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PHARMACEUTICAL STANDARDIZATION OF GUDUCHI SATVA AND GUDUCHI GHANA KALPANA PREPARED FROM *TINOSPORA CORDIFOLIA*

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ABSTRACT

Pharmaceutical standardization of *Ayurvedic* medicines is necessary to ensure quality, safety and efficacy of drugs. An immense valuable and powerful medicine in the form of metals, minerals and plants are found in the nature. But, most of the drugs as such are not absorbable into the biological systems until & unless they have certain modifications. The specialized techniques to make these drugs absorbable therapeutically or clinically viable is called pharmaceutical process. Even a small dose of drug may give powerful action, by carrying out these pharmaceutical processes. In *Bhaishajaya kalpana* **Satva** words denotes herbal preparations Eg. *Nimbuk satva, Guduchi satva* etc. Description of satva was firstly found in *Yogaratanakar* in *Rajakshama Chikatsa* in context of *Guduchyadi modak*, same quotations were mentioned in A.F.I. In A.F.I. standard procedure of preparation was also mentioned. Important Therapeutic Use of *Guduchi satva: Kshaya* (Pthisis), *Raktapitta* Bleeding disorder), *Padadaha (*Burning sensation of feet). Some properties of *Guduchi satva* mentioned in *Yogaratanakar* in *Praibhasa Prakarana* these are as follows; Strong antipyretic, If taken in proper age, then acts as *Rasayana*, Useful in *Jawara Daha, Prameha, Aruchi, Trusha, Swasa, Pandu, Arsha, Hikka,* Leucorrhoea in females. The colour of final product was pure white. **Ghana** is concentrated form of dosage forms, which is mostly used for internal administration. In our classics, *Rasakriya* is also considered as *Phanita, Avaleha* and *Ghana*, because their method of preparation is almost the same with

minor variations. **Ghana Kalpana:** *Kwatha* and others (*Swarasa, Kalka* etc.) when further processed with heat become thicker and thicker in consistency (viscous- to - semisolid- to solid) that is termed as *Rasakriya.* Thus, the herbal liquid material with the help of heat is processed till it solidifies, which ultimately can be made in to powder/tablet form, which is called **Ghana**. According to references *Ghana* is more solid than *Avaleha*. Fine powdered *Ghana* was dark brown in colour.

KEYWORDS: Guduchi, Satva Kalpna, Ghana Kalpana, Standardization ***Tinospora Cordifolia*.”**

INTRODUCTION

Pharmaceutics is the science of drugs, their discovery and uses the general aspects of the how and why of drugs. Knowledge of pharmaceutics is an essential element in medical practice and is the basis for the discovery of new medicines. Before going through preparations of any drug, one has to concentrate over all the matters related to that particular drug like, collection of raw drugs, tests about genuineness of it, different process of purification, special methods of mixing and so on. Regarding the above mentioned aspect, pharmaceutical standardization of *Ayurvedic* medicines is necessary to ensure quality, safety and efficacy of drugs. An immense valuable and powerful medicine in the form of metals, minerals and plants are found in the nature. But, most of the drugs as such are not absorbable into the biological systems until & unless they have certain modifications. The specialized techniques to make these drugs absorbable therapeutically or clinically viable is called pharmaceutical process. Even a small dose of drug may give powerful action, by carrying out these pharmaceutical processes. A full conception of the science will never be attained by the knowledge of only a part of science. Preparation of drug requires a great attention as the use of it, is related with someone’s life. It is a clear fact that theory and practical are two essential aspects of knowledge. Man cannot become perfect with the theoretical or practical knowledge alone. Physicians can fight against the diseases with the weapon of drug. Ultimately results of drugs always depend upon its preparation. **Guduchi**; **Botanical name**: *Tinospora cordifolia*, **Family**: Menispermaceae, **Parts used**; Stem, leaf, Areal root, starch., **Synonyms:** *Amruta, Bhisakpriya Chakrangi Chakra lakashana, Chinnaruha, Madhuparni Vatasadani, Tantrika, Kundalani, Tantrika, Vishagni Rasayani,* **Description:** Macroscopic: Drug occurs in pieces of varying thickness ranging from 0.6-5 cm in diameter, young stems green with smooth surfaces and swelling at nodes, older ones show a light brown surface marked with warty

protuberances due to circular lenticels, transversely smoothened surface shows a radial structure with conspicuous medullary rays traversing porous tissues, taste bitter. **Chemical Composition:** Various constituents has been reported in stem. These are A-glucosides; alkaloidal constituents (Including berberine); three crystalline substance; two bitter principlesand a neutral fatty acid. The presence of bitter principles columbin and palmarin in the drug has also been reported. In another study three bitter compounds named tinosoron' tinosporic acid and tinosporol have also been reported. Other constituents are tinosporine, tinosporide, tinosporaside, cordifol, heptasosand, alerdane furano diterpene, deterpenoid, furanolactone, tinosporidine, columbin and β-sitosterol. A kind of starch (*Guduchi satva*; yields 0.48% on fresh and 1.2% on day stem weight) is prepared from the aqueous extract of dry stem. The leaves are rich in protein and fairly rich in calcium and phosphours. **Properties and action:** *Tikta, Kashaya***,** *Laghu***,** *Ushna***,** *Madhura, Tridosha shamaka, Sangrahi, Balya, Deepana, Rasayana, Raktashodhaka, Jvaraghna* **Therapeautic properties and uses:** *Medhya, Rasayana, balya, Sthairyakara, grahi, deepana, Ayushprada, Hridaya, chakshushya, vayasthapana.* **Indications:** *Jawara, trishana, vatarakata, pandu, prameha, krimi, kasa, medoroga, kandu, visarpa, kamala, daha, kushta, chhhardi, rakatavikara, bhrama, hridroga, shwasha.* **Properties**: Immunomodulatory activity, antioxidant activity, anti – allergic activity, anti bacterial activity.

Ghana is concentrated form of dosage forms, which is mostly used for internal administration. In our classics, *Rasakriya* is also considered as *Phanita, Avaleha* and *Ghana*, because their method of preparation is almost the same with minor variations. **Ghana Kalpana:** *Kwatha* and others (*Swarasa, Kalka* etc.) when further processed with heat become thicker and thicker in consistency (viscous- to - semisolid- to solid) that is termed as *Rasakriya.* Thus, the herbal liquid material with the help of heat is processed till it solidifies, which ultimately can be made in to powder/tablet form, which is called **Ghana**. According to references *Ghana* is more solid than *Avaleha.* Fine powdered *Ghana* was dark brown in colour.

MATERIALS AND METHODS

1. Preparation of *Guduchi Satwa* in 3 batches(for sample 1),
2. Preparation of *Guduchi Ghana* in 3 batches (for sample 2)

PROCEDURE

GUDUCHI SATVA

REFERENCE: *Dravya Guna vigyana*[1] *Uttarardha* (2/ 108-109)

Ingredients: Guduchi stem -5kg

R O water -20l

Method of preparation

- *Fresh Guduchi* stem was collected, the physical impurities were removed & washed thoroughly with water.
- Cleaned stem were cutting in to small pieces 2-3 inches.(Average dia-2cm average length2.6cm)
- Five kg of *Guduchi* stem pieces were pounded in *khalwa* until fibers of stem got separated and the material becomes sticky.
- Four times R O Water(20 litres) was added into it and rubbed well with hands thoroughly and kept overnight for soaking.
- Next day the material was again well rubbed, until the sliminess disappears into the same water. Then fibers were removed and the remaining material was strained through clean cloth.
- The strained material was collected in a flat bottom stainless steel container and allowed for the sedimentation.
- When the solid particles in the materials were sedimented on the bottom of container, the upper liquid portion was decanted carefully. After decantation the starch obtained was again mixed with little quantity of water and allowed again for sedimentation and then liquid portion was removed by decantation process. Repeated washing and decantation were done, for 15 times. Then clear white starch was obtained.
- Obtained starch was taken in a SS plate and dried.
- The obtained *Satva* was stored in air tight bottle to avoid moisture absorption of *Satva*.

OBSERVATIONS

- During the initial stage of maceration the pulp was too slimy, as the procedure continued sliminess decresed and totally reduced after one hour of maceration.
- At the time of maceration the colour of water turned turbid.
- The colour of liquid after straining with four folded cloth was greenish brown.

- Additional amount of water was required for continuous decantation and sedimentation to obtain clear white satva.
- The colour of final3 product was pure white.

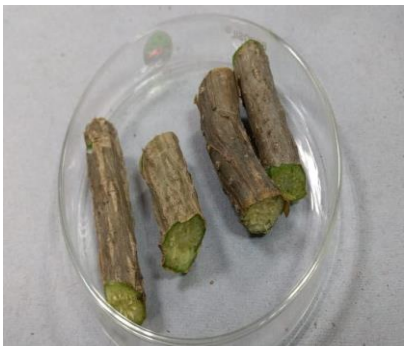
PRECAUTIONS

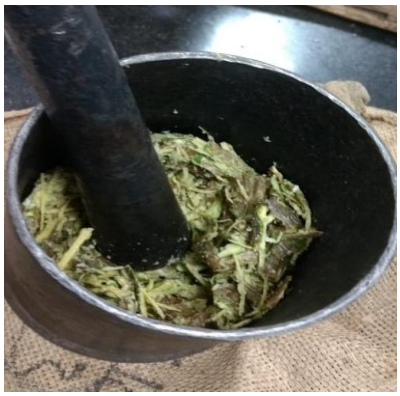
- Guduchi stem was crushed sufficiently.
- Maceration of the crushed gudichi stem was carried out till the whole sliminess disappeared
- Obtained satwa was properly dried to prevent contamination and deterioration.

Table No. 1: Process validation for *Guduchi Satva* (3 batches)

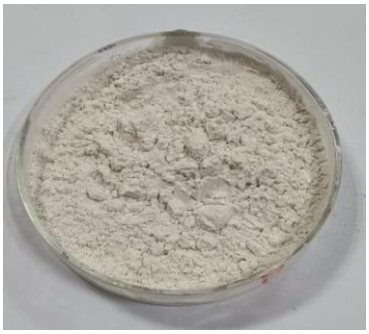
Parameters	Batch 1	Batch 2	Batch 3
Weight of fresh Guduchi stem	5 kg	5kg	5kg
Size of Guduchi stem pieces	2.6	4.2	2.6
Diameter of Guduchi stem pieces	2.1	2	1.9
Quantity of water used	20 lit	20 lit	20 lit
Duration(h)	*25*	*22*	*23*
Yield of Starch (*Satva*) obtained	121.8 g	90.1 g	30.9 g
Yield in %	2.4%	1.8%	0.61%

Guduchi Satva







GUDUCHI GHANA

Reference: *"Siddhayogasangraha*[2]*, jvaradhikar"*

Ingredients: Guduchi stem -5kg

R O water -20l

Method of preparation

- 5kg fresh *Guduchi* stem was collected andhe physica impurities were removed & washed thoroughly with water.
- Stem was cutt into pieces of 1-2 inches having 1.9-2.00 cm diameter and crushed thoroughly.
- four times of R.O. water (20 liter) was added in to crushed *Guduchi*.
- The contents were subjected to medium heat in SS vessel with continuous stirring.
- Water was evaporated slowly till its reduction to 1/4th and the *kwatha* was filtered through double fold cotton cloth to obtain *Guduchi Kwatha.*
- The *Guduchi Kwatha* was subjected to heat with constant stirring till the entire mass converted into semi solid state.
- The mass was shifted into a glass tray and placed in oven at 45^{o}C - 50^{o}C for complete drying.
- After complete drying it was collected, made into fine powder through mixergrinder, passed through 80 no. sieve and packed in air tight container.

General observations during preparation

- In the *Kwatha* preparation, during the onset of boiling, the liquid was light brownish green in colour and bitter in taste.
- Later the colour turned to dark green.
- Evaporation process started at 70^{o}C.
- Maximum temperature found in the liquid was in between 80^{o}C-90^{o}C.

- During the Ghana preparation, After 2 hours of boiling whitish froth was observed on liquid.
- After 3 hours, the liquid was found to be of viscous nature.
- After 4 hours of boiling increase in viscosity of the liquid was observed.
- After complete drying by dry oven method, the semisolid, sticky and greenish brown mass of *Ghana* turned to blackish brown.
- Fine powdered *Ghana* was dark brown in colour.

PRECAUTIONS

- All vessels washed properly before used.
- The size of Guduchi stem pieces was made into 1- 2 inches for proper crushing
- During boiling process liquid was frequently stirred to check frothing and liquid out of vessel.
- Heating process was done in between 95 ^{o} C-100 ^{o} C
- Continuous stirring of Kwatha was done to avoid burning of Kwatha.
- During final stage mild heat was given and continuous stirring was done to avoid adhesiveness to the vessel.
- To protect the material from direct heating, it was transferred into oven for drying.
- To remove the water content, drying process was done in oven in between 50^{0}C - 60^{0}C temperature.

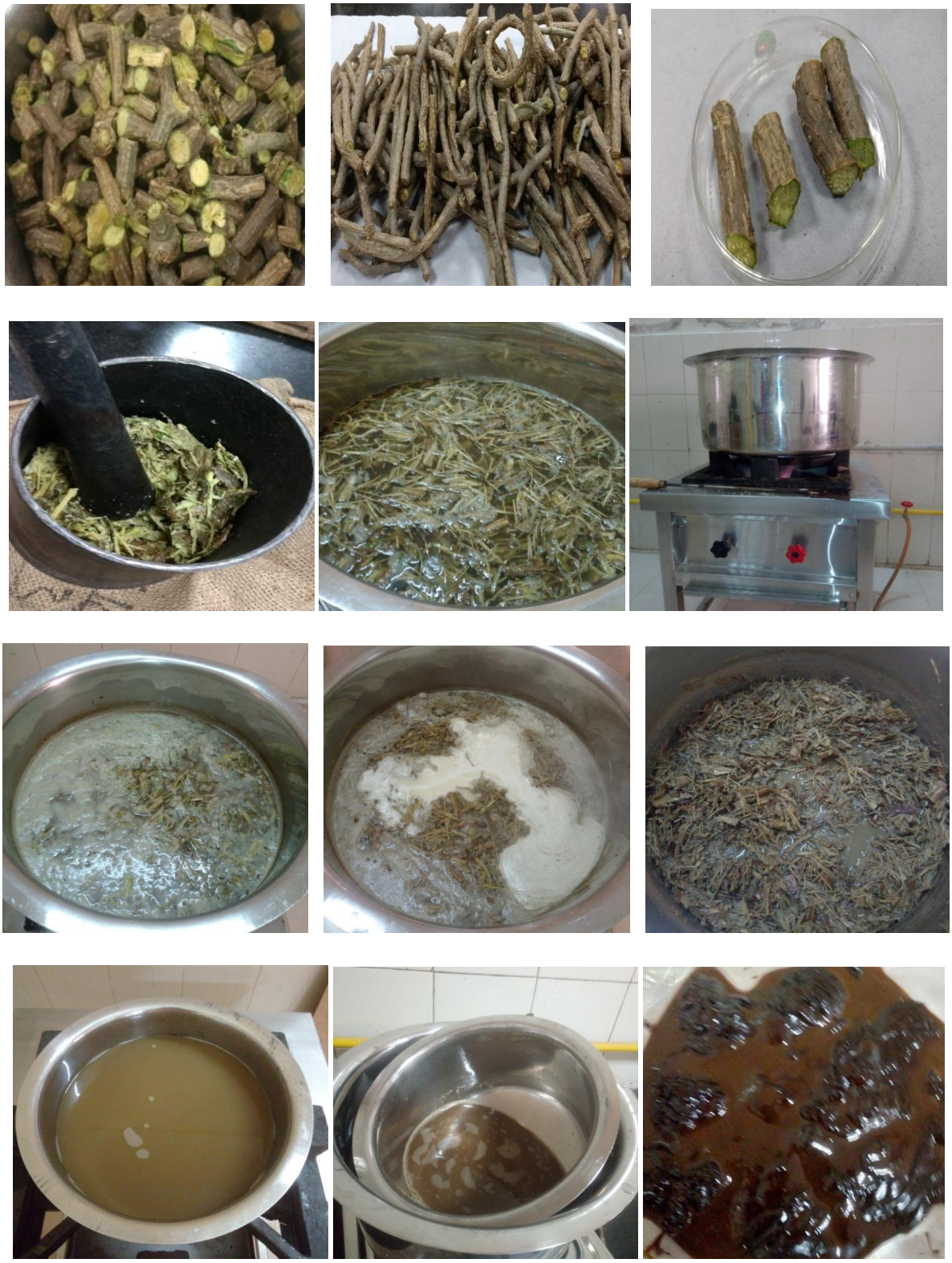
Table No. 2: Details of *Guduchi Kwatha* in different batches.

Batches	Initial qty. of Guduchi (kg)	Diameter of stem (cm)	Size of the pieces (inch)	Temperature (after 1 hour)	Obtained Kwatha (litre)	Total time taken for Kwatha preparation (h)
1.	5	2.0-2.1	1.0-2.0	80 – 90^{0}c	5.01	7
2.	5	2.0-2.1	1.0-2.0	80 – 90^{0}c	5.00	6
3.	5	1.9-2.0	1.0-2.0	80 – 90^{0}c	5.02	7

Table No. 3: Details of *Guduchi Ghana* in different batches.

Sl No	Parameters	Batch1	Batch 2	Batch 3
1	Total duration for *Ghana* Preparation (h)	6.00	7.00	6.30
2	Qty. of dried *Ghana* before powdering (g)	230.8	201.9	244.5
3	Qty. of dried *Ghana* after powdering (g)	225.8	195.9	240
4	Loss (g)	5	6	4.5
5	Time for drying (hrs)	26	25	27
6	Temperature in ^{0}c	45-50	45-50	45-50
7	Percentage of dried *Ghana* obtained(%)	4.5%	3.9%	4.8%

Guduchi Ghana



DISCUSSION

Preparation of *guduchi satva*

According to the A.F.I *Satva'* is aqueous extractable solid substance collected from herbal Plant. Word *"Guduchi Satva"* For the very first time mentioned in *"Rasendra Mangalam"* in context of *"Panchamruta Ras.*" due to its usefulness it is incorporated in the various preparations like *Panchamruta Ras*. *Guduchi satva* preparation has been mentioned in *Yoga Ratnakar, Rasa Yoga Sagar, Siddhayoga Sangraha, Dravyaguna vigyana* etc. All these texts have mentioned different methods of preparation. According to *Yoga Ratnakar Guduchi* stem was cut into small pieces and triturated well in water then it was filtered through cloth and supernatant liquid is decanted and *shankhanibha* sediment is collected The quantity of liquid and overnight soaking is not stated, in this reference. *Shankhanibha* reveals the colour of satva i.e White colour. According to *Siddha Yoga Sangraha Guduchi* stem is cut into small pieces and pounded well then it was kept for overnight soaking in water. Next day it was filtered through cloth, allowed for sedimentation, supernatant liquid is decanted and sediment was collected. In this reference soaking was mentioned but the volume of liquid is not mentioned author advised to take the water quantity sufficient. According to *'Rasa Yoga Sagar''Guduchi satva'* is called as *Guduchi modak. 'Rasa Yoga Sagar'* has also not mentioned the quantity of water but it stated that the *kalka* should be made so fine by trituration & the colour of *satva* is described as *Shubhrakhandanibha.* In commentary of *Bhavaprakash* four times of water for soaking and time of soaking (12-24 hrs) was also mentioned. In the present study *guduchi satva* was prepared as per the reference of *Dravyaguna vigyana* by *Yadavji Trikamji Acharya*. Three batches of *guduchi satva* were prepared. For each batch 5 kg of fresh *guduchi* was utilized. Five kg of *Guduchi* stem pieces were pounded in *khalwa* until fibers of stem got separated and the material becomes sticky. Four times R O Water (20 litres) was added into it and rubbed well with hands thoroughly

and kept overnight for soaking. Next day the material was again well rubbed, until the sliminess disappears into the same water. Then fibers were removed and the remaining material was strained through clean cloth.

The strained material was collected in a flat bottom stainless steel container and allowed for the sedimentation and then liquid portion was removed by decantation process. Repeated washing and decantation were done, for 15 times. Then clear white starch was obtained. And then liquid portion was removed by decantation process. Repeated washing and decantation were done, for 15 times. Then clear white starch was obtained. The whole process took 7 days for completion. Decantation was done repeatedly to get pure white coloured starch. Percentage yield of guduchi satva of three batches were 2.4%, 1.8% and 0.61% respectively. Yield was different for the three batches. The yield of The Guduchi Satvaaa greatly depends on the size, environment, association and cellular activities. In the present study more yield of guduchi satva was obtained in practical one which was carried out in the month of February. The next two batches prepared in the month of March and April yielded less starch .This difference in the yield of guduchi satva in different seasons is also supported by previous studies which state that the yield of GS is found to be more in January-February (*Shishira*); and least in May-June (*Grishma*). This may be due to impact of different seasons on cellular proliferation and plant maturity. Maximum metabolic activity of the starch grains in cellular constituents occurs after preliminary development; during which the percentage of starch also increases. Thus, it infers that full maturation of starch grain occurs in *Shishira Ritu*, which resulted into maximum yield. Colour of guduchi satva of all the three batches were white in colour and all the three samples were tasteless.

Preparation of *Guduchi Ghana*

In the present study 3 batches of *Guduchi Ghana* were prepared as per the reference of *Sidhayoga samgraha*. Five kg of fresh *Guduchi* was used in each batch. *Guduchi Ghana* was prepared. Stem was made into pieces of 1-2 inches crushed thoroughly, added with four times of potable water in a SS vessel and kept for soaking overnight (12 hrs). Next morning the contents were subjected to heat with continuous stirring. Water was evaporated slowly till its reduction to 1/4th and l was filtered to obtain *Guduchi Kwatha*. The *Guduchi Kwatha* was subjected to heat with constant stirring till the entire mass was converted into semi solid state. The mass was shifted into a glass tray and placed in oven at 45oC - 50oC for complete drying. In the present study yield of guduchi Ghana in three batches were 4.5%, 3.9% and 4.8

% respectively. Even though the three batches were prepared during the same period, slight difference in the yield was noted which can be considered as insignificant.

CONCLUSION

- Percentage yield of *Guduchi satva* of three batches were 2.4%, 1.8% and 0.61% respectively. In the present study more yield of *Guduchi satva* was obtained in the experiment which was carried out in the month of February. The next two batches prepared in the month of March, April yielded less starch.
- Yield of *Guduchi Ghana* in three batches were 4.5%, 3.9% and 4.8 % respectively. Even though the three batches were prepared during the same period, slight difference in the yield was noted which can be considered as insignificant.

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3.