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Standard Manufacturing Procedure Ofswarasa Bhavita Guduchi (Tinosporacordifolia Willd.) Churna Andguduchighana Prepared By Guduchi Swarasa

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ABSTRACT

Introduction: Guduchi(Tinospora cordifolia willd) is one of the most versatile rejuvenating plant, possessing numerous therapeutic attributes.Swarasa and Churnaform of this plant are commonly used but there are some demerits such as dose and unpleasant palatability.So, two dosage forms of Guduchi were developedby adopting Ayurvedic pharmaceutical process of Ghana(aqueous extract) and Bhavana (soaking) to overcome it.Till date no work has been done on Swarasa Bhavita Guduchi Churna prepared by soaking method and Guduchi Ghanaprepared fromGuduchi Swarasa.**Aim:**To developaStandardManufacturingProcedure (SMP)ofSwarasa Bhavita Guduchi Churna andGuduchi Ghana prepared from Guduchi Swarasa.**Materials and Methods:**Three batches of Swarasa Bhavita Guduchi Churna were prepared followed by Swarasa preparationandChurna preparation as per the reference of Bhaishajya Ratnavali.Three batches of Guduchi Ghana prepared from Guduchi Swarasa were prepared as per the reference of Sharangadhara Samhita.**Result:**Average increase yield after each Bhavana of three batches in Swarasa Bhavita Guduchi Churna was 26.4 %. Average yield % and time durationof three batches of Guduchi Ghanaprepared from Guduchi Swarasawas 5.25% and 11hrs 36 min respectively.**Conclusion:**The method of preparation given in the current study forSwarasa Bhavita Guduchi Churna andGuduchi Ghana prepared from Guduchi Swarasa may be considered as standard for future researches.

KEYWORDS: Guduchi, Swarasa,Ghana, Bhavana,Standard manufacturing procedure

I. INTRODUCTION

Guduchi is an important medicinal plant and widely distributed in India, commonly known as Giloya. It is described as‘Amrita’ means “divine nectar” referring to the life restoring. Guduchihas been acclaimed as a highly potential drug in Ayurveda, for preservation of health, prevention of disease and curative measures. In present time, this drug has been subjected to numerous chemical, pharmacological, pre-clinical and clinical investigations and large amount of compilatory work available on the same. The aqueous fraction of Tinospora codifolia stem part is effective in ameliorating immunosuppressive effect and prevents pathogenic insults in immune compromised stage.

In Ayurveda different types of dosage forms are described for diverse therapeutic purpose in various classics and method of preparation of all the dosage form are different. Panchavidha Kashaya Kalpana (five primary dosage form) are the basis of Ayurvedic preparations, it has some drawbacks such as non-availability of crude drugs all the time, very short shelf-life, inconvenient taste and dose. To counteract these problems, Upakalpana (secondary formulation) were developed by using these basic Kalpana like Ghana (aqueous extract), Churna (powder),Avaleha (paste form) and many more.Another aim behind the development of Upakalpana seems to enhance the potency.

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Swarasa is acknowledged as one of the most important dosage forms by all the seers of Ayurveda, who advocated it for varioustherapeutic purposes. Apart from its use in therapeutics, Swarasa have been used in Bhavana(soaking), Shodhana(purification), Marana(incineration) of different metals, minerals and Visha Dravya(poisonous substance).But there are some demerits of Swarasa Kalpanadue to shelf life, difficulty in portability, unpleasant palatability and large dose,so modification withoutchanging its efficacy is need of hour in today's era. Thus, theBhavanato any material with Swarasa of material having same property will enhance its quality and makes it potential in fewer doses. In current era Ghana is widely used dosage form. Especially Guduchi Ghana is commonly recommendeddue to its therapeutic efficacy. Considering this, an attempt has been made to develop standard manufacturing procedure (SMP) of Swarasa Bhavita Guduchi Churna (SBGC) and Guduchi Ghana prepared from Guduchi Swarasa(GGGS).

II. AIM

To develop standard manufacturing procedure ofSwarasa Bhavita Guduchi Churnaand Gududchi Ghana prepared from GuduchiSwarasa.

III. MATERIAL AND METHODS

The whole pharmaceutical processwas arranged in the following twosteps i.e. Procurement of raw material with its authentication and preparation of drug.

Procurement and authentication of the raw material

The fresh samples of Guduchi stem were procured from Junagadh, Gujarat in the month of March 2022 by adopting Good Collection Practices guidelines.Identification and authentication of the Guduchi stem was done at Pharmacognocy laboratory of upgraded department of Dyavyaguna, Government Ayurved College Vadodara, Gujarat.

Preparation of drug

Pharmaceutical proforma was prepared for maintaining SMPs during pharmaceutical process. Total 3 batches of SBGC and GGGS each were prepared by reference of Bhaishajya Ratnavali and Sharangdhara Samhita respectively. Before dealing with main pharmaceutical process, pilot studies were carried out to investigate the possible common problems which may impact the process.

All the samples of SBGC and GGGS were prepared in pharmaceutical laboratory of upgraded department of Rasashastra and Bhaishajya Kalpana, Vadodara, Gujarat.

The whole pharmaceutical procedure was carried out in following headings;

- PreparationofGuduchi Swarasa
- Preparationof Guduchi Churna
- Preparationof Swarasa Bhavita Guduchi Churna (SBGC)
- Preparationof Guduchi Ghana prepared from Guduchi Swarasa(GGGS)

First pilot batch was prepared as per the prepared proforma and findings obtained from that pilot batch; main batches were prepared by the adopting the same method to attain the reproducibility of that method.(Equipment specification was given in annexure 1.)

Preparation of Swarasa

Fresh Guduchi stems were taken and cleaned well with water for 3 times. Then they were converted into small pieces (avg. size of 1 inch) with the help of cutter. After that the pieces of Guduchi stem were made into paste form in mixer by adding equalamount of water.Then paste was squeezed with the help of cotton cloth and green colored liquid (GuduchiSwarasa) was obtained.The pilot study revealed that only 45 % yield of Guduchi Swarasa was obtained. On the basis of these observations, decided to make 2nd pilot batch with double quantity of water. The pilot study revealed that more yield (93.12 %) was obtained in adding 2 times of water in Guduchi stem. On the basis of these observations 2nd batch was selected for the preparation of main batches. (Figure 1)

In accordance with the requirement of Guduchi Swarasa, total 3 batches for SBGC and 3 batches for GGGS were made by adopting the same procedure mentioned in pilot batch and data are enlisted in table no. 1.

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Table No. 1: Name and quantity of ingredients with their part used for Guduchi Swarasa

Sr. no.	Ingredients	Part used	Ratio	Quantity					
				SBGC			GGGS		
				Batch 1	Batch 1	Batch 1	Batch 1	Batch 2	Batch 3
1	Fresh Guduchi	Stem	1	500 g	500 g	500 g	20 Kg	20 Kg	20 Kg
2	Water	-	2	1000 ml	1000 ml	1000 ml	40 L	40 L	40 L

Preparationof Guduchi Churna

30 kg fresh Guduchi stems were taken and washed with water for 3 times. Guduchi stem was chopped into small pieces of uniform size, 1 inch (approx.). Chopped pieces were placed in a tray and dried under sun light. After proper drying, grinding process was carried out in pulverizer. Then it was sieved through 80#. After that it was stored into airtight glass container. (Figure 2)

Preparationof Swarasa Bhavita Guduchi Churna

Before preparing final batches, two pilot batches were prepared to decide whether to take the Guduchi Churna by weight or by volume. So in pilot batch – 1, Guduchi Churna was taken in weight and in pilot batch – 2, Guduchi Churna was taken in volume and yield % of both batches was compared.The weight of Guduchi Churna after 7 Bhavana increased by 19.5% in pilot batch 1 and 28 % in batch 2. On the data available in pilot batch 2 main batches were prepared.

Previously prepared Guduchi Churna was taken in s.s.tray and spread it. Previously prepared Guduchi Swarasa was added in Guduchi Churna and mixed well. Then it was dried under sunlight for 24 hour. After drying, it was crushed in a mixer grinder. Then it was weighed and again spread in s.s. tray and added Guduchi Swarasa. This whole process was repeated for six times. After complete drying it was collected as Swarasa Bhavita Guduchi Churna.After that it was stored into airtight glass container. (Figure 3)

Total 3 batches were made by adopting the same procedure mentioned above and data are enlisted in table no. 2.

Table No. 2. : Name and quantity of ingredients with their part used for SBGC

Sr. no.	Ingredients	Part used	Quantity					
			Batch 1		Batch 2		Batch 3	
			W/V	V/V	W/V	V/V	W/V	V/V
1	Guduchi Churna	Stem	500 g	1000 g	500 g	1000 ml	500 ml	1000 ml
2	Guduchi Swarasa	Stem	1000 ml	1000 ml	1000 ml	1000 ml	1000 ml	1000 ml

Preparation of GuduchiGhanaprepared from Guduchi Swarasa

A pilot study was carried out in order to have idea about the duration of the entire process as well as to identify the heating pattern could be occurred during processes and vessels specifications.

Previously prepared GuduchiSwarasa was used to prepare GuduchiGhana.GuduchiSwarasa was subjected to the mild flame in s.s. vessel. Then it was stirred intermittently and temperature was measured. When consistency became thicker, temperature was gradually reduced. Heat was stopped when most of the water was evaporated.Ghana was collected in a food grade plastic lined s.s. tray and spread in very thin layer. Then it was subjected to dry in a hot air oven, at 50°C temperature for 3 hours. After complete drying it was scrapped and collected as Guduchi Ghana.After that it was stored into airtight glass container.(Figure 4)

On the basis of these observations pilot batch was selected for the preparation of main batches. Total 3 batches were made by adopting the same procedure mentioned in pilot batchand data are enlisted in table no. 3.

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Table No. 3: Name and quantity of ingredients with their part used for GGGS

Sr.no.	Ingredients	Part used	Quantity			
			Batch 1	Batch 2	Batch 3	Average
1	Guduchi Swarasa	Stem	38.250 L	38.450 L	38.350 L	38.350 L

IV. OBSERVATIONS AND RESULTS

When Guduchi stem was made into paste form, it became yellowish green in color and sticky in touch.Yellowish white colored residue was obtained after squeezing the Swarasa from the paste.Characteristic smell of Guduchi Swarasa was felt during preparation. During squeezing process consistency of Guduchi Swarasa was felt viscous. Results obtained during preparation Guduchi Swarasa are mentioned in table no. 4-5.

Table No.4: Average results of all batches of Guduchi Swarasa for SBGC

Parameters	Results							
No. of Bhavana	1st	2nd	3rd	4th	5th	6th	7th	Average
Total quantity of fresh Guduchi stem (g)	500	500	500	500	500	500	500	500
Average size of the pieces of the stem (inch)	01	01	01	01	01	01	01	01
Total quantity of water (ml)	1000	1000	1000	1000	1000	1000	1000	1000
Total time taken for procedure (hrs:min)	00:45	00:45	00:46	00:45	00:47	00:45	00:46	00:45
Total quantity of Swarasa obtained (ml)	1116	1100	1056	1096	1110	1120	1118	1102
Total quantity of Swarasa obtained (%)	111.6	110.0	105.6	109.6	111.0	112.0	111.8	110.1
Weight of residue after filtration (g)	451	459	443	445	463	440	445	449

Table No. 5: Results of Guduchi SwarasaforGGGS

Parameters	Results			
	Batch 1	Batch 2	Batch 3	Average
Initial quantity of fresh Guduchi stem (Kg)	20	20	20	20
Average size of the stem pieces (inch)	01	01	01	01
Total quantity of water (L)	40	40	40	40
Total time taken for preparation of Swarasa (hrs:min)	06:00	05:50	06:10	06:00
Total quantity of Swarasa obtained (L)	38.250	38.450	38.350	38.350
Total quantity of Swarasa obtained (%)	95.62	96.10	95.87	95.86
Weight of residue after filtration (Kg)	22	21.880	21.780	21.886

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After complete drying, the color of Guduchi stemchanged from green to light green. Weight of Guduchi stemwas reduced after drying. Characteristic smell of Guduchi was felt during grinding. The color of Guduchi powder was creamish yellow. Results obtained during preparation of Guduchi Churna are mentioned in table no.6.

Table No. 6. : Results of Guduchi Churna

Parameters	**Results**
Weight of fresh Guduchi stem (Kg)	30
Total time taken for preparation of GuduchiChurna (days)	17
Total time taken for drying (days)	16
Weight of Guduchi stem after drying (Kg)	7.14
Weight of Guduchi stem after pulverize (Kg)	7.12
Loss during drying process (Kg)	22.86
Loss during powdering process (Kg)	0.018
Total weight loss (Kg)	22.87
Yield after drying process (%)	23.80
Yield after pulverizing process (%)	23.74
Loss (%)	76.26
Reason of loss	Due to loss on drying and powdering process

During the preparation of SBGC average 26.4 g weight was increased after each Bhavana. Color of Guduchi Churna became more creamish after each Bhavana. After end of each Bhavana some doughy granules were seen in BhavitaGuduchiChurna.

Table No.7: Average results of all batches of SBGC

Parameters	**Results**						
No. of Bhavana	**1st**	**2nd**	**3rd**	**4th**	**5th**	**6th**	**7th**
Volume of Guduchi Churna (ml)	1000	1038	1080	1117	1155	1196	1228
Amount of Swarasa (ml)	1000	1000	1000	1000	1000	1000	1000
Duration of soaking(hr:min)	24:00						
Volume after drying(ml)	1038	1080	1117	1155	1196	1228	1265
Gain in volume (ml)	38	42	37	38	41	32	37
Total gain in volume (ml)	265						
Initial weight of Guduchi Churna before Bhavana (g)	500	519	540	558	577	597	613
Final weight of Guduchi Churna after Bhavana (g)	519	540	558	577	597	613	631
Gain in weight (g)	19	21	18	19	20	16	18
Total gain in weight (g)	131						
Weight gain in %	26.4						

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During the preparation of GGGS after 30 minutes of heating, the color of Guduchi Swarasa turned yellowish green from green.After 2 hours of boiling, yellowish green colored layer was observed on liquid.After 5 hours of boiling, very sticky nature of liquid was observed during rubbed between two fingers.After 7 hours of heating, stickiness of the liquid and adhesiveness to the vessels was increased.Consistency of liquidsubsequentlyturned into semisolid form. After drying in the oven color of Ghana was changed brownish green to brownish black. Results obtained during preparation of GGGS are mentioned in table no. 6 and temperature pattern recorded during the preparation are shown in graph no.1

Table No. 8: Results of Guduchi Ghanaprepared from Guduchi Swarasa

Parameters	Results			
	Batch 1	Batch 2	Batch 3	Average
Initial quantity of fresh Guduchi stem(Kg)	20	20	20	20
Total time taken for preparation of Ghana (hrs:min)	11.35	11.47	11:26	11.36
Final quantity of fresh Ghana obtained (Kg)	3.070	3.110	3.090	3.09
Fresh Ghana obtained (%)	15.35	15.55	15.45	15.45
Quantity of dried Ghana obtained before grinding (Kg)	1.011	1.070	1.075	1.050
Final quantity of dried Ghana powder obtained (Kg)	1.008	1.068	1.072	1.049
Weight of residue (Kg)	0.002	0.002	0.003	0.002
Total time taken for drying (day)	01	01	01	01
Dried Ghana obtained in (%)	5.05	5.35	5.37	5.25

V. DISCUSSION

Fresh Guduchi was taken in present study as per classical guideline –'Sadaiva ardra prayojyeta' (always use in fresh state). 'Angustha Pramana' (thumb size or medium size) stems were selected for study. To develop SMP, 3 batches of Guduchi Swarasa, SBGC and GGGS were prepared.

In the preparation of Guduchi Swarasaproportion of water for Swarasa extraction is not mentioned in the classic. So the pharmaceutical procedure was designed as per data available in pilot batches. Here two pilot batches for preparation of Guduchi Swarasa were prepared. Before the preparation of Swarasa, separation of physical impurities for quality maintenance, specific size reduction (1 inch) up to a certain extent to facilitate proper extraction of Swarasa. The diameters of the stem, size of the pieces were maintained uniformly in all batches. Particle size reduction provides a large surface area for drug to interact with water for adequate transfer of active constituents for better extraction. In pilot batch 1, ratio of water was equal to Guduchi stem (1:1) but due to high amount of fibrous material available in Guduchi stem yield of Swarasa was only 45 %. Then pilot batch 2 was prepared, here ratio of water was double to Guduchi stem (1:2). Obtained yield was 93.12 % in pilot batch 2.On the basis of yield %2ndpilot batch was selected for the preparation of main batches.

The preparation of Guduchi Swarasa included washing and cutting of Guduchi stem, followed by grinding it in a mixer with water after that it was squeezed through cotton cloth. It was observed that yellowish green color with viscous nature of GuduchiSwarasa due to natural color and viscous property of berberine. An average yield percentage was 110.10 %.Due to the manual squeezing of the Guduchi Swarasa, a small variance in the yield percentages was seen. The reason of loss was due to some portion of water absorb by fibrous material.

Before the preparation of SBGC preparation of Guduchi Churna was done and obtained yield % was 23.80 %.

Before preparing final batches of SBGC, two pilot batches were prepared to decide whether to take the Guduchi Churna by weight or by volume; because the volume of weighted Guduchi

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Churna was doubled [Guduchi Churna (sieved through 80#) 125 g = 250 ml)]. So in pilot batch – 1, Guduchi Churna was taken in weight and in pilot batch – 2, Guduchi Churna was taken in volume and yield % of both batches was compared.The weight of Guduchi Churna after 7 Bhavana increased by 19.5% in pilot batch 1 and 28 % in batch 2. On the basis of yield % 2nd pilot batch was selected for the preparation of main batches.

During the preparation of SBGC, weight of Guduchi Churnawas increased by 26.4 % after 7 Bhavana.After drying in sunlight for 24 hour weight of Bhavita Churna was increased after each Bhavana due to total solid content of Guduchi Swarasa.After completion of each Bhavana, some doughy granules were seen due to the unctuous nature of Guduchi Swarasa.

Before the preparation of final batches of GGGS one pilot batch was prepared and 5% yield was obtained. Total time taken for the preparation was 1 day.Inthe preparationGhanait was decided to give a higher temperature of 297°C (flame temperature) because after 6 hours stickiness and adhesiveness of liquid was increased. On the basis of pilot batches main batch were prepared.

During the preparation of GGGS,average range of temperature of both liquid media and flame were 35-95°C and 221-297°C respectively (Graph no. 1). It was stirred intermittently to prevent Guduchi Swarasa from sticking to the bottom of s. s. vessel. After 2 hours of boiling, yellowish green colored layer was observed on liquid media due to concentration of solid content and that time temperature of liquid media was 81°C. After 7 hours of heating, stickiness of the liquid and adhesiveness to the vessels was increased due to maximum portion of water was evaporated and that time temperature of liquid media was 92°C. Heating was stopped when most of the water was evaporated. Ghana was collected in a s.s. tray and spread it in very thin layer because minimum thickness of layer helped in drying process and for easy scrapping of Ghana food grade plastic was placed underneath in a tray.Then it was subjected to dry in a hot air oven, at 50°C temperature for 3 hours for evaporation of remaining portion of water. After complete drying it was scrapped and collected as Guduchi Ghana in air tight container because it is very hygroscopic in nature. It should be stored in air-tightglass containers to prevent atmospheric reactions. After drying, color of Guduchi Ghana was dark brown with a characteristic odor of GuduchiGhana. An average yield before drying and after drying was 15.45 % and 5.25% respectively.

VI. CONCLUSION

The findings of present study ensure the uniformity in the operative procedures, thus the present SMP of Swarasa Bhavita Guduchi Churna andGuduchi Ghana prepared from Guduchi Swarasacan be adopted by future utilization in large scale production and the observations of present study can be considered as standards for further researches.

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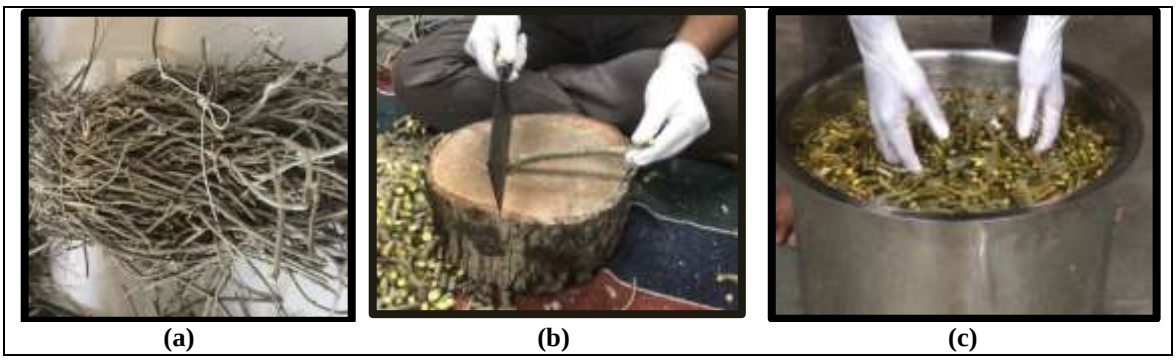

(a) **(b)** **(c)**

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(d) (e) (f)

Figure 1. Prepration of Guduchi Swarasa (a) IngredientsofGuduchi Swarasa (b) Cutting of Guduchi stem (c) Washing of Guduchi stem (d) Crushing of Guduchi stem (e) Squeezing of Guduchi stem (f)Guduchi Swarasa

(a) (b) (c)

(d) (e) (f)

Figure 2. Prepration of Guduchi Churna (a) IngredientsofGuduchi Churna (b) Cutting of Guduchi stem (c) Washing of Guduchi stem (d)Drying of Guduchi stem (e)Plverizing of Guduchi stem (f)Guduchi Churna

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Figure 3. Prepration of SBGC (a) IngredientsofSBGC (b)Adding Swarasa into Churna (c)After 6 hour of Bhavana (d)After 12 hour of Bhavana(e)After complete drying of Churna

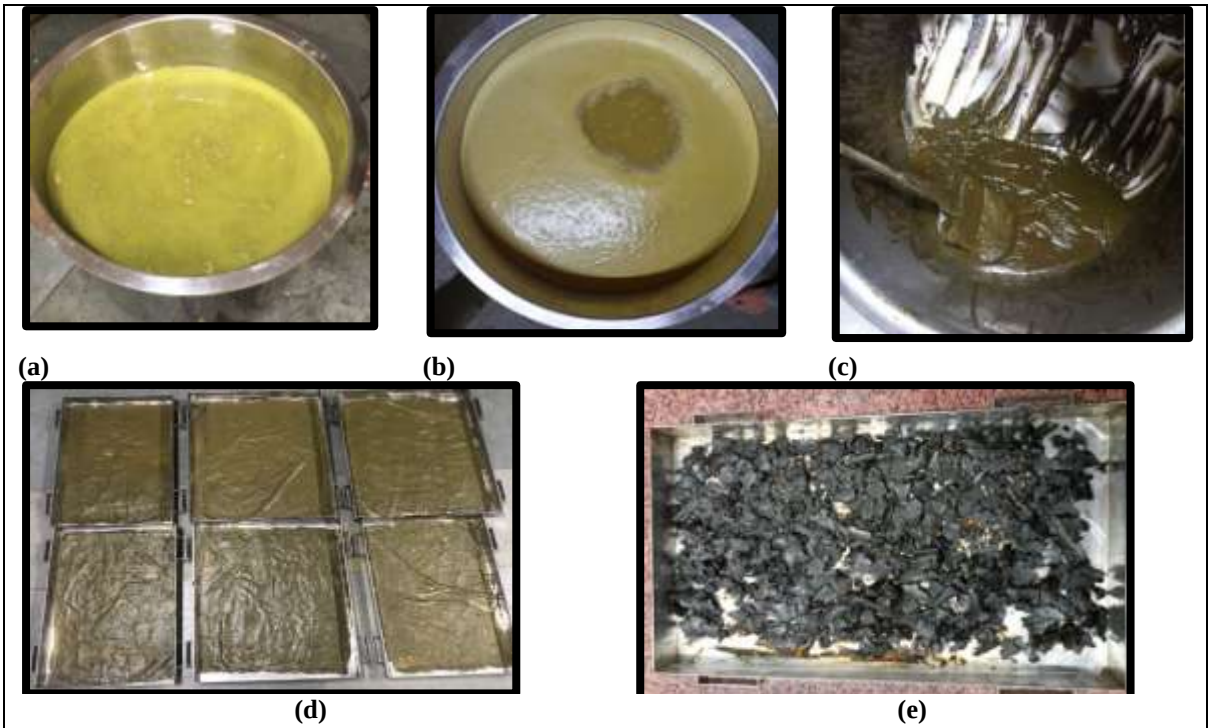

Figure 4. Prepration of GGGS (a) IngredientsofGuduchi Ghana prepared from Guduchi Swarasa (b) Heating of Guduchi Swarasa (c) Thick consistency of Guduchi Swarasa (d) Spreading of Guduchi Ghana (e) After drying Guduchi Ghana

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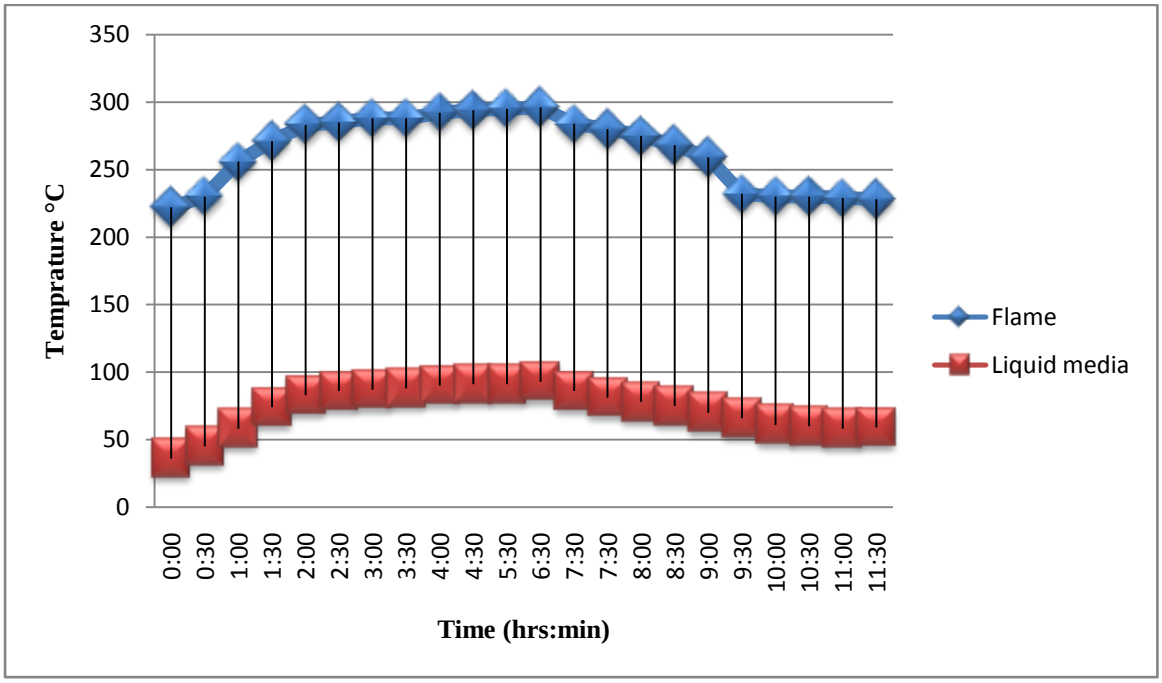

Graph 1: Showing temperature chart of GGGS

ANNEXURE 1

Equipment with their specification

Sr. No.	Equipment	Specifications
1.	Cutter	Material - S.S. Length - 29 cm Width - 8 cm
2.	Vessels	Material - S.S. Depth- 29 cm Diameter - 50 cm Capacity- 50 L
3.	Mixer grinder	Eassy cook Motor - 2 Hp with 50 Hz Capacity - 1 Kg
4.	Cotton cloth	Material -Cotton Size -60 cm x 60 cm
5.	Measuring jar	Material –Plastic Capacity -5000 ml
6.	Electric weighing balance	Swisser Capacity - Max -10 Kg, Min - 1 g
7.	Gas stove	Prestige gas cooktops Model no.: Gas Top (GT – 01) Ignition mode - electro burner supply by LPG gas line
8.	Spatula	Material - S.S. Handle - Length - 54 cm, Width - 8.5 cm Turner - Length - 8 cm Width - 2.8 cm
9.	Tray	Material - S.S. Length - 60 cm

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		Width - 33 cm Depth - 5 cm
10.	Oven	Stardy elegant & Raliable 440 Volts with 3 KW/HP
11.	Sieve	185 MIC - Standard test sieve Nominal mesh aperture size - 75 micrometer
12.	Infrared thermometer	Flake 64 Max - 30 °C to 600 °C
13.	Pulverizer	Scholars labs - 240 Vit
14.	Mixer grinder	Eassy cook Motor - 2 Hp with 50 Hz Capacity - 1 Kg

REFERENCES

[1]. Avanish k upadhyay et al.Tinospora cordifolia (Willd.) Hook. f. and Thoms. (Guduchi) – Validation of the Ayurvedic pharmacology through experimental and clinical studies. IJAR 2010 1(2): 112–121.
[2]. Sengupta et al. BMC complementary and alternative medicine 2011, 11-102http://wwwbiomedcentral.com/1472-6882/11/102
[3]. Dr. Shrivastava Shailaja. Sharangdhar Samhita. 2nd edition. Madhyamkhand, verse11th chapter. Varanasi: Chaukhamba orientalia; 1998, Pg. 137.
[4]. Agnivesha, Caraka Samhita, Hindi commentary by Kashinath Shastri and Gorakhanatha Chaturvedi, kalp 12/48, 2018, Varanasi: Chaukhambha Bharti Academy, p. 645.
[5]. Sharangadhar Samhita of Acharya Sharangadhar , along with Dipika Tika of Acharya Adhmalla & Gudharthdipika Tika of Pandit Kashiram edited by Vidhyasagar Pandit Parshuram Shashtri. Purva Khanda Ch.1 Ver. 45-47 , Varanasi: Chaukhamba Surbharti Prakashan; print 2018. p.21
[6]. Acharya YT. Siddha Yoga Sangraha. 13th ed, Nagpur: Shri Baidhnath Ayurved Bhavan Ltd; 2008. Jwaradhikar, 1. p. 4.
[7]. https://www.ajchem-b.com/article_118153_279d0a0375a7f465e45b524d18e439d4.pdf
[8]. https://www.sciencedirect.com/topics/chemistry/berberine