



The real active ingredient from Santalum album oil: efficacy studies in an anti-hair loss protocol

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Introduction:

Heavy hair loss and reduced hair density represent for many human beings a kind of very problematic and impacting conditions on daily life. Genetic and exogenous factors, hormone imbalance and heavy stress play a key role in these kinds of disorder. It is well known that the epithelium of human hair follicles expresses the olfactory receptors OR2AT4, whose stimulation mediates an increase in hair growth. Some specific molecules derived from sandalwood oil and a synthetic sandalwood odorant are considered able to interact with OR2AT4 receptors, consequently promoting hair growth. The main constituents found in Sandalwood Oil are Z-alpha-santalol (41-55%) Z-beta-santalol

(16-24%). Indeed, Santalum album (sandalwood) oil is today emerging as an interesting active source of many phytochemicals with promising personal care applications. The aim of our study is to investigate its anti-hair loss property through an in-vivo test. For this purpose it has been used pure Sandalwood Essential oil by Santanol, gently extracted by steam distillation in Australia with the highest standards of sustainability.

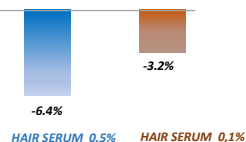
Conclusions:

It has been shown that the use of sandalwood oil at 0.5% on the scalp for 3 months by volunteers suffering of androgenic alopecia results in a statistically significant increase in the percentage of anagen hair (+6.3%) and a statistically significant decrease in the percentage of telogen hair (-6.4%). This study demonstrated the in-vivo effectiveness of Sandalwood oil in preventing excessive hair loss.

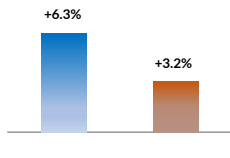
Results & Discussion:

In this study, an objective scientific approach was applied in order to demonstrate the traditionally described effectiveness of pure sandalwood oil in preventing hair loss. For this purpose, the essential oil was introduced in a simple hydro-alcoholic serum. Through instrumental and clinical analysis, and the subsequent statistical re-elaboration, it has been shown:

Percentage of telogen hair



Percentage of anagen hair



BASAL TIME



T = 3 months, HAIR SERUM 0.5%



BASAL TIME

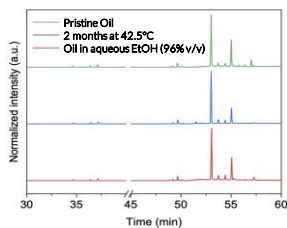


T = 3 months, HAIR SERUM 0,1%

- A non-statistically significant ($p > 0.05$) increase in the mean percentage of anagen hair and a non-statistically significant decrease in the mean percentage of telogen hair were recorded for the serum at 0.10% of Sandalwood Oil after 3 months treatment
- A statistically significant ($p < 0.05$) increase in the mean percentage of anagen hair and a statistically significant decrease in the mean percentage of telogen hair were recorded for the serum at 0.50% of Sandalwood Oil after 3 months treatment.

Materials & Methods:

GC-MS analyses have been conducted on Sandalwood Oil in order to demonstrate its thermostability at 42,5°C and compatibility with aqueous EtOH (96% v/v): no significative differences have been detected between the chromatographic profiles:



Sandalwood Oil has been introduced in a hydro-alcoholic serum (formula reported on the right) containing stabilizing ingredients-the oil being rich in potentially oxidizable substances- and skin penetration enhancers, at two different percentages: 0.1% and 0.5% w/w.

The efficacy study was carried out on 20 subjects (males and females), suffering from androgenic alopecia:

- 10 subjects applied the serum at 0.5%
- 10 subjects applied the serum at 0.1%

Both serums have been applied (2 ml) by the volunteers once a day for 3 months on the whole scalp. In order to evaluate changes in the percentages of anagen and telogen hair, the photo-trichogram method has been performed before and at the end of the treatment. The method is based on taking a photograph of a defined hair clipped area of the scalp (0.728 cm²) initially and after the treatment period.

Phase	INCI name	% w/w
A	REG-40 HYDROGENATED CASTOR OIL	1 - 5
	SANTALUM ALBUM OIL	0.1 or 0.5
A1	ANTIOXIDANTS	0.1 - 1
	ALCOHOL DENAT.	20 - 40
B	ETHOXYDIGLYCOL	1 - 5
	PENTYLENE GLYCOL	1 - 5
C	MENTHYL NICOTINATE	0.1 - 0.5
	AQUA	To 100
	CHELATING AGENT	0.1 - 0.5
	GLUCIC ACID	0.1 - 0.5
	POLYQUATERNIUM-11	0.1 - 1

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