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ORIGINAL RESEARCH ARTICLE

Pharmacognostical Studies on Inflorescences of *Aerva pseudotomantosa Blatt & Hallb*

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ABSTRACT

Aerva pseudotomantosa Blatt & Hallb (family *amaranthaceae*) is a plant of desert region. It is commonly known as bui and buari. It is herb or subshrub; Stem erect, stoloniferous or climbing, leaves alternate or opposite, margin entire, flowers perfect, unisexual or dioecious, small or very small. Inflorescences are spikes, terminal or axillary, simple or in complex thyrsoid structures. Bracts and bracteoles are membranous, persistent or bracteoles falling off with perianth in fruit. Tepals are 4 or 5, ovate or oblong, membranous or papery, lanose, with only 1 vein. Stamens are 4 or 5; filaments subulate, unequal, united to short cup at base, alternating with pseudostaminodes, pseudostaminodes subulate to oblong; anthers 2-loculed. Ovary is obovoid or subglobose, glabrous; style persistent; stigmas 2, capitate. Utricles ovoid, compressed, membranous, indehiscent or irregularly dehiscent (bursting), falling off with perianth. Seeds are reniform-orbicular, lenticular, compressed. Traditionally, the whole plant extract is widely used by various tribal communities, forest dwellers and in desert region for the treatment of variety of ailments such as in gastric complaints, in pain relief, in rheumatism and various venereal diseases. The present paper deals with comprehensive pharmacognostical studies on inflorescences part of this plant, including macroscopical analysis, preliminary examination of inflorescences powder, florescence analysis. This will help in the identification of powder drug prior using in any herbal formulations.

Key words: *Aerva pseudotomantosa*, inflorescences, gastric complaints, pain relief, macroscopical analysis.

INTRODUCTION

Aerva is a genus of plant in the family *Amaranthaceae* with about 167 species around Mediterranean, Asia and in the North America. The *Aerva pseudotomentosa* is globally distributed in Pakistan and India. It is found from arid and semiarid region of Rajasthan state mainly in Jodhpur, Barmer, Bikaner, Churu, Jaiselmer, Jhunjhunu, Sikar and Shri Ganganagar districts and it is commonly known as Bui, Buari. It is herb or subshrub; Stem erect, stoloniferous or climbing, leaves alternate or opposite, margin entire, flowers perfect, unisexual or dioecious, small or very small. Inflorescences are spikes, terminal or axillary, simple or in complex thyrsoid structures. Bracts and bracteoles are membranous, persistent or bracteoles falling off with perianth in fruit. Tepals are 4 or 5, ovate or oblong, membranous or papery, lanose, with only 1 vein. Stamens are 4 or 5; filaments subulate, unequal, united to short cup at base, alternating with pseudostaminodes, pseudostaminodes subulate to oblong; anthers 2-loculed. Ovary is obovoid or subglobose, glabrous; style persistent; stigmas 2, capitate. Utricles ovoid, compressed, membranous, indehiscent or irregularly dehiscent (bursting), falling off with perianth. Seeds are reniform-orbicular, lenticular, compressed [12].

Traditionally, the whole plant extract is widely used by various tribal communities, forest dwellers and in desert region for the treatment of variety of ailments such as in gastric complaints, in pain relief, in rheumatism and various venereal diseases. As pharmacological use of point *Aerva pseudotomentosa* has been used as anti-inflammatory, as analgesic, as anthelmintic and tonic, etc [24,25,26,27].

By taking into consideration previously quoted literature review, it has been found that not much work has been done on inflorescences of *Aerva pseudotomentosa*, yet no attempt has been made to pharmacognostical studies on the inflorescences of *Aerva pseudotomentosa*. The present paper deals with comprehensive pharmacognostical

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studies on inflorescences part of this plant, including macroscopical analysis, preliminary examination of inflorescences powder, florescence analysis, as well as behaviour of inflorescences powder with different chemical reagents. This will help in the identification of powder drug prior using in any herbal formulations.

MATERIALS AND METHODS

Collection of plant materials:

This plant was collected from the Banard road near by Jodhpur (Rajasthan) in the month of March, and authenticated by Botanical Survey of India, Jodhpur. The specimen has been submitted to the Departement of Pharmacognosy, Lachoo Memorial College of Science & Technology, Jodhpur and Rajasthan for future reference.

Macroscopical Analysis:

Shade dried inflorescences of *Aerva pseudotomentosa* was evaluated for its morphological and sensory profile by observing of its colour, odour, taste [1,2,3,4,20].

Florescence Analysis of inflorescences powder:

Florescence analysis of inflorescences powder of *Aerva pseudotomentosa* was carried out by the treatment of different chemical reagents such as 50% H_2SO_4, 50% HNO_3, 5% KOH, CH_3OH, 1N HCl, 1N methonolic NaOH, C_2H_5OH (95%), 1N ethonolic NaOH, acetone with it and powder as such and it was observed under visible and UV light for florescences [5,16,19,21,22,23].

Physicochemical parameters:

Different physicochemical parameters such as foreign organic matter, loss on drying, swelling index, foaming index, total ash value, acid insoluble ash value, water soluble ash value, sulphated ash value, ether extractive value, ethanolic extractive value and water soluble extractive value were determined as per standard procedures recommended in WHO guideline [1,5,17,21,22,23].

Examination of powdered plant material (Inflorescences) for preliminary tests:

The inflorescences powder was examined for its organoleptic characteristics and the general and micro chemical tests were performed with powder and its aqueous extract [5,6,18].

RESULTS AND DISCUSSION

Macroscopical Analysis:

The inflorescencess of *Aerva pseudotomentosa* are 7-8 cm. long and 3-6mm in diameter, straight and unbranched. It is dull-white in color. Odour characteristics and it is tasteless. Inflorescences are spikes, axillary and in complex thyrsoid structures (**Fig 1)**.

Fig 1: Inflorescencess of *Aerva pseudotomentosa* Blatt & Hallb

Fig 2 : woolly seeds of *Aerva pseudotomentosa* Blatt. & Hallb

Histochemical tests analysis:

The inflorescences powder of *Aerva pseudotomentosa* was treated with different chemical reagents and observed under microscope. The result of histochemical tests analysis of inflorescences powder is shown in (**Table 1)**.

Table 1: Histochemical tests of inflorescences powder of *Aerva pseudotomentosa.*

Test for	Reagent	Observation	Result
Parenchymatous tissue	Safranin	No Pink colour	-
Starch	Iodine	Blue colour	+
Tannin	$FeCl_3$ solution (10% w/v)	Black colour	+
Cellulose	Conc. H_2SO_4	Green colour	+
Lignified tissue	Dil HCl+Pinch of phloroglucinol	Magenta colour	+
Oil glands	Sudan red III	No pink colour	-
Mucilage	Ruthenium red	Pink colour	+
Calcium carbonate crystals	Conc. HCl	No effervesence	-
Calcium oxalate crystals	Cons. H2SO4	No effervesence	-

Florescence Analysis of inflorescences powder:

The inflorescences powder of *Aerva pseudotomentosa* was treated with different chemical reagents and observed under visible and UV light. The result of florescence analysis of inflorescences powder is shown in (**Table 2)**.

Table 2: Florescence analysis of powdered inflorescences of *Aerva pseudotomentosa.*

Treatment of powder inflorescences	Florescence observed	
	Under Visible light	Under UV light
Powder as such	Light grey	Dark grey
50%H_2SO_4	Light grey	Grey
50%HNO_3	Light grey	Grey
5% KOH	Light green	Brown
CH_3OH	Greenish grey	Dark brown
1N HCl	Light grey	Light grey
1N methonolic NaOH	Light grey	Light grey
C_2H_5OH (95%)	Greenish grey	Dark brown
1N ethonolic NaOH	Light grey	Light grey
Acetone	Greenish grey	Dark grey

Physicochemical parameters:

Different physicochemical parameters such as foreign organic matter, loss on drying, swelling index, foaming index, total ash value, acid insoluble ash value, water soluble ash value, sulphated ash value, ether extractive value, ethanolic extractive value and water soluble extractive value were determined as per standard procedures recommended in WHO guideline. Results are given in (**Table 3)**.

Table 3: Represent the results of physicochemical parameters of inflorescences powder *Aerva pseudotomentosa.*

Parameter	Limits
Foreign organic matter	0.25% w/w
Loss on drying	5.54% w/w
Swelling index	0.78
Foaming index	Less than 100
Total ash value	11.18% w/w
Acid insoluble ash value	3.44% w/w
Water soluble ash value	7.18% w/w
Sulphated ash value	1.3% w/w
Ether extractive value	0.98% w/w
Ethanolic extractive value	17.10% w/w
Water extractive value	18.22% w/w

Examination of powdered plant material (inflorescences) for preliminary tests:

The inflorescences powder was examined for its organoleptic characteristics and the general and microchemical tests were performed with powder and its aqueous extract. Results are shown in (**Table 4)**.

Table 4: Preliminary examinations of inflorescences powder of *Aerva pseudotomentosa.*

S. No.	Test	Observation	Result
1.	**Organoleptic chacteristics :-**		
	i) Colour	Off white	
	ii) Odour	Odourless	
	iii) Taste	Tasteless	
2.	**General and Microchemical tests (with powder/Aq. Ext.):-**		
	Test for		
	i) Saponins	Frothing	+
	ii) Tannins	Dark coloration	+
	iii) Anthraquinones	Amonical layer showed no pink colour	-
	iv) Mucilage	Swelling	
	v) Carbohydrates	Voilet ring formed	+
	vi) Alkaloids		
	a) Dragadroff's reagent		+
	b) Hager's reagent	Brownish red colour	+
	c) Mayer's reagent	Yellow colouration	
	d) Wagner's reagent	Creamy ppt	
	vii) Oils	Orange-brown ppt	
	viii) Steroids	No greasy spot	-

(Powder + Conc.H_2SO_4)	Reddish brown colour	+
ix) Starch (Powder + Iodine)	Blue colour	+
x) Flavanoids (Powder +Aq. NaOH sol.)	Dark yellow colour	+

CONCLUSION

Aerva pseudotomantosa Blatt & Hallb (family *amaranthaceae*) is a plant of desert region. It is commonly known as bui and buari. As pharmacological use of point *Aerva pseudotomentosa* has been used as anti-inflammatory, as analgesic, as anthelmintic and tonic in Indian traditional system of medicines. In the present study, some pharmacognostical parameters such as macroscopical characteristics, histochemical test analysis, powder florescence analysis of drugs as well as preliminary examination of the inflorescences powder for organoleptic characteristics and general chemical tests have been carried out. In conclusion these studies can be used successfully in commercial and routine laboratory works for identification of powder drug from *Aerva pseudotomentosa* prior using in any herbal formulations.

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