

Efficacy of *Abrus Precatorius* (Gunja) Seeds Oil As A Hair Growth Promoter (Keshya Rasayana) In Female Wistar Albino Rats

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Abstract

Background

Abrus precatorius is a branched climbing undershurb and it is widely distributed in the Himalayas in India. The seeds of *Abrus precatorius* are recommended for alopecia in traditional and folklore medicines. The preliminary phytochemical screening of the seeds oil revealed the presence of terpenoids and steroids.

Objective

In the present investigation hair growth promoting activity effect of seeds oil and its effect on head fungal infection is evaluated in female wistar albino rats.

Material and method

The animals were divided into three groups the control group was applied with only vehicle, standard group with 2% minoxidil solution and test group with 2% oil in emulsified in cow's milk. Qualitative and quantitative parameters were evaluated. While activity on fungus *C.albicans* was evaluated by *in vitro* study

Results

It was observed that hair growth initiation time, completion time, hair length, hair follicle density and anagenic percent in the test group animals was comparable with that of minoxidil treated animals and oil also shows antifungal effect as compared with standard drug Itraconazole.

Conclusion

Conclusively the study revealed that seed oil of *A.precatorius* is a potent hair growth promoter and also posses antifungal effect which supports traditional claim.

Key words: Hair growth, *A.precatorius*, minoxidil, *C albicans*

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Introduction

The vernacular names of *A.precatorius* are Gunga in Sanskrit, Black-eyed Susan, Coral-bead plant, Crab's eyes, Indian licorice, Jamaican licorice, Jequirity, Jequirity bean, Jumbie beads, Jumble beads, Licorice vine, Love bean, Love nut, Lucky bean, Prayer beads, Prayer beans, Precatory, Precatory bean, Red beadvine, Rosary pea, Weather plant, Weathervine, Wild liquorice in English, Ghungchi, Ratti in hindi, Kunch in Bengali, Gundumani in Tamil, Guriginja in Telgu etc.

Kingdom	Plantae
Subkingdom	Tracheobionta
perdivision	Spermatophyta
Division	Magnoliophyta
Class	Magnoliopsida
Subclass	Rosidae
Order	Fabales
Family	Fabaceae
Genus	<i>Abrus</i>
Species	<i>Precatorius</i>

Part used - Seeds, leaves and root.

Identity as described in literature

Gunjadayantu kesyam syat vatapittajvar apaham
(Dravyaguna)

Chemical constituents of seed oil - Palmitic, stearic, archidic, behenic, lignoceric, oleic, linoleic, and linolenic acid, cycloartenol, beta amyirin, campesterol, cholesterol, stigmasterol, beta sitosterol, abruquinone, abrectorine, demethoxycentaureidin rutinolide^[1]

The Ayurvedic properties of *A. precatorius* are

Rasa -upavisha

Guna - Laghu, ruksha, tikshna,

Rasa - tikta, kashaya,

Vipaka - katu

As hair growth promoting activity of many herbs are identified by conducting experiments in many animal models. *Abrus precatorius* is used in many marketed formulations for hair growth promotion. Recently it is found effective in androgen induced alopecia due to 5 alpha reductase inhibition in male albino rats^[2] and seed oil also do posses antilice activity^[3] which supports its hair friendly (Keshya) activity. So here experiments were conducted in female wistar albino rats for screening hair growth promoting potential of petroleum ether extract of *A. precatorius*

MATERIAL AND METHOD

PREPARATION OF EXTRACT

Coarsely powdered drug was taken in a Soxhlet apparatus and extracted with petroleum ether (60-80°C) till complete extraction. The solvent from the extract was recovered under reduced pressure and its yield was 1.6 % w/w. (Table 1)

CHROMATOGRAPHIC CHARACTERIZATION

For experiment, petroleum ether seed extract of *A. precatorius* was characterized by TLC on precoated silica gel G plate (10×10) (E.Merk, Germany) developed in toluene: ethyl acetate (95:5 v/v) as mobile phase gave best reso-

lution after derivatization with Lieberman burchard reagent. Steroidal component was present in this as proved by using standard procedures for phytochemical analysis^[4]

ISOLATION

The oil fraction was separated from extract obtained as unsaponifiable fraction on addition of sodium hydroxide by separating funnel later it was emulsified in Cow's milk(2%).

Animals

Healthy female wistar albino rats, weighing 120 – 150 g and aged 3 - 4 months were

used for hair growth promotion studies. The animals were handled according to CPCSEA

Guidelines of Good Laboratory Practice.^[5] The research protocol of the animal

was approved by the 'Institutional Animal Ethical Committee' of College of Pharmacy, IFTM, Moradabad- 244001, Uttar Pradesh, India.

The rats were placed in cages and kept in standard environmental conditions of 12h light and 12 h dark cycle, 23 ± 2 °C and 35 – 60 %RH. They were fed with standard diet *ad libitum* with free access to water.

Toxicity studies

Toxicity studies were carried out by applying the seed oil to the denuded rat skin in

concentrations of up to 10 % for 7 days. The extract was considered safe for animal tests

when it did not show any toxic effects or erythema on the rat skin^[6].

Treatment of animals for hair growth promoting studies

A 4 cm² area of the dorsal skin of the rats was shaved off using Veet cream (a

marketed hair removal cream) and cleansed with surgical spirit .^[7] The seed oil solution

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or vehicle or minoxidil (0.4 ml) was applied to the denuded area of the rat once a day. This treatment was continued for 30 days during which hair growth pattern was observed

visually and recorded. Skin biopsy was done on the skin on the 30th day of treatment and

tissue used for follicular analysis by histopathology . Hair growth initiation and

completion times was evaluated by observing the animal skin from the time the hairs

sprouted to and the time full length was attained. Hair length was measured 25 hairs

plucked randomly from the test area of each animal. Anagen to telogen ratio was

determined by observing the follicular morphology in the microscope with the aid of

an ocular micrometer in the eye piece of microscope. (Table 2)

Hair were also evaluated for texture and tensile strength.

Effect of seed oil of *A.precatorius* on scalp fungus (*candida albicans*) infection

It was evaluated by observing effect of seed oil in growth of fungus.

Preparation of fungal culture media (Potato Dextrose Agar (PDA)

Potato extract) 200 ml

Glucose 10 g

Agar..... 15 g

Distilled Water1 1 liter

Method -Potato extract was prepared by placing 200 g potatoes into 500 ml dist. water, cooked for 1 hour in steamer. Then strained potato infusion through cloth, melt agar in 500 ml distilled water, then 200 ml potato extract was added to melted agar, then glucose was added to adjust volume to 1000 ml, and autoclaved. Final pH: 5.6 ± 0.2 at 25°C. [8]

RESULTS AND DISCUSSION

Table 1 Physical characters of seed oil (*Abrus precatorius*)

Solvent	Colour	Percentage Yield
Petroleum ether	Yellowish green	3.2%

Table 2 Effect of treatments on of hair growth

Treatment (topical)	Initiation Time	Completion Time	Anagen/Telogen	Follicle Density/mm
Control(Vehicle only)	10	23	0.8315	1.4±0.2247
Standard (Ethanolic solution of minoxidil 2%)	6***	19***	1.9586	2.59±0.3128***
Seed oil of <i>Abrus precatorius</i> 2%	6***	18***	3.1373	3.7±0.337***

Values are mean ± SEM, n=10, *p<0.05, **p<0.01, ***p< 0.001, significance Vs control

Table 2 Effect of *A.precatorius* seed oil on *C.albicans*

Name of the Fungus	Mean diameter of zone of inhibition				Control	
	Extract of <i>Abrus precatorius</i>			Itraconazole Tablet(30 µg/disc)		
	Volume					
	10µL	1µL	0.1µL			0.01µL
<i>Candida albicans</i>	13mm	10mm	8mm	6mm	14mm	Nil

DISSCUSION

In Ayurvedic texts three terms are used to describe the symptom of hair loss, such as - indralupta, khalitya and ruhya. According to Acharya Vagabhata, when hair falls suddenly it is known as indralupta while khalitya is a long running process of hair fall. One more opinion is that indralupta affects beard, khalitya affects scalp and ruhya affects the entire body. The major reason for hair loss is over consumption of lavana rasa (salt).

. In present investigation it is found effective hair growth promoter in female rats and the texture of hair was also silky smooth and tensile strength of hair treated with *A.precatorius* and minoxidil is more than that of control hair animals as females have more urge for long hair especially in countries like India .The reported chemical constituents in seed oil are lipids^[9] which are responsible for hair growth. Seed oil was also found effective against controlling growth of scalp fungus *C.albicans*.

CONCLUSION

So it is concluded that it shows hair friendly activity (Keshya) by promoting hair growth and combating fungal infection in female wistar albino rats. As there are no major difference between hair follicular morphology of rats and human. So hair care product for females can develop in future from oil fraction of *A.precatorius*.

Reference:

- 1.Chatterjee A, Pakrashi S. The treatise of Indian medicinal plants. National Institute of Sci Commun, New Delhi 1992; pp 67-180.
2. Upadhyay sukirti, Ghosh A K, Singh Vijender and Dixit V K Effect of petroleum ether and ethanol fractions of *Abrus precatorius* on androgenic alopecia. Revista

Brasileira de farmacognosia, Brazilian Journal of Pharmacognosy 2012.22(2): 359-363.

3. Upadhyay S, Ghosh A K, Singh Vijender .Antilice activity of *Abrus precatorius*. Egyptian dermatology online journal on 2011 7 (2): 4
- 4.Harbone J.B., 1984, “*Phytochemical methods*” IInd edition, published by Chapman and Hall, 4-6.
- 5.Ministry of Environment and Forests, Government of India Public information: Good Practices:CPCSEA guidelines [Cited 2012 May 26].Available from: <http://moef.nic.in>.
6. A.S.T.M. Standard Practice for testing biomaterials in rabbits for primary skin irritation, A.S.T.M.designation F719-81; Philadelphia: American Society for Testing of Materials 1998; pp 178–179.
- 7.Adhirajan N, Dixit V K, Gowri C. Development and evaluation of herbal formulation for hair growth. Indian Drugs 2001; 38(11): 559-563.
8. United States Pharmacopeial Convention. 2007. The United States pharmacopeia, 31st ed., Amended Chapters 61, 62, 111. The United States Pharmacopeial Convention, Rockville, MD
9. Lefar MS, D Firestone Coleman E C, Brown N, Shaw D W. Lipids from the seeds of *Abrus precatorius*, joul of pharmaceutical science 2006; 57:1442-1444.

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