

How the Ingredients of the Ayurbala Hair Regenerative Oil Assist in its Function

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Introduction

The Ayurbala Hair Regenerative Oil aims to provide 3 key benefits:

1. Stimulate hair growth and stop hair loss (Ayurbala, 2024).
2. Help treat scalp conditions caused by bacteria or fungi (Ayurbala, 2024).
3. Reduce dandruff and strengthen hair roots (Ayurbala, 2024).

The oil was produced following Ayurvedic principles, a holistic medical system that originated in India over 3000 years ago (Johns Hopkins Medicine, 2024a).

This research paper aims to explore how the ingredients of the Ayurbala Hair Regenerative Oil assist in carrying out the product's key benefits by analysing the biochemical properties of each component.

Plant Rhizomes

Phlai

Zingiber cassumunar Roxb., commonly known as phlai, has been traditionally used in Asian countries, such as Thailand, as a treatment for inflammation (Han et al., 2021). The rhizomes of the plant are most commonly used for medicinal purposes for example, in essential oils (Han et al., 2021). In fact essential oils containing rhizomes of *Zingiber cassumunar* have been discovered to have antifungal and antimicrobial properties (Han et al., 2021), which could lead to the ingredient assisting in the second key benefit of the Ayurbala Hair Regenerative Oil.

Zingiber cassumunar oil containing 32 vol % of terpinen-1-ol demonstrated antibacterial activity against a wide range of bacteria (Han et al., 2021), which could help treat a broad range of scalp conditions caused by bacteria.

Against 5 strains of yeasts (*Saccharomyces cerevisiae*, *Cryptococcus neoformans*, *Candida albicans*, *Candida tropicalis*, and *Torulopsis glabrata*), essential oils containing rhizomes of *Zingiber cassumunar* have exhibited antifungal activity (Han et al., 2021). Though most of these yeast strains have little association with any scalp conditions, *Candida albicans* and *Candida tropicalis* have been associated with scalp yeast infections (Cleveland Clinic, 2024). Therefore phlai's ability to inhibit their growth can be used to treat scalp conditions caused by fungi.

Boraphet

Boraphet, with the scientific name of *Tinospora crispa*, grows in rainforests or mixed deciduous forests in Africa and Asia (Health Benefits, 2019). It is a plant that is traditionally used for regulating conditions caused by excessive body heat, such as mouth ulcers, blisters and fevers (Phu Chart, 2023). Boraphet's ability to reduce heat helps with diminishing heat inside the body that causes hair loss and hair thinning (Phu Chart, 2023). Thus *Tinospora crispa* can assist in key benefit number 1 by stopping hair loss.

Turmeric

Turmeric is a golden-orange spice that derives from the rhizomes of the turmeric plant. It has been a staple in Ayurvedic medicine for hundreds of years. The active ingredient in turmeric is a polyphenyl named curcumin, known for its antioxidant and anti-inflammatory properties (Johns Hopkins Medicine, 2024b).

Turmeric has been associated with reducing the amount of testosterone and dihydrotestosterone in one's body (Panoff, 2021). Dihydrotestosterone is a significant hormone involved in androgenetic alopecia, commonly known as male patterned baldness (Panoff, 2021). The hormone binds to androgen receptors in the scalp, inhibiting hair follicles from further growth (Panoff, 2021). Turmeric's anti-inflammatory properties, provided by curcumin, can also hinder hair loss as "Most hair loss is caused at least on some level due to inflammation" (Shatzman, 2022). Hence turmeric can assist in the prevention of hair loss aspect of key benefit 1.

Turmeric's anti-inflammatory and antifungal properties also assist in treating dandruff which aids key benefit 3 (Shatzman, 2022).

Ginger

Ginger comes from the rhizome of the ginger plant and originates in Southeast Asia (Healthline, 2024). Ginger can enhance blood circulation to the scalp when applied topically, which assists in delivering essential nutrients to your hair follicles, keeping them nourished and strengthening the hair root (Juicy Chemistry, 2021). This contributes to key benefit 3.

Ginger also assists in the reduction of dandruff aspect of key benefit 3 as the antifungal properties of the spice inhibit the proliferation of the *Malassezia* yeast, the root cause of dandruff (Juicy Chemistry, 2021). Ginger's anti-inflammatory properties also reduce swelling and soothe itchiness caused by dandruff (Juicy Chemistry, 2021).

Oils

Coconut Oil

Coconut oil is an ingredient that is often used to improve the health of one's hair. In regard to the second and third key benefits of the Ayurbala Hair Regenerative Oil, coconut oil also plays a role. In a study conducted in 2021, topical application of coconut oil was discovered to have antifungal benefits, combating dandruff and other scalp yeast infections while still promoting the growth of beneficial bacteria (Wong, 2024).

Additionally, there is evidence that coconut oil also promotes the maintenance of healthy hair. Triglycerides present in coconut oil have the ability to penetrate and interact with the hair cortex which limits the amount of water hair absorbs, reducing damage to the hair (Wong, 2024). Coconut oil is rich in lauric acid, a saturated fat, which might protect hair from protein loss (Wong, 2024). Since keratin, a protein, is the major component of hair, this promotes the maintenance of healthy hair (Wong, 2024). Coconut oil also leads to increased collagen production, strengthening hair (Wong, 2024).

Rice Bran Oil

Rice bran oil is extracted from the outer layer of the rice grain, rice bran (Healthline, 2019b). The high vitamin E content of rice bran oil stimulates increased blood circulation to the scalp, which improves the health of hair follicles and prevents hair loss, this might also assist in dandruff control (Simply Organic, 2022), thus all three key benefits of the Ayurbala Hair Regenerative Oil are aided through the addition of rice bran oil.

Rice bran oil is high in antioxidants, which help prevent the loss of hair pigmentation caused by oxidative stress (Simply Organic, 2022). Oxidative stress occurs when there is an imbalance between free radicals and antioxidants in the body (Simply Organic, 2022). As a result, this oil also helps inhibit premature greying of hair.

Sesame Oil

Sesame oil is produced from raw, pressed sesame seeds and is known for its medicinal potential, commonly referred to as “Queen of Oilseeds” (Healthline, 2023b). The antibacterial and antifungal properties of sesame oil help reduce the presence of dandruff (Healthline, 2019a), supporting key benefit 3. The fatty acids present in sesame oil ensure it penetrates deep into the skin, healing inflammation and irritation in the scalp (Healthline, 2019a). This also helps improve bald patches or areas of thinning hair as inflammation and irritation can cause hair loss (Healthline, 2019a), thus assisting key benefit 1. Additionally, since sesame oil is an emollient, it has the ability to combat dry hair and scalp (Healthline, 2019a).

Seeds

Black Cumin Seeds

From the seeds of the *Nigella sativa* plant, black cumin is a spice that has long been used in traditional medicine (Healthline, 2023a). Black cumin seeds have the ability to maintain healthy hair roots due to its unique blend of protein, fat, water and carbohydrates (NDTV Food, 2018), assisting in key benefit 3. The seeds also combat hair loss and promote hair growth when applied topically to the scalp (Chaubey, 2021), enhancing key benefit 1.

Garden Cress Seeds

Lepidium sativum (garden cress) seeds are highly packed with nutrients that promote healthy hair (Sakhuja, 2023). Garden cress seeds are rich in iron which stimulates blood circulation to hair follicles and hinders hair loss as iron deficiency is a common cause of loss of hair (Sakhuja, 2023). Folate which is integral for cell division and tissue growth is also found in garden cress seeds, making the ingredient beneficial for hair growth (Sakhuja, 2023). Vitamins present in *Lepidium sativum* seeds, such as vitamin C which stimulates collagen production, strengthening hair and preventing breakage, and vitamin A which assists in the production of sebum, ensuring enough oil in the scalp and keeping hair follicles healthy, also aid in maintaining healthy hair (Sakhuja, 2023). Hence garden cress seeds are useful for key benefit 1 and the strengthening hair root aspect of key benefit 3.

Fennel Seeds

Harvested from fennel plant flowers, fennel seeds are then dried and traditionally used in asian cooking (Brown, 2024). The seeds are typically used in India as a post-meal digestive aid (Toshi, 2022). Due to its antioxidant properties, free radicals are neutralised, reducing oxidative stress and promoting healthier hair follicles, thus helping key benefit 3. Additionally, fennel seeds provide hydration to the scalp maintaining its pH balance (Singh, 2018).

Dill Seeds

Dill seeds, *Anethum graveolens*, are a herb that has been traditionally used for its medicinal properties, such as treatment of digestive problems (PotsAndPans, 2022). In regards to hair health, dill seeds can assist hair growth by increasing blood flow to the scalp. This also has the added benefit of preventing hair loss (Floristkid, 2024), aiding the functions of key benefit 1.

Dill seeds are often found in head lice treatments and its ability to increase sweat production combats dry scalps by forcing oil secretions (NaturallyThinking, 2024), although these benefits are not advertised by the Ayurbala Hair Regenerative Oil.

Other Ingredients

Camphor

Camphor is waxy substance found in the wood of the camphor laurel and other trees in Asia and Borneo and it can also produced synthetically from turpentine oil (Adkins, 2023). Camphor appears white or transparent in colour and has been used for centuries to treat skin related issues (Chaubey, 2023). The anti-inflammatory properties of camphor enable it to reduce itchiness cause by dandruff, and its antibacterial properties prevents dandruff from forming (Chaubey, 2023). Camphor can also strengthen hair follicles, promote hair growth, and prevent hair loss as it increases blood circulation and acts as a counter-irritant (Chaubey, 2023). Thus the ingredient assists in key benefit 1 and 3 of the Ayurbala Hair Regenerative oil.

Keffir Lime Peel

From the *Citrus hystrix* tree, kaffir lime is a citrus fruit native to Southeast Asia (Joanna, 2022). In terms of hair care, the vitamin C present in the peel of the fruit stimulates collagen production, the main structural protein in hair, enabling strengthened hair growth and roots (Joanna, 2022), assisting the function of key benefit 3. Potassium in the peel promotes blood circulation and prevents hair loss (Joanna, 2022), aiding key benefit 1. Moreover, vitamin E, which is also present in the fruits' peel protects the scalp from damage (Joanna, 2022).

Clove

Cloves are the unopened flower buds of *Syzgium aromaticum* trees and are commonly used in Indian cooking (Pal, 2022). The presence of vitamin K in cloves promotes blood circulation, stimulating hair growth and assisting in key benefit 1 (Khan, 2024). Clove also consists of the compound eugenol which, when applied to the scalp, can strengthen hair roots (Khan, 2024). Therefore, cloves are also involved in the function of key benefit 3 .

Long Pepper

Long pepper is a fruit, roughly the size of a poppy seed, that derives from the long pepper flowering vine. It is grown mainly in India and the Indonesian island of Java (Covington, 2022). When applied topically, long pepper can stimulate hair growth due to its anti-inflammatory and antioxidant properties (Moolihai, 2020). Therefore the ingredients assists the Ayurbala Hair Regenerative Oil in the increased hair growth aspect of key benefit 1.

Summary Table

Key Benefit	Ingredients Aiding the Benefit's Function
1: Stimulate hair growth and stop hair loss	Rice Bran Oil Sesame Oil Kaffir Lime Peel Camphor Long Pepper Black Cumin Seeds Garden Cress Seeds Dill Seeds Clove Turmeric Boraphet
2: Help treat scalp conditions caused by bacteria or fungi	Coconut Oil Rice Bran Oil Phlai
3: Reduce dandruff and strengthen hair root	Coconut Oil Rice Bran Oil Sesame Oil Kaffir Lime Peel Camphor Black Cumin Seeds Garden Cress Seeds Fennel Seeds Clove Ginger Turmeric Phlai

Conclusion

In conclusion, each ingredient contributes to the function of at least one of the 3 key benefits, with most assisting with the third benefit (12 ingredients) and the least to the second benefit (3 ingredients). However, this does not necessarily imply that the second key benefit is the least prominent in its function as the minimal quantity of ingredients could be because there has not been much research on how the other ingredients contribute to treating scalp conditions caused by bacteria or fungi. Moreover, there were other benefits for the hair of some of the ingredients, such as dill seeds and lice treatment, which were not advertised by the Ayurbala Hair Regenerative Oil. This might be due to the fact that since that was the only ingredient found to treat lice, the impact of this function is not too great in the product as a whole.

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