

E-ISSN: 2321-2187
P-ISSN: 2394-0514
www.florajournal.com
IJHM 2020; 8(4): 101-102
Received: 13-05-2020
Accepted: 15-06-2020

Monojit Debnath
Bengal Institute of
Pharmaceutical Sciences,
Kalyani, Nadia, West Bengal,
India

Nirankush Paul
Emami Ltd., Kolkata, West
Bengal, India

Sanjib Bhattacharya
West Bengal Medical Services
Corporation Ltd., Sector V, Salt
Lake, Kolkata, West Bengal,
India

Moulisha Biswas
Bengal Institute of
Pharmaceutical Sciences,
Kalyani, Nadia, West Bengal,
India

Pallab Kanti Haldar
Department of Pharmaceutical
Technology, Jadavpur
University, Kolkata, West
Bengal, India

Corresponding Author:
Sanjib Bhattacharya
West Bengal Medical Services
Corporation Ltd., Sector V, Salt
Lake, Kolkata, West Bengal,
India

Formulation and assessment of microbial and heavy metal contents of Vidangadilouham: A classical Ayurvedic formulation

Monojit Debnath, Nirankush Paul, Sanjib Bhattacharya, Moulisha Biswas and Pallab Kanti Haldar

Abstract

Vidangadilouham is a classical Ayurvedic formulation which is mainly indicated for the management of kamla (jaundice), pandu (anaemia), prameha (diabetes) etc. In the present study, vidangadilouham was formulated as per Rasendrasarasamgraha of Gopal Krishna Bhatta and it was subjected to the evaluation of its microbial and heavy metal contamination studies as per the Ayurvedic Pharmacopoeia of India. The results indicated that the formulated vidangadilouham is safe microbiologically but the heavy metal contents are not within prescribed pharmacopoeial limits except mercury and arsenic. This observations may be of reference value for formulation development and quality control of vidangadilouham in due course.

Keywords: Vidangadilouham, louha bhasma, atomic absorption spectrophotometry

1. Introduction

Ayurveda is the oldest traditional system of Indian medicine prevalent today. Ayurvedic classical formulations place an important signature to establish their clinical efficacy when they are tested through modern parameters. But still sometimes these are found to be toxic or not to be efficacious enough as compared to modern medicine. The main reason behind this happening is lack of standardization and quality assurance. Standardization is an important tool to estimate the degree of purity and quality control of the traditional/herbal products [1]. In this study, the classical Ayurvedic formulation named Vidangadilouham is formulated for the evaluation of the prescribed microbiological and heavy metal parameters. Vidangadilouham is a classical Ayurvedic formulation which is mainly indicated for the management of kamla (jaundice), pandu (anaemia), prameha (diabetes) etc. In Ayurvedic contexts, 5 (five) different formulations are known by the name of vidangadilouham [2]. Among them, the authors have chosen the reference of Rasendrasarasamgraha of Gopal Krishna Bhatta captured in Bhaisajyaratnavali compiled by Govindadas Sen; as no significant study was found on this yoga (formulation). This vidangadilouham presents a combination of 9 (nine) putative medicinal plants (Table 1) like Vidanga: *Embelia ribes* Burm; Amla: *Emblica officinalis* Gaertn., Haritaki: *Terminalia chebula* Retz.; Bahera: *Terminalia bahera* (Gaertn.) Roxb. etc. and a mineral viz. louhabhasma (calcinated iron) [3]. In the present work, vidangadilouham is formulated and subjected to the evaluation of its official microbial and heavy metal contamination studies to setup standards for future reference.

2. Materials and methods

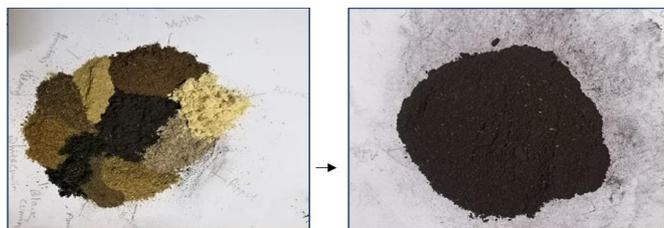
2.1 Formulation of vidangadilouham [3]

All the plant materials mentioned in sl. no. 1 to 9 of Table 1 were obtained from the authentic supplier M/s S. N. Das & Co., Kolkata, West Bengal, India in dry form and necessary identifications tests were performed for species conformation. All the plant materials were pulverised mechanically and passed through sieve # 80. The louha bhasma was procured from M/s Shree Dhootapapeshwar Ltd., Mumbai, Maharashtra, India, (Batch no. P190400134, Mfg. Date: 04/2019, Exp. Date: 03/2029).

All the powdered plant ingredients were mixed well manually and equal portion of louha bhasma was added to it. All the ingredients were mixed well thoroughly. The mixing was done manually. Thus the final form of vidangadilouham (Fig. 1, right) was prepared.

Table 1: Ingredients of Vidangadilouham

S. No.	Common name	Botanical name	Parts used	Parts
1	Vidanga	<i>Embelia ribes</i>	Fruit	1 part
2	Amla	<i>Emblica officinalis</i>	Fruit rind	1 part
3	Haritaki	<i>Terminalia chebula</i>	Fruit rind	1 part
4	Bahera	<i>Terminalia bahera</i>	Fruit rind	1 part
5	Krishna jeeraka	<i>Nigella sativa</i>	Fruit	1 part
6	Sweta jiraka	<i>Cuminum cyminum</i>	Fruit	1 part
7	Sunthi	<i>Zingiber officinale</i>	Rhizome	1 part
8	Mustaka	<i>Cyperus rotundus</i>	Rhizome	1 part
9	Pippali	<i>Piper longum</i>	Fruit	1 part
10	Louha bhasma	-	-	9 part



Ingredients of Vidangadilouham Final Product (Vidangadilouham)

Fig 1: Formulation of Vidangadilouham.

2.2 Microbial contamination study

The prescribed microbial limit tests were performed as per the Ayurvedic Pharmacopoeia of India [4]. The observed results with permissible limits thereof are summarized in Table 2.

2.3 Determination of heavy metal contents

Vidangadilouham was processed by microwave assisted wet digestion and analyzed for arsenic (As), lead (Pb), cadmium (Cd), mercury (Hg) by using atomic absorption spectrophotometer (AAS) equipped with graphite tube atomizer (GTA) as per the Ayurvedic Pharmacopoeia of India and according to the instrument's manual (Agilent 280FS AA with GTA 120) as reported by the previous workers [4, 5]. The results with permissible limits thereof are enumerated in Table 3.

Table 2: Permissible limits (as per Ayurvedic Pharmacopoeia of India) and observed microbial loads of Vidangadilouham.

S. No.	Parameters	Permissible limits	Results/g
1	<i>Staphylococcus aureus</i> /g	Absent	Absent
2	<i>Salmonella sp.</i> /g	Absent	Absent
3	<i>Pseudomonas aeruginosa</i> /g	Absent	Absent
4	<i>Escherichia coli</i> /g	Absent	Absent
5	Total microbial plate count	10 ⁵ /g	91750
6	Total yeast and mould	10 ³ /g	868

Table 3: Permissible limits (as per Ayurvedic Pharmacopoeia of India) and observed heavy metal contents of Vidangadilouham.

S. No.	Heavy metals	Permissible limits (ppm)	Heavy metal contents (ppm)
1	Lead	10	12.94
2	Arsenic	3	0.03
3	Cadmium	0.3	1.04
4	Mercury	1	0.04

3. Results and discussion

Microbial content of traditional polyherbal formulations taken internally always plays an important role for the question of its safety and efficacy. Therefore, the total bacterial count and total fungal count along with the tests for specific pathogens have been performed as per pharmacopoeial protocols. The

results indicated that the presently formulated vidangadilouham is microbiologically safe to be consumed (Table 2). Heavy metal contents in classical Ayurvedic herbo-mineral formulations is a serious concern nowadays [6, 7]. The most common heavy metals implicated in human toxicity include arsenic, lead, cadmium and mercury although nickel and chromium may also cause toxicity [8]. The Ayurvedic Pharmacopoeia of India recommends Ayurvedic formulations, should be checked for the presence of the first four above said heavy metals especially and prescribes limits for them [4]. In the present study, vidangadilouham was subjected to quantitative heavy metal analysis by AAS. The results indicated that the lead and cadmium contents of the formulated vidangadilouham are not within specified limits of Ayurvedic Pharmacopoeia of India. However, the levels of arsenic and mercury were found to be quite below the permissible pharmacopoeial limits (Table 3). Further studies are necessary to reduce the lead and cadmium contents within the permissible limits for its legitimate use. The implication of the present findings may be taken into consideration whilst dealing with the Ayurvedic formulations for human or animal consumption. The present results may be of indicative reference value for future formulation development and quality control studies on the classical Ayurvedic formulation vidangadilouham.

4. Acknowledgement

The authors are thankful to the Department of Pharmaceutical Technology, Jadavpur University, Kolkata, West Bengal, India and Bengal Institute of Pharmaceutical Sciences, Kalyani, Nadia, West Bengal, India for necessary supports related to the present study.

5. Conflict of Interest

None.

6. References

- Bhattacharya S. Heavy metals profiling of medicinal plants – exigent safety strategy. *Journal of Natural and Ayurvedic Medicine*. 2018; 2(4):00132.
- Debnath M, Biswas M, Haldar PK. A critical review on vidangadi louham: a classical Ayurvedic panacea. *World Journal of Pharmaceutical Research*. 2014; 3(4):396-405.
- Mishra S. Bhaishajyaratnavali of Govindadas Sen. Choukhamba Surabharati Prakashani, Varanasi, 2008, 714.
- Anonymous. The Ayurvedic Pharmacopoeia of India. Part I, Vol. VI, Govt. of India, New Delhi, 2008. Available at: www.ayurveda.hu (accessed on 21 September 2019).
- Behera B, Bhattacharya S. The importance of assessing heavy metals in medicinal herbs: A quantitative study. *TANG [Humanitus Medicine]*. 2016; 6(1):e3.
- Bhattacharya S. Medicinal plants and natural products can play a significant role in mitigation of mercury toxicity. *Interdisciplinary Toxicology*. 2018; 11(4):247-254.
- Bhattacharya S. The role of medicinal plants and natural products in melioration of cadmium toxicity. *Oriental Pharmacy and Experimental Medicine*. 2018; 18(3):177-186.
- Bhattacharya S. Medicinal plants and natural products in amelioration of arsenic toxicity: a short review. *Pharmaceutical Biology*. 2017; 55(1):349-354.