

## Kunzea Oil: A Future Solution for Hair Loss?



Thomas J\*, Kosari S and Naunton M

Department of Pharmacy & Health, University of Canberra, Australia

\*Corresponding author: Jackson Thomas, Department of Pharmacy & Health, University of Canberra, Australia; Phone: +61 (0)2 6201 8928, Fax: +61 (0)2 6201 5727; Email: [Jackson.Thomas@canberra.edu.au](mailto:Jackson.Thomas@canberra.edu.au)

Submission:  December 12, 2017; Published:  January 29, 2018

### Abstract

Hair loss is a significant dermatological disorder affecting about 50% men and women and some ethnic groups are found to be more susceptible than others. Current treatment options are limited for the long term management of this condition. Topical aromatherapy (involving the use of essential oils) has been previously trialled for the management hair loss with encouraging results. Our case study provides preliminary evidence for the use of kunzea oil for stimulating hair re-growth in a horse. Further studies are warranted.

**Keywords:** Alopecia; Essential oil; Kunzea oil

### Case Report

In this case report we present an interesting serendipitous observation of spontaneous hair re-growth on the denuded lesional areas of the pastern of the horse (Figure 1A). The horse was treated for a contact dermatitis induced lesion on the pastern area using an essential oil based formulation (containing 20% v/v kunzea oil in an emulsifying ointment base BP [British Pharmacopeia]). The

condition readily resolved with complete healing of the wounded surface, followed by a remarkable increase in the hair density in the previously denuded areas on the wounded pastern. This involved noted increase in the hair length and density at the site. The final photograph (Figure 1B) was taken after 21 days of twice daily application of the formulation.



**Figure 1:** The visible hair growth promoting effect of kunzea oil. The bold area in the hind pastern of the horse before (photo 1A) and after treatment with kunzea oil 20% v/v twice daily for 21 days in an emulsified ointment base BP (photo 1B).

### Discussion

Hair loss is a common problem and that can affect approximately 50% men and women usually before the age of 40. It can be a distressing event for men and women (particularly when scalp is affected) and is associated with negative psychological effects including anxiety, depression, dissatisfaction with body

appearance, low self-esteem, and reduced quality of life [1-3]. The most commonly used treatments for male pattern hair loss are finasteride (oral) and minoxidil (topical: 2% w/v; 5% w/v); however, they found to have mediocre clinical response. Upon treatment one-third of men experience moderate or marked hair regrowth, one-third will have minimal regrowth, and one-third

is expected to remain unchanged with no progression of the hair loss [4,5]. Hence, the search for novel treatments to stimulate and maintain hair growth is warranted. In the current scientific communication we present a serendipitous case of significant hair re-growth in a horse treated with kunzea oil (a myrtaceous essential oil) based formulation.

Kunzea oil is produced by steam distillation of the aerial parts of shrub *kunzeaambigua* (family Myrtaceae) which is native to Tasmania. Kunzea oil is currently approved and listed by the TGA (Therapeutic Goods Administration, Australia) for topical application in humans and animals. The author's preliminary investigations Thomas J et al. [6,8] and Thomas J [7] revealed kunzea oil's potent in vitro antimicrobial action activity (anti-bacterial, anti-fungal, anti-viral). Kunzea oil's potent activity antifungal activity (MIC [minimum inhibitory concentration] 0.01-0.03% v/v; MFC [minimum fungicidal concentration] 0.03-0.12 % v/v) against yeast fungi *Malasseziaspp* appeared to have noted clinical significance. *Malasseziaspp*. Especially *Malassezia fur* found to be involved in the pathogenesis of psoriasis and seborrheic dermatitis of the scalp, both conditions have been reported as potential antecedents for hair loss. The oil has been anecdotally used for the management of various dermatological conditions including onychomycosis, impetigo, inflammation and cold sores also as an environmentally benign insect repellent and/or cidal agent. The recent preclinical and clinical investigations of this essential oil demonstrates its potential usefulness as an antimicrobial agent for the management inflammatory skin conditions in humans and animals, and further studies are underway [6-9].

Essential oils are plant secondary metabolites containing a mixture of fatty acids, and have been investigated successfully for the management of alopecia areata in randomised controlled trials [10,11]. It has been reported that that several fatty acids (e.g. palmitic, oleic, linoleic, linolenic and arachidonic acids) have been shown to possess significant anti-androgenic effect resulting from testosterone 5 $\alpha$ -reductase inhibitory activity (a known mechanism involved in minoxidil-induced hair growth in humans)[11]. It has also been reported that stimulation of the Vascular Endothelial Growth factor (VEGF) transcription in keratinocytes results in accelerated re-growth of hair follicles (a known mechanism associated with the anti-inflammatory action of medicinal agents).

Anecdotally kunzea oil has been used for the management of inflammatory skin conditions in humans and animals [12]. Hence, intuitively the fatty acid mixtures present in the oil plus its anti-inflammatory properties potentially may have contributed to the observed hair re-growth. However, further in vitro, in vivo investigations are warranted to understand the molecular mechanisms involved in the activity. This would lay foundation to further randomized controlled investigations and kunzea oil based scalp formulations for the management hair loss.

## References

1. Tucker P (2009) Bald Is Beautiful? The Psychosocial Impact of Alopecia Areata. *J Health Psychol* 14(1): 142-151.
2. Picardi A, Abeni D, Renzi C, et al. (2003) Treatment outcome and incidence of psychiatric disorders in dermatological out-patients. *J Eur Acad Dermatol Venereol* 17(2): 155-159.
3. Gilhar A, Etzioni A, Paus R (2012) Alopecia areata. *N Engl J Med* 366(16): 1515-1525.
4. Price VH (1999) Treatment of hair loss. *N Engl J Med* 341(13): 964-973.
5. Kaufman KD, Girman CJ, Round EM, Johnson-Levonos AO, Shah AK, et al. (2008) Progression of hair loss in men with androgenetic alopecia (male pattern hair loss): long-term (5-year) controlled observational data in placebo-treated patients. *Eur J Dermatol* 18(4): 407-411.
6. Thomas J, Narkowicz C, Peterson GM, Jacobson GA, Narayana A (2009) Randomised controlled trial of the treatment of pastern dermatitis with a formulation containing kunzea oil. *Vet Rec* 164(20): 619-623.
7. Thomas J (2010) Kunzea oil: Investigation of composition, bioactivity and therapeutic potential. PhD Thesis, University of Tasmania, Hobart, Australia.
8. Thomas J, Webb CE, Narkowicz C, Jacobson GA, Peterson GM, et al. (2009) Evaluation of Repellent Properties of Volatile Extracts From the Australian Native Plant *Kunzea ambigua* Against *Aedes aegypti* (Diptera: Culcidae). *J Med Entomol* 46(6): 1387-1391.
9. Thomas J (2005) Extraction, Analysis, Phytochemical and Biological Screening of *Kunzea* Species. MPharmSc Thesis, University of Tasmania, Hobart, Australia.
10. Hay IC, Jamieson M, Ormerod AD (1998) Randomized trial of aromatherapy: successful treatment for alopecia areata. *Arch Dermatol* 134(11): 1349-1355.
11. Yoon JI, Al-Reza SM, Kang SC (2010) Hair growth promoting effect of *Zizyphus jujuba* essential oil. *Food Chem Toxicol* 48(5): 1350-1354.
12. Lee GS, Hong EJ, Gwak KS, Park MJ, Choi KC, et al. (2010) The essential oils of *Chamaecyparis obtusa* promote hair growth through the induction of vascular endothelial growth factor gene. *Fitoterapia* 81(1): 17-24.