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ORIGINAL ARTICLE **OPEN ACCESS**

Pharmaceutical and Analytical Study of Trivrut Kashay Bhavita Trivrut Churna (Fortified Trivrut Churna) Through HPTLC

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ABSTRACT
Trivrut Churna is a widely used Virechaka (purgative) medicine in Ayurveda. Trivrut is considered as best among all Virechaka Dravya. The ideal medicine for Shodhana is one which is given in Alpamatra (less dosage), induces Mahavega, Bahudoshahara, Sukha Shodaka, Laghupaka, and sukha Swada. There is a mentioning that, Bhavana-Samskara enhances the potency of the drug, so that smaller dosage of drug will be efficacious. Bhavana is a wet trituration process and also a size reduction technology, frequently used in Ayurvedic pharmaceutics. It has multi-dimensional pharmaceutical and therapeutic implications. In this paper analytical evaluation of Trivrut Kashay Bhavita Trivrut Churna has been done.
Keywords: *Operculina turpethum, Trivrut, Virechana Drug, Bhavana Samskar, Trituration, HPTLC*

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INTRODUCTION

Operculina turpethum, Silva Manso also known as Trivrut because the shape of stem is triangular. It is a well-known Indian Ayurvedic herb, which is used as a purgative medicine and used to treat many ailments. It belongs to the Convolvulaceae family. It is known by other names Indian Jalap in English, Nashotah in Hindi and Trivrut in Sanskrit. [1]. It is used in many Ayurvedic preparations such as Trivrutadi ghrita, Trivrutadi kwath, Abhyarishta, Kaishore guggul and Chandraprabha vati etc. [2] Trivrut is usually found on the roadsides across India and distribution of this herb is found in tropical regions of America, Sri Lanka, Pakistan, China, Philippines and Africa etc. [3] Bhavana is one among the Samskar of medicines, described by Acharya Charaka. Bhavana Samskar enhances the properties, qualities and potency of the drug. Bhavana is unique concept of pharmaceutical procedure in which the powdered drug or combination of drugs is completely made wet in a liquid media and grinded till the absorption of liquid in to the powder or mixture of the powders. [4] In this study the drug *Operculina turpethum* powder has been triturated with decoction of *Operculina turpethum* to prepare Bhavita Trivrut Churna and then pharmaceutical and analytical study of Trivrut Kashay Bhavita Trivrut Churna (fortified Trivrut Churna) has been done through HPTLC.

MATERIAL AND METHODS

The study comprises of two parts
1. Pharmaceutical study
2. Analytical study

Pharmaceutical study:
a) Procurement of Raw material
b) Authentication of drug
c) Preparation of Trivrut Kashay Bhavita Trivrut Churna

a. Procurement of raw material:

The fresh roots of Trivrut have been collected from Girnar forest, Gujarat, India.

b. Authentication of drug:

The correct identification of herbal plant is most important step in quality control as recommended by WHO. Samples of root has been sent to Central Research Laboratory, Parul Institute of Ayurved and Research Ishwarpura Vadodara. The sample was subjected for pharmacognostic and limit tests for phytochemicals to assess the Resinous glycosides, Saponins and bitter alkaloids which was found reactive. The drug has been authenticated as Trivrut (*Operculina turpethum*).

c. Preparation of Bhavita Trivrut Churna:

Moola Twak of *Trivrut* has been separated from the whole Root then Moola Twak has been pounded in Khalva Yantra (Mortar with pestle) in order to make coarse powder. With help of Pulveriser Coarse powder has been converted into fine powder. The obtained fine powder has been stored in airtight container.

Preparation of Bhavita Trivrut Churna:

- Bhavya Dravya: Trivrut Churna 1 kg
- Bhavana Dravya**:** Trivrut Kashay

Trivrut Kashay preparation- Pounded Yavakuta Churna of *Trivrut* has been boiled with water i.e. 750 grams Yavakutachurna in 6000 ml of water (1:8 ratio), and reduced to 1/4th.

Bhavana-Fine powder of Trivrut was taken into Bhavana Machine and 7*Bhavana*of Trivrut Kashay was given. After completion of each Bhavana the Bhavita churna was allowed to dry for whole night. Then next Bhavana has been given. Each day fresh Kashaya has been prepared for Bhavana.

Duration of *Bhavana*-

Bhavana was given for three days

1st day - 3 hours
2nd day- 4 hours
3rd day- 4 hours 30 mins
4th day - 5 hours
5th day - 5 hours 15 mins
6th day - 6 hours
7th day – 7 hours

Trituration was done continuously until it attained solid consistency. This was considered one Bhavana. After *Bhavana* the Chu*rna* has been Shade-dried & converted into fine powder with Grinder and sieve. Trivrut Kashay Bhavita Trivrut Churna was stored in packaging of 12 grams each in airtight sachets.

Changes observed in the Bhavita Churna during Bhavana- Before Bhavana it was yellowish white in colour and normal in smell. During Bhavana the colour became darker and was having some unpleasant smell. After Bhavana the Churna has been dried. In dried Churna colour remained dark but unpleasant smell reduced.

Analytical Profile of Trivrut and Trivrut Kashaya Bhavita Trivrut Churna

The analytical profile of Bhavita Trivrut Churna and Trivrut Churna prepared out of *Operculina turpethum* is done with the reference of PLIM guidelines. The Analytical study has been carried out in Central Research laboratory, Parul Institute of Aurveda and Research, Vadodara, Gujarat. HPTLC has been done in Vasu Pharmaceuticals, Vasu Health Care, Vadodara, Gujarat.

Fig 01. Collected raw drug Trivrut-moola

Fig 02. Preparation of Trivrut Churna

The following are the analytical profile data:

Physiochemical Studies: Physiochemical parameters like pH value, LOD, total ash, acid insoluble ash and water soluble and alcohol soluble extractive values, total alkaloids, Bulk density, Tap density, mesh analysis, TLC were determined as per PLIM guidelines.

Phytochemical screenings: Preliminary qualitative phytochemical screening was carried out and revealed the presence of a wide range of phytoconstituents Alkaloid, Starch, Carbohydrates, Tannins & Polyphenols, Flavonoids, Saponins& Steroids. The HPTLC Fingerprinting analysis was carried out in

Trivrut Churna and Bhavita Trivrut Churna consisting of CAMAG Linomat 5- Applicator. The chromatogram obtained was studied under 254 nm, 366 nm and 540nm after derivatization.

Preparation of Test solution: Weigh accurately 0.5 g of sample in a conical flask, to it added 10 ml of methanol and reflux on water bath for 30 mins. On completion of time, allowed to cool and filtered with Whatmann filter paper No. 1.

Preparation of Spray-reagent [Anisaldehyde-sulphuric acid reagent]: 0.5 ml Anisaldehyde is mixed with 10 ml Glacial acetic acid followed by 85 ml Methanol and 5 ml Sulphuric acid (98%).

RESULTS

Table 1: Analytical Profile of Bhavita Trivrut Churna and Trivrut Churna with anticipatory interpretation

Sr	Parameters	Bhavita Trivrut Churna	Trivrut Churna	
1	pH	6	6.5	Quantitative indication of acidic nature of the drug
2	Loss on Drying	4.3%	1.8%	Indicates the loss of amount of water & other volatile impurities present in the sample
3	Total Ash value	5.5%	5%	It indicates the purity of the drug
4	Acid insoluble Ash	2.01%	1.0%	
5	Water Soluble Extractive	49%	32%	Indicates the water-soluble constituents in the drug
6	Alcohol Soluble Extractive	18%	15%	Indicates the Alcohol soluble constituents in the trial drug
7	Bulk Density	93.33%	100%	
8	Tap density	70	86	

HPTLC: Bhavita Trivrut Churna and Trivrut Churna

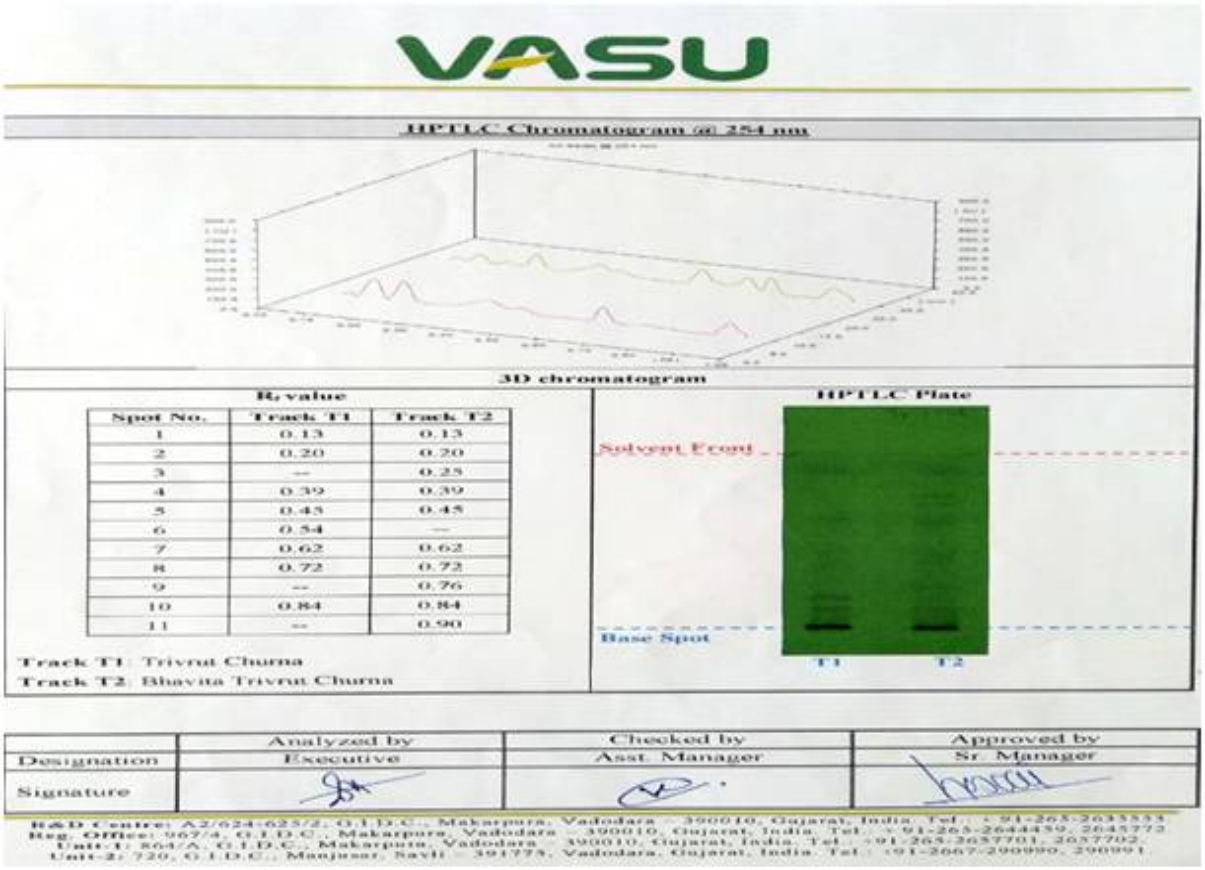

Fig. 03 HPTLC Chromatogram @ 254 nm

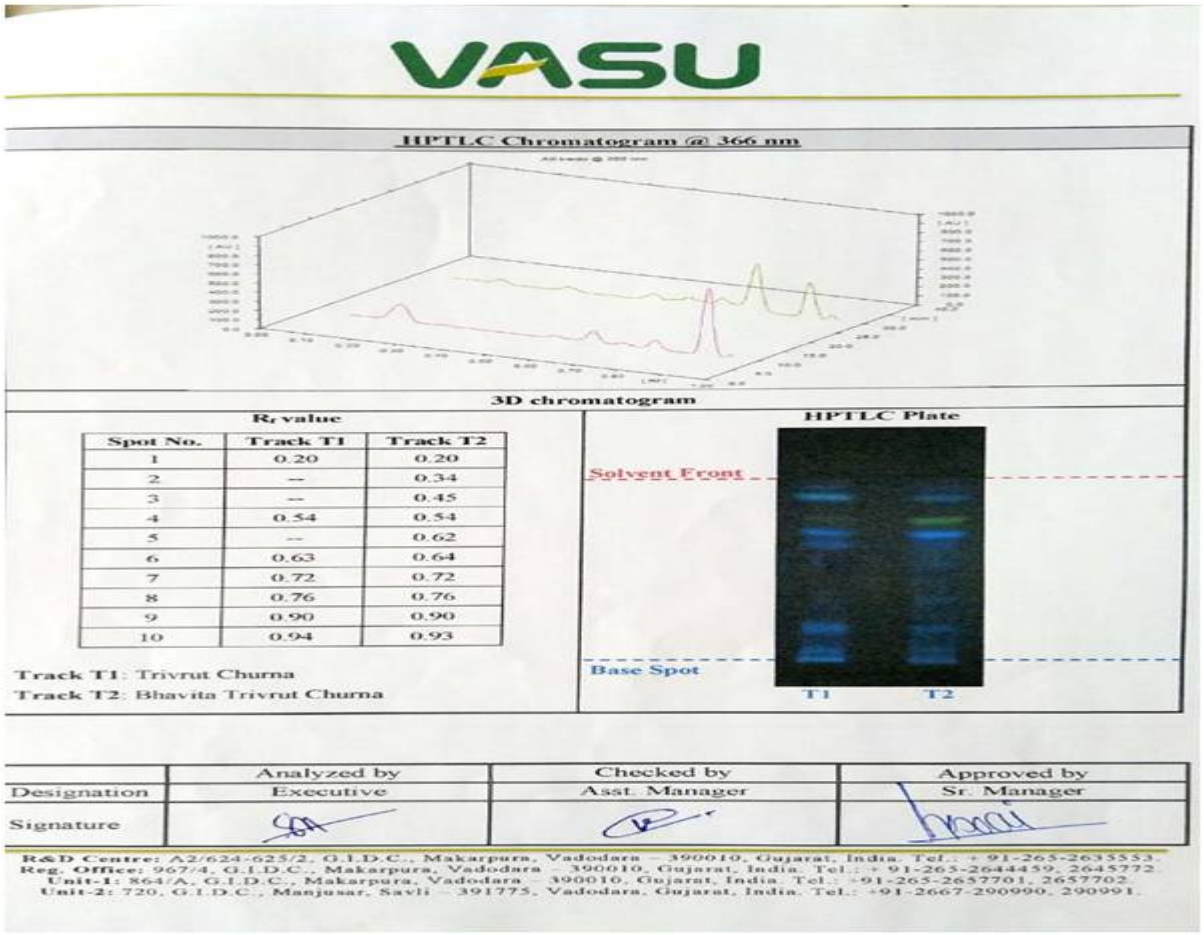

Fig. 04 HPTLC Chromatogram @ 366 nm

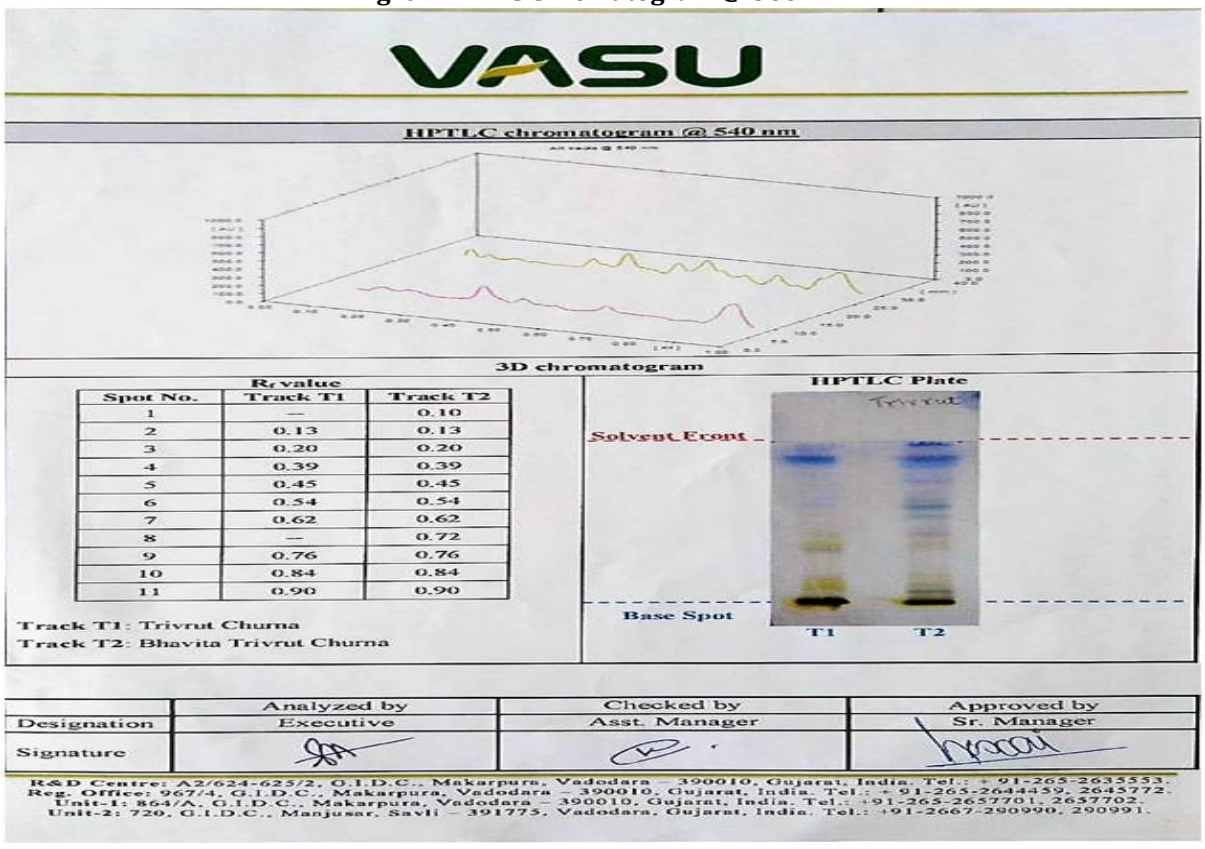

Fig. 05 HPTLC Chromatogram @ 540 nm

Table 2: HPTLC Chromatogram @ 254 nmR_f Value

Spot No.	*Bhavita Trivrut Churna*	*Trivrut Churna*
1	0.13	0.13
2	0.20	0.20
3	0.25	-
4	0.39	0.39
5	0.45	0.45
6	-	0.54
7	0.62	0.62
8	0.72	0.72
9	0.76	-
10	0.84	0.84
11	0.90	-

Table 3: HPTLC Chromatogram @ 366 nm R_f Value

Spot No.	*Bhavita Trivrut Churna*	*Trivrut Churna*
1	0.20	0.20
2	0.34	-
3	0.45	-
4	0.54	0.54
5	0.62	-
6	0.64	0.63
7	0.72	0.72
8	0.76	0.76
9	0.90	0.90
10	0.93	0.94

Table 4: HPTLC Chromatogram @ 540 nm R_f Value

Spot No.	*Bhavita Trivrut Churna*	*Trivrut Churna*
1	0.10	-
2	0.13	0.13
3	0.20	0.20
4	0.39	0.39
5	0.45	0.45
6	0.54	0.54
7	0.62	0.62
8	0.72	-
9	0.76	0.76
10	0.84	0.84
11	0.90	0.90

DISCUSSION

Analytical Profile of *Bhavita Trivrut Churna* and *Trivrut Churna* (Table 1) shows anticipatory interpretations such as pH of the drug is acidic in nature. Loss on drying is 4.3% in *Bhavita Trivrut Churna* and 1.8% in plain *Trivrut Churna*. Water soluble extractive of *Bhavita Trivrut Churna* is 49% and *Trivrut Churna* is 32%. Alcohol soluble extractive of *Bhavita Trivrut Churna* is 18% whereas *Trivrut Churna* is 15%. Table 2, 3 and 4 shows R_f values of HPTLC Chromatogram at different resolution of 254,366 and 540 nm [1]. The Moola (root bark) of the Trivrut plant contains glycosidic resin, which is insoluble glycoside turpethein [2]. It also contains saponins, flavonoids, glycosides, and phenolics. Essential oil, glucose and fructose are also present in Operclina Turpethum. The Chemical constituents of Trivrut are resins which is a mixture of α- and β-turpethein, glycosides, coumarins, scopoletin, saponins flavonoids, steroids, and carbohydrates [3]. The presence of wide variety of phytoconstituents including glycosidic resin, coumarin, beta-sitosterol, reducing sugars, and essential oils makes the drug potent to treat various diseases [4,5]. In this study while comparing the R_f values obtained with HPTLC shows that *Bhavita Trivrut Churna* has more value of R_f (Fig.3, 4 and 5) than plain *Trivrut Churna* which suggests that after processing with Bhavana Samskar the drug may have enhanced quality and potency. Enhanced potency, property and quality will be also more beneficial in terms of treatment and further it can be considered for reduction of dosage also.

CONCLUSION

The current study was an attempt to find out the active principles of Trivrut Kahaya Bhavita Trirut Churna (Triturated Trivrut Powder) and established an analytical profile of *Bhavita Trivrut Churna* prepared out of the selected *Operculina turpethum*. The analytical profile shows that *Bhavita Trivrut Churna* has more active constituents than plain *Trivrut Churna* and further research may be carried out with the found activities and will be also helpful in Preclinical and Clinical studies.

REFERENCES

1. Gupta, S., &Ved, A. (2017). *Operculina turpethum* (Linn.) Silva Manso as a Medicinal Plant Species: A Review on Bioactive Components and Pharmacological Properties. Pharmacognosy reviews, 11(22), 158–166. https://doi.org/10.4103/phrev.phrev_6_17
2. Singh, Dr. Manu & Sharma, Veena. (2012). *Operculina turpethum* as a panoramic herbal medicine: A review. International Journal of Pharmaceutical Sciences and Research. 3.
3. https://powo.science.kew.org/taxon/urn:lsid:ipni.org:names:270819-1
4. Saokar, Reshma& Sujatha, Dr. (2018). Bhavana Samskara Makes the Medicine Perfect. International Journal of Functional Informatics and Personalised Medicine. 5. 157-161.
5. Ding, W., Zeng, F., Xu, L., Chen, Y., Wang, Y., & Wei, X. (2011). Bioactive dammarane-type saponins from *Operculina turpethum*. *Journal of natural products*, *74*(9), 1868-1874.

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