

Pharmacognostical studies of "*Maha Agad*": A research article

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Abstract

Nature is the best combinatorial chemistry and possesses solutions to all ailments for the mankind. Evidences suggests that two thirds of the worlds herbal species bear therapeutic values, and these plants have been used in the traditional system of medicine since the onset of human civilization. In *Ayurveda*, *Ashtang Sangrah UttarSthan*, *Acharya Vagbhatta* has also mentioned one such formulation known as *Maha Agad* which is used in the context of treatment of snake, spider, rat and scorpion poisoning. Also used in the conditions like gastro enteritis, indigestion, artificial poison, fever & have *bhutaghna* properties. In today's scenario, the quality assurance of herbal medicine is an important factor and basic requirement for herbal drug industry. Standardized *ayurvedic* formulations of good quality are essential for beneficial therapeutic use. So, an attempt has been made to highlight this herbal preparation through the pharmacognostic studies and was analyzed by employing various parameters which included pharmacological, physicochemical parameters, and T.L.C profiling. The evolved parameters will be useful for quality control and standardization of *Maha Agad*.

Keywords: *Maha Agad*; Physicochemical analysis; T.L.C profiling; *Ayurveda*

1. Introduction

Herbal plant materials are used widely in the developing and developed countries as a mainstream of medicine or as an alternative medicine. Latterly, plant research has been increased all over the world and larger evidence has been accumulated which highlights the immense potential of the medicinal plants used in different traditional systems of medicine [1,2]. Various plant species provide a rich source of bioactive compounds that are used to treat and prevent several human disorders all over the world[3]. However a key obstacle, which has hindered the acceptance of the alternative medicines, is the lack of documentation and the quality control. There is a need for documentation of research work carried out on traditional medicines [4]. For the acceptance of the *Ayurvedic*/herbal products on the modern parameters, their standardization and quality control are very essential³. The process of standardization can be gained by stepwise pharmacognostic studies [5]. These studies help in identification and authentication of the plant material [6]. Modern analytical techniques like TLC, HPTLC, Physical analysis, Total Ash, Acid insoluble ash, Water soluble ash, method has a pivotal role in quality control and standardization [7,8].

In the present study, *Maha Agad* is duped for its analytical research work. It is a drug of choice in acute toxicopathological conditions mentioned by *Acharya Vagbhatta* in *Ashtang Sangrah UttarSthan*. It has 14 ingredients, namely *Trivrit*, *Vishalya*, *Haridra*, *Daruharidra*, *Yashtimadhu*, *Manjishtha*, *Pippali*, *Maricha*, *Shunthi*, *Panch lavan* and *bhavana dravya of Basta mutra*/ Goat urine, indicated in the treatment of snake, spider, rat and scorpion poisoning. Also used in the conditions like gastroenteritis, indigestion, artificial poison, fever & have *bhutaghna* properties [9]. However, till date no pharmacognostic study has been carried out regarding *Maha Agad* hence the present investigation was

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undertaken. The objective of the present study is to evaluate various pharmacognostic standards like macroscopy; ash values, extractive values, T.L.C profiling of *Maha Agad*.

2. Material and methods

2.1. Collection of the materials

Raw drugs of *Maha Agad* were collected from different sources. Some drugs were purchased from Pannalal store, Haridwar and Nidco Herbal Heritage, Dehradun such as *Langli*, *Yashtimadhu*, *Manjishtha*, *Pippali*, *Maricha*, *Sauvarchala Lavana*, *Saindhava Lavana*, *Vida Lavana*, *Samudra Lavana* and *Audbhid(Reh) lavana*. And some drugs like *Haridra*, *Daruharidra*, *Shunthi*, and *Trivrit* were procured from land area of Dehradun, Nainital, Haridwar, then dried and stored.

2.2. Authentication

The collected raw drugs were then identified and authenticated by the experts of P.G department of Dravyaguna, U.A.U, Rishikul campus, Haridwar.

2.3. Preparation of materials

Equal quantities of the obtained fruits, stem, roots/ rhizomes were shade dried and made into coarse powder one by one with the help of iron mortar and pestle, then by grinding they were made into fine powder form and mixed together mechanically to get a homogenous mixture at Herbal automation, Haridwar. Next process of *bhavana* was done in Ras shastra department, Rishikul campus. Goat urine(*Bastamutra*) was taken for the *bhavana* process, which was collected in sterile bottles from a meat vendor in Haridwar. It took 2-3 days to complete one *bhavana* and a total of 7 *bhavana* was given to *Maha Agad*. It was then kept in an air tight container for further use.

2.4. Analysis of *Maha Agad*

The Organoleptic, Physico-chemical and T.L.C studies were conducted at Sardar Bhagwan Singh University, Dehradun. Physico-chemical parameter was determined as per the Guidelines of The *Ayurvedic Pharmacopoeia of India* [10]

- **Macroscopic Study / Organoleptic Parameters** – Various parameters like color, touch, odor and texture of the finished product(*Maha Agad* churn) were observed and recorded.
- **Physico-chemical Analysis** – Physico-chemical parameters of *Maha Agad* like Loss on drying, Total ash, Acid insoluble ash, Water soluble ash, Extractive values Viz., Water soluble extractive value, Alcohol soluble extractive value were determined as per the API guideline [10]

2.5. Thin Layer Chromatography[10]

- **Stationary phase-** T.L.C plates were coated with 0.25mm layer of silica gel G.
- **Activation of pre-coated Silica gel G plates-** Plates were dried and activated in hot oven at 105°C for 30 minutes prior to chromatography.
- **Test solution:** Alcohol and Aqueous Extract
- **Mobile phase:** Chloroform: methanol :ethyl acetate (60:40:1)
- **Visualization:** Iodine crystals
- **Procedure:** TLC plates were taken, coated with Silica gel G slurry (10g+6.2ml D.W) and dried. After drying the coated TLC plates were activated at 105°C for 30 minutes and then used. Spots of extracts(alcohol and aqueous) were placed above 1 cm from the base of the plate with the help of capillary tube. Then kept in TLC chamber having different mobile phase. After that plates were placed in iodine chamber for visualization.

2.6. Calculation of Rf Value

$$R_f = \frac{\text{Distance travelled by solute from origin line}}{\text{Distance travelled by solvent from origin line}}$$

3. Results

3.1. Organoleptic Characters

Organoleptic Characters of *Maha Agad* has been presented in Table-1

Table 1 Organoleptic Characters of *Maha Agad*

1.	Appearance	Fine powder
2.	Color	Dark brown
3.	Odor	Pungent, smell of <i>basta mutra</i>
4.	Taste	Katu(pungent)
5.	Touch	Soft

3.2. Physico-chemical Parameters

The data of Physicochemical parameters of *Maha Agad* are tabulated in Table-2


Table 2 Physico-Chemical Standards of *Maha Agad*

S. No.	Parameters	Values of <i>Maha Agad</i>
1.	Loss on drying (%) [11]	18%
2.	Total Ash (%) [12]	20.5%
3.	Acid Insoluble Ash (%) [13]	0.21%
4.	Water Soluble Ash (%) [14]	16%
5.	Alcoholic Extractive Value (%) [15]	8.2%
6.	Aqueous Extractive Value (%) [16]	3.2%

3.3. Thin layer chromatography

The details of the chromatogram obtained when viewed in day light has been presented in table-3

Table 3 Details of TLC Profile Of *Maha Agad*

Rf Value	Test Method	
Alcohol extract: 0.68 0.48	Stationary Phase: Silica gel G	
Aqueous extract: 0.13 0.52	Mobile solution: Chloroform: methanol :ethyl acetate (60:40:1)	
	Visualization: Iodine Vapours	

4. Discussion

To establish the identity, purity, quality and safety of herbal medicine, standardization is an vital tool[17]. According to WHO the macroscopic and microscopic description of a plant is the first step to establish the identity and the degree of purity of herbal drugs and should be carried out before any tests are undertaken[18]. Thus, the present work was taken up with an objective to lay down detail pharmacognostical standards that will contribute significantly to the quality control of *Maha Agad*. This is the first research report for the macroscopy of *Maha Agad*, which is a qualitative evaluation

based on the study of organoleptic characters of the formulation and helps in further establishment of the diagnostic parameters. In organoleptic features, most of the ingredients have pungent(*katu*) taste, so the final product *Maha Agad* has pungent taste. Due to the process of *bhavana*, the powder formed was fine in texture, have smell of *Basta mutra*(goat urine), and the color has changed from light brown to dark brown.

Determination of the moisture content of the drugs used in *Ayurvedic* system of medicine is highly essential. A higher or lower percentage shows that the drug was resorted in wet, dry or humid climate. Excessive moisture may favor the growth of microorganisms which may result in the deterioration of the drug [18]. Loss on drying in case of *Maha Agad* is 18%

Ash values of drug gives an idea of earthly matter or the inorganic composition and other impurities present along with drugs. It is used as a reliable method to detect adulteration. The total ash is particularly important in the evaluation of purity of drugs[19]. Here in the research work, the percentage of Total ash value is 20.5%, Acid insoluble ash value is 0.21%, Water soluble ash is 16%. The results showed that the total ash value of the formulation is higher than other ash values.

Extractive values are helpful to evaluate the chemical composition of the crude drug and also help in the estimation of specific constituents soluble in particular solvents[20,21]. Result showed that alcohol extractive value is 8.2% whereas aqueous extractive value is 3.2%. Among the two extractive values, alcohol soluble extractive value was higher than water soluble extractive value.

TLC Identification is used for semi-quantitative analysis of both the alcohol and aqueous extracts. Rf value of Alcohol extract is 0.48, 0.68 and Aqueous extract is 0.13 and 0.52.

5. Conclusion

The present study concludes for the first time, the complete pharmacognostical parameters of *Maha Agad*. This will provide useful information for identification and to determine the quality and purity of the plant materials. On the basis of the results obtained in the present study, the ingredients of *Maha Agad* are authentic and without adulterants. Observed values of physico-chemical parameters such as loss on drying, total ash, acid insoluble ash, water soluble ash, water soluble extractives, alcohol soluble extractives are within acceptable ranges. On the basis of observations and experimental results, the evaluation research of *Maha Agad* may be used as standard reference for further research work and clinical studies.

Compliance with ethical standards

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Disclosure of conflict of interest

No conflict of interest to be disclosed.

References

- [1] Sagar Bhanu P.S., Zafar R., Panwar R. Herbal drug standardization. *The Indian Pharmacist* 2005; 4(35): 19-22.
- [2] Patel P.M., Patel N.M., Goyal R.K. Quality control of herbal products, *The Indian Pharmacist* 2006; 5(45): 26-30.
- [3] Anonymous. *The international pharmacopoeia, General methods of analysis Vol. 1, 3rd ed.* Geneva, World Health Organization.1979.
- [4] Dahanukar, S.A., Kulkarni, R.A. and Rege, N. N.: *Ind. J Pharmacol*, 32: 81-118 (2000).
- [5] Ozarkar, K. R.: *Studies on anti-inflammatory effects of two herbs Cissus quadrangularis Linn. and Valeriana wallichi DC using mouse model.* Ph.D. Thesis, University of Mumbai, Mumbai (2005).
- [6] Anonymous: *Macroscopic and microscopic Examination: Quality Control Methods for Medicinal Plant Materials*, WHO, Geneva (1998).

- [7] Shrikumar S., Maheshwari U., Sughanti A., Ravi T.K., “WHO guidelines for herbal drug standardization”.2006.
- [8] Anonymous. W.H.O. Geneva Quality Control Methods for Medicinal plants materials. 1st ed, New Delhi: A.I.T.B.S. publishers& Distributors; 2002:11, 18, 61-3.
- [9] Murthy K.R Srikantha, Ashtanga Samgraha, Fourth edition Chaukhamba Orientalia, reprint 2005.
- [10] The Ayurvedic Pharmacopoeia of India, Vol 1, Part II, Department of AYUSH, New Delhi, 2007; Government of India; Ministry of Health and family welfare, 2007
- [11] The Ayurvedic Pharmacopoeia of India, Vol 1 Part II, Appendix 2, (2.2.10) Department of AYUSH, New Delhi, 2007; Government of India; Ministry of Health and family welfare, 2007; 1(II): 141.
- [12] The Ayurvedic Pharmacopoeia of India, Vol 1, Part II, Appendix 2, (2.2.3) Department of AYUSH, New Delhi, 2007; Government of India; Ministry of Health and family welfare, 2007; 1(II): 140.
- [13] The Ayurvedic Pharmacopoeia of India, Vol 1, Part II, Appendix 2, (2.2.4) Department of AYUSH, New Delhi, 2007; Government of India; Ministry of Health and family welfare, 2007; 1(II): 140.
- [14] The Ayurvedic Pharmacopoeia of India, Vol 1, Part II, Appendix 2, (2.2.5) Department of AYUSH, New Delhi, 2007; Government of India; Ministry of Health and family welfare, 2007; 1(II): 140.
- [15] The Ayurvedic Pharmacopoeia of India, Vol 1, Part II, Appendix 2, (2.2.7) Department of AYUSH, New Delhi, 2007; Government of India; Ministry of Health and family welfare, 2007; 1(II): 141.
- [16] The Ayurvedic Pharmacopoeia of India, Vol 1, Part II, Appendix 2, (2.2.8) Department of AYUSH, New Delhi, 2007; Government of India; Ministry of Health and family welfare, 2007; 1(II): 141.
- [17] Singh S, Manchawal L, Chauhan MG. Pharmacognostic study of male leaves of *Trichosanthes dioica* Roxb. with special emphasis on microscopic technique. *J Pharmacogn Phytother.* 2010;2:71–5. [Google Scholar]
- [18] Anonymous. World Health Organisation (WHO): Quality Control Methods for Medicinal Plant Materials. Geneva: WHO; 1998. [Google Scholar]
- [19] Nayak BS, Patel KN. Pharmacognostic study of *Jatropha curcas* leaves. *Int J Pharm Tech Res.* 2010;2:140–3. [Google Scholar]
- [20] Thomas S, Patil DA, Patil AG, Chandra N. Pharmacognostic evaluation and physicochemical analysis of *Averrhoa carambola* L fruit. *J Herb Med Toxicol.* 2008;2:51–4. [Google Scholar]
- [21] Kumar S, Kumar V, Prakash O. Pharmacognostic study and anti-inflammatory activity of *Callistemon lanceolatus* leaf. *Asian Pac J Trop Biomed.* 2011;1:177–81. [PMC free article] [PubMed] [Google Scholar]