WORLD JOURNAL OF PHARMACEUTICAL RESEARCH
SJIF Impact Factor 8.084
Volume 8, Issue 12, 744-756. Research Article ISSN 2277– 7105

STANDARDIZATION OF SIDDHA FORMULATION - *ABINI VAIPPU* OF KONGANAR SARAKKU VAIPPU WITH OPIUM (*ABINI*) LIKE PROPERTIES

A. Thanigainathan[1]*, R. Murugavel[2], K. S. Uma[1] and N. Kabilan[1]

[1]Department of Siddha, The TN DR MGR Medical University, Guindy, Chennai.

[2]Department of Nanju noolum maruthuva needhi noolum, National Institute of Siddha, Chennai.

Article Received on
03 Sept. 2019,

Revised on 24 Sept. 2019,
Accepted on 14 Oct. 2019

DOI: 10.20959/wjpr201912-15809

***Corresponding Author**
A. Thanigainathan
Department of Siddha, The TN DR MGR Medical University, Guindy, Chennai.

ABSTRACT

The purpose of the study is to prepare and standardize the Siddha formulation-*Abini Vaippu* (ABV). Initially, the literary evidence of ABV and its ingredients were reviewed. The ingredients of ABV were purified and ABV was prepared by Siddha Methodology of Konganavar with standard quality. Organoleptic characters like appearance, colour, taste and odour of ABV was noted. ABV was screened for moisture content, total ash value, acid insoluble ash, water soluble extractive value, alcohol soluble extractive value to estimate the quality of study drug. Preliminary Phytochemical evaluation of ABV was carried out following the standard procedure. The physicochemical parameters of ABV were found within normal limits. The results of the preliminary phytochemical test showed that alkaloids, carbohydrate saponins, proteins and amino acids, diterpenoids and fats and fixed oil were present in aqueous extract of ABV.

KEYWORDS: Abini Vaippu, Papaver somniferum, Physicochemical, Phytochemical.

INTRODUCTION

Siddha system is one of the oldest systems of medicine in India. The term Siddha means achievements and Siddhars are saintly persons who achieved results in medicine. Siddhars are pioneers in ancient chemistry in Asia especially in India. Indian climate does not allow collecting all herbals throughout the year. Non availability of certain herbals at particular season may not allow preparing the particular drug. In order to overcome this trouble,

siddhars have described "*Vaippumuraigal*" which means substitute preparation of drugs. It can be prepared by mixing few other herbals and by following certain procedures. Similarly by mixing few metals, minerals and toxic substances with some other minerals and herbals followed by several processing, we can get semisynthetic inorganics which can be used to prepare medicines (Amuthan, Arul *et al*, 2013). Standardization of herbal medicines is the process of prescribing a set of standards or inherent characteristics, constant parameters, definitive qualitative and quantitative values that carry an assurance of quality, efficacy, safety and reproducibility. The authentication of herbal drugs and identification of adulterants from genuine medicinal herbs are essential for both pharmaceutical companies as well as public health and to ensure reproducible quality of herbal medicines (WHO).

Abini Vaippu

Abini Vaippu, a polyherbal formulation with Abini (Opium) like properties has been mentioned in Siddha system by *Konganar* (Vasudeva Shastri *et al*, 1990). The ingredients of *Abini Vaippu* as per the literature are

Purified *Etti Vithai* (Seeds of *Strychnosnux-vomica*) - 10 *palam* (350gm)
Dried *Erukkam Poo* (Flower of *Calotropis gigantea*) - 10 *palam* (350gm)
Veppampisin (Gum of *Azadirachta indica*) - 4 *palam* (140 gms)
Kasakasa (Seeds of *Papaver somniferum*) - 2 *palam* (70 gms)
Panaivellam (Jaggary of *Borassus flabellifer*) - 100 gms
Oomathan Saaru (Leaf Juice of *Datura stramonium*) - 700 ml
Nallennai (Seed Oil of *Sesamum indicum*) - 100 ml

Fresh barks of *Naval* (*Syzygium cumini*) were collected and crushed to get juice. Extracted juice was poured into the iron vessel containing seeds of *Strychnosnux-vomica*. The vessel was covered and kept in idle for 30 minutes. After the prescribed time, the seeds taken from the juice were dried under shade and crushed into small pieces. Mid rib of the leaves of *Datura stramonium* were removed and washed. Other ingredients were checked for prescribed limits of foreign matter (Ayurvedic Pharmacopoeia of India).

Purified seeds of *Strychnosnux-vomica* and dried flowers of *Datura stramonium* were taken in a vessel and boiled with 5.6 litres of potable water until it becomes 700 ml (1/8th). The decoction was filtered and cooled. Gum of *Azadirachta indica* and Seeds of *Papaver somniferum* were placed in mortar and the decoction was added little by little and were

ground with pestle. The process was repeated until the whole decoction is absorbed into the content. Leaves of *Datura stramonium* were crushed to extract the fresh juice. The product was ground with above juice. Then palm jaggery was added and ground till the content become electuary form. The above content was ground with gingelly oil and kept in mud plate covered by a cotton cloth and kept in open space for 48 days. The medicine was collected and preserved in the glass bottle for further use (Vasudeva Shastri *et al*, 1990).

In siddha, the action of a drug is mostly determined by its properties (Murugesan Mudaliyar, 2003)

Suvai (Taste)

Gunam (Character)

Veeriyam (Potency)

Pirivu (Biotranformation)

Seykai (Action)

Each property has a unique way of action on *tridoshas* in our body and thus contribute to various pharmacological actions (Madupu, Paramkusha. (2012). *Veppam* (Hot) is the *Veeriyam* (Potency) of all the ingredients. *Suvai* (Taste) of the most of the ingredients fall under *Inippu* (Sweet) with other having *Kaippu* (Bitter) taste (Marilena Gilca *et al*, 2015). The taste and potency is same as that of *Abini* (Opium).

Abini is the dried latex of *Papaver somniferum* with its alkaloids having therapeutic actions as Astringent, Expectorant, Diaphoretic, Antispasmodic, Hypnotic and Sedative and is frequently administered to relieve pain and calm excitement. (Mani *et al*, 2014). The main ingredient of *Abini Vaippu*, *Strychnus nux-vomica* showed sedative properties in albino mice (Sukul A *et al*, 1999) and anti-diarrhoeal activity (Shoba FG *et al*, 2001). The alcoholic extract of the flowers of *Calotropis gigantea* also shows analgesic activity (Pathak *et al*, 2007). Poppy seed works on calming nerves and inducing sleep. Drinking warm milk with poppy seed paste before going to bed is good for sound sleep and treating insomnia (Murugesan Mudaliyar, 2003).

In this study Organoleptic characters, physicochemical Parameters and Phytochemical test for alkaloids, carbohydrates, glycosides, saponins, phytosterols, phenols, tannins, flavonoids, proteins and amino acids, diterpenes, quinines, gum and mucilage, fats and fixed oil of *Abini Vaippu* were done.

MATERIALS AND METHODS

The drugs were purchased from authorized country raw drug store in Chennai. Abini Vaippu was prepared in the Drug Standardisation laboratory of The Tamilnadu Dr MGR Medical University, Chennai -32. Initially, organoleptic characters, Physicochemical evaluationand preliminary phytochemical screening were done by following the standard procedure.

Evaluation of Organoleptic Characters

Organoleptic characters refer to the evaluation of formulations by appearance, colour, odour, taste, etc. Organoleptic evaluation of ABV was carried out using traditional and standard techniques.

Physicochemical evaluation

Physicochemical evaluation of the study drug was done following the standard procedure. (B. Lavanya 2016., WHO 1998). Three samples screened for loss on drying, total ash value, acid insoluble ash, water soluble ash to estimate the quality of study drug.

Determination of Total Ash values

The ash remaining following ignition of *Abini Vaippu* is determined by three different methods which measure total ash, acid-insoluble ash and water-soluble ash.

The total ash method

It is designed to measure the total amount of material remaining after ignition. This includes both "physiological ash", which is derived from the plant tissue itself, and "non-physiological" ash, which is the residue of the extraneous matter (e.g. sand and soil) adhering to the plant surface.

Procedure

2 gm of *Abini Vaippu* weighed, placed evenly in a previously ignited and tarred silica crucible. Ignited in a muffle furnace at 600°C until it turned white in colour. It indicated the absence of carbon.

$$Totalash\ \% = \frac{Weight\ of\ the\ Ash}{Weight\ of\ the\ sample\ taken} \text{x}100$$

Determination of acid insoluble ash

Acid-insoluble ash is the residue obtained after boiling the total ash with dilute hydrochloric acid, and igniting the remaining insoluble matter. This measures the amount of silica present, especially as sand and siliceous earth.

Procedure

Added to the ash 15 to 25 ml of the hydrochloric acid and boiled for 10 minutes, covering the dish with a watch glass to prevent sputtering. Allowed to cool and filtered the contents of the dish through the ash less filter paper (Whatman 40 size). Washed the filter paper in hot water until the washings are free from hydrochloric acid, as tested by silver nitrate solution and returned to crucible. Evaporated carefully on the water bath and ignited in the muffle furnace at 550° C + 25° C for 1 hour. The crucible was allowed to cool in the desiccator and weighed.

$$Acid\ Insolubleash\ \% = \frac{Weight\ of\ the\ Acid\ insoluble\ residue\ weight}{Weight\ of\ the\ sample\ taken} \text{x100}$$

Determination of water soluble ash

Total ash 1g was boiled for 5min with 25ml water and insoluble matter collected on an ash less filter paper was washed with hot water and ignited for 15min at a temperature not exceeding 4500° C in a muffle furnace. Difference in weight of ash and weight of water is used for calculating water soluble ash.

Total Moisture Content

The moisture content of drugs in conjunction with a suitable temperature will lead to activation of enzyme and given suitable conditions may lead to proliferations of living organism. As most vegetable drug contain all essential food requirements for moulds, insects and mites.

Loss on drying

Take 2g of *Abini Vaippu* in a 100ml weighed beaker and keep it in an Hot air oven for about 4-5hrs, at 110^{o}c and then it is cooled and weighed.

$$LossOnDrying\ \% = \frac{(W2g - W3g)}{(W2g - W1g)} \text{x100}$$

W1 - Beaker Wt

W2 - Sample Wt + Beaker Wt

W3 - (Dried sample Wt + Beaker Wt)

Water soluble extractive

5g of *Abini Vaippu* is taken in 250ml iodine flask. Add 100ml of water and then keep it in shaker for about 6hrs and then it is left to stand for whole night. Then it is filtered with Whatman 4 size filter paper. Take 10ml from that filtrate into 250ml beaker. It is kept in oven at 110^0c for one hour and then it is cooled and weighed.

$$WaterSolubleExtractive\ \% = \frac{W2g - W1g}{Samplewt} \text{x} \frac{100}{10} \text{x} 100$$

W1 - Empty Beaker Wt.

W2 - 10 ml Water Soluble Extract Wt.

Alcohol soluble extractive

2.5g of *Abini Vaippu* is taken in 250ml iodine flask. Add 50ml of ethanol and then keep it in shaker for about 6hrs and then it is left to stand for whole night. Then it is filtered with Whatman 4 size filter paper. Take10ml from that filtrate into 250ml beaker. It is kept in oven at 110^0c for one hour and then it is cooled and weighed.

$$AlcoholSolubleExtractive\ \% = \frac{W2g - W1g}{Samplewt} \text{x} \frac{50}{10} \text{x} 100$$

W1 - Empty Beaker Wt.

W2 - 10 ml Water Soluble Extract Wt.

Estimation of pH

Sample preparation

5gm of *Abini Vaippu* is taken in beaker and 100ml of water is added to it. This solution is measured for pH using pH Metre.

Procedure

After preparing 5% solution of the finished product, the pH was checked by using digital pH meter. The electrode is immersed into the sample solution until a steady reading is reached. The electrode is then rinsed and stored in storage solution after measurement have been completed.

The Preliminary Phytochemical Screening test

The preliminary phytochemical screening test was carried out for each extracts of the samples as per the standard procedure. (Kumar Anil et al 2012). Aqueous extracts of the 5 gms ABV was prepared with 100 ml of distilled water. It is kept in shaker for 8 hrs and 16 hrs idle. The

extract is then filtered. Phytochemical Screening of the drug have been done using standard procedures.

Detection of Alkaloids

Extracts were dissolved individually in diluted hydrochloric acid and filtered.

Mayer's test: 2 ml of extract was treated with few drops of Mayers' reagent, formation of yellow coloured precipitate indicates the presence of alkaloids.

Wagner's test: 2 ml of filtrate was treated with Wagner's reagent. Formation of brown / reddish precipitate indicates the presence of alkaloids.

Dragendroff's Test: Filtrates were treated with Dragendroff's reagent. Formation of red precipitate indicates the presence of alkaloids.

Hager's Test: Filtrates were treated with Hager's. Presence of alkaloids confirmed by the formation of yellow colored precipitate.

Detection of Carbohydrate

Extract was dissolved individually in 5 ml distilled water and filtered.

Molisch's test: 2 ml of filtrate was treated with few drops of alcoholic α naphthol solution. Formation of the violet ring at junction indicates presence of carbohydrates.

Benedict's test: Filtrate was treated with Benedict's reagent and heated gently. Orange red precipitate indicates the presence of reducing sugars.

Detection of Glycosides

Extracts were hydrolyzed with dil. HCl, and then subjected to test for glycosides.

Modified Borntrager's Test: Extracts were treated with Ferric Chloride solution and immersed in boiling water for about 5 minutes. The mixture was cooled and extracted with equal volumes of benzene. The benzene layer was separated and treated with ammonia solution. Formation of rose-pink colour in the ammoniacal layer indicates the presence of anthranol glycosides.

Cardiac glycoside (Keller-Killiani test): Extract was shaken with distilled water (5 mL). To this, glacial acetic acid (2 mL) containing a few drops of ferric chloride was added, followed byH2SO4 (1 mL) along the side of the test tube. The formation of brown ring at the interface gives positive indication for cardiac glycoside and a violet ring may appear below the brown ring.

Detection of Saponins

Froth test: Extracts was diluted with distilled water to 20 ml and this was shaken in a graduated cylinder for 15 minutes. Formation of 1 centimetre layer of foam indicates the presence of Saponins.

Foam test: 0.5gram extract was shaken with 2 ml of water. If foam produced persists for 10 minutes, it indicates the presence of steroids.

Detection of Phytosterols

Salkowski's test: Extract was treated with chloroform and filtered; the filtrates were treated with few drops of concentrated sulphuric acid, shaken and allowed to stand for few minutes. Golden yellow colour indicates the presence of triterpenes.

Detection of Phenols

Ferric Chloride test: 2 ml of extracts was treated with 3-4 drops of ferric chloride solution. Formation of bluish black colour indicates the presence of triterpenes.

Detection of Tannins

Gelatin test: To the extracts, 1% of gelatin solution containing sodium chloride was added, formation of white precipitate indicates the presence of tannins.

Detection of Flavonoids

Alkaline reagent test: Extract was treated with few drops of 10% sodium hydroxide, formation of intense yellow colour then on addition of diluted hydrochloric acid it becomes colourless, it indicates the presents of flavonoids.

Lead acetate test: Extract was treated with few drops of lead acetate solution, yellow colour precipitate indicates presence of flavonoids.

Detection of proteins and aminoacids

Ninhydrin Test: The extracts were treated with few drops of Ninhydrin and heated gently. Formation of blue colour indicates the presence of proteins.

Detection of Diterpenes

Copper Acetate test: Extracts were dissolved in water and treated with 3-4 drops of copper Acetate solution, formation of emerald green colour indicates the presence of diterpenes.

Test for Gum and mucilage

The extract was dissolved in 10 ml of distilled water and to this 2ml of absolute alcohol with the constant stirring white cloudy precipitate indicates the presence of gum and mucilage.

Detection of Fat and Fixed oil

Spot test: A small quantity of extract is pressed between two filter papers. Oil stain on the paper indicates the presence of fixed oils.

Detection of Quinones

Extract was treated with concentrated HCL and observed for the formation of yellow precipitate or yellow discolouration.

RESULTS

Organoleptic evaluation of ABV was carried out using traditional and standard techniques. (Santosh Kumar Singh, *et al*, 2014) And Organoleptic Characters of ADK was tabulated in Table1.

Table 1: Organoleptic characters of ABV.

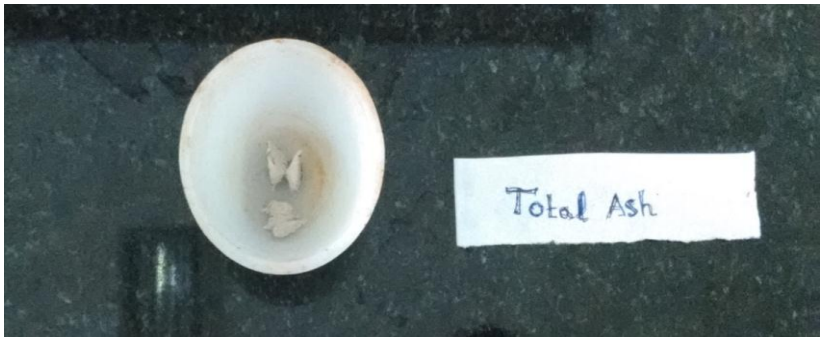
Characters	ABV
Colour	Dark Brown
Taste	Sweet
Odour	Aromatic odour
Appearance	Semi solid
Touch	Sticky

Physicochemical parameters

Results of analysis of Physiochemical parameters of Abini Vaippu was tabulate in Table.2

Table 2: Physicochemical values of ABV.

Abini Vaippu	Physicochemical values
Total ash	6.37 %
Water soluble ash	2.45 %
Acid insoluble ash	Less than 1 %
Loss on drying	4.74 %
Water soluble extractive	69.66 %
Alcohol soluble extractive	5.24 %
pH	5.02



Total ash of ABV

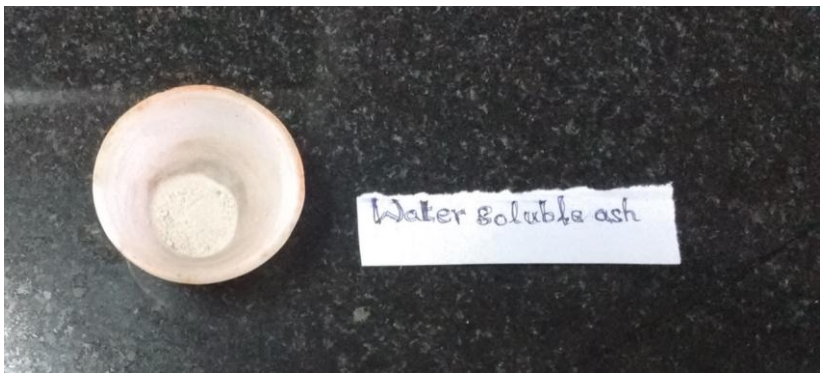


Fig. Water soluble ash of ABV

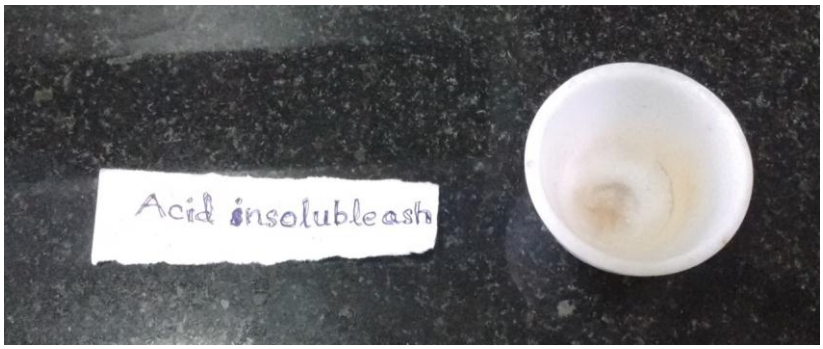


Fig. Acid insoluble ash of ABV

Fig. Phytochemical analysis of ABV.

Phyto-chemical analysis

Results of preliminary Phyto -chemical analysis of Aqueous and Ethanol extract of Adhatodai Kudineer was tabulated in Table.3.

Table 3: Phytochemical analysis of ABV.

S.No	Phytochemicals	Test name	Results
1	Alkaloids	Mayer's Test	+
		Wagner's Test	+
		Dragendroff's Test	+
		Hager's Test	+
2	Carbohydrates	Molisch's Test	+
		Benedict's Test	+
3	AnthranolGlycosides	Modified Borntrager's Test	-
	Cardiac Glycosides	Keller Killani's Test	-
4	Saponins	Froth's Test	+
		Foam Test	+
5	Phytosterols	Salkowski's Test	-
6	Phenols	Ferric chloride Test	-
7	Tannins	Gelatin Test	-
8	Flavonoids	Alkaline Reagent Test	-
		Lead acetate Test	-
9	Proteins	Ninhydrin Test	+
10	Diterpenes	Copper acetate Test	+
11	Gum and mucilage	Extract+Alcohol	-
12	Fat and Fixed Oil	Spot Test	+
13	Quinone	Extract + NaOH	-

DISCUSSION

Abini Vaippu was not used widely and its reports on organoleptic, preliminary phytochemicals, physicochemical tests are not available. Preliminary Phytochemicals screening test of ABV showed presence of Alkaloids, Sugar, Fats, proteins, diterpenoids and saponins. Opium also contains alkaloids like Papaverine, morphine, codeine, etc (Mani *et al*, 2014), which are mainly used as pain killer. Glucose or sucrose solutions administered orally provide effective analgesia for procedural pain in neonates (Kracke GR *et al*, 2005). Because analgesia with sugar solutions can be decreased by **opioid receptor antagonists**. In addition, Sugar as a vehicle for iron fortification presents several advantages over the other vehicles used in the last three decades (Layrisse M *et al*, 1976). Fatty acid itself can act as an analgesic (Ledón N *et al*, 2003). Studies also suggest that morphine when combined with omega 3 fatty acid can act as a improved analgesic (Laino, Carlos. 2017). Main ingredients of ABV also showed proven analgesic and sedative activity. The above experiments confirms the safety of

Abini Vaippu for human consumption and also it well establishes the fact that ABV can be used as a substitute for Opium.

ACKNOWLEDGEMENT

Authors thank the Vice chancellor, Registrar, The Tamil Nadu Dr. M. G. R. Medical University for infrastructure to carry out this study in the Department of Siddha.

REFERENCES

1. Amuthan, Arul & Subramaniam, Barathi. 18 siddhars and Siddha Medicine: The forgotten Indian Saints and their Medical Knowledge. University News, 2013; 51: 41-44 and 53.
2. Formulary of Siddha Medicines, IMPCOPS.
3. Laino, Carlos. Innovations in Pain Management: Morphine Combined with Omega-3 Fatty Acids. The Open Conference Proceedings Journal, 2017; 08: 52-65. 10.2174/2210-28901708010052
4. Kracke GR, Uthoff KA, Tobias JD. Sugar solution analgesia: the effects of glucose on expressed mu opioid receptors. Anesth Analg, Jul, 2005; 101(1): 64-8. table of contents. PubMed PMID: 15976207.
5. Layrisse M, Martinez-Torres C, Renzi M, Velez F, González M. Sugar as a vehicle for iron fortification. Am J Clin Nutr., Jan, 1976; 29(1): 8-18. PubMed PMID: 1246979.
6. Ledón N, Casacó A, Rodríguez V, Cruz J, González R, Tolón Z, Cano M, Rojas E. Anti-inflammatory and analgesic effects of a mixture of fatty acids isolated and purified from sugar cane wax oil. Planta Med., Apr, 2003; 69(4): 367-9. PubMed PMID: 12709906.
7. Madupu, Paramkusha. "Doshaghna Guna Ganana" (DGG) -A new arithmetic assessment of drugs' effect on dosha based on Guna prbhava (Effect of properties). International Journal of Ayurvedic Medicine, 2012; 3(3): 130-139. 3.
8. Mani, Dayanandan & Dhawan, Sunita Singh. Scientific basis of therapeutic uses of opium poppy (Papaver somniferum) in Ayurveda. Acta horticulturae, 2014; 1036: 175-180. 10.17660/ActaHortic.2014.1036.20.
9. Marilena Gilca and Alina Barbulescu, TASTE OF MEDICINAL PLANTS: A POTENTIAL TOOL IN PREDICTING ETHNOPHARMACOLOGICAL ACTIVITIES?, Journal of Ethnopharmacology, http://dx.doi.org/10.1016/j.jep.2015.08.040

10. Murugesan Mudaliar, K. S. Gunapadam Porutpanbu Nool- Part - 1, Moligai Vagupu, 7th ed, Department of Indian Medicine and Homeopathy. Government of Tamil Nadu, Chennai, 2003.
11. Pathak, AK & Argal, Ameeta. Analgesic activity of Calotropis gigantea flower. Fitoterapia, 2007; 78: 40-2. 10.1016/j.fitote.2006.09.023.
12. Santosh Kumar Singh, Jay Ram Patel, Prashant Kumar Dubey, and Arvind Dangi. Pharmacognostic study and phytochemical screening of leaf of Adhatoda vasica (Acanthaceae). Journal of Medicinal Plants Studies, 2014; 2(4): 29-31.
13. Shoba FG, Thomas M. Study of antidiarrhoeal activity of four medicinal plants in castor-oil induced diarrhoea. J Ethnopharmacol, Jun, 2001; 76(1): 73-6. PubMed PMID: 11378284
14. Sukul A, Sinhabau SP, Sukul NC. Reduction of alcohol induced sleep time in albino mice by potentized Nux vomica prepared with 90% ethanol. Br Homeopath J., Apr, 1999; 88(2): 58-61. PubMed PMID: 10335413.
15. The Ayurvedic Pharmacopoeia Of India - 2016, Pharmacopoeia Commission for Indian Medicine & Homoeopathy, Ministry of AYUSH, Government of India.
16. Vasudeva Shastri & Venkattarajan. Konganar Sarraku Vaippu (100), Saraswathy Mahal Library of Serfoji, Tanjore, 1990.
17. WHO guidelines on good manufacturing practices (GMP) for herbal medicines, 2007. ISBN: 9789241547161