

# Effect of Topical Application of Oils of Amla, Coconut, Sarson and Samsol on Growth of Rabbit's Hair and Sheep Wool

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## Abstract

Vegetable oils and certain herbal preparations have been used since ancient times for the dressing of human hair and to promote hair growth. This investigation determined the topical effect of oils of Amla, coconut, sarson and Samsol on the rabbits hair growth and a comparison was made with untreated controls and with those applied locally a 0.5% solution of Vitamin E in ethanol. Experiments were also conducted to study the effect of such treatment on the sheep wool growth.

The data obtained showed that these applications do accelerate rabbits' hair growth but to varying degrees. Quantitatively, the effect of vitamin E appears to be similar to that of Sarson oil and maximum hair length was attained by the sarson treated group. It is conceivable that the hair growth stimulating effect of vegetable oils tested is due to the direct effect of fats or possibly due to their vitamin E contents or some other active ingredient. In sheeps, oils of Amla, coconut and sarson have exerted non-significant effect on the wool growth. Samsol and vitamin E retarded the rate of wool growth in sheep. This difference from rabbits' hair might be due to differences between the two species as the sheep has been reported to possess no definite fat layer within its skin (JPMA 31:246, 1981).

## Introduction

Local application of alpha-tocopherol (Vitamin E) has been shown to promote hair growth in rabbits (Kamimura and Sasaki, 1965). Many commercial hair oils have also been claimed to strengthen and stimulate the hair growth in man. Furthermore, in many parts of the world, various herbal preparations containing *Asparagus african*, *Fallugia paradoxa*, *Rosmarinus officinalis*, *Salvia officianalis*, and many others are being marketed for use as hair tonics and growth promoters (Lewis and Elvin-Lewis, 1977). However, little research work appears to have been conducted to prove the real efficacy of such folk preparations. Experiments were, therefore, undertaken to study the hair growth promoting effect of oils of Amla (*Emblica officinalis*), coconut (*Cocos nucifera*), sarson (*Brassica sarson*) and Samsol (a commercial herbal hair oil). These indigenous oils have been used for centuries for the dressing of hair especially in the Indo-Pak subcontinent and have been claimed to promote hair growth (Said, 1969; Nadkarni, 1954). In addition, it was also of interest to study the effect of these treatments on wool growth of local sheep as some of them are sometimes applied in infected cases in the folk medicine.

## Material and Methods

### Rabbits

Albino rabbits of either sex from a local strain weighing between 250-300 gram were used. They were kept separately in the cages and fed on a standard chick-starter mash supplied by Lever Brothers Ltd. In addition, green fodder and tap water was allowed ad libitum. They were kept in animal room under artificial light at room temperature throughout the experimental period.

### Sheep

Eighteen female Lohi sheeps, 1-2 years of age, having 25-30 Kg body weight were randomly selected from a herd kept at Department of Livestock Management University of Agriculture, Faisalabad. They

were made free of ecto-and endoparasites and were kept under routine feeding and managerial conditions.

### **Oils and Chemicals Used**

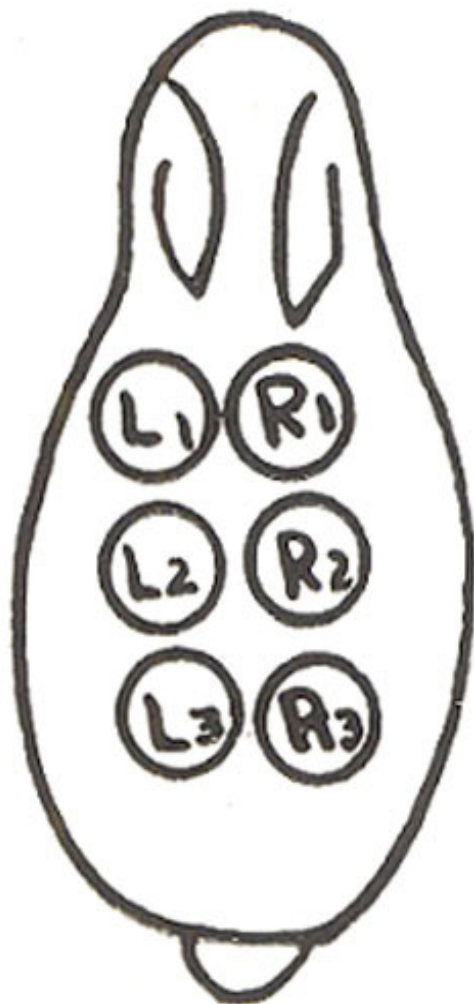
The oil of Sarson (Brown mustard) and coconut oil are fixed oils which are expressed respectively from Brassica sarson seeds and the Coconut fruit, *Cocos nucifera*. These oils were purchased from the local market. The Amla oil which is the oily extraction of *Emblica officinalis* (Indian gooseberry) fruit was obtained from a Unani Pharmaceutical Company "Ajmal Dawakhana", Lahore, Samsol is a commercial hair oil claimed to contain extract of certain herbs and is alleged to strengthen the hair and to promote its growth. Vitamin E (alphatocopherol acetate) of Roche Laboratories, Switzerland was used. Its 0.5% alcoholic solution was prepared.

### **Grouping of Animals**

Both the rabbits and sheep were divided into six groups with three animals in each group. Five treated and one untreated control groups were randomly allotted to the six groups. Within each group the animals were numbered as 1, 2, and 3.

### **Methodology**

The experimental design described by Kamimura and Sasaki (1965) was used for these experiments. Six spots of 5 x 5 cm were selected on the back of each experimental animal on both sides of the mid-line. Spots on right side were named as R1, R2 and R3 while that on left side were designated as L1, L2 and L3 (Fig. 1).



*Fig. 1 : Rabbits' back showing shaved parts for oil application.*

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Position R1, L2, R2, L3 and R3, L1 were clipped very carefully close to the skin in rabbit No. 1,2 and 3 respectively. The oils on the respective parts were applied daily and hair plucked from these spots were measured weekly upto 9 weeks.

### **Results and Discussion**

Hair growth has been demonstrated to depend on the mitotic activity of hair bulbs in their follicles (Montagna, 1958). Thus the substances enhancing absorption of glucose and Oxygen and in this way increasing the energy supply to the hair bulbs have been observed to stimulate the growth of hair. Similarly, local application of vitamin E which improves circulation around the hair bulbs has been reported to promote hair growth in rabbits (Kamimura and Sasaki, 1964). The rabbit's hair growth was also found to be effected by sun-light, environmental temperature, feed and age. Moreover, to some extent hair growth is irregular and varies within individuals. However, when the animals are kept on

similar managerial and environmental conditions and the sites of application are made on both sides of the vertebral column with changing positions, these irregularities can be overcome (Ryder and Stephenson, 1968).

The data obtained in the present study is summarized in Table 1.

Average Weekly Hair Lengths (Cm)±SEM in Untreated Rabbits and in Rabbits Receiving Daily Topical Applications of Certain Indigenous Oils/ Preparations

Oil/Preparation Applied	MEAN HAIR LENGTHS (Cm)±SEM AFTER								
	1st week	2nd week	3rd week	4th week	5th week	6th week	7th week	8th week	9th week
Untreated (control)	1.18±0.20	1.20±0.05	1.22±0.04	1.25±0.04	1.50±0.06	1.55±0.04	1.63±0.06	1.78±0.06	2.01±0.05
Amla Oil	1.13±0.06	1.42±0.04*	1.53±0.06**	1.55±0.06**	1.56±0.05	1.58±0.05	1.58±0.06	1.60±0.07	1.60±0.05
Coconut Oil	1.12±0.03	1.24±0.03*	1.41±0.04**	1.48±0.03**	1.48±0.07	1.49±0.03	1.76±0.04	1.96±0.03	2.15±0.04
Sarson Oil	1.23±0.04	1.38±0.03*	1.45±0.05**	1.83±0.03**	1.85±0.04**	1.94±0.09**	2.14±0.03**	2.18±0.03**	2.22±0.02**
SAMSOL	1.11±0.04	1.13±0.03	1.40±0.05*	1.73±0.07**	1.75±0.03**	1.78±0.03**	1.79±0.05	1.83±0.04	1.91±0.05
Vitamin E (0.5%) in Ethanol	1.04±0.04	1.44±0.04*	1.64±0.07**	1.89±0.07**	1.88±0.04**	1.89±0.03**	1.92±0.03**	1.99±0.04**	2.26±0.07**

Each value is a mean of 6 observations.

\* —Indicates significant differences ( $P < 0.05$ ) from untreated control.

\*\* —Indicates highly significant difference ( $P < 0.01$ ) from untreated control.

All values without asteric are non-significant ( $P > 0.05$ ) from untreated control.

The daily topical applications of Amla oil have promoted the rabbit's hair growth ( $P < 0.05$ ) from the untreated control at the end of 2nd week which continued till 4th week and thereafter the differences were non-significant. The coconut oil applications have also promoted hair growth but the effect was of shorter duration as the hair were longer than untreated group only at the end of 2nd and 3rd weeks. However, the effect of Sarson oil was more pronounced and persistent. The mean hair lengths of this group remained significantly ( $P < 0.05$  and  $0.001$ ) more than the control from 2nd to the end of experimental period. The Samsol hair lotion was found to promote hair growth. Its effect became significant in the 3rd week and remained as such till the end of 6th week. The local applications of 0.5% vitamin E (Alpha-tocopherol) lotion in ethanol also stimulated the hair growth in rabbits. The hair lengths of this group remained significant ( $P < 0.05$ ) between 2nd and 9th weeks. These results of vitamin E application are in agreement with those of Kamimura and Sasaki (1964). Quantitatively, the hair growth promoting effect of vitamin E appears to be similar to that of Sarson oil.

These data suggest that the applications of vegetable oils do accelerate hair growth but to varying degrees. This observation appears, at least partially to support the common Indo-Pakistani folk belief that certain oils promote man's hair growth. In addition, the ancient empirical use of these oils especially that of Sarson in daily dressing of the hair as mentioned by Nadkarni (1954) and Saeed (1969) appears to be justified. The oils of Amla and Coconut have been observed to exert hair growth promoting effect of short duration (from 2 to 4 weeks). Samsol promoted hair growth from 3rd to 6th weeks but its effect becomes visible after 3rd week. However, Sarson oil, which is the most commonly used agent for dressing of hair in this subcontinent, according to these studies showed best results. Its effect appears to be even more than that of vitamin E lotion. Vitamin E as already mentioned has been suggested to promote hair growth in rabbits by improving local circulation and consequently the glucose and oxygen supply to the hair follicles. It is, therefore, conceivable that the vegetable oils tested might be containing different quantities of the fat soluble vitamin E which is abundantly present in wheat germ oil and in many foods (Goth, 1978). If this is taken to be true then it would mean that out of all the oils tested, Sarson is the richest with Vitamin E. However, this effect may be due to the oils themselves as the fats have long been suggested to cause thickening of fatty layers of skin along-with active growth of hair. This thickening might be due to downward growth of the hair follicles into fatty layers (Ryder, 1958). The quantitative differences among various oils tested suggest that these oils may contain some hair growth promoter probably vitamin E or some other substance. It is, therefore, proposed that elaborate studies should be undertaken to determine the mechanism of action of these

oils. The data on the effect of these applications on sheep wool growth is graphically represented in figure 2.

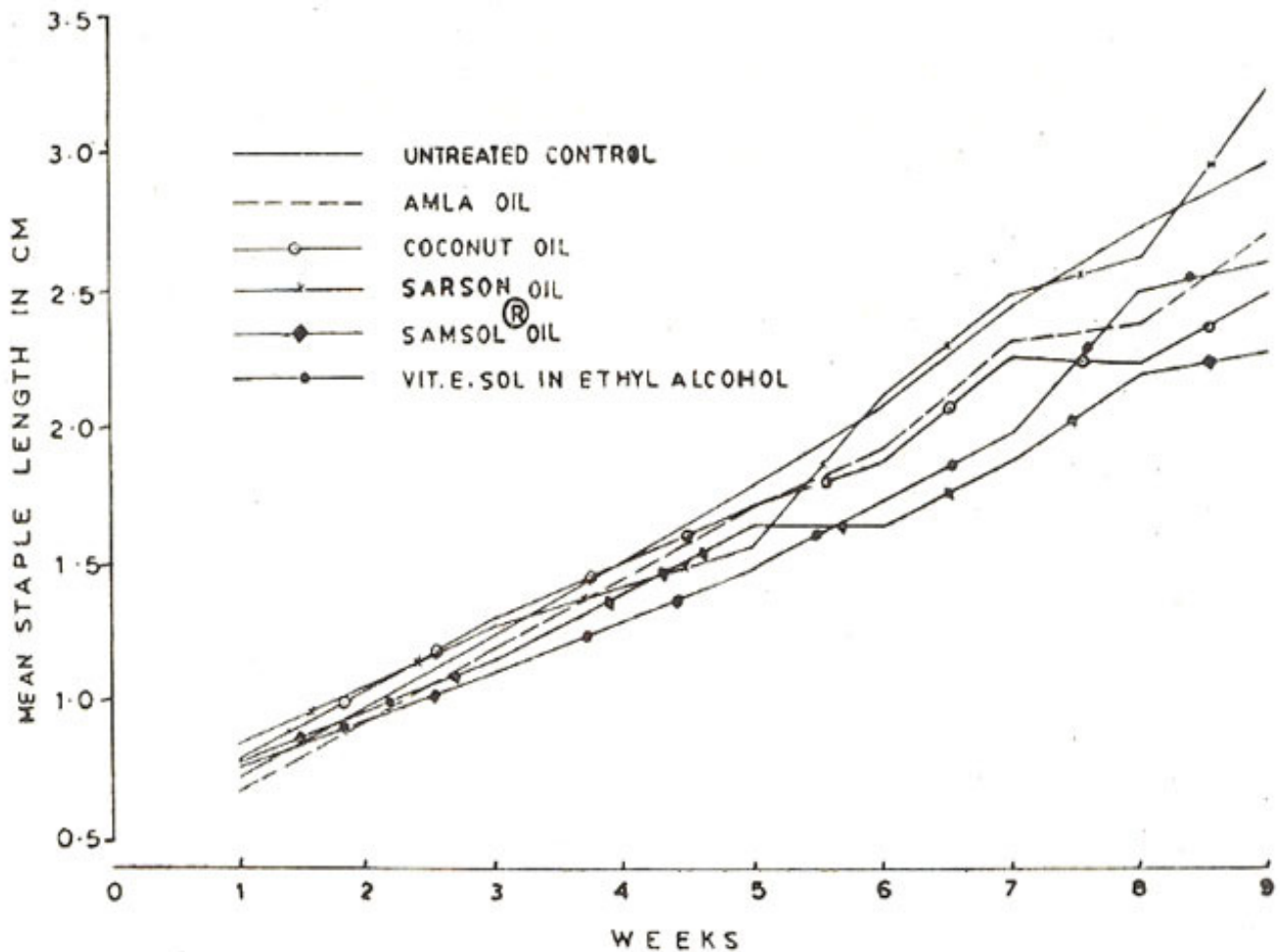


FIGURE:3. EFFECT OF OILS ON WOOL GROWTH IN SHEEP

The statistical analysis revealed that oils of Amla, coconut and Sarson have exerted nonsignificant ( $P > 0.05$ ) effect. Instead, Samsol hair oil and 0.5% vitamin E in ethanol have significantly ( $P < 0.05$  or 0.0001) retarded the rate of wool growth in sheep from about 4th to 9th weeks. Thus it is clear that in contrast to rabbit's hair, the wool growth in sheep is inhibited by the vitamin E lotion and as well as the vegetable oils. It has already been mentioned that fats cause thickening of the fatty layers of skin (Royder, 1958) but it is not common for sheep to have definite fatty layer within its skin (Dempsey, 1956). Therefore, it is possible that due to these reasons, the tested oils did not promote wool growth in sheep. The mechanism of wool growth retardation by vitamin E and Samsol is not yet known.

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