ISSN 0976 – 3333

Available Online at www.ijpba.info

International Journal of Pharmaceutical & Biological Archives 2013; 4(6): 1208 - 1212

ORIGINAL RESEARCH ARTICLE

Pharmacognostic Studies on Leaf of *Ancistrocladus heyneanus* WALL

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Received 03 Sep 2013; Revised 17 Dec 2013; Accepted 15 Dec 2013

ABSTRACT

Ancistrocladus heyneanus Wall. is a palaeotropical climbing twining plant, found in lowland to submontane, wet to seasonal evergreen or swamp forests, with eleven species occurring in tropical Africa and at least five species in West India, SE Asia, Borneo and Taiwan. It is a scandent shrub having hooked branches. Flowers are small, very caduceus, in branched panicals, corolla about equaling the calyx. Calyx-lobes enlarged in fruit unequal, long, obovate, cuneate, with prominently and closely reticulate veins. Petals are small, white, ovate-oblong. Stamens are 10, alternately short. Fruit is small, surrounded by 5 wings. The sparingly branched, sympodial stem is complex and can exceed 10 cm diameter. It is along one side attached to the tree with grapnels (short, hooked lateral thorns, formed from modified stem apices), opposite to the leaves.

Scientific interest in this genus has grown considerably because the canopy liana *Ancistrocladus korupensis* is considered a potential anti-AIDS source by the National Cancer Institute because of its highly effective mode of action against the HIV. The active principle is michellamine B, an acetogenic napthyl isoquinoline alkaloid,which is present in mature leaves, korupensamine E is a new anti-malarial drug extracted from the same plant.

The present paper deals with pharmacognostical studies on the leaves of *Ancistrocladus heyneanus* which revealed the presences of alkaloids, starch, tannins and mucilage. Physicochemical evaluation includes ash analysis, percent extractive and moisture content. These findings will be useful towards establishing pharmacognostic standards on standards for the identification of plant. Purity and quality of leaf powder, which will be gaining relevance in plant drug research.

Key words: *Ancistrocladus heyneanus*, michellamine B, hooked branches, pharmacognosy.

INTRODUCTION

The Ancistrocladaceae members are producers of naphthylisoquinoline alkaloids [3,4], biosynthetically unprecedented [5], and biologically active[4,6,7,8,910] secondary metabolites. *Ancistrocladus korupensis* is endemic to Cameroon Africa.[11]which contains Korundamine A, Michellamine A-E, Korupensamine A-E ,Youndamine A and B, Getrimine B.[5,6,7,8,9,10]. Michellamine B [12] displayed *in vitro* anti-human immunodeficiency virus activity [11], acts by inhibiting enzymatic activity of reverse transcriptage and cellular fusion for HIV-I and HIV- II and inhibits human DNA polymarase.[13]

Medicinal uses of *A. robertisoniorum*[14] *A.* hamatus[15], *A. tectorius* [16,17] , *A. cochinchinensis*[18], *A. griffithii*[19], *A barteri* [20], *A. ealaensis*[21] , *A. robertisoniorum*[22], *A. tazanienis*[23-25] , *A. abbreviates*[26,27] are known.

Fig 1: ***A. heyneanus twig showing hook***

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Fig 2: ***A. heyneanus young plant***

MATERIALS AND METHODS

Collection of plant material:

The mature leaves of *A. heyneanus* Wall were collected from, the Mulshi and nearby areas of Western Ghats of Maharashtra in month of March and April, and were identified with the help of Flora of the presidency of Bombay [28].

Macroscopical Analysis:

Mature leaves were collected washed, dried in shade (for two weeks) so as to prevent the decomposition of chemical constituents, powdered in blender stored in cool dry place. Organoleptic evaluation was done by observing colour, odour, and taste [29, 30].

Florescence Analysis of leaf powder:

Florescence analysis of mature leaf powder of *A. heyneanus* was done by using powder as such, and also treatment of powder with different chemical reagents such as 50 % H_2SO_4, 50 % HNO_3, 5% KOH, 95 % C_2H_5OH ,CH_3OH, 1N HCl, 1N NaOH, acetone ,1N Ethanolic NaOH, 1N Methonolic NaOH, Nitrocellulose and Nitrocellulose + NaOH under long wavelength ,day light, and short wavelength [31,32].

Physico-chemical parameters:

The physicochemical parameters of mature leaf powder of *A. heyneanus* Wall were examined which includes foreign organic matter, loss on drying, foaming index, swelling index along with ash analysis and solvent extractive values by using different solvents [33,34] .

Ash Analysis:

The mature leaf powder of *A. heyneanus* was subjected for determination of total ash value, acid insoluble ash value and water soluble ash value.

Percentage extractives:

Petrolium ether, ethanol, acetone, chloroform, methanol, Diethyl ethyl ether solvent and water used to determine the percentage extractives of leaf powder of *A. heyneanus.* Loss on drying petroleum ether extractive value, ethanolic extractive value, water soluble extractive value, acetone soluble extractive, chloroform soluble extractive, methanol soluble extractive, Diethyl ethyl ether soluble extractive values of leaf powder of *Ancistrocladus heyneanus* were determined.

Examination of powdered leaf for preliminary phytochemical tests:

The leaf powder was examined for its organoleptic characteristics and phytochemical tests were done [37].

RESULTS AND DISCUSSIONS

Macroscopical Analysis:

The leaves of *A. heyneanus* are 10-30 cm. long and 4-5cm in diameter, Leaves are altermnate,4-16in a crown , sub acute, glabrous, shining, venation are reticulate, petioles are very short. Outer surface is yellowish-green, odour is characteristics, taste is bitter and acrid (**Table 1**).

Florescence Analysis of leaf powder:

The leaf powder of *A. heyneanus* was treated with different chemical reagents and observed under long wavelength, day light and short wavelength.. The result of florescence analysis of leaf powder is shown in (**Table 2)**.

Physicochemical parameters:

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

Percentage extractive values:

Extractive values of the leaf powder of *A. heyneanus*, were determined by using diferent solvants like Petroleum ether, Acetone, Chloroform , Methanol diethylethyl ether and Distilled water were determined as per standard procedures recommended in WHO guideline and results are given in (**Table 4)**.

Examination of powdered leaf for preliminary tests:

The leaf powder was examined for its organoleptic characteristics and phytochemical tests were carried out for powder (**Table 5)**.

Table 1: Organoleptic characteristics of mature leaf powder of *A. heyneanus*

S. No	Tests	Observations
1	Colour	Light yellow
2	Odour	Characteristic
3	Taste	Acid

Table 2: Physico-chemical parameters of mature leaf powder of *A. heyneanus.*

S. No	Parameters	Observations
1	Foreign organic matter	1.5% w/w
2	Loss on drying	56% w/w
3	Swelling index	8.0%
4	Foaming index	Less than 100

Table 3: Ash analysis of mature leaf powder of *A. Heyneanus*

S. No	Ash Analysis	Values
1	Total ash value	5.8 % w/w
2	Acid insoluble ash value	0.78 % w/w
3	Water soluble ash value	6.9 % w/w
4	Sulfated ash value	1.0 % w/w

Table 4: Percentage extractive of mature leaf powder of *A heyneanus.*

S. No	Solvents	% Extractive value
1	Petroleum ether	1.6 % w/w
2	Ehhanolic	20.15 % w/w
3	Distilled water	11.5 % w/w
4	Acetone	3.6 % w/w
5	Chloroform	14.0 % w/w
6	Methanol	8.0 % w/w
7	Diethyl ether	3.4 % w/w

Table 5: Florescence analysis of mature leaf powder of *A. heyneanus*

Treatment of leaf powder with	Under Long wavelength	In Day Light	Under Short wavelength
Powder as such	Green	Yellowish green	Yellow
50% H_2SO_4	Black	Light yellow	Yellowish green
50% HNO_3	Black	Light yellow	Yellowish green
5% KOH	Black	Light yellow	Yellowish green
95% C_2H_5OH	Black	Light yellow	Yellow
CH_3OH	Black	Light yellow	Yellow
1N HCl	Black	Light yellow	Yellowish brown
1N NaOH	Black	Light yellow	Yellowish green
Acetone	Black	Light yellow	Light green
1N Ethanolic NaOH	Black	Light yellow	Yellow
1N Methanolic NaOH	Black	Green	Green
Nitrocellulose	Black	Green	Green
Nitrocellulose + NaOH	Black	Green	Green
Powder + 1 N NaOH in methanol dry for 30 min. + Nitrocellulose	Blackish yellow	Greenish black	Yellowish

Table 6: Qualitative examinations of mature leaf powder of *A. heyneanus*

S. No	Tests	Reagents used	Observations	Result
1	Saponins	Powder + dist. water	Frothing	+
2	Mucilage	Powder + dist. water	Swelling	+
3	Carbohydrates	Powder + Molisch's reagent		+
4	Alkaloids	a)Dragendroff's reagent		+
		b) Hager's reagent		+
		c) Mayer's reagent		+
		d) Wagner's reagent		+
5	Oils	Powder + Filter paper	No oily spot	-
6	Steroids	powder + Conc. H_2SO_4	Brownish red colour	-
7	Flavanoids	Powder + aq. NaOH	Greenish yellow colour formation	+
8	Starch	Powder + Iodine	Blue colour formation	+
9	Tannins	Powder + $FeCl_3$	Dark Colour formation	+
10	Anthraquinone	Powder + Ammonia Solution	No change in colour	-

(+) = indicates presence; (-) = indicates absence

CONCLUSION

In these studies, some pharmacognostic parameters such as macroscopic study, florescence analysis of drug as well as preliminary examination of the leaf powder for organoleptic evaluation and phytochemical tests have been carried out. In conclusion these studies can be used successfully in laboratory works for identification *A. heyneanus* prior to use leaf powder in any herbal formulations as well as further research work.

ACKNOWLEDGEMENT

Author thankful to BCUD University of Pune, Pune, Maharashtra, India for providing funds to carry out work.

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