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DETERMINATION OF HAIR GROWTH STIMULANTION ACTIVITY OF *ACACIA LEUCHOPHOLEA* LEAF EXTRACT ON SHAVED SURFACE OF SKIN ON RATS

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ABSTRACT

Herbal formulations always have attracted considerable attention because of their good activity and comparatively less side effects with synthetic drugs. The objective of present study involves preparation. The leaf extract of *Acaia Leucopholia* shown the best results in hair growth stimulation activity on rats. In this herbal Preparation the extract was taken from reflex condensation and the Preparation was applied topically on the skin of the rat. The test drug is compared with the standard drug Minoxidil which is a vasodilator and antihypertensive. The results when compared with the standard and test the test drug samples shown the ascending order results. The test sample – 3 has shown the equal result with the standard drug. Thus we concluded that due to the presence of alkaloids in the plant leaf extract the plant has got the very good hair growth stimulating activity.

KEYWORDS: *Acaia Leucopholia.*

INTRODUCTION

Hair is made up of dead cells. On our heads, we have hundreds and thousands of follicles, pore-like structures within the scalp that produce hair. Each follicle produces many hairs throughout our lifetime. Live hair cells are generated inside the follicle by the papilla.[1] As the new cells grow, the older cells die and are forced along the follicle towards the scalp. The dead cells are compressed to form a protein called keratin. The hair shaft that we see is the keratin emerging from the scalp. Finger-nails are made of keratin, too. Each hair consists of

keratin, small amounts of water and a binding agent, which holds the keratin and water together.

The components of Hair

Hair is made up of several layers: 1. Cuticle 2. Cortex 3. Medulla.

Cuticle

The outer, protective coating of the hair is formed from overlapping scales and can be several layers thick. These scales are what make the hair flexible. The outer coating is translucent, which allows the colour of the hair (from the cortex) to be seen. You can make the scales 'open up' to allow chemicals and other substances to penetrate the hair.

Cortex

The main bulk of the hair consists of long fibres, twisted together to form a rope. This is the cortex. At the centre of the finest threads of the cortex are three spiral, spring-like chains that are bonded together. It is these chains that give hair its ability to stretch and allow us to direct the hair into different styles.[2] The chains (polypeptide chains) are held together by three types of bond: 1. *Hydrogen* 2. *Salt* 3. *Di-sulphide or sulphur*

The Di-sulphide bonds are the ones you need to break if you want to change the shape of the hair permanently but you need break only 25 to 30 percent of the bonds, i.e., less than one third. The cortex determines the colour of the hair. There are two pigments:

- Melanin, which gives us brown and black
- Pheomelanin, which gives us yellow and red

Medulla

This is the centre of the hair shaft. It does not play a part in hairdressing. There are three types of human hair: 1. Primary 2. Secondary 3. Tertiary

Primary

This hair is very fine. It helps us regulate the temperature of our bodies by aiding the evaporation of perspiration. It grows everywhere on our bodies except for our lips, the palms of our hands, soles of our feet and our eyelids. Primary hair has a number of special features:

1. It has no medulla;
2. There is often no pigment, which is why primary hair can be hard to see;
3. It is rarely more than half an inch long; and

4. It has no erector pili muscle to hold it up.

Secondary

Secondary hair is short, bristly and coarse. Our eyelashes and eyebrows are secondary hair and it appears in the opening spaces of our ears and noses. It is sensitive to touch - think about how your eyelids blink to protect your eyes if you touch your eyelids. Our eyebrows also protect our eyes by preventing sweat, water and oil from running down the scalp.

You can identify secondary hair by a number of special features:

- It grows straight out from the skin;
- It has no erector pili muscle;
- It has a large medulla;
- It is often curved, such as eyelashes;
- It is usually between half an inch and an inch in length; and
- It usually increases in density as we get older.

Tertiary

This is the longer hair that grows on our scalps. In adults it appears under the arms and in the groin area and, in men, on the beard and moustache. Historically, tertiary hair was probably there to keep us warm and protect us from the sun.[3] It has no particular function any more. Each tertiary hair has its own sebaceous gland to produce oil and an erector pili muscle to lift it up from the scalp. Grows from the follicle at an angle - this is what we see as the direction of growth. It varies across the head and can change direction creating natural partings or features like a double crown (see how hair grows) It contains pigment - this gives hair its own distinct colour; and It can be straight, curly or wavy.

MATERIALS AND METHODS

Initially the plant leaf was dried in air for 10 days. Then the leaf was powdered and dried. Again the powdered leaf was taken in small cloth pieces and inserted into the round-bottomed flask. In a round-bottomed flask, immersed the plant material in a solvent containing the composition of 70% of methanol and 30% water, flask connected directly to a reflux condenser. After complete arrangement of the apparatus heating mantle placed at the bottom of the conical flask. The temperature was maintained at below 15^0C. When the solvent reaches its boiling point, the vapour was condensed and the solvent was recycled to the flask.

Groups	No: of animals	Minoxidil (1ml of 2%)	Plant Leaf extract (1mg/ml)
Normal	3	-----	----
Standard	3	1ml of 2%	----
Test – 1	1	-----	1mg/ml
Test – 2	1	-----	2mg/ml
Test – 3	1	-----	3mg/ml

S.No	Test for chemical constituents	Leaf	Bark
1.	*Alkaloids:* a. Hager test b. Wagner test c. Mayer test	 + + +	 + + +
2	*Glycosides:* a. keller killani test	 +	 +
3	*Carbohydrates*: a. Benedict test b. Fehling test c. Molisch test	 + + +	 + + +
4	*Protein* a. Biuret's test	+	+
5	*Saponins*	+	+
6	*Tannin*	+	+
7	*Starch*	+	+

The animals weighed by us were in between 150-180 grams. After weighing was completed, the animal properly washed with water. Then the animal was kept a side 10 minutes for the purpose of air dry. After air drying we took the formulation of hair removal and applied to the surface of the skin of rats. The lotus milk and jasmine flower extract formulation was applied neatly and evenly on particular surface on the rat hair skin layer. Then wait for 5 minutes after that we clean the surface of the skin with the help of cotton and remove the hair. After that one more time place the rats under the water and wash out the hair from skin. Then take the animal and kept a side for air drying. Then take the leucopholia plant leaf extract and apply on the surface of skin. After application observe the animal for some time. To know the skin irritation the animal is remained in a separate cage and the drug was applied topically on to the shaved skin. No disturbance of other rats bite should occur to the experimental rat. The animals are observed for 25 days for the hair growth activity and the drug solution was applied topically for once in every three days. The hair growth is observed after 5,10,15,20 days. If the normal growth is observed such that the formulation is showing the good hair growth stimulant activity. Then the growth is compared with the standard animals which got topical application of Minoxidil.

RESULTS

Evaluation of chemical constituents using various chemical tests:

Effect of Hair growth stimualtion activity of *Acacia leuchopholea* on rats:

Groups	No: of animals	Minoxidil (1ml/2%)	Plant leafextract (1mg/ml)	Hair growth (in mms)
Normal	3	----	----	20
Standard	3	1ml/2%	----	18
Test – 1	1	----	1mg/ml	12
Test – 2	1	----	2mg/ml	13
Test – 3	1	----	3mg/ml	17

DISCUSSION

Hair fall is an abnormal condition of head occurs due to either heredity or environmental factors. In general hair fall is regular for all the healthy individuals, but the excess hair fall can be called as alopecia. Alopecia also leads to baldness which occurs due to heredity. Now a days various formulations are occuring in synthetic substances along with those substances herbal formulations are also becoming popular. Hence according to the traditional importance and the safety efficacy the herbal formualtion i.e leaf extract of the plant acacia leucopholia also shown the good results in the research work and can be utilised for any of the herbal preparations as shampoos or lotions.

CONCLUSION

The hydroalcoholic leaf extract of Acacia leucopholia can utilised for abnormal growth of hair or on the condition of excess hair fall. The plant can be utilised for further studies of alopecia. The above extract is free for the toxic conditions and proven as nonirritant to the skin.

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