Evaluation of an Unani compound formulation - Majoon-e-Sandal

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Abstract

Traditional healing through herbs have been the practiced of many countries since ages, as they were generally believed to be non toxic natural products. According to World Health Organization, the usage of herbal drugs exceeds 2-3 times than Allopathic. Modern medicine is more concern for the cure of diseases but remains indifferent to health preservation. There is an urgent need to combine the best elements of traditional medicine and modern medicine to improve the health care system of human kind. An ideal team for the evaluation of traditional medicine will include scientists from Ayurveda, Siddha, Unani and tribal medicine. The world Health Organization (WHO) has estimated 80 % of the World population relies on traditional medicine for primary health care. India is one of the richest sources of medicinal and aromatic plants. Because of the rapid progress of the herbal drug industry in India for the last quarter century, an increasing need is felt to standardize the herbal products. It is necessary to develop the scientific protocols such as SOP and pharmacopoeial standards of the poly herbal drug Majoon-e-Sandal. The drug is used in the ailments of stomachic, antibilious, psychoneurosis, vomiting and nausea. Study revealed that microbial load and heavy metals such as lead, cadmium, mercury and arsenic were not detected in the drug. Pesticide residues and aflatoxin were also absent in the drug. The data evolved in the present work will aid in identifying the raw drugs used in finished product and will help to fix the scientific standards for Majoon-e-Sandal.
***Keywords*:** Majoon-e-Sandal, Heavy metals, Microbial load, Aflatoxins, Pesticide residues.

Introduction

The demand of herbal medicine is increasing day by day due to their efficacy, rare chances of side effects in the treatment and good faith of society on herbal medicine and also their products (Rawat et al, 2003). India has a vast heritage of traditional systems of medicine for various ailments. Due to lack of quality control measures, people are unable to utilize the benefit of the traditional systems of medicine. Due to this scientific awareness a scenario has created to undertake the research activities like standardization of traditional medicines and to develop the scientific methods for the manufacture of quality medicines. Majoon-e-sandal is one of the important Unani medicine categorized under the Majooniath categories, listed in the National Formulary of Unani Medicine, part-II. The drug is being used in ailment of stomachic, antibilious, psychoneurosis, vomiting and nausea (Anonymous, 2007). An attempt has been made to scientifically evaluate the Unani compound formulation Majoon-e-Sandal for laying down standards and subjected to pharmacognostic, analytical parameters and TLC studies.

Material and methods

Preparation of powders

All the ingredients were procured from Chennai raw drug dealers with the knowledge of Unani physician, identified and authenticated by botanist, RRIUM, Chennai, Tamil Nadu. All the dried ingredients were powdered (sieve number 80) and kept separately. The Majoon-e-Sandal was prepared as per the formulation composition given below (Anonymous, 2007).

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Formulation composition

S. No	Unani name	Botanical/ English name	Part used	Quantity
1.	Sandal Safaid	*Santalum album* Linn.	Heart wood	110 g
2.	Aab-e-Zulal Tamar Hindi	*Tamarindus indica* Linn.	Fruit pulp	250 ml
3.	Aab-e-Anar Trush	*Punica granatum* Linn.	Seed extract	350 g
4.	Tabasheer Safaid	*Bambusa bambos* Druce.	Bamboo manna	15 g
5.	Ood Kham	*Styrax benzoin* Benz.	Resin	15 g
6.	Zafran	*Crocus sativus* Linn.	Dried stigmas and top of styles	5 g
7.	Qand Safaid	Sugar	-	750 g

Preparation of Majoon-e-Sandal:

The Majoon-e-Sandal was prepared as per the formulation composition given in NFUM part - II (Anonymous, 2007). All the ingredients were taken of pharmacopoeial quality and quantity. Mixed the powders of the *Santalum album* (110g), *Bambusa bambos* (15g) and *Styrax benzoin* (15g) for the formulation composition and kept separately. *Tamarindus indica* was soaked in water for 2 hr, crushed with hand and filtered through muslin cloth and kept separately. *Punica granatum* seeds were crushed with hand and filtered it through muslin cloth and kept separately. *Crocus sativus* was grinded by adding rose water and kept separately. Dissolved 750g of sugar in 500ml of water, at the boiling stage 0.1% citric acid was added, mixed thoroughly and filtered through muslin cloth. Then boiled the filtrate on slow heat and added the mixed extract of *Tamarindus indica* and *Punica granatum* followed by *Crocus sativus.* Then the content mixed thoroughly and prepared the 79% consistency of quiwam. Removed the vessel from the fire, while hot condition added the mixed powders of the *Santalum album, Bambusa bambos and Styrax benzoin* followed by 0.1% of sodium benzoate and mixed thoroughly to prepare the homogenous product. Allowed to cool to room temperature and packed it in tightly closed container to protect from light and moisture.

Powder microscopy

Finished product (5g) was mixed with 50ml of water in a beaker with gentle warming, till the sample completely dispersed in water. This solution was centrifuge and decants the supernatant. The sediment washed several times with distilled water, centrifuged again and decanted the supernatant. A few mg of the sediment was taken and mounted in glycerine and observed the salient features and drawings of the drug using Camera Lucida (Johansen, 1940).

Analytical parameters

The prepared three batch samples were subjected for analytical parameters such as physico-chemical studies like total ash, acid insoluble ash, water soluble ash, alcohol and water solubility, loss on drying at 105º, microbial load and heavy metal were carried out as per the WHO guidelines (Anonymous, 1998). Aflotoxin, pesticide residues were carried out by standard methods (Anonymous. 2000). The bulk density, sugar estimation and *pH* values for 1% and 10% aqueous solution were also carried out (Anonymous, 1987).

Thin layer chromatography

Preparation of extracts

2g of drug samples were soaked in chloroform and alcohol separately for 18 hours, refluxed for ten minutes on water bath and filtered. The filtrates were concentrated on water bath and made up to 5ml in a standard flask separately.

Development of TLC

The chloroform and alcohol extracts were applied on precoated silica gel 60 F_{254} TLC plate (E.merck) as absorbent and developed the plate using solvent systems, toluene : ethyl acetate 9:1 and 1: 1 respectively. After

developing, the plates were dried and observed the colour spots at UV-254, UV-366 nm and vanillin-sulphuric acid spraying reagent (Wagner *et. al*., 1984).

Results and Discussion

Majoon-e-Sandal is a semi solid, brown coloured, characteristic of its own odour and in sweet taste.

Microscopically observation:

Microscopically observation of the Majoon-e-Sandal were shown in Figure. 2. Vessels pitted with transverse to oblique perforations with tail like projections at one or both ends of length upto 750µ and breath upto 100µ, medullary ray parenchyma cells, xylem parenchyma cells mostly rectangular, xylem fibres thick walled of length upto 1800µ and breadth upto 35µ **(Sandal Safaid)**; very few pollen grains spherical, nearly smooth in outline with clear exine and intine upto 100µ **(Zafran)**.

Chemical analysis:

Analytical parameters of the Majoon-e-Sandal are tabulated in Table-I. Quantitative standards revealed that the ash content was 4.77% and 1.07% of acid insoluble siliceous matter was detected in the drug. The water soluble extractive value (42.53%) indicates the presence of inorganic content. The alcohol soluble extractive (47.47%) value indicates the extraction of polar constituents. This drug contains the 22.64% of the reducing sugar and 4.11% of the non reducing sugar. Study revealed that total bacterial count and total fungal count were found to be within the permissible limit. Heavy metal like arsenic, lead, cadmium and mercury were not detected in the drug. Pesticide residue such as o,p-DDD, p,p'- DDD, o,p-DDE, p,p'-DDE, o,p'-DDT, p,p'-DDT, Endosulfan, α-HCH, β-HCH, γ-HCH, δ-HCH was absent in all the drug.

TLC analysis

Thin layer chromatography studies of chloroform and alcohol extract of all the three batch samples were showed identical spots in UV - 254 nm, UV - 366 nm and v. s reagent. The R_f values of the chloroform and alcohol extracts were shown in table - I and II. The plates were visualised using vannilin-sulphuric acid and heated at 105º till appears colored spots (Fig. 1 & 2).

Conclusion

Hence, the microscopic features, analytical parameters, TLC profiles together may be used for quality evaluation and the standardization of the compound formulation Majoon-e-Sandal. Thus the data generated in this analysis will help in setting up regulatory limit, to ensure the quality of in Indian medicine.

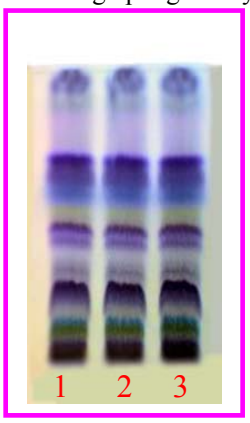

Fig. 1. TLC for Chloroform extract

Fig. 2. TLC for Alcohol extract

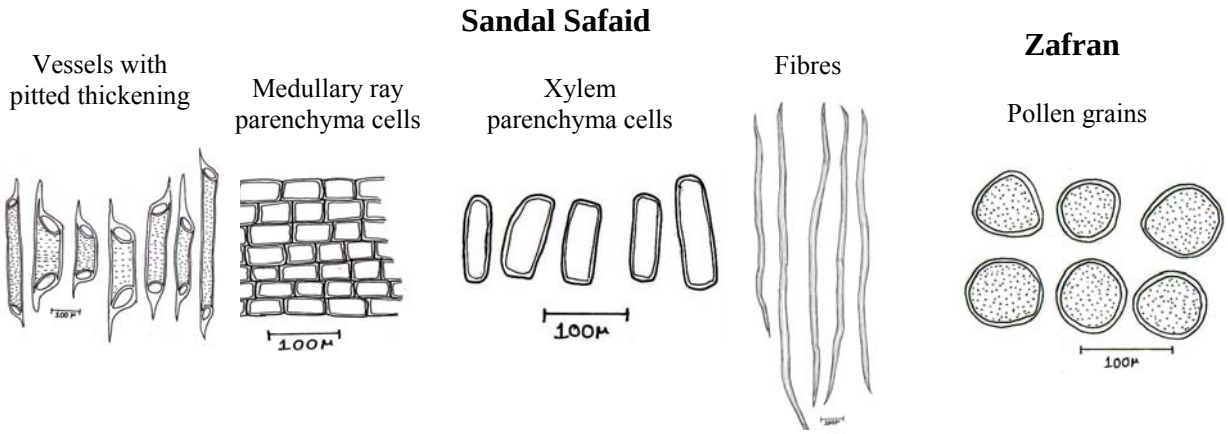

Fig. 3. Powder microscopy for Majoon-e-Sandal

Table – I. Physico-chemical parameters of the Majoon-e-Sandal

S. No.	Parameters	Batch I	Batch II	Batch III
1.	**Loss on Drying at 105ºC (% w/w)**	22.57	22.44	22.61
2.	**Extractive values** ***a. Alcohol (% w/w)*** ***b. Water (% w/w)***	 47.50 42.60	 47.53 42.51	 47.40 42.48
3.	**Ash Values** ***a. Total ash (% w/w)*** ***b. Acid insoluble ash (% w/w)***	 4.85 1.10	 4.70 1.09	 4.78 1.07
4.	**pH values** ***a. 1% Aqueous solution*** ***b. 10% Aqueous solution***	 6.30 5.30	 6.20 5.40	 6.40 5.20
5.	**Sugar estimation** ***a. Reducing sugar (% w/w)*** ***b. Non reducing sugar (% w/w)***	 22.68 4.09	 22.68 4.10	 22.53 4.13
6.	**Bulk Density**	1.4347	1.4367	1.4373

Table – II. R_f Values of chloroform extract of the Majoon-e-Sandal

Solvent system	**R_f Values**		
	UV 254nm	**UV 366nm**	**V. S. Reagent**
Toluene: Ethyl acetate (9 : 1)	0.93 Pink	0.65 Fluorescence blue	0.93 Blue
	0.65 Pink	0.52 Light blue	0.68 Violet
	0.49 Light pink	0.32 Light blue	0.54 Blue
	0.38 Light pink	0.25 Fluorescence blue	0.49 Yellowish green
	0.20 Pink	0.18 Blue	0.44 Violet
	0.20 Pink	0.13 Light blue	0.29 Light green
	0.10 Pink	0.10 Blue	0.25 Violet
			0.13 Blue

Table – III. R_f Values of alcohol extract of the Majoon-e-Sandal

Solvent system	R_f Values		
	UV 254nm	**UV 366nm**	**V. S. Reagent**
Toluene : Ethyl acetate (1 : 1)	0.88 Light pink	0.85 Blue	0.95 Blue
	0.72 Light pink	0.80 Blue	0.92 Violet
	0.56 Light pink	0.65 Light blue	0.84 Blue
	0.48 Pink	0.56 Light blue	0.77 Light blue
	0.33 Pink	0.44 Light blue	0.68 Blue
	0.16 Light pink		0.57 Violet
			0.46 Greenish yellow
			0.34 Light blue
			0.21 Light blue
			0.16 Light blue
			0.12 Light blue

Table – IV. Microbial load of Majoon-e-Sandal

S. No.	Parameter Analyzed	Results	WHO Limits
1	Total Bacterial Count	32,000 CFU/gm	10^5 CFU / gm
2	Total Fungal Count	300 CFU/gm	10^3 CFU / gm
3	Enterobacteriaceae	Absent / gm	10^3 CFU / gm
4	Salmonella	Absent / gm	Nil
5	Staphylococcus aureus	Absent / gm	Nil

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