

Development of Quality Control Parameters for Henna Powder

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ABSTRACT

Standardization of herbal formulation is essential in order to assess the quality of drugs, based on the concentration of their active principles. The present paper reports on standardization of henna (*Lawsonia inermis* Linn family: - Lythraceae) powder. In the present study four marketed samples of Henna powder were procured and standardized as per W.H.O., ayurvedic pharmacopoeia of India guidelines on the following parameters viz. organoleptic characters, physical characteristics, physico-chemical properties, Preliminary Phytochemical Analysis And by Thin Layer Chromatographic study (TLC). These parameters were found to be sufficient to evaluate the henna powder and can be used as reference standards for the quality control/quality assurance.

Keywords: Henna, Thin Layer Chromatography, Standardization, Phytochemical.

INTRODUCTION

n recent years, there has been great demand for plant derived products in developed countries. These products are increasingly being sought out as medicinal products, neutraceuticals and cosmetics¹. Standardization and analysis of the chemical marker of the Ayurvedic and other poly herbal formulation is always very big problem². Standardization for every plant medicine in the market, since the scope of variation in batches medicine different of is enormous³. "Standardization" expression is used to describe all measures, which are taken during the manufacturing process and quality control leading to a reproducible guality⁴. "Evaluation" of a drug means confirmation of its identity and determination of its quality and purity and detection of its nature of adulteration⁵. Various marketed formulation shows dose variation, content variation and lack of standardization which affects it efficacy and activity, so it is important to develop fast sensitive and accurate methods of analysis for ayurvedic formulation⁶. This paper includes the evaluation of quality control methods and parameter of four samples of different brands of Henna Powder designated as HP-1, HP-2, HP-3 and HP-4. It is one of the famous herbal formulation containing only one chief herbal ingredients. Different manufacturing companies' uses different active constituents for their preparations, which are not claimed on the pack or container due to their efficacy, cannot be access accurately⁷. The henna powder is used as coloring agent and in cosmetic use. Therefore, the present standardization study of henna powder was evaluated as per ayurvedic pharmacopoeia of India and other official quidelines.

MATERIALS AND METHODS

Materials

Henna powder: Four marketed formulation of henna powder from different manufactures (designated as HP-1, HP-2, HP-3 and HP-4) were procured from local market for the evaluation work.

Chemicals: Ethanol, toluene, ethyl acetate, methanol, conc. H₂So₄ and reagents for phyto-chemical screening.

Instruments: Hot Air Oven, Density Apparatus

Methods

Organoleptic properties of henna powder

Organoleptic properties of each of four batches of henna powder were done by using reported method⁸⁻⁹ and result shown in table no. 5 refer fig. 1 (A, B, C and D).



Figure 1: Physical Evaluation of Henna Powder



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 Table 1: Organoleptic properties of different formulation

 of Henna Powder

Henna powder sample	Appearance	Color	Taste	Odor
HP-1	Powder	Light Green	Aromatic bitter	Characteristic
HP-2	Powder	Light Green	Aromatic bitter	Characteristic
HP-3	Powder	Brownish Green	Aromatic bitter	Characteristic
HP-4	Powder	Blackish Green	Aromatic bitter	Characteristic

Extractive values

Henna powder 5gm from each batch for individual extraction was extracted with ethanol and water separately by cold maceration and their extractive values were determined as per the methods given in Indian pharmacopoeia¹⁰ and W.H.O.¹¹ guidelines and results shown in table no. 2.

Table 2: Extractive values of Henna Powder

Extractive	HP-1	HP-2	HP-3	HP-4
Water	26.15	25.86	25.62	25.93
Alcohol	19.26	18.32	18.85	19.13

Physical characteristics

The physical characteristic of the henna powder were determined for HP-1, HP-2, HP-3 and HP-4 in terms of the bulk density, tapped density, Carr's index, Hausner's Ratio and angle of repose, according to standard procedure¹² result shown in table no. 3.

Table 3: Physical characteristics of different formulations of Henna Powder

Parameters	HP-1	HP-2	HP-3	HP-4
Bulk density	26	20	24.5	24
Tapped density	15	11	14	13.2
Carr's index	56.69	54.00	56.14	54.00
Hausner's ratio	0.6538	0.65	0.6530	0.6666
Angle of repose	23.33	30.38	29.98	31.46

Loss on drying

Loss on drying for all four batches was determined as per standard procedure^{10, 13} results shown in table no. 4.

Table 4:	Loss or	n drvina	of Henna	Powder
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S. No.	Henna powder sample	Loss on drying (gm)
1.	HP-1	1.35
2.	HP-2	1.13
3.	HP-3	1.54
4.	HP-4	1.46

Phytochemical screening

For this evaluation, alcoholic extract of all four marketed henna powder was used and phytochemical evaluation was done by using reported methods^{2, 14} results shown in table no. 5.

Table 5: Phytochemical evaluation of Henna Powder

Phytoconstituents	HP-1	HP-2	HP-3	HP-4
Alkaloids	+	+	+	+
Glycosides	+	+	+	+
Carbohydrates	-	-	-	-
Steroids	+	+	+	+
Tannins	+	+	+	+

Chromatographic study

The alcoholic extract of all marketed henna powder was used for thin layer chromatographic study according to the standard procedure given in ayurvedic pharmacopoeia of India. The alcoholic extract of different batches of henna powder were evaluated by Thin Layer Chromatography using toluene: ethyl acetate (9:1) as mobile phase and silica gel coated mobile phase With methanolic sulphuric acid (5%) as spraying agent¹⁵ results shown in table no. 6.

Table 6: Rf values of constituent present in HennaPowder

Batch	Rf values of Spots			
sample	In visible light	Under UV with MeH ₂ So ₄		
HP-1	0.40, 0.63, 0.67	0.08, 0.42, 0.55, 0.63, 0.87		
HP-2	0.42, 0.65, 0.71	0.09, 0.40, 0.57, 0.62, 0.84		
HP-3	0.41, 0.61, 0.65	0.08, 0.38, 0.6, 0.68, 0.88		
HP-4	0.45, 0.64, 0.69	0.087, 0.38, 0.60, 0.70, 0.90		

RESULTS AND DISCUSSION

The leading brands of henna powder in the market purchased and designated as HP-1, HP-2, HP-3 and HP-4 were standardized for their physicochemical and phytochemical properties. The henna powder samples comply for the requirements of extractive value, physical characteristics, loss on drying, phytochemical screening and thin layer chromatography. The color and odor of the henna powder was characteristic of their active constituent. The bulk density of the henna powder ranges from 20 to 26 and tapped density of all batches ranges between 13 to 17. The henna powder contains alkaloids, steroids, tannins and glycosides. The chromatogram of alcoholic extract of henna powder shows 3 spot at visible light and 5 spots with spraying methanolic sulphuric acid (5%) reagent under U.V.



CONCLUSION

After analysis of samples of henna powder by different parameters, they show good similarity between them. Henna powder are identified and authenticated through organoleptic and physicochemical studies, which is further confirmed by similar TLC profiles. Pharmacognostic characters established for the raw materials could be employed as quality control standards for evaluating its identity and can be used for routine analysis.

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