API-Vol:1/129)	(Fr.)	2 Parts
3.	Ajamodā	Apium leptophyllum (Pers.) F.V.M.ex Benth	(API-Vol:1/2)	(Fr.)	3 Parts
4.	Nāgarā (Śuṇṭhī)	Zingiber officinale Roxb.	(API-Vol:1/103)	(Rz.)	5 Parts
5.	Harītakī	Terminalia chebula Retz.	(API-Vol:1/47)	(P.)	12 Parts

Method of preparation:

Take all the ingredients of pharmacopoeial quality.

Roast Saindhava Lavaṇa 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 Śuṇṭhī; 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 Cūrṇa, and wash it thoroughly in water to remove salt without loss of Cūrṇa and use the washed Cūrṇa 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*; treat 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 (**Śuṇṭhī);** 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 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) 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 Cūrṇa 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), Pariṇāmaśūla (Duodenal ulcer), Āmavāta (Rheumatism), Hṛdroga (Heart disease)

Dose: 5 g daily in divided doses

Anupāna: Kāñjika, Butter milk, Ghee, Warm Water.

GHṚTA

General Description:

Ghṛtas are preparations in which the Ghṛta is boiled with prescribed liquid media [Svarasa / Kaṣāya etc.] and a fine paste [Kalka] of the drugs specified in the formulation composition. Unless specified otherwise Ghṛta means Go Ghṛta.

General Method of Preparation:

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

      If the Drava dravya is either Kṣīra or Dadhi or Māṃsa rasa or Takra, the ratio of Kalka should be one-eighth to that of Ghṛta.
   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 Ghṛta.
   d. Where the number of Drava-dravyas is more than four, each Drava should be equal to that of Ghṛta.

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 Ghṛta.

4. In general, the Ghṛta 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 Ghṛta 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. Mṛdu Pāka: In this stage, the Kalka looks waxy and when rolled between fingers, it rolls like lac without sticking. The Ghṛta 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 Ghṛta. The Ghṛta obtained at this stage is used for *Pāna* [Internal administration] and *Vasti* [Enema].

   c. Khara Pāka*:* Further heating of the Ghṛta, leads to *Khara pāka*. *Kalka* becomes brittle when rolled in between fingers. The Ghṛta obtained at this stage is used only for *Abhyaṅga* [External application].

8. The period of Pāka depends upon the nature of liquid media used in the process.

   a. Takra or Āranāla — 5 Nights

   b. Svarasa — 3 Nights

   c. Kṣīra — 2 Nights

9. Pātra Pāka*:* It is the process by which the Ghṛta is augmented or flavored by certain prescribed substances. The powdered drugs are suspended in a vessel containing warm, filtered Ghṛta.

The medicated Ghṛta 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 Ghṛta will become thick and may solidify in cold seasons.

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

24. BRĀHMĪ GHṚTA

AFI, Part-I, 6:32

Definition:

BRĀHMĪ GHṚTA is a semisolid preparation made with the ingredients in the formulation composition given below with Ghṛta as the basic ingredient.

Formulation composition:

1.	Brāhmī svarasa (brāhmī)	Bacopa monnieri (Linn.) Wettst.	(API-Vol:2/25)	(Pl.)	1.536 l
2.	Ghṛta (Goghṛta)	Clarified butter from cow's milk			768 g
3.	Śuṇṭhī	Zingiber officinale Roxb.	(API-Vol:1/103)	(Rz.)	12 g
4.	Marica	Piper nigrum Roxb.	(API-Vol:1/103)	(Fr.)	12 g
5.	Pippalī	Piper longum Linn	(API-Vol:4/91)	(Fr.)	12 g
6.	Śyāmā (Trivṛt)	Operculina turpethum (Linn.) Silva Manso.	(API-Vol:3/213)	(Rt.)	12 g
7.	Trivṛt (Śveta Trivṛt)	Operculina turpethum (Linn.) Silva Manso.	(API-Vol:3/213)	(Rt.)	12 g
8.	Dantī	Baliospermum montanum Muell Arg.	(API-Vol:3/41)	(Rt.)	12 g
9.	Śaṅkhapuṣpī	Convolvulvus pluricaulis Choisy	(API-Vol:2/147)	(W.P.)	12 g
10.	Nṛpadruma (Āragvadha)	Cassia fistula Linn	(API-Vol:5/8)	(Fr.Pulp.)	12 g
11.	Saptalā	Euphorbia dracunculoides Lam	(API-Vol:2/150)	(Pl.)	12 g
12.	Kṛmihara (Viḍaṅga)	Embelia ribes Burm.f.	(API-Vol:1/123)	(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 Ghṛta to prepare Mūrchita Ghṛta (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 Ghṛta 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 Lakṣaṇa)*.
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 Ghṛta, 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.

Therapeuticuses: Apasmāra (Epilepsy), Unmāda (Insanity), Vandhyatva (Infertility), Kuṣṭha (Skin disorders), Vāksvara Bhaṅga (Inability to speak properly), Sṃrtikṣaya (Memory loss), Buddhi māndya(Mental retardation)

Dose: 12 to 24 g daily in divided doses.

Anupāna: Warm Milk and Warm Water.

25. DAŚAMŪLA GHṚTA

AFI, Part-I, 6:16

Definition:

DAŚAMŪLA GHṚTA is a medicated preparation made with the ingredients in the Formulation composition given below with Ghṛta as the basic ingredient.

Formulation composition:

1.	Bilva	Aegle marmelos Corr	(API-Vol:4/10)	(Rt./St.Bk.)	307.6 g
2.	Śyonāka	Oroxylum indicum Vent.	(API-Vol:3/209)	(Rt./St.Bk.)	307.6 g
3.	Gambhārī	Gmelina arborea Linn	(API-Vol:4/31)	(Rt./St.Bk.)	307.6 g
4.	Pāṭalā	Stereospermum suaveolens (L.F) DC	(API-Vol:4/87)	(Rt./St.Bk.)	307.6 g
5.	Agnimantha	Clerodendrum phlomidis Linn (Premna integrifolia)	(API-Vol:3/3)	(Rt./St.Bk.)	307.6 g
6.	Śālaparṇī	Desmodium gangeticum DC.	(API-Vol:3/178)	(Pl.)	307.6 g
7.	Pṛśniparṇī	Uraria picta Desv.	(API-Vol:4/99)	(Pl)	307.6 g
8.	Bṛhatī	Solanum indicum Linn	(API-Vol:2/27)	(Pl.)	307.6 g
9.	Kaṇṭakārī	Solanum surattense Burm.f.	(API-Vol:1/59)	(Pl.)	307.6 g
10.	Gokṣura	Tribulus terrestris Linn	(API-Vol:1/38)	(Fr.)	307.6 g
11.	Water for decoction	Water			12.29 l
	reduced to	-			3.07 l
12.	Ghṛta (Goghṛta)	Clarified butter from cow's milk			768 g
13.	Puṣkarāhvā (Puṣkara)	Inula racemosa Hook.f	(API-Vol:4/102)	(Rt.)	12 g

14.	Śaṭhī (Śaṭī)	Hedychium spicatum Ham . Ex.Smith	(API-Vol:1/99)	(Rz.)	12 g
15.	Bilva	Aegle marmelos Corr.	(API-Vol:3/29)	(Rt./St.Bk.)	12 g
16.	Surasā (Tulasī)	Ocimum sanctum Linn	(API-Vol:4/128)	(Pl.)	12 g
17.	Śuṇṭhī	Zingiber officinale Roxb.	(API-Vol:1/103)	(Rz.)	12 g
18.	Marica	Piper nigrum Linn.	(API-Vol:3/115)	(Fr.)	12 g
19.	Pippalī	Piper longum Linn	(API-Vol:4/91)	(Fr.)	12 g
20.	Hiṅgu -śuddha	Ferula foetida Regel.	(API-Vol:1/49)	(Exd.)	12 g

Method of preparation:

Take all ingredients of pharmacopoeial quality.
Clean and dry all the herbal raw materials thoroughly before pulverization.

Treat Ghṛta to prepare Mūrchita Ghṛta (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 Hiṅgu to prepare Śodhita Hiṅgu (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 dravyas (number 13 to 20) to the wet grinder and grind with sufficient quantity of water to prepare a homogeneous blend (*Kalka*).

Take Mūrchita Ghṛta 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 Lakṣaṇa*)*.
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 Ghṛta, 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 doṣa), Kaphaja Kāsa (Cough due to Kapha doṣa), Vātakapha Roga (Diseases due to Vāta Kapha doṣa), Sūtikā roga (Puerperal disorders), Hasta Pāda dāha (Burning sensation in palms & soles.)

Dose: 12 g daily in divided doses.

Anupāna: Warm Water, Warm Milk.

26. DAŚAMŪLA ṢAṬPALAKA GHṚTA

AFI, Part-I, 6:17

Definition:

DAŚAMŪLA ṢAṬPALAKA GHṚTA is a medicated preparation made with the ingredients in the Formulation composition given below with

Ghṛta as the basic ingredient.

Formulation composition:

1.	Bilva	Aegle marmelos Corr	(API-Vol:4/10)	(Rt./St.Bk.)	240 g
2.	Śyonāka	Oroxylum indicum Vent.	(API-Vol:3/209)	(Rt./St.Bk.)	240 g
3.	Gambhārī	Gmelina arborea Linn	(API-Vol:4/31)	(Rt./St.Bk.)	240 g
4.	Pāṭalā	Stereospermum suaveolens (L.F) DC	(API-Vol:4/87)	(Rt./St.Bk.)	240 g
5.	Agnimantha	Clerodendrum phlomidis Linn (Premna integrifolia)	(API-Vol:3/3)	(Rt./St.Bk.)	240 g
6.	Śālaparṇī	Desmodium gangeticum DC.	(API-Vol:3/178)	(Pl.)	240 g
7.	Pṛśniparṇī	Uraria picta Desv.	(API-Vol:4/99)	(Pl.)	240 g
8.	Bṛhatī	Solanum indicum Linn	(API-Vol:2/27)	(Pl.)	240 g
9.	Kaṇṭakārī	Solanum surattense Burm.f.	(API-Vol:1/59)	(Pl.)	240 g
10.	Gokṣura	Tribulus terrestris Linn	(API-Vol:1/38)	(Pl.)	240 g
11.	Water for decoction	Water			12.29 l
	reduced to	-			3.07 l
12.	Kṣīra (Godugdha)	Cow's milk			3.072 l
13.	Pippalī	Piper longum Linn	(API-Vol:4/91)	(Fr.)	21.33 g

14.	Pippalī mūla	Piper longum Linn	(API-Vol:2/133)	(Rt.)	21.33 g
15.	Cavya	Piper chaba Vahl.	(API-Vol:2/29)	(Rt.)	21.33 g
16.	Citraka	Plumbago zeylanica Linn	(API-Vol:1/29)	(Rt.)	21.33 g
17.	Śuṇṭhī	Zingiber officinale Roxb.	(API-Vol:1/103)	(Rz.)	21.33 g
18.	Kṣāra (Yava)	Hordeum vulgare Linn	(API-Vol:2/175)	(Ash of Pl.)	21.33 g
19.	Sarpi (Goghṛta)	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 Ghṛta to prepare Mūrchita Ghṛta (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 Ghṛta 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 $50^0$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 śān̄ti) and constantly check the *kalka* for formation of *varti (Madhyama pāka lakṣaṇa)*.
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 Ghṛta, 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), Pāṇḍu (Anaemia), Kāsa (Cough), Ajīrṇa (Indigestion), Jvara (Fever), Plīharoga (Spleen disease)

Dose: 12 g daily in divided doses.

Anupāna: Warm Milk and Warm Water.

27. DHĀTRYĀDI GHṚTA

AFI, Part-I, 6:21

Definition:

DHĀTRYĀDI GHṚTA is a medicated preparation made with the ingredients in the formulation composition given below with Ghṛta as the basic ingredient.

Formulation composition:

1.	Dhātrī rasa (Āmalakī)	Phyllanthus emblica (Emblica officinalis Gaertn.)	(API-Vol:1/4)	P.	768 ml
2.	Vidārī rasa (Vidārī)	Pueraria tuberosa DC	(API-Vol:2/173)	Rt.Tr.	768 ml
3.	Ikṣu rasa	Saccharum officinarum Linn	(API-Vol:4/33)	St.(Juice)	768 ml
4.	Śatāvarī rasa (Śatāvarī)	Asparagus racemosus Willd	(API-Vol:4/108)	Rt.	768 ml
5.	Kūṣmāṇḍaka ras (Kūṣmāṇḍa)	Benincasa hispida (Thunb)Cogn.	(API-Vol:4/55)	Fr.P.	768 ml
6.	Sarpi (Goghṛta)	Clarified butter from cow's milk			768 ml
7.	Kṣīra (Godugdha)	Cow's milk			768 ml
8.	Mṛdvīkā (Drākṣā)	Vitis vinifera Linn.	(API-Vol:3/45)	Dr.Fr.	24 g
9.	Yaṣṭyāhvaya (Yaṣṭī)	Glycyrrhiza glabra Linn	(API-Vol:1/127)	Rt.	24 g
10.	Candana (Śveta Candana)	Santalum album Linn.	(API-Vol:3/207)	Ht.Wd.	24 g
11.	Sitā	Sugar candy			24 g

Method of preparation:

Take all ingredients of pharmacopoeial quality.

Treat Ghṛta to prepare Mūrchita Ghṛta (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 Mṛdvīkā and grind with sufficient quantity of water to prepare a homogeneous blend.

Take Mūrchita Ghṛta 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 lakṣaṇa)*.

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 Ghṛta, 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 doṣa), Pittaja Pāṇḍu (Anemia due to Pitta doṣa), Mada (Intoxication), Mūrcchā (Syncope), Madātyāya (Alcoholism), Unmāda (Insanity), Raktapitta (Bleeding disorders), Asṛgdara (Excessive bledding from vaginal tract), Vandhyatva (Infertility), Vātarakta (Gout), Pittavikāra (Disorders of Pitta doṣa), Asthi Srāva (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.

28. JĀTYĀDI GHṚTA (Synonym Vraṇa Śodhanādi Ghṛta)

AFI, Part-I, 6:11

Definition:

JĀTYĀDI GHṚTA is a medicated preparation made with the ingredients in the formulation composition given below with Ghṛta as the basic ingredient.

Formulation composition:

1.	Jātī patra (Jātī)	Jasminum officinale Linn. Var. grandiflorum	(API-Vol:3/71)	Lf.	14.76 g
2.	Nimba patra	Azadirachta indica A. Juss	(API-Vol:2/124)	Lf.	14.76 g
3.	Paṭola patra	Trichosanthes dioica		Lf.	14.76 g
4.	Kaṭukā	Picrorrhiza kurroa Royle ex Benth.	(API-Vol:2/85)	Rz.	14.76 g
5.	Dārvī (Dāruharidrā)	Berberis aristata DC	(API-Vol:2/33)	St.	14.76 g
6.	Niśā (Haridrā)	Curcuma longa Linn.	(API-Vol:1/45)	Rz.	14.76 g
7.	Sāriva (Śveta Sārivā)	Hemidesmus indicus (Linn.) R.Br.	(API-Vol:1/107)	Rt.	14.76 g
8.	Mañjiṣṭhā	Rubia cordifolia Linn.	(API-Vol:3/112)	Rt.	14.76 g
9.	Abhaya (Uśīra)	Vetiveria zizaniodes (Linn.) Nash.	(API-Vol:3/219)	Rt.	14.76 g
10.	Siktha (Madhūcchiṣṭa)	Bee's wax			14.76 g
11.	Tuttha	Copper sulphate			14.76 g
12.	Madhuka (Yaṣṭī)	Glycyrrhiza glabra Linn	(API-Vol:1/127)	Rt.	14.76 g
13.	Naktāhvā (Karañja)	Pongamia pinnata (Linn.) Merr.	(API-Vol:1/63)	Sd.	14.76 g
14.	Sarpi (Goghṛta)	Clarified butter from cow's milk			768 g
15.	Water	Water			3.07 l

Method of preparation:

Take all ingredients of pharmacopoeial quality.

Treat Ghṛta to prepare Mūrchita Ghṛta (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 Ghṛta 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 lakṣaṇa)*. 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 cooling.
Pack it in tightly closed glass containers to protect from light and moisture.

Description:

A low melting Ghṛta, yellowish green in color, unctuous to touch with pleasant odour.

Identification:

Thin layer chromatography:

Extract 2 g of Jātyādi Ghṛta 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 Marmāśrita vraṇa (Ulcers in vital points), Kledī Vraṇa (Oozing / weeping ulcer), Gambhīra Vraṇa (Deep-rooted ulcers), Saruja Vraṇa (Painful ulcers), Raktaja Vraṇa (Bleeding ulcers), Duṣṭa vraṇa (Non-healing ulcers)

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

29. KALYĀṆAKA GHṚTA

AFI, Part-I, 6:7

Definition:

KALYĀṆAKA GHṚTA is a medicated preparation made with the ingredients in the formulation composition given below with Ghṛta as the basic ingredient.

Formulation composition:

1.	Harītakī	Terminalia chebula Retz.	(API-Vol:1/47)	P.	12 g
2.	Bibhītaka	Terminalia belerica Roxb.	(API-Vol:1/26)	P.	12 g
3.	Āmalakī	Phyllanthus emblica (Emblica officinalis Gaertn.)	(API-Vol:1/4)	P.	12 g
4.	Viśālā (Rakta Indravāruṇī)	Citrullus colocynthis Schrad. (Official Substitute)	(API-Vol:3/65)	Fr.	12 g
5.	Bhadrailā (Sthūlailā)	Amomum subulatum Roxb	(API-Vol:2/158)	Sd.	12 g
6.	Devadāru	Cedrus deodara (Roxb.) Loud	(API-Vol:4/23)	Ht.Wd	12 g
7.	Elavāluka	Prunus avium Linn.f.	(API-Vol:5/31)	St.Bk	12 g
8.	Śveta Sārivā	Hemidesmus indicus (Linn.) R.Br.	(API-Vol:1/107)	Rt.	12 g
9.	Kṛṣṇa Sārivā	Cryptolepis buchanani Roem & Schult	(API-Vol:4/47)	Rt.	12 g
10.	Haridrā	Curcuma longa Linn.	(API-Vol:1/45)	Rz.	12 g
11.	Dāruharidrā	Berberis aristata DC	(API-Vol:2/33)	St.	12 g
12.	Śālaparṇī	Desmodium gangeticum DC.	(API-Vol:3/178)	Rt.	12 g
13.	Pṛśniparṇī	Uraria picta Desv.	(API-Vol:4/99)	Rt.	12 g
14.	Phalinī (Priyaṅgu)	Callicarpa macrophylla Vahl	(API-Vol:2/143)	Infl.	12 g
15.	Nata (Tagara)	Valeriana wallichii	(API-Vol:1/109)	Rt	12 g

16.	Bṛhatī	Solanum indicum Linn	(API-Vol:2/27)	Pl.	12 g
17.	Kuṣṭha	Saussurea lappa CB. Clarke	(API-Vol:1/76)	Rt	12 g
18.	Mañjiṣṭhā	Rubia cordifolia Linn.	(API-Vol:3/112)	St	12 g
19.	Nāgakesara	Mesua ferrea Linn	(API-Vol:2/118)	Stmn.	12 g
20.	Dāḍima - Phala tvak	Punica granatum Linn	(API-Vol:4/16)	P.	12 g
21.	Vella (Viḍaṅga)	Embelia ribes Burm.f.	(API-Vol:1/123)	Fr.	12 g
22.	Tālīsapatra (Tālīsa)	Abies webbiana Lindl	(API-Vol:4/126)	Lf.	12 g
23.	Elā (Sūkṣmailā)	Elettaria cardamomum (Linn.) R.Br.	(API-Vol:1/101)	Sd.	12 g
24.	Mālatī mukula (Jātī)	Jasminum officinale Linn. Var. grandiflorum	(API-Vol:3/71)	Fl.	12 g
25.	Utpala	Nymphaea stellata Willd.	(API-Vol:3/221)	Fl.	12 g
26.	Dantī	Baliospermum montanum Muell Arg.	(API-Vol:3/41)	Rt	12 g
27.	Padmaka	Prunus cerasoides D.Don.	(API-Vol:3/145)	Ht. Wd	12 g
28.	Hima (Rakta Candana)	Pterocarpus santalinus Linn.	(API-Vol:3/155)	Ht. Wd	12 g
29.	Sarpi (Goghṛta)	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 Ghṛta to prepare Mūrchita Ghṛta (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 Ghṛta 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 lakṣaṇa*).

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 Ghṛta, yellowish green in color with pleasant odour and bitter taste.

Identification:

Thin layer chromatography:

Extract 2 g of Kalyāṇaka Ghṛta 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), Pāṇḍu (Anaemia), Apasmāra (Epilepsy), Bhūtonmāda (Exogenous psychosis), Bālagraha (Specific disorders of children), Viṣavikāra (Disorders due to poison), Gara Viṣa (Slow/accumulated poison), Vandhyatva (Infertility), Yoni Roga (Diseases of the female genital tract), Kaṇḍū (Itching), Śopha (Oedema), Meda (Adipose tissue), Moha (Delusion), Jvara (Fever), Smṛti Daurbalya (Weak memory) and Daurbalya.

Dose: 12 g daily in divided doses.

Anupāna: Warm milk, Warm water.

30. PAÑCAGAVYA GHṚTA

AFI, Part-I, 6:25

Definition:

PAÑCAGAVYA GHṚTA is a semi-solid preparation made with the ingredients in the formulation composition given below with Ghṛta as the basic ingredient.

Formulation composition:

1.	Gomaya svarasa	Water extract of fresh cow dung	3.07 l
2.	Kṣīra (Godugdha)	Cow's milk	3.07 l
3.	Dadhi (Godadhi)	Curd from cow's milk	3.07 kg
4.	Mūtra (Gomūtra)	Urine of cow	3.07 l
5.	Havi (Goghṛta)	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 Ghṛta to prepare Mūrchita Ghṛta (Appendix 6.2.8.2)**.**

Take Mūrchita Ghṛta 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 śāṇti). 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 Ghṛta, 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), Kāmalā (Jaundice)

Dose: 12 g daily in divided dose.

Anupāna: Warm milk, Warm water.

31. PAÑCATIKTA GHṚTA

AFI, Part-I, 6:26

Definition:

PAÑCATIKTA GHṚTA is a medicated preparation made with the ingredients in the formulation composition given below with Ghṛta as the basic ingredient.

Formulation composition:

1.	Nimba	Azadirachta indica A.Juss	(API-Vol:5/119)	St.Bk.	480 g
2.	Paṭola	Trichosanthes dioica		Lf.	480 g
3.	Vyāghrī (Kaṇṭakārī)	Solanum surattense Burm.f.	(API-Vol:1/59)	Pl.	480 g
4.	Guḍūcī	Tinospora cordifolia (Willd.) Miers.	(API-Vol:1/41)	St.	480 g
5.	Vāsaka (Vāsā)	Adhatoda vasica Medic	(API-Vol:4/138)	Rt.	480 g
6.	Water for decoction	Water			12.29 l
	reduced to				3.07 l
7.	Harītakī	Terminalia chebula Retz.	(API-Vol:1/47)	P.	128 g
8.	Bibhītaka	Terminalia bellerica Roxb.	(API-Vol:1/26)	P.	128 g
9.	Āmalakī	Phyllanthus emblica (Emblica officinalis Gaertn.)	(API-Vol:1/4)	P.	128 g
10.	Ghṛta (Goghṛta)	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 Ghṛta to prepare Mūrchita Ghṛta (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 Pañcatikta 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 Ghṛta 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 lakṣaṇa).*

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 Ghṛta, 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: Duṣṭa vraṇa (Non-healing ulcers), Kuṣṭha (Leprosy/skin diseases), Vātavyādhi (Disorders due to vitiated Vāta doṣa), Pittavyādhi (Diseases due to vitiated Pitta doṣa), Kaphavikāra (Disorders due to vitiated Kapha doṣa), Kṛmi (Worm infestation), Arśa (Piles and), Kāsa (Cough)

Dose: 12 g daily in divided doses.

Anupāna: Warm milk, Warm water**.**

32. PHALA GHṚTA

AFI, Part-I, 6:30

Definition:

PHALA GHṚTA is a medicated preparation made with the ingredients in the formulation composition given below with Ghṛta as the basic ingredient.

Formulation composition:

1.	Mañjiṣṭhā	Rubia cordifolia Linn.	(API-Vol:3/112)	Rt.	12 g
2.	Kuṣṭha	Saussurea lappa CB. Clarke	(API-Vol:1/76)	Rt.	12 g
3.	Tagara	Valeriana wallichii	(API-Vol:1/109)	Rt.	12 g
4.	Harītakī	Terminalia chebula Retz.	(API-Vol:1/47)	P.	12 g
5.	Bibhītaka	Terminalia bellerica Roxb.	(API-Vol:1/26)	P.	12 g
6.	Āmalakī	Phyllanthus emblica (Emblica officinalis Gaertn.)	(API-Vol:1/4)	P.	12 g
7.	Śarkarā	Sugar			12 g
8.	Vacā	Acorus calamus Linn	(API-Vol:2/168)	Rz.	12 g
9.	Haridrā	Curcuma longa Linn.	(API-Vol:1/45)	Rz.	12 g
10.	Dāruharidrā	Berberis aristata DC	(API-Vol:2/33)	St.	12 g
11.	Madhuka (Yaṣṭī)	Glycyrrhiza glabra Linn	(API-Vol:1/127)	Rt.	12 g
12.	Medā	Asparagus racemosus (Official substitute)		Rt.Tr.	12 g
13.	Dīpyaka (Yavāni)	Trachyspermum ammi (Linn.) Sprague ex Turril.	(API-Vol:1/129)	Fr.	12 g
14.	Kaṭurohiṇī (Kaṭukā)	Picrorhiza kurroa Royle ex Benth.	(API-Vol:2/85)	Rz./ Rt.	12 g

15.	Payasyā (Kśira Vidārī)	Ipomoea digitata Linn.	(API-Vol:5/88)	Rt.Tr.	12 g
16.	Hiṅgu	Ferula foetida Regel.	(API-Vol:1/49)	Exd.	12 g
17.	Kākolī	Lilium polyphyllum D.Don.			
		[Withania somnifera (Official substitute)]	(API-Vol:3/79)	Rt.	12 g
18.	Vājigandhā (Aśvagandhā)	Withania somnifera Dunal	(API-Vol:1/15)	Rt.	12 g
19.	Śatāvarī	Asparagus racemosus Willd	(API-Vol:4/108)	Rt.Tr.	12 g
20.	Ghṛta (Goghṛta)	Clarified butter from cow milk			768 g
21.	Kṣīra (Godugdha)	Cow's milk			3.072 l

Method of preparation:

Take all ingredients of pharmacopoeial quality.

Treat Ghṛta to prepare Mūrchita Ghṛta (Appendix 6.2.8.2)**.**

Treat Hiṅgu to prepare Śodhita Hiṅgu (Appendix 6.2.7.12.).

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

Take Mūrchita Ghṛta 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 lakṣaṇa).* 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 Ghṛta, 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), Garbhiṇīroga (Diseases during pregnancy), Kārśya (Emaciation), Uttara Vasti (Vaginal Douche)

Dose: 12 g daily in divided doses.

Anupāna: Warm water.

33. SĀRASVATA GHṚTA

AFI, Part-I, 6:43

Definition:

SĀRASVATA GHṚTA is a medicated preparation made with the ingredients in the Formulation composition given below with Ghṛta as the basic ingredient.

Formulation composition:

1.	Ajākṣīra	Goat's milk			3.07 l
2.	Abhayā (Harītakī)	Terminalia chebula Retz.	(API-Vol:1/47)	P.	24 g
3.	Śuṇṭhī	Zingiber officinale Roxb.	(API-Vol:1/103)	Rz.	24 g
4.	Marica	Piper nigrum Linn.	(API-Vol:3/115)	Fr.	24 g
5.	Pippalī	Piper Longum Linn	(API-Vol:4/91)	Fr.	24 g
6.	Pāṭhā	Cissampelos pareira Linn	(API-Vol:1/92)	Rt.	24 g
7.	Ugrā (Vacā)	Acorus calamus Linn	(API-Vol:2/168)	Rz.	24 g
8.	Śigru	Moringa oleifera Lam	(API-Vol:4/110)	Rt.Bk.	24 g
9.	Saindhava lavaṇa	Rock Salt			24 g
10.	Water	Water			3.07 l
11.	Sarpi (Goghṛta)	Clarified butter from cow's milk			768 g

Method of preparation:

Take all ingredients of pharmacopoeial quality.

Treat Ghṛta to prepare Mūrchita Ghṛta (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 Ghṛta in a stainless steel vessel and heat mildly.

Add increments of Kalka. Stir thoroughly while adding Ajākṣīra 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 lakṣaṇa)*

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 Ghṛta, 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), Smṛti (Memory), Jāṭharāgni (Appetite)

Dose: 12 g daily in divided dose.

Anupāna: Warm milk, Warm water.

34. TRAIKAṆṬAKA GHṚTA

AFI, Part-I, 6:15

Definition:

TRAIKAṆṬAKA GHṚTA is a medicated preparation made with the ingredients in the formulation composition given below with Ghṛta as the basic ingredient.

Formulation composition:

1.	Trikaṇṭaka (Gokṣura)	Tribulus terrestris Linn	(API-Vol:1/40)	Fr.	768 g
2.	Water for decoction	Water			12.29 l
	reduced to				3.07 l
3.	Elā (Sūkṣmailā)	Elettaria cardamomum (Linn.) R.Br.	(API-Vol:1/101)	Sd.	9.14 g
4.	Girijatu (Śilājatu)	Exd. From rock crevices			9.14 g
5.	Śilābheda (Paṣāṇabheda)	Bergenia ciliata (Haw) Sternb.	(API-Vol:1/90)	Rz.	9.14 g
6.	Yaṣṭī	Glycyrrhiza glabra Linn	(API-Vol:1/127)	Rt.	9.14 g
7.	Varī (Śatāvarī)	Asparagus racemosus Willd	(API-Vol:4/108)	Rt.	9.14 g
8.	Darbha	Imperata cylindrica (Linn) Beauv.	(API-Vol:5/21)	Rt.	9.14 g
9.	Drākṣā	Vitis vinifera Linn.	(API-Vol:3/45)	Dr. Fr.	9.14 g
10.	Ambu (Hrīvēra)	Coleus vettiveroides		Rt.	9.14 g
11.	Śauṇḍī (Pippalī)	Piper Longum Linn	(API-Vol:4/91)	Fr.	9.14 g
12.	Vasuka	Calotropis procera (Ait.) R.Br. (Official substitute)	(API-Vol:1/8)	Pl.	9.14 g
13.	Vaśira (Cavya)	Piper chabaVahl.	(API-Vol:2/29)	Rt.	9.14 g

14.	Kāśa	Saccharaum spontaneum Linn.	(API-Vol:3/88)	Rt.	9.14 g
15.	Ikṣu Mūla	Saccharum officinale Linn	(API-Vol:4/33)	Rt.	9.14 g
16.	Matsyākṣikā (Matsyākṣī)	Alternanthera sessilis (Lilnn.) R.Br	(API-Vol:2/104)	Pl.	9.14 g
17.	Dugdha (Godugdha)	Cow's milk			768 g
18.	Ghṛta (Goghṛta)	Calrified 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 Ghṛta to prepare Mūrchita Ghṛta (Appendix 6.2.8.2).

Pulverize Gokṣura *(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 Gokṣura 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 Ghṛta in a stainless steel vessel and heat mildly.

Add increments of Kalka. Stir thoroughly while adding Gokṣura 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 lakṣaṇa)*.

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 Ghṛta, greenish in color with pleasant odour and bitter taste.

Identification:

Thin layer chromatography:

Extract 2 g of Trikaṇṭaka Ghṛta 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.

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

Therapeutic uses: Mūtrakṛcchra (Dysuria), Prameha (Metabolic disorder), Aśmarī (Urinary calculus), Mūtra Śarkarā (Gravel in urine), Mūtradoṣa (Urinary disorders), Mūtrādāha (Burning micturition)

Dose: 12 g daily in divided doses.

Anupāna: Warm water, Ṭṛṇapañcamūla kvātha, Warm milk.

35. TRIPHALĀ GHṚTA

AFI, Part-I, 6:14

Definition:

TRIPHALĀ GHṚTA is a medicated preparation made with the ingredients in the formulation composition given below with Ghṛta as the basic ingredient.

Formulation composition:

1.	Harītakī	Terminalia chebula Retz.	(API-Vol:1/47)	P.	12 g
2.	Bibhītaka	Terminalia bellerica Roxb.	(API-Vol:1/26)	P.	12 g
3.	Āmalakī	Phyllanthus emblica (Emblica officinalis Gaertn.)	(API-Vol:1/4)	P.	12 g
5.	Śuṇṭhī	Zingiber officinale Roxb.	(API-Vol:1/103)	Rz.	12 g
6.	Marica	Piper nigrum Linn.	(API-Vol:3/115)	Fr.	12 g
7.	Pippalī	Piper Longum Linn	(API-Vol:4/91)	Fr.	12 g
8.	Drākṣā	Vitis vinifera Linn.	(API-Vol:3/45)	Dr.Fr.	12 g
9.	Madhuka (Yaṣṭī)	Glycyrrhiza glabra Linn	(API-Vol:1/127)	Rt.	12 g
10.	Kaṭurohiṇī (Kaṭukā)	Picrorhiza kurroa Royle ex Benth.	(API-Vol:2/85)	Rz./Rt	12 g
11.	Prapauṇḍarīka	Nelumbo nucifera Gaertn	(API-Vol:2/69)	Fl.	12 g
12.	Sūkṣmailā	Elettaria cardamomum (Linn.) R.Br.	(API-Vol:1/101)	Sd.	12 g
13.	Viḍaṅga	Embelia ribes Burm.f.	(API-Vol:1/123)	Fr.	12 g
14.	Nāgakēśara	Mesua ferrea Linn	(API-Vol:2/118)	Stmn.	12 g
15.	Nīlōtpala (Utpala)	Nymphaea stellata Willd.	(API-Vol:3/221)	Fl.	12 g
16.	Śveta Sārivā	Hemidesmus indicus (Linn.) R.Br.	(API-Vol:1/107)	Rt.	12 g

17.	Kṛṣṇa Sārivā	Cryptolepis buchanani Roem & Schult	(API-Vol:4/47)	Rt.	12 g
18.	Candana (Śveta Candana)	Santalum album Linn.	(API-Vol:3/207)	Ht.Wd	12 g
19.	Haridrā	Curcuma longa Linn.	(API-Vol:1/45)	Rz.	12 g
20.	Dāruharidrā	Berberis aristata DC	(API-Vol:2/33)	St.	12 g
21.	Ghṛta (Goghṛta)	Clarified butter from cow's milk			768 g
22.	Payasa (Godugdha)	Cow's milk			768 g
23.	*Triphalā rasa kvatha	*Kvātha of Emblica officinalis, Terminalia chebula, Terminalia bellirica*			2.3 l

* Equal parts of Harītakī, Āmalakī and Bibhītaka.

Method of preparation:

Take all ingredients of pharmacopoeial quality.

Wash and dry all the herbal raw materials thoroughly.

Treat Ghṛta to prepare Mūrchita Ghṛta (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.

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 Ghṛta in a stainless steel vessel and heat it mildly. Add increments of Kalka. Stir thoroughly while adding Triphalā kvatha 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 lakṣaṇa)*.

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 Ghṛta, green in colour, unctuous to touch with pleasant odour and bitter taste.

Identification:

Thin layer chromatography:

Extract 2 g of Triphalā Ghṛta 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 (Erysipelas), Pradara (Excessive vaginal discharge), Netrarujā(Pain in eyes), Netrasrāva (Lacrimation), Kāsa (Cough), Kaṇḍū (Itching), Rakta Doṣa (Disorders of Blood), Śvayathu (Oedema), Khālitya (Alopecia), Keśa Patana (Falling of hair), Viṣama Jvara (Intermittent fever), Arma (Pterygium), Śukla Netra Roga (Eye disorders related to sclera), 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, Mahiṣākṣa and Kanaka Guggulu are usually preferred for medicinal preparations. Mahiṣākṣa 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 Dolā Yantra containing any one of the following fluids.
    a. Gomūtra,
    b. Triphalā kaṣāya.,
    c. Nirguṇḍī patra Svarasa with Haridrā Cūrṇa,
    d. Vāsāpatra Kaṣāya,
    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.

36. KAIŚORA GUGGULU (Vaṭī)

AFI, Part-I, 5:2

Definition:

KAIŚORA GUGGULU is a Vaṭī preparation made with the ingredients in the formulation composition given below with Guggulu as the basic ingredient.

Formulation composition:

1.	Guggulu - śuddha	Commiphora wightii (Arn.) Bhand.	(API-Vol:1/43)	Exd.	768 g
2.	Harītakī	Terminalia chebula Retz.	(API-Vol:1/47)	P.	256 g
3.	Bibhītaka	Terminalia bellerica Roxb.	(API-Vol:1/26)	P.	256 g
4.	Āmalakī	Phyllanthus emblica (Emblica officinalis Gaertn.)	(API-Vol:1/4)	P.	256 g
5.	Chinnaruhā (Guḍūcī)	Tinospora cordifolia (Willd.) Miers.	(API-Vol:1/41)	St.	1.54 kg
6.	Water for decoction	Water			12.29 l
	reduced to				6.14 l
7.	Harītakī	Terminalia chebula Retz.	(API-Vol:1/47)	P.	8 g
8.	Bibhītaka	Terminalia bellerica Roxb.	(API-Vol:1/26)	P.	8 g
9.	Āmalakī	Phyllanthus emblica (Emblica officinalis Gaertn.)	(API-Vol:1/4)	P.	8 g
10.	Śuṇṭhī	Zingiber officinale Roxb.	(API-Vol:1/103)	Rz.	24 g
11.	Marica	Piper nigrum Linn.	(API-Vol:3/115)	Fr.	24 g
12.	Pippalī	Piper longum Linn	(API-Vol:4/91)	Fr.	24 g
13.	Kṛmiripu (Viḍaṅga)	Embelia ribes Burm.f.	(API-Vol:1/123)	Fr.	24 g

14.	Trivṛt	Operculina turpethum (Linn.) Silva Manso.	(API-Vol:3/213)	Rt.	12 g
15.	Dantī	Baliospermum montanum Muell Arg.	(API-Vol:3/41)	Rt.	12 g
16.	Amṛtā (Guḍūcī)	Tinospora cordifolia (Willd.) Miers.	(API-Vol:1/41)	St.	48 g
17.	Ghṛta (Goghṛta)	Calrified 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 Kaṣāya and filter through a *muslin cloth*.

Boil Śuddha - Guggulu (Appendix 6.2.7.4) in the above Kaṣāya in an iron vessel and concentrate, add fine powders of remaining drugs with continuous stirring. Add Ghṛta to the above mixture to form a semisolid mass for preparation of *vaṭi*.

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

Dry the rolled vaṭis 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 **(Harītakī)**; 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 **(Suṇṭhī)**; 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 **(Viḍaṅga)**; 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 (**Trivṛt)**; 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 **(Guḍūcī)**.

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.
pH (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), Vātaśoṇita (Gout), Pramehapiḍaka (Diabetic carbuncle), Vraṇa (Ulcer), Kāsa (Cough), Kuṣṭha (Diseases of Skin), Gulma (Abdominal lump), Śvayathu (Oedema), Pāṇḍu (Anaemia), Meha (Excessive flow of urine),
Jarādōṣa (Geriatric disorder)

Dose: 3 g daily in divided doses.

Anupāna: Mudga Yuṣa, Milk , Sugandhijala

VAṬĪ AND GUṬIKĀ

General Description:

Medicines prepared in the form of tablets or pills are known as Vaṭī and Guṭikā.. These are made of one or more drugs of plant, animal or mineral origin. Guṭikā, Vaṭaka, Modaka, Piṇḍi and Vaṭī are synonymous terms used in classics for Vaṭī .

The drugs of plant origin are dried and made into fine powders, separately. The minerals are made into Bhasma or Sindūra, 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 Kastūrī, Karpūra, 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 (*Guḍa*) 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 Guṭikas 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 Vaṭīs should not lose their original color, smell, taste and form. When sugar, salt or Kṣāra is an ingredient, the pills should be kept away from moisture.

37. MARICĀDI GUṬIKĀ

AFI, Part - I, 12:20)

Definition:

MARICĀDI GUṬIKĀ is a preparation made with the ingredients in the Formulation composition given below.

Formulation composition:

1.	Marica	Piper nigrum Linn.	(API-Vol:3/115)	Fr.	12 g
2.	Pippalī	Piper Longum Linn	(API-Vol:4/91)	Fr.	12 g
3.	Yava kṣāra (Yava)	Hordeum vulgare Linn	(API-Vol:4/146)	Water soluble ash of plant	6 g
4.	Dāḍima	Punica granatum Linn	(API-Vol:4/18)	Fr. R.	24 g
5.	Guḍa	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 (Prakṣepa Dravya) and pass through sieve number 85 to obtain fine powder.

Collect Yava kṣāra 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 Guḍa pāka.

Add fine powders of Prakṣepa Dravya and Yava kṣāra 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 **(Dāḍima)**.

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.

KṢĀRA

General Description:

KṢĀRA 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 overnight and later 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 Kṣāra.

Kṣāras are white in colour and hygroscopic in nature therefore should be kept in air-tight bottles. These last indefinitely.

38. APĀMĀRGA KṢĀRA

AFI, Part-I, 10:2

Definition:

APĀMĀRGA KṢĀRA is an off-white alkaline preparation made with the ingredients in the Formulation composition given below.

Formulation composition:

1.	Apāmārga bhasma (Apāmārga)	Achyranthes aspera Linn.	(API-Vol:2/7)	(Pl.)	1 Part
2.	Water	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 (Bhasma).

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 Kṣāra 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-insoluable ash	:	Not more than 1 per cent,	Appendix 2.2.4.
pH (10%aqeous 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), Grahaṇī (Malabsorption syndrome), Viṣūcikā (Gastro-enteritis with piercing pain), Alasaka (Intestinal atony), Ajīrṇa (Dyspepsia), Arucī (Tastelessness), Ānāha (Distention of abdomen due to obstruction to passage of urine and stool), Arśa (Piles), Śarkarā(Gravel in urine), Aśmarī (Urinary calculus), Kṛmi (Helminthiasis), Antarvidradhi (Hernia), Śvāsa (Asthma)

Dose: 125 to 500 mg daily in divided dose.

Anupāna: Water.

39. ARKA LAVAṆA

AFI, Part-I, 10:1

Definition:

ARKA LAVAṆA is a preparation made with the ingredients in the formulation composition given below.

Formulation composition:

1.	Arka patra (Arka)	Calotropis procera (Ait.) R.Br.	(API-Vol:1/10)	Lf.	1 part
2.	Lavaṇa (Saindhava Lavaṇa)	Rock Salt			1 part

Method of Preparation:

Take ingredients of pharmacopoeial quality.

Collect mature Arka patra. Place alternate layers of Arka patra and Saindhava Lavaṇa 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), Yakṛtodara (Enlargement of Liver)

Dose: 1g daily in divided doses.

Anupāna: Water, Butter milk.

40. KALYĀṆAKA KṢĀRA

AFI, Part-I, 10:6

Definition:

KALYĀṆAKA KṢĀRA is a preparation made with the ingredients in the formulation composition given below.

Formulation composition:

1.	Suṇṭhī	Zingiber officinale Roxb.	(API-Vol:1/103)	(Rz.)	1 Part
2.	Marica	Piper nigrum Linn.	(API-Vol:3/115)	(Fr.)	1 Part
3.	Pippalī	Piper longum Linn	(API-Vol:4/91)	(Fr.)	1 Part
4.	Saindhava Lavaṇa	Rock salt			1 Part
5.	Sauvarcala Lavaṇa	Black salt			1 Part
6.	Viḍa Lavaṇa	Black salt (Official subsititute)			1 Part
7.	Harītakī	Terminalia chebula Retz.	(API-Vol:1/47)	(P.)	1 Part
8.	Bibhītaka	Terminalia bellerica Roxb.	(API-Vol:1/26)	(P.)	1 Part
9.	Āmalakī	Phyllanthus emblica (Emblica officinalis Gaertn.)	(API-Vol:1/4)	(P.)	1 Part
10.	Dantī	Baliospermum montanum MuellArg.	(API-Vol:3/41)	(Rt.)	1 Part
11.	Aruṣkara (Bhallātaka)	Semecarpus anacardium Linn	(API-Vol:2/19)	(Fr.)	1 Part
12.	Citraka	Plumbago zeylanica Linn	(API-Vol:1/29)	(Rt.)	1 Part
13.	Sneha (Tila) - taila	Sesamum indicum linn	(API-Vol:4/128)	(Oil.)	QS

14.	Mūtra (Gomūtra)	Cow's urine	QS

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 śarāva. 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.
pH (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), Pāṇḍu (Anaemia), Udara Roga (Diseases of abdomen), Kṛmi (Helminthiasis), Mutrāghāta (Urinary obstruction), Aśmarī (Urinary calculus), Śopha (Oedema), Hṛdroga (Heart disease), Grahaṇī (Malabsorption syndrome), Meha (Excessive flow of urine), Plīharujā(Pain due to splenic disease), Ānāha (Distention of abdomen), Śvāsa (Asthma), Kāsa (Cough), Agnimāndya (Digestive impairment)

Dose: 1 g daily in divided doses.

Anupāna: Ghṛta.

41. MŪLAKA KṢĀRA

AFI, Part-I, 10:10

Definition:

MŪLAKA KṢĀRA is a powder preparation made with the ingredients in the formulation composition given below.

Formulation composition:

1.	Mūlaka bhasma (Mūlaka)	Raphanus sativus Linn	(API-Vol:2/109)	Pl.	1 part
2.	Water	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 Kṣāra 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.
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 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: Mūtrakṛcchra (Dysuria), Aśmarī (Urinary calculus), Gulma (Abdominal lump), Vātavikāra (Disorders due to Vata doṣa)

Dose: 1g daily in divided doses.

Anupāna: Water.

42. PALĀŚA KṢĀRA

AFI, Part-I, 10:9

Definition:

PALĀŚA KṢĀRA is a white alkaline preparation made with the ingredients in the formulation composition given below.

Formulation composition:

1.	Palāśa bhasma (palāśa)	Butea monosperma (Lam) Kuntze	(API-Vol:4/78)	Pl.	1 part
2.	Jala	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 Kṣāra 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.
pH (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), Plīhayakṛtvṛddhi (Spleno-hepatomegaly), Mūtrakṛcchra (Dysuria), Aśmarī (Urinary calculus), Śarkarā (Gravel in urine), Grahaṇī (Malabsorption syndrome), Ānāha (Distention of abdomen due to obstruction to passage of urine and stool), Viṣūcikā (Gastro-enteritis with piercing pain)

Dose: ½ to 1 g daily in divided doses.

Anupāna: Warm water, Milk.

43. YAVA KṢĀRA

AFI, Part-I, 10:11

Definition:

YAVA KṢĀRA is an alkaline preparation made with the ingredient in the formulation composition given below.

Formulation composition:

1.	Yavanāla bhasma (Yava)	Hordeum vulgare Linn	(API-Vol:4/146)	Pl.	1 part
2.	Jala	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 Kṣāra 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.
pH (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 / colic), Udara (Diseases of abdomen), Gulma (Abdominal lump), Plīhāmaya (Splenic disease), Mūtrakṛcchra (Dysuria)

Dose: ½ to 1 g daily in divided dose.

Anupāna: Warm water, Ghṛta.

TAILA

General Descripition:

Tailas are preparations in which Taila is boiled with prescribed liquid media [Svarasa / Kaṣāya 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]
    And, occasionally,
    d. 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 Kṣīra or Dadhi or Māṃsa 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 numbers 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 [Kvātha 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 throughout 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 Pāka should be carried out on a mild to moderate flame.
8. Three stages of Pāka are specified for therapeutic purposes.

   a. Mṛdu 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 *Pāna* [Internal administration] and *Vasti* [Enema].

   c. Khara Pāka*:* Further heating of the Taila, leads to Khara Pāka. Kalka becomes brittle when rolled in between fingers. The Taila obtained at this stage is used only for Abhyaṅga [External application].

9. The period of Pāka depends upon the nature of liquid media used in the process.

   a. Takra or Āranāla 5 Nights

   b. Svarasa 3 Nights

   c. Kṣīra 2 Nights

10. Pātrapāka*:* 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.

44. BALĀGUḌŪCYĀDI TAILA

AFI, Part-I, 8:34

Definition:

BALĀGUḌŪCYĀDI 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	Sida cordifolia Linn.		(Rt.)	256 g
2.	Guḍūcī	Tinospora cordifolia (Willd.) Miers.	(API-Vol:1/41)	(St.)	256 g
3.	Surapādapa (Devadāru)	Cedrus deodara (Roxb.) Loud	(API-Vol:4/23)	(Ht.Wd.)	256 g
4.	Water for decoction	Water			12.29 l
	reduced to				3.072 l
5.	Jaṭā (Jaṭamāṃsī)	Nardostachys jatamansi DC	(API-Vol:1/51)	(Rt./Rz.)	16 g
6.	Āmaya (Kuṣṭha)	Saussurea lappa CB. Clarke	(API-Vol:1/76)	(Rt.)	16 g
7.	Candana (Raktacandana)	Pterocarpus santalinus Linn.	(API-Vol:3/155)	(Ht.Wd.)	16 g
8.	Kunduruṣka (Kunduru)	Boswellia serrata Roxb	(API-Vol:4/50)	(Exd.)	16 g
9.	Nata (Tagara)	Valeriana wallichii	(API-Vol:1/109)	(Rt./Rz.)	16 g
10.	Aśvagandhā	Withania somnifera Dunal	(API-Vol:1/15)	(Rt.)	16 g
11.	Sarala	Pinus roxburghii Sargent.	(API-Vol:3/189)	(Ht.Wd.)	16 g
12.	Rāsnā	Pluchea lanceolata Oliver & Hiem.			
		[Alpinia galanga (Official Substitute)]	(API-Vol:3/162)	(Rz.)	16 g

13.	Taila (Tila)	Sesamum indicum linn	(API-Vol:4/128)	(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 Tila (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 Tila in a stainless steel vessel and heat it mildly.

Add increments of Kalka. Stir thoroughly while adding the Kaṣāya.
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 lakṣaṇa)*, 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.
Aflatoxins:		Appendix 2.7.

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

Therapeutic uses: In conditions of Vātarakta (Gout), Raktagata Vāta (Hypertension), Śopha (Oedema), Skandhagata Vāta (Frozen shoulder)

Dose: External application for Abhyaṅga.

45. DHĀNVANTARA TAILA (Synonym 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)	Sida cordifolia Linn.		(Rt.)	4.608 kg
2.	Water for decoction	Water			36.864 l
	reduced to				4.608 l
3.	Payaḥ (Godugdha)	Cow's milk			4.608 l
4.	Yava	Hordeum vulgare Linn	(API-Vol:2/175)	(Sd.)	59.07 g
5.	Kola	Zyzyphus jujuba Lam.	(API-Vol:3/94)	(Fr.)	59.07 g
6.	Kulattha	Vigna unquiculata (Linn.) Walp. (Dolichos biflorus)	(API-Vol:1/75)	(Sd.)	59.07 g
7.	Bilva	Aegle marmelos Corr	(API-Vol:4/10)	(Rt./St.Bk.)	59.07 g
8.	Śyonāka	Oroxylum indicum Vent.	(API-Vol:3/209)	(Rt./St.Bk.)	59.07 g
9.	Gambhārī	Gmelina arborea Linn	(API-Vol:4/31)	(Rt./St.Bk.)	59.07 g
10.	Pāṭalā	Stereospermum suaveolens (L.F) DC	(API-Vol:4/87)	(Rt./St.Bk.)	59.07 g
11.	Gaṇikārikā (Laghu Agnimantha)	Clerodendrum phlomidis Linn	(API-Vol:3/3)	(Rt./St.Bk.)	59.07 g
12.	Śālaparṇī	Desmodum gangeticum DC.	(API-Vol:3/178)	(Rt./St.Bk.)	59.07 g
13.	Pṛśniparṇī	Uraria picta Desv.	(API-Vol:4/99)	(Rt./St.Bk.)	59.07 g
14.	Bṛhatī	Solanum indicum Linn	(API-Vol:2/27)	(Rt./St.Bk.)	59.07 g

15.	Kaṇṭakārī	Solanum surattense Burm.f.	(API-Vol:1/59)	(Rt./St.Bk.)	59.07 g
16.	Gokṣura	Tribulus terrestis Linn	(API-Vol:1/40)	(Rt./St.Bk.)	59.07 g
17.	Water for decoction	Water			6.144 l
	reduced to				768 ml
18.	Taila (Tila)	Sesamum indicum linn	(API-Vol:4/128)	(Oil.)	768 ml
19.	Medā	Polygonatum cirrhifolium Royle.			
		[Asparagus racemosus (Official substitute)]		(Rt.Tr)	6 g
20.	Mahāmedā	[Asparagus racemosus (Official substitute)]		(Rt.Tr.)	6 g
21.	Dāru (Devadāru)	Cedrus deodara (Roxb.) Loud	(API-Vol:4/23)	(Ht.Wd.)	6 g
22.	Mañjiṣṭhā	Rubia cordifolia Linn.	(API-Vol:3/112)	(Rt.)	6 g
23.	Kākolī	Lilium polyphyllum D.Don.			
		Withania somnifera (Official substitute)	(API-Vol:3/79)	(Sub.Rt.)	6 g
24.	Kṣīrakākolī	Fritillaria royelei Hook			
		Withania somnifera (Official substitute)	(API-Vol:5/86)	(Sub.Rt.)	6 g
25.	Candana (Raktacandana)	Pterocarpus santalinus Linn.	(API-Vol:3/155)	(Ht.Wd.)	6 g
26.	Śārivā (Śveta Sārivā)	Hemidesmus indicus (Linn.) R.Br.	(API-Vol:1/107)	(Rt.)	6 g
27.	Kuṣṭha	Saussurea lappa CB. Clarke	(API-Vol:1/76)	(Rt.)	6 g
28.	Tagara	Valeriana wallichii	(API-Vol:1/109)	(Rt./Rz.)	6 g
29.	Jīvaka	Malaxis acuminata D.Don			
		Pueraria tuberose (Official substitute)	(API-Vol:5/52)	(Rt.Tr.)	6 g
30.	Ṛṣabhaka	Pueraria tuberose (Official substitute)			6 g

31.	Saindhava lavaṇa	Rock Salt			6 g
32.	Kālānusārī (Tagara)	Valeriana wallichii	(API-Vol:1/109)	(Rt./Rz.)	6 g
33.	Śaileya	Parmelia perlata (Huds.) Ach.	(API-Vol:3/172)	(Pl.)	6 g
34.	Vacā	Acorus calamus Linn	(API-Vol:2/168)	(Rz.)	6 g
35.	Agaru	Aquilaria agallocha Roxb.	(API-Vol:4/4)	(Ht.Wd.)	6 g
36.	Punarnavā (Rakta Punarnavā)	Boerhaavia diffusa Linn.	(API-Vol:3/157)	(Rt.)	6 g
37.	Aśvagandhā	Withania somnifera Dunal	(API-Vol:1/15)	(Rt.)	6 g
38.	Varī (Śatāvarī)	Asparagus racemosus Willd	(API-Vol:4/108)	(Rt.Tr.)	6 g
39.	Kṣīraśukla (Kṣīravidārī)	Ipomoea digitata Linn.	(API-Vol:5/88)	(Rt.Tr.)	6 g
40.	Yaṣṭī	Glycyrrhiza glabra Linn	(API-Vol:1/127)	(Rt.)	6 g
41.	Harītakī	Terminalia chebula Retz.	(API-Vol:1/47)	(P.)	6 g
42.	Bibhītaka	Terminalia bellerica Roxb.	(API-Vol:1/26)	(P.)	6 g
43.	Āmalakī	Emblica officinalis Gaertn. (Phyllanthus emblica)	(API-Vol:1/4)	(P.)	6 g
44.	Śatāhvā	Anethum sowa Roxb.ex Flem .	(API-Vol:2/153)	(Fr.)	6 g
45.	Sūrpaparṇi (Māṣaparṇī)	Teramnus labialis Spreng.	(API-Vol:3/118)	(Pl.)	6 g
46.	Elā (Sūkṣmailā)	Elettaria cardamomum (Linn.) R.Br.	(API-Vol:1/101)	(Sd.)	6 g
47.	Tvak	Cinnamomum zeylanicum Blume	(API-Vol:1/113)	(St.Bk.)	6 g
48.	Patra (Tejapatra)	Cinnamomum tamala (Buch-Ham)Nees & Eberm.	(API-Vol:1/115)	(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 Tila (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 Tila in a stainless steel vessel and heat it mildly.

Add increments of Kalka. Stir thoroughly while adding the two Kaṣāya.
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 lakṣaṇa)*, 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, reddish 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 doṣa), Pakṣavadha (Hemiplegia), Sarvāṅga Vāta (Quadriplegia), Dhātu Kṣaya (Tissue wasting), Sūtikā Roga (Puerperal diseases), Bāla Roga (Diseases of children), External application for Abhyaṅga

Dose: Internally 6 to 12 ml daily in divided doses; as well as external application Q.S.

46. GANDHARVAHASTA 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.	Gandharvahasta Mūla (Eraṇḍa)	Ricinus communis Linn	(API-Vol:1/34)	(Rt.)	4.800 kg
2.	Yava	Hordeum vulgare Linn	(API-Vol:2/175)	(Sd.)	3.072 kg
3.	Nāgara (Śuṇṭhī)	Zingiber officinale Roxb.	(API-Vol:1/103)	(Rz.)	96 g
4.	Water for decoction	Water			24.58 l
	reduced to				6.14 l
5.	Kṣīra (Godugdha)	Cow's milk			1.54 l
6.	Eraṇḍa taila	Ricinus communis Linn	(API-Vol:1/34)	(Oil.)	768 g
7.	Gandharvahasta mūla (Eraṇḍa)	Ricinus communis Linn	(API-Vol:1/34)	(Rt.)	192 g
8.	Śuṇṭhī	Zingiber officinale Roxb.	(API-Vol:1/103)	(Rz.)	48 g

Method of preparation:

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

Treat Eraṇḍa taila to prepare Mūrchita Eraṇḍa Taila (Appendix 6.2.8.1).

Pulverize the dried ingredients numbered 1 to 3 (*Kalka 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 lakṣaṇa)*.

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: Vidradhī (Abscess), Plīhā(Enlargement of spleen), Gulma (Abdominal lump), Udāvarta (Upward movement of gases), Śopha (Oedema), Udara (Diseases of abdomen), Mahāvāta Roga (Major neurological disorders)

Dose: 6 to12 ml daily in divided doses

Anupāna: Warm water.

47. KOṬṬAMCUKKĀDI TAILA

AFI, Part-I, 8:10

Definition:

KOṬṬAMCUKKĀDI 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.	Koṭṭam (Kuṣṭha)	Saussurea lappa CB. Clarke	(API-Vol:1/76)	(Rt.)	21.0 g
2.	Cukku (Śuṇṭhī)	Zingiber officinale Roxb.	(API-Vol:1/103)	(Rz)	21.0 g
3.	Vayambu (Vacā)	Acorus calamus Linn	(API-Vol:2/168)	(Rz.)	21.0 g
4.	Śigru	Moringa oleifera Lam	(API-Vol:4/114)	(St.Bk)	21.0 g
5.	Laśuna	Allium sativum Linn.	(API-Vol:3/108)	(Bl.)	21.0 g
6.	Kārtoṭṭi (Himsrā)	Capparis spinosa Linn.	(API-Vol:5/41)	(Rt.)	21.0 g
7.	Devadruma-(Devadāru)	Cedrus deodara (Roxb.) Loud	(API-Vol:4/23)	(Ht.Wd.)	21.0 g
8.	Siddhārtha (Sarṣapa)	Brassica campestris Linn.	(API-Vol:3/193)	(Sd.)	21.0 g
9.	Suvahā (Rāsnā)	Pluchea lanceolata Oliver & Hiem.			
		Alpinia galanga (Official substitute)	(API-Vol:3/162)	(Rz.)	21.0 g
10.	Tilaja (Tila)	Sesamum indicum linn	(API-Vol:4/128)	(Oil.)	768 g
11.	Dadhi (Godadhi)	Curd from cow's milk			768 g
12.	Ciñcā rasa (Ciñcā)	Tamarindus indica Linn	(API-Vol:4/14)	(Lf.)	3.072 g

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 Sarṣapa, dry, powder and pass through sieve number 85. Grind Laśuna and Sarṣapa 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 lakṣaṇa*)*, 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 (Diseases due to Vāta doṣa), Aṅgastambha (Stiffness of body), External application for Abhyaṅga

48. KṢĪRABALĀ TAILA

AFI, Part-I, 8:11

Definition:

KṢĪRABALĀ 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 kaṣāya	Sida cordifolia Linn.		(Rt.)	16 Parts
2.	Balā kalka	Sida cordifolia Linn		(Rt.)	1 Part
3.	Taila (Tila)	Sesamum indicum linn	(API-Vol:4/128)	(Oil.)	4 Parts
4.	Kṣīra (Godugdha)	Cow's milk			4 Parts
5.	Jala	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 (*Kalka 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 kaṣāya, 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 lakṣaṇa)*, 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 (Diseases due to Vāta doṣa), Śukra Doṣa (Vitiation of śukra dhātu), Rajodoṣa (Menstrual disorder), Kārśya (Emaciation), Svarabheda (Hoarseness of voice),
External application for Abhyaṅga, Nasya (Nasal drops), Pāna (Oral use), Bastiprayoga (Enema)

Dose: 6 to 12 ml daily in divided doses.

Anupāna: Warm water, milk.

49. SAINDHAVĀDI TAILA

AFI, Part-I, 8:60

Definition:

SAINDHAVĀDI 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 lavaṇa	Rock salt			28 g
2.	Arka	Calotropis procera (Ait.) R.Br.	(API-Vol:1/8)	(Rr.)	28 g
3.	Marica	Piper nigrum Linn.	(API-Vol:3/115)	(Ft.)	28 g
4.	Jvalanākhya (Citraka)	Plumbago zeylanica Linn	(API-Vol:1/29)	(Rt.)	28 g
5.	Mārkava (Bhṛṅgarāja)	Eclipta alba Hassk	(API-Vol:2/21)	(Pl.)	28 g
6.	Haridrā	Curcuma longa Linn.	(API-Vol:1/45)	(Rz.)	28 g
7.	Dāruharidrā	Berberis aristata DC	(API-Vol:2/33)	(St.)	28 g
8.	Taila (Tila)	Sesamum indicum linn	(API-Vol:4/128)	(Oil.)	768 g
9.	Jala	Water			3.072 l

Method of preparation:

Take all ingredient of pharmacopoeia quality.

Treat Tila Taila to prepare Mūrchita 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 pāka lakṣaṇa)* 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 Nāḍī Vraṇa (Sinus due to Kapha Doṣa and Vāta Doṣa)

Dose: As prescribed by the physician for Abhyaṅga (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.

50. DĀRVĪ MALAHARA (GEL)

Based on Caraka Cikitsa 25/93

Definition:

DĀRVĪ MALAHARA is a semisolid preparation made with the ingredients given in the Formulation composition.

Formulation Composition:

1.	Rasāñjana	Berberis aristata DC /B. asiatica/B. lycium	(API-Vol:2/33) Root extract	2 g
2.	Sphaṭikā	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	Water		100ml

Method of Preparation:

Preparation of Rasañjana:

Rasāñjana 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 Sphaṭikā (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 Rasāñjana 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 Sphaṭikā*:* 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:

pH (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: Śveta Pradara (Leucorrhoea), Yonikaṇḍū (Itching), Yoni śotha(Vaginitis and other wounds and ulcers)

Precaution: Discontinue if there is any irritation or discomfort.