

# Standardization of a Unani Drug Bisehri Booti (*Aerva lanata* Linn.)

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## Abstract

*Aerva lanata* L. (Family: Amaranthaceae) known as 'Bisehri Booti' in Indian subcontinent, has been mentioned in few classical Unani literature and is used frequently by Hakeems of Western Uttar Pradesh in different urinary diseases. In Unani literatures it has found only fractional description where mainly organoleptic characters have been described. Till now Unani physicians have not adopted scientific methods for identification and standardization of a numbers of Unani drugs including Bisehri Booti (*A. lanata*). The present study was therefore undertaken to determine the preliminary physico-chemical and phytochemical characteristics of *A. lanata* on qualitative parameters in which it was found that alkaloids, amino acids, proteins, glycosides, saponins, tannins, sterol/terpenes, sugars and flavonoids were present, while phenol and resins were absent. A number of attributes such as solubility in alcohol (1.67%) and water (3.07%), pH at 1% (7.39) and 10% (6.36%), moisture content (4.2%), total ash value (7.30%), loss of weight on drying (5.92%), bulk density (0.33%), successive extractive values Petroleum ether (2.92%), Diethyl-ether (0.22%), Chloroform (0.38%), Acetone (0.27%), Alcohol (9.27%), Water (14.38%), non successive extractive values in Alcohol (11.98%) and water (12.69%) were recorded. These parameters may help to standardize the test drug.

**Keywords:** Bisehri Booti, Standardization, Physico-chemical and Phyto-chemical, Amaranthaceae, *Aerva lanata* Linn.

## Introduction

Bisehri Booti (*Aerva lanata* Linn.; family *Amaranthaceae*) (Fig. 1) is relatively a less known drug of Unani Medicine which is used in Haematuria, Burning micturation, Albuminuria, Lithiasis and some other nephrological disorders by many Unani physicians especially in Western Uttar Pradesh (Afaq *et al.*, 1991; Savadi and Algavadi, 2009; Ragavendran *et al.*, 2012). Although it has not been mentioned in important books of Unani medicine, however a physician of twentieth century Hm. Abdul Qadir (Qadir, 1930) has mentioned this drug in his book Mujarrabat-e-Qadri with necessary details. Bisehri Booti has been identified as *Aerva lanata* (Linn.) (Afaq *et al.*, 1991). Over a period of time it got reputation as an antilithiatic agent which was also effective in other ailments of kidney and prostate etc. (Afaq *et al.*, 1991; Afridi, 1992; Ahmad, 1994).

Bisehri Booti is a woody, prostrate or succulent perennial herb, 30-60 cm in height, native of Asia, Africa, and Australia. The plant is distributed throughout the hotter parts of India especially all over plains and hilly area up to 900 mts.

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It spreads in the state of Tamil Nadu, Andhra Pradesh and Karnataka, plains of Bengal from Deccan, Westward to Konkan, Madhya Pradesh and also in Punjab and Trai region of U.P. (Karnick, 1972; Kapoor, 1976). Flowering season is from Oct/ Nov to June (Patnaik, 1956; Trimen, 1974; Ahmad, 1994). Although, the whole plant is used to treat a number of diseases but the differential effects of different parts of the plant have also been described in Unani and Ayurvedic literature. It is also reported to be present in Sri Lanka, South Asia, Saudi Arabia, Egypt, tropical Africa, South Africa, Java and Philippines (Lakshami and Lethi, 2014).

The root is claimed to be demulcent diuretic and useful in strangury in Ayurveda, The roots are used in the treatment of headache. It is valued for cough, also as a vermifuge for children (Dymock, 1890; Kirtiker and Basu, 1987). The plant is an anthelmintic and demulcent and is used in lithiasis. It is also regarded as useful medicine for cough, sore throat, indigestion, wounds and for diabetes. A decoction of the plant is considered an efficacious diuretic and is considered useful in catarrh of bladder. The plant is used to cure diarrhea, cholera and dysentery. The root is diuretic, demulcent, tonic and is given to pregnant women. The root and flower are used to cure headache. The flowers are used in gonorrhoea and for removal of kidney stones (Nadkarni, 1976; Chopra *et al.*, 1956; Gupta and Tandon, 2004). The herb is used in malaria and skin disease. In piles, it is given with black pepper and milk (Afaq *et al.*, 1991; Anonymous, 2000). The plant is useful to treat boils, cephalgia, cough, strangury and lithiasis (Sala, 1993).

The description of the plant in the literature of traditional medicines and its age-old practice by the physician of Unani and Ayurvedic medicine to treat a number of diseases specially the kidney diseases successfully, indicate that it is an important medicinal plant which has wide therapeutic potential. Further, in a recent study it has been reported to possess significant nephroprotective effect against chemically induced nephrotoxicity (Ahmad, 1994). However, the drug has probably not been standardized on scientific parameters as sufficient data is not available to determine its identity and quality. In view of the above therefore physico-chemical and phyto-chemical study of this drug was carried out in order to fix its standard.

## **Material and Method**

### **Collection of Plant material**

The whole plant of Bisehri booti (*Aerva lanata* Linn) was collected from the premises of Ajmal Khan Tibbiya College, Aligarh Muslim University, Aligarh. Its identity was confirmed by the Pharmacognosy section of the department of Ilmul

Advia, AKTC, AMU Aligarh. A Voucher specimen (SC-0140/13S) of the plant material has been deposited in the Herbarium and Museum of department of Ilmu Advia, Faculty of Unani Medicine, AMU, Aligarh, for record and future reference.

### Parameters of Standardization

- (i) The organoleptic characters including colour, smell, texture, taste, appearance were noted carefully.
- (ii) The dried powder of whole plant was used for chemical analysis. Various physico-chemical studies such as total ash, acid insoluble ash, water soluble ash, alcohol and water soluble matter, bulk density, moisture content, successive extractive values using soxhlet extraction method, and pH studies were carried out as per guidelines of WHO (Anonymous, 1998, 2008 ; Afaq *et al.*, 1994; Jenkins *et al.*, 1967).
- (iii) Qualitative analysis of the drug was conducted to identify the organic chemical constituents present in the drug (Overtone, 1963; Harborne, 1973).
- (iv) The thin layer chromatographic analysis was conducted following Stahl (1969) and Harbone (1973) method on pre-coated silica gel 60F264 TLC plates. The plates were visualized in day light, in short UV and Long UV.
- (v) Fluorescence analysis of the successive extract and powdered drug were studied under day light as well as in short UV and Long UV.

### Observations

- (a) Organoleptic characters: The powder of the plant Bisehri Booti was found to be light green with agreeable smell and astringent taste (Table 1).
- (b) Physico-chemical constants: Different physicochemical constants determined using suitable measures. The values recorded have been presented in Table 2 & 3.

**Table 1:** Organoleptic Character of Bisehri Booti (*Aerva lanata* Linn)

Colour	Light green
Appearance	Powder
Texture	Fine
Taste	Astringent
Smell	Agreeable

**Table 2:** Physico-chemical constants of powder of Bisehri Booti (*Aerva lanata* Linn)

S.No.	Parameters	Percentage (w/v)*
1.	Ash value	
	Total ash	7.30
	Acid insoluble ash	1.40
	Water soluble ash	5.80
2.	Soluble Part	
	Ethanol soluble	1.67
	Aqueous soluble	2.77
3.	Successive Extractive Value	
	Pet. Ether	2.92
	Di-ethyl ether	0.22
	Chloroform	0.38
	Acetone	0.27
	Alcohol	9.27
	Aqueous	14.38
4.	Non Successive Extractive Values	
	Alcoholic	11.98
	Aqueous	12.69
5.	Moisture content	4.22
6.	Loss on Drying	5.92
7.	pH values	
	1% water solution	7.39
	10% water solution	6.36
8.	Bulk density	0.33

\*Note: Values are average of three experiments

- (c) Fluorescence studies of the powdered drug after its reaction with different chemical reagents and successive extract were studied under day light as well as in short UV and Long UV (Table 4 & 5 respectively).
- (d) TLC profile of different extract in different solvents have been recorded in (Table 6 & Fig.2).

## Discussion

Physico-chemical and Phyto-chemical standardization are considered most important tools of quality control of Unani drugs. The efficacy and potency of a

**Table 3:** Phyto-chemical constituents determined after the qualitative study of extract of Bisehri Booti

S.No.	Test	Test/ Reagent	Inference
1.	Alkaloid	Drgendorff's reagent Wagner's reagent Mayer's reagent	+ve +ve +ve
2.	Amino acid	Ninhydrin Solution	+ve
3.	Protein	Xanthoproteic Test Biuret Test	+ve +ve
4.	Glycoside	NaOH Test	+ve
5.	Flavonoid	Mg ribbon and Dil. Hcl	+ve
6.	Phenol	Ferric Chloride Test	-ve
7.	Resin	Acetic Anhydride Test	-ve
8.	Sterol/ Terpene	Hosse's Reaction Test Moleschott's Reaction	+ve +ve
9.	Sugar	Molisch Test Benedict Test	+ve +ve
10.	Tannin	Ferric Chloride Test	+ve
11.	Saponin	Honey Comb Frothing Test	+ve

Indications: (-ve) Absence and (+ve) Presence of constituent



**Fig. 1:** Bisehri Booti (*Aerva lanata* Linn) Plant

**Table 4:** Fluorescence analysis of Bisehri Booti powder with different chemical reagents

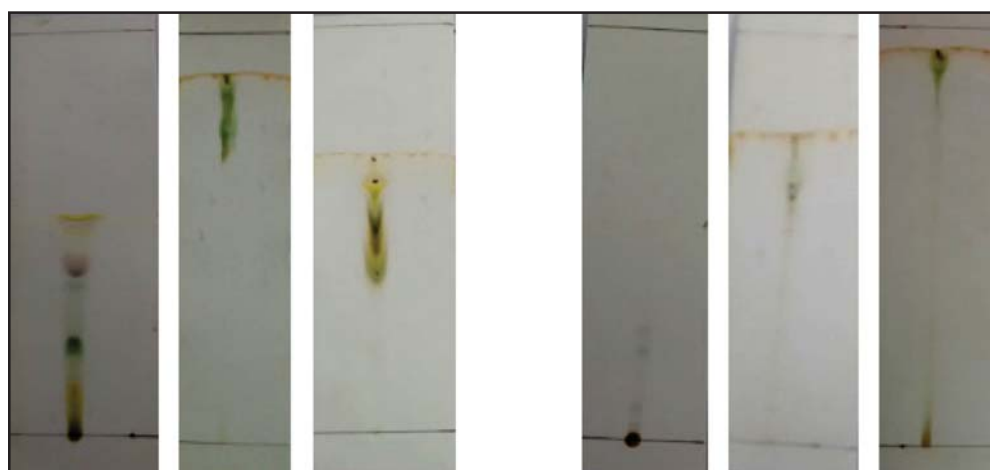
S. No.	Powdered drug+ Chemical Reagents	Day light	UV short	UV long
1.	Powdered drug + Conc. HNO <sub>3</sub>	Dark Brown	Dark Green	Black
2.	Powdered drug + Conc. HCl	Dark Brown	Dark Green	Black
3.	Powdered drug + Conc. H <sub>2</sub> SO <sub>4</sub>	Dark Red	Black	Black
4.	Powdered drug + 2% Iodine solution	Dark Red	Blackish Green	Black
5.	Powdered drug + Glacial Acetic Acid	Cherry Red	Black	Black
6.	Powdered drug +NaOH (10%)	Light Green	Dark Green	Green
7.	Powdered drug + Dil. HNO <sub>3</sub>	Light Green	Green	Dark Green
8.	Powdered drug + Dil. H <sub>2</sub> SO <sub>4</sub>	Green	Green	Black
9.	Powdered drug + Dil. Hcl	Light Green	Green	Blackish Green
10.	Powdered drug +Dragendorff's reagent	Brown	Dark Green	Black
11.	Powdered drug + Wagner's reagent	Dark Brown	Green	Black
12.	Powdered drug + Benedict' reagents	Light Green	Green	Grey
13.	Powdered drug + KOH (10%) Methanolic	Light Green	Light Green	Green
14.	Powdered drug + CuSO <sub>4</sub> (5%)	Greenish White	Light Green	Cherry Green
15.	Powdered drug +Ninhydrin (2%) in Acetone	Light Green	Green	Grey
16.	Powdered drug + Picric Acid	Greenish Yellow	Green	Dark Green
17.	Powdered drug + Lead Acetate (5%)	White	Green	Dark Green

**Table 5:** Fluorescence analysis of Bisehri Booti extract in different lights

S.No.	Extract	Day Light	UV Short	UV Long
1.	Pet. Ether	Green	Green	Purple
2.	Di-ethyl ether	Light Green	Dark Green	Greenish
3.	Chloroform	Grey	Dark Green	Dark Green
4.	Acetone	Light Yellow	Light Green	Dark Green
5.	Alcohol	Dark Brown	Dark Green	Dark Brown
6.	Aqueous	Cherry Brown	Black	Black

**Table 6:** Thin Layer Chromatography profile

Treatment	Mobile Phase	Visible	No. of Spots	R <sub>f</sub> values of the spots
Petroleum Ether Extract				
Day light	(i) P. Ether: Diethyl Ether (4:1)	5		0.42,0.47,0.69,0.90,0.95.
UV Short		5		
UV Long		5		
Day light	(ii) Chloroform: Methanol (1:1)	3		0.537,0.629,0.857.
UV Short		3		
UV Long		3		
Day light	(iii) Chloroform: Acetic Acid (4:1)	4		0.763,0.833,0.944,0.972.
UV Short		4		
UV Long		4		
Chloroform Extract				
Day light	(i) P. Ether: Diethyl Ether (4:1)	4		0.047,0.142,0.380,0.476.
UV Short		4		
UV Long		4		
Day light	(ii) Chloroform: Methanol (1:1)	3		0.081,0.754,0.803.
UV Short		3		
UV Long		3		
Day light	(iii) Chloroform: Acetic Acid (4:1)	3		0.853,0.946,0.986.
UV Short		3		
UV Long		3		



**Fig. 2.1:** TLC of Pet. Ether Extract **Fig.2.2:** TLC of Chloroform Extract

drug depends upon its physico-chemical as well as on Phyto-chemical properties, therefore, determination of Physico-chemical characters of the drugs for the purpose of identification is necessary so that the drug can be used successfully for its described pharmacological effect. Since the chemical constituent present in plant drugs vary not only plant to plant but also among different samples of same species, depending upon soil condition, atmosphere, collection, storage, and drying conditions of the sample drugs therefore the identity and quality of the plant intended to be used in the management of diseases must be ensured. It will help in maintaining the objectivity of the pharmacological activity and its therapeutic use.

Since the present study presents one of the earliest reports on the standardization of Bisehri Booti therefore, the findings recorded in the respect of various organoleptic, physico-chemical and phyto-chemical parameters set the standard of its identity and quality. It can be used by physicians, pharmacists and manufacturer as a reference. The TLC profile indicated that the test drug possesses 5 different constituent which may be responsible for the biological activity of the plant in different diseases. It warrants therefore, that further quantitative and analytical studies should be conducted to find out the main constituent or the combination of constituent of pharmacological and therapeutic utility.

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